

Send to

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TO

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2-11-81

→ Bob Betake - Colorado State University

SUBJECT

Bonneville Cutthroat

FROM

Bruce May - Selmon N.E.

MESSAGE (WRITE CONCISE MESSAGE. SIGN AND FORWARD PARTS 1 AND 2 TO ADDRESSEE. RETAIN PART 3)

Bob

I recently reviewed your monograph on Western trout. It is an exceptional piece of work and you should be congratulated.

In your discussion on the Bonneville Cutthroat you stated that little had been done in the way of life history studies, which is partially true. Enclosed is a report completed in 1978 for Utah Division of Wildlife Resources. Apparently you were not aware of this prior to publishing of the monograph.

SIGNATURE

Apparently the work started in 1979 is beginning to pay off (proposal enclosed). Fish from Birch Creek and

REPLY (USE THIS SPACE FOR REPLY. SIGN AND DATE. RETURN PART 2 TO SENDER. RETAIN PART 1)

Water Canyon have been stocked into two additional waters and plans are to continue the reintroductions.

Sincerely

Bruce

SIGNATURE

DATE



UTAH STATE DIVISION OF WILDLIFE RESOURCES

From: S. M. Clark
Regional Supervisor

Date: January 4, 1977

To: Donald Andriano
Chief, Fisheries Management

Subject: Utah Cutthroat Management
Proposal

Enclosed is a Utah cutthroat trout management proposal for the Southern Region. This is the same type of information that will be presented at the Bonneville Chapter meeting. I would like to establish a meeting with you and our Fisheries Manager to go over the proposal and the Bonneville presentation sometime prior to January 15.

Please let me know when a meeting can be confirmed.

Thank you.

Best regards,

S. M. Clark

SMC:rh

Enclosure

UTAH CUTTHROAT TROUT MANAGEMENT PROPOSAL

for the Southern Region

1977

BACKGROUND

The original range of cutthroat trout extended from Alaska to Northern California, throughout the Intermountain area and east to the Upper Missouri, Platt, Colorado, and Rio Grande drainages. The cutthroat trout species found throughout this very large range was represented by several subspecies (Sigler and Miller, 1963).

The Intermountain area, including Utah, had only one species of endemic salmonid, the cutthroat trout. As discussed by Behnke (1976), early workers felt that this native trout was represented by two subspecies: Salmo clarki utah of the entire Bonneville basin and Salmo clarki pleuriticus of the Colorado River basin (Tanner and Hayes, 1933; Platts, 1957; Sigler and Miller, 1963). In light of the habitat complexity existing in the Bonneville basin before and following desiccation of the Lake Bonneville and because a small portion of northwestern Utah is drained by the Raft River, tributary to the Upper Snake River of the ^{Columbia}~~Colorado~~ River drainage, the possibility exists that three, and potentially four, subspecies actually represented the native cutthroat trout in Utah (Behnke, 1976).

The value of cutthroat trout to residents of Utah and this fishes abundance and subsequent decline has been documented by several early workers (Yarrow, 1874; Siler, 1884; Woodruffe, 1892). It was reported that single seine catches of 3500-4000 lbs of trout occurred in Utah Lake during the 1860's. The initial decline in the once abundant populations of native cutthroat is felt to be the result of over harvest and loss of habitat due to agricultural water diversions.

This loss of resident salmonids was further hastened by the introduction of rainbow trout (1883) and other non-resident trout species and subspecies (Sigler and Miller, 1963). These introductions of rainbow trout and other non-resident cutthroat subspecies (i.e. Yellowstone Lake cutthroat) created conditions where mixing has greatly influenced genotypic and morphological characteristics. Early efforts to describe the native trout in Utah were frustrated because of the lack of diagnostic criteria on which to base comparisons and the amount of hybridization that had resulted from introduction of cutthroat subspecies and rainbow trout (Tanner and Hayes, 1933; Behnke, 1976). Tanner and Hayes (1933) stated, "The exact identity of the trout in this State as they existed when the first explorers entered it is still a puzzle and is becoming more difficult to solve because of the scarcity of native fish and the mixing of introduced forms." This lack of definite description and the uncertainty of where pure populations might still exist has led many to believe that S. c. utah was probably extinct (Miller, 1950; Cope, 1955; Sigler and Miller, 1963). There is, however, recent evidence indicating that extinction is not the case in S. c. utah and that remnant populations can still be found in small isolated areas in the State.

