



Giacomini Wetland Restoration Project

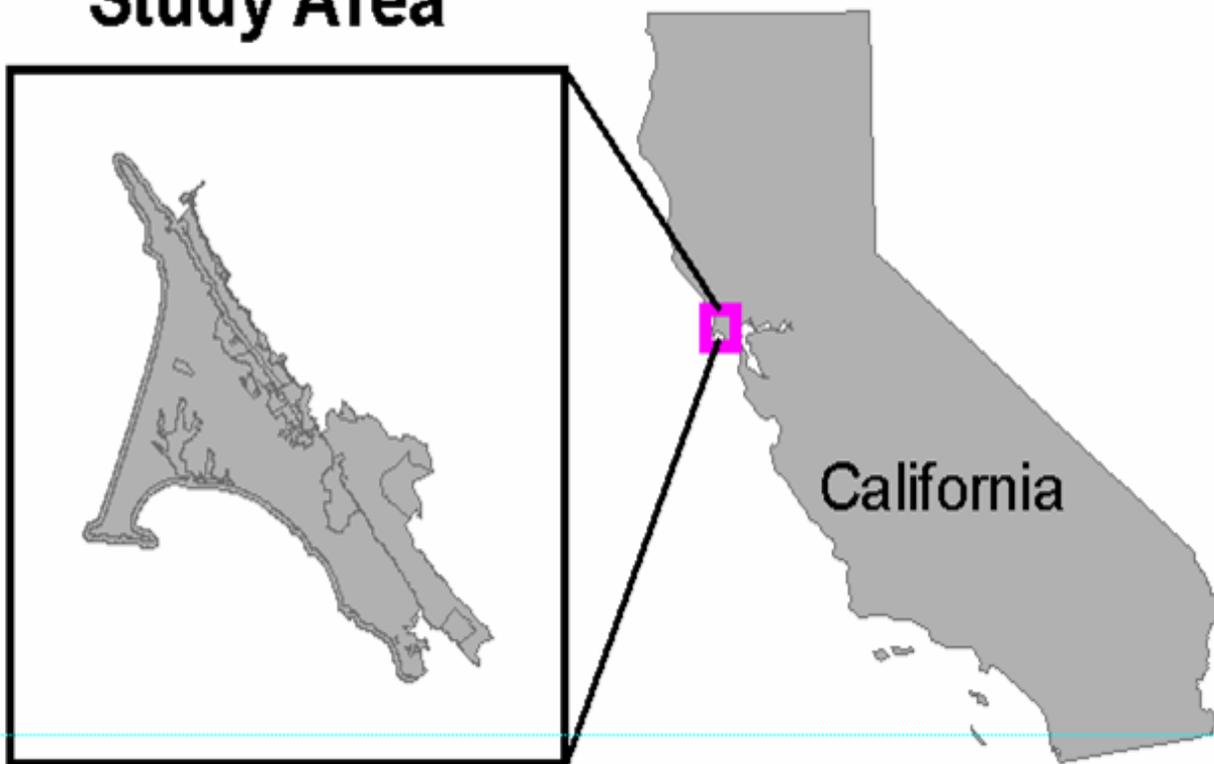
Restoring the Long-Term Health of Tomales Bay





Project Location

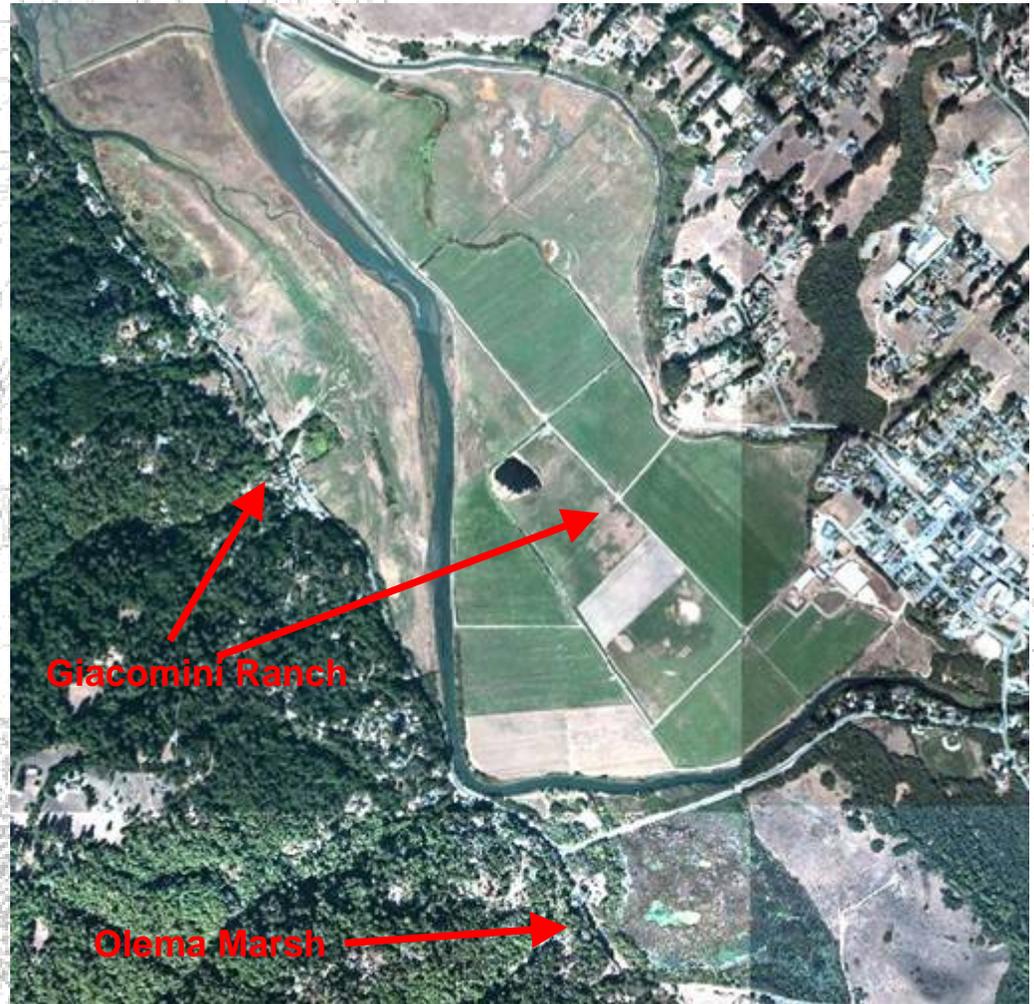
Study Area





Project Background

- Waldo Giacomini Ranch purchased by NPS in 2000
- NPS and local non-profit jointly own Olema Marsh





Project Background

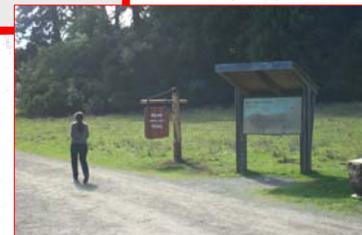
- Funding for Giacomini Ranch purchase from:
 - *Congressional appropriations*
 - *CalTrans for NPS to assume obligations to mitigate for impacts to wetlands from road repair*





Project Background

- Funding for restoration from:
 - *CalTrans wetland mitigation monies*
 - *Private and Public Grants*
 - Gordon and Betty Moore Foundation, NFWF, NAWCA, NCWC, MCF, Coastal Conservancy, Proposition 50 (CA)
 - Other pending proposals
- Funding for public access from:
 - *Pending and Proposed Private and Public Grants*





Project Background

- Starting in 2000, Giacomini Ranch operated by Giacomini family under Reservation of Use agreement with NPS
 - Agreement expired in 2007





Purpose and Objectives

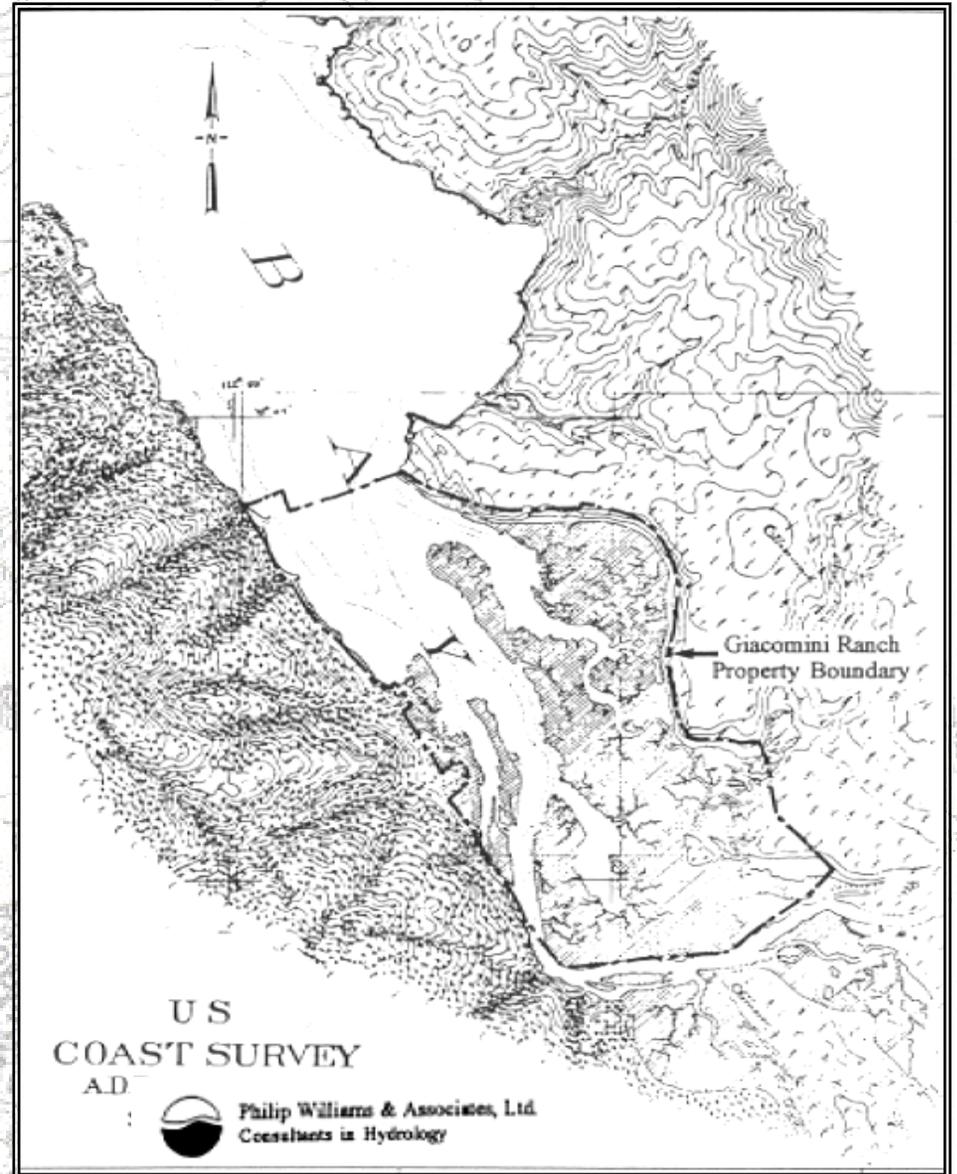
Purpose as Stated in Purchase Agreement:

