

Guidelines for the Collection of Nooksack Dace
(*Rhinichthys cataractae* spp.)



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Disclaimer

This document has been prepared in cooperation with members of the by the Recovery Team for Non-Game Freshwater Fish Species (BC). It is intended to guide collection and salvage activities likely to impact Nooksack dace. It does not necessarily represent the views of all individual members of the recovery team, or the official positions of the organizations with which the individual team members are associated. The guidelines are based on the best available knowledge and are subject to modifications resulting from new findings and revised objectives.

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Introduction

The following guidelines represent advice regarding the collection and scientific study of Nooksack dace, and has been reviewed by relevant members of the Recovery Team for Non-game Freshwater Fish Species in BC. Nooksack dace are listed under the Species at Risk Act (*SARA*) as endangered. The purpose of the guidelines is to inform regulators issuing collection and study permits under *SARA* and the *BC Wildlife Act*. The guidelines are meant to apply to Nooksack dace, but the rationale presented may be relevant to other listed fish species in the province. The Recovery Team reserves the right to update the guidelines based on new information or interpretations.

Background

The Nooksack dace is a small (<15 cm) stream-dwelling cyprinid (minnow). It is considered a subspecies of the widespread and common longnose dace *Rhinichthys cataractae*. Within Canada it is known from four lowland streams in British Columbia's Fraser Valley: the Brunette River (Burnaby), Fishtrap Creek (Abbotsford), Pepin Creek and Bertrand Creek (Langley). It is extirpated from some tributaries in these watersheds where it was abundant in the 1960s. The global distribution includes approximately 20 additional streams in north-west Washington. Its current status in Washington State is unknown. Nooksack dace are strongly associated with riffle habitats. Young-of-the-year fish are found in shallow marginal pool habitat in close proximity to the riffles inhabited by adults.

Nooksack dace populations are sampled regularly for scientific study and the monitoring of habitat restoration projects. At current levels the impact of these activities is believed to be negligible. Nooksack are also regularly captured and relocated during fish salvage operations for in-stream works. These include municipal drainage works, road and utility crossing projects, habitat enhancement and compensation projects, and other works approved under the federal *Fisheries Act*.

Recommendations

Locations

Critical habitat for the species is identified and mapped in the Recovery Strategy for Nooksack Dace, available on the Species at Risk Public Registry (<http://www.sararegistry.gc.ca>). These guidelines should be applied to all fish sampling and salvage conducted within Critical habitat. As a precautionary measure, they should also be applied to all sampling and salvage done within 50 m of riffle habitats in areas outside of identified Critical Habitat, but within the Pepin, Fishtrap, and Bertrand Creek watersheds.

The taxonomic relationship and geographic boundaries between Nooksack dace and a second subspecies of *R. Cataractae*, known from other watersheds in the Fraser Valley, is the subject of ongoing research (see Nooksack dace identification, below). For this reason, *R. cataractae* from all locations in the Fraser Valley are of scientific interest and fish accidentally killed or retained for other reasons, should be deposited in a recognized museum collection (see lethal sampling, below).

Collection and Handling Methods

Adult Nooksack dace are usually concentrated in the fastest available currents. The preferred methods of collecting them is by baited minnow traps or kick seine. Capture rates are low with minnow traps, and this method is not effective for estimating abundance. To avoid undue stress on animals, traps should be left in for less than 24 hours. All traps should be accounted for at all times, as traps that are forgotten in a stream will continue to trap and kill fish even when unbaited. In kick-seining, fish are flushed into a small pole seine by manually disturbing the substrate immediately upstream of the net. Electrofishing may be used when substrate is too large to move manually, to help calibrate density or abundance estimates using other collection methods, and in attempts to determine presence after kick seining has failed. To minimize adverse effects on dace, electrofishing of occupied habitat should be restricted to a single pass once per season using the minimum effective voltage and duty cycle at 60 to 90 Hz. More intensive sampling protocols require review and approval by the Recovery Team on a case by case basis. Electrofishing operations will also be subject to DFO restrictions on timing and location to protect salmonids and eggs.

