Pickleweed? We don't need no stinkin' pickleweed!

Salt Marsh Harvest Mouse Habitat Use in the Suisun Marsh

Laura Patterson, Staff Environmental Scientist
Division of Environmental Services

Outline

- The critter
- The reason we study it
- The demography and habitat use study
- The routine monitoring
- The telemetry study
- The conservation implications

The critter

Salt Marsh Harvest Mouse

Reithrodontomys raviventris

Salt Marsh Harvest Mouse

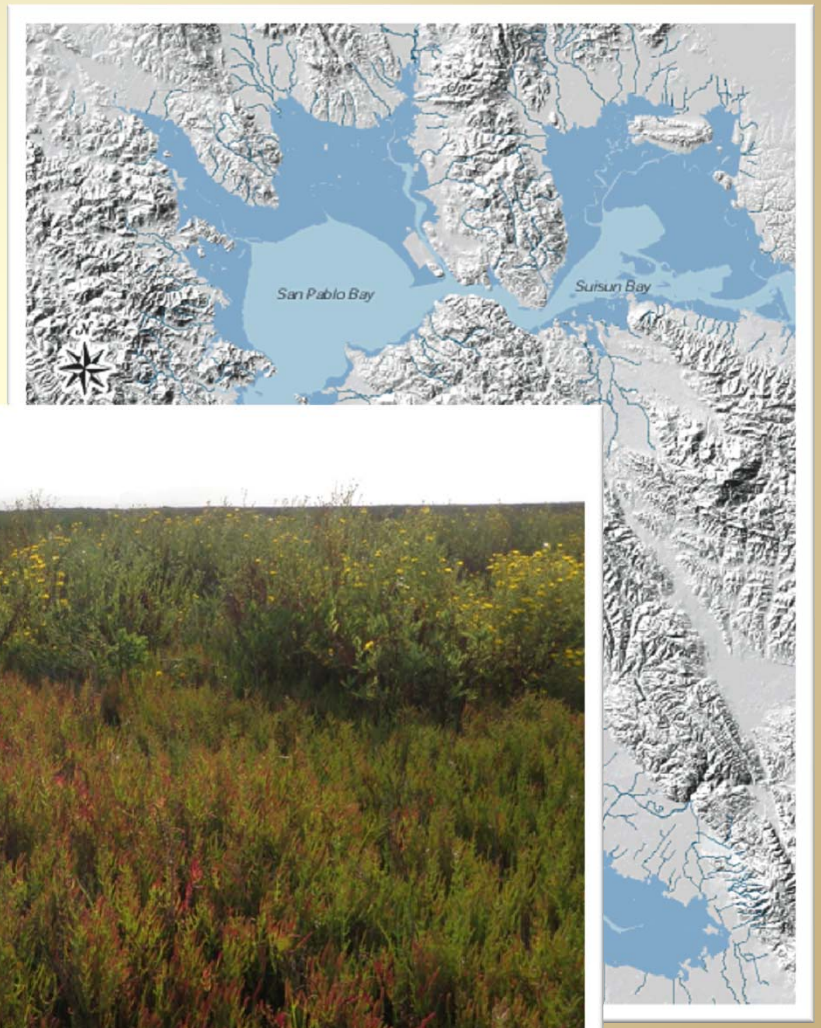
"The Salt Marsh Harvest Mouse also eat other carcusses [*sic*] and fish. They are herbivores." – Wikipedia

