© Katherine Smith

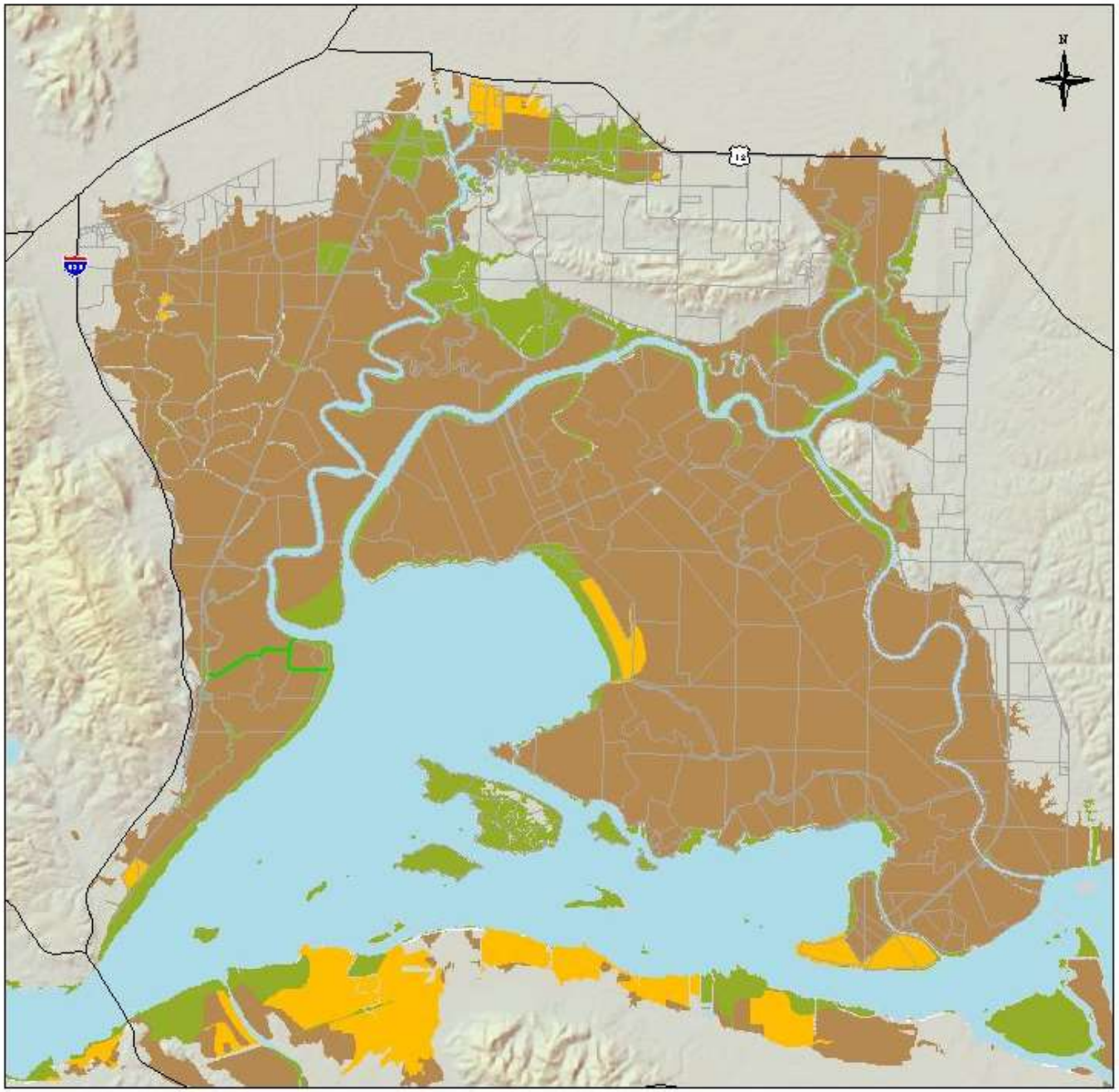
Emerging Perspectives on Salt Marsh Harvest Mouse Conservation and Management – Ducks, Dikes and Demographics

Katherine Smith
California Department of Fish and Wildlife
UC Davis

Salt Marsh Harvest Mouse

Endangered Species
- Federal: 1970
- State: 1971

Only Mammal Restricted To Habitat Loss
Coastal Marshes



Marsh Types of Suisun

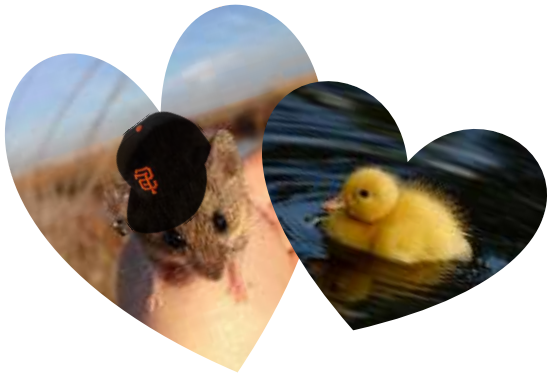
- Tidal Marsh
- Muted Tidal Marsh
- Managed Marsh

Source: 1999 SF Bay EcoAtlas

San Francisco Estuary Institute
Science Consortium

2 0 2 Kilometers

How can we perform multispecies management that benefits both the endangered salt marsh harvest mouse and economically and culturally important waterfowl?

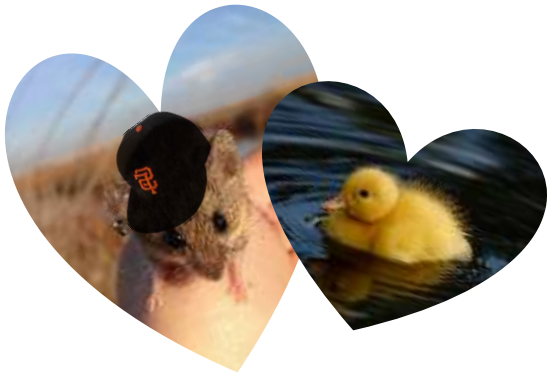


How do we make this work?

