

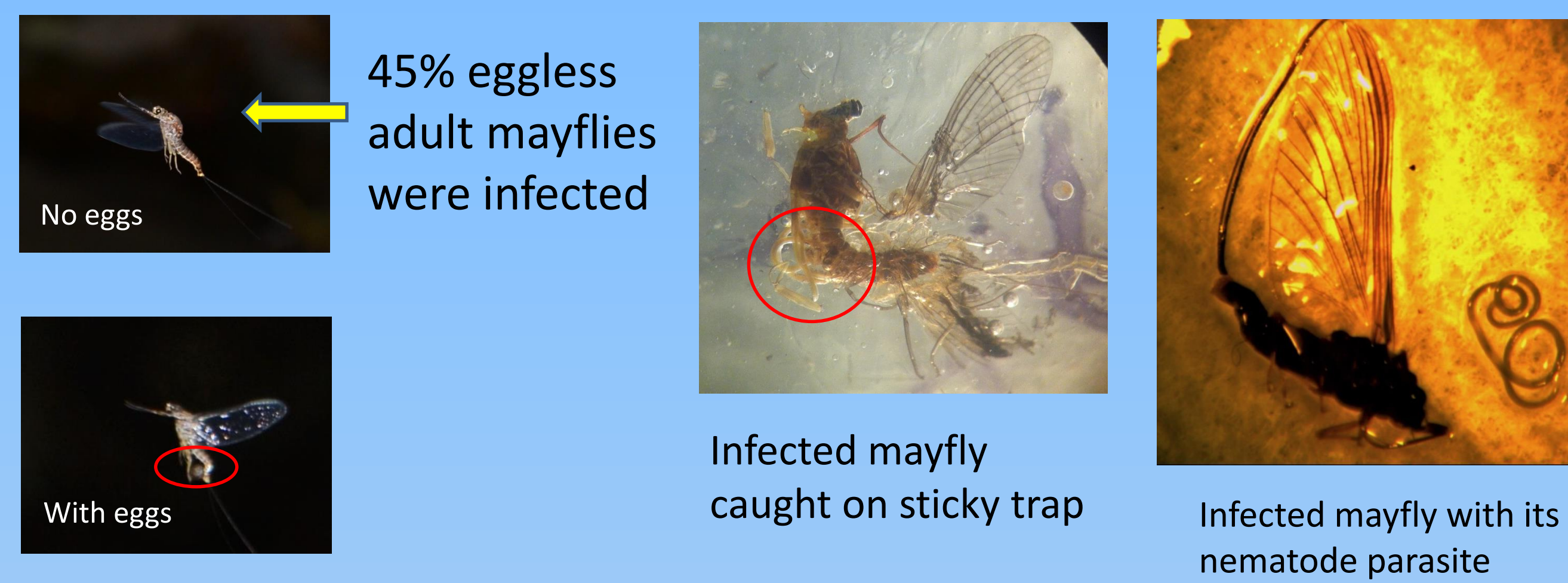


Life history of Mermithid nematode parasites of the migratory mayfly, *Ephemera maculata*

