

San Francisco Bay Restoration: Restoration Opportunity and the Scientific Basis

JEREMY LOWE

SAN FRANCISCO ESTUARY INSTITUTE

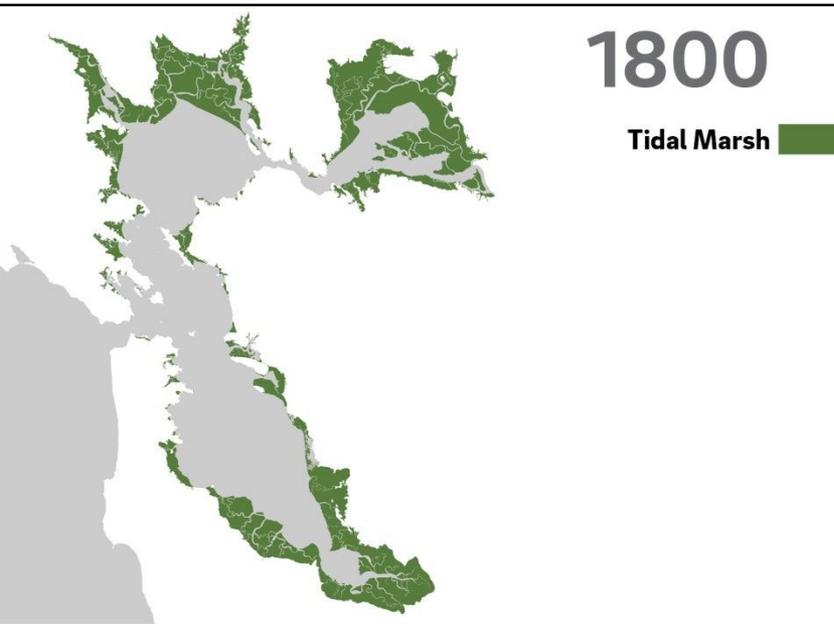
Association of
Environmental
Professionals

May 19, 2017

SFEI | AQUATIC
SCIENCE
CENTER
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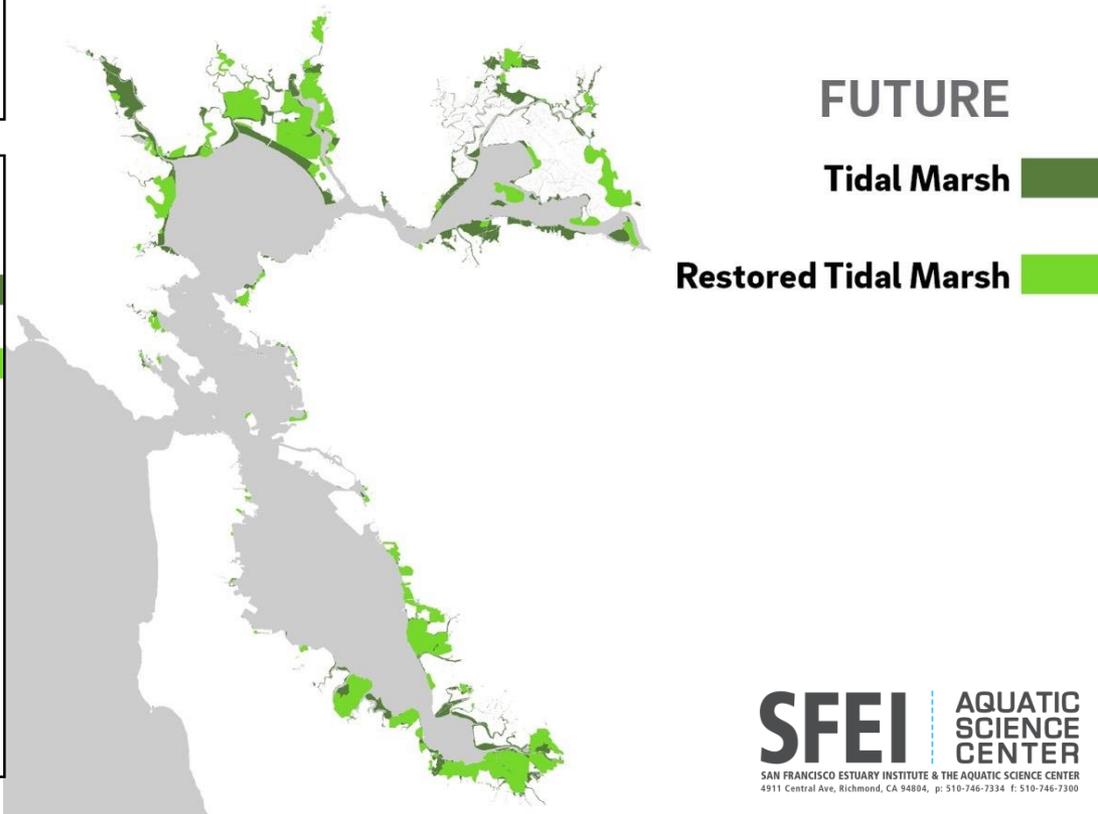
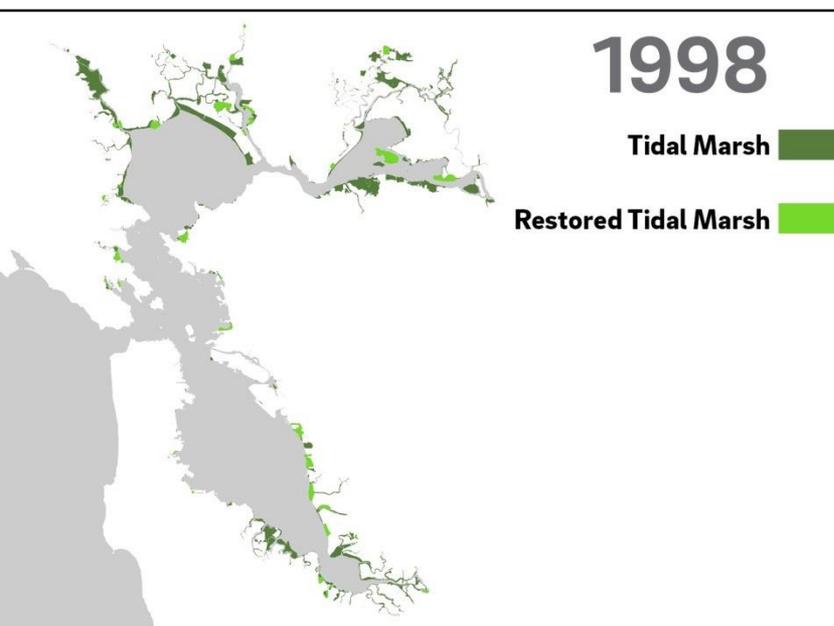