- Restore a significant portion of the historic tidal marsh



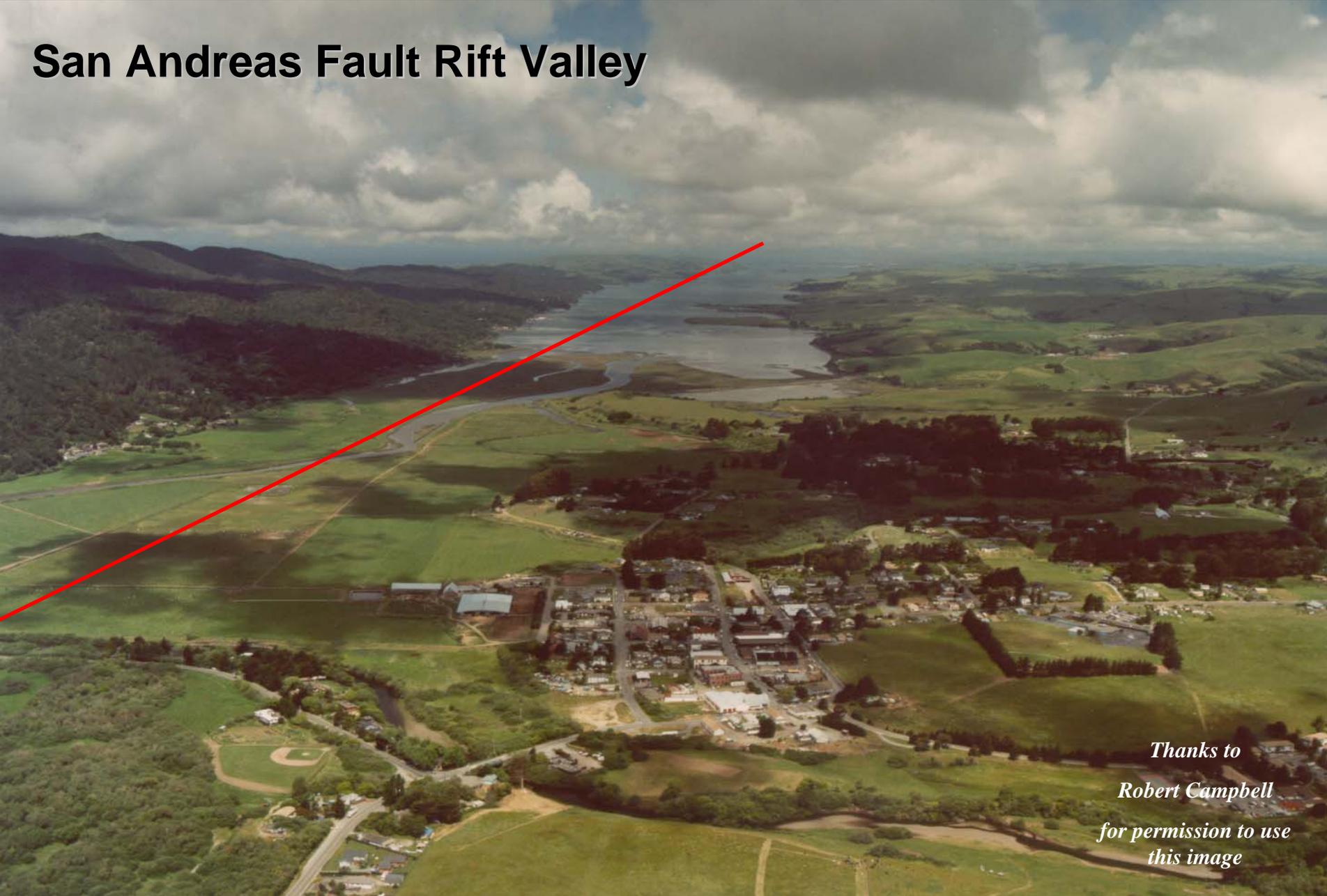


- Giacomini Ranch and Olema Marsh once a large integrated tidal wetland complex





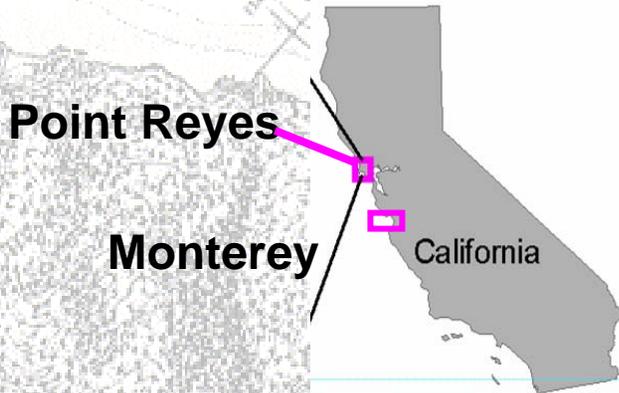
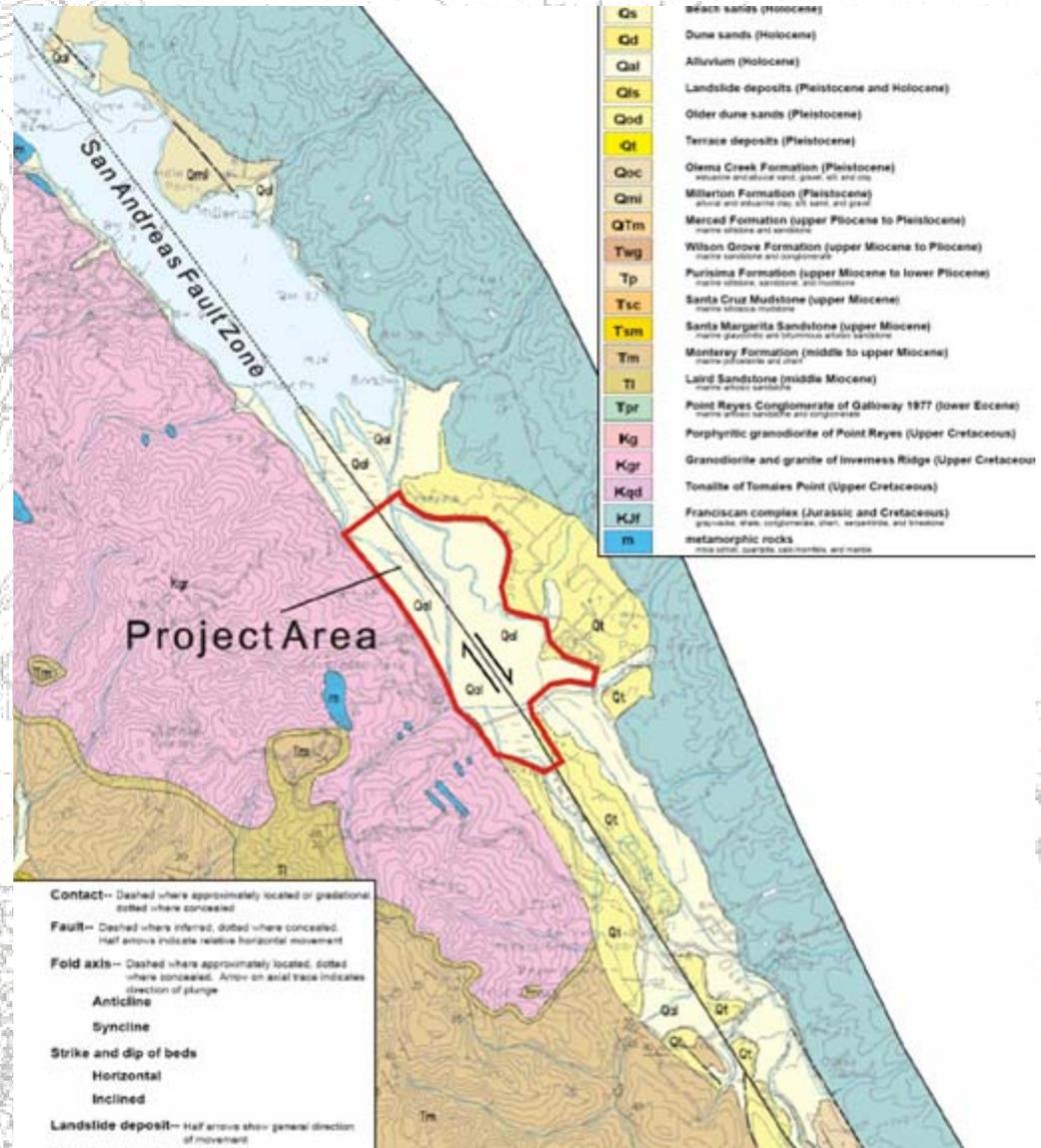
San Andreas Fault Rift Valley



*Thanks to
Robert Campbell
for permission to use
this image*



- Movement of Continental and Pacific Plates caused striking dissimilarities in geology on either side of Tomales Bay

