

Title: Relative Effects of Organic and Inorganic Constituents of the Suspended Sediment Load on Salmonid Foraging and Prey Availability

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Abstract: Organic particles in the suspended load contribute significantly to stream turbidities in the low to moderate range (< 60 NTU) on both ascending and descending limbs of a hydrograph. The foraging efficiency of juvenile salmonids were measured in both the field and laboratory at various turbidities and ratios of organic to inorganic particle concentrations. Field data were collected from a 200-meter study reach of the North and South Forks of Caspar Creek, Mendocino Co., and Prairie and Little Lost Man Creek, Humboldt Co. Data were collected on six separate sampling events encompassing a range of stream discharges and turbidities. Each 200-meter reach was snorkeled to assess the feeding rate of salmonids. Individuals were observed for a 3-minute period each over a 30-minute period, with the number of prey captures/fish determined. Juvenile coho (*Oncorhynchus kisutch*) and steelhead trout (*Oncorhynchus mykiss*) were subsequently captured and the foregut contents sampled by gastric lavage. Feeding rate and the biomass of invertebrate prey sampled from the foreguts of juvenile coho salmon and steelhead trout declined throughout the range of turbidities sampled (4-50 NTU). Feeding rates of juvenile steelhead trout were also measured in artificial stream channels in which individuals were offered live prey under differing levels of suspended sediment concentration and organic to inorganic particle ratios. Feeding trials were conducted at low (4-30 NTU) and high (42-68 NTU) levels of suspended sediment concentration (mg/L), and three different organic to inorganic particle ratios. Organic to inorganic particle ratios varied as 0.75:0.25, 0.50:0.50, and 0.25:0.75 by weight in grams. Foraging efficiency of juvenile steelhead trout decreased significantly with experimental SSC but, not among the three experimental organic to inorganic particle ratios. Both field and laboratory studies revealed that while the foraging efficiency of juvenile salmonids was decreased by increased turbidities, fish continued to capture prey at turbidity levels in the range of 40-50 NTU's.

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