Percent Riffle in Reach and Nooksack Dace

Function Updated by mbayly on Thu, 04/24/2025 - 19:10.

Species Information

Common Name: Nooksack Dace
Genus: Rhinichthys cataractae

Stressor Details

Stressor Name: Riffle
Units: % of riffle in reach
Metric: Riffle in reach
Scale: linear
Function Type: continuous
Vital Rate/Process: System capacity

Life Stage & Context

Life Stages: Adults
Geography: Lower Fraser Valley (British Columbia)
Activity: All activities
Season: Spring, Summer (April-Sept)

Descriptions

Overview

> The shape and threshold for the final curve (10%) is based on Pearson et al. (2007) and Pearson (2004), which shows a large decline in percent reaches occupied by Nooksack Dace when percent riffle in reach in below 10%. The habitat suitability curve for Longnose Dace (Edwards et al. 1983) also supports the shape (a threshold response) of the function. The presumed ecological mechanism is that once riffle habitat declines below a minimum threshold (i.e., 10%) there is no longer sufficient habitat to support a large or continuous population, and riffles may be spatially isolated and unoccupied. based on expert opinion provided at the workshop held in November 2024, the originally proposed continuous declining response after threshold (10% riffle) was modified to a step response (Jordan Rosenfeld, Pers. Comm., 2024)

Function Derivation

> Based on data from Nooksack Dace and Longnose Dace; Empircal data (Correlative model); Published; Expert opinion

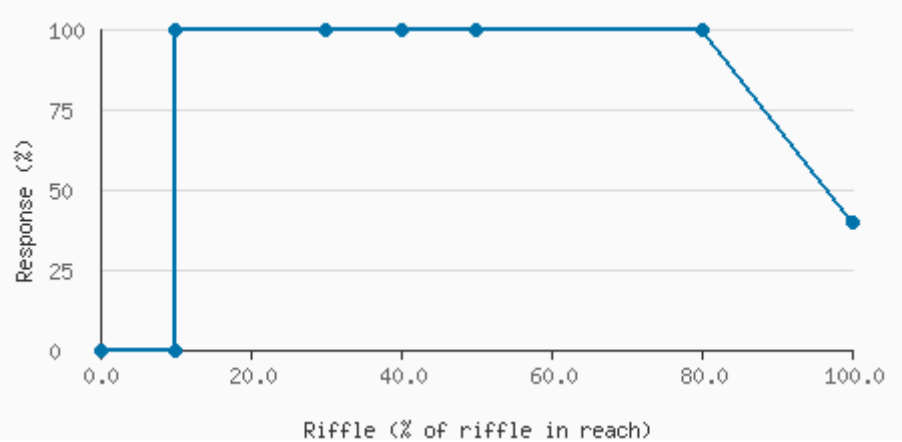
Transferability of Function

> As local adaptations are likely minimal among different Nooksack Dace populations, we would not expect much variation in true tolerance among populations. This function should therefore be broadly applicable to all populations of the species with caution.

Source of Stressor Data

> Percent riffle data is available for most (but not all) reaches in Bertrand, Pepin, Fishtrap Creeks, and the Salmon River, collected as part of Pearson (2004) and subsequent field work to define critical habitat for Nooksack dace.

Stressor Response Data



Percent Riffle	System capacity (%)	SD	low.limit	up.limit
0.00	0.00	0	0	100
10.00	0.00	0	0	100
10	100.00	0	0	100
30.00	100.00	0	0	100
40.00	100.00	0	0	100
50.00	100.00	0	0	100
80.00	100.00	0	0	100
100.00	40.00	0	0	100

Citations

Usoof, A.M. and Rosenfeld, J.S. 2024. Relationship between system capacity and Percent Riffle in Reach for Nooksack Dace.

Edwards, E. A., H. Li, and C. B. Schreck. 1983. Habitat Suitability Index Models: Longnose Dace. U.S. Dept. Int., FishWildl. Serv. FWS/OBS-82/10.33.

Pearson, M. P. 2004. The ecology, status and recovery prospects of Noonsack dace (Rhinichthys Cataractae ssp.) and Salish sucker (Catostomus sp.) in Canada. University of British Columbia.

Pearson, M. P., T. Hatfield, J. D. McPhail, J. S. Richardson, J. S. Rosenfeld, H. Schreier, D. Schluter, D. J. Sneep, M. Stejpovic, E. B. Taylor, and P. M. Wood. 2007. Recovery Strategy for the Nooksack Dace (Rhinichthys cataractae) in Canada. Species at. Fisheries and Oceans Canada, Vancouver B.C.