CERP Program-Level Adaptive Management Plan

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South Florida Ecosystem Restoration

Joint Restoration Working Group and Science Coordination Group Meeting

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CERP Adaptive Management Defined

- Structured management approach to address uncertainties by testing hypotheses
- Links science to decision making
- Adjusts implementation, as necessary, to improve the probability of achieving restoration success

Program-Level Adaptive Management Plan Overview

- Purpose and Requirement
- Adaptive Management (AM) Plan Development
- Identified Key Questions by Region
- Developed Science Based Strategies
- Tools to Link Science to Management Decisions
- Next Steps

CERP Program-Level Adaptive Management Plan Purpose

- Goal is to Describe:
  1. the scientific framework and processes upon which Everglades restoration is being undertaken;
  2. how new knowledge is being integrated into decision making; and
  3. how and when adjustments to CERP implementation can be made

Program-Level AM Plan Conceptual Framework to Inform

- Changes to Project and Operations
- Updates to CERP Schedule and System Operating Manual
- Revisions to Planning Models, Performance Measures, and Interim Goals and Targets
- Updates to Monitoring and Assessment Plan (MAP), Coordination, and Implementation

Program-Level AM Plan Contents

- Prioritized Key Questions Related to CERP Implementation
- AM Strategies to Address Key Questions
- Management Options Matrices that Link RECOVER Monitoring to Current and Future CERP Projects

Key Questions and AM Strategies - Northern Estuaries

1. Understand Water Quantity and Quality (Nutrients and Suspended Solids) effects on oyster larvae transport and recruitment

Adaptive Management Strategies

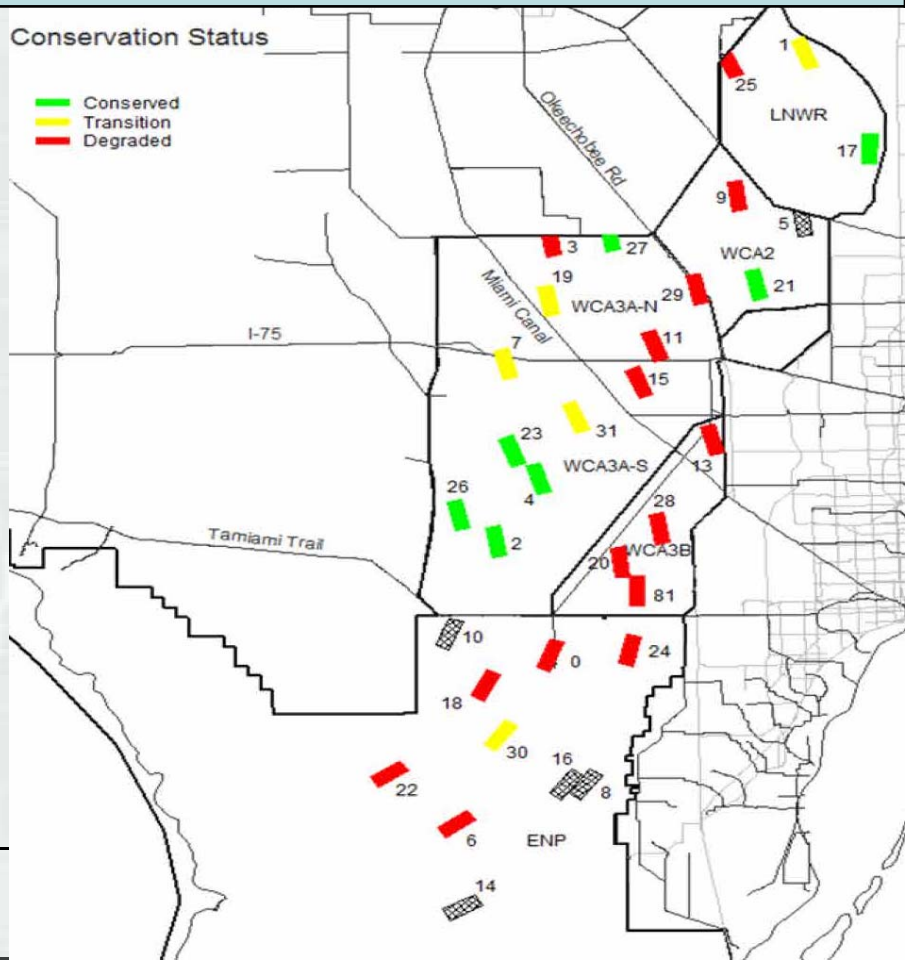
- Develop Particle Transport Model to inform placement of oyster cultch
- Monitoring and synthesis to understand water quality synergistic effects with salinity on oyster recruitment

