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## **Nooksack Dace**

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*The habitat of the  
Nooksack Dace is  
rapidly disappearing  
due to  
human activities.*





## Why are Nooksack Dace at Risk?

Nooksack Dace are considered critically imperiled in British Columbia, because they have a very restricted distribution and their habitat is rapidly disappearing due to human activities. The entire world distribution of Nooksack Dace occurs only in the Fraser Valley in British Columbia and the Chehalis River and Puget Sound drainages in Washington state. In British Columbia they can only be found in four small streams in the Abbotsford, Aldergrove and Clearbrook areas of the Fraser Valley. These streams are part of the Nooksack River drainage system that has been greatly altered by a rapidly expanding human population and by land development.

Several factors linked to human activities are responsible for the loss and degradation of Nooksack Dace stream habitat. Pollution from fertilizers, pesticides, and sewage has affected these delicate streams. Ditching, diversion, water extraction for irrigation use, and expansion of storm sewer systems have changed stream flow. Land clearing and ditch maintenance activities have removed streamside vegetation and

reduced the amount of available hiding cover for the fish, causing over-heating of the

*Nooksack Dace have disappeared from some streams within their Canadian range.*

water in the summer. Gravel extraction has produced siltation, causing further loss of cover and of feeding areas as the rocks along the stream bottom become buried in mud. All these activities are largely responsible for the

disappearance and deterioration of Nooksack Dace stream habitat in the Fraser Valley.

Current scientific evidence suggests the British Columbia distribution of Nooksack Dace is shrinking and that they now have a precarious existence in Canada. Recently, Nooksack Dace have disappeared from some smaller tributaries and stream headwaters in their Canadian range. Although these streams flow south into the Nooksack River drainage of Washington, this area is an unlikely refuge because it is adversely affected by the same human factors causing declines in British Columbia. Thus, Nooksack Dace populations in Canada are trapped between the deteriorating environment upstream and unsuitable habitat downstream. Clearly, the long term outlook for Nooksack Dace is dismal and corrective measures are required soon if the fish are to avoid extirpation (the disappearance of this species from this portion of its range).

## What is their status?

In 1993, BC Environment biologists, supported by the Habitat Conservation Fund, thoroughly surveyed streams south of the Fraser River. They found Nooksack Dace present in only 4 of 34 streams examined. Further, no dace were

found in Howes Creek, or in the headwaters of Fishtrap and Bertrand creeks that formerly contained this fish. Once abundant throughout Fishtrap Creek, Nooksack Dace now occur rarely. They are rapidly being extirpated from this stream

due to impacts of recent human development. Healthy populations of Nooksack Dace can still be found in Bertrand, Pepin and Cave creeks, but their status causes some concern as these streams are seriously

threatened by increasing urbanization.

Due to its restricted range and threats to its remaining stream habitat, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is considering the Nooksack Dace for possible designation as an "Endangered" species. The B.C. Conservation Data Centre has placed the Nooksack Dace in its highest risk category ("critically imperiled because of extreme rarity"), recognizing its vulnerability to extirpation in Canada.

## What do they look like?

Nooksack Dace are small streamlined fish. The largest specimen that has been found in B.C. streams is only 10.5 cm long. They have a sub-terminal mouth (the snout overhangs the mouth), small scales and a moderately forked tail. The usual colouring is olive-grey on the back and white to silver on the belly with a dull brassy stripe that runs along the sides of the fish. Often there is a black stripe in front of the eyes and a pale marking at the front and back of the dorsal fin. The colour and markings of Nooksack Dace help protect the fish from predation by making it hard to see in the stream environment.

Males and females are similar

*The endangered Salish Sucker is also found in Nooksack Dace streams.*

in colour, but males do tend to have longer and darker pectoral fins. Juvenile dace have a very conspicuous black line that

runs along their sides from the snout to the base of the tail. Once again this marking helps young dace blend into their environment. Nooksack Dace may be distinguished from their close relative the Longnose Dace by scale counts. Nooksack Dace have approximately 54 scales along the lateral line and



24 around the caudal peduncle, compared to 67 and 31, respectively, for Longnose Dace.