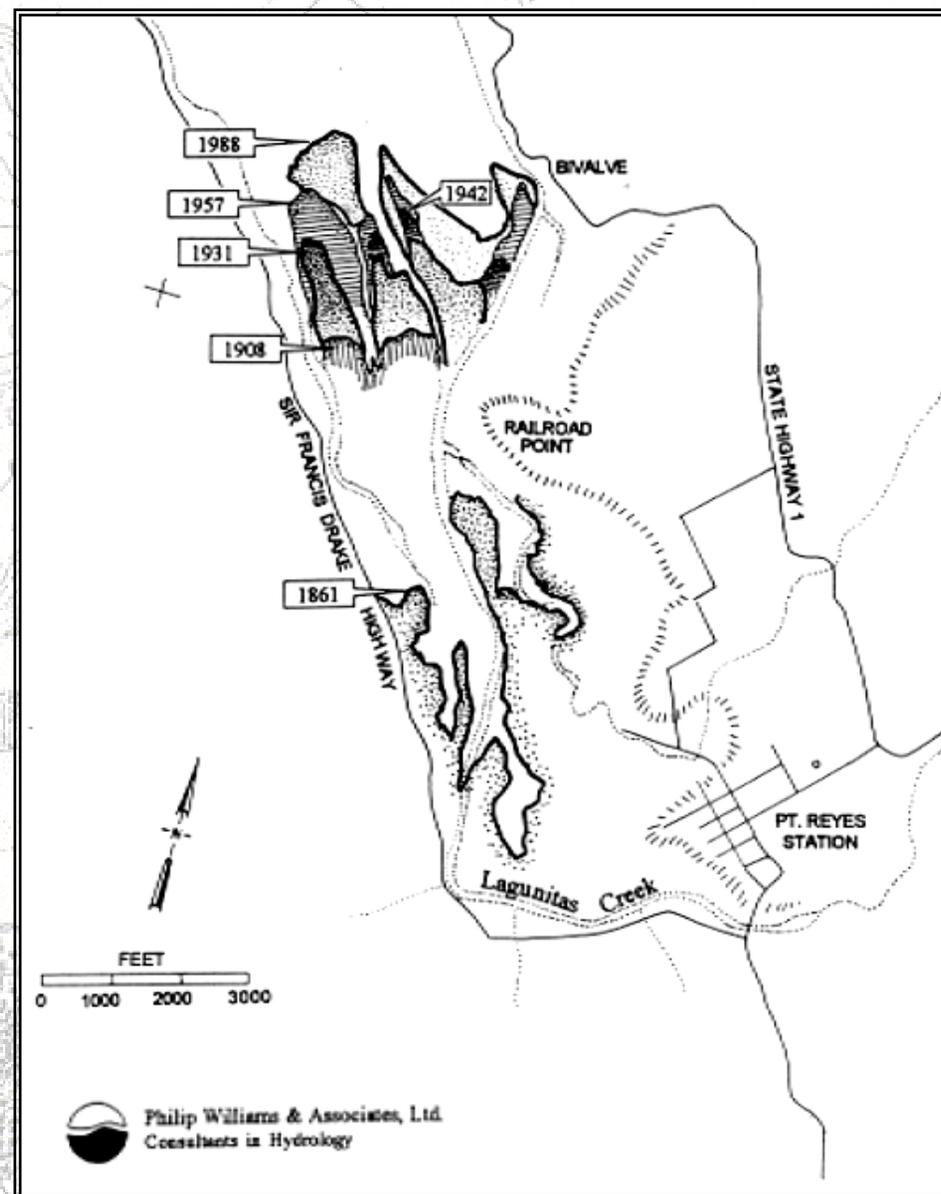




- Substantial increase in sedimentation with land development

- Wetland acreage in Bay doubled

- Changed system from tidally driven to fluvial driven



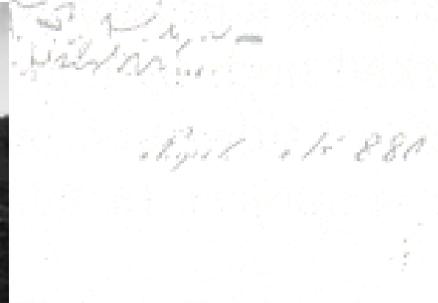


Further Development Continued to Change System

- Large portion of wetland diked in 1946 for dairy ranch



Levee Road



Levees



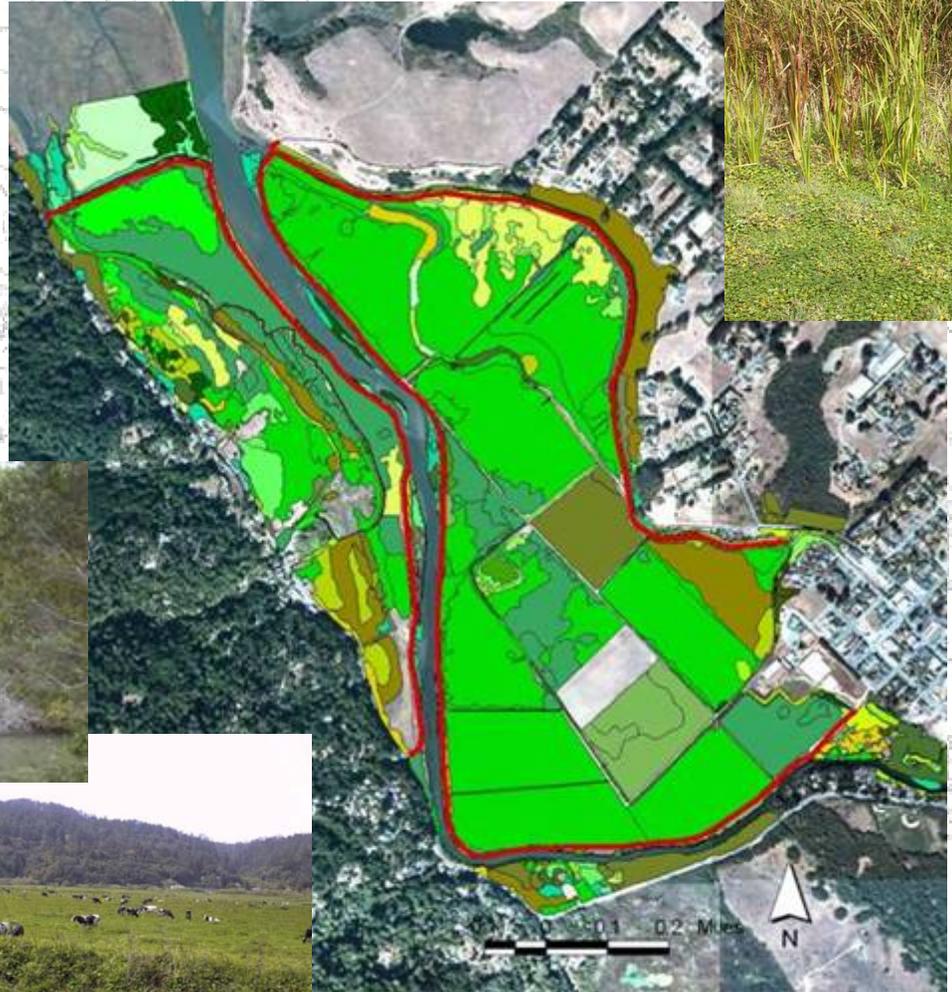
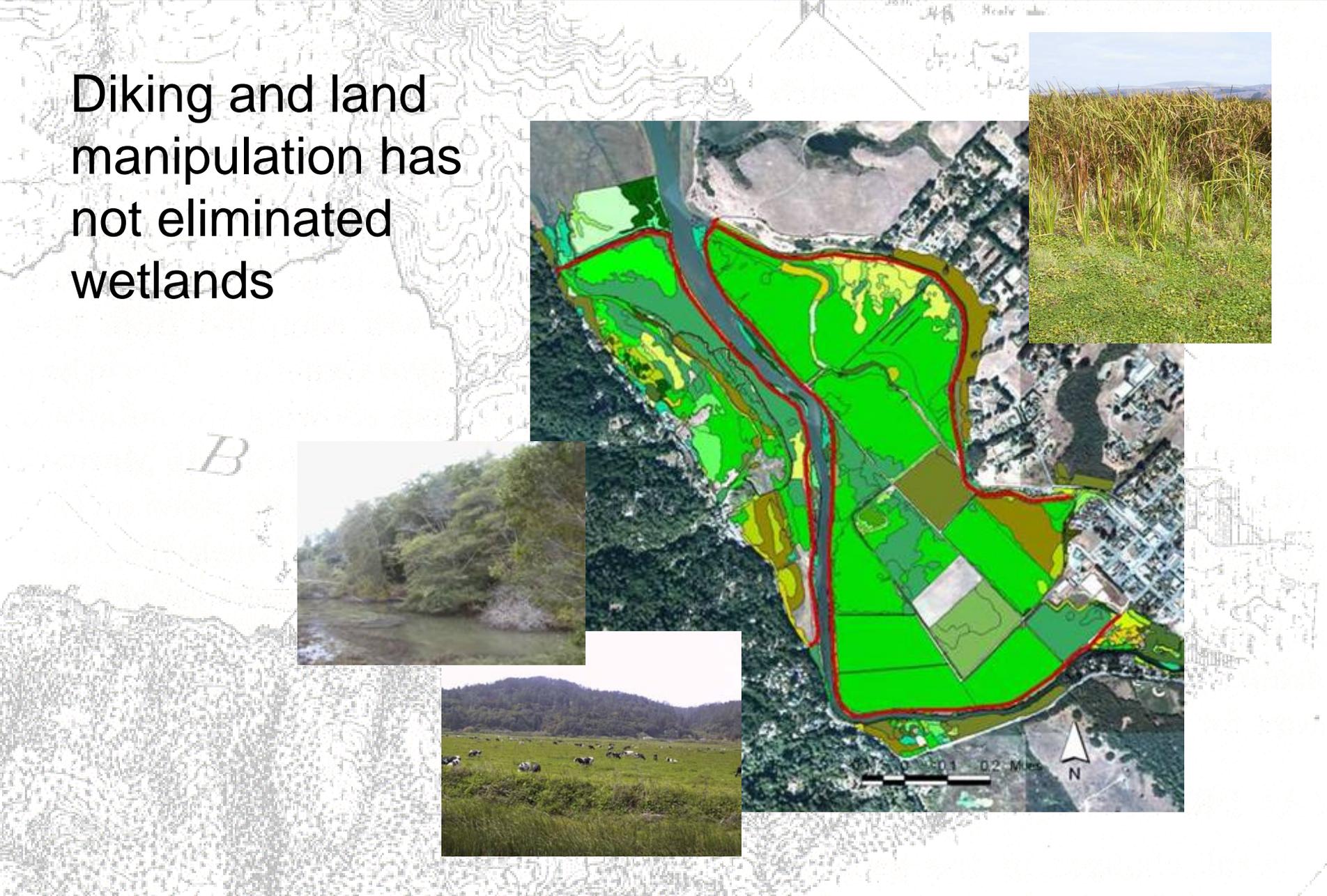
Tidegates



