




South Bay Salt Pond Restoration Project

Science Program Up-date



Lynne Trulio
May 25, 2005



South Bay Salt Pond Restoration Project

This talk will cover...

- Science Team Activities
- Scientific Basis of the Project Objectives
- Draft Adaptive Management Plan






South Bay Salt Pond Restoration Project

Science Team Activities


- Workshops
 - Sediment Dynamics 1 & 2
 - Birds and their Habitats 1 & 2
 - Fish and their Habitats 1
- Science Syntheses
- Posted on the Website under Science Team on *Science* page



South Bay Salt Pond Restoration Project

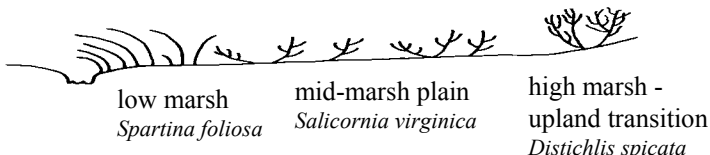
Science Syntheses

- Targeted literature reviews focused on the Project Objectives
- Ten key science issues directly tied to Project Objectives
- What do we know, what don't we know and what do we need to know to achieve the Project Objectives



Ten Key Science Issues


- 1 Maintain/improve Ecosystem Function
- 2 Understand Sediment Budget/dynamics
- 3 Restore Tidal Marsh/associated Habitats
- 4 Recover Special Status/Indicator Species (in progress)
- 5 Manage Ponds for Migratory Birds



low marsh
Spartina foliosa


mid-marsh plain
Salicornia virginica

high marsh -
upland transition
Distichlis spicata



Ten Key Science Issues

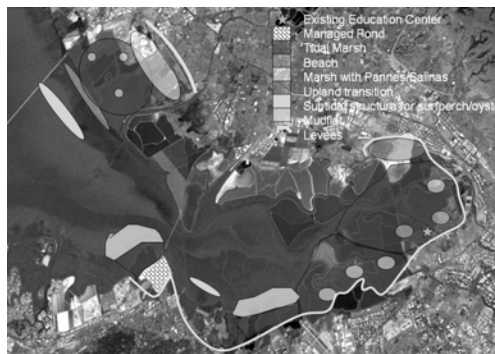
- 6 Effects of Hydrological Modifications (in progress)
- 7 Pollutant Effects
- 8 Impact of Invasive and Nuisance Species
- 9 Public Access effects on Wildlife and Habitats
- 10 Protecting Infrastructure



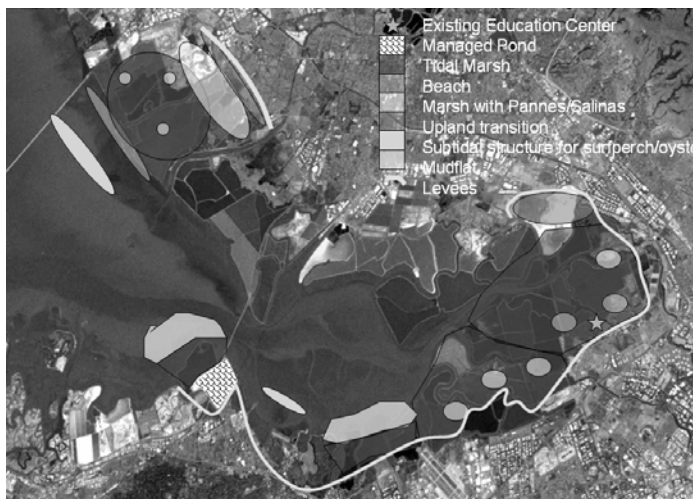


NSP Charette

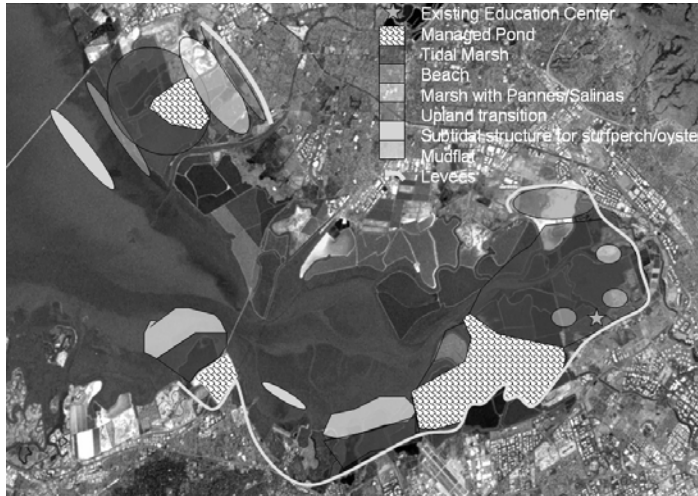
- Organized by the NSP
- February 2005
- Develop a vision for 2050
- Based on scientific expert opinion