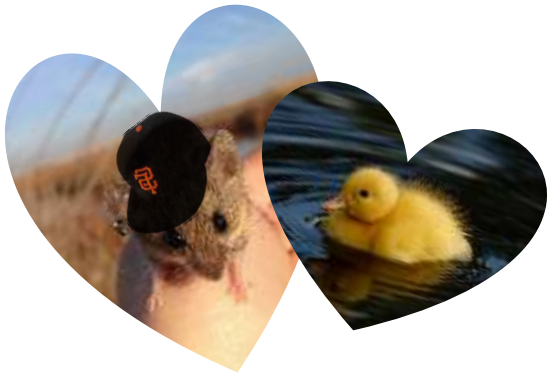
What are the effects of waterfowl management?

vs.

What are the effects of tidal restoration?



What are the relative habitat values of managed and tidal wetlands?



Unanswered Questions

When do they breed?

How many young can they have?

How long do they usually live?

What do they like to eat?

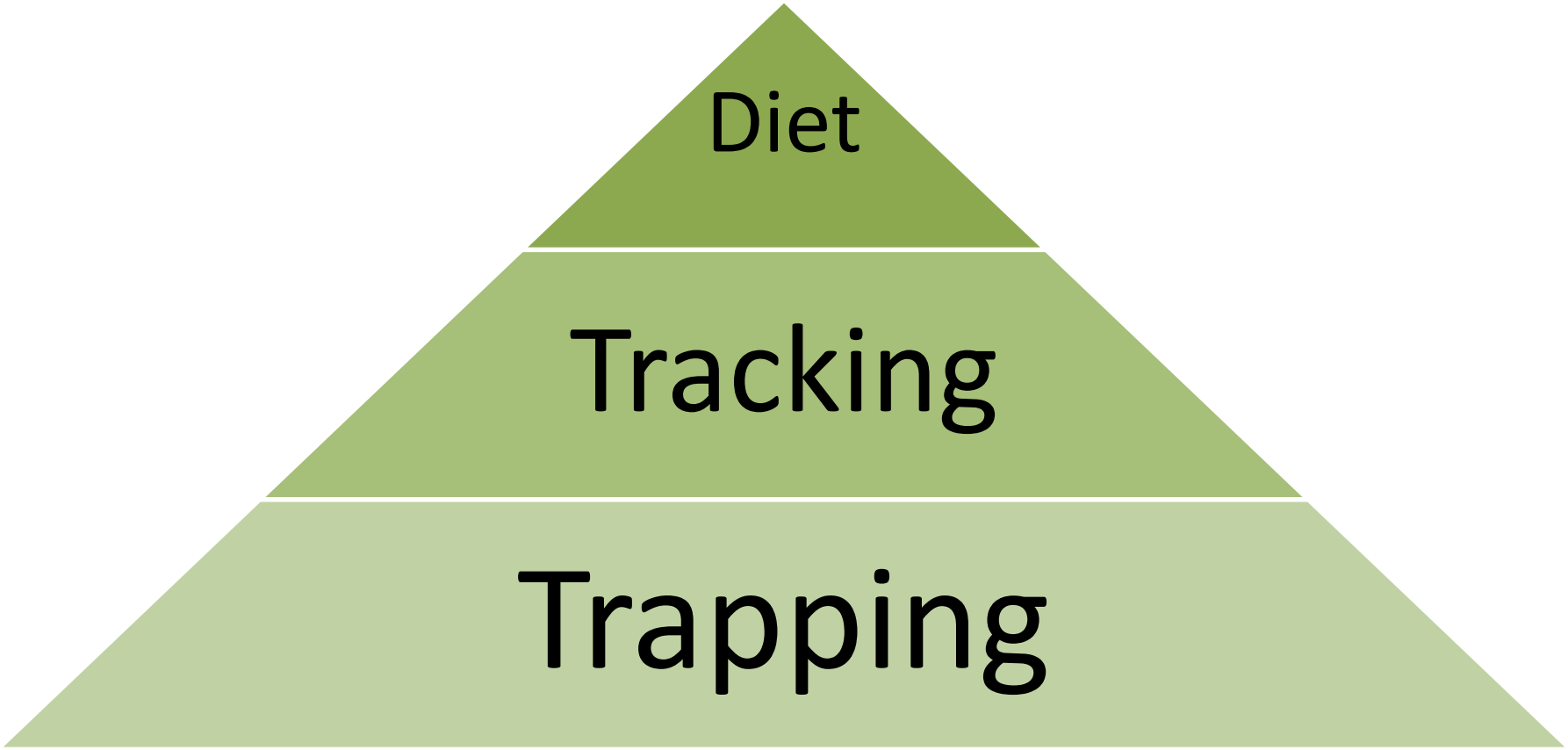
How many are there?

How large are home ranges?

What are activity patterns?

How are we doing it?

What do we want to know? | Design Justification | Methods | Preliminary Results | Ravi-lations



Trapping

What do we want to know? | Design Justification | Methods | Preliminary Results | Ravi-lations

- Demographics
- Habitat effects and values
- Populations
- Correlations with duck populations

Trapping

What do we want to know? | **Design Justification** | Methods | Preliminary Results | Ravi-lations

Trapping

What do we want to know? | **Design Justification** | Methods | Preliminary Results | Ravi-lations

