STATUS REPORT

ON THE

YELLOWSTONE CUTTHROAT TROUT

(*Salmo clarki bouvieri*)

IN MONTANA

Submitted to:

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

By

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INTRODUCTION

This report discusses the present distribution of Yellowstone cutthroat trout (Salmo clarki bouvieri) in the state of Montana, exclusive of the national parks. For at least the last 20 years, fishery biologists in the state have been aware of a continuing loss of Montana's native cutthroat trout populations. According to Behnke (1972), similar loss is occurring throughout the western United States. A conservative estimate is that 99% of the original populations of S. clarki in the interior regions of the United States have been lost in the last 100 years. Because of this suspected loss of individual populations, the Montana Department of Fish Wildlife and Parks (MDFWP) initiated this study to document the past and present distribution of cutthroat populations within the state. Two separate studies have been undertaken--one on the westslope cutthroat (Salmo clarki lewisi) and this report on the Yellowstone cutthroat (Salmo clarki bouvieri).

POPULATION EVALUATION

Taxonomy and Distribution

The Yellowstone and westslope cutthroat trouts are similar in morphological and meristic characteristics. However, they do differ greatly in basic spotting patterns (see Figures 1 and 2). Yellowstone cutthroats have larger and fewer spots than the westslope. Additionally, the spots are distributed all over the body, whereas the westslope tends to have few spots below the lateral line. Roscoe (1974) examined both subspecies for differences in meristic and morphological characters and reported finding only that the gill raker counts and pyloric caeca differed significantly between the subspecies. Behnke (1979) presented the following counts for these two meristic characters:

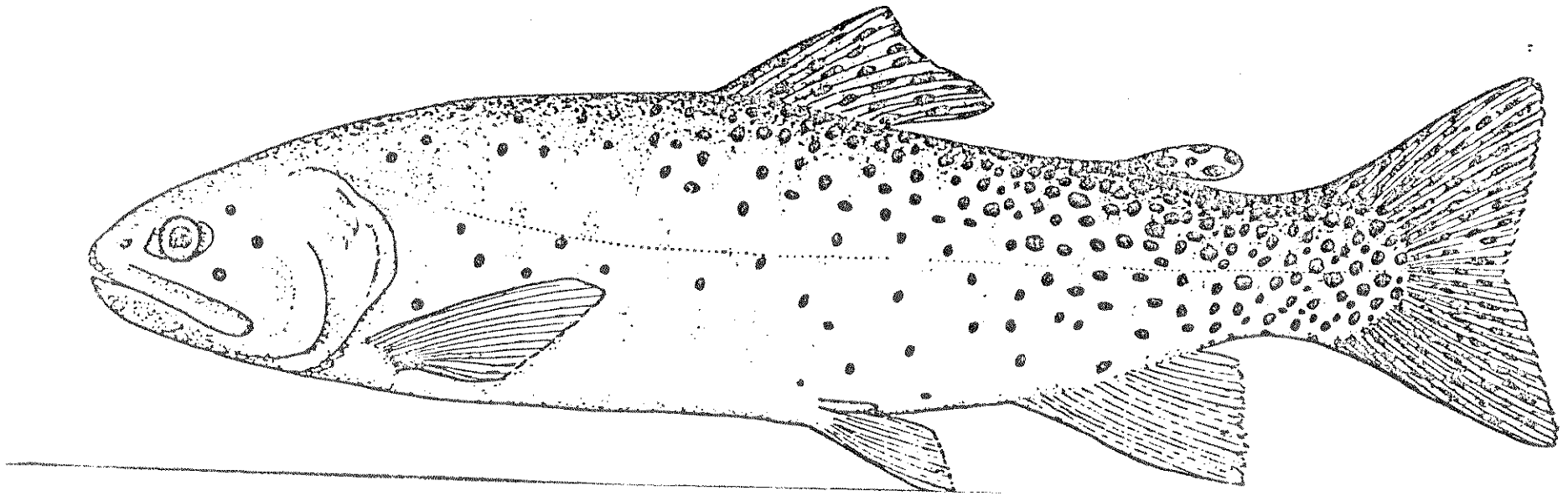

Figure 1. Spotting Pattern Of The Yellowstone Cutthroat Trout
(From Roscoe, 1974)

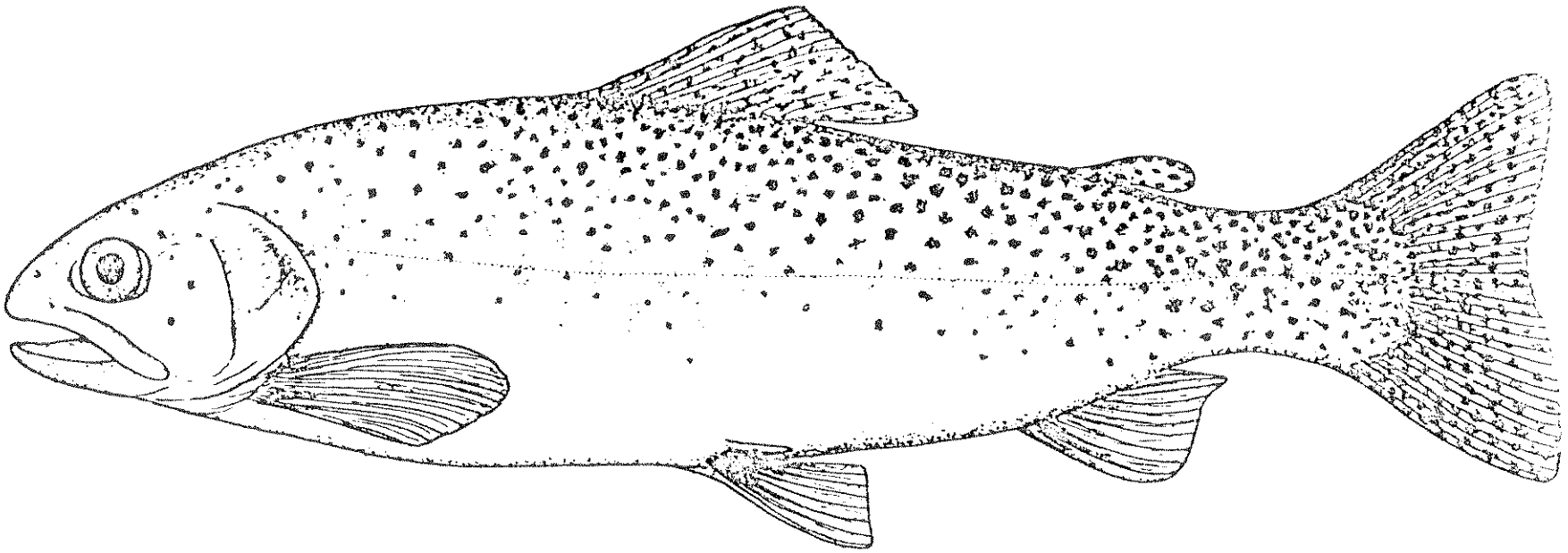

Figure 2. Spotting Pattern Of The Westslope Cutthroat Trout
(From Roscoe, 1974)

	Yellowstone Cutthroat	Westslope Cutthroat
Pyloric caeca	35-43 (range 25-50)	30-40 (range 25-50)
Gill rakers	19-20 (range 17-23)	18-19 (range 17-21)

Cutthroat trout are considered a polytypic species with several geographically distinct forms. This species exhibits the most extensive continental distribution of the western North American trouts (Behnke, 1972). Behnke (1979) recognized 15 subspecies, two of which he considers extinct (Salmo clarki maconaldi, Colorado, and Salmo clarki subspecies, from the Alvord Lake basin of northwestern Nevada and southcentral Oregon). Of the remaining 13 subspecies, eight are considered to be in a threatened, endangered or unknown status by state and federal governmental agencies.

In Montana, two subspecies are found, Salmo clarki lewisi (westslope trout) and S. clarki bouvievi. In addition, S. c. lewisi found east of the Continental Divide is further divided into a distinct race commonly referred to as the Missouri River cutthroat.

The taxonomy of Salmo clarki has been in a confused state for the last 100 years. The meristic characteristics of the cutthroat trout in the various western basins are similar, while quite different external appearances occur frequently between these cutthroat (Roscoe, 1974). Many early investigators were confused by the presence of several different forms of cutthroat trout, rainbow trout and a form of trout which appeared to be intermediate between the rainbow and cutthroat trouts (Roscoe, 1974). The general situation has been further confused by the natural hybridization with rainbow and golden trout, by the introduction of cultured hybrids into the cutthroats' range and by the transfer of coastal and interior forms into each other's regions and the resulting introgression of the two forms (Scott and Crosman, 1973). At

one time, the Yellowstone cutthroat was called by the westslope cutthroats subspecies name, lewisi, due partly to the theory that the Yellowstone cutthroat gave rise to the upper Missouri cutthroat. This theory has since been discarded, but this example does show how much confusion existed in the taxonomic classification of this species.

More recently, the taxonomy of the cutthroat trout has been the focus of a number of researchers' efforts. Chief among those has been the work of Dr. Robert Behnke (1979), who presents the most recent data and theories on cutthroat taxonomy, distribution, life history, and present status.

Cutthroat trout were first observed in Montana on the east side of the Continental Divide near Great Falls, Montana, by Lewis and Clark in 1806 (Roscoe, 1974). Cutthroat trout similar to those described from the Great Falls area were also observed in the Beaverhead, Gallatin, Clark Fork, Upper Missouri River, Kootenai, and Flathead drainages. These trout are now considered westslope cutthroats and are believed to represent the first divergence of interior cutthroat trout from a coastal cutthroat ancestor (Behnke, 1979). Behnke groups all trout from the upper Columbia, South Saskatchewan and upper Missouri basins as this subspecies.

The Yellowstone cutthroat is thought to have been derived from a different ancestral stock than the westslope cutthroat. The original range of Yellowstone cutthroat is unknown; however, it is believed that the Yellowstone cutthroat was native to the entire Snake River system, although it has been replaced by redband trout below Shoshone Falls of the Snake River and by the westslope cutthroat in the Salmon and Clearwater drainages (Behnke, 1979, and Wallace, 1979). It is believed that the Yellowstone cutthroat invaded the Yellowstone drainage from the Pacific Creek of the Snake River, over Two Ocean Pass, to the Atlantic Creek of the Yellowstone River drainage. Evermann

(1896) described the Two Ocean Pass area, which is located in Yellowstone Park along the Continental Divide, as follows:

> Two-Ocean Pass is a nearly level piece of meadow land surrounded by high hills except where narrow valleys of the Pacific and Atlantic creeks open out from it. Atlantic Creek is a branch of the Upper Yellowstone River. It is certain that there has been and usually is a free waterway through Two-Ocean Pass of such a character as to permit fishes to pass easily and readily from the Snake to the Yellowstone or in the opposite direction.

Behnke (1979) suggested a modification of Evermann's overland route which was based upon his own observations in 1967. He felt that Yellowstone trout ran up the head of Atlantic Creek for spawning but did not enter Two Ocean Creek or Pacific Creek. Instead, he felt that the actual mechanism for travel across the Divide was North Two Ocean Creek, which divides with one branch becoming Pacific Creek (Snake River tributary) and one branch Atlantic Creek (Yellowstone tributary).

The S. c. bouvieri became established approximately 8,000 years ago in Yellowstone Lake. In the Yellowstone drainage, the native cutthroat spread in all tributaries as far east as the Tongue River (see Figure 3). Behnke (1979) concluded that the Yellowstone cutthroat trout never spread in the Missouri basin beyond the Yellowstone drainage.

Presently in Montana, Yellowstone cutthroats can be found in the Yellowstone drainage basin and also outside of their native drainages due to stocking efforts by governmental agencies.

LIFE HISTORY

Any discussion on the life history of S. c. bouvieri is made difficult due to the past confusion on the taxonomy of this subspecies. Therefore, much of the information presented below is derived from the species level.

