

# Everglades National Park

## Freshwater Aquatics Monitoring

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# Invasive Species Programs Everglades National Park's

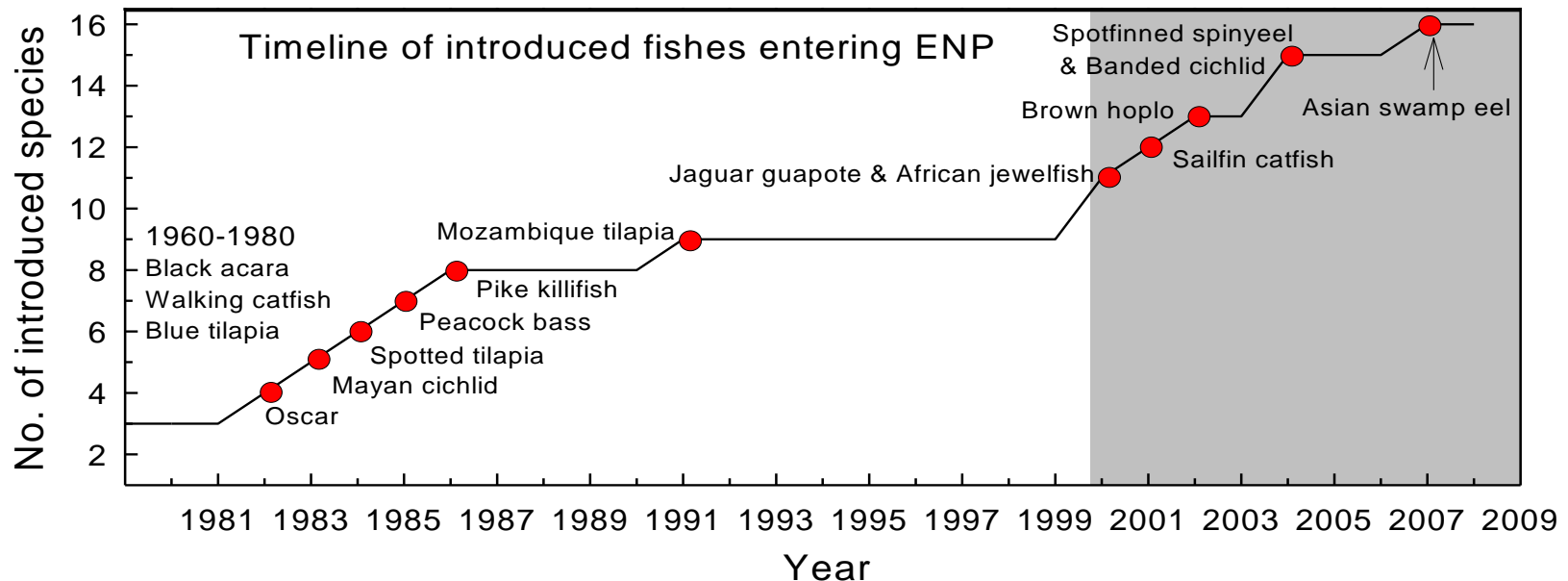
## Mandates:



- Preserve flora and fauna in a **natural** state.  
(1934 Everglades Establishment Act)
- Maintain **natural** abundance, diversity, and ecological integrity of **native** plants and animals.  
(1989 Everglades National Park Expansion Act)

# Invasive Species Programs

- Generally species lists
- 16 species of non-native fish
- *Pomacea insularum* and *P. diffusa*-2005
- Misc other aquatic invertebrates



# Priority Animal Species

- **Priority Animals**

- The most recent introductions
- Most abundant
- And those not in ENP yet!



- **Newly Detected Animal Species**

- Vermiculated Sailfin Catfish (*Pterygoplichthys disjunctivus*)



