

# Tapple and Bjornn 1983: Fines and Steelhead Embryo

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Function Updated by stobias on Mon, 12/02/2024 - 13:30.

## Species Information

**Common Name:** Steelhead Trout  
**Genus:** *Oncorhynchus mykiss irideus*

## Stressor Details

**Stressor Name:** Sedimentation  
**Units:** % smaller than 6.35mm  
**Metric:** Substrate particles  
**Scale:** linear  
**Function Type:** continuous

## Life Stage & Context

**Life Stages:** Egg  
**Geography:** Idaho and Washington Streams

## Descriptions

### Overview

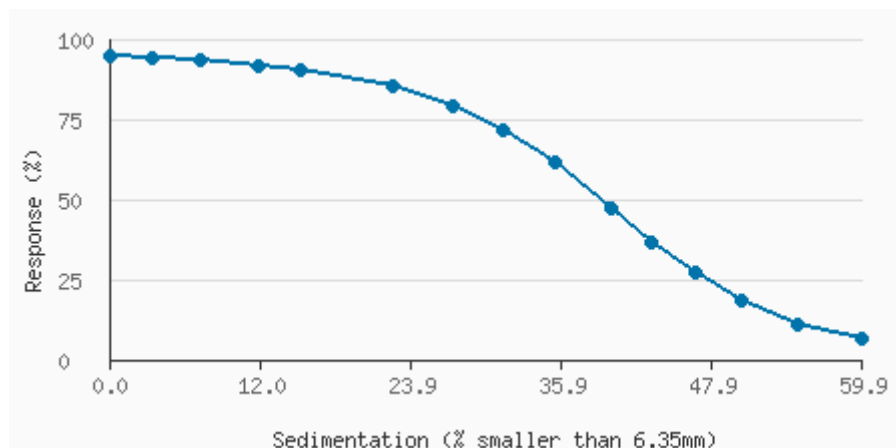
[Taken from figure caption] Relation between embryo survival and percentage of substrate particles smaller than 6.35mm for chinook salmon.

[Taken from paper] Redds that remain intact during incubation may become less suitable for embryos if inorganic fine sediments and organic materials are deposited in the interstitial spaces between the larger particles. The fine particles impeded the movement of water and alevins in the redd, and the organic material consumes oxygen during decomposition; if the oxygen is consumed faster than the reduced intragravel water flow can replace it, the embryos or alevins will asphyxiate.

### Function Derivation

field study

## Stressor Response Data



| Stressor (X) | Mean System Capacity (%) | SD   | low.limit | up.limit |
|--------------|--------------------------|------|-----------|----------|
| 0.00         | 94.66                    | 0.00 | 94.66     | 94.66    |

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 3.46  | 93.95 | 0.71  | 93.95 | 93.95 |
| 7.21  | 93.24 | 6.41  | 93.24 | 93.24 |
| 11.92 | 91.81 | 4.98  | 91.81 | 91.81 |
| 15.24 | 90.39 | 11.03 | 90.39 | 90.39 |
| 22.59 | 85.05 | 15.66 | 85.05 | 85.05 |
| 27.30 | 79.36 | 21.00 | 79.36 | 79.36 |
| 31.32 | 71.53 | 13.17 | 71.53 | 71.53 |
| 35.47 | 61.57 | 16.73 | 61.57 | 61.57 |
| 39.91 | 47.33 | 27.76 | 47.33 | 47.33 |
| 43.23 | 36.65 | 17.08 | 36.65 | 36.65 |
| 46.70 | 27.40 | 18.15 | 27.40 | 27.40 |
| 50.30 | 18.51 | 9.25  | 18.51 | 18.51 |
| 54.87 | 10.68 | 5.34  | 10.68 | 10.68 |
| 59.86 | 6.41  | 0.00  | 6.41  | 6.41  |

## Citations

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Bjornn, T. C., & Reiser, D. W. (1991). Habitat requirements of salmonids in streams. American Fisheries Society Special Publication, 19(837), 99. Tappel, P. D., & Bjornn, T. C. (1983). A new method of relating size of spawning gravel to salmonid embryo survival. North American Journal of Fisheries Management, 3(2).

## References

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