Tidal Wetlands

No Management Activities

Low Management Treatment

No Recent Management Activities

High Management Treatment

Recently Disced

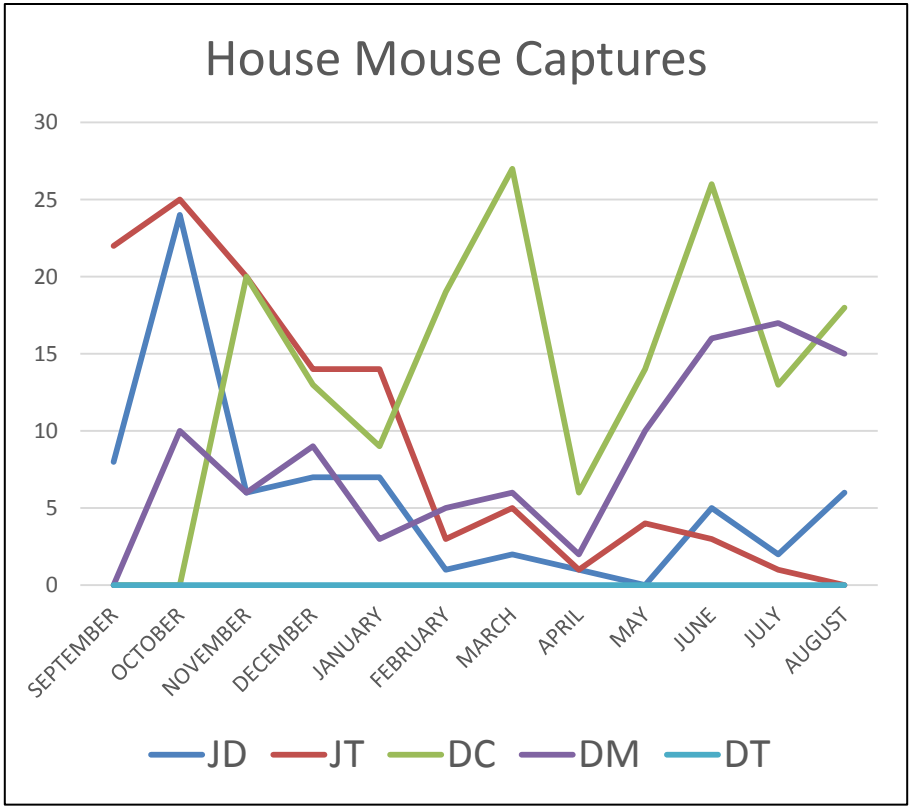
Trapping

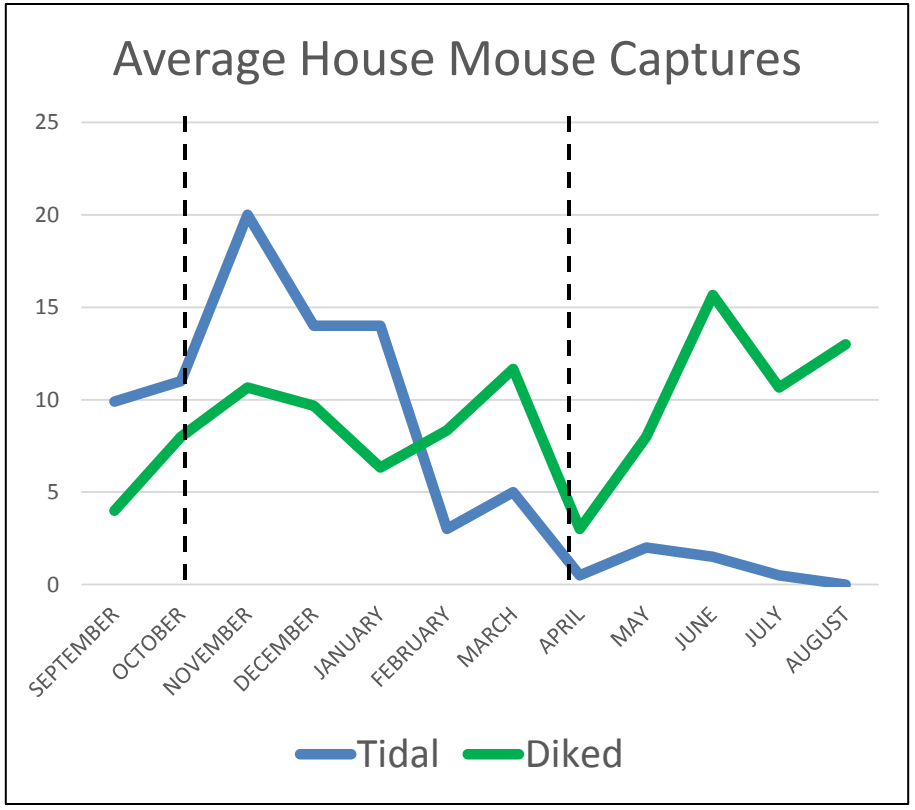
What do we want to know? | Design Justification | **Methods** | Preliminary Results | Ravi-lations

- Trapping monthly/bimonthly
- Set traps at sunset, baited with bird seed and cotton
- Check traps at sunrise
- Measure and mark individuals

Trapping

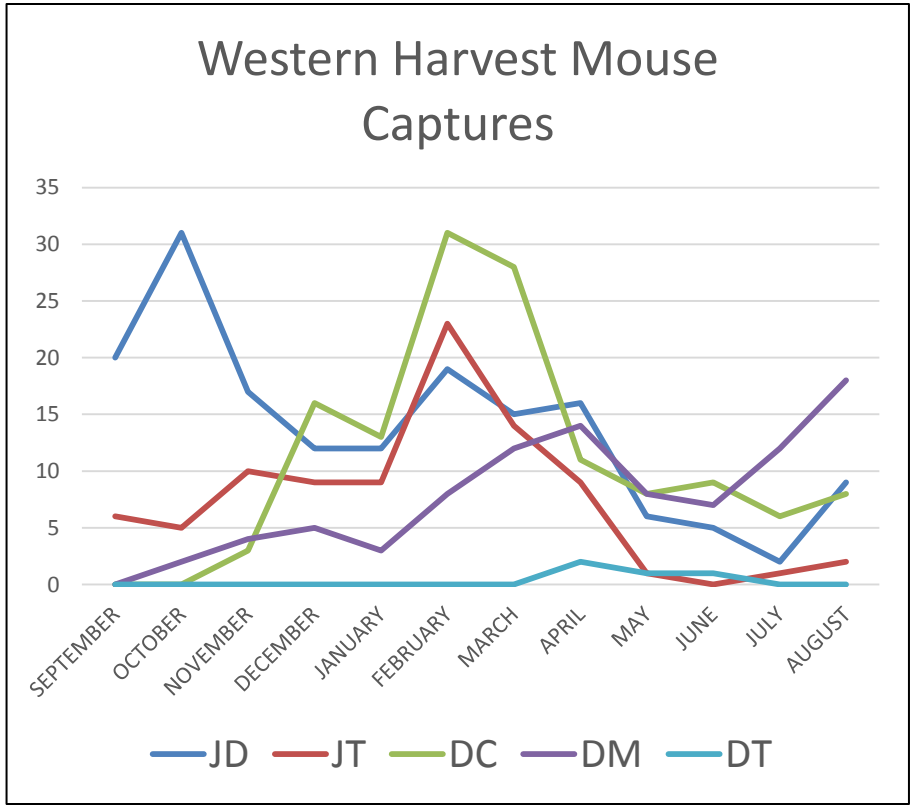
What do we want to know? | Design Justification | Methods | **Preliminary Results** | Ravi-lations