Another endangered species, the Salish Sucker, is found in streams inhabited by Nooksack Dace and can be distinguished from them on the basis of its larger size, more rounded snout, and the presence of small projections (papillae) on its lips. Trout and salmon also inhabit the streams where Nooksack Dace are found. Salmonids may be separated from Nooksack Dace by the presence of teeth and a small fleshy lobe (adipose fin) on their backs between the dorsal fin and tail.

### What makes them unique?

**N**ooksack Dace are closely related to, and likely evolutionarily derived from, Longnose Dace. Today, the geographic distributions of the two species do not overlap. Nooksack Dace are part of the “Chehalis fauna,” a unique assemblage of fishes that originated in an unglaciated area south of Puget

*Nooksack Dace are part of a unique group of fishes that originated during the Pleistocene.*

Sound during the Pleistocene glaciation. It was during this time that Nooksack Dace developed their distinctive characteristics. The Nooksack Dace migrated north into southwestern British Columbia through lakes and water channels that formed as the glacial ice melted and retreated north. Once they arrived in British Columbia, Nooksack Dace adapted to conditions in the Fraser Valley to survive in small headwater streams, while those that remained in Washington are regularly found in large, fast flowing rivers.

### How do they reproduce?

In British Columbia, Nooksack Dace spawn in the spring (April through May) when water temperatures are between 7 and 9°C. Spawning occurs at night in the upstream end of riffles (shallow, fast flowing water). Both sexes breed in their third spring when they are about two years old. The female deposits small sticky eggs that adhere to the gravel of the stream bottom. Female dace produce between 200 and 2000 eggs, with the number of eggs increasing with the size of the fish. Unlike Longnose Dace, Nooksack Dace do not exhibit marked spawning colouring or territorial behaviour linked to breeding. There is no parental care of the young. Once the eggs hatch, the young move into slow glides (moderate depth, slow current) or pools (deeper water with little or no current) to live. Details of the life history and habitat needs of Nooksack Dace are still quite vague and more information is badly needed.

### What do they eat?

Nooksack Dace eat small riffle-dwelling invertebrates. In particular, they feed on fresh water insect larvae called midges or chironomids. Nooksack Dace collected at mid morn-

ing usually have empty stomachs but intestines filled with the remains of larval midges, caddis-flies, mayflies, and beetles. This suggests that Nooksack Dace probably feed at night. Young dace feed on midge pupae and tiny crustaceans.

Detailed information on food abundance and type in “Nooksack Dace streams” is not available. However, it is reasonable to suggest that any adverse human impacts on the stream ecosystems where they live will negatively affect the food supply of Nooksack Dace and the other fish that share their home.

### Where do they live?

In British Columbia, Nooksack Dace inhabit small streams that are usually less than 6 metres wide. The streams flow through a very diverse landscape of farmland and small acreages, housing projects, and gravel extraction mines. These Fraser Valley streams have high water flows in the winter but may have seriously low flows in the summer.

Adult Nooksack Dace are bottom dwelling and live in riffles and fast glides, where loose gravel substrate provides areas for foraging and places to

hide from predators. These important stream characteristics were once common in the headwaters of the Nooksack River drainage, but are now threatened by urban development. In situations of low stream flow or habitat degradation, adult dace may move into pools, but they do not grow well or reproduce in this type of habitat.

