Comal Springs
Riffle Beetle
Propagation

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Background

• Low survival over time
• Low pupation/ecdlosion rate
• Many projects to improve
  • Wood and roots as resources
  • Manufactured feed
  • Microbiome
  • Tube orientation
  • Wild vs captive biofilm
Objectives

1. Improve F1 adult production
   • Phase I – Determine if a box design can maintain or improve pupation/eclosion rates
   • Phase II – Determine if higher larvae densities can maintain or improve pupation/eclosion rates
   • Phase III – Determine if adding wild-cultivated biofilm will improve pupation/eclosion rates compared to captive-cultivated biofilm

2. Write a CSRB propagation handbook
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Methods – Phase I
Boxes vs Tubes

• Three boxes – 20 larvae each
• Approximately 90 days
• Survival and pupation recorded
Results – Phase I Boxes vs Tubes

- Weak larvae
- Low survival, one pupation
- Box overflowed easily
- Tubes selected for Phases II and III
- Evidence for use of flow through
Methods – New Flow-Through System

- Large heated sump
- Hoses with heat exchanger coils
- Caddies to hold tubes
- Back up recirculating capability
Methods – Adults for F1 Larvae Production

• Producing for Phase II and III
• 60 adults to reproduce
Methods – Phase II Density

• Treatments of 20, 30, and 40 larvae per tube
• Three replicates per treatment
• Trial duration – dependent on larvae stage
Methods – Phase III Biofilm

• Resources conditioned in Comal Springs
• Three replicates of 20 larvae
• Higher densities if possible
• Use Phase II for comparison
Implications So Far

- Moving to a flow-through system will benefit CSRB
  - Better survival and pupation
  - Less cleaning = less stress
- Using tubes is the best method so far
  - Better mimics flow of a spring
  - Easier-opening tubes
Future Implications

• Can we use higher densities the Refugia?
  • Fewer tubes needed to produce F1s
  • Less water needed to support the same population size

• Is wild biofilm superior in practice?
  • If yes – improve Refugia production
  • If no – pursue other research avenues
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Methods – CSRB Propagation Handbook

- Review of all information
  - Reports
  - Manuscripts
  - Husbandry records
  - Research outcomes
Future Implications

• Current information aggregated
  • See implications easier
  • Identify gaps in information for future research
• Provide guide for CSRB propagation
  • Future husbandry and research team members
  • Research associates (BIO-WEST, TXST)
Thank You!

- Edwards Aquifer Authority
- BIO-WEST partners
- Texas State partners
- Husbandry team
- SMARC staff
Questions?