# Fiscal Year Treatments: Cold weather 2010



# Monitoring

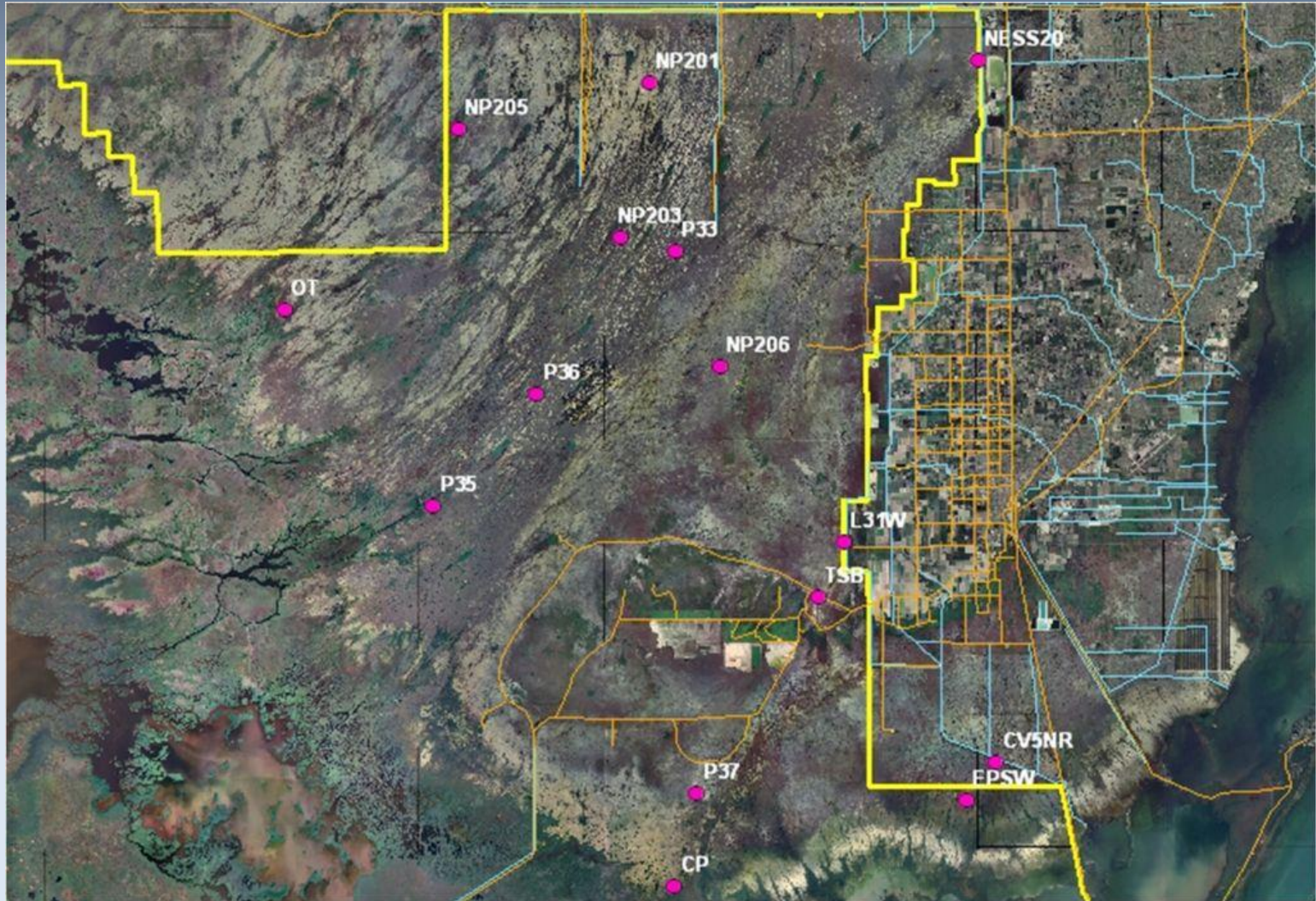
- Fish monitoring
  - Park-wide sample-Annually
  - Monthly Rocky Glades
  - Long-term monitoring
  - Other monitoring efforts-Cooperators
  - Misc observations
- Non-native apple snail
  - *Pomacea insularum*
    - Old Tamiami Canal survey every 8-10 days
    - May 2005-April 2010
    - May 2010-Once per month
  - *P. diffusa* at Frog City
  - Annual survey of border canals