At present, the status of native cutthroat populations is undetermined and very unclear. The most recent edition of the U. S. Department of Interior's "Red Book" of endangered species (1973) listed S. c. utah as "status undetermined". Behnke (1976) indicates that this status was based primarily on the present confused taxonomic status. The International Union for the Conservation of Nature, classes Salmo clarki utah as "rare". Holden, et. al (1974), in a publication generated by the Bonneville Chapter of the American Fisheries Society, considered it endangered. Behnke (1973), summarized S. c. utah as rare with a highly restricted distribution.

The status of "undetermined" is, at present, the most likely classification that can be attached to S. c. utah. Classification of S. c. utah as either threatened or endangered would at this point be presumptuous. An endangered classification indicates that an organism is in peril of becoming extinct. A threatened status indicates that external factors influencing an organism is causing it to become endangered. Neither of these status classifications adequately cover the present conditions in which S. c. utah are presently found in Utah. Because certain pure populations are known to exist and because both State and Federal personnel are presently aware of these populations, the future of S. c. utah is now more secure than it has been for the past few decades. Even though S. c. utah might not technically be considered as threatened or endangered, one would have to consider pure populations as presently "rare" and with a limited distribution.

Prior to discussing present population status and potential management opinions that may be available, it would be important to briefly examine the taxonomic difficulties that surround S. c. utah. Behnke (1976), stated that the taxonomy of S. c. utah has been confused by the lack of clearcut differentiating characteristics and also by variation in historical nomenclature.

The problem with nomenclature centers around the many specific and subspecific names that have been applied to Bonneville basin cutthroat trout (mykiss, purpuratus, virginalis, spilurus, pleuriticus, and utah). As indicated by Behnke, the name Salmo utah was proposed by Suckley (1874), to distinguish the trout in Utah Lake from S. virginalis in the streams of the Bonneville basin. It should be noted that the morphological differences in appearance of the lake

populations were due to environmentally induced characteristics. This same condition exists in brown trout found in Lake Powell and Flaming Gorge Reservoir. An explanation of the mechanism centers around guanine deposition and its replacement of the normal spotting pattern with a silvery sheen. Behnke (1970), indicated that Suckley's published account of S. utah fixes the name utah as the earliest name applied solely to trout of the Bonneville basin. Current nomenclature includes all cutthroat trout as a single species (Salmo clarki), with subspecies being distinguished by major drainages or geographical areas. Hence, the name S. c. utah has been used to designate those native trout found in the Bonneville basin.

Even more troublesome than nomenclature differences is the lack of unique diagnostic characters upon which positive identification can be based (Behnke, 1970; Behnke, 1976). Biochemical analysis, to date, has also proven to be of little value in providing conclusive differences in several groups of cutthroat and rainbow trout (Stalnaker, et. al, 1975).

A review of museum specimens collected from the Salt Lake and Utah Lake drainages (1872-1915) has provided certain taxonomic differences upon which to base classification. Behnke stresses that the differences are based on comparison of anticipated mean values of certain characters. It is also stressed that there is much overlap in many of taxonomic characters found in interior cutthroat trout forms. To summarize the best diagnostic characteristics for S. c. utah, as a whole, the following expected mean values should be used for comparison: vertebrae, 62-62; gillrakers, 18-20; pyloric caeca, 30-40; scales above lateral line, 36-42; scales in lateral series, 155-170;

basibranchial teeth present in at least 90% of populations (Behnke, 1976). The spotting pattern is also slightly different than other cutthroat subspecies. Spots are larger, sparse, and more evenly distributed over the entire body in S. c. utah.