PHOTO Shira Bezael



Bay tidal marsh was reduced from 200,000 acres to 40,000 acres

Restoration can re-establish 100,000 acres of tidal marsh





2000
0 in



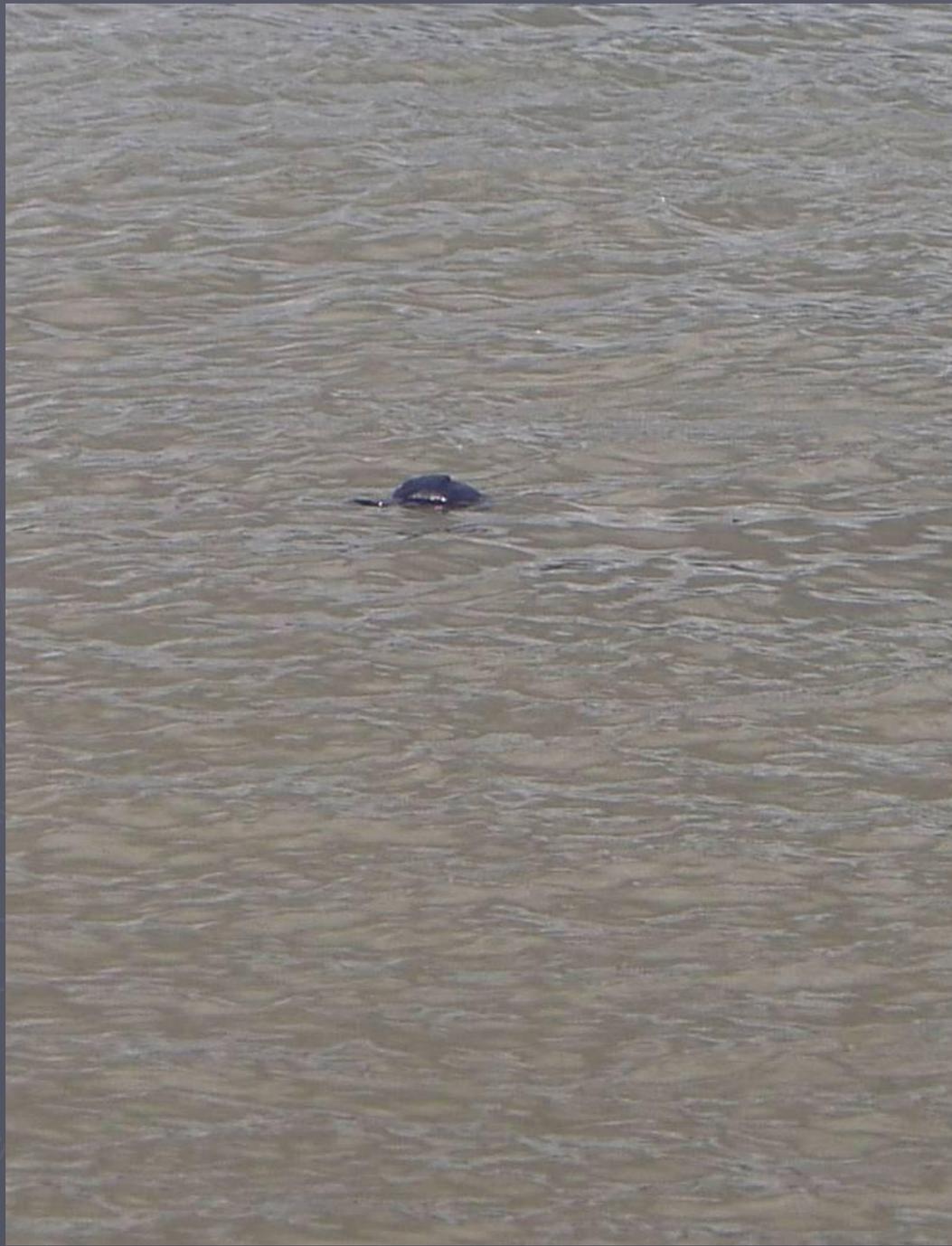
2050

1-in-20-chance

16 in



2100
1-in-20-chance
42-52 in



2100+
?? in

THE
Baylands
AND
Climate Change

WHAT WE CAN DO

BAYLANDS ECOSYSTEM HABITAT GOALS
SCIENCE UPDATE 2015



- Science synthesis
- Goal: healthy ecosystem, providing a resilient shore for people and wildlife