Larissa Walder, Hiromi Uno, & Mary Power
UC Berkeley

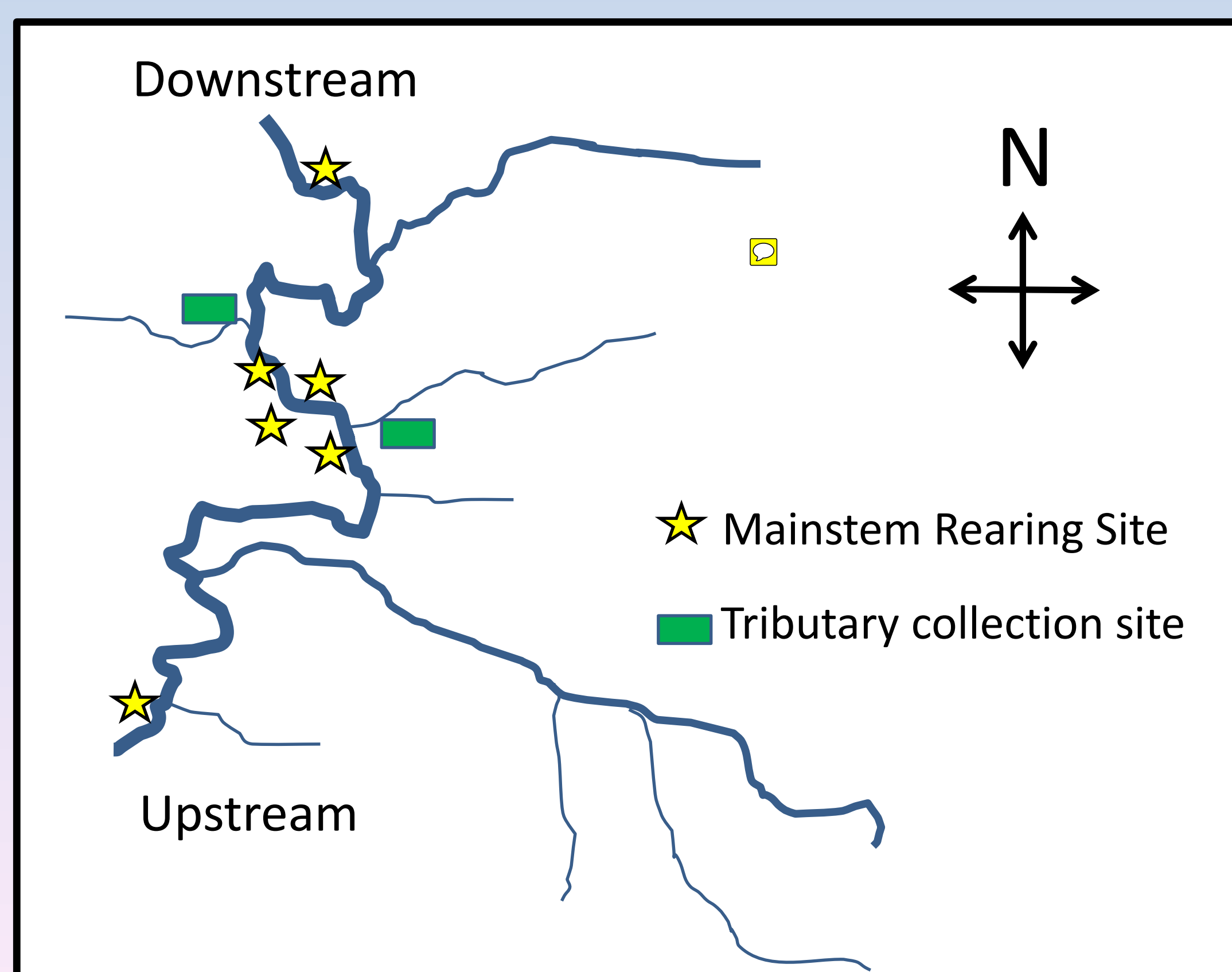
Abstract

- Site: UC Berkeley's Angelo Coast Range Reserve, in the South Fork Eel and its tributaries
- A large amount of temperature gradient exists along the South Fork, with upstream locations significantly colder than downstream sites
- Past work: the mayfly *Ephemera maculata* migrates between tributaries and the South Fork Eel River (Uno), and has high rates of nematode infection
- In a rearing experiment, warmer temperatures were associated with earlier *E. maculata* emergence and greater parasite prevalence
- Nematode prevalence is greatest early in the season, with a sex distribution skewed towards males



Questions Asked

- How does nematode infection impact host population dynamics?
- How does longitudinal temperature variation effect host and parasite phenologies?
- Do parasite characteristics including prevalence, intensity, and sex distribution change throughout the host's flight season?