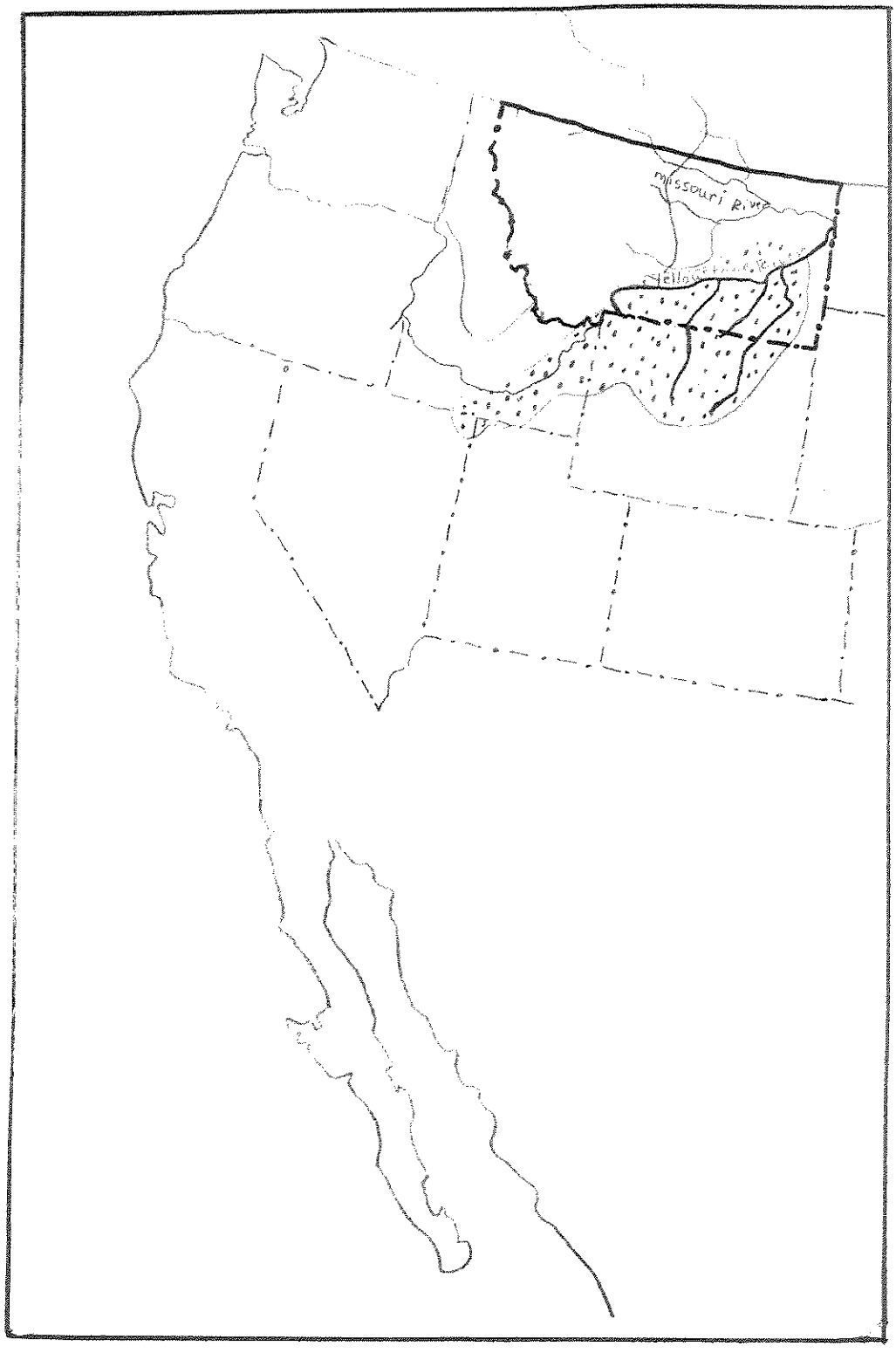

Figure 3. Distribution Of The Yellowstone Cutthroat Trout

Reproduction

Adult cutthroat trout inhabit clear, cold rivers and streams and clear, cold, deep, oligotrophic lakes. Preferred habitat characteristics include silt free, rocky substrates in riffle areas; a 1:1 pool to riffle ratio with areas of slow, deep water; stable water flows, banks and temperature regimes with abundant instream cover (Hickman et al., 1981). Adult cutthroat trout spawn in small streams with gravelly substrates in riffle areas. Spawning first occurs in males at ages II+ to III+ and in females at ages III+ to IV+ (Hickman et al., 1981). In tributaries to Yellowstone Lake, fish in the spawning runs range from age 3 to 7 years with fish of age group IV+ and V+ composing 77 to 98% of the runs from 1951 to 1959 (Bulkley, 1961).

The Yellowstone cutthroat spawn in spring and early summer when the water temperature approaches 10°C (50°F) (Scott and Crossman, 1973). Other researchers have found spawning to occur when water temperatures are between 6 and 17°C (Hickman et al., 1981, MDFW&P, 1975). Water velocities at redd sites range from 31 to 92 cm/sec with optimal velocities of 11 to 40 cm/sec (Hickman et al., 1981). Optimal spawning substrate should contain no more than 5% fines.

The female prepares a redd by lying on her side and thrashing her tail up and down to create a depression which is usually at least 305 mm (1 foot) in diameter and 102 to 127 mm (4 to 5 inches) deep. More than one male may take part in the spawning act. Eggs are released by the female, fertilized by the male and settle between the spaces in the gravel. After spawning, the females cover the redd with as much as 152 to 203 mm (6 to 8 inches) of gravel. Females may make more than one redd, and males may spawn with more than one female. In lake environments, Yellowstone cutthroats suffer a high

post spawning mortality rate. If a female survives to spawn a second time, it typically occurs two years later.

The average number of eggs produced per female is 1100 to 1700, although egg numbers can range from 226 to 442 for females 201 mm to 434 mm (7.9 to 17.1 inches) in length (Scott and Crossman, 1973). In westslope trout in Montana, the average number of eggs produced per female varies with body weight from 431 eggs for a female spawner weighing 122 g to 2025 eggs for a female weighing 956 g (Smith et al., 1983). Campbell (1971) reported that for female fish aged II+, the number of eggs produced varied from 136.2 to 474 eggs.

In the upper Yellowstone River, a pure strain population of Yellowstone cutthroat exists. Tagging studies of this population have shown that adult cutthroats run as far as 19 to 23 kilometers (12 to 14 miles) up the Yellowstone River to the mouth of a tributary (Cedar Creek) and up the tributary to spawn (Berg, 1978). Spawning was found to occur from mid-June to mid-July in 1973 and 1974 and from late June to late July 1975 (MDFWP, 1975). Peak spawning occurred in Cedar Creek when water temperatures ranged from 12.2°C to 13.3°C (54°F to 56°F). In three years of data collection, males were predominant in the beginning and end of the spawning run, while at the peak of the runs the sex ratio was nearly 1:1 (MDFWP, 1975). Average lengths of the spawners from the Yellowstone River were 358 mm (1973), 353 mm (1974) and 345 mm (1975), respectively (MDFWP, 1975).

In Yellowstone Lake tributaries, mean total length of spawners was found to vary from year to year (353 to 401 mm) with statistically significant changes occurring in some years. These changes were decreases in mean length in northern streams and increases and decreases in fish length in southern streams. Cope (1953) explained that the fishing pressure along the north shore of Yellowstone Lake was much more intense than along the southern shore

(95% of angler effort was on northern shore), while he felt the decrease and increase in the southern tributaries were likely due to natural fluctuations in the population.

Eggs are usually 4.3 to 5.1 mm in diameter, demersal and adhesive at first (Scott and Crossman, 1973). Eggs hatch in 28 to 49 days (depending on water temperatures), and the fry remain in the gravel for up to 2 weeks after hatching. Suitable incubation substrate gravel is 0.3 to 8 cm in diameter with water column velocities over the redds ranging from 11 to 92 cm/sec with optimal velocities from 30 to 60 cm/sec (Hickman et al., 1981). After emergence, the fry exhibit one of three dispersal patterns: they move downstream to a larger river or lake (this occurs in the Yellowstone River with mainstem adults migrating to small tributaries to spawn and the alevins returning to the mainstem to mature); they move upstream from an outlet river to a lake (this occurs in the Yellowstone Lake cutthroats); or they undergo a local dispersion within a common spawning and rearing area to areas of low velocity (Hickman et al., 1981). Fry in streams prefer shallow water with slow velocities (<30 m/sec, preferring <8 m/sec). Juveniles are most often found at water depths of 45 to 75 cm where water velocities range from 25 to 50 cm/sec. Juveniles use overhanging banks and rubble for cover. Optimal temperature for early growth is 15°C (Hickman, 1981).

Movement

S. clarki bouvieri exhibits reproductive homing behavior. As stated earlier, spawning adults from the mainstem Yellowstone River return to the tributaries in which they were hatched. Berg (1978) reported,

> A high return of tagged fish to Cedar Creek (tributary to Yellowstone River) in years subsequent to their initial tagging in Cedar Creek indicates a strong homing instinct. Similar homing instincts of cutthroat trout have been reported in tributaries to Yellowstone Lake

in Yellowstone National Park. The study in Yellowstone Park indicated that only 1 to 15% of cutthroat spawned each year after reaching maturity, 10-26 percent were biennial spawners and 46 percent skipped 2 years. If expected mortality of cutthroat spawners between spawning seasons and the possibility of biennial or triennial spawners are considered, the homing rate of cutthroat spawners to Cedar Creek is remarkably high.

LaBar (1971) summarized the research on homing by Yellowstone cutthroats. He states that only a small percentage of repeat spawners entered streams different from those in which they originated. The mechanisms which allow the cutthroat to home are not known; however, LaBar suggests that more than a single cue is used to locate the home stream and, in smaller streams, visual cues may be more important than olfaction. McCleave (1967) found that blocking the olfactory or visual sense did not affect the percent of trout homing or straying to spawning tributaries of Yellowstone Lake. He did find, however, that visual cues did increase the speed of homing.

Age and Growth

Growth and potential maximum size for cutthroats is greatly influenced by environmental factors and varies from stock to stock. In Yellowstone Lake, the maximum age is VII. Yellowstone Lake cutthroat introduced in South Gap Lake, Wyoming, lived to ages X and XI (Behnke, 1979), although they were only 279 mm to 880 mm (11 to 13 inches) long (elevation was slightly over 11,000 feet). Carlander (1969) gives an extensive summary of age-length relations indicating area, altitude and habitat.

Food

Food of this species consists mainly of insects and small fish. The young start feeding 14 to 23 days after hatching, and the food at first is small invertebrates. River and lake dwelling fish feed mostly on fishes (Scott and Crossman, 1973).

Cutthroats tend to occupy headwater streams when competing with other trout. Most headwater streams are relatively unproductive with most energy inputs to the stream in the form of allochthonous materials. Canopy cover is important for maintaining stream temperature and providing allochthomous materials to the stream. Adult invertebrates are usually most numerous in riffle areas, and a pool to riffle ratio of 1:1 is optimal for trout rearing and trout food production (Hickman et al., 1981).

The prime requirements for optimal feeding stations appear to be low water velocity and access to food supply (Hickman et al., 1981), i.e., energy accretion at a low energy cost. Feeding stations of dominant and subdominant adult trout will include overhead cover where available. Feeding stations of subadult and juveniles may not always include cover. A cover area of $\geq$25% of total stream area will provide adequate cover for adults, while $\geq$15% is adequate for juveniles.

POPULATION STATUS

Historical Abundance

The Yellowstone cutthroat trout in Montana was at one time abundant in most of the waters of the Yellowstone River basin from the Montana-Wyoming border to the Tongue River system. Evermann (1894) suggested that Yellowstone cutthroats were quite abundant in the Tongue River basin and further reported that

> Small parties have reported as many as 800 fish taken with hook and line in a few days (in Tongue River). There is so much fishing done now in that region that most residents are of the opinion that if something is not done to stock the stream its fame as a fishing resort will soon be lost.

Yellowstone cutthroat trout began to decline by 1894 as a result of fishing pressure and increased water and land use (Hanzel, 1959). In 1957-1958,

Hanzel investigated the distribution of cutthroat trout in Montana. He made collections on the Yellowstone River from the Montana-Wyoming border to the mouth of the Big Horn River and found that the Yellowstone cutthroat was present in the Yellowstone River for a distance of 145 km (90 miles) downstream from Yellowstone National Park and that remnants of pure cutthroat trout were mostly confined to the small headwater streams. Hanzel further reported that cutthroat trout were recorded from 63 streams and 25 lakes but were predominant in only 23 streams and 12 lakes.