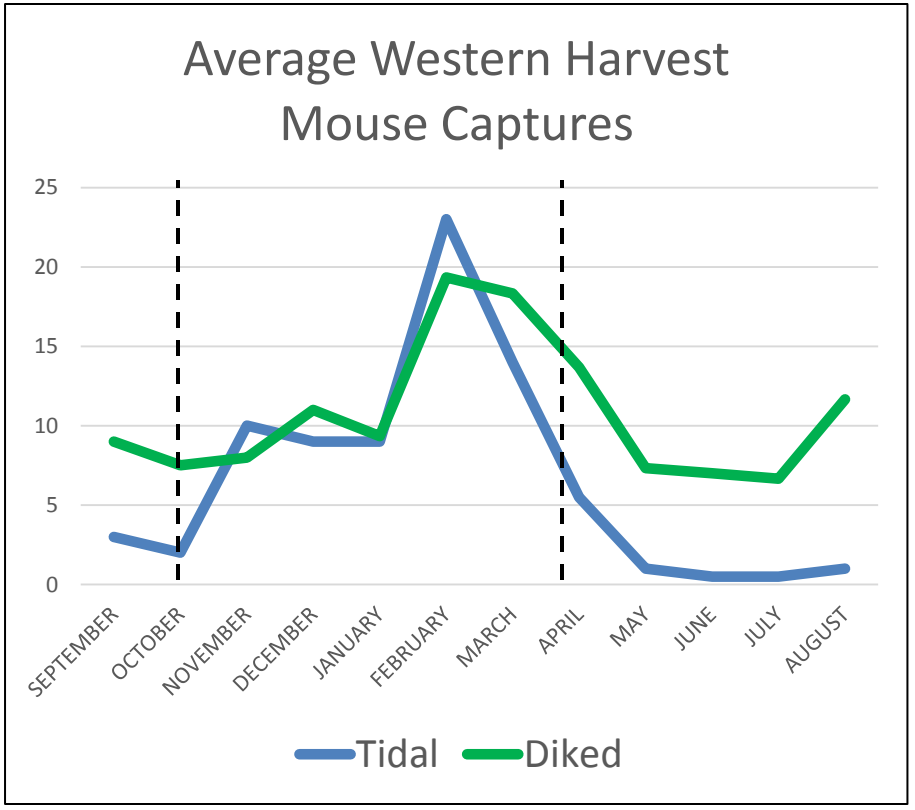




Trapping

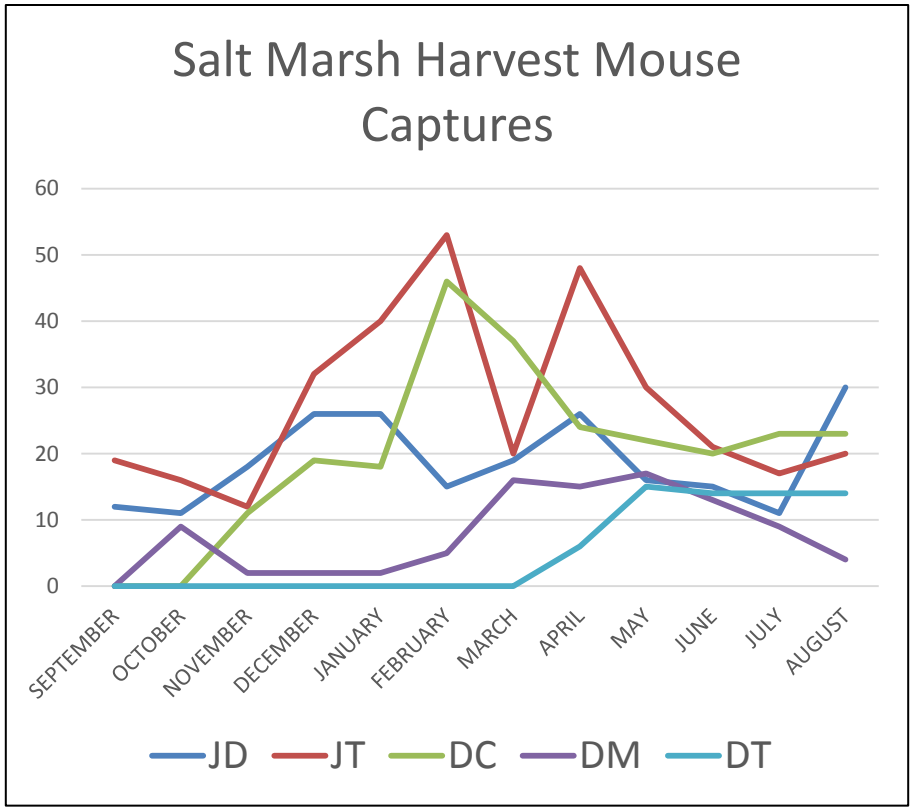
What do we want to know? | Design Justification | Methods | **Preliminary Results** | Ravi-lations