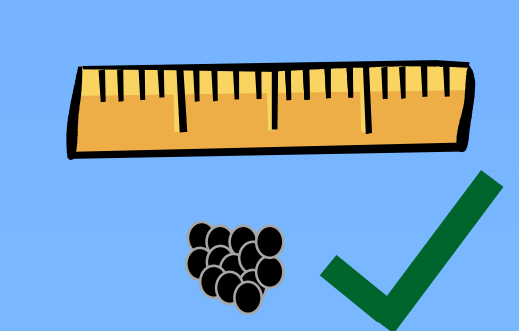
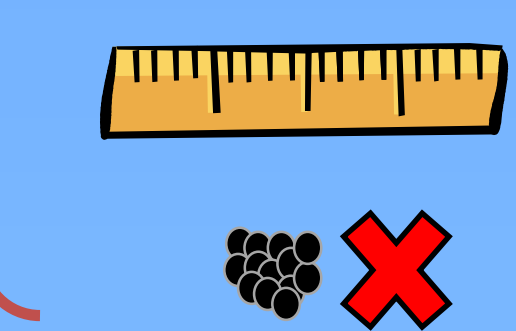


Background

Consequence of Infection???

Infected:

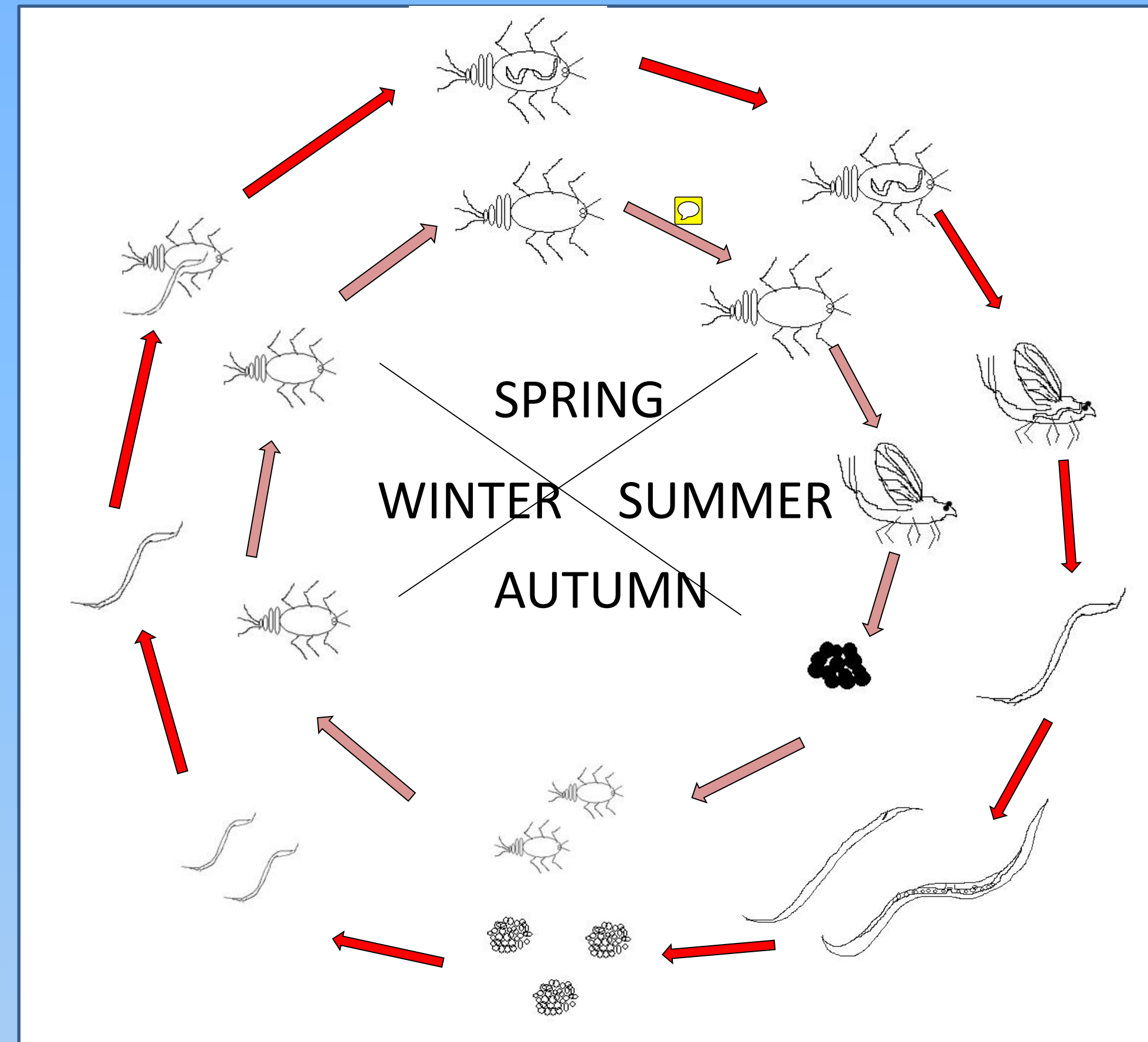
- Shorter (ave.=6.27 mm +/- 0.06 SE)
- No eggs!



