

Everglades National Park

Non-native fish and apple snails

Jeff Kline

Everglades National Park



Invasive Species Programs



- 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)

Priority Animal Species

Priority Animals

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



Newly Detected Animal Species

- None in 2010-2011

Monitoring

- Fish monitoring
 - Park-wide sample-Annually
 - Monthly Rocky Glades
 - Long-term monitoring
 - Other monitoring efforts- Cooperators
 - Misc observations



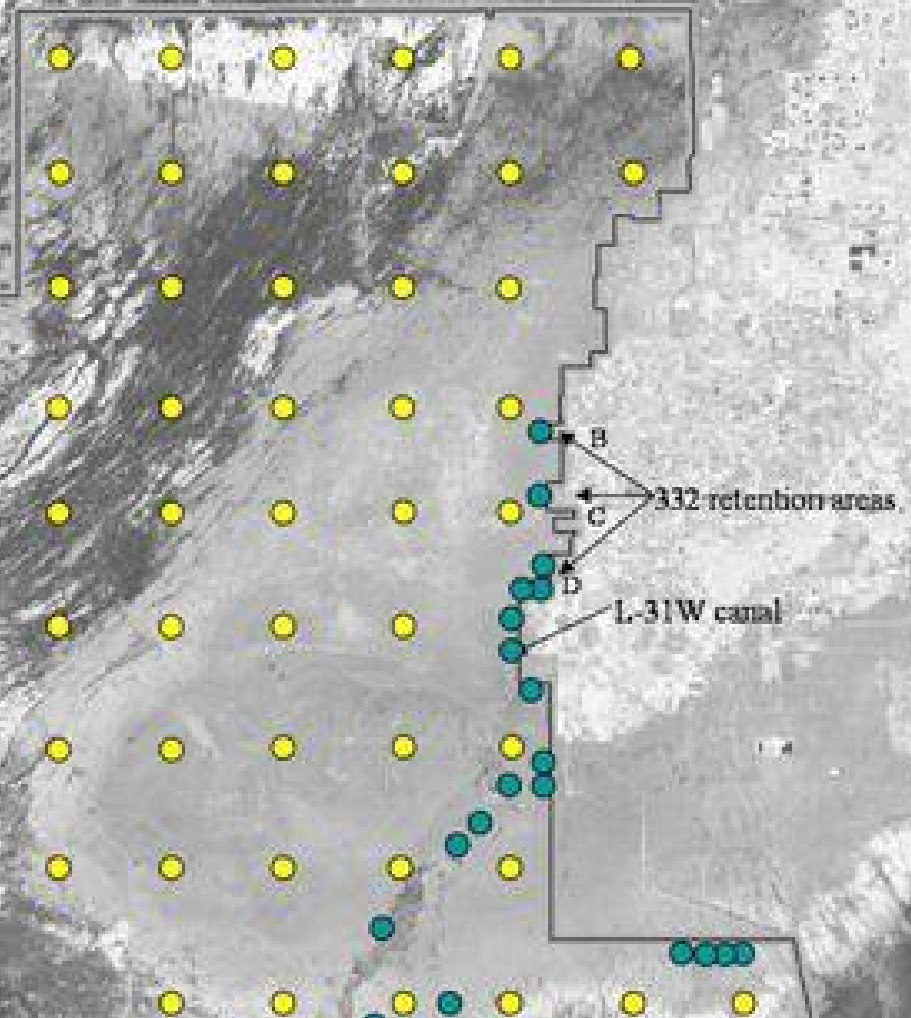
- Non-native apple snail
 - Pomacea insularum*
 - Old Tamiami Canal and L-29 Canal
 - Annual survey of border canals