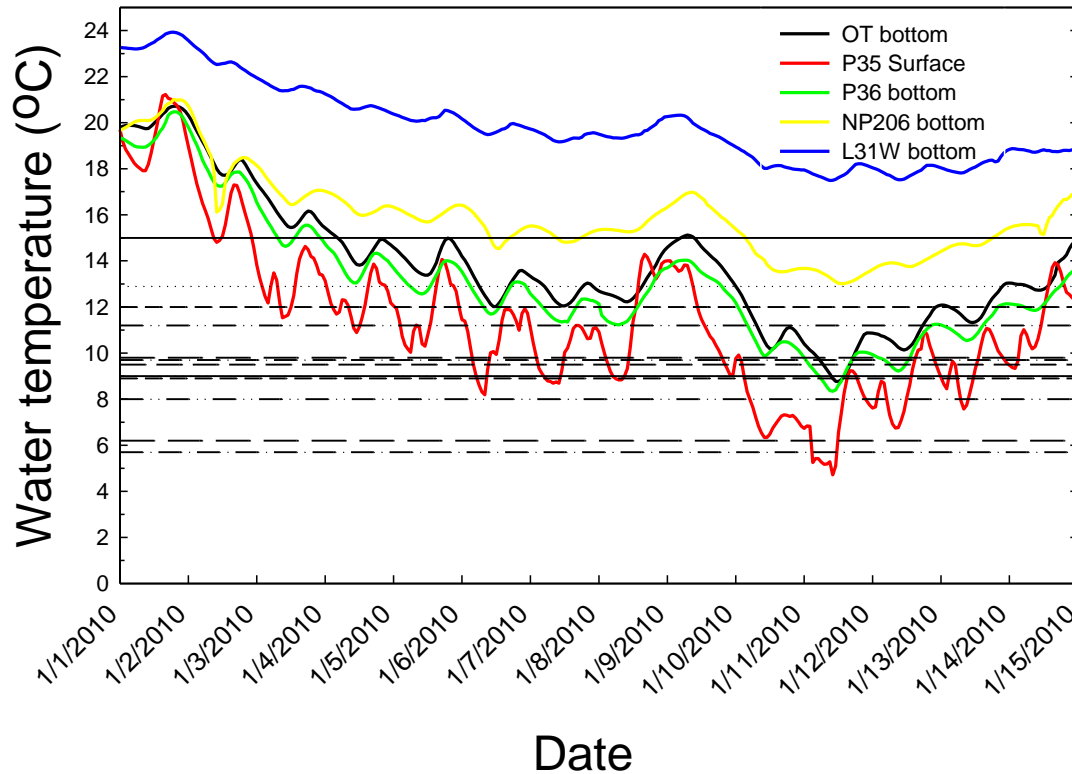
# Monitoring: Misc observations



# Monitoring: Temperature stations



# Monitoring



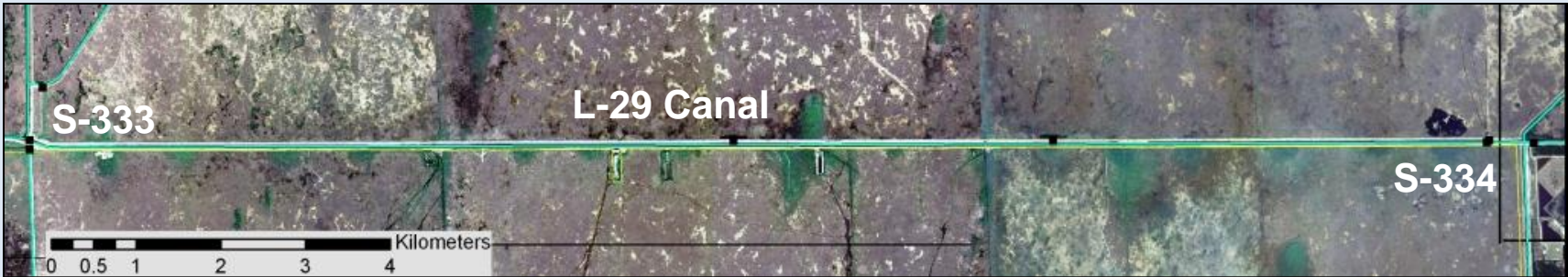
- Peacock bass-15 °C
- ..... Oscar-12.9 °C
- Jaguar guapote-12.0 °C
- Spotted tilapia-11.2 °C
- Walking catfish-9.8 °C
- Pike killifish-9.7 °C
- African jewelfish-9.5 °C
- Mayan cichlid-9.0 °C
- ..... Sailfin catfish-9.0 °C
- Black acara-8.9 °C
- Asian swamp eel-8.0 °C
- Blue tilapia-6.2 °C
- Brown hoplo-5.7 °C

2010 Everglades Invasive Species Summit  
Monitoring: Misc observations

*Rotala rotundifolia*



“Uncertain if it will spread from the canal to other areas...but anywhere you see *Bacopa*, you could expect it to establish”