State of California

Coastal Conservancy



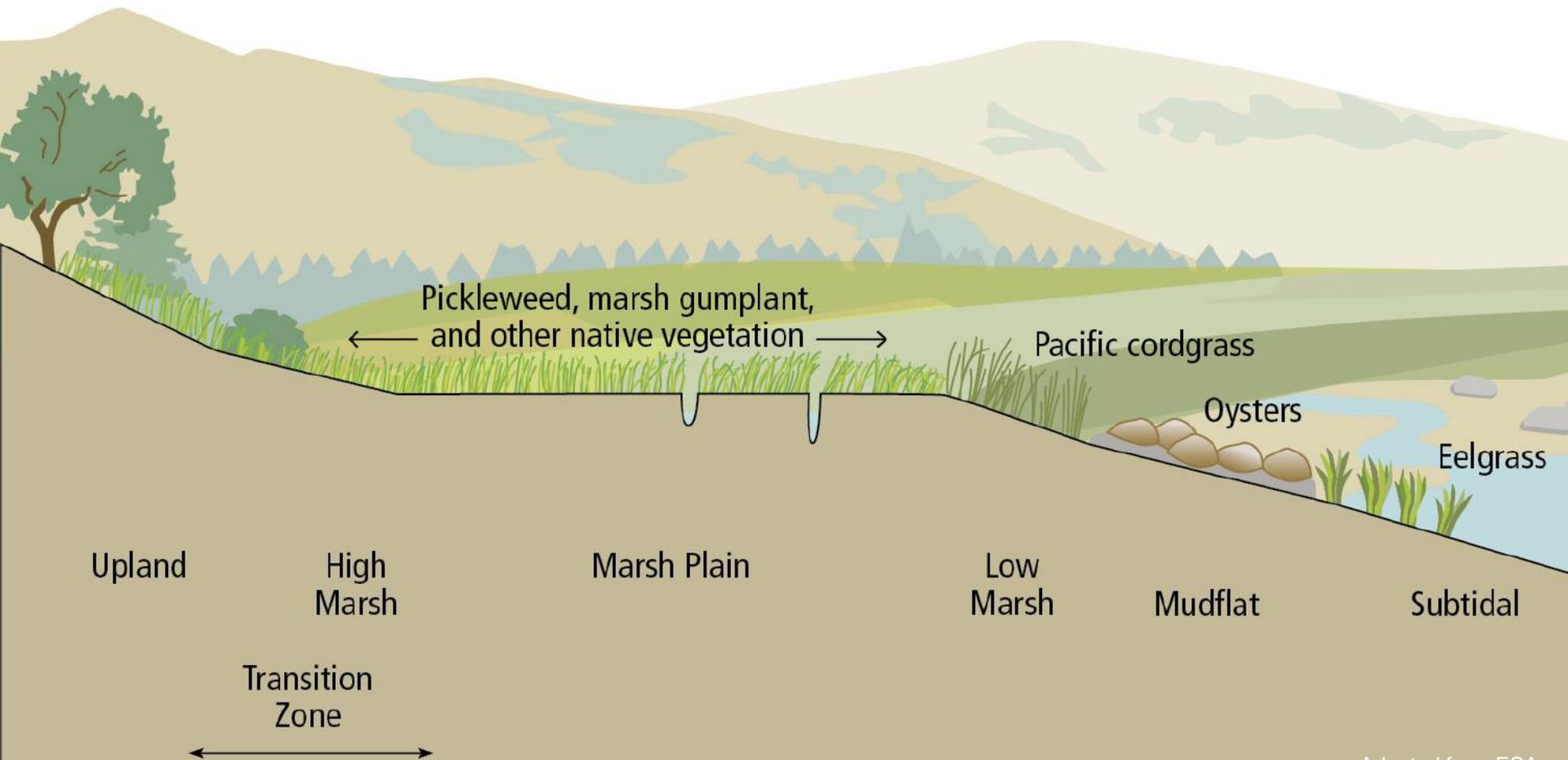


WHAT WE CAN DO

- *Restore complete systems, including processes*

Shira Bezalet

Restore COMPLETE SYSTEMS

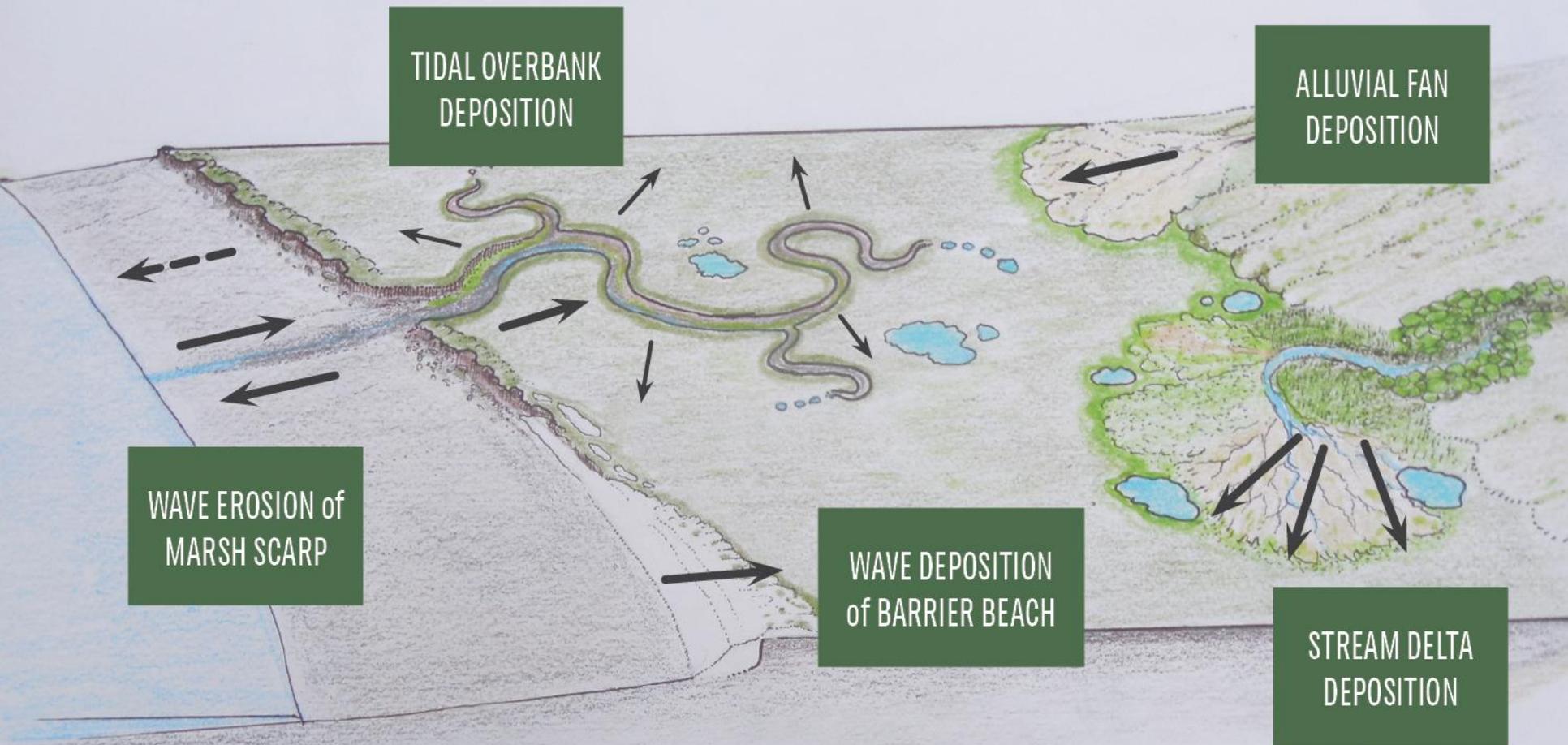


MEANS
RESTORING

PROCESSES

NOT JUST
PLACES

COURTESY PETER BAYE





WHAT WE CAN DO

- *Restore complete systems, including processes*
- *Restore soon, in areas marshes are likely to persist*

Shira Bezalet

restore

**MARSHES BY 2030 IN AREAS
WHERE THEY'RE LIKELY TO**

persist

2006



Cris Benton

2014



Build up of sediment and vegetation takes time

Higher starting elevation means marshes survive
sea-level rise for longer



WHAT WE CAN DO

- *Restore complete systems, including processes*
- *Restore soon, in areas marshes are likely to persist*
- *Plan for the Baylands to migrate*

Shira Bezalel

PLAN FOR THE BAYLANDS TO *migrate*



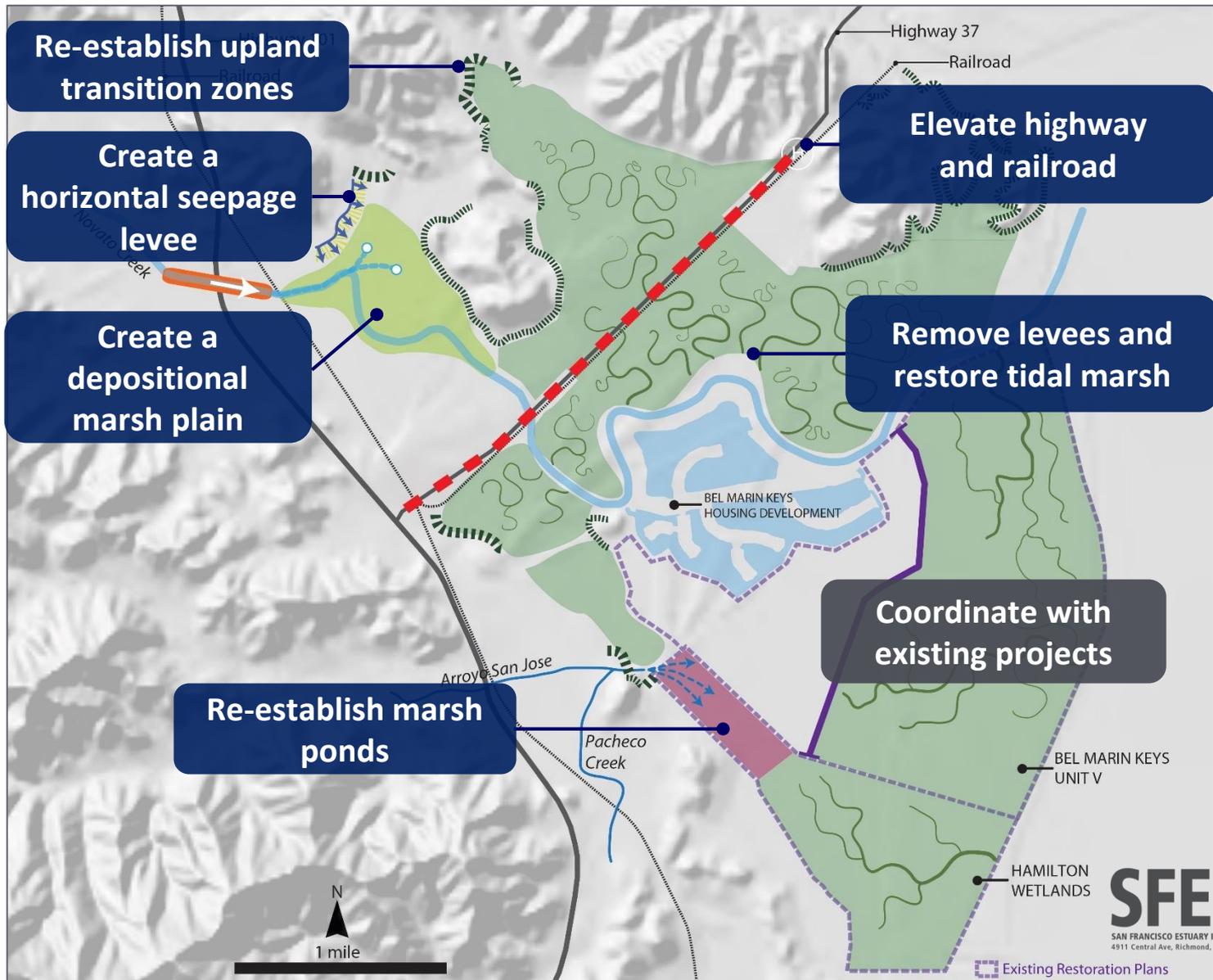


WHAT WE CAN DO

- *Restore complete systems, including processes*
- *Restore soon, in areas marshes are likely to persist*
- *Plan for the Baylands to migrate*