The Yellowstone cutthroat today is found only in a fraction of its original range. Various reasons have been given for this decline including hybridization of cutthroats with rainbow and golden trout, indiscriminate stocking of different cutthroat strains and rainbow trout into pure yellowstone cutthroat waters, competition by brown trout and perhaps brook trout, and finally dewatering of spawning tributaries and man-caused perturbations to cutthroat stream environments.

Present Status

To determine the present distribution of Yellowstone cutthroat in Montana, an analysis of the MDFWP's computerized fisheries data base was performed. The data base is a state-wide depository of fisheries data collected primarily by department personnel with limited contributions from federal agency personnel. However, the data base does not necessarily contain all of the fisheries data collected by the department. Most data entries were between 1977 and 1981 with the exception of stocking records which went back to the 1920's. The computer data base is divided into three basic components: a lake data base, a stream data base and planting (stocking) records.

Methods

The Department used the computerized data base to generate a list of lakes and streams (exclusive of the National Park System) where the only trout species present was thought to be Yellowstone cutthroat. A second list was generated which included the lakes and streams where Yellowstone cutthroat were found with brook trout and/or brown trout. These species were considered competitors of the Yellowstone cutthroat but were not considered to be species where hybridization would occur. The Department's data file on each stream or lake generated by the computer was then examined to determine what trout species were present and their relative abundance; whether the stream or lake was planted and if it was, the numbers and kinds of fish stocked.

A stream and lake value rating system was developed in an attempt to rank the likelihood of identifying relatively pure Yellowstone cutthroat populations. The rating system was predicated upon two assumptions:

1) If rainbow, golden trout or other cutthroat strains were found in the same waters as the Yellowstone cutthroat, then it was likely that the Yellowstone genotype had been contaminated.

2) If rainbows, golden trout or other cutthroat strains were stocked into waters containing Yellowstone cutthroats, then the likelihood of pur strains of Yellowstone cutthroat remaining were not known and assumed to be contaminated.

The rating system ranking is as follows:

Class 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

Class 2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

Class 3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exists but competitors are present, or planting records indicate that a competing species was planted in the drainage.

Class 4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

Class 5 - Waters designated by field personnel as containing pure Yellow stone populations where contaminating species are known to exist. Competitors may/may not be present.

Stream and Lake Data

A total of 138 stream reaches and 194 lakes were examined from MDFWP's regions 1, 2, 3, 4, and 5 (see Figure 4 for region locations).

Region	# of Streams Reviewed	# of Lakes Reviewed
1	2	21
2	0	12
3	102	37
4	1	17
5	30	107

Regions 3 and 5 represent the areas of the state where the Yellowstone cutthroat was believed to be historically distributed. Regions 1, 2 and 4 represent areas where the westslope cutthroat (*S. C. lewisi*) is the "native," and it may be assumed that the Yellowstone cutthroat is present only as a result of past stocking efforts.

As stated earlier, an inherent assumption at the beginning of this study was that all streams examined contained populations of *S. c. bouvieri* alone or were sympatric with brook and/or brown trout.

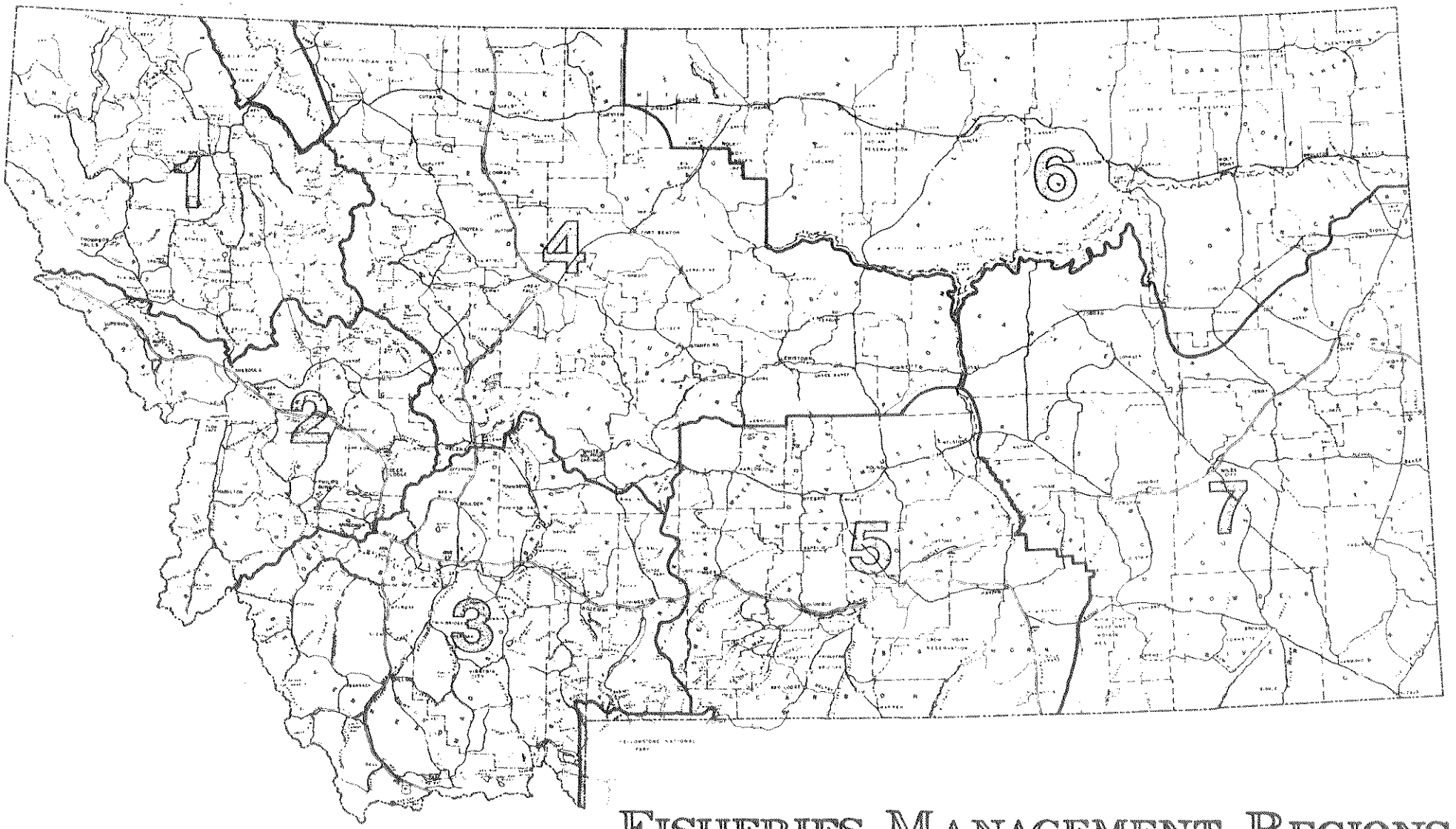

Figure 4. Map Of The Study Area With Region Locations

Stream Data

Of the 138 streams reviewed (Tables 2-4), 19% (26) were found to contain pure populations of Yellowstone cutthroat trout and 17% (23) contained pure populations of Yellowstone cutthroats with either brook trout and/or brown trout (both being classified as competitors). These two competing species were found in approximately an equal number of stream reaches.

Of the remaining 89 stream reaches examined, 36% (50) were found to have had a history of contaminant species stocking although no contaminants were known to presently exist in the streams. The predominant contaminant stocked was Salmo clarki subspecies (designated in Tables 2-4 Udct). The genetic history of this contaminant is confused, not traceable, and the genotype is considered by the Department not to be pure strain Yellowstone cutthroat.

Stream reaches where Yellowstone cutthroats were sympatric with contaminant species numbered 39(28%), with rainbow trout the predominant contaminant in Regions 3 and 5. Interestingly, of the 37 stream reaches where rainbow trout were found, rainbow-cutthroat hybrids were also present in 22 of them.

The population status of the stream dwelling Yellowstone cutthroat within the stream reaches examined was found to be in a relatively unhealthy state. In approximately 70% of the streams examined, the populations were characterized by the field biologists as being uncommon, rare, abundance unknown or presence not verified but expected. The remaining populations were characterized as being common and/or abundant. In only one case was a population classified as being common and having a significant number of large-sized fish.

Another method of data analysis was undertaken to aid in the determination of the present distribution of stream dwelling Yellowstone cutthroats.

The total number of stream kilometers evaluated was tallied for each stream value class (1-5). Table 1 portrays the results. This data provides an additional dimension to the analysis. For example, although 18% of the streams contained allopatric populations of Yellowstone cutthroat trout, they made up only 11% of the total stream kilometers evaluated.

TABLE 1

Stream Inhabitants	Total Stream Length	Percentage of Total km Examined
Yellowstone Cutthroat Only (Class 2)	147.7 km	11%
Yellowstone Cutthroat & Competitors (Class 3)	176.4 km	13%
Yellowstone Cutthroat & Stocked Contaminants + Competitors (Class 4)	453.3 km	41%
Yellowstone Cutthroat + Contaminants + Competitors (Class 5)	536.7 km	35%

*Competitors = brook or brown trout; contaminants = rainbow, golden trout or other cutthroat forms.

Lake Data

Of the 194 lakes reviewed (Tables 5-9), 40% (77) were found to contain only populations of Yellowstone cutthroat trout, while an additional 40% contained Yellowstone cutthroats and had a history of contaminant species stocking (Figure 6). The predominant contaminant stocked was Salmo clarki subspecies. As mentioned earlier, the genetic history of these fish is quite confused and their genetic purity as Yellowstone cutthroats is doubtful.

Examination of the mountain lake data revealed that in only 5% (10) of the lakes were competitor species present with Yellowstone cutthroat trout. In all cases, the competitor species was brook trout with brown trout never being recorded in any of the lakes reviewed. Additionally, there were no trout species present in 14 lakes, but these lakes were designated by the Department's field biologists as potential habitat for Yellowstone cutthroat introductions.

Lakes where Yellowstone cutthroat trout were sympatric with contaminant species number 15 (8%), with golden trout the predominant contaminant in Region 5 and the westslope cutthroat trout the predominant contaminant in Region 1 (actually, the Yellowstone cutthroat should probably be considered the contaminant in Region 1 since the westslope subspecies is native there and the Yellowstone cutthroat introduced).

In terms of the population status of the Yellowstone cutthroat lake populations, slightly over half of the lakes reviewed were categorized as having common or abundant populations of Yellowstone cutthroats, while almost 10% had populations which were characterized as having a proportional number of large-sized fish (Tables 4-8). However, approximately 11% were found to have populations which were considered to be rare, unknown or uncommonly found.

Discussion

These data indicate that the decline in the geographic distribution of the Yellowstone cutthroat observed by many investigators continues. If it is assumed that the computer list of data provided by the Department was derived in a manner which accurately reflected the Department's understanding of Yellowstone cutthroat trout distribution in the state, then it can be concluded that there has been a continual, significant loss in Yellowstone cutthroat

trout populations in Montana. If only 24% of the total stream kilometers examined in this study contain what we tentatively believe are pure strain Yellowstone cutthroat trout, then a strategy for management of this subspecies becomes all the more important.

One further analysis could be made to perhaps better illustrate the loss in Yellowstone cutthroat populations in Montana through time. If we assume that the Yellowstone cutthroat originally inhabited all the waters of the upper Yellowstone drainage, we know that that drainage is composed of approximately 4217.3 stream km's. Using the data generated above, our best estimate of the total number of stream kilometers where we believe pure strain yellowstone cutthroat presently exist is only 324 km or approximately 8% of their original range as it was reported by Starr in 1889 (Hanzel, 1959) (Figure 7).

FACTORS AFFECTING POPULATION ABUNDANCE

Genetic Contamination

As stated earlier in this report, there has been and continues to be a significant decline in the population of genetically pure Yellowstone cutthroat trout in Montana. Most evidence suggests that the overriding causative factor has been the stocking of rainbow trout in Yellowstone cutthroat waters and the resultant hybridization and genetic contamination of the species. Hanzel (1959) reported that rainbow trout was first introduced in Montana in 1891, has been extensively stocked since that time and that in practically all cutthroat drainages where rainbows were introduced, hybrids between rainbows and cutthroats can be found. The data developed during this study substantiates this finding.