Charette Vision 1



Charette Vision 2



Charette's Uncertainties List


- Mercury
- Sediment Dynamics/Mudflats
- Bird Use of Different Habitats, esp. tidal marsh ponds/pannes
- Non-avian benefits
- Socio-economic dynamics
- Very large scale issues






Pulling it all together


- **Scientific Basis of the Project Objectives**
 - Help guide PMT and Stakeholders in Alternatives evaluation process
 - Help in restoration target development
- **Draft Adaptive Management Plan**
 - Blueprint for moving the Project forward in the face of uncertainty
 - Plans for the ISP and the Project itself



Scientific Basis of the Project Objectives


- Developed by the Science Team using the Science Syntheses, Workshop results, Charette, Consultant modeling and reports and other authoritative information
- **NOT the official position of the PMT**
- For use by the PMT and Stakeholders in evaluating Alternatives and setting restoration targets






Goal of the Analysis


- Provide an answer to these questions:
 - What are the minimum conditions needed to achieve the Project Objectives?
 - Where are there conflicts between Project Objectives that represent challenges?
- Looked at all the Project Objectives, but rare species and migratory birds were the drivers in this analysis.



A few assumptions

- Project will provide all habitat needed to meet the South Bay recovery goals for rail, mouse and plover.
- Project area will support migratory bird diversity found at post-ISP level.
- Ponds will be managed per ISP or as reconfigured under the Project.





A few results

- Rail and Mouse---~7,400 acres of tidal marsh (1984 Recovery Plan, now under revision)
- Plover--between 500 and 3,000 acres of seasonal pond nesting habitat
- Pre-ISP migratory bird numbers supported on half the current pond acreage
- 50% tidal marsh/50% managed pond is a good, conservative place to start.



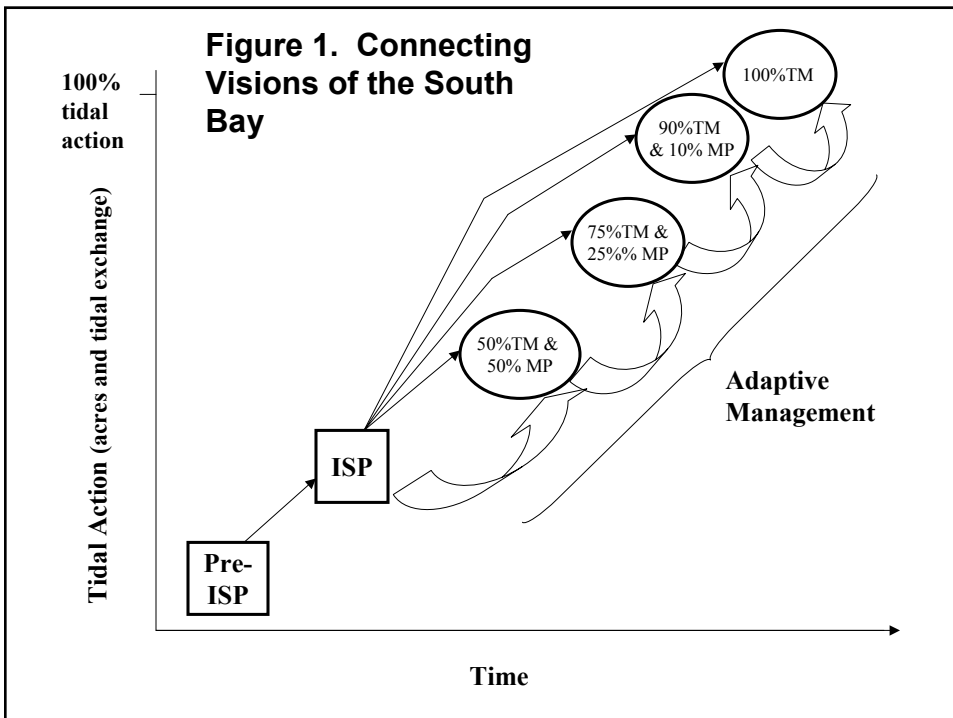
Project Challenges


- Plover habitat vs. tidal marsh and migratory bird habitat
- meHg and tidal marsh restoration
- Public access and wildlife diversity
- Tidal marsh/pond habitats and mosquitoes



There are many uncertainties...