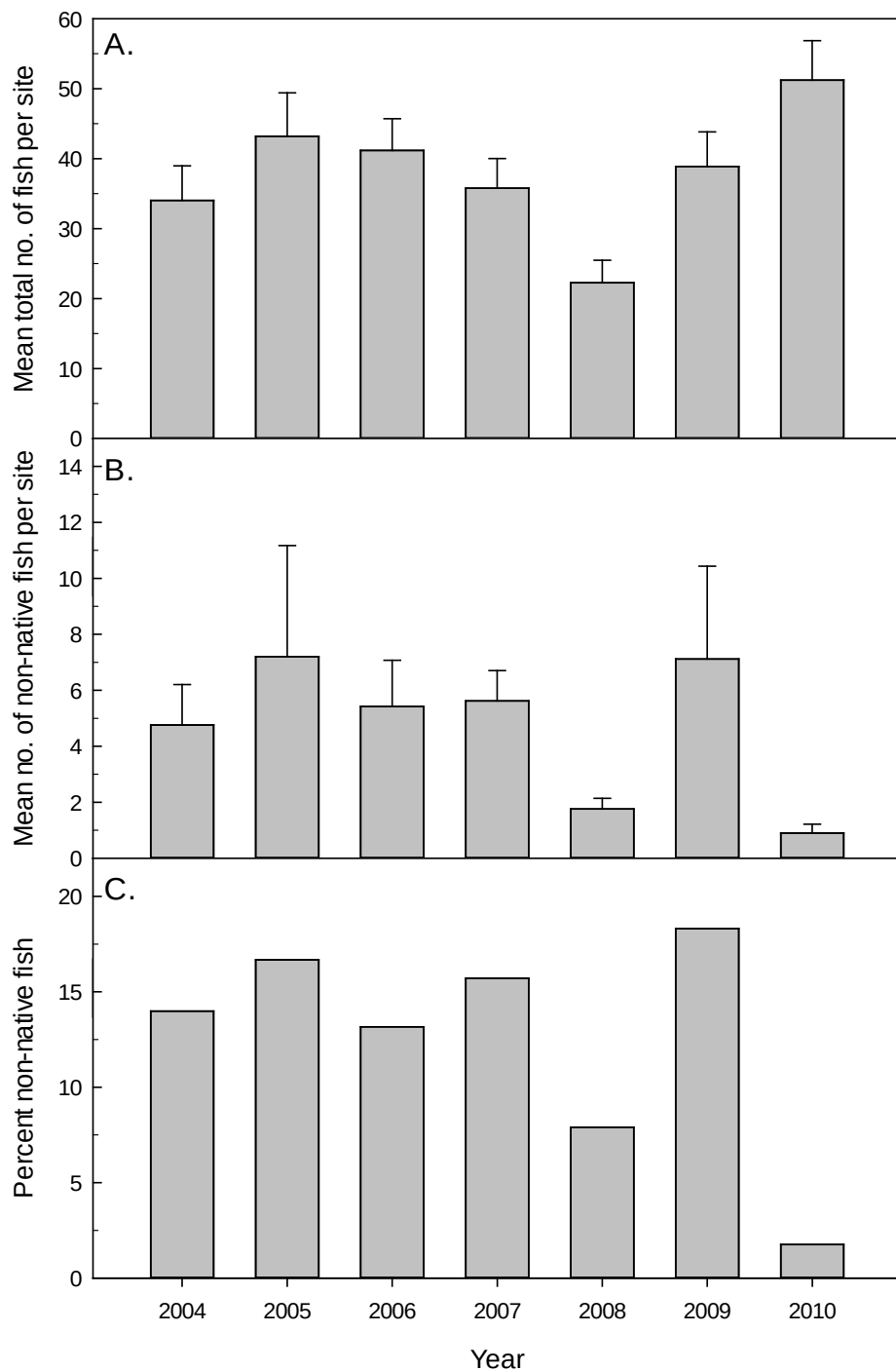


CESI Exotics 2004-2005

Objectives:

- Spatially extensive
"snapshot" of distribution
- An example design for
long-term monitoring