Another stocking problem has been the mixing of pure strain Yellowstone cutthroats with other cutthroat stocks, resulting in a dilution of the pure

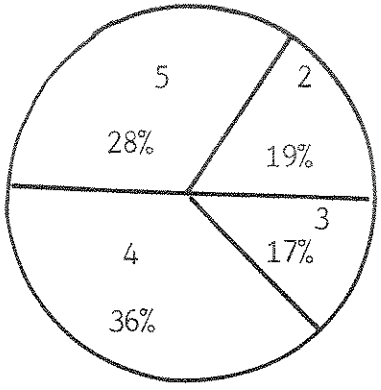

Figure 5. Percent Distribution Of Yellowstone Cutthroat Stream Populations Within Each Stream Value Class

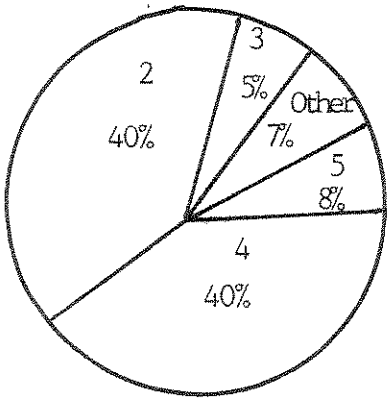

Figure 6. Percent Disrtibution Of Yellowstone Cutthroat Lake Populations Within Each Lake Value Class

STREAM AND LAKE VALUE RATING SYSTEM

Class 1= Documented, genetically pure Yellowstone cutthroat trout populations present.

Class 2= Pure Yellowstone cutthroat trout populations as designated by field personnel.

Class 3= Pure Yellowstone cutthroat trout populations as designated by field personnel + competing species present.

Class 4= Yellowstone cutthroat trout populations where no contaminating species are present but the drainage has a record of contaminate species stocking in the past;± competing species.

Class 5= Yellowstone cutthroat trout + contaminating species present in the drainage ± competing species present.

(Competing species= brook trout and/or brown trout; Contaminating species= rainbow, golden trout or other cutthroat forms)

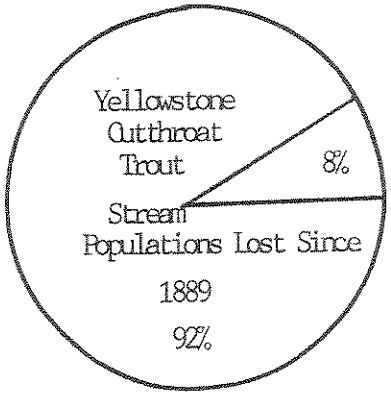

Figure 7. Percent Distribution Of Total Stream Kilometers Of Yellowstone Cutthroat Trout Habitat Lost Since 1889.

strain genotype. This has occurred in the native ranges of both Yellowstone and westslope cutthroats. Marnell (1984) reported that the westslope cutthroat has suffered gene pool contamination resulting from hybridization between native trout and introduced fishes in Glacier Park. Evidently, over 45 million fish were stocked in Glacier Park between 1912 and 1960, with most of these being Yellowstone cutthroats.

Habitat Perturbations

Human related impacts on the environment of the Yellowstone cutthroat include dewatering of tributary streams, logging and mining activities, livestock grazing, and exploitation by fishermen. Quantitative studies to determine the relative impact of each of these factors to the environment of the Yellowstone cutthroat either have not been done or were not found by this author. However, the MDFWP (1975) completed a fisheries inventory and planning study of the Yellowstone River drainage which included a detailed discussion of human related impacts; this is summarized below. Presently the Department is preparing a report on the Yellowstone River mainstem population which may offer new information on this topic; it will be available this fall (Clancy, 1984).

To further define the relative importance of the various habitat perturbation factors in a non-quantifiable fashion, the professional opinion of the field biologist responsible for management of the upper Yellowstone River drainage (Chris Clancy) was sought. Following is a summary of our conversation:

"In the Yellowstone River cutthroat population, the most urgent problem is the dewatering of tributary streams used for spawning. A less urgent but still significant problem is the fishing pressure received by the mainstem cutthroat population. Logging, mining and livestock grazing effects were all

seen as being of less importance to the mainstem Yellowstone cutthroat population."

For the tributary (Yellowstone cutthroat) populations, Clancy (1984) felt that genetic contamination and dewatering of the lower stream reaches were the most significant problems. Of lesser importance were the pertubations generated by mining, logging and livestock grazing. Clancy (1984) also stated that the effects of competition by other trout species and overfishing of stream dwelling cutthroats are not known at this time.

Dewatering of Streams

Dewatering of streams in the Yellowstone River drainage and dewatering of the tributaries used for spawning by mainstem populations, is a very serious problem. Berg (1978) reported that most major tributaries to the Yellowstone River were dewatered for irrigation purposes immediately after spring runoff. Additionally, he found that during the peak of the 1974 irrigation season, 15.7 miles of streams in the Shields River mainstem and Yellowstone and Shields Rivers were completely dewatered, 18.7 miles had only a "trickle flow" and 23.5 miles contained less than the minimum flow necessary to sustain a good fishery. (MDFW&P 1975) If the Yellowstone River supports a number of genetically distinct groups of Yellowstone cutthroats which segregate for spawning purposes, then these groups may be eliminated with complete dewatering of the tributaries. The remaining few tributary streams which sustain migrant Yellowstone cutthroat are likely to be vital to the future survival of the mainstem population (Berg, 1978). Further information on dewatering effects in the Yellowstone drainage can be found in MDFW&P (1975).

Livestock Grazing

In tributaries supporting moderate to heavy livestock grazing, the stream banks tend to be destabilized and the riparian vegetation reduced or destroyed. Thurow (1981) observed a higher proportion of silt substrate, channels consisting of fewer pools, few undercut banks and minimal riparian vegetation in moderate to heavy livestock grazing situations. Behnke (1979) reported that trout biomass was found to be 3 to 4 times higher in protected sections of streams than in sections exposed to livestock grazing. These changes frequently trigger a subsequent change in the channel morphology so that a habitat characterized by slow, deep water with abundant cover is converted to a shallow, high-velocity flow without cover, causing a decline in trout abundance (Behnke, 1979).

In the Shields River drainage, a study of man-made alterations to the stream bank and channels was performed by Johnson (1964). This study found that 142 alterations had occurred, including 59 dikes, 63 riprapped banks, 6 channel clearances and 14 channel relocations. Of these changes, agricultural activities accounted for 89% of the altered miles. The number and weight of game fish was 90% lower in an altered stream section than in an unaltered section (MDFWP, 1975).

Logging

Extensive clearcutting of forested areas has occurred on both private and U.S. Forest Service lands in the headwater basin of the Shields River. Documented physical impacts of logging on the lentic environment include increased peak discharges, reduced late summer flows, increased stream temperature, soil erosion, increased stream turbidities and sediment loads, and reduced light penetration impairing primary production in streams (MDFWP,

1975). Any major logging and road building activity has the potential to adversely affect the Yellowstone cutthroat trout. Peak water flow increases may cause impacts on stream channels during the spring spawning period. Sediments deposited in riffle areas could smother eggs or newly hatched fry. Reduced water yields in the fall could mean a severe dewatering of the stream.

Exploitation

The Yellowstone cutthroat trout is probably the easiest fish to catch of the four major trout species present in the state (brook trout, brown trout and rainbow trout). The vulnerability of the cutthroat trout to angling has been observed by many researchers. However, whether exploitation of this subspecies by fishermen has historically been a major reason for its decline is unclear. Studies exploring this problem either have not been accomplished or were simply not found by this author.

More recently, evidence has been collected by the MDFWP which suggests that exploitation by fishermen has become a serious problem in the Yellowstone River cutthroat population. Clancy (1984) reported that there is a continuing trend toward smaller average lengths in the Yellowstone River cutthroat population, smaller sized (length) spawners and higher average annual mortality rates. For example, the average length of mainstem Yellowstone cutthroats in Cedar Creek in 1973, 1974, 1975, and 1983 were 358 mm (14 inches), 353 mm (13.9 inches), 345 mm (13.6 inches), and 335 mm (13.2 inches), respectively (MDFWP, 1975; Clancy, 1984). Additionally, in 1973 36% of the spawners sampled in Cedar Creek were 381 mm (15 inches) or larger, while in 1983 only 13% were found to be longer than 381 mm (Clancy, 1984).

In response to this problem, in 1984 the MDFWP changed the fishing regulations for Yellowstone cutthroats in the upper 80.5 km (50 miles) of the Yellowstone River to catch and release only.

Competition

Various researchers (Hanzel, 1959; Berg, 1978; Benke, 1976) have reported that one of the reasons for decline of pure populations of cutthroats has been the displacement of native trout with more tolerant introduced species, primarily the brook trout and brown trout. However, the areas of competition between these species have not been well documented. Griffith (1972) studied the interspecific interaction between brook trout and cutthroat trout. He found that there was no experimental evidence to suggest that brook trout could displace equal-sized cutthroat trout. However, he did find that juvenile cutthroats dominated equal-sized brook trout. He suggested that stream gradient may influence the distribution of brook and cutthroat trout in streams inhabited sympatrically. When cutthroat and brook trout are found sympatrically, the brook trout tend to be located in low stream gradients, while cutthroats are found further upstream where the gradient increases. Griffith compared allopatric and sympatric habitat utilization by both species and reported only minor interspecific differences for all age groups, suggesting that these differences developed in allopatry and not during the time the two species were sympatric.

RECOMMENDATIONS FOR FUTURE ACTIONS

This report should be looked upon as only the first step in the process of defining the status of Yellowstone cutthroat trout populations within the state of Montana. Other steps which could be taken to further define the Yellowstone cutthroat's status in order of priority, are as follows:

1. FWP's Regions 3 and 5 should have their field biologists review this report to determine whether they believe it accurately reflects the cutthroat situation as they understand it. Of particular importance is whether the data gathered in Tables 1-8 are up to date and whether additional data are available.
2. The Department should determine whether it wishes to preserve the remnant populations of pure strain Yellowstone genotype and define the role it should play within the state's fishery management scheme.
3. The Department should develop a management strategy/plan for the Yellowstone cutthroat trout. Components of this plan could include:
   a) Identification of all waters to be managed for pure strain Yellowstone cutthroats.
   b) Identification of new waters to transplant pure genotypes into, if warranted. (Use data already on data base with recommendations made by field biologists.)
   c) Development of mechanisms to allow protective management of these waters, such as:
      1) Agreements with federal agencies which will allow a vigorous protection of these waters from mining, logging, and grazing abuses.

2) Development of special angling regulations which will protect this subspecies and increase the harvest of competing and contaminating trout species.

3) A designation of "highest-value fishery resource" for all waters identified in (a) and (b) above. This would afford some protection to the drainages from resource development projects.

4. The Department should undertake a field reconnaissance of all the stream reaches classified as containing pure strain Yellowstone cutthroat (Stream Value Rating 2). The purpose of this effort would be two-fold: to obtain representative samples of S. c. bouvieri and to evaluate the stream habitat for S. c. bouvieri production. (It would be best if one person evaluated all stream reaches since subjective determinations are involved.)

5. The Department should send samples of S. c. bouvieri collected in #2 above for electrophoretic analysis and should send portions of the same samples for morphometric examinations and identifications.

6. A study is needed to determine the role that the state hatcheries should have, if any, in propagating pure strain Yellowstone cutthroat trout.

7. Additional studies are needed to more specifically determine the effects of logging, mining and livestock grazing on Yellowstone cutthroat populations in the Upper Yellowstone drainage system; to determine the effect of competition from brook, brown and rainbow trout on Yellowstone cutthroat populations; to determine the magnitude and significance of fishing pressure on stream populations of Yellowstone cutthroats.