Shira Bezalel

PLAN FOR A RESILIENT *landscape*



EXPERIMENT WITH *pilot projects*



Source: City of San Jose



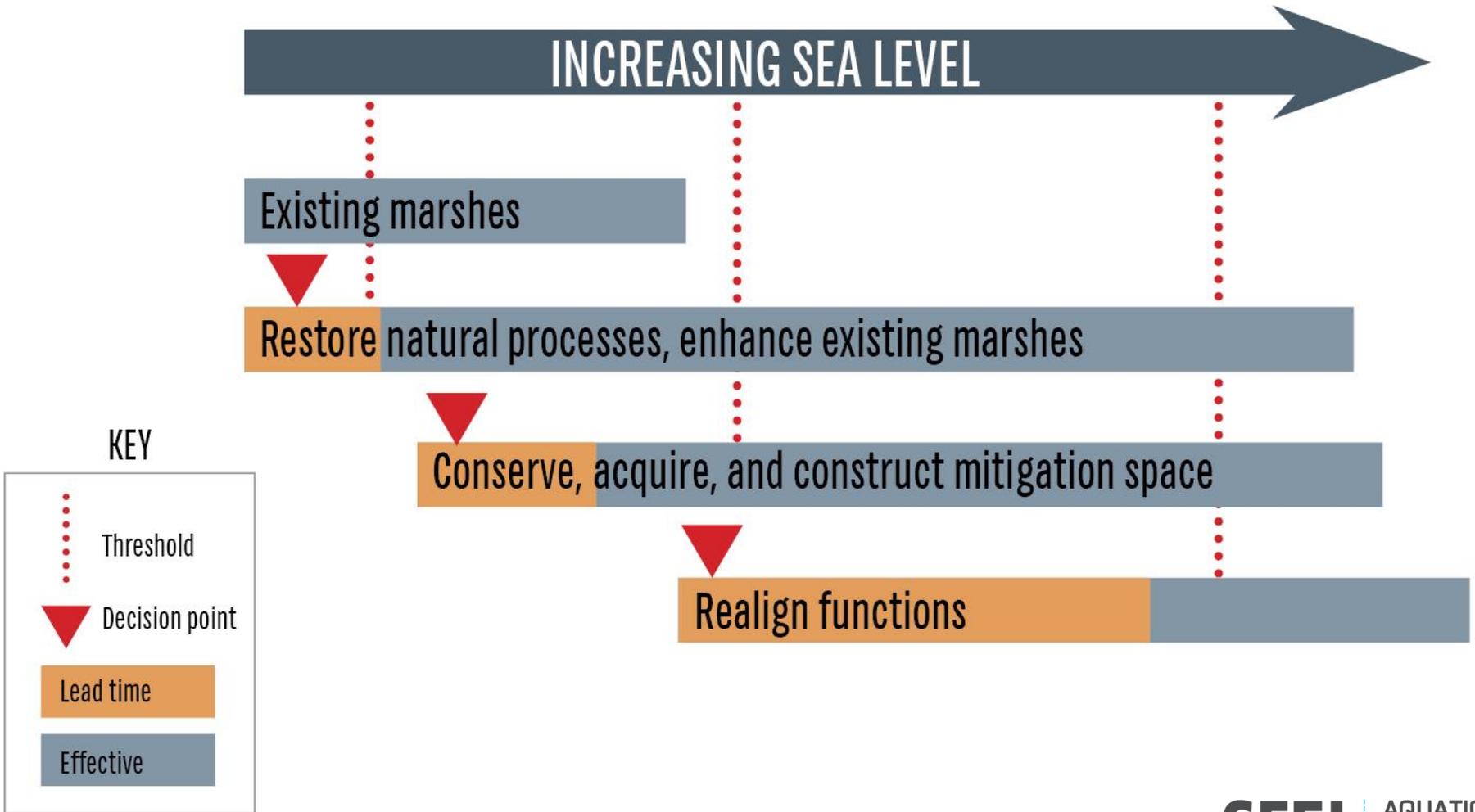
Source: Google

Image © 2013 DigitalGlobe



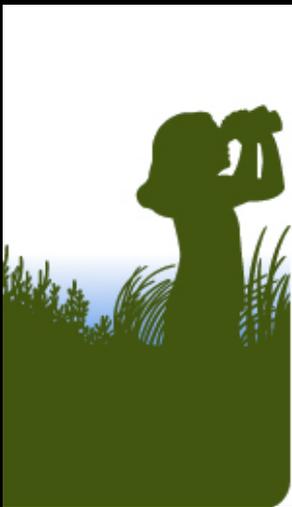
Source: Peter Baye

PLAN FOR *adaptation*



Baylands Goals Science Update





South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay



April 2008



September 2009



May 2010



October 2010

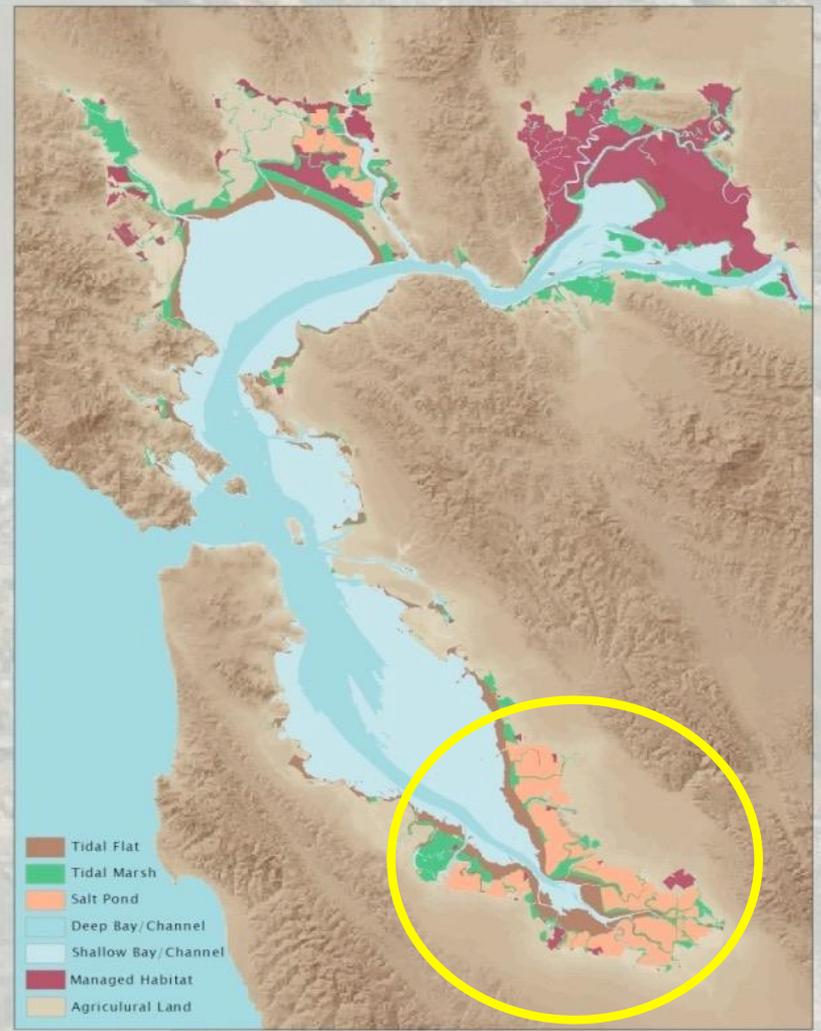
SALT POND A21 SOUTH BAY SALT POND RESTORATION PROJECT

Kite aerial photographs of a small channel in the northeast corner following the 2006 breach to tidal flow. Field of view is ~ 120 feet. . C. Benton

John Bourgeois, Executive Project Manager
South Bay Salt Pond Restoration Project



~1850



~2000



2003 Transfer: A Public/Private Partnership

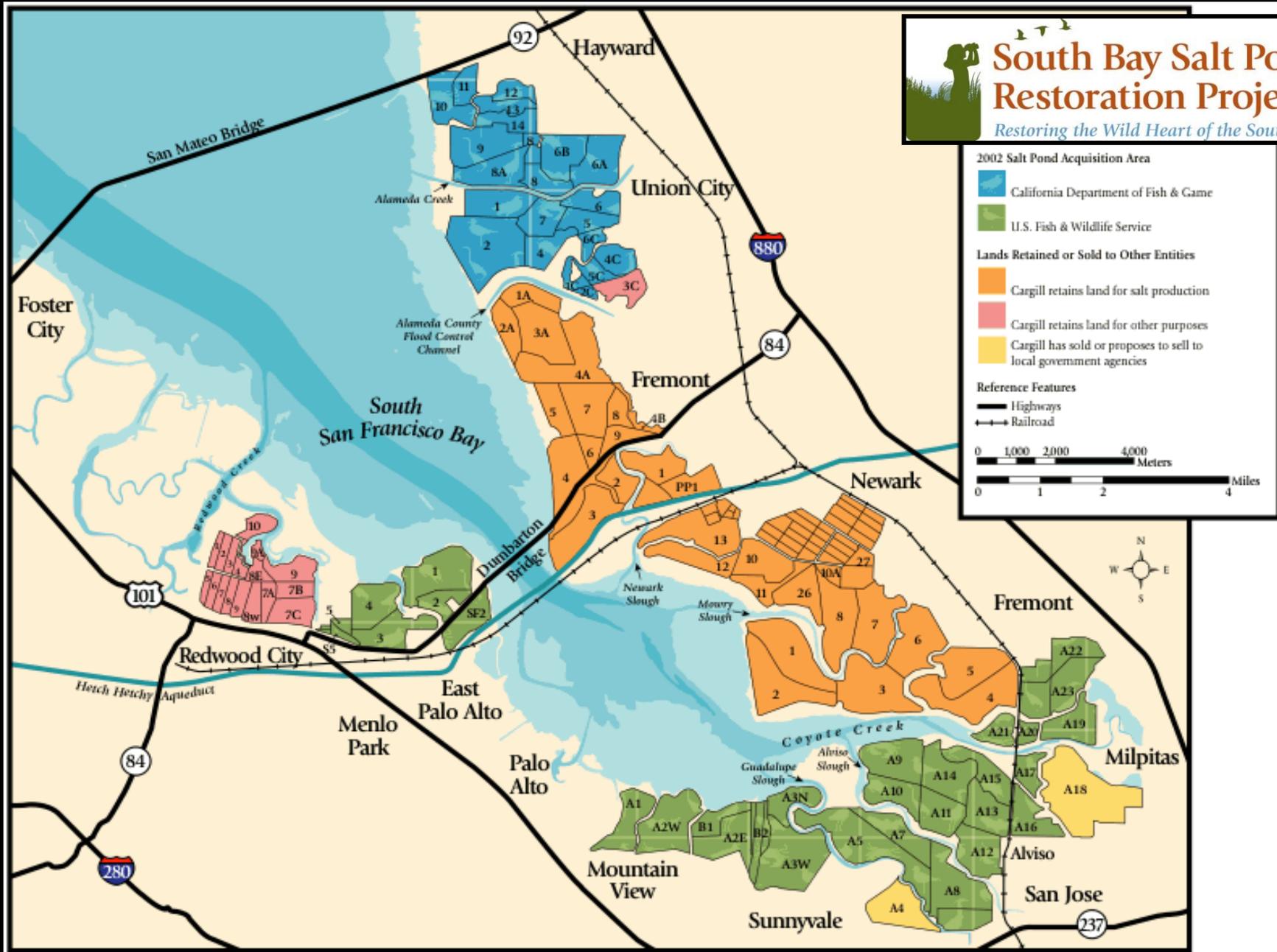
- 16,500 acres
 - 15,100 in South Bay
 - 1,400 along Napa River





