

# Reach-Scale Effects of a Stream Logjam on Benthic Macroinvertebrate Community Composition

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## BACKGROUND



Logjams are accumulations of fallen wood that span the width of a stream or river. They offer refuge from high-velocity waters and provide stable surfaces for colonization. In addition, they concentrate food resources and create numerous microhabitats.

## HYPOTHESIS

- ❖ Because logjams concentrate food resources, we expected aquatic macroinvertebrate abundance, richness, and diversity to increase near the logjam and decrease further away from it.
- ❖ Logjams create numerous microhabitats downstream. Thus, for each functional feeding guild (groups of macroinvertebrates with common feeding strategies and food resources), we expect the area downstream of the logjam to exhibit a different trend in abundance when compared to upstream.

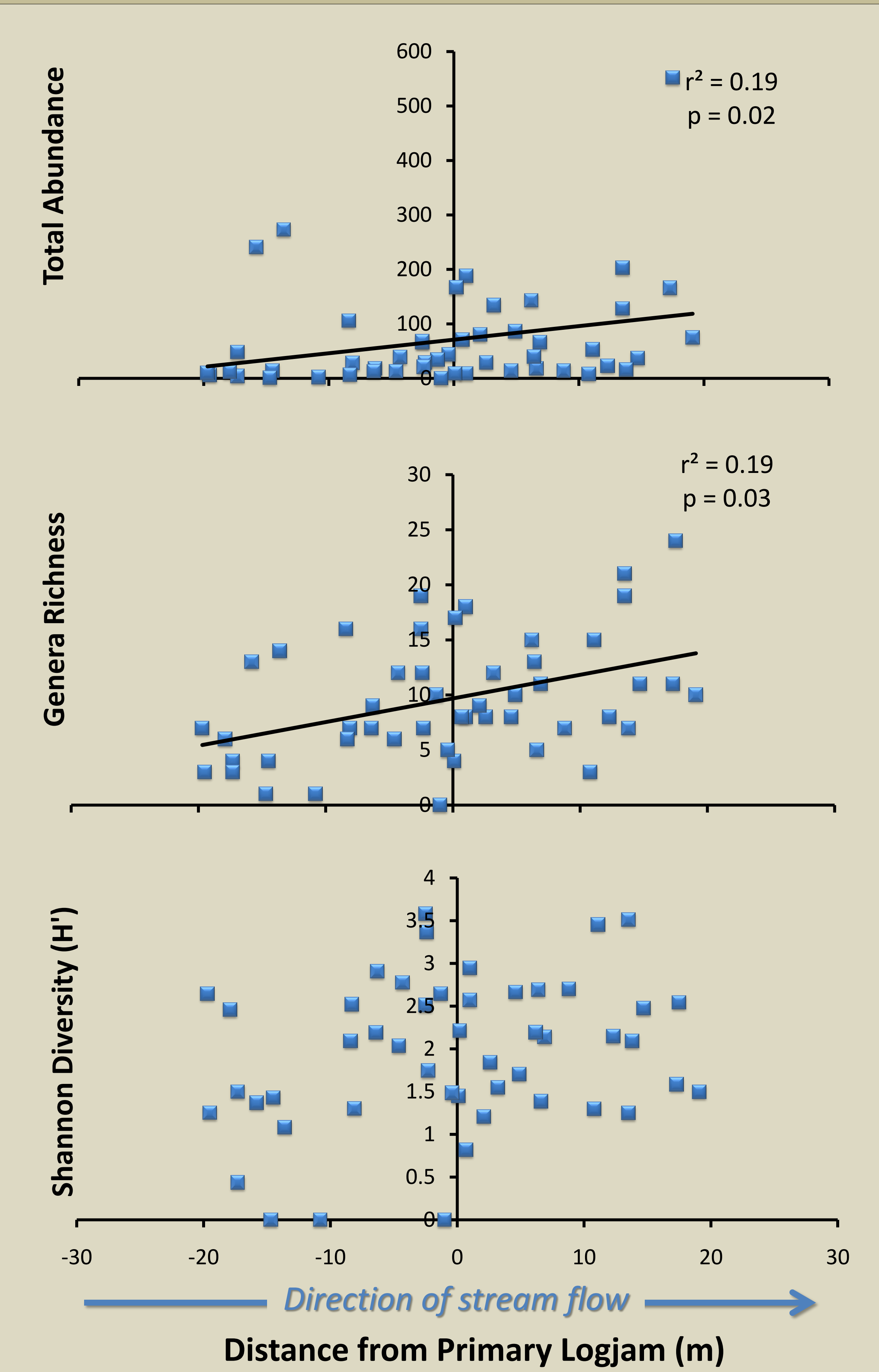
## METHODS

The study was conducted summer 2010 at Cabin Creek in Superior National Forest. Surber samples were collected from 50, randomly assigned sites within a 40-m stretch centered at a logjam. Aquatic insects were identified to the genus-level and divided into functional feeding guilds.