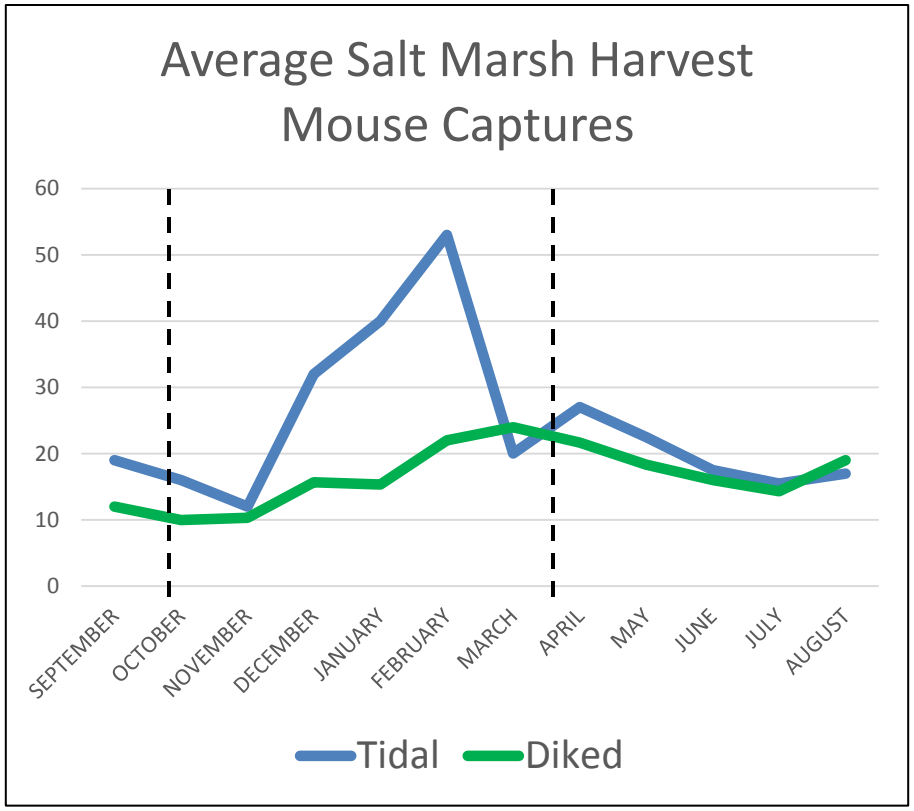




Trapping

What do we want to know? | Design Justification | Methods | **Preliminary Results** | Ravi-lations





Trapping

What do we want to know? | Design Justification | Methods | Preliminary Results | Ravi-lations

- Male Bias, reversed somewhat following draw down
- Surprising breeding habits
- Intriguing habitat use
- Diked wetlands supporting mice just days after discing
- Three dimensional habitat trapping challenges

Tracking

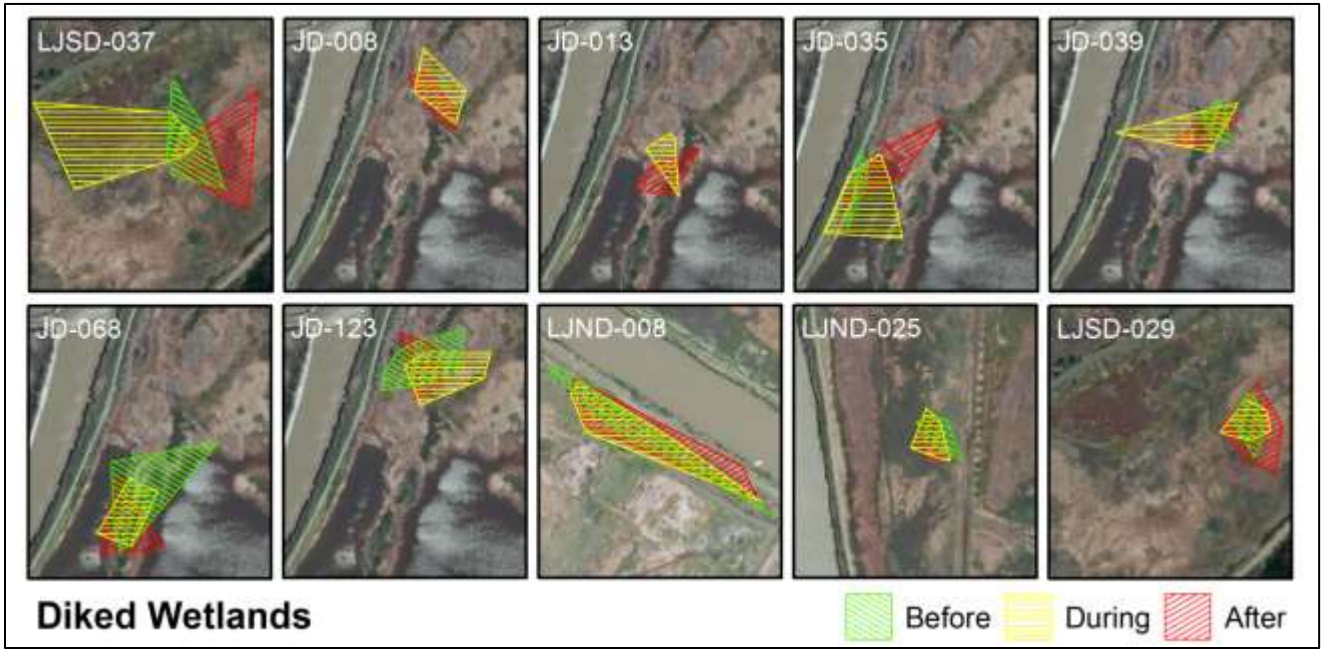
What do we want to know? | Design Justification | Methods | Preliminary Results | Ravi-lations

- Habitat use
- Activity patterns
- Responses to land management activities
  - Waterfowl management
  - Restoration (indirectly)

Tracking

What do we want to know? | **Design Justification** | Methods | Preliminary Results | Ravi-lations

