

Peter A. Bisson
Weyerhaeuser Company
Longview, Washington 98632

Occurrence of the Shorthead Sculpin, *Cottus Confusus*, in a Headwater Tributary of Deschutes River, Washington

Abstract

Five specimens of the shorthead sculpin (*Cottus confusus*) have been collected from Hard Creek, a cold-water tributary of the upper Deschutes River in western Washington. They represent the first recorded occurrence of this species from a southern Puget Sound river system, and their presence above the barrier falls of Deschutes River suggests that the shorthead sculpin invaded the Puget Sound region earlier than had previously been believed.

The shorthead sculpin, *Cottus confusus*, is a cold-loving species that prefers fast-flowing streams fed by snow melt or cold springs (Bond, 1963; Reimers and Bond, 1967). In the Puget Sound region this sculpin has been reported by McPhail (1967) to inhabit eastern drainages from Skykomish River south to Green River as well as some small streams in the Kitsap Peninsula on the west side of the sound (Fig. 1). Neither Bailey and Bond (1963) nor McPhail (1967) noted its presence in rivers entering the southern part of Puget Sound.

Five specimens of *C. confusus* (Table 1) were collected by electrofishing in Hard Creek, Lewis Co., Washington (T14N-R3E-Sect. 13) on 23 October 1975. Hard Creek is a small spring-fed Deschutes River tributary entering the river 12.7 km upstream from Deschutes Falls, an impassable barrier located 66.1 km from the river mouth. The collection site is characterized by a steep gradient with many debris dams, dense canopy, and cold water. Temperatures in Hard Creek have not been recorded in excess of 13 C. No other fishes were observed. Part of an adjacent stream (Ware Creek) from which most streamside vegetation had been removed was found to contain numerous cutthroat trout (*Salmo clarki*) but no sculpins; but Thurston Creek, a somewhat larger tributary entering the Deschutes 2.7 km downstream from Deschutes Falls, contained cutthroat trout, juvenile coho salmon (*Oncorhynchus kisutch*), and the torrent sculpin, *Cottus rhotheus*.

The external morphology of the specimens (Table 1) agrees in most respects with the description of the species given by Bailey and Bond (1963), although there appears to be a slight reduction in head size among the Hard Creek population. In addition, axillary prickling is poorly developed in each of the specimens, a feature associated by Bailey and Bond with certain other isolated populations.

The presence of *C. confusus* above the barrier falls of Deschutes River necessitates a re-examination of its distributional history in western Washington. Bailey and Bond (1963) believe that *C. confusus* first entered Puget Sound by crossing into the South Fork of the Snoqualmie River from the Yakima River, as it is the only sculpin present above Snoqualmie Falls. McPhail (1967) stated that this invasion took place during the late stages of glacial Lake Russell prior to entry of the sea into Puget Sound, because dispersal into the rivers of southern Puget Sound had apparently not taken place, nor had the species utilized the connection that once existed between Puget Sound and Che-