South Bay Salt Pond Restoration Project

Restoring the Wild Heart of the South Bay



San Francisco Bay Today



Key uncertainties

- Wildlife use of changing habitats
- Habitat evolution and sediment dynamics
- Mercury methylation
- Water quality
- Invasive species
- Public access
- Infrastructure support
- Sea level rise and climate change



Ecological Trade-offs

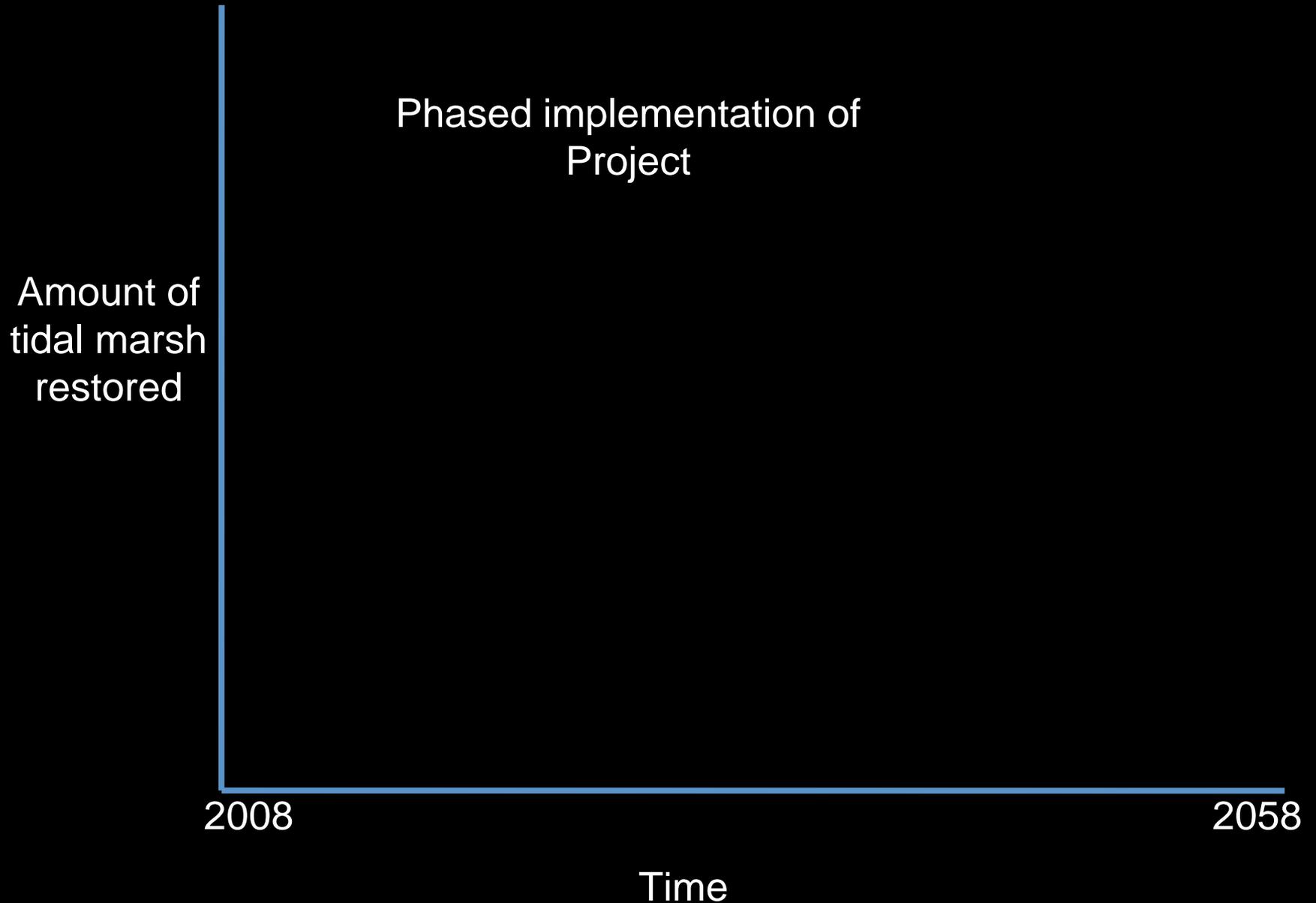
- Tidal Marsh species vs. Salt Pond species