Not infected

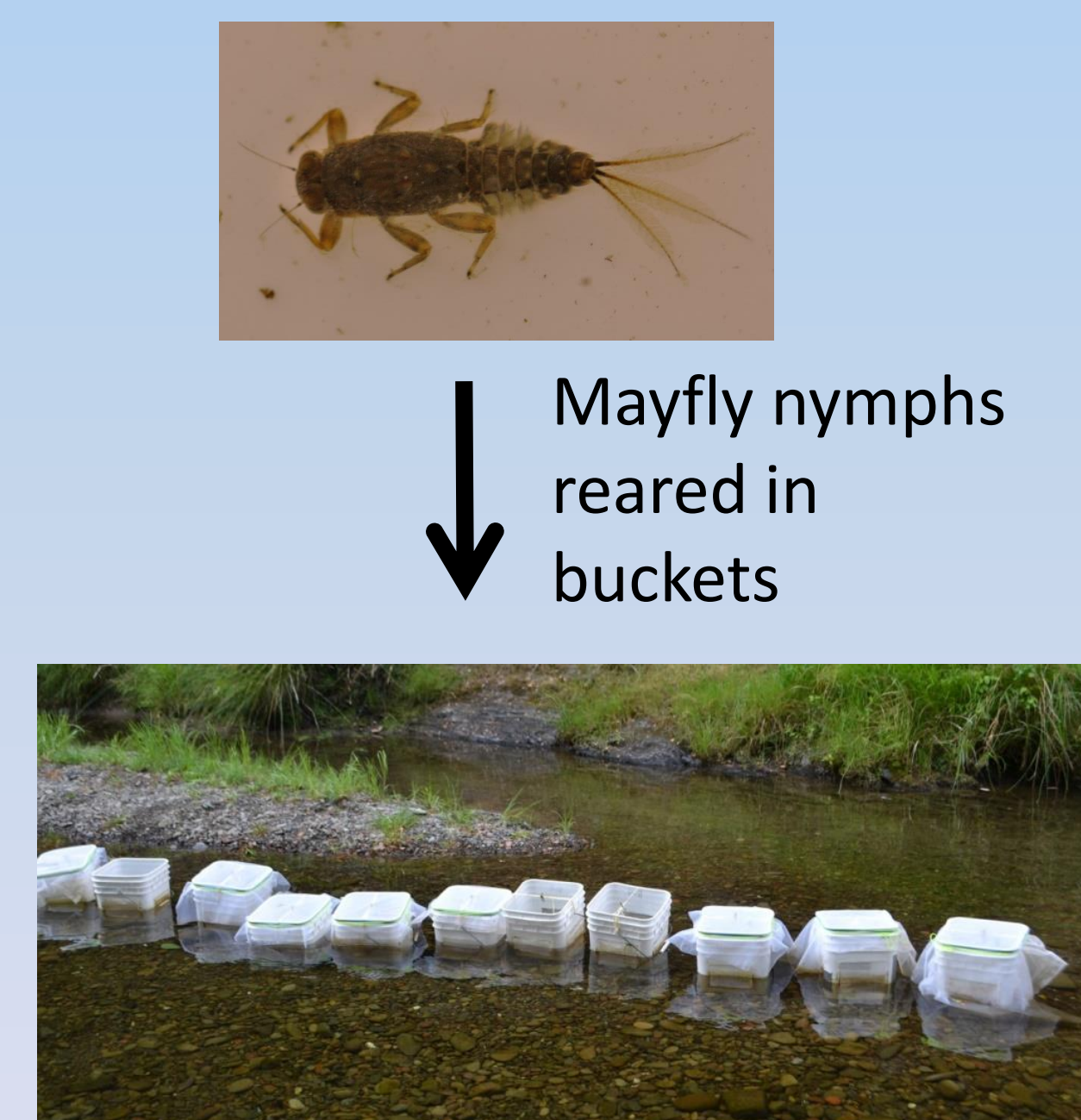
- Longer (ave.=7.43 mm +/- 0.06 SE)
- Eggs!