PRESENT STATUS AND MANAGEMENT IMPLICATION

At this point it is well to discuss the various management implications generated by the existence of a unique form of aquatic wildlife. There appears to be two approaches or viewpoints that can be associated with management philosophy involving unique (rare, endangered, threatened, specialized, beneficial, harmful, etc.) wildlife forms. One viewpoint encompasses the feeling that such wildlife forms create only problems for management efforts. This problem oriented management philosophy sees so many problems standing in the way of any management goal that may be attained that they cloud and finally totally obscure the objective and the goal is finally dismissed. In relating this viewpoint to management of a unique fish like the Utah cutthroat, problem oriented management tends to concentrate on the problems that may be generated with little thought of how this fish might help in reaching certain management goals. Problems related to this philosophy could possibly include the following: will this fish come to the attention of individuals or groups who would seek to get total protection by considering it as endangered; will an increased awareness cause increased pressure, thus creating the need for special regulations; is funding and/or man-power available to establish an immediate large management program.

Concerns:
Species - most
ethical.
about concerned
benefit and
value to public
viewing the
problems

The converse to this philosophy is being objective oriented. Under objective orientation, problems become a normal and expected part of management...they are challenges to be overcome, and while they are being overcome, management does not lose sight of its ultimate goal or objective. In relating this objective-oriented philosophy to management of S. c. utah, several points can be made. Presently, three populations of S. c. utah have been judged pure. All of these populations are found in small isolated streams (Birch Creek, Beaver County; Water and Reservoir Canyons, Washington County). Habitat conditions existing in these waters would be considered marginal as far as trout management is concerned. All streams are small with low water flow and have poor instream habitat and are subject to occasional flooding. In spite of these environmental extremes and difficulties, Utah cutthroat populations appear to be in a healthy state. Many of the streams in Utah, particularly in the Southern Region, are characterized by these same environmental deficiencies. Fisheries management with trout forms such as rainbow, brown, brook, and our present strain of hatchery cutthroat, has in many cases, proven to be unsuccessful in these small marginal waters. In other cases, these waters have not been actively managed because conditions are so adverse that use of presently cultured trout forms would meet with predicted failure. The success of present Utah cutthroat populations in surviving and even thriving in these adverse environmental conditions, opens the door to a potential program of managing these marginal waters and thus optimizing our fisheries management capabilities.

It would be naive to consider that working with Utah cutthroat

will be totally successful in establishing fishable populations in all marginal waters, or in stopping the momentum of having this fish placed under some kind of Federal or State protection. The fact remains, however, that this fish has the potential and presently the opportunity to become more important in our objective of fisheries management. Without formalizing some form of active management program, we tend to leave ourselves open to criticism from individuals and agencies concerned with the status of S. c. utah, but more importantly, we lose valuable time in assessing the potential this fish may have in helping to achieve fishery management goals.

MANAGEMENT PROPOSAL

This management proposal for S. c. utah in the Southern Region consists of two aspects, each with comparable importance. The first would be to investigate and get verification on all possible S. c. utah populations within the Region. This would mean resurveying many of the small isolated streams to see if cutthroat populations exist. At the same time, source areas for introduction could be cataloged. In most cases, this has been accomplished, but there are a few waters that should be checked.

The second part of the proposal would be to review and select methods and streams for introduction. Because of the work load of hatcheries, it is not suggested that brood stock and/or production of S. c. utah be established at the hatcheries. There are, however, culture techniques that could be carried out in situ on the streams where introduction is to be completed. Some ideas on these culture techniques are as follows:

1. Installation of gravity flow hatching jars on the streams that are scheduled for S. c. utah introduction.
2. Use of Vibert boxes installed into selected streams.
3. Deposit fertilized eggs in pre-constructed and artificially positioned redds within the streams.
4. Deposit fertilized eggs in natural stream gravels.
5. Introduction of an adult spawning population to recipient streams.

All of the above options would require pre-planning and inspection of proposed stream sites. Construction of support structures would also be necessary in certain instances. An evaluation of the most promising options could be undertaken during the next few spawning seasons at Birch Creek, Beaver County, with the results being monitored with the use of a fry emergence trap (Porter, 1973) and other monitoring techniques.

Subsequent to evaluation of culture techniques, streams for introduction could be selected and the necessary measures taken to better insure success. A list of streams is included to illustrate potential waters where S. c. utah could be established without adverse interference to present management (Table 1). The list presented is by no means all inclusive, as many other streams within the Region may prove favorable to such a program. Chemical treatment would be necessary in some instances but because the streams are small and have generally low flows, costs should be minimal.