Nooksack dace sampling should be restricted to before April 30 or after July 15, outside the spawning/incubation period. Handling should be minimized, but if necessary, fish should be lightly anaesthetized in a 70 mg/l solution of MS222 (tricaine methanesulfonate) first. After handling fish should be allowed to fully recover from sedation and released at their point of capture. With proper care acute mortality rates should be below 1%, although some delayed mortality undoubtedly also occurs. Nooksack dace killed accidentally should be retained for deposit in a recognized museum collection (see information in lethal sampling section below).

To prevent the spread of invasive species and disease organisms the Recovery Team recommends that all sampling equipment (traps, seines, boats, boots, etc.) be sterilized using appropriate methods prior to moving gear from one water body to another. Treatment with diluted bleach is the most straightforward method at this time. A suitable protocol was recently developed for amphibian researchers in British Columbia and is available at: http://www.env.gov.bc.ca/wld/frogwatch/amphibian_disease.htm

Scientific Sampling

Lethal Sampling

Lethal sampling is permitted for the collection of voucher specimens to document newly discovered populations. A minimum of one and a maximum of two individuals should be retained for deposit with the Beaty Biodiversity Museum¹ and/or the Royal British Columbia Museum². Fish should be overdosed in anaesthetic (MS 222 or clove oil) and preserved in 95% ethanol or 10% formalin. If formalin is used, a fin clip of each individual should be preserved in 95% ethanol. Applications to conduct lethal sampling of Nooksack dace for other purposes will be considered on a case by case basis by the Recovery Team.

¹ The Beaty Biodiversity Museum , University of British Columbia, 2370-6270 University Blvd., Vancouver, BC, V6T 1Z4 Phone: (604) 822-0297 Fax: (604) 822-2416 Email: info@beatymuseum.ubc.ca

² Royal BC Museum, 675 Belleville Street, Victoria, BC Canada, V8W 9W2, Tel: (250) 356-RBCM (7226) Fax: (250) 387-5674

In Situ Scientific Studies - Use of Non-native Species

The Recovery Team recommends full prohibition of use of non-native plant or animal species in experimental studies in the wild. By “non-native species” we refer to all species that do not naturally occur within the watersheds where Nooksack dace occur.

Salvage Operations

Each riffle should be isolated using fine mesh stop nets. If the substrate is moveable, the enclosure should be kick seined using a minimum of 3 passes, or until no Nooksack dace are caught for at least one pass. It should then be electroshocked until no Nooksack dace are captured for at least one pass. Captured fish should be held for the minimum practical amount of time in well oxygenated water at ambient stream temperature. This is best accomplished using a perforated holding container partially immersed in the stream. If relocation is necessary, fish should be released into the closest suitable habitat within the watershed in accordance with fish transplant regulations (http://www-heb.pac.dfo-mpo.gc.ca/intro_trans/regulations_e.htm).

Nooksack Dace Identification

Nooksack dace are small (<15 cm), torpedo-shaped cyprinids (minnow family). They have a long snout, large pectoral fins, barbells at the corner of the jaws, and a loose fleshy connection (frenum) between the upper lip and the snout. When placed in a bucket they characteristically settle to the bottom with their pectoral fins fanned out. Individuals less than 100 mm have a dark, mid-lateral stripe ending in a dark tail-spot. Fry down to 12 mm have a distinctive dark lateral stripe on the snout, passing through the eye. Fry are typically seen in loose schools in shallow water (usually <20 cm), actively foraging within the water column.

Nooksack dace are very difficult to distinguish from a second subspecies of *R. cataractae* that also occurs in the Fraser Valley, the Columbia longnose dace. The number of scales along the lateral line is usually less than 58 in Nooksack dace and is usually more than 60 in the Columbia form. A zone of past hybridization appears to occur in the Coquitlam and Alouette River watersheds (Maple Ridge and Pitt Meadows). Scale counts are more varied in these fish. They are not considered Nooksack dace.





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Gravid Female

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