

Role of fitness trade-offs and dispersal in persistence of generalists across a wetland predator-permanence gradient

Mark Galatowitsch *¹, Angus McIntosh ¹, Sharyn Goldstein ¹

¹ School of Biological Sciences, University of Canterbury, Private Bag 4800, Christchurch 8140, NZ

Mechanisms that allow populations of generalists to persist and disperse across a range of heterogeneous habitats despite experiencing variable selection pressures are important in lentic habitats. Invertebrates in temporary habitats must develop quickly and disperse, or have wide environmental tolerances. Conversely, those in permanent habitats must avoid vertebrate predators (e.g., fish). These diverse conditions result in life-history trade-offs that influence fitness and population dynamics. In addition, gene flow and recruitment between spatially separated habitats are influenced by terrestrial dispersal between permanent and temporary habitats and resulting meta-population dynamics. We predict that (1) terrestrially dispersing generalists have bet-hedging behaviors and oviposit in both habitat types to maximize reproductive potential, and that (2) distance between habitat types and spatial arrangement of ponds influences the extent and persistence of generalists. Population dynamics of *Xanthocnemis zealandica* and *Sigara arguta* are being examined through field surveys, microsatellite analyses and mesocosm experiments with generalists in Canterbury alpine lake-pond complexes. Results will enhance understanding of how life-history trade-offs and dispersal interact to maximize aquatic generalist fitness with implications for population, community and evolutionary responses to global changes.