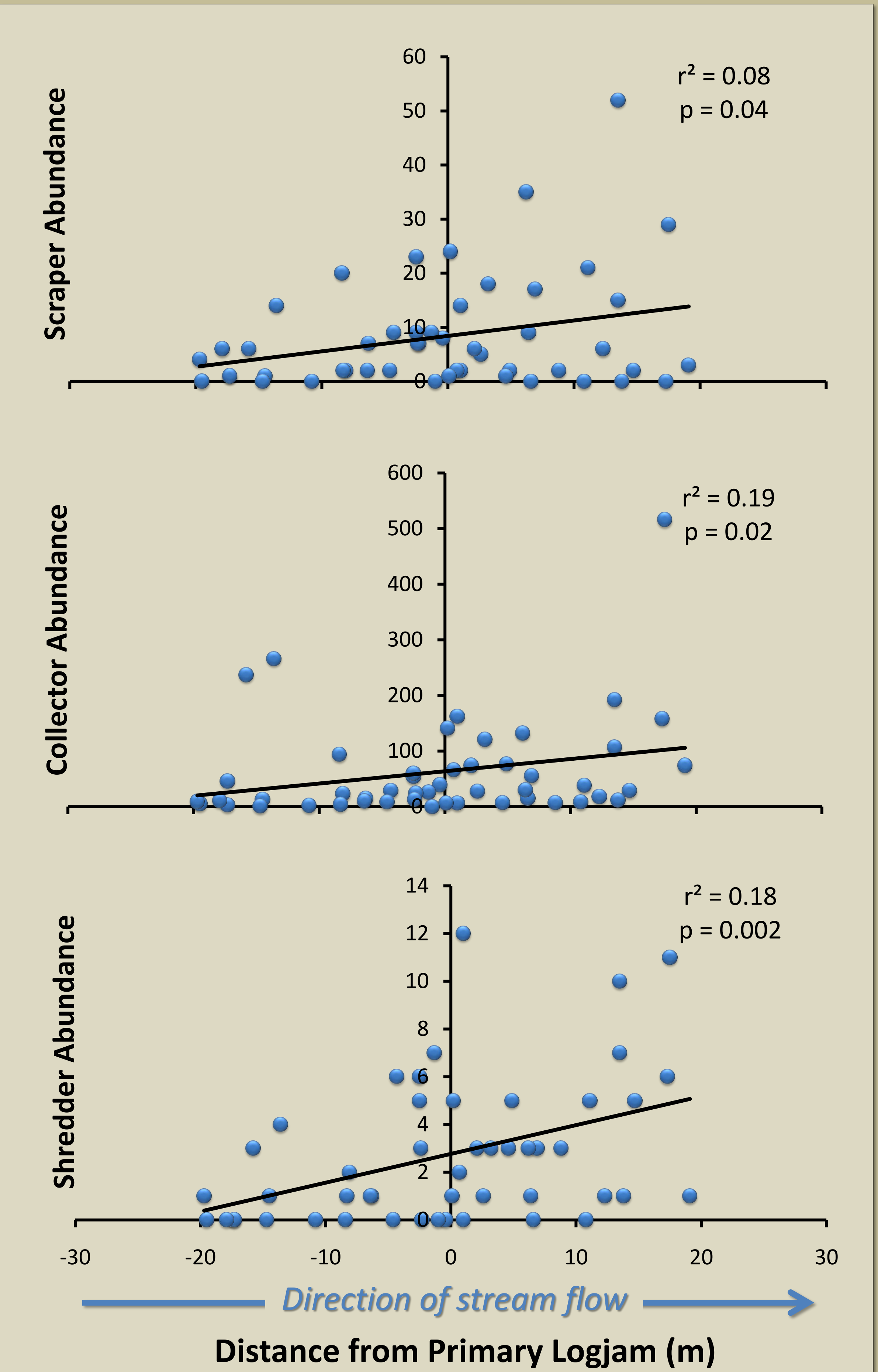
## RESULTS

### Community Parameters



**Fig 1.** Macroinvertebrate community composition as a function of distance from the logjam (located at “zero” on the x-axis). Macroinvertebrate abundance and richnesss tended to increase at the logjam, but showed highest values downstream of it. The trend for Shannon Diversity was not significant ( $p > 0.05$ ).

### Functional Feeding Guilds



**Fig 2.** Abundances of the three principle feeding guilds as a function of distance from logjam. Scrapers feed on attached algae, collectors feed on fine particulate organic matter (FPOM), and shredders feed on coarse particulate organic matter (CPOM). All showed an increase in abundance downstream of the logjam.

## DISCUSSION

- ❖ Rather than seeing a concentration of macroinvertebrates in the immediate vicinity of the logjam, we found that community parameters and functional feeding group abundance continued to increase downstream of the logjam.
- ❖ Increased abundance of feeding guilds downstream of the logjam may reflect food resource distribution. The trend observed among scrapers, collectors and shredders suggests that logjams concentrate benthic algae and fine and course particulate organic mater (i.e., FPOM and CPOM) at least 20-m downstream of the logjam.
- ❖ Our data suggests that logjams exert far-reaching downstream effects and that the effects on the benthic macroinvertebrate community seen downstream are greater than those seen at the logjam itself.



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