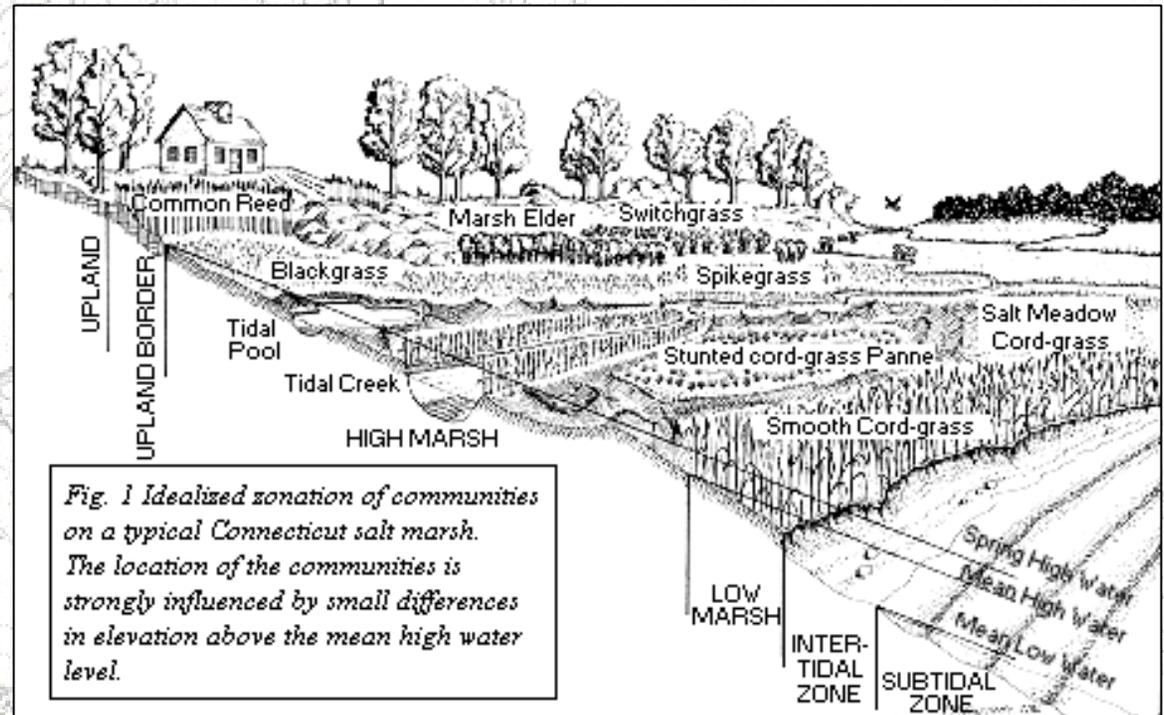
Ditching

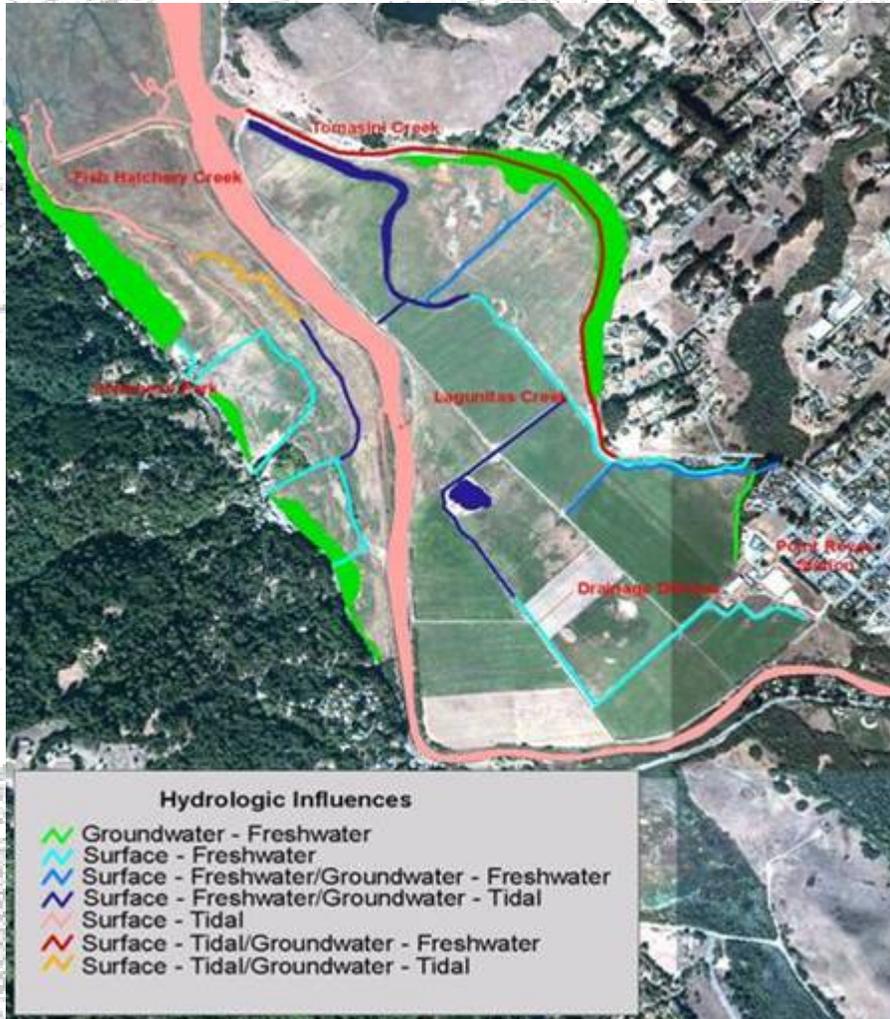


Diking and land manipulation has not eliminated wetlands

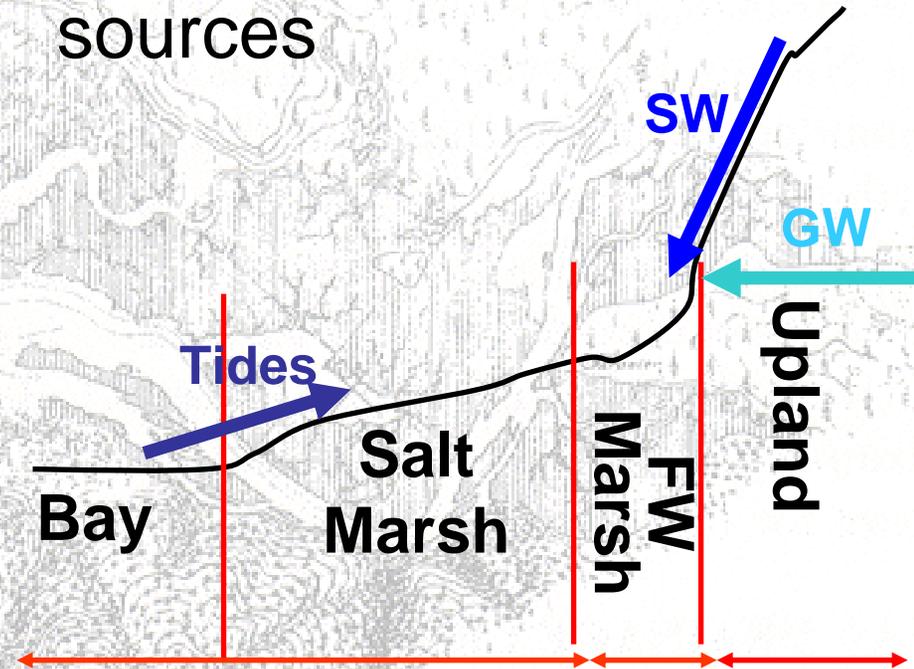


Tomales Bay
wetlands do
not strictly
follow
traditional
paradigm of
upland to
wetland
gradient





The dynamic geologic nature of watershed has led to Project Area being influenced by multiple hydrologic sources