Reithrodontomys raviventris

Salt Marsh Harvest Mouse

Salt Marsh Harvest Mouse

Reithrod



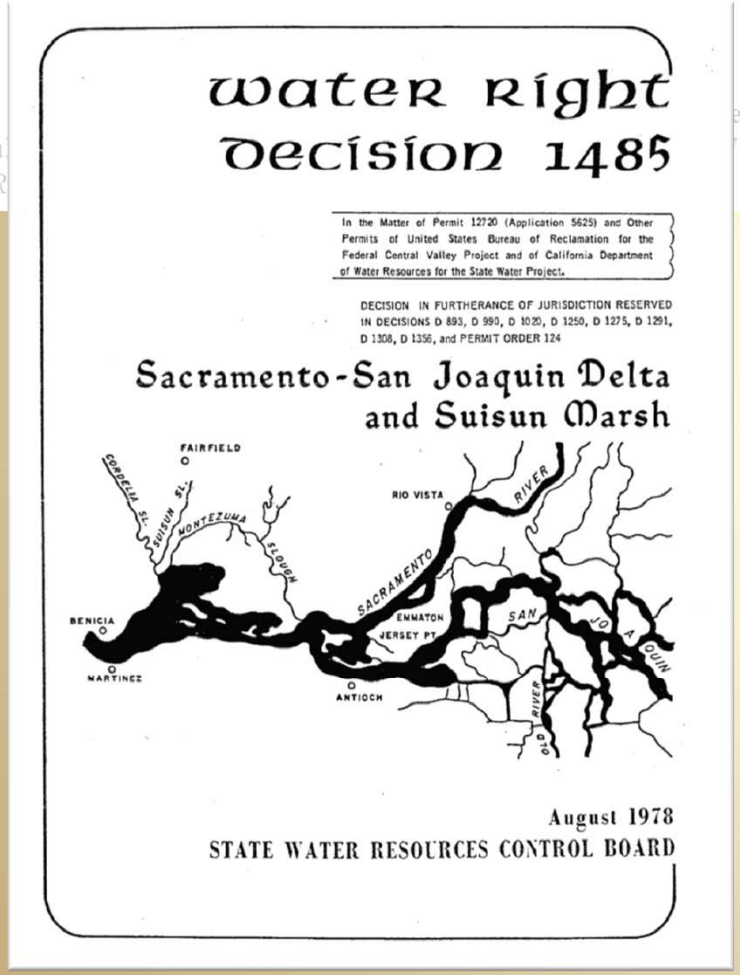
The reason we study it

It's listed

	LISTING STATUS				CRITICAL HABITAT	RECOVERY PLAN		
	State	List Date	Federal	Effective List Date	Designation	Effective Date	Version	Date
Salt-marsh harvest mouse *Reithrodontomys raviventris*	SE	6-27-71	FE	10-13-70			Final	1984

DWR's Involvement

		LISTING STATUS		CRITICAL HABITAT		RECOVERY PLAN		
		Federal	Effective List Date	Designation	Effective Date	Version	Date
Sa	71	FE	10-13-70			Final	1984
R							



WATER RIGHT DECISION 1485

In the Matter of Permit 12720 (Application 5625) and Other Permits of United States Bureau of Reclamation for the Federal Central Valley Project and of California Department of Water Resources for the State Water Project.

DECISION IN FURTHERANCE OF JURISDICTION RESERVED IN DECISIONS D 893, D 990, D 1020, D 1250, D 1275, D 1291, D 1308, D 1356, and PERMIT ORDER 124

Sacramento-San Joaquin Delta and Suisun Marsh

August 1978
STATE WATER RESOURCES CONTROL BOARD

DWR's Obligation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
AREA OFFICE
2800 Cottage Way, Room E-2740
Sacramento, California 95825-1880

December 7, 1981

Memorandum

To: Regional Director, Bureau of Reclamation, 2800 Cottage Way, Room W-1105, Sacramento, CA 95825-1880

From: Area Manager, Sacramento, CA (SESO) (AFA-SE; 11-1-81-F-130)

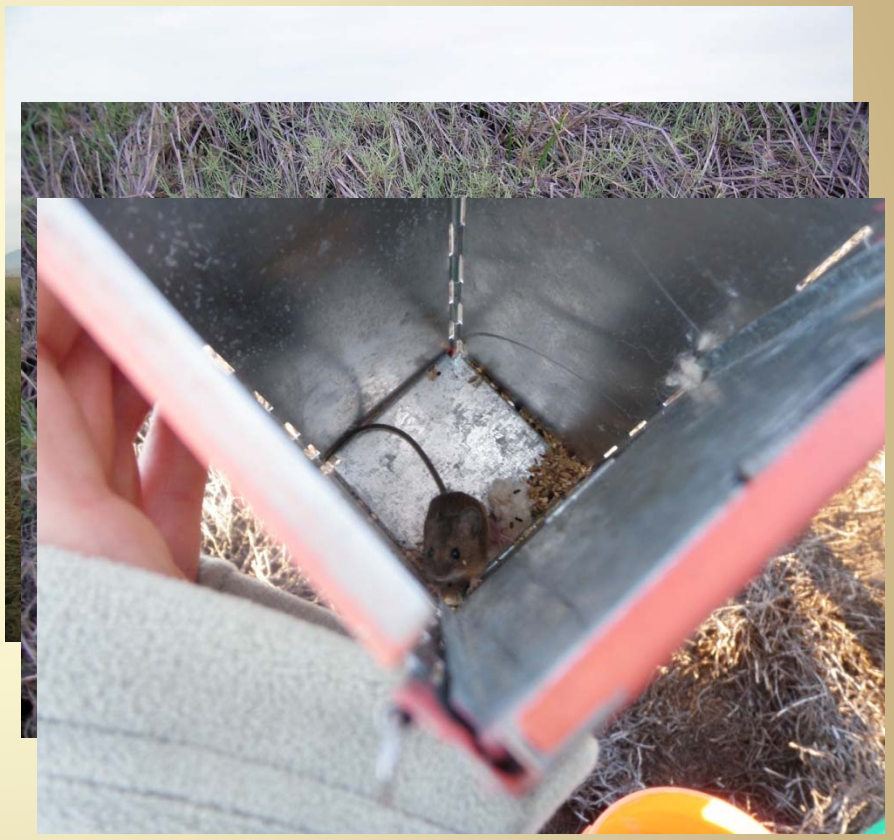
Subject: Section 7 Determination, Suisun Marsh Management Study, Solano County, California