Key Questions and Strategies - Greater Everglades

1. **Role of flow velocities and volumes in maintaining ridge-and-slough patterns?**
2. **Area landscape restoration timeframes quickly (decadal) vs. slowly (century-millenia). Need for additional non-structural restoration actions.**

Adaptive Management Strategies

- Synthesis, update/development and application of performance measures to evaluate effects on tree islands and ridge and slough in different parts of the system.
- Field tests of flow (Decomp Physical Model),
- Tree islands and ridge and slough mescosms (LILA), and
- Flow/active marsh improvement tests

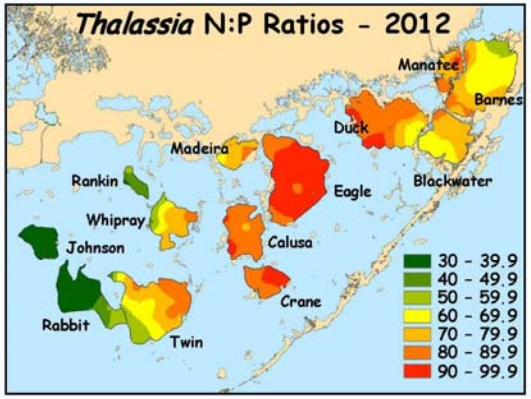


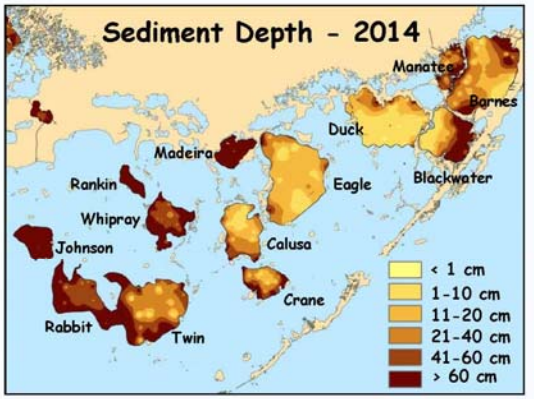
Key Questions and AM Strategies - Southern Coastal Systems

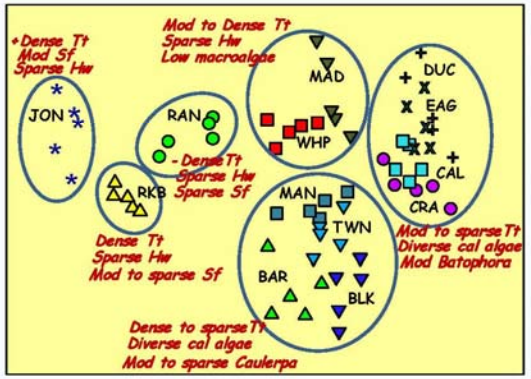
1. **Volumes and flow patterns to restore submerged aquatic vegetation, oysters, and fish communities in coastal Everglades**
2. **Magnitude of sea-level rise effects on ecosystem. Inform identification of areas where early restoration actions to improve resiliency to sea-level rise**

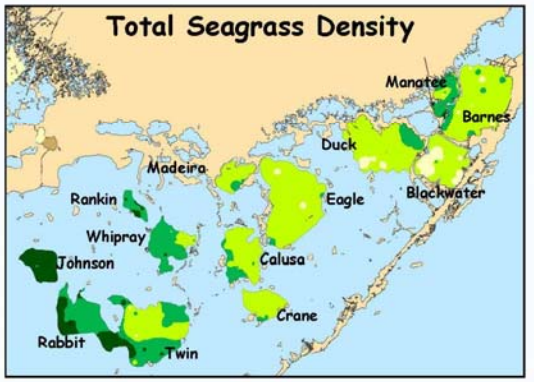
Adaptive Management Strategies

- Evaluate of restoration increments (pre-CERP, current, CEPP, CERP) using salinity and ecological models
- Monitor responses to C-111 SC and Biscayne Bay and operational tests.
- Conduct risk and vulnerability assessment of climate effects on restoration benefits
- Implement monitoring proposed by CEPP to assess sea-level rise effects