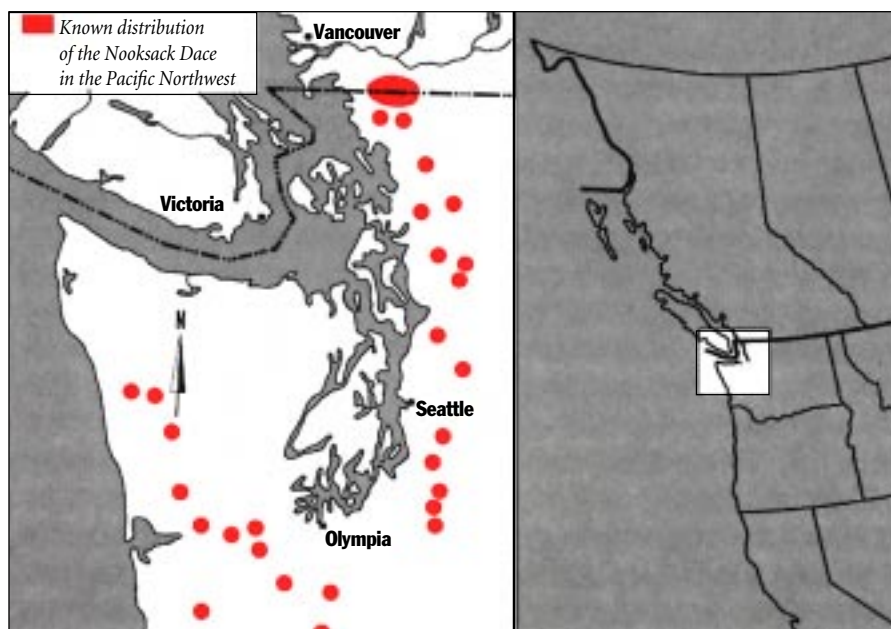
Juvenile fish inhabit slow glides and pools with mud or sand bottoms, where tall grasses and other plants along the stream banks provide cover and shade. Destruction of this foliage increases the occurrence of high temperatures and low stream flows during the summer, reducing the amount of suitable Nooksack Dace habitat. These glides and pools are found adjacent to faster flowing riffles that contain adult dace.

Adult Nooksack Dace tend to congregate in large numbers in riffles and share their habitat with Cutthroat Trout, juvenile Coho Salmon, Lamprey, Sculpins and another endangered native fish, the Salish Sucker. Improvements in Nooksack Dace habitat will consequently benefit a large number of other fish species.

### What can we do?

The provisions of the Fisheries Act have not been sufficient to protect the stream habitat occupied by salmonids and other fish. It is unlikely that Nooksack Dace will avoid extinction solely because of legal arrangements. Nooksack Dace are limited in their Canadian distribution to four fragile streams, all in an area of rapid urbanization. Although these streams run through housing developments and farmland, most people are unaware of

*Important stream characteristics are now threatened by urban development.*




the existence of the Nooksack Dace or other endangered native fishes such as the Salish Sucker. These two fish species occur nowhere else in Canada.

Widespread public awareness is urgently needed to establish the basis of concern required to generate efforts to save Nooksack Dace stream habitat. In particular, because most of the land developments that affect the streams are dealt with at the municipal level, it is important that these governing bodies are alerted to the problem. The

issuing of land development permits and licences for gravel extraction should be sensitive to the needs of maintaining the remaining Nooksack Dace stream habitat. Interference with the natural flow regime of the streams through straightening and diversions can have a disastrous impact on Nooksack Dace

*The public can help by supporting conservation and stewardship activities.*

habitat. Land owners whose properties border these streams should be encouraged to assume a stewardship role as far as habitat protection and improvement are concerned.

The public can do much to help protect Nooksack Dace in Canada by supporting conservation and stewardship initiatives and by learning more about the diversity of aquatic life found in these inconspicuous streams. In a broader context, these streams not only provide a home to the Nooksack Dace and other fish, but also diversify and enrich the environment in which we all live. 



**FAST FREE-FLOWING STREAMS ARE IDEAL NOOKSACK DACE HABITAT.**



**IMPROPER CULVERT INSTALLATION BLOCKS MOVEMENT OF FISH.**

*Susan Inglis photos*



**AGRICULTURE AND URBAN DEVELOPMENT ARE MAJOR THREATS TO NOOKSACK DACE.**



A TYPICAL ADULT NOOKSACK DACE.  
*Susan Inglis photo*

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