Subsidence

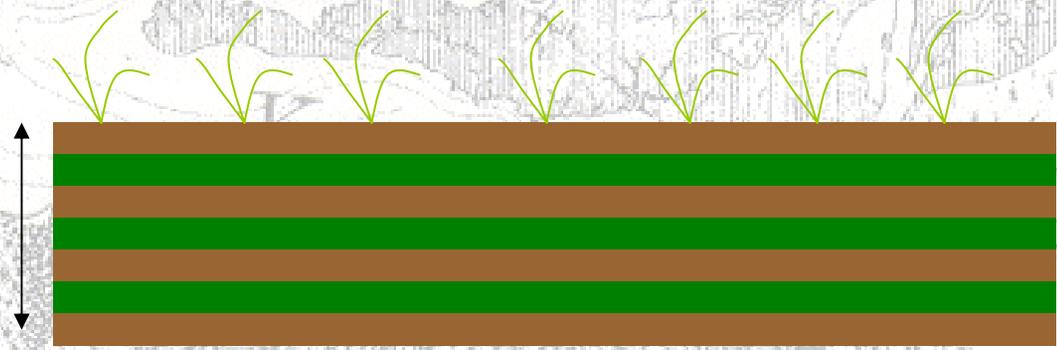


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||

5 ft





Subsidence rates

- 7 to 10 feet in northern San Francisco Bay
- 15 to 20 feet in Sacramento Delta

Sacramento Delta *Mildred Island*



San Francisco Bay *Salt Ponds*



Aggradation

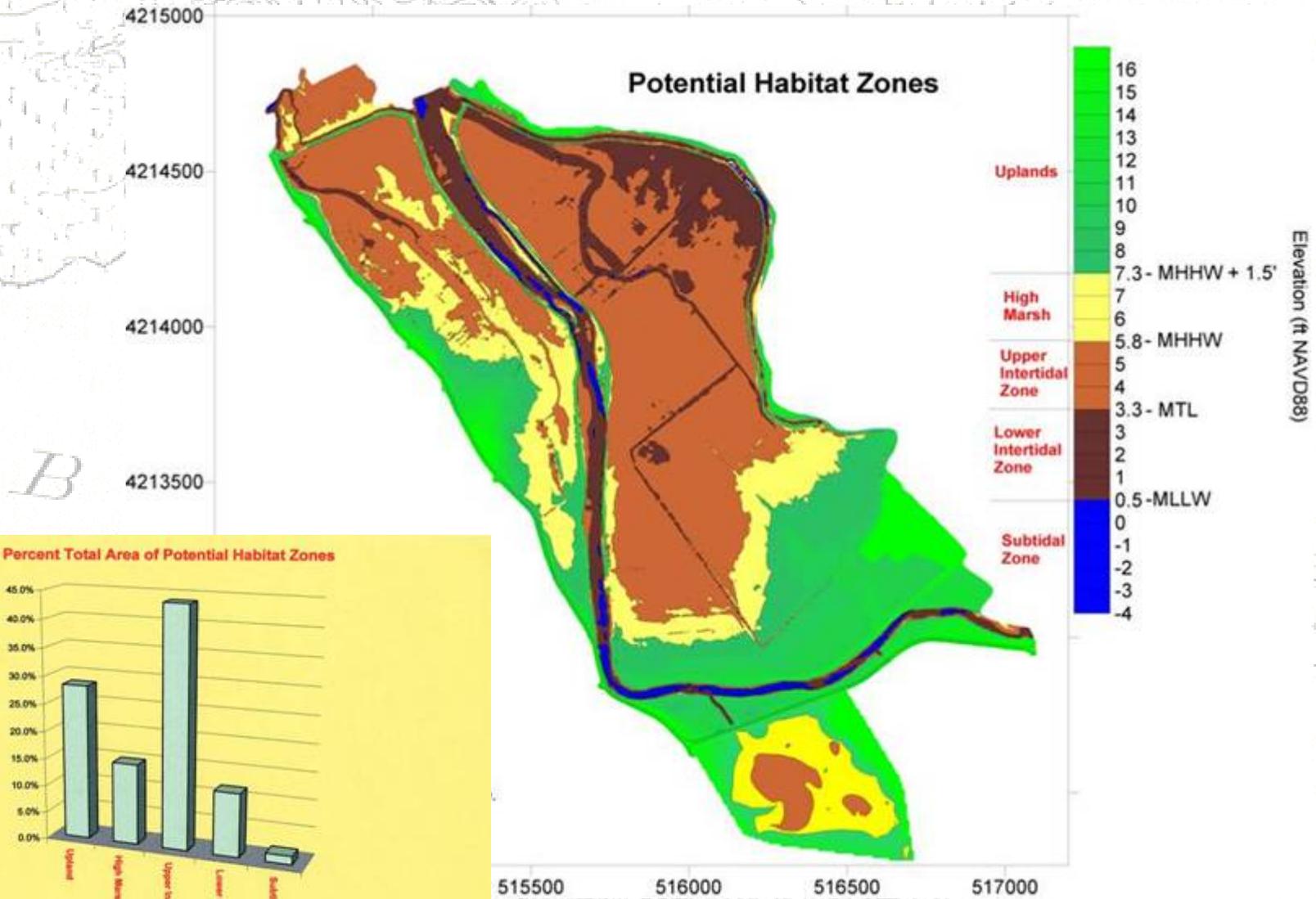


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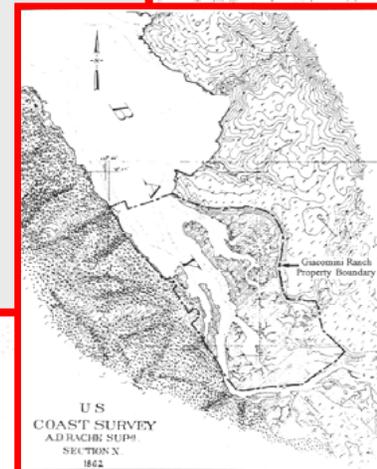




Purpose and Objectives

What Should be the Purpose of this Project?

– Restore historic conditions?





Purpose and Objectives

What Should be the Purpose of this Project?

- Restore historic conditions?
- **Manipulate landscape to restore specific acreages of habitat?**





Purpose and Objectives

Purpose: Restore natural hydrologic and ecological processes and functions in a significant portion of the Project Area





Purpose and Objectives

Purpose: Restore natural hydrologic and ecological processes and functions in a significant portion of the Project Area

Goal: Pursue a watershed-based approach to restoration such that our actions would not only improve functionality of the Project Area, but the watershed as a whole





Tomales Bay - Internationally Renowned Wetland Ecosystem

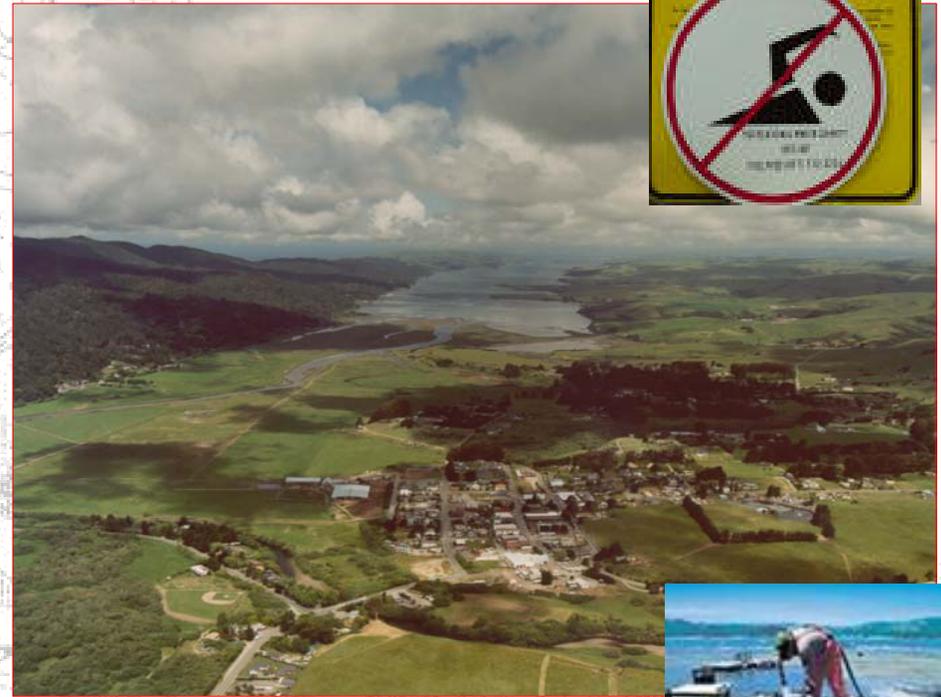
- *Ramsar Wetland*
- *Critical Coastal Area*
- *One of four major upwelling areas in the world*
- *Ranked top 6 most biologically diverse areas in the US*
- *Home to Hundreds of Rare, Threatened, and Endangered Species*





- Tomales Bay degraded by pollution and other impacts

- Threatens wildlife, as well as human uses such as recreation and mariculture





ARROWS

*Hydrologically
connected
wetlands act
as filter*

- *20% of
freshwater
inflow moves
through Project
Area*





Purpose and Objectives

Purpose: Restore natural hydrologic and ecological processes and functions in a significant portion of the Project Area

Goal: Pursue a watershed-based approach to restoration

Goal: Enable the public to experience the restoration process as long as opportunities do not conflict with the project's purpose.





Summary of Planning Process

- Baseline Studies Initiated - 2001
- Public Scoping – Fall 2002/Winter 2003
 - Identification of Lead and Cooperating Agencies
- Public Workshops – 2004 - 2005
- DEIS/EIR Initiated – Winter 2005
- Release of DEIS/EIR – Winter 2006
 - Public Meeting – January 2006
- Release of FEIS/EIR – June 2006
- Certification/Approval – July – August 2006



Challenging Issues in Project Planning

- *Special Status Species Conflicts*
- *Public Access*





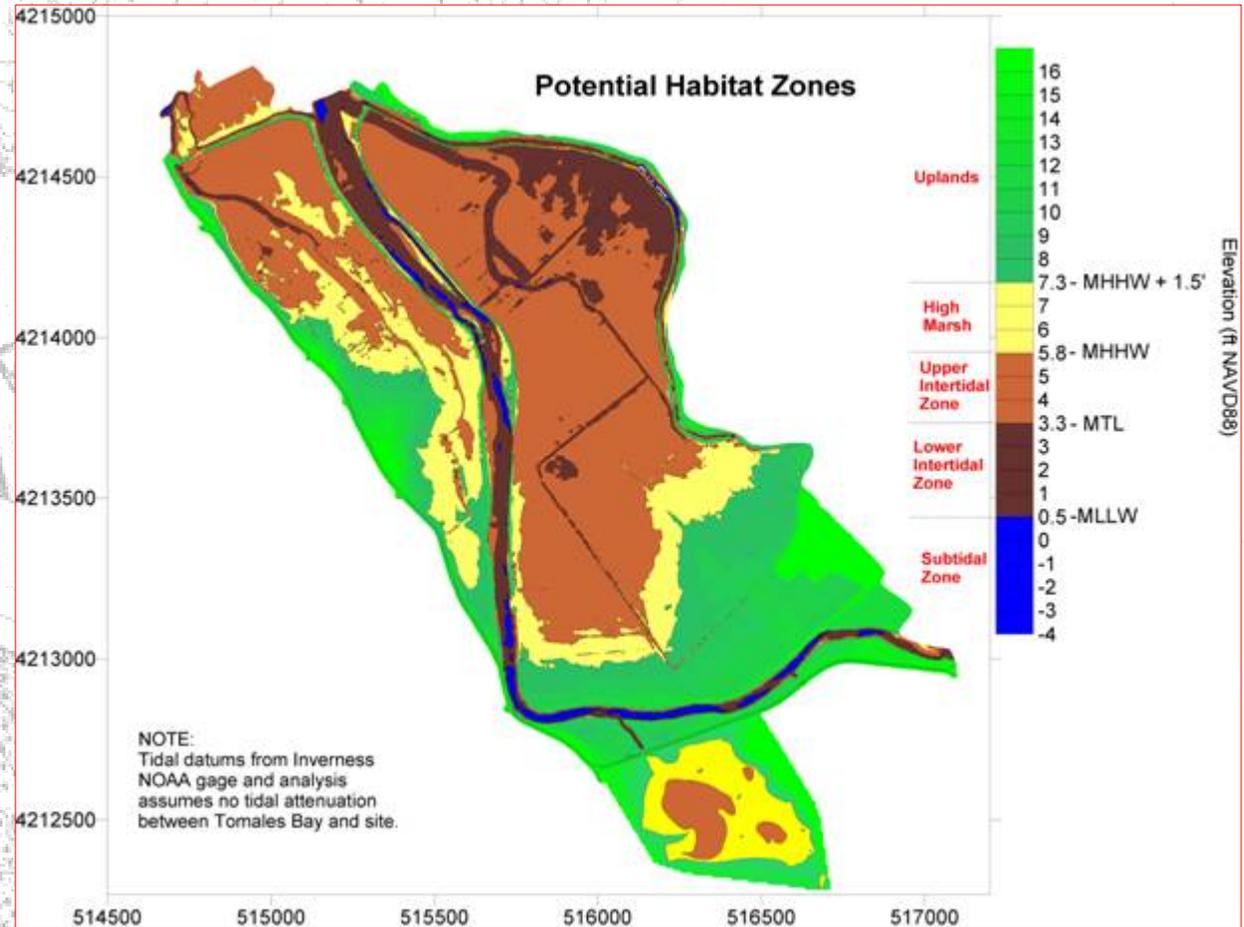
Project Design

- Design focuses primarily on removal of constraints on hydrologic processes
 - *Removal of levees, tidegates, ditches, culverts*
- Only minimal excavation or grading activities
 - *Special status species habitat creation, tidal channel creation, manure slurry removal, non-native vegetation removal, and lowering of high elevation areas*



