Honea et al. 2009: Fine sediments and Egg-to-Fry Survivorship

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Species Information

Common Name: Chinook Salmon
Genus: (Oncorhynchus tshawytscha

Stressor Details

Stressor Name: Fines
Units: Fine Coverage (%)
Metric: Fine Coverage of the Substrate <1.7mm
Scale: linear
Function Type: continuous
Vital Rate/Process: Survivorship

Life Stage & Context

Life Stages: Egg
Geography: Idaho and Washington
Activity: Incubation
Season: Incubation

Descriptions

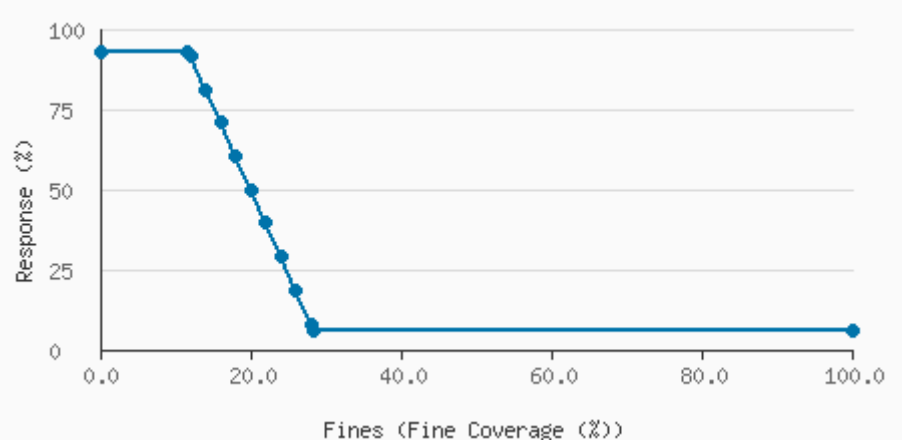
Overview

> Experimental gravel mixture and Chinook Salmon embryo survival. Mesocosm study and literature review. 90% survival achieved when gravel mixture mean size >10mm and decreasing survival with small fine coverage (not reviewed). Fines. Sedimentation.
>
> Egg-to-fry survivorship function:
> Surv = 0.93 if f < 11.6
> Surv = (-5.21*f)+1.54 if 11.6 ? f < 28.3
> Surv = 0.06 if f ? 28.3
>
> Where f is % fines < 1.7 mm.

Source of Stressor Data

> Mesocosm study and literature review.

Stressor Response Data



Raw Stressor Values	Scaled Response Values 0 to 100	SD	low.limit	up.limit
0	93	0	0	100
11.6	93	0	0	100
12	91.48	0	0	100
14	81.06	0	0	100
16	70.64	0	0	100
18	60.22	0	0	100
20	49.8	0	0	100
22	39.38	0	0	100
24	28.96	0	0	100
26	18.54	0	0	100
28	8.12	0	0	100
28.3	6	0	0	100
100	6	0	0	100

Citations

Honea, J. M., Jorgensen, J. C., McCLURE, M. M., Cooney, T. D., Engie, K., Holzer, D. M., & Hilborn, R. (2009). Evaluating habitat effects on population status: influence of habitat restoration on spring?run Chinook salmon. Freshwater Biology, 54(7), 1576-1592.

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, 2, 123–135.

References

2009 Honea et al - https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1365-2427.2009.02208.x

Tappel and Bjornn 1983 - https://afspubs.onlinelibrary.wiley.com/doi/abs/10.1577/1548-8659(1983)3%3C123:ANMORS%3E2.0.CO;2