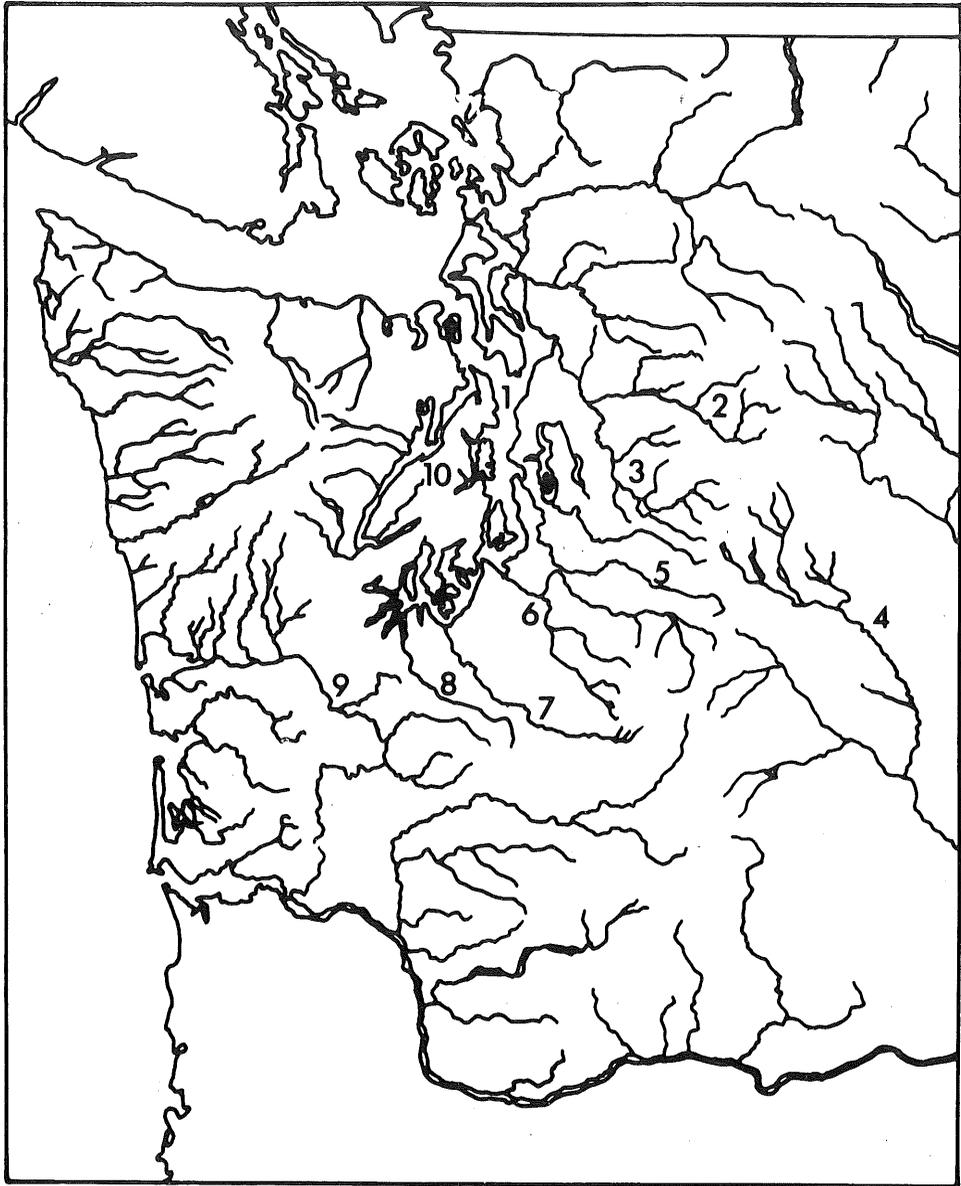


Figure 1. Location of drainage systems mentioned in the text. 1. Puget Sound, 2. Skykomish River, 3. Snoqualmie River, 4. Yakima River, 5. Green River, 6. Puyallup River, 7. Nisqually River, 8. Deschutes River, 9. Chehalis River, 10. Kitsap Peninsula.

halis River. However, the discovery of *C. confusus* in the headwaters of the Deschutes River indicates that the shorthead sculpin reached Puget Sound earlier than has previously been believed and has had time to spread to its southernmost river. An earlier invasion might also eliminate the need to postulate a crossing of Lake Russell from the eastern rivers to the Kitsap Peninsula (McPhail, 1967); an alternative explanation is that the species spread from stream to stream along the border of the Puget Sound glacial lobe and that the Kitsap Peninsula was last to be colonized. If this were the case, there is a

TABLE 1. Selected morphological features of five specimens of *C. confusus* (OS 5162) from Hard Creek, Deschutes River drainage. Morphometric measurements are expressed as a proportion of standard length.

Standard Length (mm)	79.7	65.8	†66.6	46.8	36.5
Total Length	1.182	1.213	1.179	1.218	1.200
Body Depth	.194	.208	.204	.199	.189
Caudal Peduncle Depth	.084	.093	.096	.088	.080
Caudal Peduncle Length	.146	.187	.110	.171	.170
Predorsal Length	.315	.318	.306	.314	.337
Highest Dorsal Spine	.084	.079	.078	.068	.080
Highest Dorsal Soft Ray	.123	.125	.125	.139	.121
Highest Anal Ray	.162	.140	.120	.122	.104
Longest Pectoral Ray	.257	.236	.225	.246	.241
Longest Pelvic Ray	.176	.193	.170	.169	.151
Head Length	.291	.284	.282	.278	.274
Head Width	.256	.258	.248	.233	.233
Snout Length	.094	.088	.090	.090	.099
Postorbital Head Length	.138	.144	.129	.132	.143
Interorbital Width	.041	.047	.036	.047	.047
Length of Upper Jaw	.142	.121	.117	.096	.088
No. Dorsal Spines	7	7	8	7	8
No. Dorsal Soft Rays	17	18	17	17	17
No. Anal Rays	13	13	12	13	13
No. Pectoral Rays	14	15	15	14	14
No. Pelvic Rays	1,3	1,4	1,4	1,4	1,4
No. Preopercular Spines	2	2	2	3	3

definite possibility that *C. confusus* exists in suitable headwater areas of the Nisqually and Puyallup river systems, and perhaps also in the Chehalis River drainage.

Acknowledgments

I thank Carl Backman, John Marshall, and Dale McGreer for field assistance and Dr. C. E. Bond for reviewing the manuscript. The specimens are deposited in the museum of the Department of Fisheries and Wildlife, Oregon State University.

Literature Cited

- Bailey, R. M., and C. E. Bond. 1963. Four new species of freshwater sculpins, genus *Cottus*, from Western North America. Occ. Pap. Mus. Zool., Univ. Mich. 634:1-27.
- Bond, C. E. 1963. Distribution and Ecology of Freshwater Sculpins, genus *Cottus*, in Oregon. Univ. of Mich., Ann Arbor, Ph.D. thesis.
- McPhail, J. D. 1967. Distribution of freshwater fishes in Western Washington. Northw. Sci. 41:1-11.
- Reimers, P. E., and C. E. Bond. 1967. Distribution of fishes in tributaries of the lower Columbia River. Copeia 1967 (3):541-550.

Received January 30, 1976

Accepted for publication April 12, 1976