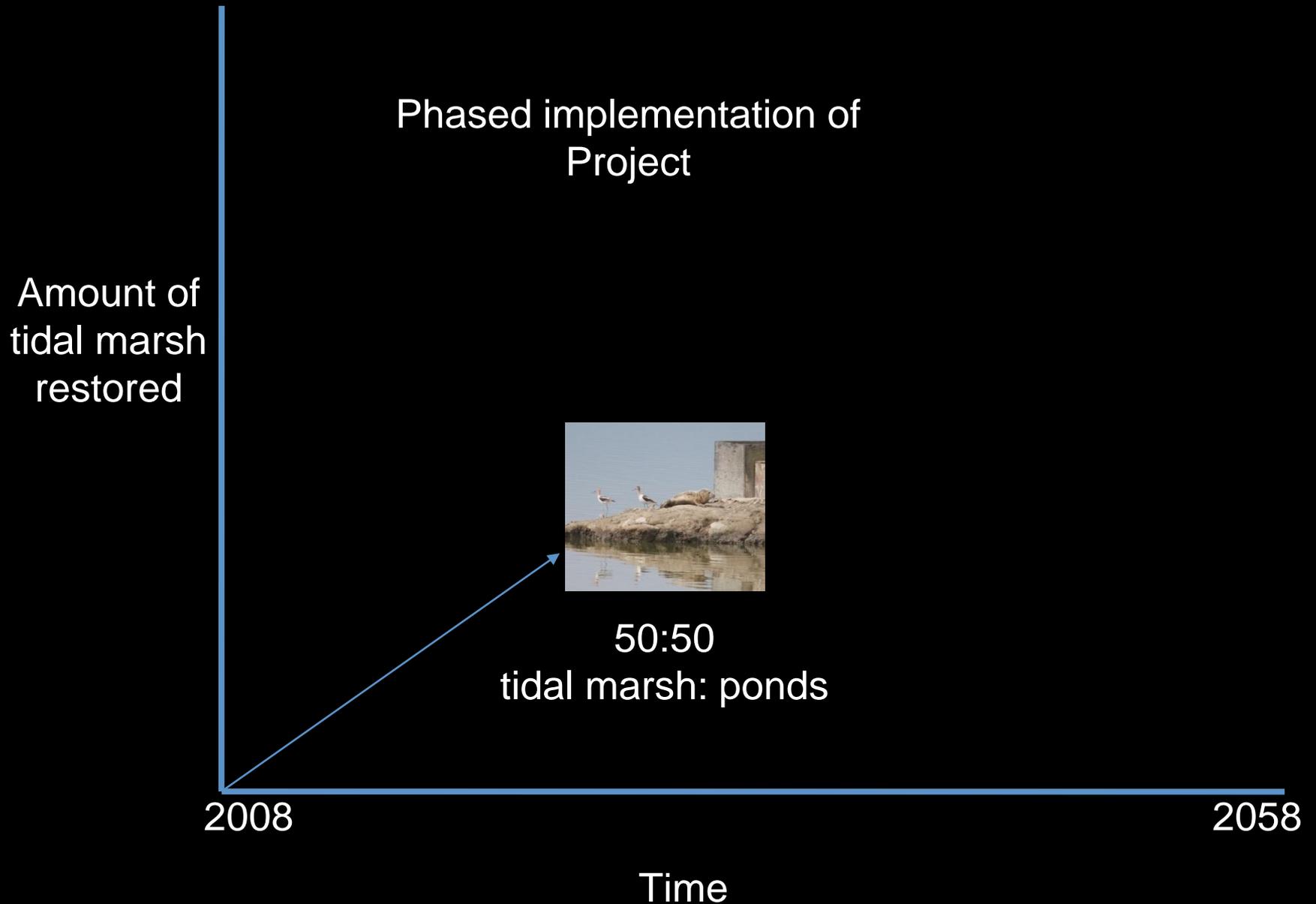


January
2006

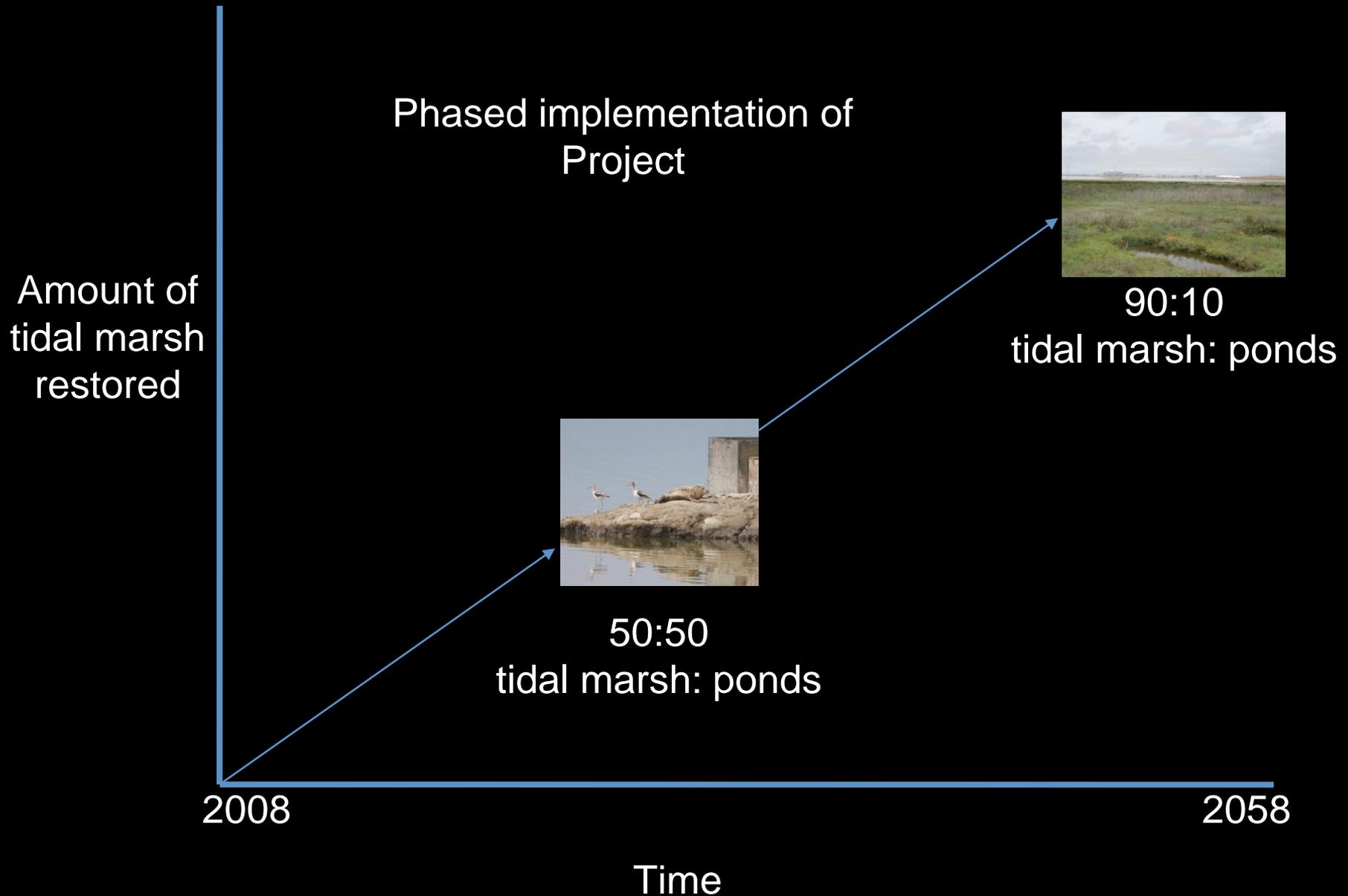
Adaptive Management Restoration



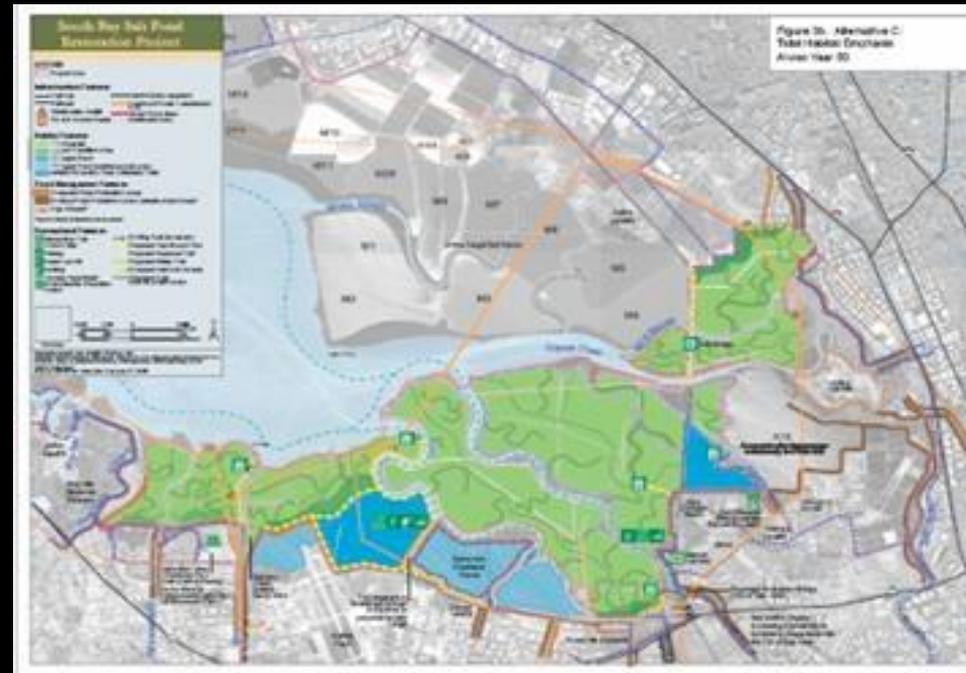
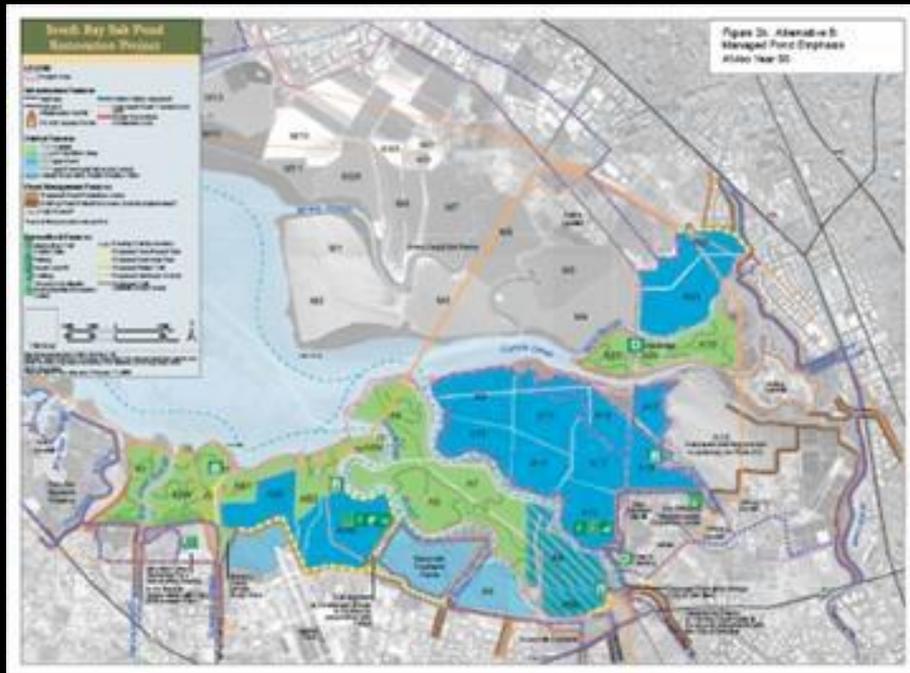
Adaptive Management Restoration