TABLE 2

DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED DRAINAGES OF FW&P'S REGION 3(6)

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
Armstrong Spring Creek	Yellowstone River	C	Rb(A), Bn(A)	0.5	T 1928-1964 302,026 Rb; 40,400 Udct; 111,050 Bn	5	H/G
Adair Creek	Shields River	C	None	6.0	None	2	S/H
Anderson Creek	Mill Creek (Shields River)	A	None	2.6	T 1942-1947 9,128 Udct; 7,000 Yct	4	H/G
Area Creek	Billman Creek (Shields River	U	None	8.0	None	2	L
Bangtail Creek	Shields River	C	Bk(C)	16.4	T 1942-1953 15,720 Bk; 39,000 Bn	3	S/H
Bassett Creek	Yellowstone River	R	None	7.2	T 1937 1,240 Bk	3	L
Bear Creek - 01	Yellowstone River	U	Rb(U), RbxCt(U)	3.9	N.E.	5	H/H
Bear Creek - 02	Yellowstone River	U	Rb(U), Bk(E), RbxCt(U)	4.8	N.E.	5	L
Beaver Creek	Mission Creek (Yellowstone River)	E	None	4.8	None	2	L
Bennett Creek	Shields River	C	None	7.2	1941-1950 42,096 Udct 18,400 Yct	4	S/H
Big Creek - 03	Yellowstone River	E	None	9.7	T 1928-1973 69,034 Yct; 53,986 Rb, 314,064 Udct	5	L

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
Billman Creek - 01	Yellowstone River	U	Rb(U), Bk(U), Bn(U), RbxCt(U)	17.4	T 1940 15,000 Yct	5	L
Brackett Creek - 01	Shields River	C	RbxCt(R), Bn(C), Rb(U)	23.5	T 1928-1968 10,328 Rb; 121,866 Bk, 124,000 Yct; 87,200 Udct; 248,000 Bn	4	L
Brackett Creek - 02		C	Bk(C), Bn(U)	9.3		4	H/G
Buck Creek	Shields River	R	None	6.4	T 1942-1944 27,000 Yct	2	L
Bull Run Creek	Adair Creek (Shields River)	E	None	1.6	None	2	L
Cache Creek	Flathead Creek (Shields River)	E	Bk(E)	12.1	T 1945-1950 57,000 Udct; 5,000 Bn	4	L
Canyon Creek	Shields River	U	Bn(U)	16.9	T 1942-1952 10,000 Udct; 82,000 Bn	4	L
Cedar Creek	Yellowstone River	U	Rb(U), Bk(R), Bn(U), RbxCt(E)	5.6	N.E.	5	G/G
Clear Creek	Shields River	U	None	4.0	None	2	L
Corral Creek	Red Rock Creek (Beaverhead)	U	Bk(A)	7.4	T 1931 10,200 Udct	3	L
Cottonwood Creek	Big Creek (Yellowstone River)	E	None	9.7	T 1947-1958 72,000 Udct; 25,000 Bn	4	L
Cottonwood Creek	Cinnabar Creek (Yellowstone River)	E	None	4.8	None	2	L
Cottonwood Creek	Shields River	E	None	4.8	T 1951-1968 20,523 Rb; 40,000 Udct	4	L/H

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
Crevice Creek	Yellowstone River	E	None	9.7	T 1943-1952 4,880 Yct; 2,240 Udct	4	L
Daisy Dean Creek	Shields River	R	None	9.0	T 1928-1952 12,500 Rb; 63,600 Udct; 8,000 Bk; 45,000 Bn	4	L
Deep Creek	Shields River	U	None	8.0	T 1928-1949 45,750 Udct; 40,400 Yct	4	L
Dry Creek	Yellowstone River	C	None	8.0	T 1943 5,000 Bn	3	S/H
Dry Creek	Trail Creek (Yellowstone River)	U	None	5.6	None	2	L
Dry Creek	Flathead Creek (Shields River)	U	Bk(U)	9.3	None	3	L
Dugout Creek	Shields River	R	None	12.6	T 1941-1946 3,976 Udct; 18,200 Yct	4	L
Eagle Creek	Yellowstone River	E	None	6.4	None	2	L
East Fork Bear Creek	Bear Creek (Yellowstone River)	E	Rb(E), Bk(E), RbxCt(E)	7.2	N.E.	5	
East Fork Bear Creek	Rock Creek (Shields River)	C	None	3.2	None	2	S
Eight Mile Creek - 01	Yellowstone River	R	Rb(R), Bk(R), RbxCt(E)	6.4	N.E.	5	L
Eight Mile Creek - 02	Yellowstone River	U	Rb(U), Bk(C), RbxCt(E)	7.9	N.E.	5	L

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
Elbow Creek	Yellowstone River	E	None	20.9	L 1932-1946 62,460 Udct; 20,465 Yct	4	L
Eldridge Creek	Coke Creek (Billman Creek)	C	None	4.8	See Coke Creek Entry	2	S/H
Elk Creek	Shields River	C	Bn(U)	9.5	None	3	S/H
Emigrant Spring Creek - 01	Yellowstone River	R	Bk(R), Rb(R), RbxCt(E)	5.6	T 1943 1,400 Rb	5	L/G
Emigrant Spring Creek - 02		R	Bk(R), Rb(R), RbxCt(E)	4.2		5	L/G
Fairy Lake Creek	Cache Creek	E	None	11.3	T 1945-1951 31,000 Udct; L 1950-1980 8,250 Rb; 7,020 Udct; 2,118 Wct; 22,696 Yct	4	L
Ferry Creek	Yellowstone River	R	Bk(C), Bn(R)	4.8	None	3	L
Falls Creek	Shields River	E	None	19.3	None	2	L
Flathead Creek	Shields River	C	Bn(U), Bk(U)	19.2	T 1928-1954 258,200 Udct; 76,650 Bk; 351,900 Bn; 59,000 Yct	4	S/H
Fleshman Creek - 01	Yellowstone River	U	Rb(U), Bk(C), Bn(U), RbxCt(R)	9.5	T 1928 26,250 Udct	5	L
Fleshman Creek - 02		C	Bk(C)	8.9		4	S/H
Fridley Creek - 01	Yellowstone River	U	Rb(U), Bk(C), RbxCt(R)	10.6	N.E.	5	L
Fridley Creek - 02							

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
Fox Creek	Brackett Creek	U	None	4.8	None	2	L
Goat Creek	Smith Creek (Shields River)	C	Bk(U)	2.9	None	3	S/H
Green Canyon Creek	Flathead Creek	C	None	4.8	None	2	S/H
Hammond Creek	Rock Creek	U	None	6.4	T 1939-1942 12,067 Bk; 5,000 Bn	3	S/H
Hellroaring Creek	Yellowstone River	E	None	24.3	None	2	L
Horse Creek	Brackett Creek	R	None	3.2	None	2	L/H
Horse Creek	Tom Miner Creek (Yellowstone River)	C	Bn(R)	12.9	None	3	S/H
Horsefly Creek	Shields River	C	Bk(R)	19.5	None	3	S
Hyalite Creek	Big Creek (Yellowstone River)	E	None	8.0	None		L
Kay Creek	Shields River	C	Bn(C)	5.6	None	3	S/H
Lewis Creek	Big Creek (Yellowstone River)	E	None	7.7	T 1944-1946 2,464 Udct; 10,000 Yct	4	L
Little Mission Creek	Mission Creek (Yellowstone River)	A	None	6.1	T 1940-1954 17,040 Udct; 16,000 Bn; 25,000 Yct	4	H/G
Little Trail Creek	Yellowstone River	R	None	8.0	T 1940-1942 21,000 Rb; 5,000 Yct	4	L
Lodge Pole Creek - Lower	Shields River	E	None	3.9	T 1942-1952 24,976 Udct; 12,000 Yct	4	L
Lodge Pole Creek - Upper	Shields River	U	None	4.5			

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
McDonald Spring Creek	Yellowstone River	C	Rb(C), Bn(A)	3.4	N.E.	5	G/G
Meadow Creek	Smith Creek (Yellowstone River)	C	Bk(C), Bn(U)	5.6	T 1942-1943 20,000 Yct	3	S/H
Middle Fork Horse Creek	Horse Creek (Shields River)	C	None	8.8	T 1942-1952 15,000 Udct; 35,000 Bn	4	S/H
Miles Creek	Brackett Creek	C	Bn(R)	11.3	None	3	S/H
Mill Creek	Shields River	U	None	9.7	T 1931-1973 15,316 Rb; 231,342 Udct; 286,775 Yct	4	L
Mission Creek - 01	Yellowstone River	R	Rb(R), Bn(C), RbxCt(R)	17.2	N.E.	5	L
Mission Creek - 02		U	Rb(R), Bn(R), RbxCt(U)	6.3		5	
Mol Heron Creek - 01	Yellowstone River	U	Rb(U), Bn(R), RbxCt(U)	8.4	N.E.	5	G/G
N. Fork Brackett Creek	Brackett Creek	C	Bn(R), Bk(C)	3.6	T 1928-1968 10,328 Rb; 87,200 Udct; 121,866 Bk; 248,100 BN; 124,000 Yct	4	S/H
N. Fork Elk Creek	Elk Creek (Shields River)	E	None	12.9	T 1942-1954 4,000 Udct; 16,000 Bk; 42,000 Bn	4	L
N. Fork Flathead Creek	Flathead Creek (Shields River)	C	Bk(C)	4.0	T 1945-1951 25,000 Udct; 10,000 Bn	4	S/H

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
N. Fork Eight Mile Creek	Eight Mile Creek (Yellowstone River)	R	Rb(R), Bk(U), RbxCt(E)	5.0	N.E.	5	L
Nelson Spring Creek	Yellowstone River	C	Rb(Z), Bn(Z)	4.0	N.E.	5	G/G
Nixon Creek	Brackett Creek	U	Bn(R)	4.8	None	3	L
Porcupine Creek	Shields River	U	Bn(R)	7.2	T 1928-1954 208,500 Udct; 25,000 Bn; 18,560 Yct	4	L
Queen Gulch	Elkhorn Creek (Jefferson)	C	None	0.8	L 1938-1981 40,000 Udct; 5,918 Yct	3	L
Rock Creek	Yellowstone River	C	None	12.5	T 1928-1947 82,392 Udct; 42,680 Yct	4	H/H
Rock Creek - 01	Shields River	R	Bk(E), Bn(R)	7.2	T 1928-1954 208,500 Udct; 25,000 Bn; 18,560 Yct	4	L
Rock Creek - 02		C	Bk(A), Bn(C)	11.6		4	S/H
Rock Creek - 03	Shields River	C	None	3.7	None	2	S/H
Scofield Creek	Shields River	U	None	3.9	T 1941-1944 18,200 Yct	2	L
Serrett Creek	Shields River	E	None	3.2	None	2	L
Shields River - 03	Yellowstone River	C	Bn(U), Bk(U)	45.9	T 1931-1962 14,340 Rb; 183,004 Udct; 15,250 Bk; 20,296 Bn; 156,108 Yct	4	S/H

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
Six Mile Creek - 01	Yellowstone River	R	Bn(R)	4.8	T 1928-1964 1,500 Rb; 119,156 Udct; 242,079 Yct	4	L
Six Mile Creek - 02		R	Bn(C)	3.4		4	
Six Mile Creek - 03	Yellowstone River	U	Bn(U)	4.7	None	3	
Skunk Creek	Brackett Creek	U	Bn(R)	4.8	None	3	L
Smith Creek - 01	Shields River	A	Bk(C), Bn(U)	4.0	T 1936-1954 90,100 Udct; 71,040 Yct	4	H/G
Smith Creek - 02		C	Bk(U)	3.4		4	S/H
South Fork Elk Creek	Elk Creek	C	None	12.9	T 1942-1944 20,000 Bn	2	S/H
South Fork Horse Creek	Horse Creek (Bear Creek)	C	Bk(C)	8.0	T 1931-1952 87,515 Rb; 33,800 Udct; 35,000 Bn	4	S
South Fork Shields River	Shields River	U	Bk(U)	11.3	T 1941-1954 31,900 Udct; 15,000 Bn; 25,000 Yct	4	L
Spring Creek and Tributaries	Shields River	A	Bn(A)	8.0	None	3	H/G
Suce Creek - 01	Yellowstone River	R	Rb(R), Bn(R), RbxCt(R)	2.4	N.E.	5	L
Suce Creek - 02		R	Rb(R), Bn(R), RbxCt(R)	4.3	N.E.	5	
Suce Creek - 03		U	Rb(U), Bn(U), RbxCt(U)	1.0	N.E.	5	
Tom Miner Creek - 01	Yellowstone River	C	Bn(R)	10.9	T 1936-1962 58,600 Rb; 104,562 Udct; 62,455 Yct	4	G/G

TABLE 2 - Continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)/(5a)
Tom Miner Creek - 02	Yellowstone River	U	None	6.4	T 1936-1962 58,600 Rb; 104,562 Udct; 62,455 Yct	4	L
Turkey Creek	Shields River	U	None	3.2	T 1941-1942 8,200 Yct	2	L
Willow Creek - 01	Shields River	R	Bn(R)	12.2	T 1939-1944 21,590 Yct	3	L
Willow Creek - 02		R	None	1.6		2	L

TABLE 2 - Footnotes

[1]Cutthroat Relative Abundance:
A = Abundant
C = Common
U = Uncommon
R = Rare
E = Presence not verified but expected

[2]Other Trout Species:
Rb = Rainbow Trout
Bn = Brown Trout
Bk = Brook Trout
Udct = Undesignated Cutthroats
RbxCt = Rainbow/Cutthroat hybrid
Gl = Golden Trout
RbxGl = Rainbow/Golden hybrid
Yct = Yellowstone Cutthroat Trout
Wct = Westslope Cutthroat Trout

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species. N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

TABLE 2 - Footnotes (continued)

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Department's field personnel.

