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Enigmatic native trouts of the upper Columbia River Basin

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Introduction

Numerous species of trouts of the genus Salmo were described from the Columbia River basin but current classification groups all of the native trouts in two species, the cutthroat trout, Salmo clarki, and the rainbow trout, S. gairdneri. The simple binomial or trinomial system of zoological nomenclature cannot adequately identify all of the complex evolutionary diversity actually existing and the name Salmo gairdneri is questionable for the "rainbow" and "steelhead" trout native to the upper basin.

The recognition and identification of native trouts, particularly with the rare forms of cutthroat trout, is basic to any endangered and threatened species program and for any management plans for indigenous species. A more direct economic issue, however, concerns the recognition of diversity (local races) of anadromous "steelhead" trout. These races have been selected for thousands of years to make the most effective use of a drainage basin by evolving discrete populations homing to specific areas and each with subtle life history differences. When a drainage basin is blocked by a dam and the anadromous trout maintained by hatchery propagation, an attempt to preserve as much of the original diversity as possible should be standard procedure in the planning of a propagation program.

The Trouts

The cutthroat trout must have been first on the scene in the Columbia basin. Cutthroat trout are indigenous throughout the upper basin above falls on the Kootenai, Pend Oreille, Spokane and Snake rivers. The presence of cutthroat trout above these falls denotes their occurrence before the falls were formed. The "rainbow" trout, invading later were blocked from the upper basin until introduced by man.

Two basic forms of cutthroat trout are native over a large area of the upper basin. The "northern Idaho" or "Montana westslope" cutthroat probably initiated divergence from a common ancestor in glacial Lake Missoula. Its distribution includes the Kootenai, Clark Fork, St. Joe, Salmon and Clearwater drainages. It also crossed the Continental Divide to extend its range in the headwaters of the Missouri River (downstream to Great Falls) and in the South Saskatchewan drainage. The correct subspecific name for this trout is Salmo clarki lewisi. The western limits of S. c. lewisi distribution may have reached Lake Chelan, Washington. The other form of native cutthroat trout once widely distributed in the middle and upper basin is characterized by large, pronounced, roundish spots on the body (lewisi spotting pattern is characterized by smaller, "star"-shaped spots). The large-spotted cutthroat trout is native to much of the Snake River drainage and probably to parts of the Cascade Range. From the Snake River, this cutthroat trout crossed the Continental Divide and became established throughout the Yellowstone drainage. The Yellowstone Lake cutthroat trout and the Henrys Lake cutthroat trout are typical of this large-spotted form. The correct subspecific classification of this trout is uncertain. S. c. bouvieri, named for the now extinct trout of Waha Lake, can be provisionally accepted.

Another distinct cutthroat trout is native to the upper Snake River. I have called this trout "the fine-spotted Snake River cutthroat." The original range of the fine-spotted cutthroat is not known for certain but probably consisted

of an area from Jackson Lake to some point downstream of the present Palisades Reservoir. No scientific name has been formally proposed to describe the fine-spotted cutthroat trout. Its origin is attributed to isolation in an ice-dam lake during the last glacial period.

Cutthroat trout are also native to the isolated streams of the lava plains region in southern Idaho (Sun Valley area). Their identity and present existence are not known.

The taxonomic data I have on the resident "rainbow" trout and "steelhead" trout of the middle and upper Columbia basin reveals they represent an evolutionary line distinct from the typical rainbow and steelhead trout occurring along the Pacific Coast. The values for the number of vertebrae, scales and pyloric caeca are typical of a trout I have called the "redband" trout (Behnke, 1972; Schreck and Behnke, 1971). Dr. Richard Wallace of the University of Idaho has studied the characteristics of the "rainbow" or "steelhead" trout of the Salmon and Clearwater drainages and we find them typical of the "redband" trout. Three samples from the Dworshak National Fish Hatchery on the North Fork of the Clearwater River, examined by Dr. Wallace, differ from the native races studied and the 1975 Dworshak sample has character values typical of coastal rainbow trout. The point to be emphasized here in relation to the success of maintaining anadromous runs by artificial propagation is the differential survival between native and non-native stocks of salmonid fishes documented by Ricker (1972).

My interpretation of the origin of the redband trout is that they represent an early divergence from an evolutionary line leading to the rainbow trout. After the last glacial epoch, the rainbow trout and redband trout again came in contact in the Columbia basin and probably hybridized to produce an array of intermediate populations obscuring clear-cut separation between rainbow trout and redband trout. "Pure" redband trout populations were found in areas isolated from contact with rainbow trout such as above barrier falls and in desiccating basins. As with the cutthroat trout, the stocking of hatchery rainbow trout in areas where the rainbow is not native, has caused hybridization with native redband trout.

Resident populations of redband trout hold some significant potential for fisheries management. When existing in reservoirs they have rapid growth and feed on Gila chubs (Kunkel, 1976). I have caught redband trout on artificial flies in water of 28.3° C (83° F). Their active feeding and vigorous fight when hooked at such a temperature indicates a considerable metabolic reserve or scope for activity at temperatures that would be lethal for most trout species.

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