Adaptive Management Restoration



South Bay Salt Pond Restoration Proposed "Bookend" Alternatives



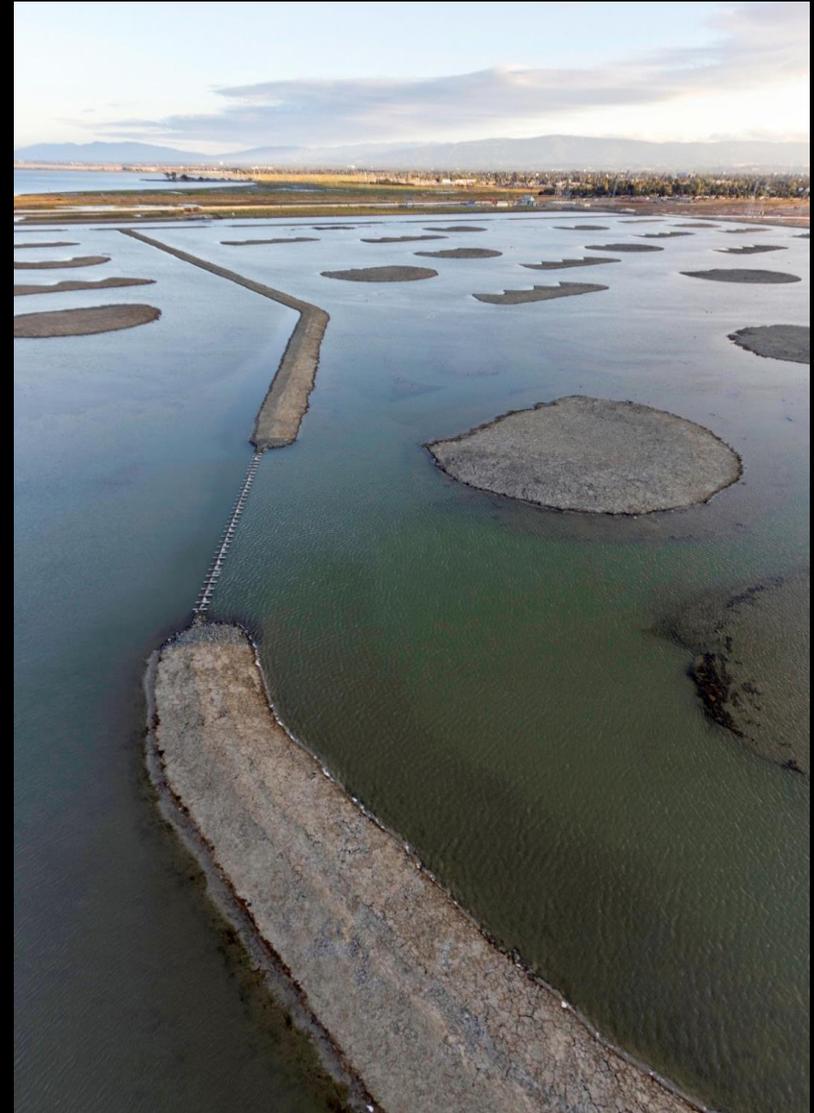
Managed Pond Emphasis

Tidal Marsh Emphasis



1,600 acres tidal restoration
1,440 acres muted tidal

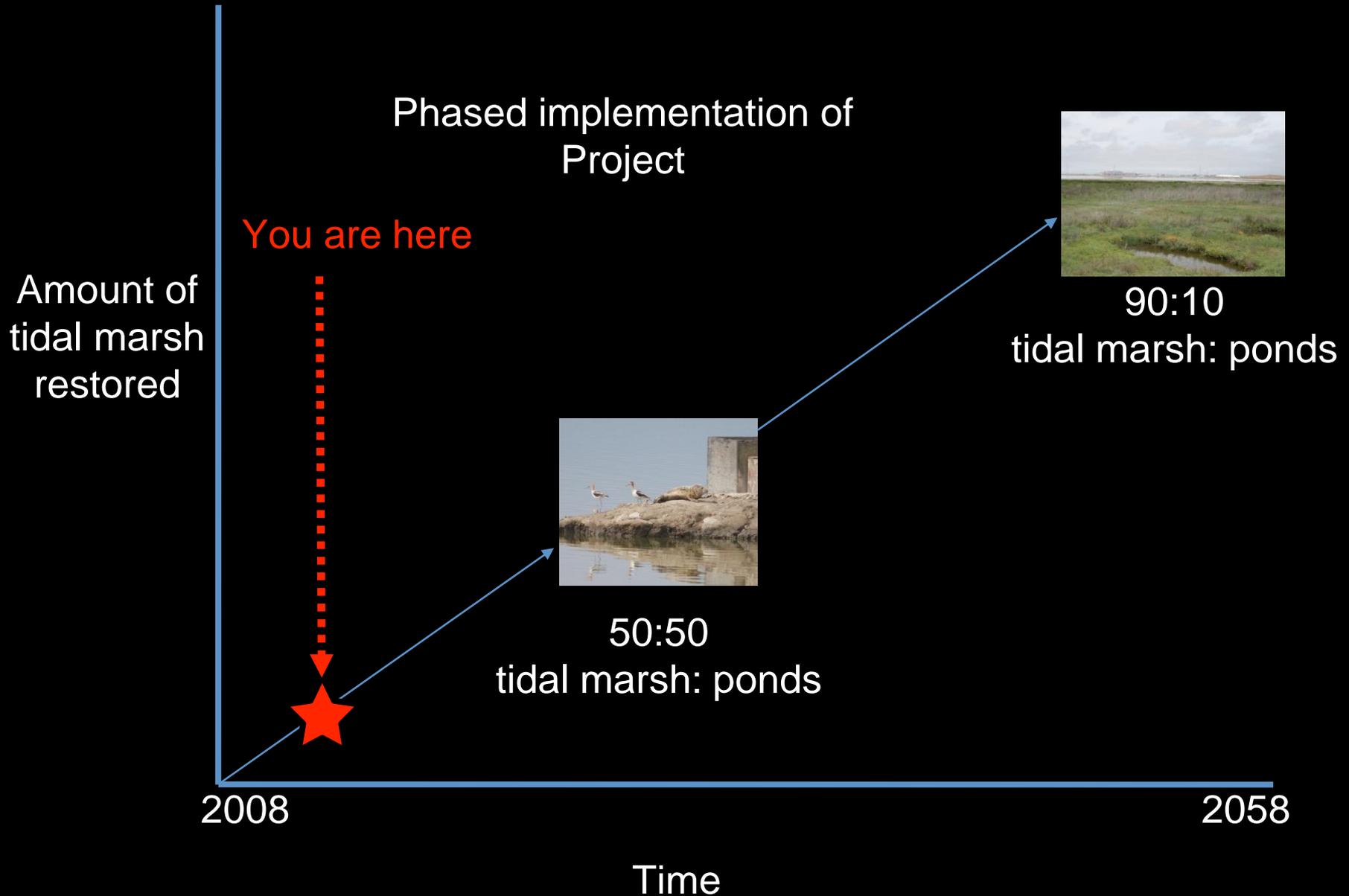
710 acres reconfigured ponds



7 miles of new trails

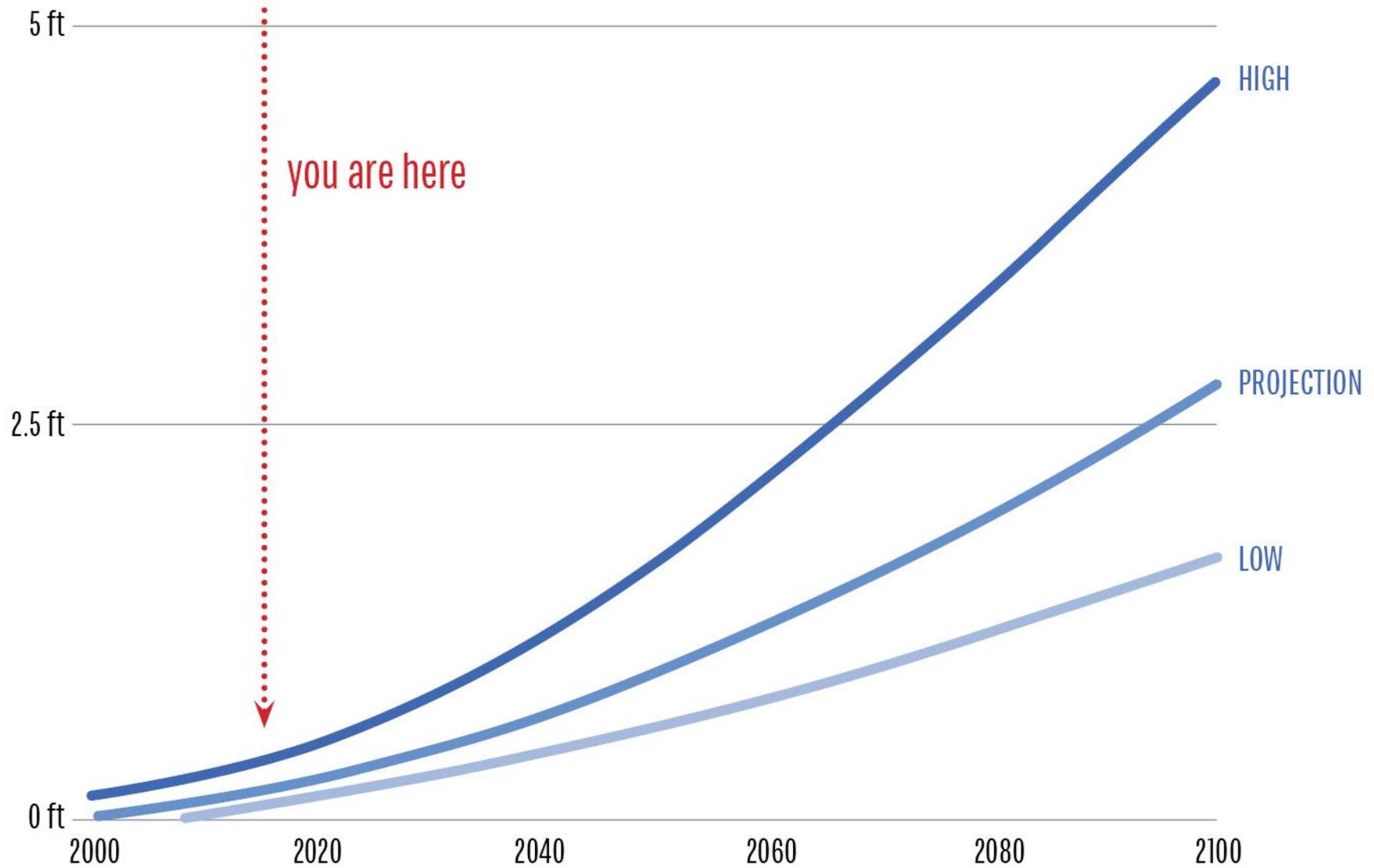