[5a]Relative Importance of Stream for Spawning Purposes for Yellowstone River Cutthroats (from Berg, 1978):

G = Greatest Habitat - Contains a migrant population of Yellowstone cutthroat in top quality habitat. Abundance may range from rare-abundant.
H = High Priority Habitat - Same as G except habitat is obviously of poorer quality.

[6]All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

TABLE 3
DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED DRAINAGES OF FW&P'S REGION 5(6)

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Bad Canyon Creek	Stillwater River	Z	Bn(A)	6.4	None	3	S
Bridger Creek	Yellowstone River	R	Bk(C), Bn(U), Rb(R), RbxCt(U)	10.8	N.E.	5	L
Broadwater River	Clarks Fork Yellowstone River	R	Bk(A)	7.2	T 1941-1969 6,795 Rb; 4,000 Yct; L 1933 7,500 Bk	4	L
Brush Fork Willow Creek	West Fork Willow Creek	R	Bk(A)	2.1	None	3	L
Chicken Creek - 01	West Rosebud Creek	Z	None	2.4	None	2	S
Chicken Creek - 02		Z	None	2.4	L 1975-1983 3,455 Yct	2	L
Clarks Fork Yellowstone River	Yellowstone River	R	Bn(U), Rb(R), RbxCt(R)	46.2	T 1941 4,300 Rb	5	L
Crooked Creek	Bighorn River	U	Bk(C)	15.4	T 1941 4,667 Udct	4	S
E. Fork West Red Lodge Creek	West Red Lodge Creek	U	Bk(A)	5.3	T 1950-1980 9,106 Rb; 5,000 Bk; 1,500 Yct	4	L
East Rosebud Creek	Rosebud Creek	A	RbxGl(C), Gl(V), Bk(C)	17.7	L 1967-1980 59,803 Yct T 1932-1981 629,775 Rb; 210,000 Udct; 720 Yct	5	S

TABLE 3 - continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Elk Creek	East Boulder River	A	Bn(A), Bk(C), RbxCt(U)	7.2	N.E.	5	H
Grove Creek	Stillwater River	U	Bn(A), Rb(U)	12.9	N.E.	5	L
Little Rocky Creek	Stillwater River	C	Rb(C), Bn(A)	7.1	N.E.	5	S
Lower Deer Creek - 01	Yellowstone River	R	Bn(C), Bk(C)	23.7	T 1935-1950 144,792 Udct; 30,000 Bn	4	S
Lower Deer Creek - 02		C	Bn(C), Bk(C)	24.8		4	L
Power Creek	East Red Lodge Creek	U	Bk(U), Rb(U)	8.9	N.E.	5	L
Red Lodge Creek	Rock Creek	R	Bn(A), Bk(A), Rb(C)	16.6	N.E.	5	L
Rock Creek	Clarks Fork Yellowstone River	R	Bk(A), Rb(C), RbxCt(C)	4.8	N.E.	5	L
Rock Creek		R	Bk(A), Rb(U), Bn(C)	27.4		5	S
Slough Creek	Lamar River	D	None	16.4	T 1939-1950 99,734 Udct; 47,600 Yct	4	S
Soda Butte Creek	Lamar River	R	Bk(M)	8.0	T 1940-1947 80,450 Yct; 10,000 Udct	4	L
Stillwater River - 02	Yellowstone River	R	Bk(C), Rb(U), RbxCt(R)	3.2	T 1928-1982 339,086 Rb; 325,325 Udct; 720 Yct	5	L
Stillwater River - 03	Yellowstone River	R	Bk(C)	32.2	T 1936-1953 80,738 Rb; 172,190 Udct; 20,000 Bn	4	S
Tee Pee Creek	Bad Canyon Creek	Z	None	2.4	None	2	L

TABLE 3 - continued

DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Upper Deer Creek	Yellowstone River	C	Bn(C), Bk(C)	5.8	T 1942-1952 3,000 Bk; 32,000 Bn	3	S
W. Boulder River	Boulder River	E	Bn(C), Rb(U)	19.5	N.E.	5	S
Woodbine Creek	Stillwater River	U	None	12.2	T 1933-1946 2,200 Rb; 4,640 Udct	4	L
Yellowstone River - 06	Missouri River	R	Rb(B), Bn(B)	30.9	N.E.	5	L
Yellowstone River - 07		R	Bn(B), Rb(B), Bk(R)	72.3	N.E.	5	L
Yellowstone River - 07		R	Bn(B), Rb(B), Bk(R)	23.5	N.E.	5	H

TABLE 3 - Footnotes

[1]Cutthroat Relative Abundance:
A = Abundant
C = Common
U = Uncommon
R = Rare
E = Presence not verified but expected
D = Common with proportional number of large-sized fish
Z = Abundance unknown

[2]Other Trout Species:
Rb = Rainbow Trout
Bn = Brown Trout
Bk = Brook Trout
Udct = Undesignated Cutthroats
RbxCt = Rainbow/Cutthroat hybrid
Gl = Golden Trout
RbxGl = Rainbow/Golden hybrid
Yct = Yellowstone Cutthroat Trout

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species. N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

TABLE 3 - Footnotes (continued)

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Department's field personnel.

[6]All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

TABLE 4

DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED DRAINAGES OF FW&P'S REGION 1,4(6)

REGION	DRAINAGE NAME	TRIBUTARY TO:	CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SECTION LENGTH (km)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
1	Biglow Creek	Wheeler Creek	C	None	3.2	L 1960 7,875 Udct	4	L
1	Kate Creek	Wheeler Creek	U	None	3.2	None	2	L
4	Suprise Creek	Wolf Creek	U	Bk(U)	12.8	L 1961-1982 35,792 Rb; 3,066 Udct; 10,000 Bk; 14,328 Yct	4	L

TABLE 4 - Footnotes

[1]Cutthroat Relative Abundance: C = Common
U = Uncommon

[2]Other Trout Species: Rb = Rainbow Trout
Bk = Brook Trout
Udct = Undesignated Cutthroats

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species.
N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Department's field personnel.

[6]All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

TABLE 5

DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED LAKES IN FW&P'S REGION 1(6)

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Cabin Lake	Four Lakes Creek	C	Wct(A)	5.6	1952-1983 22,516 Rb; 54,599 Wct	5	L
Chain Lake #3	Red Meadow Creek	A	None	8.5	Chain Lake #1	4	L
Chain Lake #4		A	None	3.7	1969-1982 562 Udct; 2,024 Wct	4	L
East Lake (Lost Lake)	UN Swan River	U	None	44.2	1954 10,000 Udct	4	L
Flotilla Lake	Lake Creek	A	None	60.6	1938-1939 100,000 Udct	4	No Data
Frigid Lake (Upper Cold)	North Fork Cold Creek	A	None	20.0	1941 35,000 Udct	4	L
George Lake	George Creek	C	None	49.8	1965 5,200 Udct	4	H
Gray Wolf Lake	Swan River	A	None	132.6	1932-1954 20,316 Udct	4	G
Hungry Horse Reservoir	S. Fork Flathead River	R	Wct(C), Dv(B), Rb(R)	8903.0	N.E.	5	L
Link Lake	Red Meadow Creek	D	Wct(A)	5.9	N.E.	5	L
Lower Cold Lake	North Fork Cold Creek	A	None	22.7	None	2	H
Margaret Lake	Forest Creek	C	None	18.6	1948 & 1982 9,600 Udct; 8,000 Wct	4	L
Mt. Henry Lake	UN Basin Creek	V	Wct(A)	3.4	N.E.	5	L
Scott Lake	Lake Creek	A	None	11.1	1941 10,000 Udct	4	No Data

TABLE 5 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
South Crow Creek Lake #2	South Fork Crow Creek	No Data	No Data	23.8	South Crow Creek Lake 3 & 5 1968 2,032 Udct		L
South Crow Creek Lake #4		A	None	13.8		4	S
Sunburst Lake	George Creek	B	Wct(A)	57.6	N.E.	5	S
Tee Pee Lake	Tee Pee Creek	V	Wct(U)	17.5	N.E.	5	L
Terrace Lake	UN Trib. West Fork Fishtrap Creek	C	Wct(A)	10.0	N.E.	5	L
Tom Tom Lake	Wheeler Creek	A	None	4.1	1941 3,600 Udct	4	S
West Tranquil Lake	UN Bear Creek	C	Wct(A)	14.2	N.E.	5	No Data

TABLE 5 - Footnotes

[1]Cutthroat Relative Abundance:
A = Abundant
C = Common
U = Uncommon
R = Rare
D = Common with proportional number of large-sized fish
V = Uncommon with proportional number of large-sized fish
B = Abundant with proportional number of large-sized fish

[2]Other Trout Species:
Rb = Rainbow Trout
Udct = Undesignated Cutthroats
Wct = Westslope Cutthroat Trout
Dv = Dolly Varden

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species. N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

TABLE 5 - Footnotes (continued)

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Department's field personnel.

[6]All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

TABLE 6

DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED LAKES IN FW&P'S REGION 2(6)

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Baker Lake	Baker Creek/W. Fork Bitterroot	C	None	3.5	1939-1952 L. 8,740 Udct	4	No Data
Bighorn Lake	Big Horn Creek	A	None	5.8	1952 L. 6,864 Udct	4	No Data
Boulder Lake	Gold Creek	C	None	46.1	None	2	No Data
Copper Lake	Copper Gulch	C	None	1.5	None	2	No Data
Little Lake	Wrangle Creek	C	None	6.5	None	2	L
Lower Twin Lake	Un Trib. to E. Fork Blk.	A	None	6.3	1950-1952 L. 13,584 Udct	4	No Data
Meadow Creek Lake	Meadow Creek	A	None	5.1	Meadow Creek T. 29,280 Rb, 1932-1952 L. 501,760 Udct	4	No Data
Morrell Lake	N. Fork Cottonwood Creek	A	None	10.3	1939-1951 L. 8,000 Rb, 50,500 Udct	4	No Data
North Cedar Log Lake	Cedar Log Creek	C	None	5.6	None	2	No Data
South Cedar Log Lake	Cedar Log Creek	A	None	16.0	None	2	No Data
Upper Camas Lake	Camas Creek	D	None	6.0	None	2	No Data
Webb Lake	Un Trib. to Ringeye Creek	C	None	2.7	1940-1952 L. 50,085 Udct	4	No Data

TABLE 6 - Footnotes

[1]Cutthroat Relative Abundance: A = Abundant
C = Common
D = Common with proportional number of large-sized fish
P = Species absent but could be present if introduced

[2]Other Trout Species: Rb = Rainbow Trout
Udct = Undesignated Cutthroats

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species. N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Departament's field personnel.