Co-migration of Parasites and Host



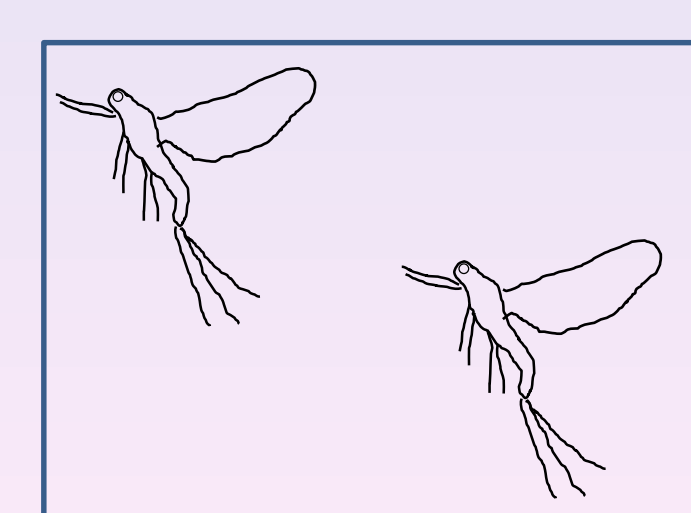
Methods

Mainstem Rearing Experiment

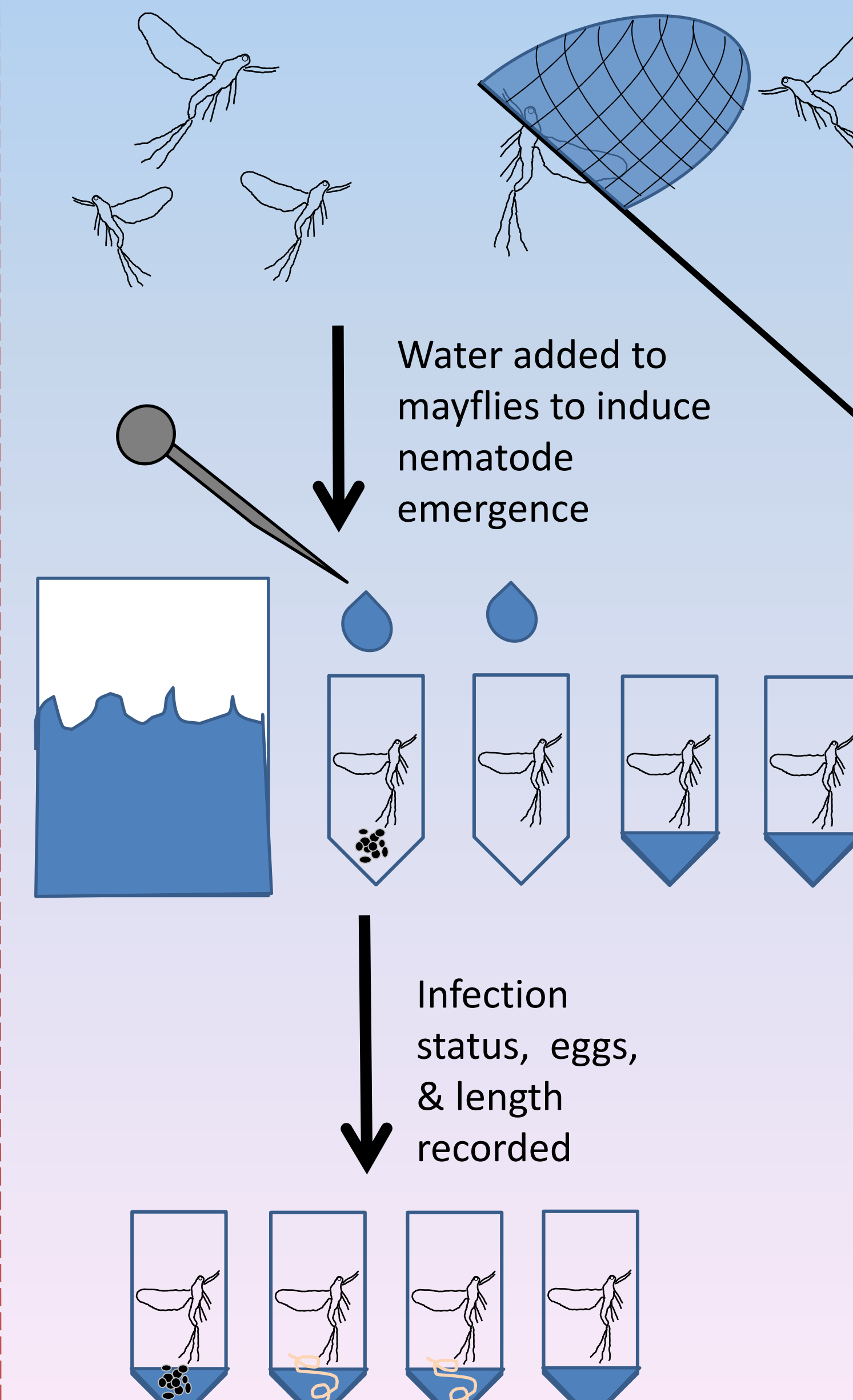


Buckets monitored for nymphs, emerged adults, and mortality

Emerged		
Alive		
Dead		

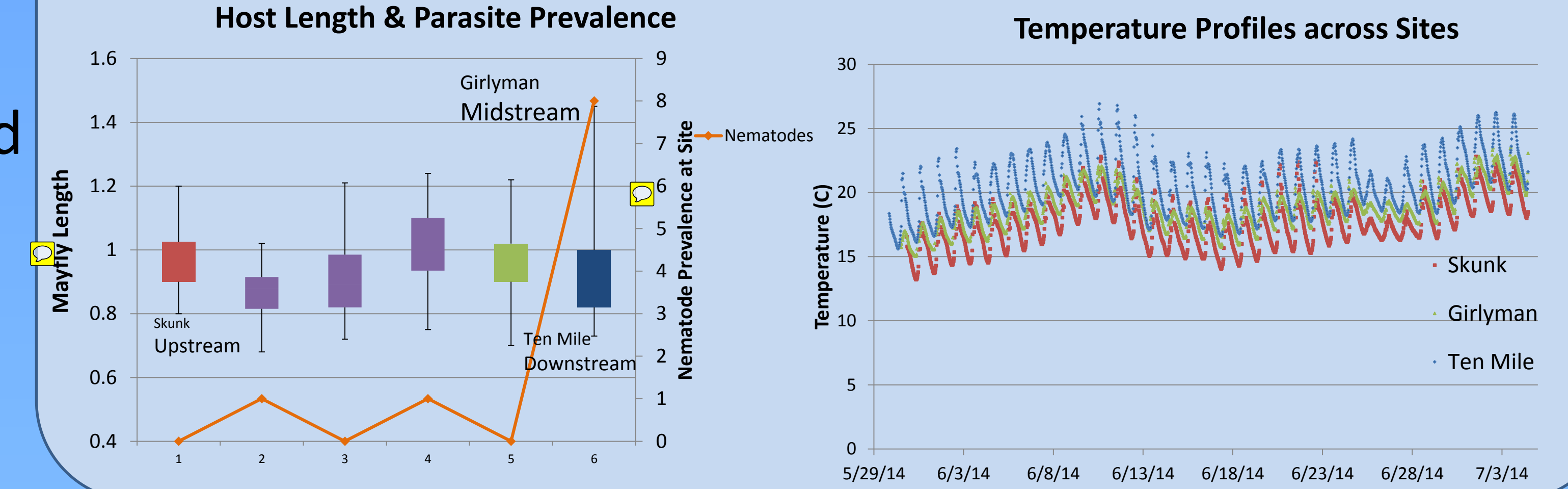


Tributary Adult Collection

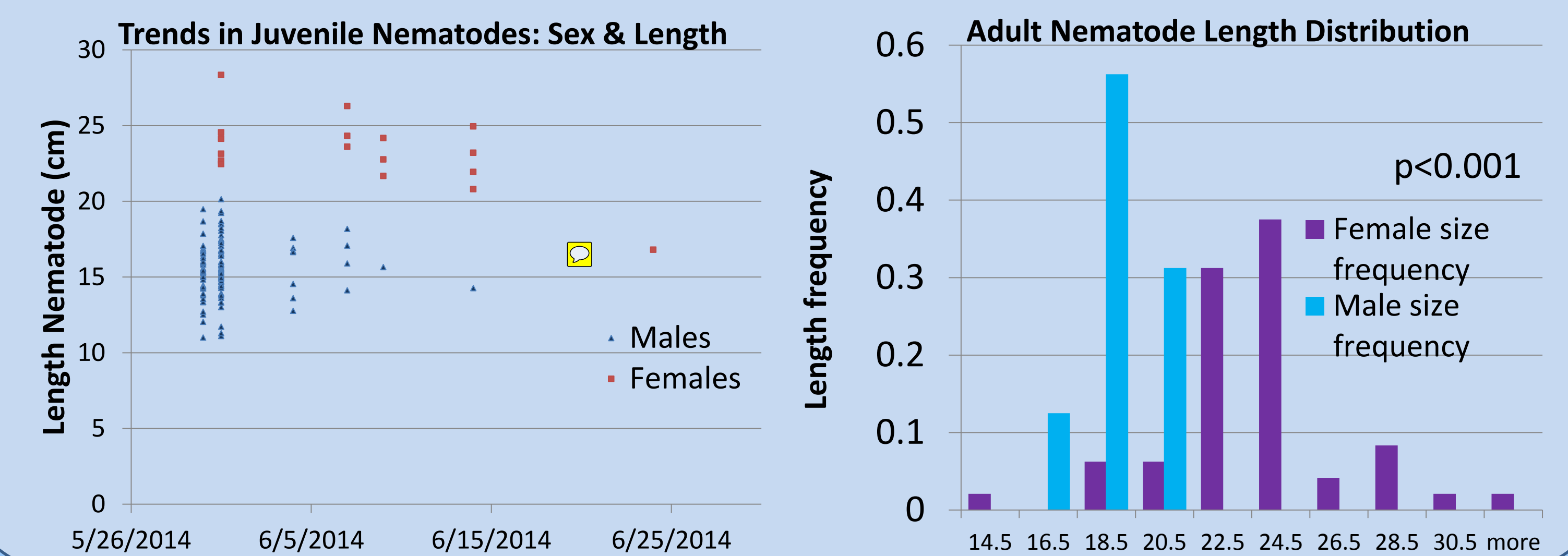


