

Beechie et al. 2021: Stream Temperature and Coho Salmon Summer Rearing

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Species Information

Common Name: Coho Salmon

Genus: *Oncorhynchus kisutch*

Stressor Details

Stressor Name: Stream Temperature

Units: °C

Metric: 7-Day Maximum Weekly Average

Scale: linear

Function Type: continuous

Vital Rate/Process: Survivorship

Life Stage & Context

Life Stages: Juvenile, Parr

Activity: Rearing

Season: Summer

Descriptions

Overview

The functional relationship between the summer rearing capacity and the 7-day average daily maximum stream temperature for coho salmon.

Increasing stream temperature decreases coho salmon abundance and productivity via changes in summer rearing capacity and productivity. We estimate the productivity multiplier based on 7-day average daily maximum (7-DADM) stream temperature which decreases summer rearing productivity from its base value:

$T < 18^{\circ}\text{C}$, 1

$18^{\circ}\text{C} \leq T < 24^{\circ}\text{C}$, $1 - 0.17 \cdot (T - 18)$

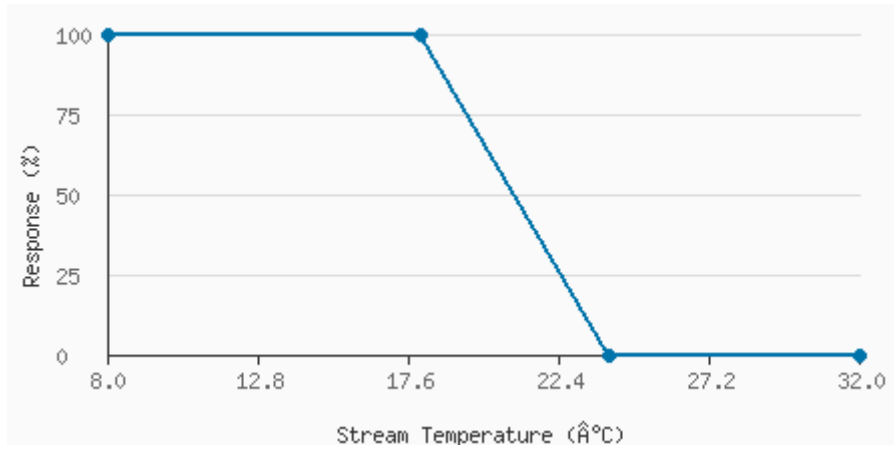
$T \geq 24^{\circ}\text{C}$, 0

That is, at temperatures

Function Derivation

expert opinion

Stressor Response Data



Stressor (X)	Mean System Capacity (%)	SD	low.limit	up.limit
8	100	0	0	0
18	100	0	0	0
24	0	0	0	0
32	0	0	0	0

Citations

Beechie, T. J., C. Nicol, C. Fogel, J. Jorgensen, J. Thompson, G. Seixas, J. Chamberlin, J. Hall, B. Timpane-Padgham, P. Kiffney, S. Kubo, and J. Keaton. 2021. Modeling Effects of Habitat Change and Restoration Alternatives on Salmon in the Chehalis River Basin Using a Salmonid Life-Cycle Model. U.S. Department of Commerce, NOAA Contract Report NMFS-NWFSC-CR-2021-01.

References

<https://repository.library.noaa.gov/view/noaa/29486> - <https://repository.library.noaa.gov/view/noaa/29486>