Project Design

Existing elevations similar to undiked natural marsh





Project Design

Because there is little subsidence, gradual conversion from pasture to marsh





Construction

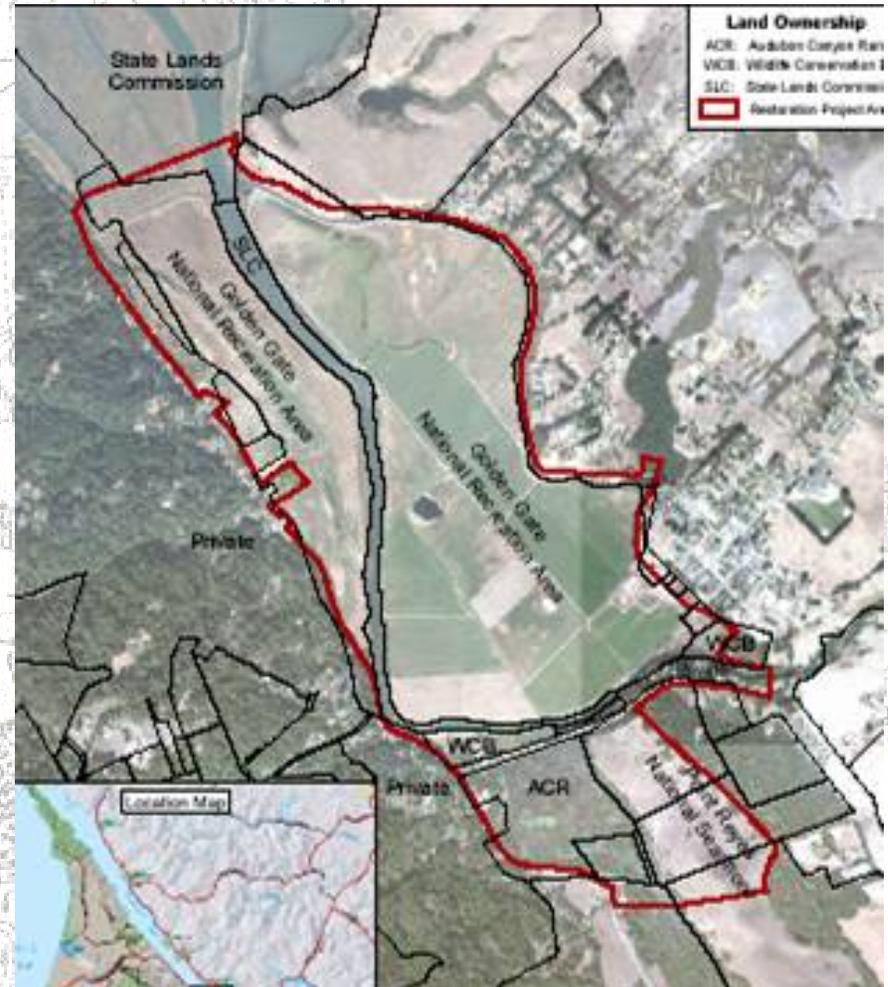
- ***Phase I of Restoration:***
Fall 2007
- ***Phase II of Restoration:***
June through Fall 2008
- ***Public Access:*** Start Date
Dependent on Funding





Phase I - 2007

- Removal of agricultural infrastructure and conditions
- Special status species habitat enhancement



Phase I - 2007

1. Building Demolition

- *More than 95 percent of materials recycled*



Phase I - 2007

2. Manure Pasture Excavation

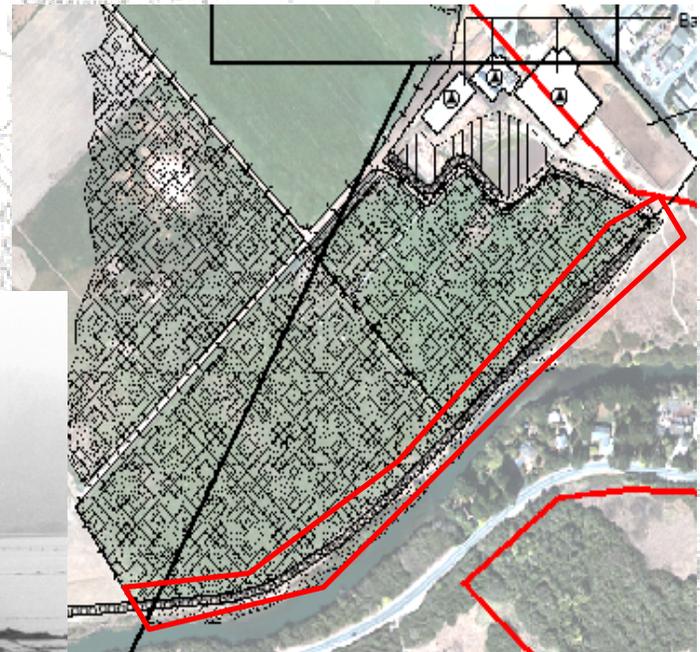
- *Potential source of nutrients to Tomales Bay during flood overflow situations*



Phase I - 2007

3. Excavation of East Pasture South Levee

- *Incorporated in 2007 because of flood-relief implications*





Phase I - 2007

3. Excavation of East Pasture South Levee

- *Scrapers used to shave down levees to adjacent pasture grade*





Phase I - 2007

3. Excavation of East Pasture South Levee

- *Disturbed areas seeded with native grass seed*
- *Erosion Control Blanket installed*

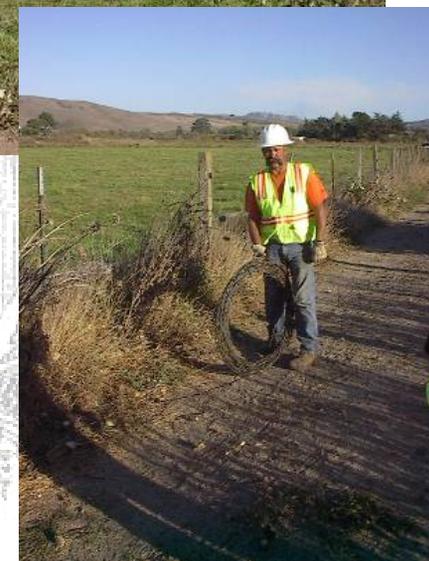




Phase I - 2007

4. Removal of irrigation **pipeline** and **barbed wire** and **post fencing**

- *Removal of agricultural infrastructure from future marsh areas*





Phase I - 2007

4. Removal of irrigation **pipeline** and **barbed wire** and **post fencing**

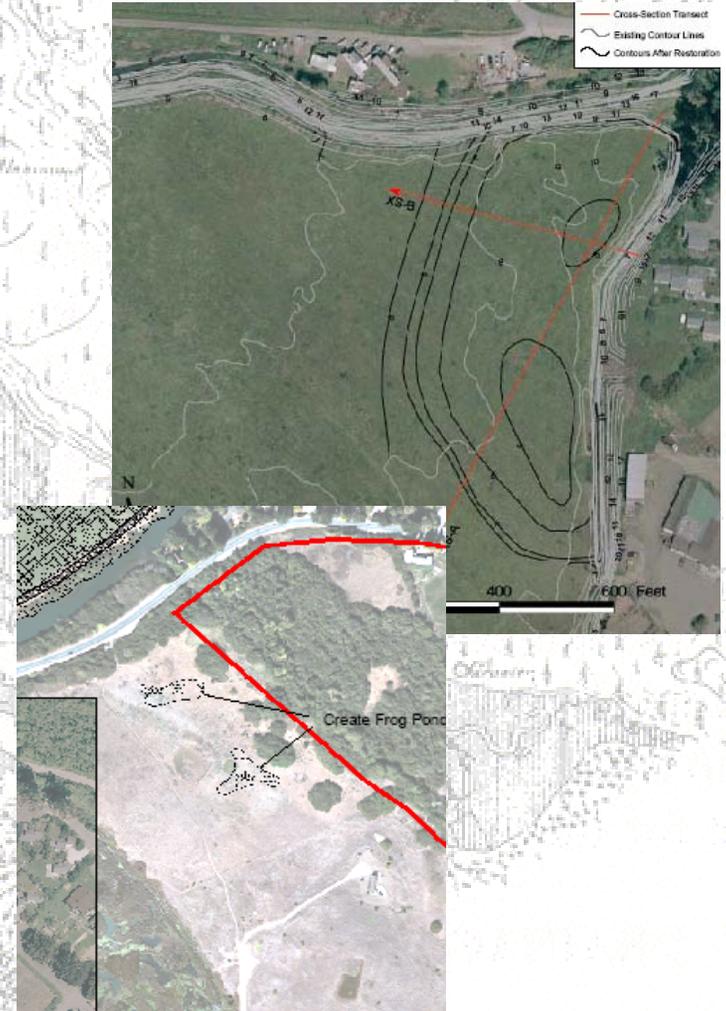
- *Removal of agricultural infrastructure from future marsh areas*



Phase I - 2007

5. Creation of Special Status Species Habitat

- ***Tomales Triangle Freshwater Marsh (5.2 acres)***
- ***Olema Creek Frog Ponds (0.73 acre)***
 - *Mitigation for conversion of artificial freshwater habitat to saltwater habitat*



