

Threats



Threats to Habitat

Habitat loss due to:

- filling
- diking
- subsidence
- changes in water salinity
- Invasive plants
- Climate change (Sea Level Rise, marsh conversion to mudflat, extreme weather events)
- Oil spills
- Shift in rainfall to later in the winter

Habitat suitability is limited by:

- small size (=small populations and decreased genetic viability)
- Fragmentation (limits dispersal)
- lack of other vital features such as sufficient escape habitat

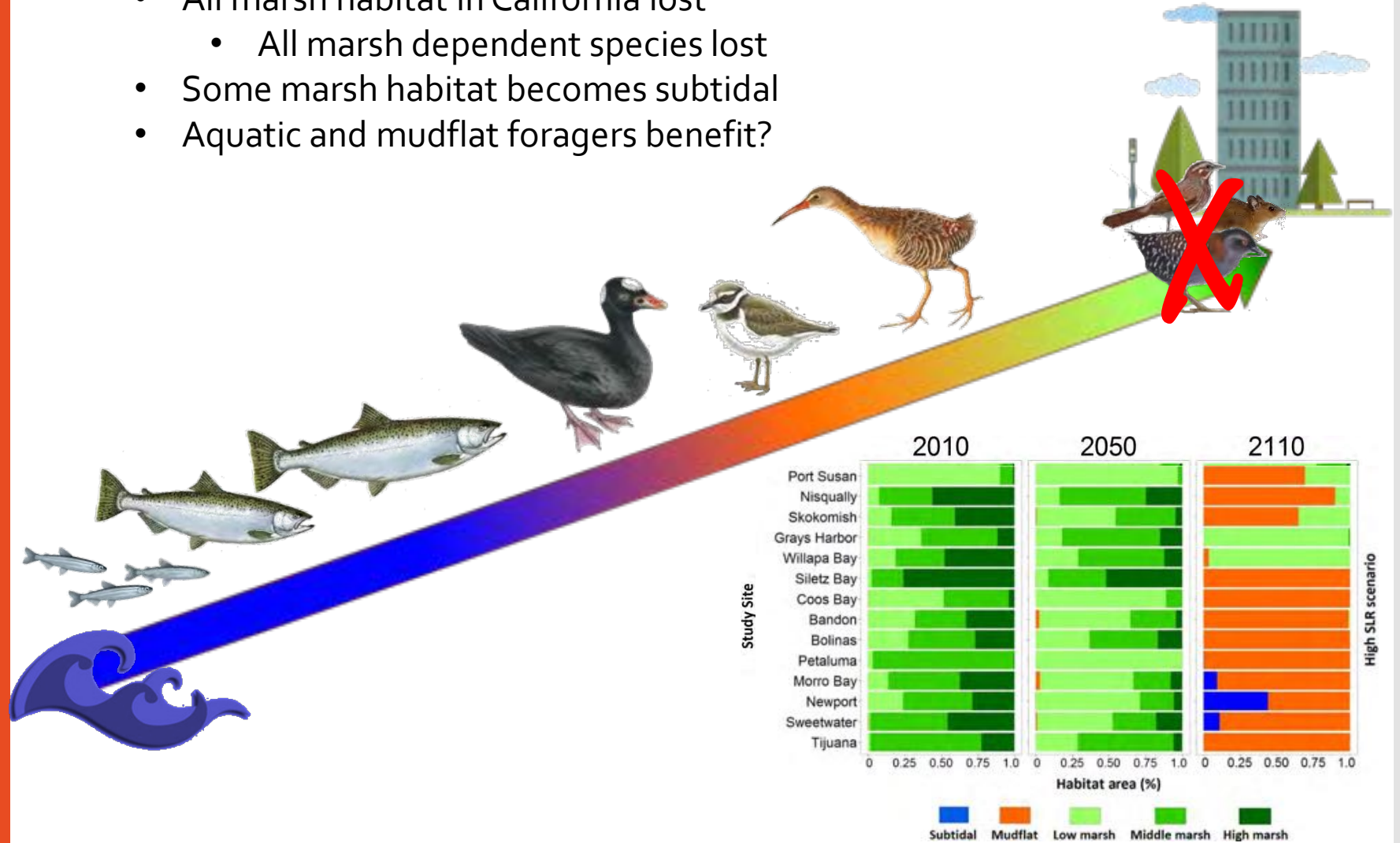
Fragmentation



Sea Level Rise and Climate Change

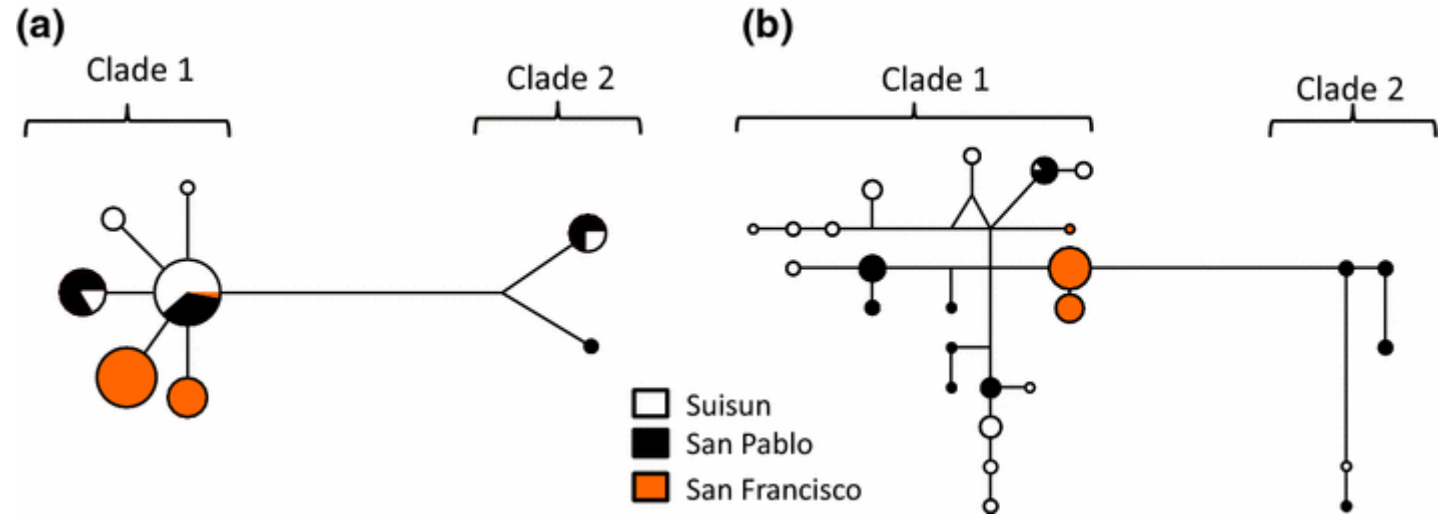
5.5 Feet Sea Level Rise

- All marsh habitat in California lost
 - All marsh dependent species lost
- Some marsh habitat becomes subtidal
- Aquatic and mudflat foragers benefit?



Genetic Bottleneck

- Southern subspecies has dramatically lower ability to respond to change
- Could hinder recovery
- Translocation may be necessary in the future



Development
– Losing
Future
Habitat
Now

2019



1993

Hantavirus in brief

How the virus spreads to humans



Symptoms

- | Early | Later, 1-2 days |
|----------------|-----------------------|
| • Chills | • Dry cough |
| • Fever | • Headache |
| • Muscle aches | • Nausea, vomiting |
| | • Shortness of breath |

Characteristics

- Most prevalent in rural areas
- Campers and hikers more likely to catch the virus, because tents rest on the ground
- Cannot be spread between humans

4 Acute respiratory distress: serious infection that quickly worsens

Infected mice in the Bay Area

California deer mice showing signs of hantavirus infection from 2001-10. No data for Solano or San Joaquin counties.

County	Number collected	Number infected	Percent infected
San Mateo	87	9	10.3%
Contra Costa	20	2	10%
Marin	18	1	5.6%
Alameda	198	1	0.5%
Santa Clara	21	0	0%
Santa Cruz	8	0	0%
San Francisco	13	0	0%

Source: U.S. Centers for Disease Control and Prevention, California Department of Public Health, McClatchy-Tribune BAY AREA NEWS GROUP

Contaminants – Chronic and Acute Threats





Management

SMHM
Monitoring



https://www.youtube.com/watch?v=_P8uG45zioc

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Survey Types

- Live Trapping
- Camera Trapping
- Acoustic Monitors
- eDNA?