- Bird use of tidal marsh and managed habitats, meHg, *Spartina alterniflora* and other problem species
- **We cannot know the final configuration**
- **Adaptive Management**—Will tell us how far along the tidal marsh continuum we can go and still reach the Project Objectives.






Two things to avoid:


- Undertaking irreversible actions that move the Project to far toward tidal marsh—i.e., carefully plan each Phase to the limits of our knowledge.
- Implementing Project actions that preclude reaching a full or nearly full tidal marsh—i.e., small projects that short-circuit more complete tidal marsh restoration.





Draft Adaptive Management Plan

- What is adaptive management?
- Part 1: Science, Monitoring and Applied Studies
- Part 2: Institutional Structures and Processes





What is adaptive management?

- A **cyclic process** for learning from management decisions and applying that knowledge to future decisions;
- Essential in systems with much **uncertainty**;
- Views all **management actions** as experiments
- **Collects data** through monitoring and applied studies (research)
- A **planned approach** to reliably learn why policies (or critical components of policies) succeed for fail" (Light and Blann 2003).




What adaptive management is NOT

AM is NOT...

- Trial and error;
- Simply changing management direction in the face of failed policies;
- A well-developed system or an easily implemented approach to management.







South Bay Salt Pond Restoration Project

Adaptive Management is based on...

- **Thorough understanding** of the system
- **Predictions** of system response to change
- **Monitoring** to assess response
- **Study** to improve predictions and understand unexpected responses



South Bay Salt Pond Restoration Project

Science Section

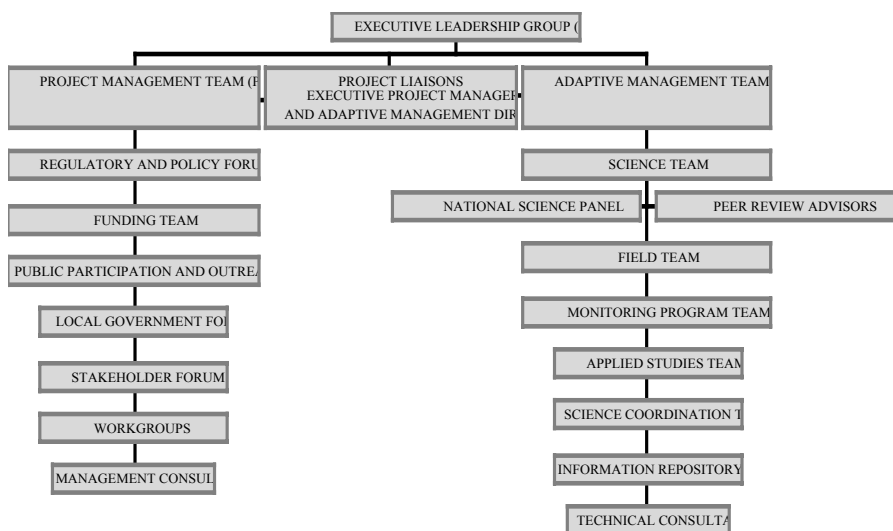
- **Restoration Targets**—from literature, field data, modeling, compliance
- **Monitoring** to assess progress toward targets and early warning—parameters and protocols
- **Applied Studies** to reduce uncertainties—focus on meHg, bird use, sediments, problem species.




Institutional Structure Section

- Structures and processes for decision-making
- Completes the loop between developing data and applying that data to management
- Goals:
 - Generate and synthesize information
 - Convert information into effective decisions
 - Collaborate with the public on decision-making
 - Store and organize data

Potential Org Structure






Science Team Activities



- Scientific Basis of POs—part of AMP
- Draft of AMP, including basic study designs—early June
- More Workshops—Pond Ecology and Management, Trophic Levels
- New Syntheses on emerging issues
- Advising PMT on monitoring and studies to conduct in the short and long-term



Thanks to...

- **Deborah Clark**—research & assistance drafting AMP Institutional section
- **Science Team** for Syntheses, comments on AMP, developing studies and all their hard work!