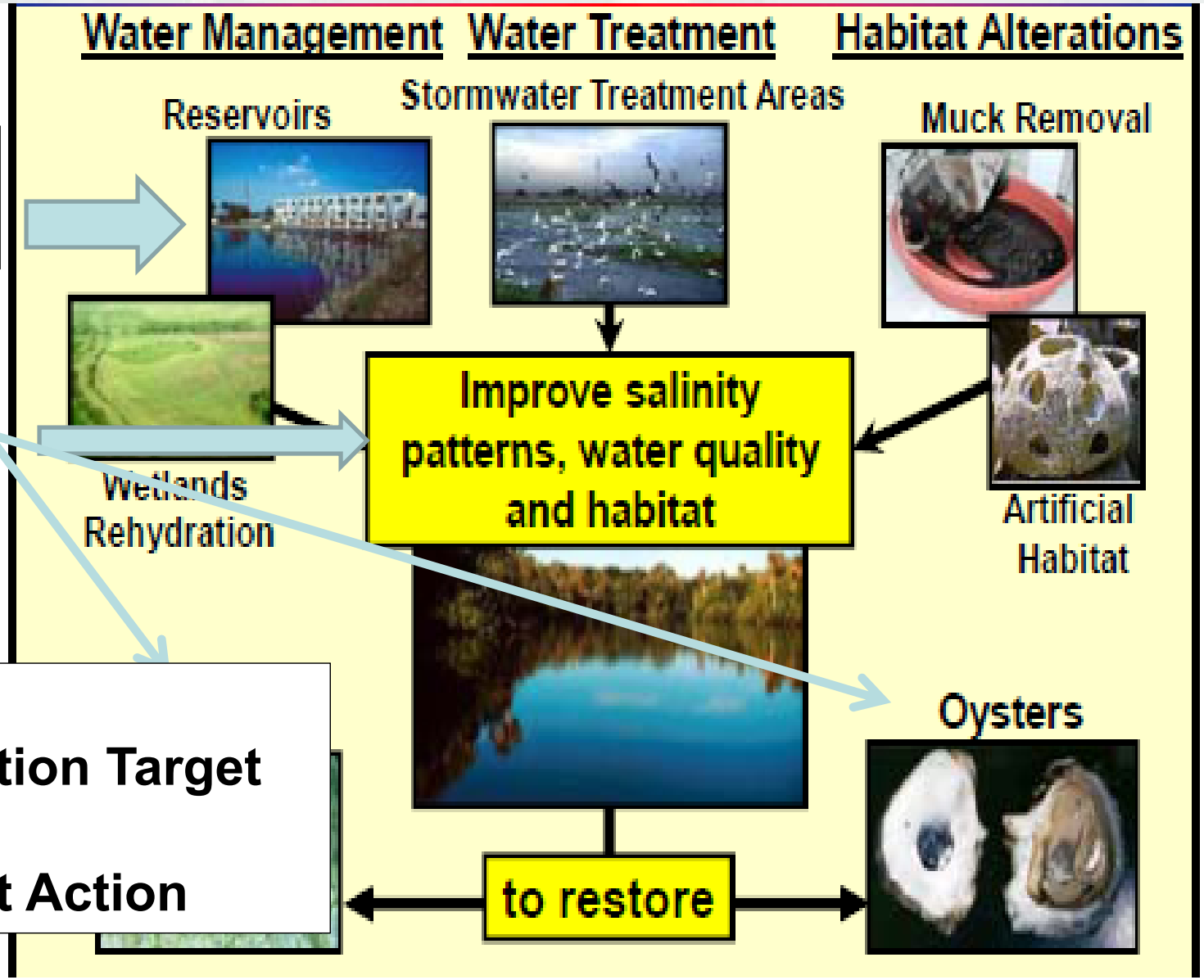
Management Options Matrices

Northern Estuaries St. Lucie Example

Management Options

Monitoring Indicators

- **Thresholds**
- **Full Restoration Target**
- **Triggers for Management Action**



St. Lucie - CERP Program vs. Project Performance

Performance Measure	Target	Current	IRL-S	CEPP	CERP
>2000 cfs High Flow	0	174	157	121	90
Oysters per acre	--	574,674	594,909	655,614	--

ID	Indicator	Threshold	Restoration Target	Trigger(s) for Action	Management Option 1	Management Option 2	Management Option 3
NE-9	**Oyster habitat** MAP: Benthic mapping and substrate ID (every 5 years) **Oyster sampling** to measure progress towards goals for health (disease), density, acreage, recruit-ment	Increase by 50 acres every 5 years Source: RECOVER 2005	922 acres of suitable oyster habitat Source: USACE and SFWMD 2004; Table 6-8, p. 6-72	Minimum 4 year period compare to baseline and look for incremental progress towards IRL-S and then CEPP expected performance for oyster density and oyster health. RECOVER monitoring of recruitment, growth, predation, disease in existing locations can be used to	If 922 acres of potential substrate is found in SLE. Determine if salinity flow regime is being observed in substrate area or if substrate is a limitation.	Dredge muck of other areas noted on benthic map.	Add oyster cultch as appropriate to expand acreage (not included in the PIR)

Next Steps

- Decision Coordination Team Concurrence
- Science Coordination Group Briefing
- Post as Living Document on www.EvergladesRestoration.Gov
- Inform RECOVER Activities, Project Planning, and Operations

Questions?

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