Adaptive Management Restoration

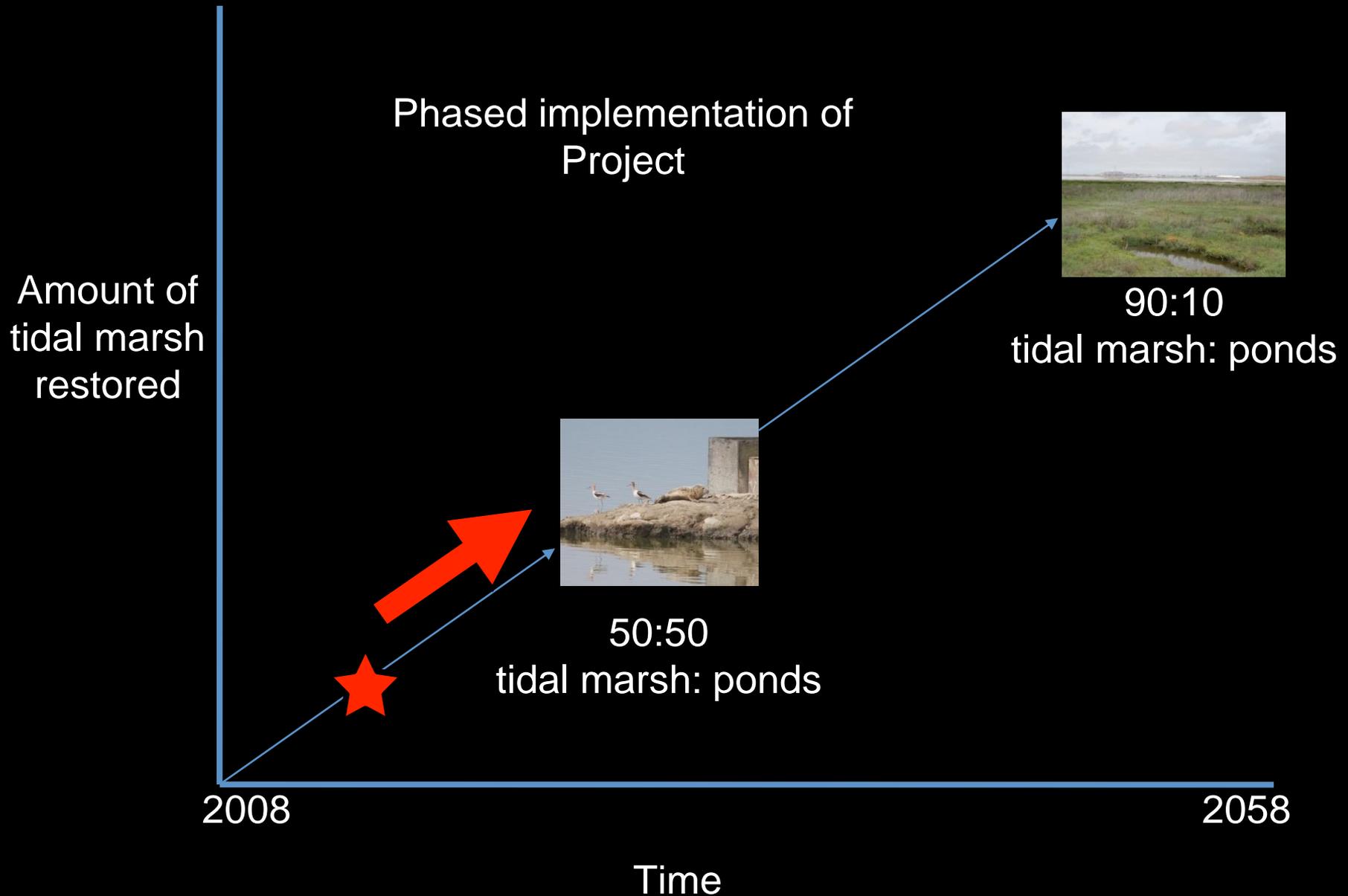


SEA LEVEL *rise* FOR CALIFORNIA

Courtesy NRC 2012



Adaptive Management Restoration



THE
Baylands
AND
Climate Change

WHAT WE CAN DO

BAYLANDS ECOSYSTEM HABITAT GOALS
SCIENCE UPDATE 2015



State of California

Coastal Conservancy





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Partnerships

