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January 9, 1990

Dr. R. J. Behnke
Department of Fishery and Wildlife Biology
Colorado State University
Fort Collins, Colorado 80523
U.S.A.

Dear Dr. Behnke:

I enclose a draft section on the Chester Lake char for the new edition of "*Fishes of Alberta*." I would greatly appreciate your reading it over and giving me any critical comments that you may have. By way of this letter I am also sending copies to Kyle McNeilly, Jim Stelfox, and Winefred Schenk for any comments that they may have. I would prefer to be able to be exact on the specific identification but given the present state of information would like to be as accurate re uncertainty as possible!

It had always been my belief based on conversation with Peter McCart about 15 years ago that it was his Inuvik stock used in the Chester Lake planting (although he was not involved in any way with the stocking and, in response to his questioning, I wrote and told him where Chester Lake was).

Very best regards,

Yours sincerely,

J.S. Nelson, Professor
Department of Zoology

JSN/slif

cc: Mr. Kyle McNeilly
Mr. Jim Stelfox
Mr. Winefred Schenk

Salvelinus malma (Walbaum)

DOLLY VARDEN

malma - vernacular name in Kamchatka

OR

Salvelinus alpinus (Linnaeus)

ARCTIC CHAR

alpinus - alpine

Note: It is not firmly established whether Dolly Varden or Arctic char were introduced into Chester Lake; an account of both is therefore given.

DESCRIPTION:

Dolly Varden are readily distinguished from bull trout by the characters given in the key. Distinguished from Arctic char, Salvelinus alpinus, in having relatively long gillrakers (versus short) and relatively small spots on the back (usually smaller than diameter of eye pupil versus being larger than diameter of eye pupil).

Arctic char are somewhat similar to bull trout but have the following differences: fewer but larger spots (often pink or red), many greater in diameter than the pupil of the eye; higher number of gillrakers on the lower limb of the first gill arch (12-19 versus 8-13 in bull trout); on average more pyloric caeca, about 20-74; spawning individuals of brighter coloration.

DISTRIBUTION

Dolly Varden are native to northeastern Asia and western North America from Washington to Alaska and, in the north, east to westernmost Northwest Territories.

Arctic char are native to northern parts of the Northern Hemisphere such as Iceland, northern Europe (including the British Isles), northern USSR, and northern North America from Alaska to Maine. They occur in some coastal areas and occur on islands in the Canadian Arctic Archipelago (including Lake Hazen on Ellesmere Island, the most northern large lake in the world).

Either Dolly Varden or Arctic char were successfully introduced in Alberta in Chester Lake, west of Calgary between Lower Kananaskis Reservoir and Spray Lakes Reservoir and 4 km northeast of Mud Lake.

BIOLOGY

Both Dolly Varden and Arctic char have anadromous and freshwater populations. They feed primarily on fish and invertebrates (usually benthic organisms). Spawning occurs in the fall with hatching in the spring.

In Chester Lake, Alberta, there appears to be good reproduction and rapid growth (Ladd, 1982). Spawning males are said to be brightly colored.

Recently introduced cutthroat trout may provide an additional food source. The char in Chester Lake currently provides a very successful fishery.

HISTORICAL NOTE

Dolly Varden were described by J.J. Walbaum (based on descriptions of earlier workers) in 1792 from Kamchatka as Salmo malma. The common name, Dolly Varden, was first applied in California in reference to the fish's resemblance in color pattern to dress goods with spots called Dolly Varden. Arctic char were described by C. Linnaeus in 1758 from northern Europe as Salmo alpinus.

There is some doubt as to whether it was Dolly Varden or Arctic char that were introduced into Chester Lake 31 August 1974. Eggs from two different populations were held in Calgary, one from the Firth River and one from the Mackenzie (Inuvik stock) and at the time it was thought that both were Arctic char; however, the former was almost certainly Dolly Varden and the latter is uncertain. The mystery could, of course, be resolved if specimens could be studied but, pending that, the case is as follows.

Dr. Peter J. McCart, then of Aquatic Environments Ltd., stated in early conversation with us that he had char of Inuvik stock that were originally brought to Calgary as eggs, used in one of his studies, and subsequently planted by the government's Fish and Wildlife Division in a lake. Apparently some 1600 individuals of 10-13 cm length, left over from one of his studies, were planted rather than be destroyed. The source of the Chester Lake stock agrees with what Mr. Winefred Schenk remembers and agrees with Ladd (1982).

In addition, Dr. D.G. McDonald of McMaster University, wrote an M.Sc. thesis at the University of Calgary in 1974, under the supervision of Dr.

Brian McMahon, in which he had developing eggs of a char. The eggs were obtained from anadromous individuals (2 females and 2 males) from the Firth River, Yukon Territory. Only a few fish were reared much beyond hatching. We have no evidence that suggests that this was the source used in the Chester Lake stocking.

Dr. Robert J. Behnke (Colorado State University, Fort Collins) examined photographs and data of Chester Lake fish sent to him by Mr. Kyle McNeilly of Calgary in 1989. He concluded that the char in question were northern Dolly Varden. However, the identification was partly based on the apparently mistaken belief that it was McDonald's-Firth River fish that were used in the Chester Lake planting and the knowledge that the only anadromous char in the Firth River is now known to be Dolly Varden (pers. comm. R.J. Behnke), and not Arctic char as thought at the time of McDonald's thesis. In accepting McCart's Inuvik fish as the donor source we still cannot be sure if Dolly Varden or Arctic char were involved (gillraker and pyloric caeca counts that have been taken do not rule out either species). However, on the basis of K. McNeilly's examination of specimens and R.J. Behnke's examination of photographs, we are inclined to favor their contention that it is Dolly Varden that are present in Chester Lake, but we emphasize the need for a taxonomic study of specimens.

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Chester L.
Dolly Varden



ROBERT J. Behnke

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Air Mail Par avion



FISH A

Young male, spawning coloration

Sept 84

KYLE MENEELY



more ventral view of Fish B



Fish C

All mature males have
severe kypes

This fish had 24 L.S. gill rakers
and 38 caecae