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Effects of Habitat Structure and Local Predators on Dragonfly Oviposition and Success

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Animal population success is a combination of local factors influencing both habitat use as well as mortality and growth rates. For species with two-part life histories like dragonflies, the wetland conditions producing high dragonfly emergence are largely unknown, but previous work suggests egg-laying decisions by adult females as well as local predators and habitat structure may limit naiad distributions and emergence patterns. In 24 mesocosms we varied the presence and absence of small-bodied fish (*Gambusia holbrooki*) and submerged aquatic vegetation (SAV; *Utricularia* spp.) and examined oviposition events and emergence over 9 months. Total adult oviposition (# times observed/mesocosm) and total naiad success (# exuvia/mesocosm) were analyzed with ANOVA. Total oviposition by adults (all species combined) was similar across treatments. Species-specific oviposition patterns were also similar across treatments, except *Tamea* spp., which preferentially laid eggs in mesocosms with SAV. Total dragonfly emergence (all species) was highest in fishless habitat without SAV and there was no emergence in the treatment with mosquitofish that lacked SAV. In several cases, mosquitofish were observed consuming dragonfly eggs following oviposition. The assemblage of emerging dragonflies varied by treatment for the other three treatment combinations with the three most abundant species producing the highest number of successful naiads in three distinct habitat combinations. Dragonflies show no ability to discriminate between fish and fishless habitats, and most of these species did not discriminate between habitats with and without SAV. However, both small fish and SAV can affect total emergence patterns as well as the composition emerging from freshwaters.