Hampton 1988: HSI Coho Fry Depth

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Species Information

Common Name: Coho Salmon
Genus: Oncorhynchus kisutch

Stressor Details

Stressor Name: Depth
Units: m
Metric: Water Depth (total depth)
Scale: linear
Function Type: continuous
Vital Rate/Process: Habitat Suitability Index

Life Stage & Context

Life Stages: Fry
Geography: Trinity River California
Activity: rearing
Season: Summer (rearing)

Descriptions

Overview

> Trinity River coho salmon depth habitat suitability curve (Hampton 1988) as used by Rosenfeld & Ptolemy (2012). Suitability rises from 0 at 0 m to an optimum at ~0.34 - 0.39 m (consistent with Hampton's reported fry preference of 0.9 - 1.2 ft), declines to ~0.23 by ~0.8 m, has a minor secondary hump near 1.0 m, and approaches 0 at ~1.5 m. Values were extracted from the vector line work of the published figure (dotted/solid lines traced point-by-point and simplified), so they approximate the original curves to within ~0.01 m and ~1 suitability unit. Note the figure's axis labels read cm·s?¹ and cm, but the scales (0 - 1.5) are clearly m/s and m.
>
> Stressor-response relationship data sourced from: Rosenfeld & Ptolemy (2012) Fig. 2b - Depth habitat suitability curve for coho salmon, Trinity River (dotted line) (p. 1923).
>
> Likely to have low transferability.

Function Derivation

> Empirical frequency-of-use (use/availability) preference curve from snorkel observations, smoothed and normalized to 0-1.

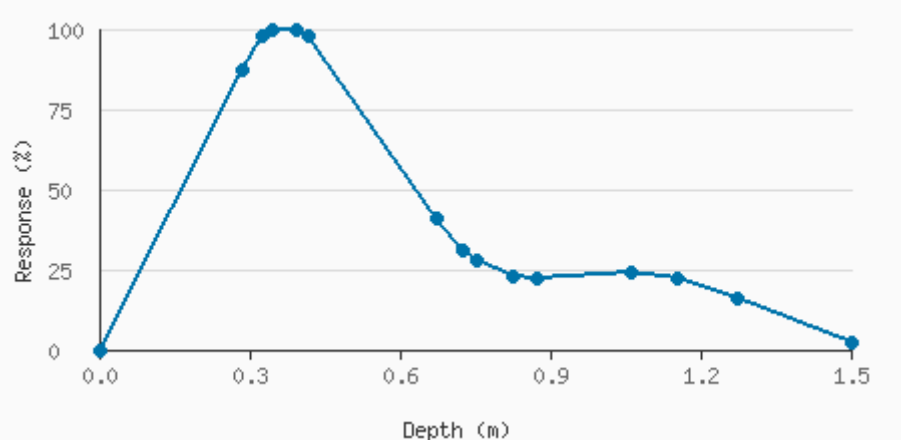
Transferability of Function

> LOW: Developed for a large regulated California river; the extreme preference for zero velocity is likely site-specific.

Source of Stressor Data

> Hampton (1988): snorkel observations of coho fry (?50 mm FL; 130 observations, 913 fish) vs. IFG4-modelled habitat availability, 1985–1987.

Stressor Response Data



Raw Stressor Values	Scaled Response Values 0 to 100	SD	low.limit	up.limit
0	0	0	0	100
0.281	87	0	0	100
0.32	98	0	0	100
0.34	100	0	0	100
0.385	100	0	0	100
0.409	98	0	0	100
0.658	41	0	0	100
0.712	31	0	0	100
0.737	28	0	0	100
0.81	23	0	0	100
0.856	22	0	0	100
1.041	24	0	0	100
1.129	22	0	0	100
1.247	16	0	0	100
1.468	2	0	0	100

Citations

Rosenfeld, J. S., & Ptolemy, R. (2012). Modelling available habitat versus available energy flux: Do PHABSIM applications that neglect prey abundance underestimate optimal flows for juvenile salmonids? Canadian Journal of Fisheries and Aquatic Sciences, 69(12), 1920–1934. https://doi.org/10.1139/f2012-115.

Hampton, H. (1988). Development of habitat preference criteria for anadromous salmonids of the Trinity River. U.S. Department of the Interior, Fish and Wildlife Service, Division of Ecological Services, Sacramento, California.

References

Rosenfeld and Ptolemy 2012 - https://doi.org/10.1139/f2012-115