Parkwide sample 2010

Mean Total CPUE high

CPUE of non-natives low

Percent composition low

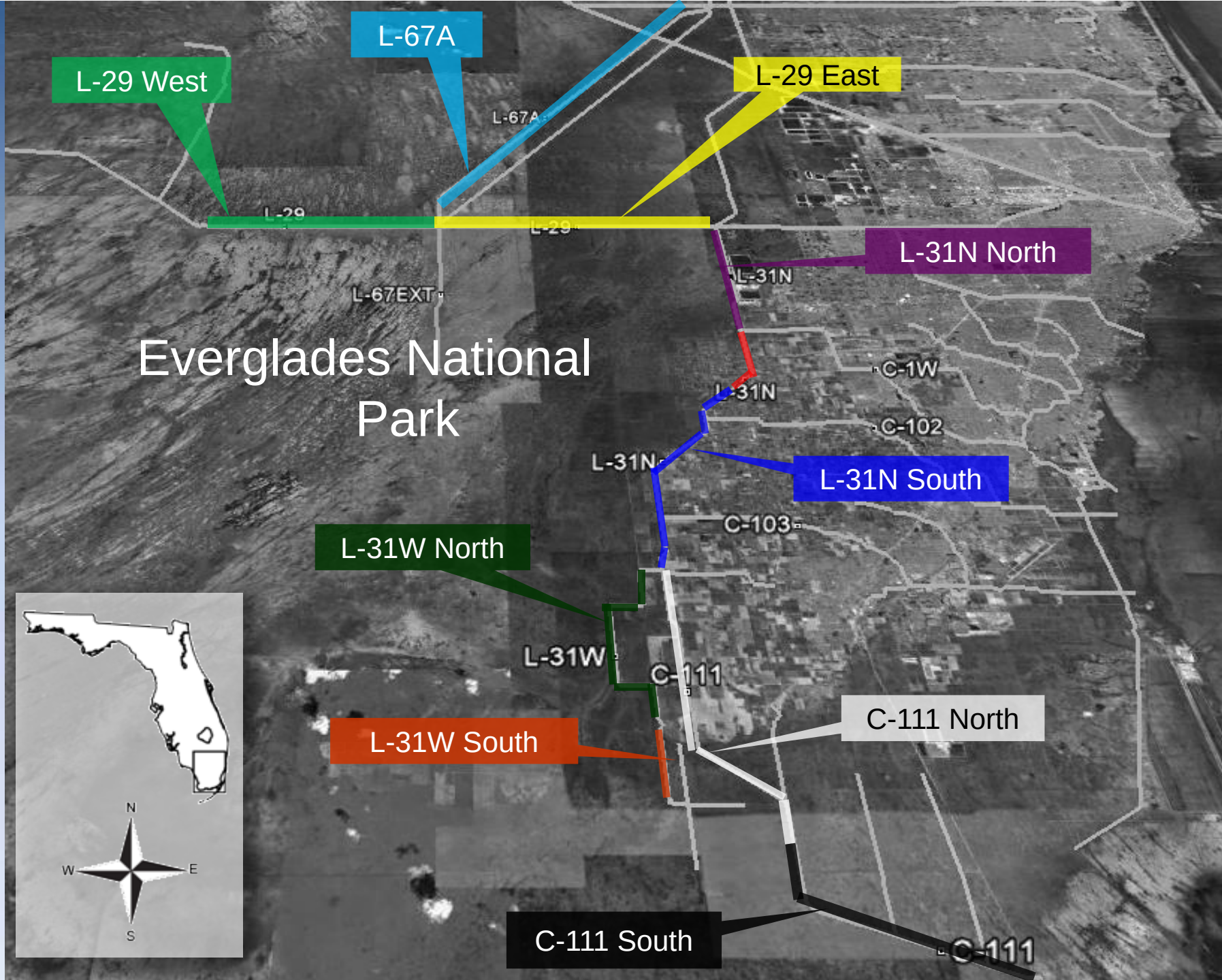
How do Canals Function as Habitat for Native & Non-native Fishes Across the Everglades Ecosystem?