- Real time responses to changes in habitat
- Behavior patterns throughout the day
- Better understand microhabitat use



Tracking

What do we want to know? | Design Justification | **Methods** | Preliminary Results | Ravi-lations

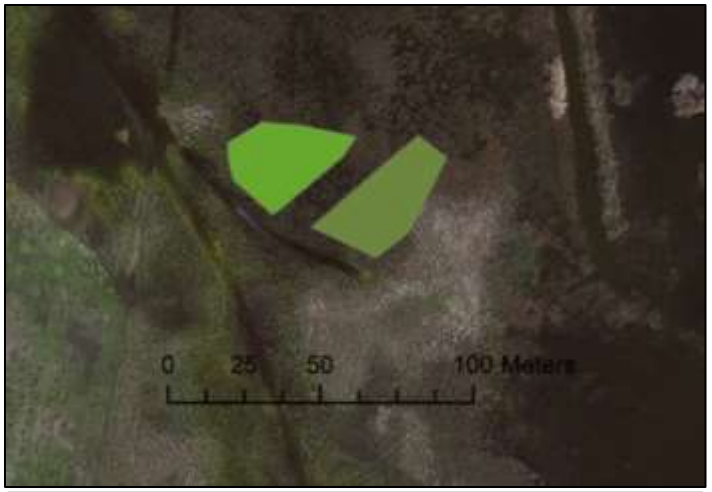
- Quarterly
  - October – Flood up
  - February – Circulation
  - April – Draw down
  - July –Dry Work Season

- Collar largest males and non-pregnant females
- Triangulate and home in throughout the day

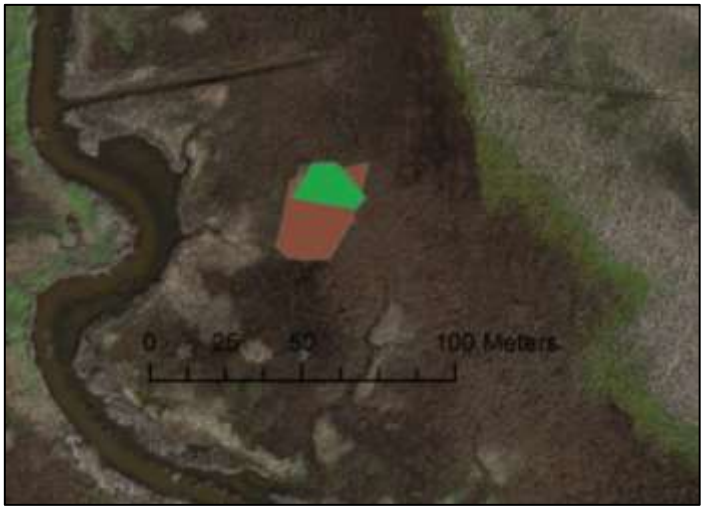
Tracking

What do we want to know? | Design Justification | Methods | **Preliminary Results** | Ravi-lations

Tidal



Low



High

Tracking

What do we want to know? | Design Justification | Methods | Preliminary Results | Ravi-lations

- Stereotypical movement patterns
- Striking variet
- High variation
- Vocalizations

Diet Study

What do we want to know? | Design Justification | Methods | Preliminary Results | Ravi-lations

- What are preferred food types?
- Which food preferences overlap with waterfowl?
- How do preferences change over the year?

Diet Study

What do we want to know? | **Design Justification** | Methods | Preliminary Results | Ravi-lations

- Can't measure actual diet choices
- Waterfowl managers actively promote growth of some vegetation types