Myth vs Reality

- Preferred habitat is pickleweed
- Activity period
- Distance moved
- Move up in veg or upland?
- Use of invasive plants – Lepidium, Phragmites, Salsola
- Will not cross roads or open space
- Both subspecies of SMHM become torpid
- SMHM will can move over 100m in a night (300m Rice 1974) likely move more in marginal habitat
- Home range
- Breeding likely March thru November
- Salt marsh harvest mice commonly occur in the upper portions of salt marshes where terrestrial grasses are absent or remote, while western harvest mice tend to be dependent on proximity to terrestrial grass vegetation

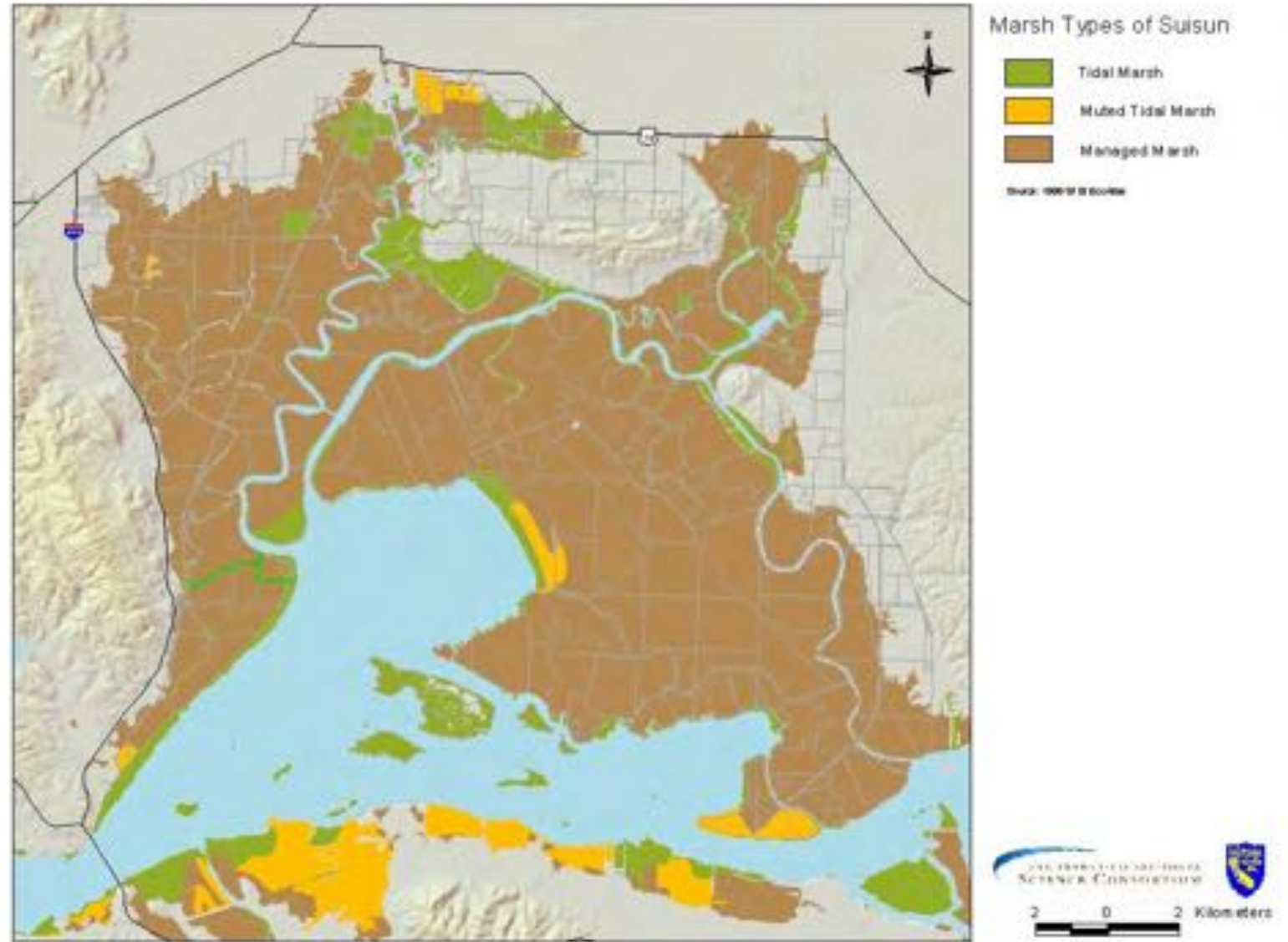
Myth vs Reality

- Salinity may influence salt marsh harvest mouse habitat independent of its correlation with *Sarcocornia*. Zetterquist (1978) found that salt marsh harvest mice were most abundant in portions of diked salt marshes where salinity was extremely high. A high physiological tolerance for salt in food and water (Fisler 1965; Coulombe 1970) may confer a competitive advantage.
- Routine flooding and draining associated with conventional methods of waterfowl marsh management in Suisun Marsh may cause prolonged submergence of salt marsh harvest mouse habitat, and negatively affect species.
- Tidal restoration will improve SMHM habitat

Tidal Marsh Restoration is not the only answer

High densities of SMHM

Waterfowl management and
mouse conservation



To Think About

