

Diel Shifts in Salmonid Fry Position

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Objective

To study diel shifts in the habitat preferences of Steelhead (*Oncorhynchus mykiss*) and Coho Salmon (*Oncorhynchus kisutch*) fry.

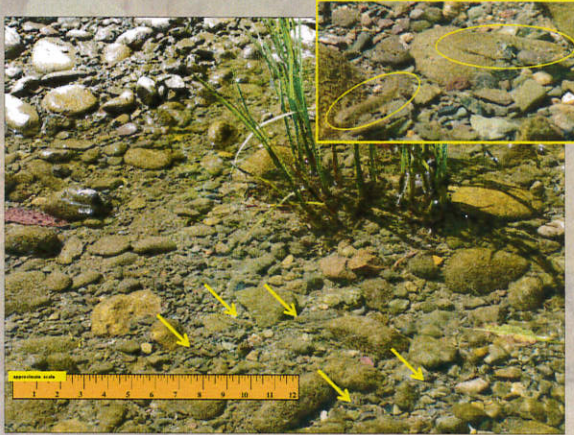


Figure 1. Daytime use of shallow stream margin habitat by steelhead fry. Yellow arrows indicate fry.

Rationale

Improving our understanding of fry position relative to water depth and stream margin, and how that varies, can aid in identifying the risks of fish stranding due to fluctuations in stream flow.



Figure 2. Daytime fry positions marked for study.

Methods

Diel shifts in habitat selection by newly emerged salmonid fry were investigated at three sites in three California coastal watersheds under low-flow conditions. After marking the focal point of individual fry, water depth and distance to the stream edge were measured during the day at each point. This process was repeated at night and differences in fry position between day and night were compared.

Discussion

The consistency of our results across multiple watersheds suggests diel shifts to the shallow margins of streams is a common attribute for stream rearing salmonids in this region. This diel pattern in habitat use also suggests newly emergent fry may be more vulnerable to stranding with changes in stream water surface elevations at night. While our observations have implications for the timing of vineyard water use for frost protection, additional research is suggested to more fully inform the risks of salmonid stranding mortality.

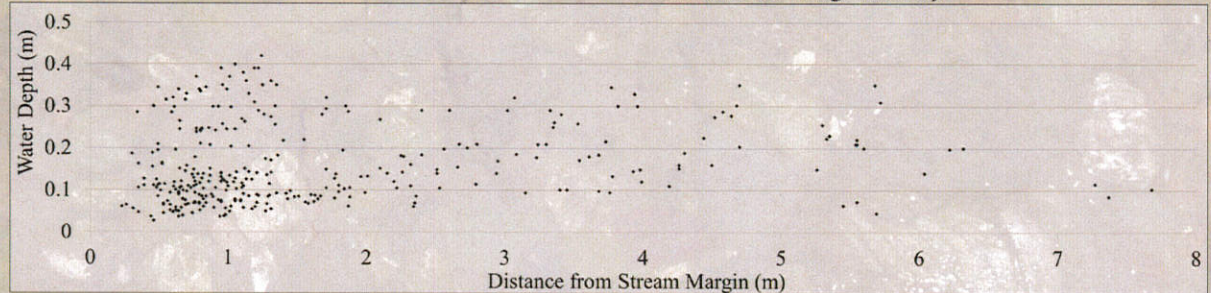


Figure 3. Daytime focal points for all observed steelhead and coho salmon fry over the course of the study period.

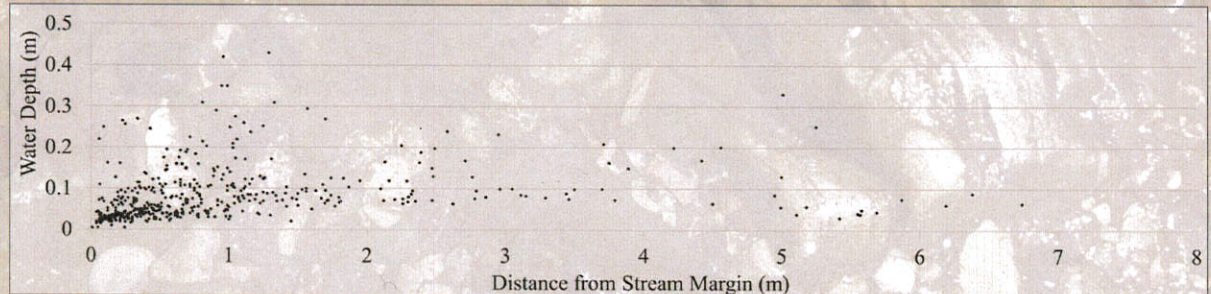


Figure 4. Nighttime focal points for all observed steelhead and coho salmon fry over the course of the study period.

Results

Fry tended to move inshore at night. The proportion of fry within 0.5 meters of the stream margin increased from 8% during the day to 44% at night. The proportion of fry in 10 cm of water or less increased from 32% in the day to 74% at night. The diel shift to shallow stream margins was significant at all sites ($p \leq 0.0001$).

Acknowledgments

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