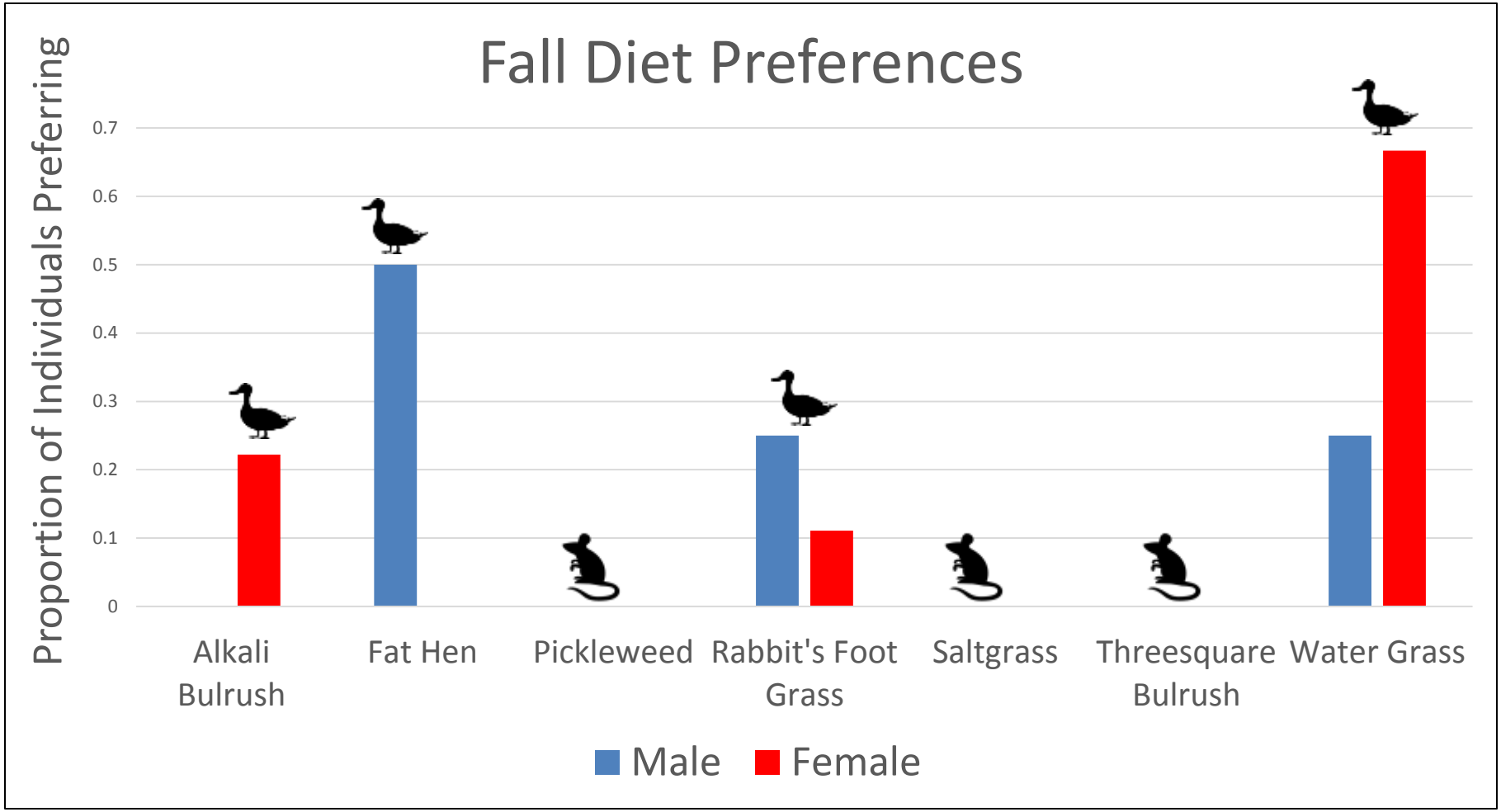
Diet Study

What do we want to know? | Design Justification | **Methods** | Preliminary Results | Ravi-lations

– Tr
– Fa
– Pl d
– A items

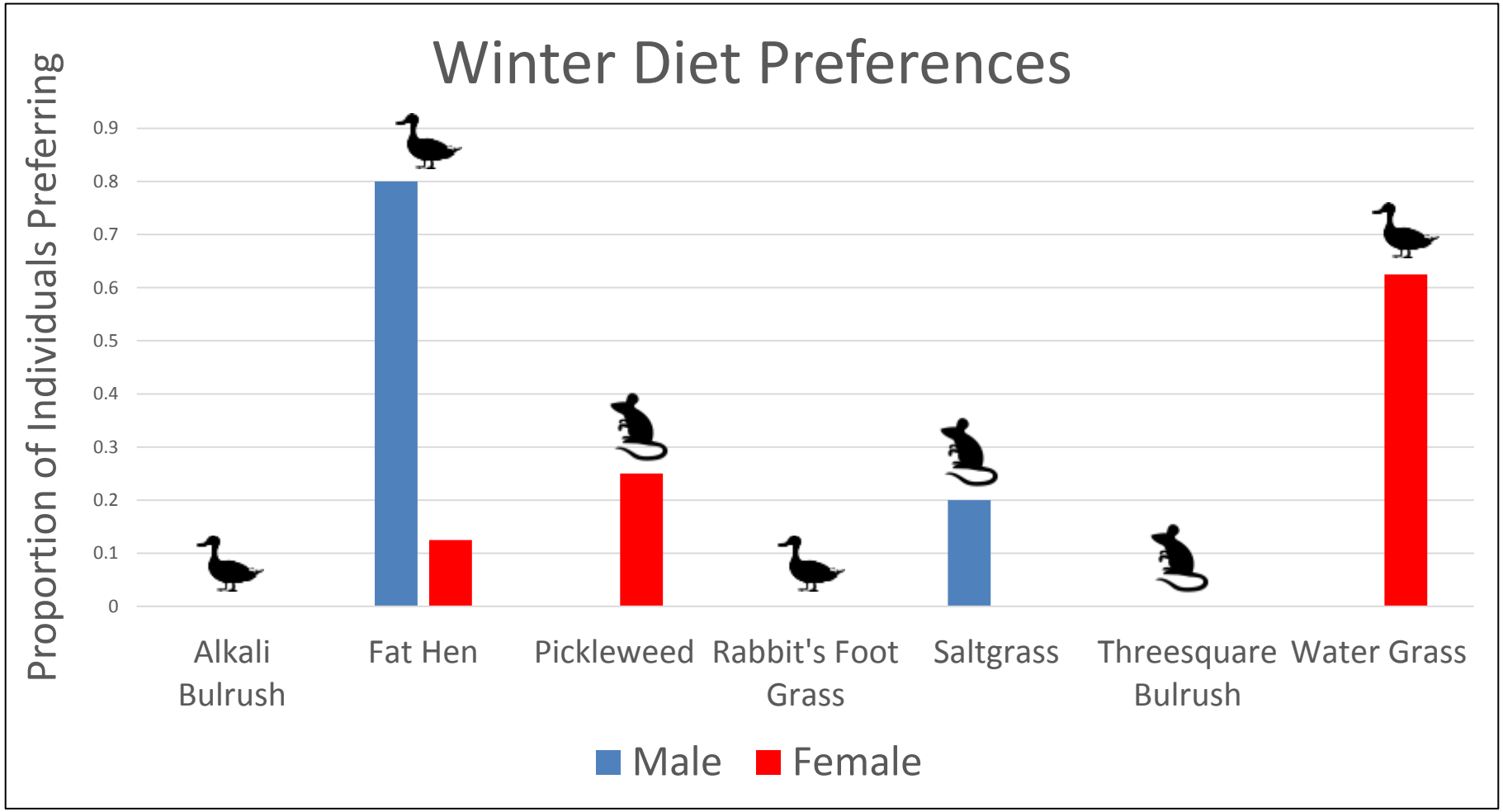
Diet Study

What do we want to know? | Design Justification | Methods | **Preliminary Results** | Ravi-lations



Diet Study

What do we want to know? | Design Justification | Methods | **Preliminary Results** | Ravi-lations