A follow-up evaluation of the overall program would be instigated into Regional fishery responsibilities to assess populations responses,

angler response and utilization, and liabilities and benefits generated by such a program.

SUMMARY

To summarize the intent and overall scope of this proposal, several key thoughts should be reemphasized. The primary purpose of the proposal is not to treat S. c. utah as an endangered or threatened species, thus generating a special program to insure their survival from a protectionist attitude or standpoint. The primary purpose is, however, to evaluate the potential of this fish to provide additional fishing opportunity in marginal waters and to assess the possible benefits that may be gained by use of this fish in Regional Fisheries Management.

An important point to consider is that native Utah cutthroat are presently confined to very small isolated streams which generally typify marginal trout habitat. Even though they are confined in these poorer waters, Utah cutthroat populations appear to be in a healthy state, with no overt sign of over population or poor physical appearance. Present populations allow for the potential to establish additional Utah cutthroat populations in the many marginal and small trout waters within the Bonneville basin. The possibility also exists that characteristics possessed by this fish could be of value in management activities on the more prime waters within the basin.

It is safe to say that initiation of an active program for management of S. c. utah will not stop all individuals or agencies in requesting some type of protection for this unique fish. The State's constitutional right to manage this particular fish would, however, be substantially enhanced by an active management program,

no matter how large or small. An active management program would, in many cases, cause concerned individuals to relax and allow the Division to proceed with it's management goals without the threat of a species being classified as threatened or endangered. A key to public acceptance of any program of Utah cutthroat will be centered around the goals and objectives of the program. A token gesture will likely not produce the desired results needed to evaluate the potential value of this subspecies to fisheries management or to relieve the pressure for establishing some form of protection.

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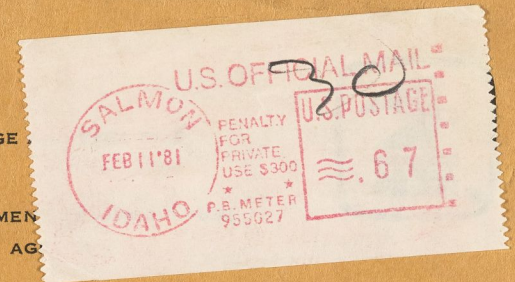
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Table 1. Present and potential streams for S. c. utah.

Water	Drainage	Remarks
Water Canyon	Virgin River	Known populations
Reservoir Canyon	Virgin River	" "
Birch Creek	Beaver River	" "
Deep Creek	Sevier River (East Fork)	Possible populations
Rancher Creek	Sevier River (East Fork)	" "
Sam Stow Canyon	Sevier River	" "
North Fk. Chalk Creek	Sevier River	Potential streams for introduction
Chokecherry Creek	Sevier River	" " "
Rock Creek	Sevier River	" " "
Gates Creek	Sevier River	" " "
Niotche Creek	Sevier River	" " "
Meadow Creek	Sevier River	" " "
Yogo Creek	Sevier River	" " "
Doxford Creek	Sevier River	" " "
Mill Creek	Sevier River	" " "
Deer Creek	Sevier River	" " "
Durkee Creek	Sevier River	" " "
Beaver Creek	Sevier River	" " "
Bullion Creek	Sevier River	" " "
Cottonwood Creek	Sevier River	" " "
Ten Mile Creek	Sevier River	" " "
City Creek	Sevier River	" " "
Lost Creek	Sevier River	" " "
Birch Creek	Sevier River	" " "
Prospect Creek	Sevier River	" " "
Rock Creek	Sevier River	" " "
Greenwich Creek	Sevier River	" " "
West Fk. Asay Creek	Sevier River	" " "
Bunker Creek	Sevier River	" " "
Louder Creek	Sevier River	" " "
Sanford Creek	Sevier River	" " "
Devil's Creek	Beaver River	" " "
North Fk. North Creek	Beaver River	" " "
South Fk. North Creek	Beaver River	" " "
Parowan Creek	Escalante Desert	" " "
Second Left-hand Canyon	Escalante Desert	" " "
Summit Creek	Escalante Desert	" " "

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