# 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.

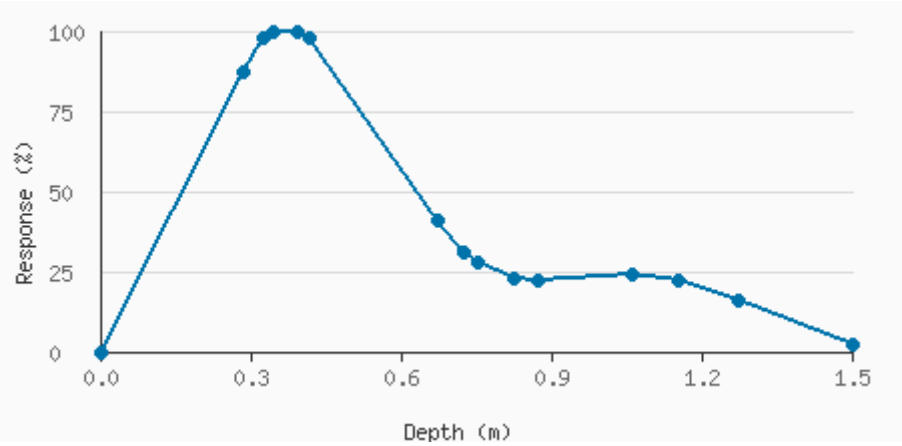
### Transferability of Function

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