



Candidate for the positions of Assistant Professor of Biological Control & Assistant Professor of Subtropical IPM: Sara Emery

Wildlife, Fish and Conservation Biology, UC Davis, Davis, California, USA

Date: Monday, February 06, 2023
Time: 4:00 pm - 4:50 pm
Format: In-Person Seminar & Virtual Access
Location: Genomics Auditorium 1102A

Zoom: 938 1040 4405
Passcode: 833289

Title:

“Big data, biological control & precision ecology”

Abstract:

My research focuses on the intersection of the environmental and climatic factors affecting the phenology of individual species, biological control and community ecology. This presentation will give an overview of three ways that I approach research of invertebrates that directly inform management strategies. Firstly, I created a phenology model for the walnut husk fly (*Rhagoletis completa*) and show that the thermal requirement is decreasing over time. I tested a provocative hypothesis that cabbage stem flea beetles experience 8-year population cycles. I find that cold winters drive these cycles and pesticides are ineffective at curbing them. The second research area reflects research done on commercial farms in Sweden to test the effects of tillage intensity on natural enemy diet and community. Though much research has been conducted on the effects of tillage intensity, “before-after-control-impact” experimental designs are lacking. My work shows that there are negative effects on predator and decomposer abundance and communities after higher intensity tillage, but these effects are short-lived.

The third area of research reflects both lab and field work showing the importance of indirect interactions on our expectations for stable biological control. I developed a cage trial to test the ecological theory that indirect interactions are not static within system. My research shows that the sign and strength of indirect interactions can shift based on predator preference, predator satiation, predator switching and asymmetric non-consumptive effects between the prey species. The effects of indirect interactions on the field scale are demonstrated by aphid populations that benefit from, but aphid predators decline with, larger caterpillar populations. Arthropods in agricultural habitats represent an important model system to explore the relationship between the population ecology of individual species and ecosystem services or disservices and identify variables that enhance the resilience of natural and managed systems to invasive species and other stressors.