6All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

TABLE 7

DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED LAKES IN FW&P'S REGION 3(6)

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Aldridge Lake	Aldridge Creek	C	None	10.1	1928-1981 L. 91,420 Udct; 127,502 Yct	4	H
Avalanche Lake	W. Fork Beaver Creek	C	None	2.0	1976-1979 L. 3,091 Yct	2	S
Black Lion Lake	Boulder Creek	S	None	4.8	1979 L. 1,000 Yct	2	L
Cataract Lake	S. Fork Hilgrad Creek	C	None	3.2	1973 L. 1,560 Yct	2	L
Cedar Lake	Cedar Creek	C	None	10.5	1976-1981 L. 3,023 Yct	2	L
Cliff Lake	N. Meadow	C	None	4.1	1931-1981 L. 53,621 Udct; 4,988 Yct	4	L
Cottonwood Lake	Cottonwood Creek	C	None	3.7	1963-1979 L. 450 Udct; 4,655 Yct	4	H
Cradle Lake (Upper)	Papoose Creek	C	None	1.6	1977-1981 L. 2,008 Yct	2	L
Crystal Lake	Un Trib. - East Fork MI	C	None	2.5	1952-1981 L. 5,760 Udct; 6.942 Yct	4	H
Delmoe Lake	Pipestone Creek	C	None	4.5	1928-1983 L. 50,934 Yct; 4,910 Rb; 115,710 Udct	4	L
Elkhorn Lake	Elkhorn Creek	S	None	4.8	L-None T-1942 40,000 Udct	4	L

TABLE 7 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Fairy Lake	Fairy Creek	C	None	5.1	1950-1980 L. 8,250 Rb; 7,020 Udct; 2,118 Wct; 22,696 Yct	4	L
Ferguson Lake	Alder Creek			7.1	1938-1979 L. 40,265 Rb; 35,150 Udct; 2,513 Yct	4	L
Fire Lake	Fire Creek - Elbow Creek	C	None	3.7	1934-1979 L. 4,200 Rb; 3,982 Yct	4	H
Foolhen Lake	Foolhen Creek	S	None	3.3	1938-1979 L. 15,401 Rb; 25,160 Udct; 2,018 Yct	4	L
Glenwood Lake	Tizer Creek	U	None	5.0	1946-1979 L. 4,800 Rb; 7,975 Udct; 5,869 Yct	4	S
Gnome Lake	S. Fork Hilgard Creek	C	None	2.3	1973 L. 1,560 Yct	2	L
Gorge Lake North	Gorge Creek	U	None	4.3	1976-1979 L. 2,018 Yct	2	L
Gorge Lake South	Gorge Creek	U	None	6.8	1976-1979 L. 2,018 Yct	2	L
High Hope Lake	Dry	C	None	4.6	1977-1980 L. 2,001 Yct	2	L
Hopkins Lake	Elkhorn Creek	D	None	5.3	1971-1980 L. 3,143 Yct	2	L

TABLE 7 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Lake Abundance	Canyon Creek	S	None	1.5	1948-1981 L. 8,320 Udct; 4,015 Yct	4	L
Lake Cameron	Mill Creek	C	None	2.0	1976-1980 L. 3,503 Yct	2	L
Lake HaHand	Sentinel/Beaver/ Madison	C	None	2.4	1963-1972 L. 1,000 Udct; 4,048 Yct	4	L
Louise Lake	S. Boulder River	C	None	4.9	1956-1979 L. 1,328 Gt; 5,493 Yct	4	L
Lower Dutchman Lake	M. Fork Squaw Creek	C	None	4.8	1977-1980 L. 4,046 Yct	2	L
Pear Lake	Birch Creek	C	None	14.6	1940-1979 L. 28,000 Rb; 23,820 Udct; 10,164 Yct	4	S
Pine Creek Lake	Pine Creek Tributary	C	None	12.6	1932-1981 L. 58,182 Udct; 37,633 Yct	4	H
Rainbow Lake	Rock Creek	C	None	4.5	1942-1979 L. 2,120 Rb; 15,320 Udct; 5,043 Yct	4	S
Rock Lake	Rock Creek - Shields River	C	None	19.3	1935-1983 L. 8,000 Rb; 16,700 Udct; 5,549 Yct	4	H
Smeller Lake	Smeller Creek - Rock Creek	C	None	8.1	1935-1979 L. 8,000 Rb; 1,100 Udct 14,735 Yct	4	H

TABLE 7 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Stone Creek Lake - Lower	Stone Creek	S	None	4.3	1939-1979 L. 44,960 Rb; 5,113 Yct	4	L
Stone Creek Lake - Upper	Stone Creek	S	None	6.8		4	
Tendoy Lake	Tendoy Creek	C	None	8.5	1968-1981 L. 7,217 Yct	2	L
Tub Lake	Pear Lake, Birch Lake	C	None	4.9	1980-1981 L. 2,007 Yct	2	S
Waukena Lake	Rock Creek	C	None	14.2	1959-1979 L. 15,000 Rb; 2,513 Yct	4	L
Zimmer Lake	Zimmer Creek	C	None	10.5	1936-1976 L. 2,110 Udct; 12,517 Bk; 8,460 Yct	4	L

TABLE 7 - Footnotes

[1]Cutthroat Relative Abundance: C = Common
U = Uncommon
D = Common with proportional number of large-sized fish
S =

[2]Other Trout Species: Rb = Rainbow Trout
Bk = Brook Trout
Udct = Undesignated Cutthroats
RbxCt = Rainbow/Cutthroat hybrid
Wct = Westslope Cutthroat Trout

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species.
N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

TABLE 7 - Footnotes (continued)

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Department's field personnel.

[6]All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

TABLE 8

DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED LAKES IN FW&P'S REGION 4(6)

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Bear Lake	Bear Creek - S. Fork Sun River	C	None	10.0	None	2	G
Camas Lake	Camas Creek	C	None	3.2	1938-1940 L. 26,720 Yct	2	S
Castle Lake	Alabaugh Creek	C	None	1.0	1934-1983 L. 10,360 Rb; 43,000 Udct; 684 Gr; 3,878 Yct	4	No Data
Grace Lake	Big Birch Creek	C	None	2.8	1969-1983 L. 7,346 Yct	2	L
Keep Cool Reservoir	Thomas Creek	U	Rb(C)	11.4	1950-1983 L. 68,598 Rb; 3,156 Yct; 18,545 Bn	5	L
Kiyo Lake	N. Fork Little Badger Creek	U	None	2.9	1975-1977 L. 2,312 Yct	2	L
Lake Edith	Big Birch Creek	C	None	4.9	1940-1983 L. 8,480 Udct; 27,446 Yct; 1,000 Gr	4	L
Lake Levale	Open Creek	C	None	2.0	1934 L. 14,059 Udct	4	H
McGuire Reservoir #1	Sheep Creek	C	None	0.4	1969-1983 L. 2,380 Rb; 6,384 Yct	4	L
Our Lake	S. Fork Teton River	U	None	5.6	1959-1983 L. 25,000 Udct; 14,396 Yct	4	L

TABLE 8 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING	STREAM VALUE RATING	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT
Renshaw Lake	Renshaw Creek - Fairview Creek	U	None	1.8	1939-1983 L. 2,400 Rb; 15,000 Udct; 13,248 Bk; 500 Gt; 7,400 Gr; 13,817 Yct	4	L
Rhoda Lake	Dry Wolf Creek	C	None	1.4	1959-1983 L. 580 Udct; 1,075 Gt; 6,874 Yct	4	L
Sock Lake	Red Shale Creek	V	None	4.1	1960-1983 L. 500 Gt; 6,327 Yct	4	L
Spring Creek Resrvoir	Spring Creek	C	None	1.6	1952-1982 L. 2,550 Rb; 30,000 Gr; 14,819 Yct	4	L
Surprise Creek Reservoir	Surprise Creek	C	None	4.4	1940-1983 L. 37,340 Rb; 3,066 Udct; 10,000 Bk; 14,328 Yct	4	L
Tunnel Lake	Sun River	C	None	5.2	1939-1983 L. 35,200 Rb; 47,416 Udct; 15,000 Bk; 19,000 Bn; 31,000 SS; 4,500 Gr; 32,334 Yct	4	L
Upper Baldy Lake	Big Birch Creek	C	None	2.8	1969-1983 L. 7,346 Yct	2	L

TABLE 8 - Footnotes

[1]Cutthroat Relative Abundance: C = Common
U = Uncommon
V = Uncommon with proportional number of large-sized fish

[2]Other Trout Species:
Rb = Rainbow Trout
Bn = Brown Trout
Bk = Brook Trout
Udct = Undesignated Cutthroats
Gr = Artic Grayling
Gt = Golden Trout
SS = Coho Salmon

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species. N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

TABLE 8 - Footnotes (continued)

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Department's field personnel.

[6]All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

TABLE 9

DISTRIBUTION OF YELLOWSTONE CUTTHROAT TROUT IN COMPUTER SELECTED LAKES IN FW&P'S REGION 5(6)

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Afterbay Pool	Rock Creek	R	Bk(C)	1.0	None	3	L
Albino Lake	Beartooth Creek	C	None	15.9	1940-1983 L. 2,110 Udct; 5,000 Bk; 35,758 Yct	4	L
Alpine Lake	Three Creeks	S	None	4.2	1972-1981 L. 3,613 Yct	2	L
Anchor Lake	Farley Creek	C	None	4.9	None	2	L
Aquarius Lake	Sedge Creek	C	None	4.7	1955-1977 L. 20,000 Gr; 5,600 Yct	2	L
Arch Lake	Arch Creek	D	None	2.6	1971-1977 L. 12,664 Yct	2	H
Avalanche Lake	Huckleberry Creek	S	None	25.2	1950-1979 L. 3,180 Udct; 12,390 Yct	4	L
Beaver Ponds	Yellowstone River Dr.	S	None	0.8	None	2	L
Big Butte Lake	Farley Creek	R	Gt(P)	8.9	1968-1982 L. 5,600 Gt; 7,500 Yct	4	L
Big Park Lake	East Rosebud Creek - Stillwater River	D	Gt(R), Yct(R), CtxGt(V)	3.2	1955 L. 1,600 Gt	5	L
Blue Canyon Lake	Black Canyon Creek	D	None	33.3	None	2	L
Blue Lake	Unnamed Creek - E. Fork Bounder R.	S	None	2.1	1965-1981 L. 2,000 Hdct; 4,620 Yct	4	L
Bowback Lake	W. Fork Rock Creek	C	None	2.6	1968-1980 L. 3,304 Yct	2	H

TABLE 9 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Bramble Creek Lake #1	Bramble Creek/ Boulder River	C	None	1.3	1965-1979 L. 3,000 Udct; 616 Yct	4	L
Bridge Lake	Bridge Creek/ Boulder River	S	None	5.6	1970-1983 L. 6,232 Yct	2	L
Broadwater Meadow	Broadwater River	R	Bk(A), Gr(R)	0.6	1933 L.	3	L
Broadwater Meadow #3		U	Bk(C), Gr(U)	3.2	7,500 Bk	3	L
Camp Lake	Canyon Creek/East Boulder River	C	None	3.2	None	2	S
Canyon Lake	Farley Creek	A	Rb(C), RbxCt(C)	26.6	N.E.	5	L
Chickadee Lake	Rainbow Creek/ Boulder River	C	None	1.6	1978 L. 600 Yct	2	L
Cliff Lake	Hellroaring Creek - Rock Creek	V	Bk(U)	13.3	1977 L. 1,650 Yct	3	L
Clover Leaf Lake	Lake Creek	Z	None	29.6	1936-1975 L. 8,400 Udct; 32,722 Yct	4	L
Corner Lake	Lady of the Lake Creek	C	None	4.5	1980 L. 1,002 Yct	2	S
Crystal Lake	Lake Creek	Z	None	11.1	1968-1978 L. 12,500 Yct	2	L
Davis Lake	Davis Creek	S	None	2.1	1934-1979 L. 4,650 Udct; 510 Yct	4	L
Dewey Lake	East Rosebud Creek - Stillwater River	D	None	15.1	1955-1981 L. 4,800 Gt; 13,748 Yct	4	L
Dollar Lake	Sedge Creek	U	Gr(C)	0.4	None	2	L
Dude Lake	Dude Creek - W. Fork Rock Creek	C	None	4.9	1931-1983 L. 27,600 Bk; 8,025 Yct	3	S