David A. Gandy & Jennifer S. Rehage



CESI
Critical Ecosystem Studies Initiative

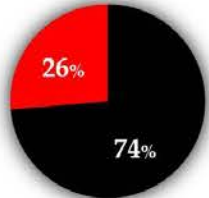




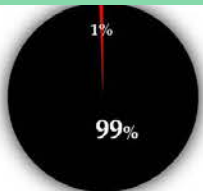
Early wet season-June 2010

CPUE: Native Nonnative

All Canals



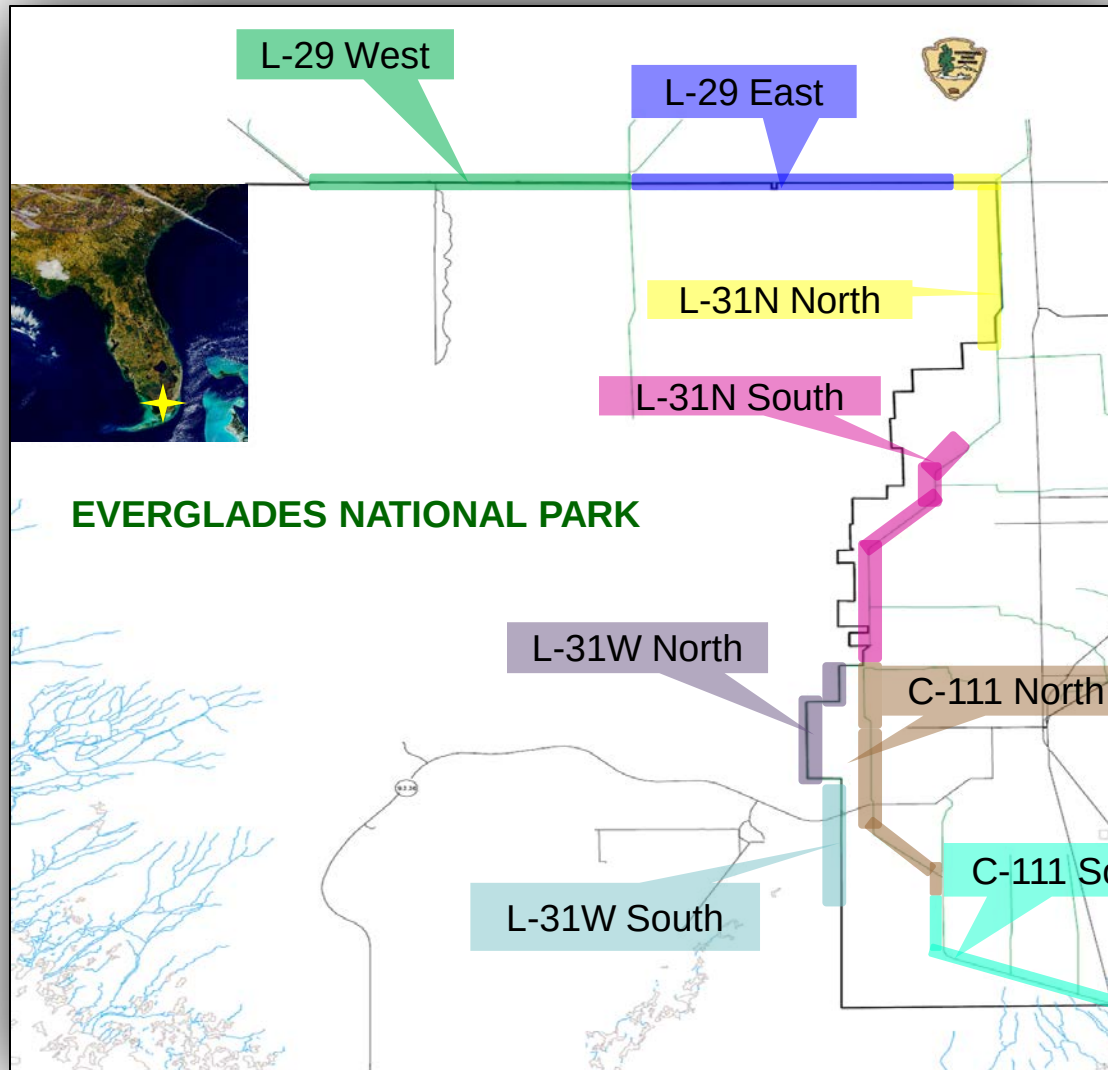
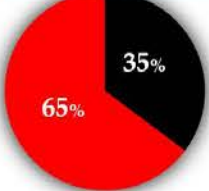
L-29 West