Results

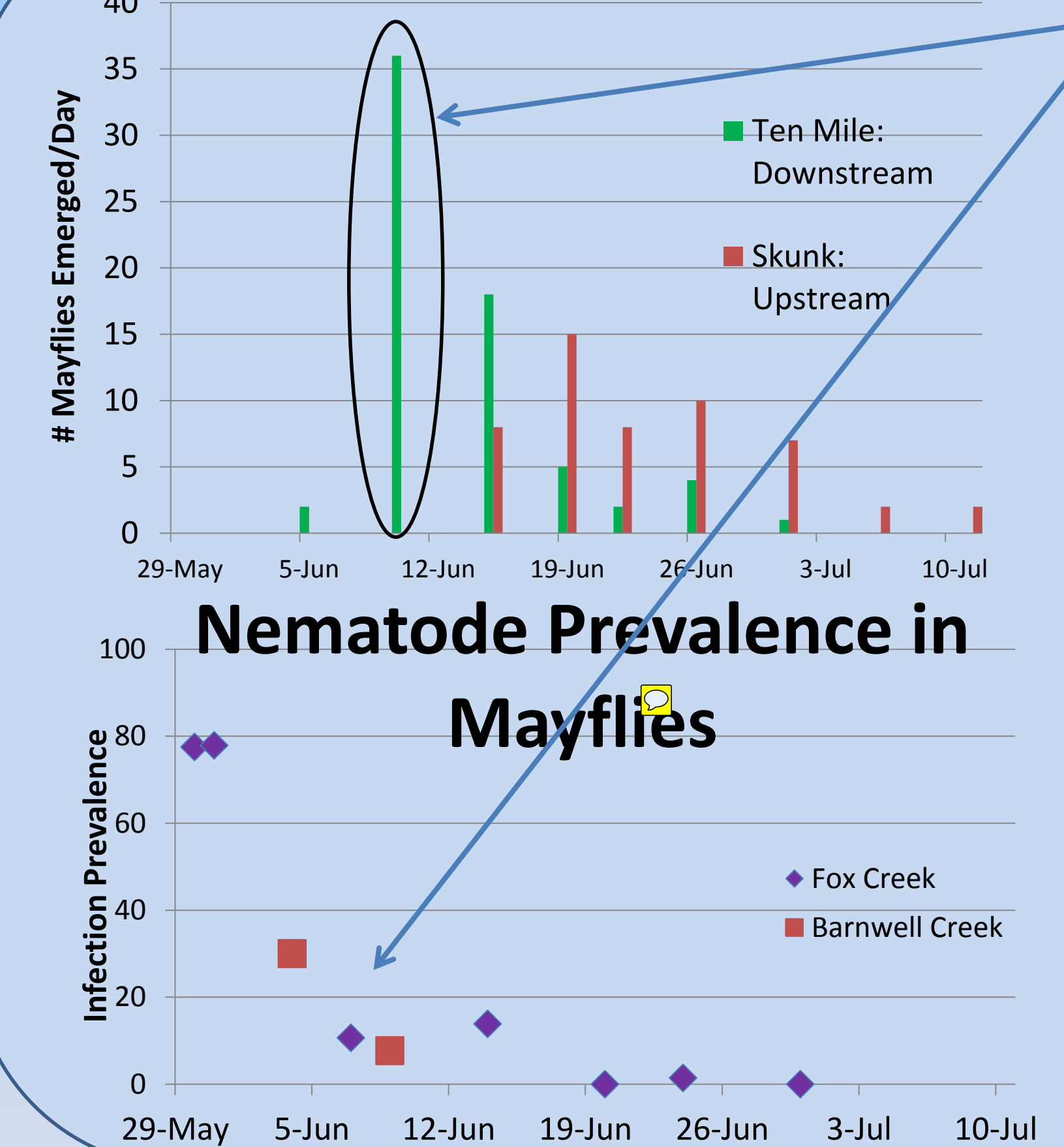
Temperature on Host and Parasite



Dimorphic Nematodes & Strange Sex Ratios



Mayfly Emergence Times



- Peak emergence from downstream site (Ten Mile) occurred after nematode prevalence was already decreasing
- Since nematode prevalence in the bucket experiment was HIGHEST at Ten Mile, it is possible that most of the infected adults originated from locations more downstream of study sites

Conclusions

- Parasite prevalence is highest at the beginning of the host season
- Since downstream hosts from warmer water temperatures emerge earlier, and because the most downstream site showed the highest prevalence, it is likely that higher temperatures favor nematode parasites
- More male than female nematodes were collected, which could suggest a population sex bias

Acknowledgements

Thanks to Hiromi Uno for her help and support, to Mary Power for her guidance, to Stephanie Carlson for her funding aid, and to George Poinar for future nematode identification.