TABLE 9 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Duggan Lake	East Rosebud Creek/ Stillwater River	R	Gt(R), GtxCt(U)	1.8	None	5	S
Echo Lake	Granite Creek/ E. Rosebud Crrek	D	None	4.9	1971 L. 7,056 Yct	2	L
Eedica Lake	Eedica Creek/ W. Rosebud Creek	S	None	3.6	1979 L. 2,334 Yct	2	H
Elk Lake	Elk Creek/Boulder River	S	None	3.7	1936-1977 L. 6,000 Rb; 920 Yct	4	H
Estelle Lake	Lake Creek	Z	Bk(C)	7.6	None	3	L
Fish Lake	Rainbow Creek/ Boulder River	A	None	7.2	1944 L. 1,200 Bk	3	G
Flatrock Lake	Lake Creek	Z	None	15.0	1968-1978 L. 18,010 Yct	2	L
Fossil Lake	East Rosebud Creek - Stillwater River	D	None	66.7	1967-1982 L. 76,002 Yct	2	G
Forsaken Lake	Lake Creek	Z	None	12.3	1977 L. 3,700 Yct	2	L
Froze to Death Lake	Armstrong Creek	D	None	30.2	1978 L. 10,000 Yct	2	L
Glacier Lake	Rock Creek	V	Bk(U)	71.5	1933-1982 L. 7,600 Udct; 46,219 Bk; 69,440 Yct	4	L
Golden Lake	Lake Creek	C	None	19.8	1968 L. 7,052 Yct	2	L
Heather Lake	Un Trib. Wounded Man Creek	C	None	1.8	None	2	H
Hidden Lake	Lake Creek	C	Gt(C)	7.3	1937 L. 11,500 Bk	5	L

TABLE 9 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Hipshot Lake	Lake Creek	P	None	3.9	1979 L. 1,026 Yct		L
Horseshoe Lake	Upsidedown Creek/ Boulder River	A	None	6.4	1970 L. 291 Yct	2	S
Horseshoe Lake	Un Trib. Rock Creek	C	None	2.0	1976 L. 1,300 Yct	2	L
Jasper Lake	Lake Creek	C	None	32.6	1968-1982 L. 20,028 Yct	2	L
Jorden Lake	Farley Creek	C	None	14.6	1959-1981 L. 2,110 Udct; 11,230 Yct	4	L
Kaufman Lake	Falls Creek	C	None	16.0	1958-1979 L. 10,000 Gt; 44,975 Yct	4	S
Kersey Lake	Un Trib. to Broadwater River	C	Lt(P), Bk(A)	47.8	1933-1981 L. 54,120 Bk; 5,000 Lt; 22,694 Yct	3	S
Koo Koo Lake	Ship Creek - W. Fork Rock Creek	C	None	2.5	1972 L. 1,760 Yct	2	S
Lake Abundance	L. Abundance Creek, Slough Creek, Lake Abundance Creek	C	None	22.8	1938-1977 L. 24,300 Udct; 85,994 Yct	4	H
Lady of the Lake	Lady of the Lake Creek	U	Bk(A)	17.3	None	3	L
Lake at Falls	East Rosebud Creek - Stillwater River	D	Gt(U), GtxCt(U)	20.2	1955 L. 6,400 Gt	5	L
Lady of the Clouds	Russell Creek	C	None	9.6	1967-1976 L. 3,360 Yct	2	S
Lake of the Winds	Russell Creek	C	None	16.5	1956-1977 L. 10,052 Gt; 4,000 Yct	4	L

TABLE 9 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Leaky Raft Lake	Sky Top Creek	C	None	3.4	1976 L. 425 Yct	2	S
Leo Lake	Russell Creek	C	None	3.4	1968 L. 3,120 Yct	2	S
Line Lake	Line Creek	C	None	1.9	1937-1983 L. 2,500 Udct; 5,440 Bk; 3,119 Yct	4	L
Little Trail Lake	Lake Creek	P	None	0.6	None		L
Lost Lake	Lake Fork Rock Creek	C	None	4.6	1960-1975 L. 14,786 Udct; 2,503 Yct	4	L
Lower Aero Lake	Sky Top Creek	C	Bk(C)	76.9	1959 L. 2,110 Udct	4	L
Lower Arch Lake	Arch Creek/ E. Rosebud Creek	C	None	9.8	1971 L. 6,240 Yct	2	S
Margaret Lake	Clarks Fork River	D	None	1.6	1955-1981 L. 1,760 Udct; 3,449 Yct	4	S
Marker Lake	W. Fork Rock Creek	B	None	6.3	1950-1978 L. 3,600 Udct; 5,080 Yct	4	L
Medicine Lake	Medicine Creek	D	None	12.3	1955-1978 L. 6,400 Gt; 14,020 Yct	4	L
Melody Lake	Farley Creek	C	None	1.9	None	2	S
Mermaid Lake	Russell Creek	P	None	2.8	1982 L. 695 Yct	2	L
Moon Lake	Moon Creek - Rock Creek	V	None	33.3	1938-1981 L. 31,100 Udct; 1,040 Bk; 33,447 Yct	4	L

TABLE 9 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Mountain Goat Lake	Mountain Sheep Lake - Rock Creek	D	None	5.1	1976-1982 L. 1,322 Yct	2	L
Mountain Sheep Lake	Rock Creek	D	None	3.0	1969-1976 L. 4,050 Yct	2	L
Narrow Escape Lake	Hawley Creek/ Boulder River	C	None	4.7	1977 L. 1,100 Yct	2	S
Nemidji Lake	West Rosebud Creek	S	None	5.5	1979 L. 4,142 Yct	2	L
Nuggett Lake	Nuggett Creek/ W. Rosebud Creek	C	None	3.4	1976 L. 1,660 Yct	2	L
Ouzel Lake	Russell Creek	P	None	1.4	1971-1981 L. 1,923 Yct		L
Peace Lake #1	Peace Lake - Wounded Man Creek	C	None	1.9	None	2	G
Peace Lake #2	Wounded Man Creek	C	None	0.4	None	2	S
Quyat Lake	Lake Creek	P	None	1.0	None		L
Ram Lake	Chicken Creek	S	None	5.8	1975-1983 L. 3,455 Yct	2	L
Rock Island Lake	Clarks Fork River	C	Bk(A)	55.4	1933-1981 L. 42,300 Udct; 30,400 Bk; 146,169 Yct	4	S
Round Lake	Lady of the Lake Creek	U	Bk(C)	12.5	1933-1949 L. 3,570 Rb; 4,000 Udct; 33,270 Bk; 13,888 Yct	4	L
Sedge Lake	Sedge Creek	C	Gr(C)	1.9	None	2	S
Senal Lake	W. Fork Dude Creek	R	Bk(U)	1.3	None	3	L
Speculator Lake	Speculator Creek/ Boulder River	S	None	3.9	1976 L. 2,425 Yct	2	L

TABLE 9 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Star Lake	Star Creek	C	Bk(U)	3.2	1940-1976 L. 5,575 Rb; 4,060 Udct; 10,000 Bk; 1,790 Yct	4	L
Stash Lake	Sky Top Creek	P	None	1.3	1982 L. 406 Yct		L
Stephanie Lake	Russell Creek	P	Gt(P)	5.6	1982 L. 2,778 Yct	5	S
Surprise Lake	Sodalite Creek	V	None	2.9	1968-1977 L. 2,000 Yct	2	L
Swamp Lake	Lady of the Lake Creek	U	Gr(P)	4.2	1967-1970 L. 2,000 Yct	2	L
Swede Lake	Lake Creek	P	None	4.8	1980 L. 1,179 Yct		S
Trail Lake	Lake Creek	P	None	2.9	1979 L. 708 Yct		L
Triangle Lake	W. Fork Rock Creek Dr.	P	None	2.5	1971-1977 L. 1,290 Yct	2	L
Triangle Lake	Russell Creek	P	None	2.5	1979 L. 1,026 Yct		L
Triangle Lake	Rock Creek	V	None	3.2	1969-1977 L. 2,860 Yct	2	L
Turgulse Lake	Armstrong Creek	D	None	33.5	1978 L. 10,000 Yct	2	L
Twin Outlets Lake	East Rosebud Creek/ Stillwater River	V	Gt(C), GtxCt(U)	11.9	None	5	L
Unnamed Lake #89A	Russell Creek	P	None	0.7	None		P
Unnamed Lake #119	Farley Creek	C	None	1.1	None	2	S
Unnamed Lake #131	Farley Creek	P	None	3.8	None		S
Unnamed Lake #217	Lake Creek	Z	None	1.2	None	2	L

TABLE 9 - continued

LAKE NAME	OUTLET/DRAINAGE	YELLOW-STONE CUTTHROAT RELATIVE ABUNDANCE (1)	OTHER TROUT SPECIES PRESENT/ RELATIVE ABUNDANCE (2)	DRAINAGE SURFACE AREA (Ha)	TRIBUTARY (T) OR HEADWATER LAKE (L) STOCKING (3)	STREAM VALUE RATING (4)	HABITAT VALUE FOR YELLOWSTONE CUTTHROAT (5)
Upper Aero Lake	Sky Top Creek	C	None	118.1	1946-1982 L. 18,110 Udct; 88,614 Yct	4	L
Upper Arch Creek Lake	Arch Creek - E. Rosebud Creek	D	None	19.0	1980 L. 3,508 Yct	2	L
Weasel Creek Lake #2	Weasel Creek - Boulder River	C	None	3.5	None	2	H
Weasel Lake	Sodalite Creek	P	None	1.5	1981 L. 423 Yct		L
Weeluna Lake	West Rosebud Creek	S	None	4.1	1980 L. 1,297 Yct	2	L
West Boulder Lake	Falls Creek	S	None	5.3	1958-1979 L. 5,000 Gt; 1,960 Yct	4	L
Widowed Lake	Farley Creek	P	None	1.3	None		L

TABLE 9 - Footnotes

[1]Cutthroat Relative Abundance:
A = Abundant
C = Common
U = Uncommon
R = Rare
D = Common with proportional number of large-sized fish
V = Uncommon with proportional number of large-sized fish
B = Abundant with proportional number of large-sized fish
P = Species absent but could be present if introduced
S =
Z = Abundance unknown

[2]Other Trout Species:
Rb = Rainbow Trout
Bn = Brown Trout
Bk = Brook Trout
Udct = Undesignated Cutthroats
RbxCt = Rainbow/Cutthroat hybrid
Wct = Westslope Cutthroat Trout
Dv = Dolly varden
Gt = Golden Trout
Gr = Artic Grayling
GtxCt = Grayling/Cutthroat hybrid
Lt = Lake Trout

[3]Stocking records were checked only in those drainages where the date base showed no contaminating species.
N.E. = Not evaluated.

[4]Stream Value Rating: 1 - Waters documented to contain genetically pure populations of Yellowstone cutthroat trout through the use of electrophoresis.

2 - Waters designated by field personnel (based on visual examination) as containing pure Yellowstone populations where no record of the presence of contaminating species or competitors exist. (Contaminating species = rainbow, westslope cutthroat, golden or any hybrid trout; competitor species = brown trout, brook trout).

3 - Waters designated by field personnel as containing pure Yellowstone cutthroat populations where no record of contaminating species exist but competitors are present, or planting records indicate that a competing species was planted in the drainage.

TABLE 9 - Footnotes (continued)

4 - Waters designated by field personnel as containing pure Yellowstone populations where no contaminating species exist, but planting records indicate that a contaminating species was planted in the drainage. Competitors may/may not be present.

5 - Waters designated by field personnel as containing pure Yellowstone populations where contaminating species are known to exist. Competitors may/may not be present.

[5]Habitat Value for Yellowstone Cutthroats: G = Greatest or highest value habitat.
H = High priority habitat.
S = Substantial value habitat.
L = Limited value habitat.

This value is a judgment call made by the Deparatment's field personnel.

[6]All the data in this table was derived from the MDFW&P's computer and microfiche data banks.

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Patrick Graham

Montana Dept. Fish, Wildlife and Parks

1420 E. 6th Ave.

Helena, MT

August 30, 1984

Dear Pat,

Attached is the final draft of my report on the status of the Yellowstone cutthroat. I've made the changes as requested per the meeting of Aug.3,1984 as follows:

1. Delete recommendation # 5 contained in the draft report.
2. Add habitat ratings for all streams (as opposed to just Class 1 &2).
3. Add Rod Berg's spawning habitat ratings for streams used by the mainstem population of Yellowstone cutthroats in Region 3.
4. Prioritize the recommendations.
5. I tried to find additional data dealing with the relative importance of the various habitat perturbations occurring in the Yellowstone drainage. I spoke with George, Chris Clancy and tried to speak to Workman and Berg but I was not able to contact them. Both George and Chris knew of no other written information around so, without doing a great deal more literature research I settled for getting Clancy to pritorize the issues for me.
6. I did not change significantly the recommendation on the hatchery question since I would only be offering my opinion on the issue and I don't really think I'm qualified to do so.

I believe that with this report submission I have fulfilled my contract obligations. If you have any questions about the report please don't hesitate to call me.

Yours Truly,

Kathleen Hadley

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