Phase I - 2007

- Tomales Triangle Freshwater Marsh



April 16 1880

Phase I - 2007

- Olema Creek Frog Ponds





Phase I - 2007

6. Fill of Manure Ponds at Dairy Facility and Grading of Surrounding Area

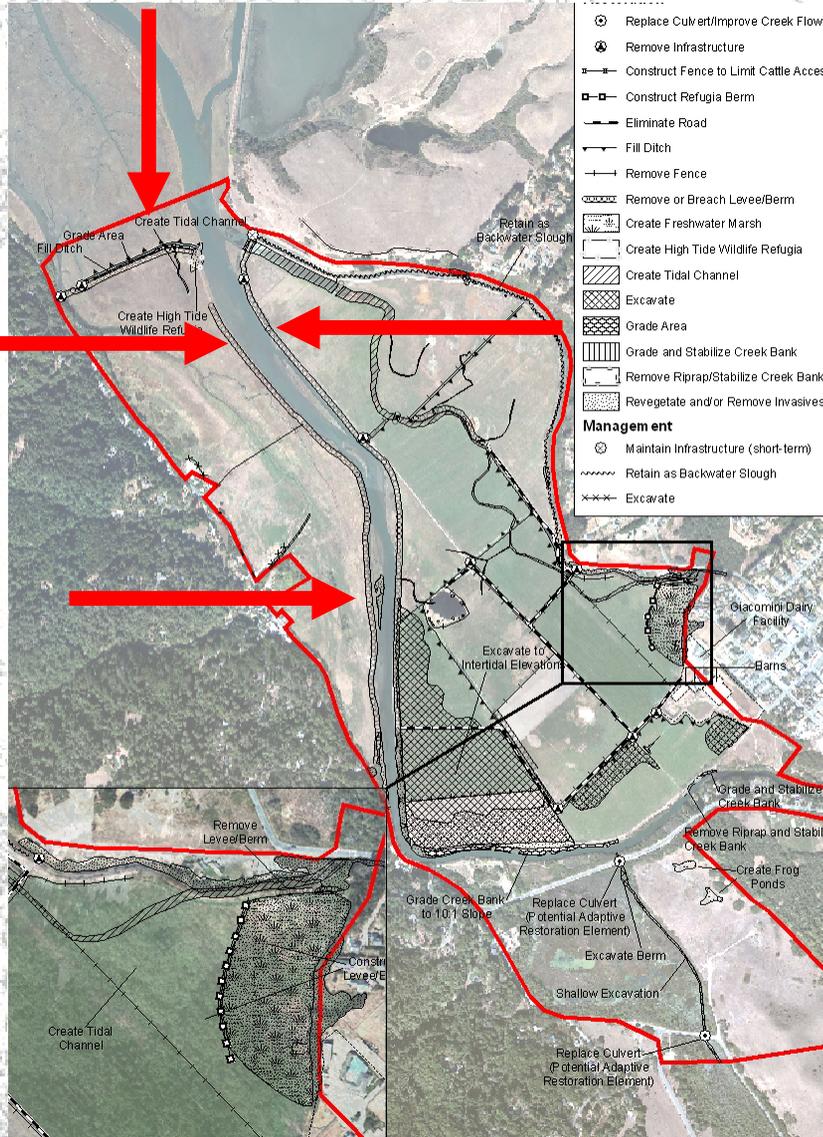
- *Where did all the excavation go?*
- *Create “pad” for Construction Staging and future Public*