Diet Study

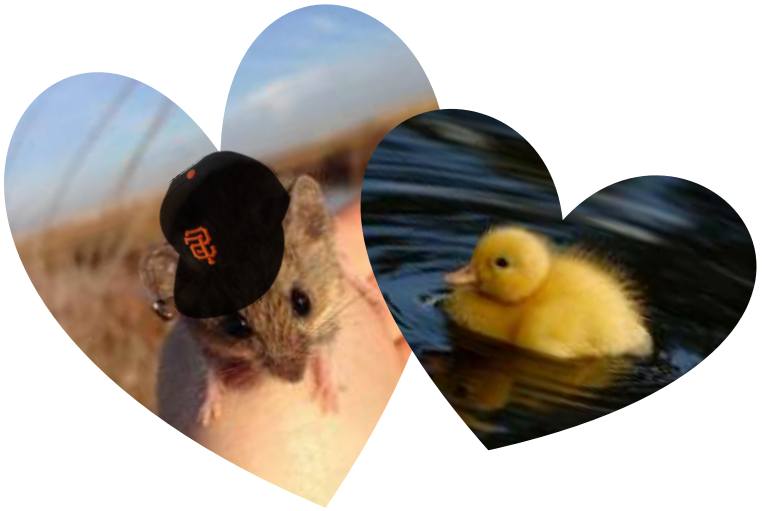
- Invertebrate prey
  - Beetles/Earwig
  - Mealworms
  - Isopods
- Prefer same foods as ducks
- Don’t choose foods we assume they would

Can we make it work?

- Trapping Data
  - In some blocks more mice in diked wetlands
- Tracking Data
  - Management activities do not appear to affect behaviors
  - Smaller home ranges
- Diet Data
  - Large overlap in preference

How?

Ask me in three years!



Achievements

- +800 Volunteer Hours, 50 Volunteers
- ~3,000 Capture Events
- +12,000 Trap Nights
- ~1,500 Individuals Marked

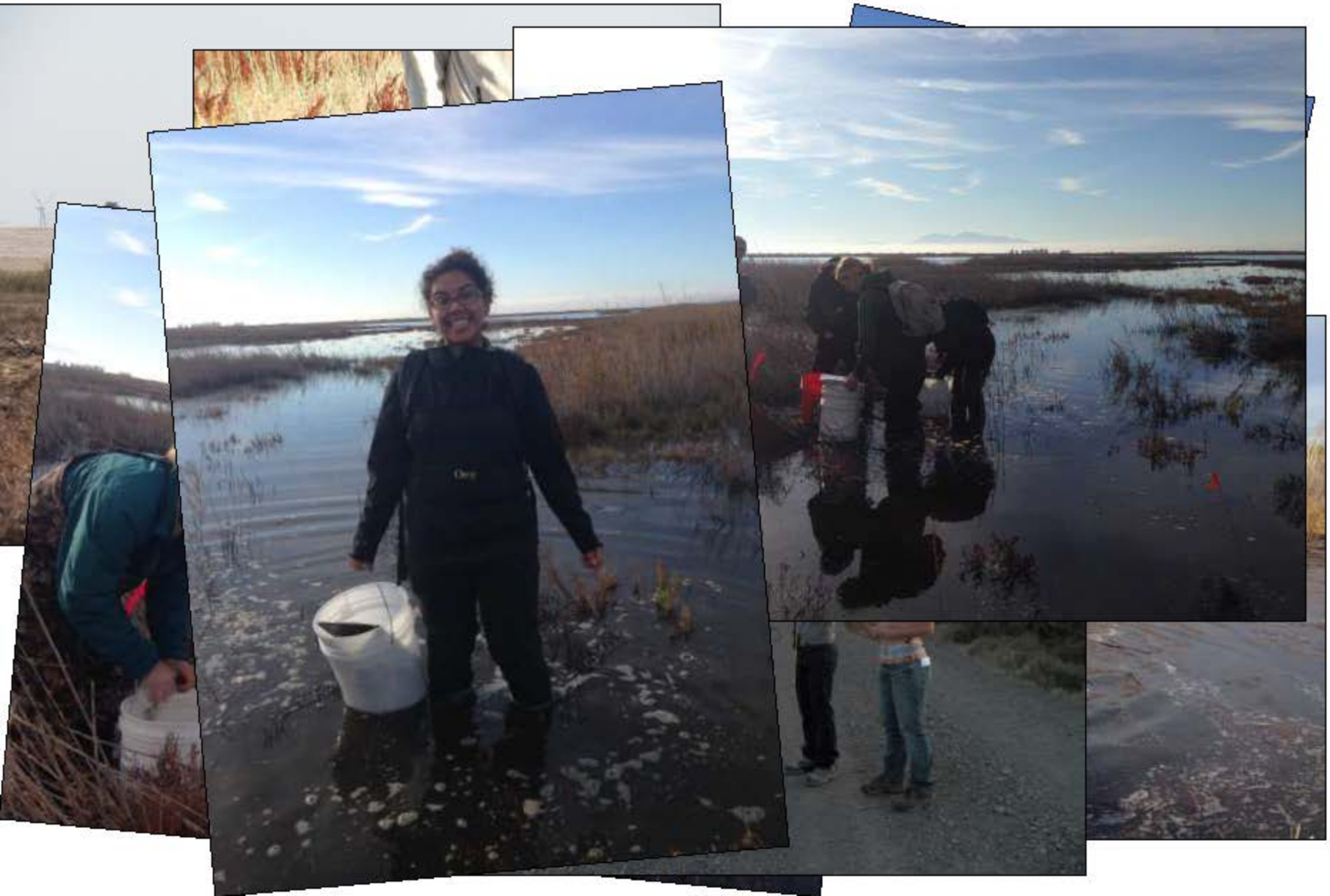
Acknowledgements

Laurie Barthman-Thompson
Sarah Estrella
Melissa Riley

Caitlin Roddy
Sarah Fredricks

Dr. Doug Kelt

These projects were supported by a grant from a partnership of the California Department of Fish and Game and California Department of Water Resources, US Fish and Wildlife Service Section 6 Grant # F12AP00296, Kelt Lab at UC Davis, The Walter and Elizabeth Howard Award, and the Delta Stewardship Council.

Questions?
Comments?
Suggestions?

Participate!