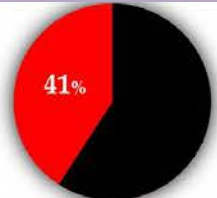
L-29 East



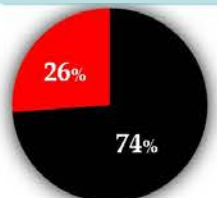
L-31N South



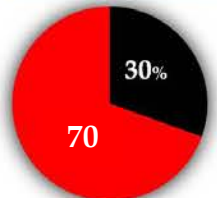
L-31W North



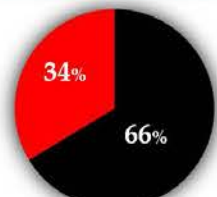
L-31W South



C-111 North



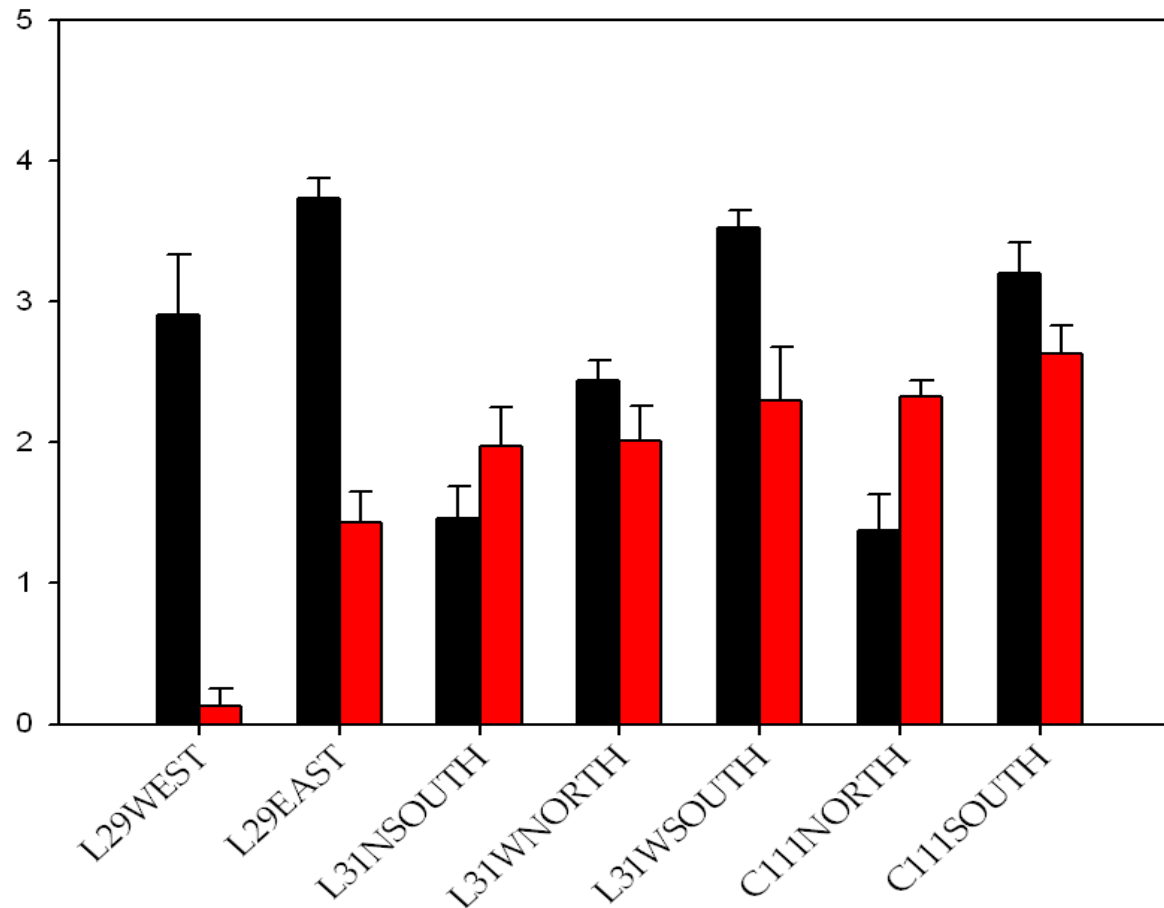
C-111 South



In this June 2010 (Early wet only) sampling event, **nonnative** fishes on average account for about 26% of fish numbers, with high variation among canals & sampling units. (Note- L31N North is excluded do to lack of safe boat launch site)

Mean CPUE by Canal: Natives vs. **Nonnatives** (Early Wet -Only)

$\ln(\text{CPUE} + 1)$



Late Wet Season-Oct/Nov 2010

CPUE: Native Nonnative

All Canals



L-29 West



L-67A



L-29 East



L-31N South



L-31W North



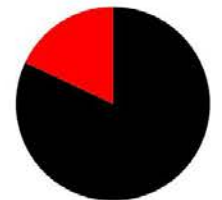
L-31W South



C-111 North



C-111 South



Monitoring

Island apple snail
Pomacea insularum

2011
L-29 Canal & L-31N



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?