Terrestrial Spider Response to Logjam Mediated Influences

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Background/Hypothesis

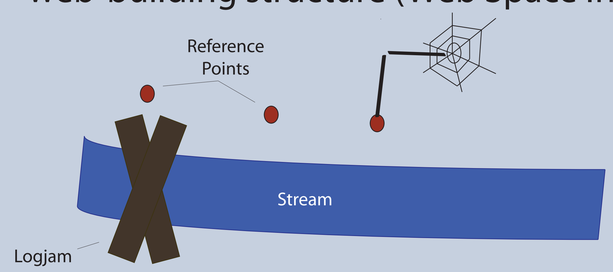
Spiders in riparian zones, or the areas adjacent to streams, are known to increas in population density with increased aquatic insect emergence (Kato et al. 2003).

Logjams, or woody accumulations in streams, can retain organic materials and increase habitat complexity, thus increasing macroinvertebrate production (Wallace et al. 1995).

We **hypothesized** that increased aquatic insect emergence found at a logjam will increase nearby spider density.

Methods

- Webs sought out around a logjam in Cabin Creek in Northern Minnesota in May & August 2011.
- Each web measured to a reference point.
- Each reference point given an estimate of nearby web-building structure (Web Space Index).



Results

May

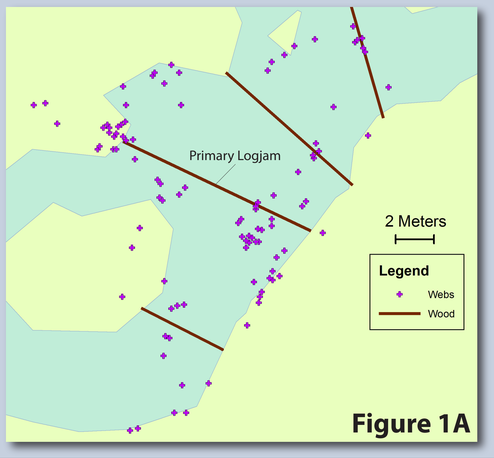


Figure 1A

August

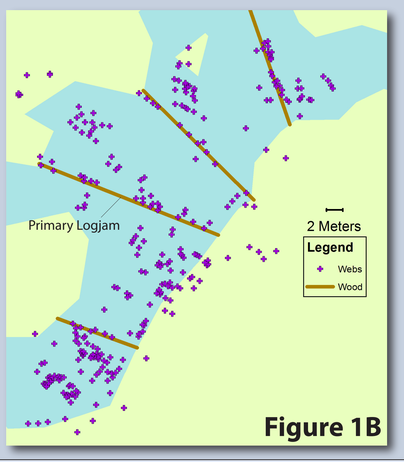


Figure 1B

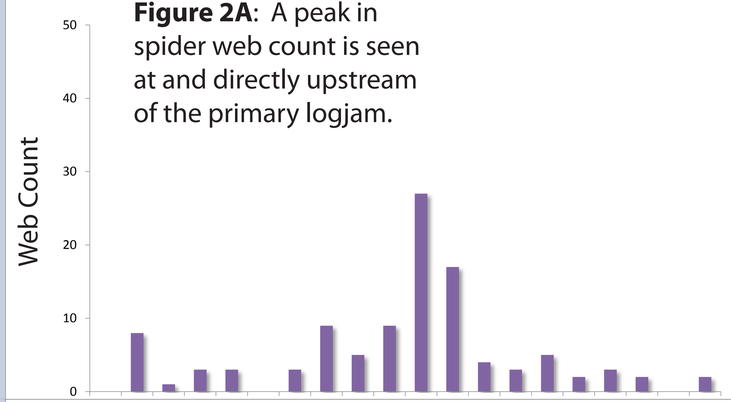


Figure 2A: A peak in spider web count is seen at and directly upstream of the primary logjam.

Figure 2B: No clear pattern is observed.

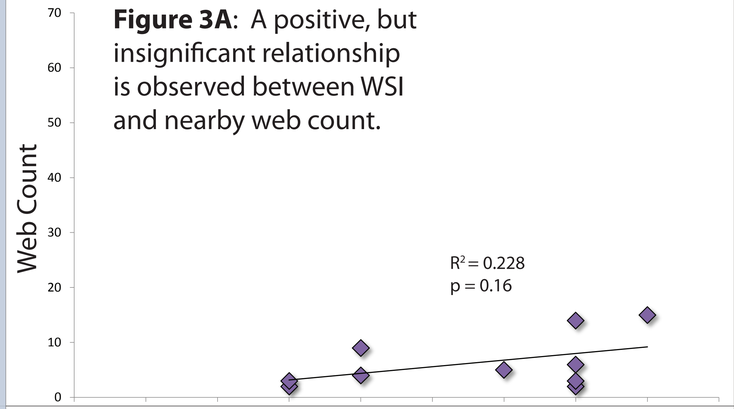


Figure 3A: A positive, but insignificant relationship is observed between WSI and nearby web count.

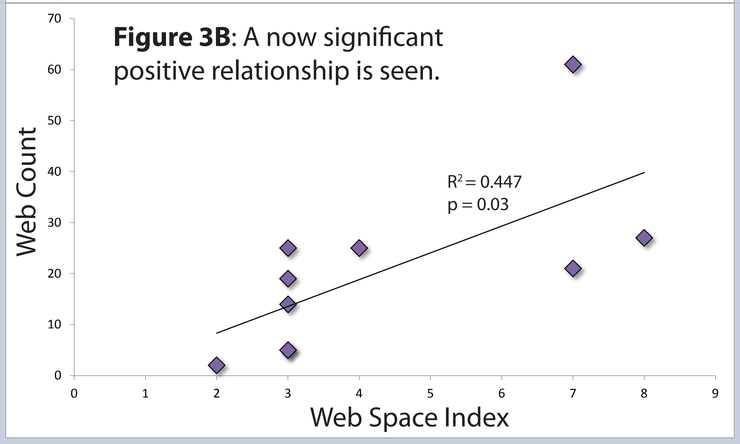


Figure 3B: A now significant positive relationship is seen.

Conclusions

- Web spiders cluster around the logjam in May, but not in August (Fig. 2).
- Web Space Index becomes a significant predictor of web count in August (Fig. 3).
- This suggests a temporal shift in limiting factor to spiders: prey is limiting in May, while space is limiting in August.
- Alternatively, the higher population observed in August may lead to some spiders being forced to choose sub-optimal habitat.

Acknowledgments

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Literature Cited

Kato, C., T. Iwata, S. Nakano and D. Kishi. (2003). Dynamics of aquatic insect flux affects distribution of riparian web-building spiders. Oikos 103:111-20.

Wallace, J.B., J.R. Webster, and J.L. Meyer. 1995. Influence of log additions on physical and biotic characteristics of a mountain stream. Canadian Journal of Fisheries and Aquatic Sciences 52:2120-2137.