Restoration and Management

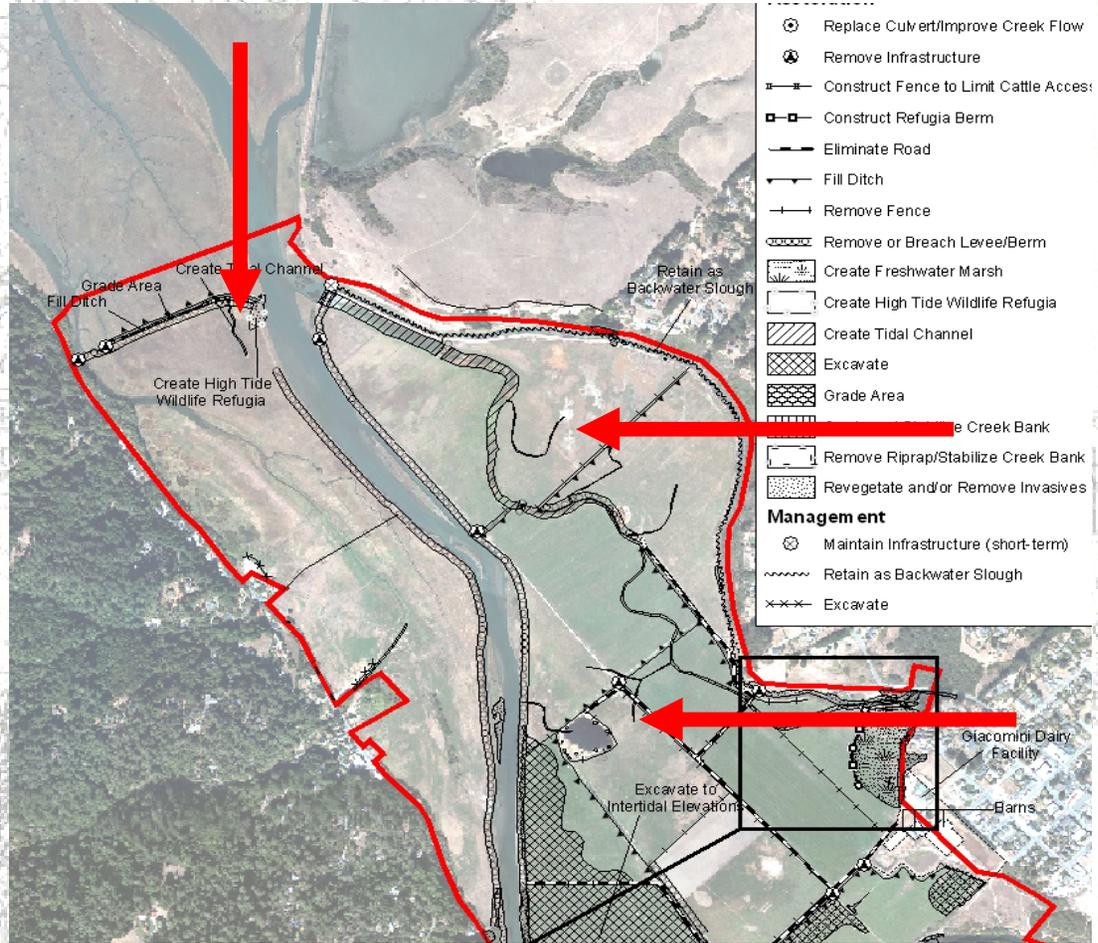
**Levee
Removal**





Phase II - 2008

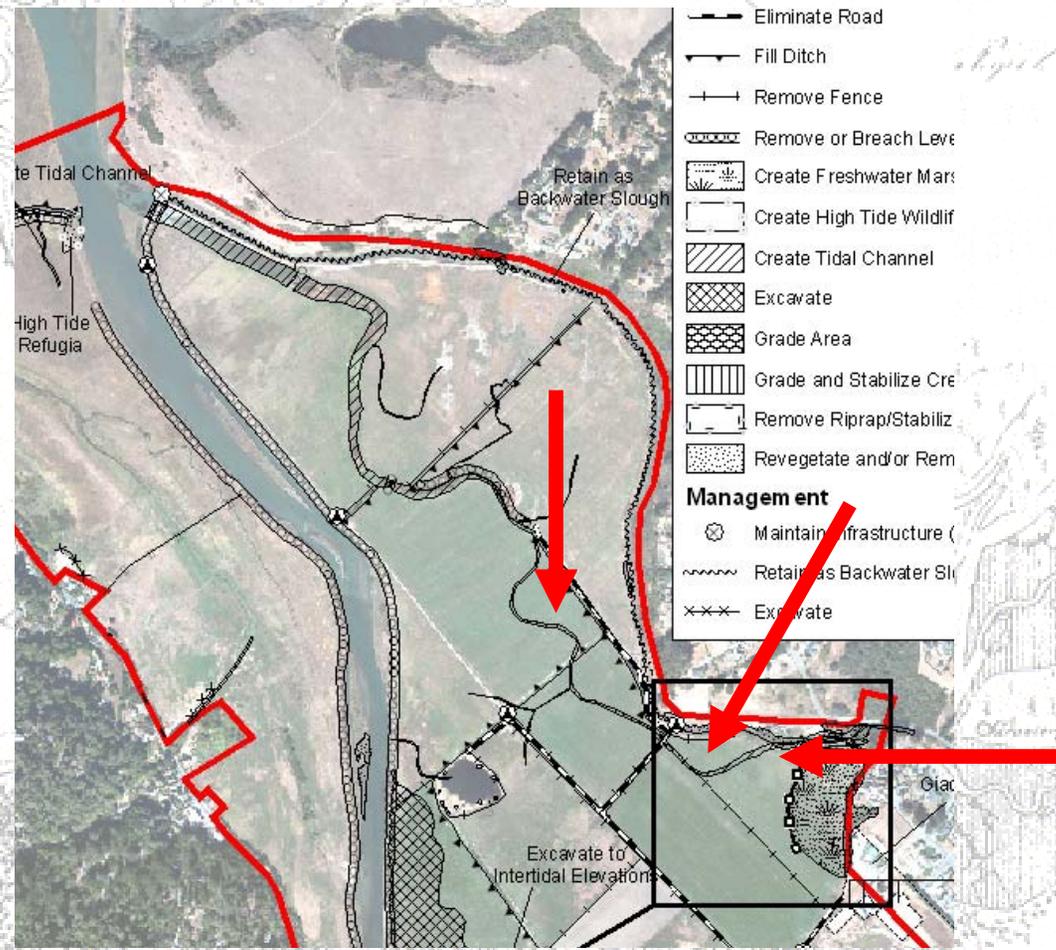
Tidal Channel Creation





Restoration and Management

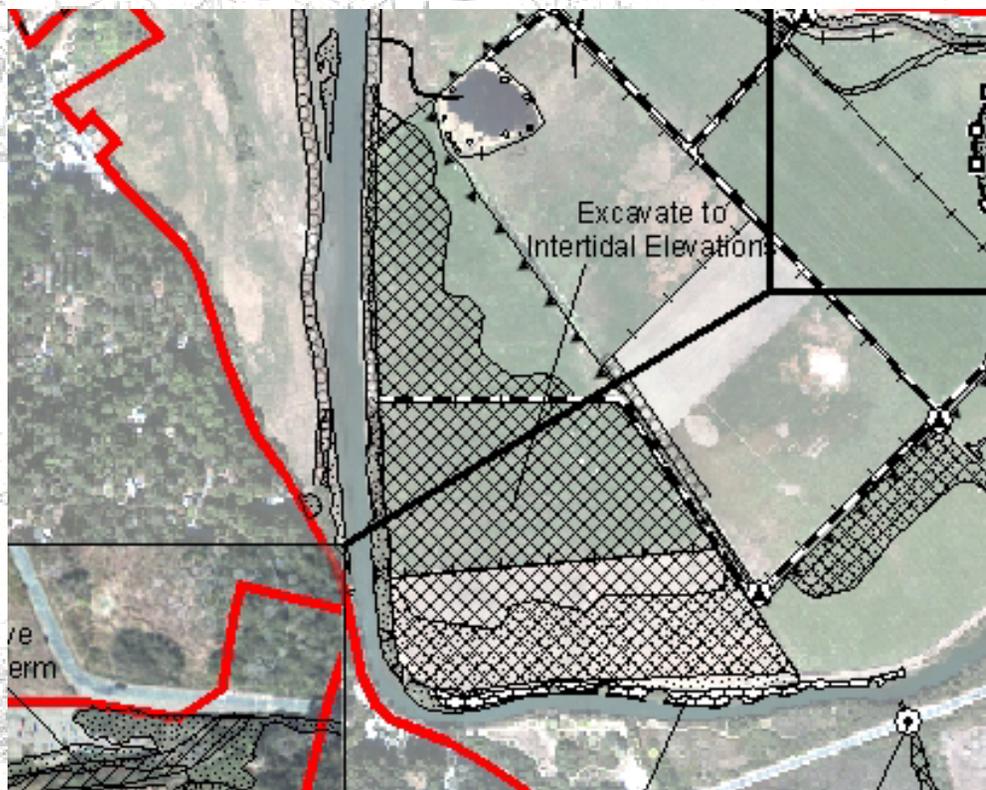
Realignment of Tomasini Creek





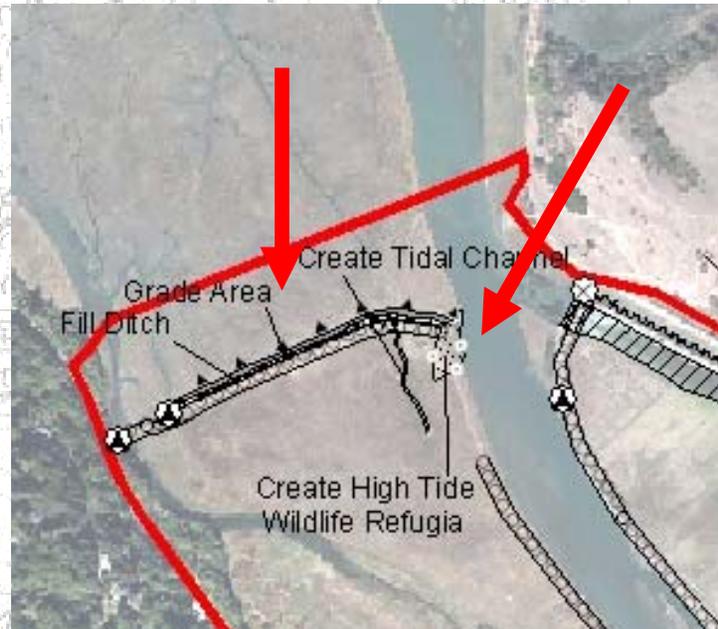
Restoration and Management

***Excavation to
Lower
Intertidal and
Floodplain
Elevations***



Restoration and Management

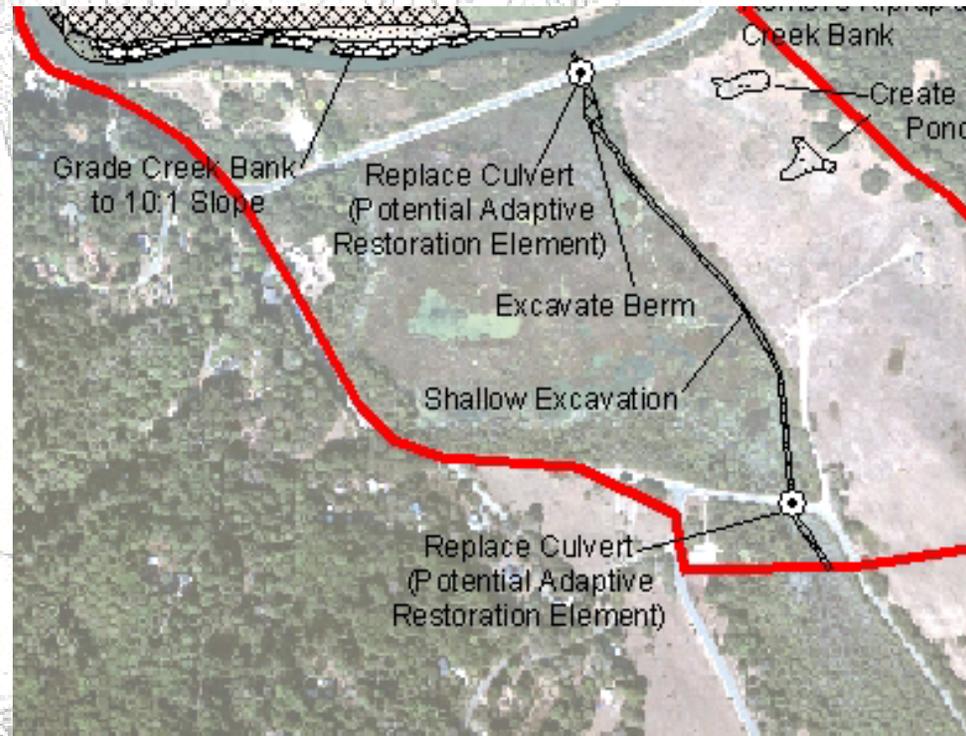
**Removal of
North Levee
and Filling of
Borrow Ditch**





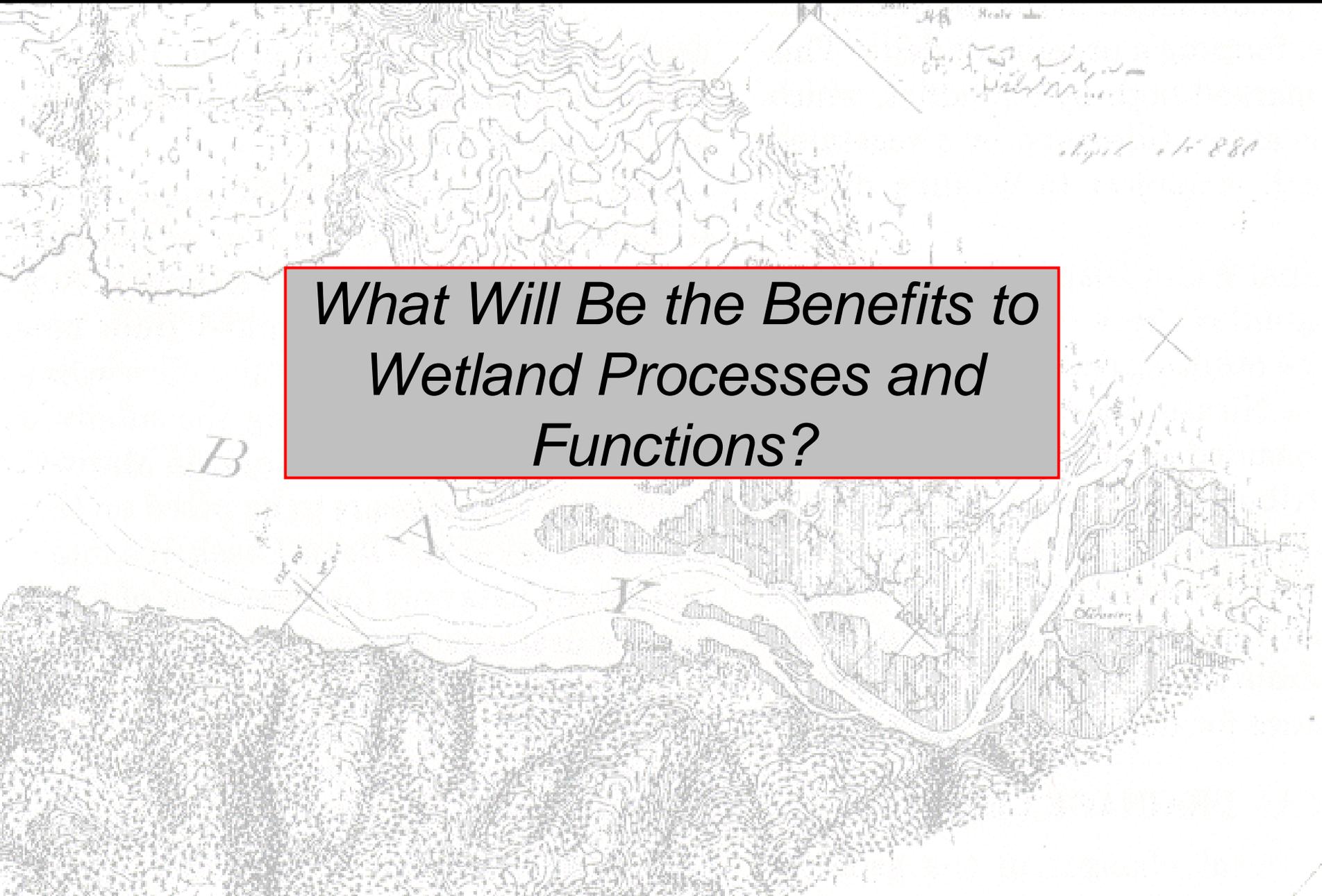
Restoration and Management

Restoration of Olema Marsh





*What Will Be the Benefits to
Wetland Processes and
Functions?*





Benefits – Hydrologic Processes and Functions

- 206-acre **increase** in tidally inundated areas
- 2,000% **increase** in floodwater storage volume in Giacomini Ranch during 2 year-event
- 0.3 to 1.1 foot **decrease** in vertical floodwater elevations for adjacent residences





Benefits – Hydrologic Processes and Functions





Benefits - Water Quality

- ***Project Area***

- Discontinuation of agricultural management
- Elimination of infrastructure

- ***Watershed***

- 19-20% potential **decrease** in suspended sediment delivery to Tomales Bay during 2-year event
- 2 to 18% potential **decrease** in nutrients, contaminants, and pathogens delivered to Bay during 2-year event



Benefits -Vegetation

- 90% **increase** in native vegetation communities
- 30.0 acre **increase** in wetlands
- 11.6 acre **increase** in riparian habitat
- ~350 acre **increase** in special status species habitat





Benefits - Wildlife

- >42% **increase** in high value wildlife habitats
- Major **benefits** expected for special status species
 - Salmonids
 - Tidewater goby
 - California clapper and black rails
 - Saltmarsh common yellowthroat and other riparian/neotropical migrant species
 - Minor/moderate adverse effects possible for certain freshwater species: Offset by mitigation