# Monitoring

Island apple snail  
*Pomacea insularum*



# Monitoring

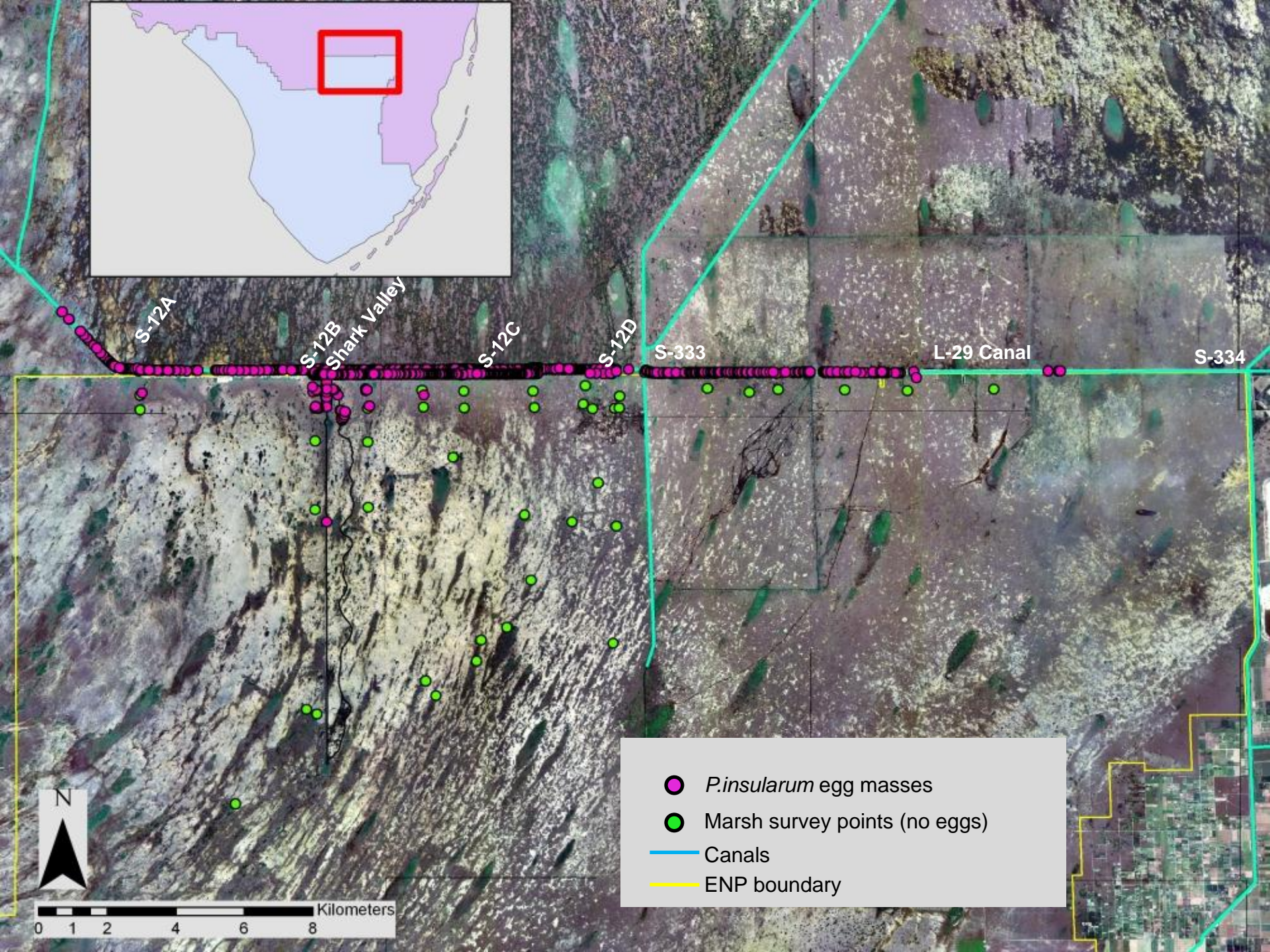
Island apple snail  
*Pomacea insularum*



# Monitoring

Island apple snail  
*Pomacea insularum*





# Needs & Gaps

- Prevention is key with fish and aquatic inverts!
- Non-native species must be considered when designing water management changes
  - Non-native species are “bio-pollution”.
  - Study alternative ways of delivering water without delivering non-native species.
  - Restore unnatural habitats
- How do we work better with external management agencies with different mandates and objectives to meet our mandates?

# Questions?