Rosenfeld et al. 2016: HSI Coho Juvenile Depth (12 cm FL)

Downloaded on: 2026-11-12, From: https://mjbayly.com/stressor-response/rosenfeld-et-al-2016-hsi-coho-juvenile-depth-12-cm-fl
Function Updated by mbayly on Thu, 10/15/2026 - 16:29.

Species Information

Common Name: Coho Salmon
Genus: Oncorhynchus kisutch

Stressor Details

Stressor Name: Depth
Units: m
Metric: Water Depth (total depth; 12-cm FL juvenile)
Scale: linear
Function Type: continuous
Vital Rate/Process: Habitat Suitability Index

Life Stage & Context

Life Stages: Parr
Geography: Washington/BC.
Activity: rearing
Season: Late summer–early fall (low flow)

Descriptions

Overview

> Bioenergetic-based depth habitat suitability curve for 12-cm fork length (~21.2 g) juvenile Coho Salmon. Suitability is standardized net energy intake from a drift-foraging model (focal depth assumed at 40% of water column depth), rescaled to 0–100. Suitability increases with depth as the volume of the reactive field (and therefore prey flux) increases, approaching the maximum at ~1 m; unlike frequency-based depth curves, suitability does not decline in deep water.
>
> Stressor-response relationship data sourced from: Appendix, TABLE A.2. Depth habitat suitability values for 6-, 8-, 10-, and 12-cm-FL juvenile Coho Salmon based on bioenergetics — 12 cm FL column (p. 1219); see also Figure 3b.
>
> See curve for 6cm FL. See source publication for remaining curves.

Function Derivation

> Mechanistic drift-foraging bioenergetic (net energy intake) model, standardized to a maximum of 1.

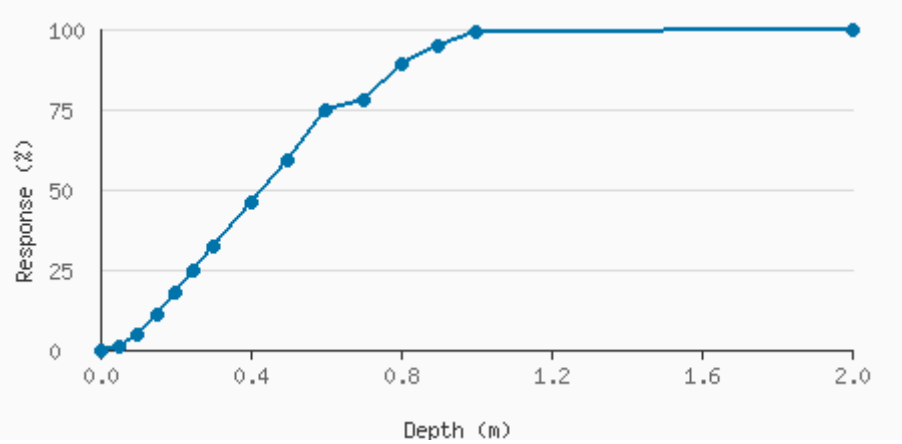
Transferability of Function

> Sensitive to drift concentration, temperature (fixed at 12°C) and fish size; best suited to drift-feeding juvenile salmonids.

Source of Stressor Data

> Drift-foraging bioenergetic model (Hughes & Dill 1990 framework) run over homogeneous depth-velocity fields; drift concentrations from Husdon Creek, BC; fixed 12°C.

Stressor Response Data



Raw Stressor Values	Scaled Response Values 0 to 100	SD	low.limit	up.limit
0	0	0	0	100
0.05	1	0	0	100
0.1	5	0	0	100
0.15	11	0	0	100
0.2	18	0	0	100
0.25	25	0	0	100
0.3	32	0	0	100
0.4	46	0	0	100
0.5	59	0	0	100
0.6	75	0	0	100
0.7	78	0	0	100
0.8	89	0	0	100
0.9	95	0	0	100
1	99	0	0	100
2	100	0	0	100

Citations

Rosenfeld, J., Beecher, H., & Ptolemy, R. (2016). Developing bioenergetic-based habitat suitability curves for instream flow models. North American Journal of Fisheries Management, 36(5), 1205–1219.

References

Rosenfeld et al., 2016 - https://doi.org/10.1080/02755947.2016.1198285