Conservation Measures: The goal of these measures is to retain at least 2,500 acres of preferred salt marsh harvest mouse habitat adequately distributed throughout the marsh. This mouse habitat must meet all the criteria outlined for preferred habitat (page 8). Monitoring of habitat,

SMHM Conservation Areas

SMHM Conservation Areas

SMHM Conservation Areas



SMHM Conservation Areas

SMHM Conservation Areas

It's not all fun and games…

It’s not all fun and games…

It's not all fun and games…

…but it is a lot of fun

The demography and habitat study

Sustaita et al. (2011)

The Journal of Wildlife Management 75(6):1498–1507; 2011; DOI: 10.1002/jwmg.187

Research Article

Salt Marsh Harvest Mouse Demography and Habitat Use in the Suisun Marsh, California

DIEGO SUSTAITA,[1,2] *California Department of Fish and Game, Bay Delta Region, 7329 Silverado Trail, Napa, CA 94558, USA*

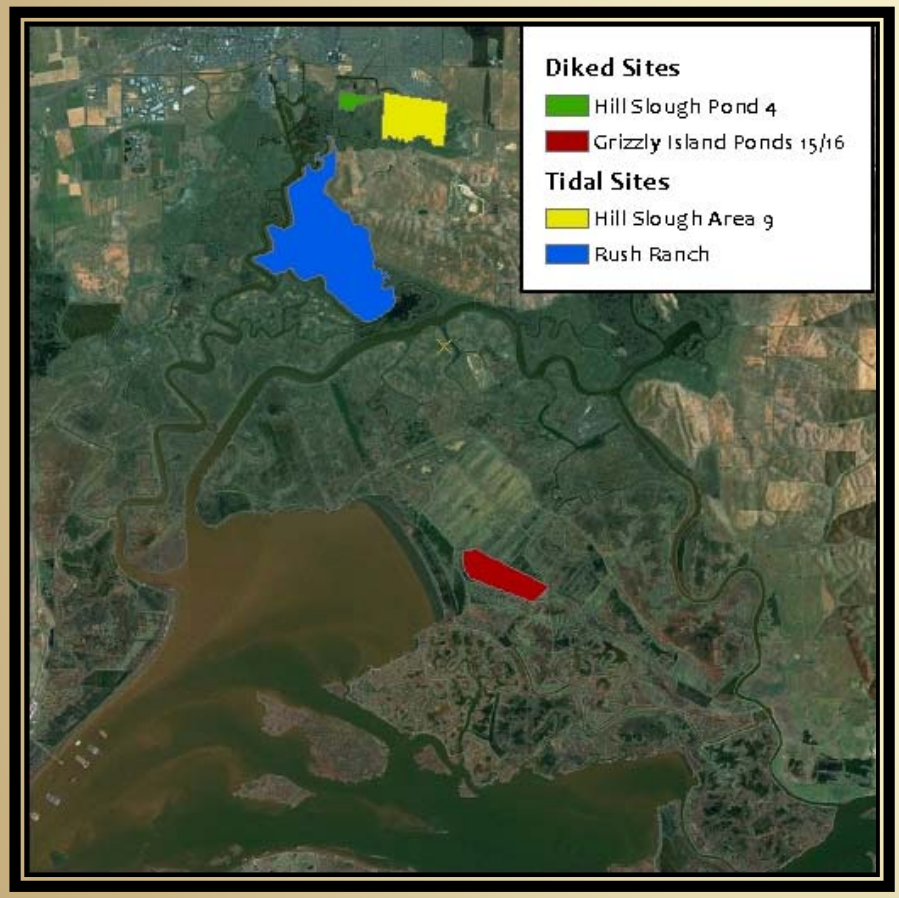
PATTY FINFROCK QUICKERT, *California Department of Water Resources, FloodSAFE Environmental Stewardship and Statewide Resources Office, 1416 Ninth Street Room 1623, Sacramento, CA 95814, USA*

LAURA PATTERSON, *California Department of Water Resources, Division of Environmental Services, 3500 Industrial Boulevard, West Sacramento, CA 95691, USA*

LAUREEN BARTHMAN-THOMPSON, *California Department of Fish and Game, Bay Delta Region, 7329 Silverado Trail, Napa, CA 94558, USA*

SARAH ESTRELLA, *California Department of Fish and Game, Bay Delta Region, 7329 Silverado Trail, Napa, CA 94558, USA*

Study Design



Mixed Veg Composition

Atriplex prostrata

Frankenia salina

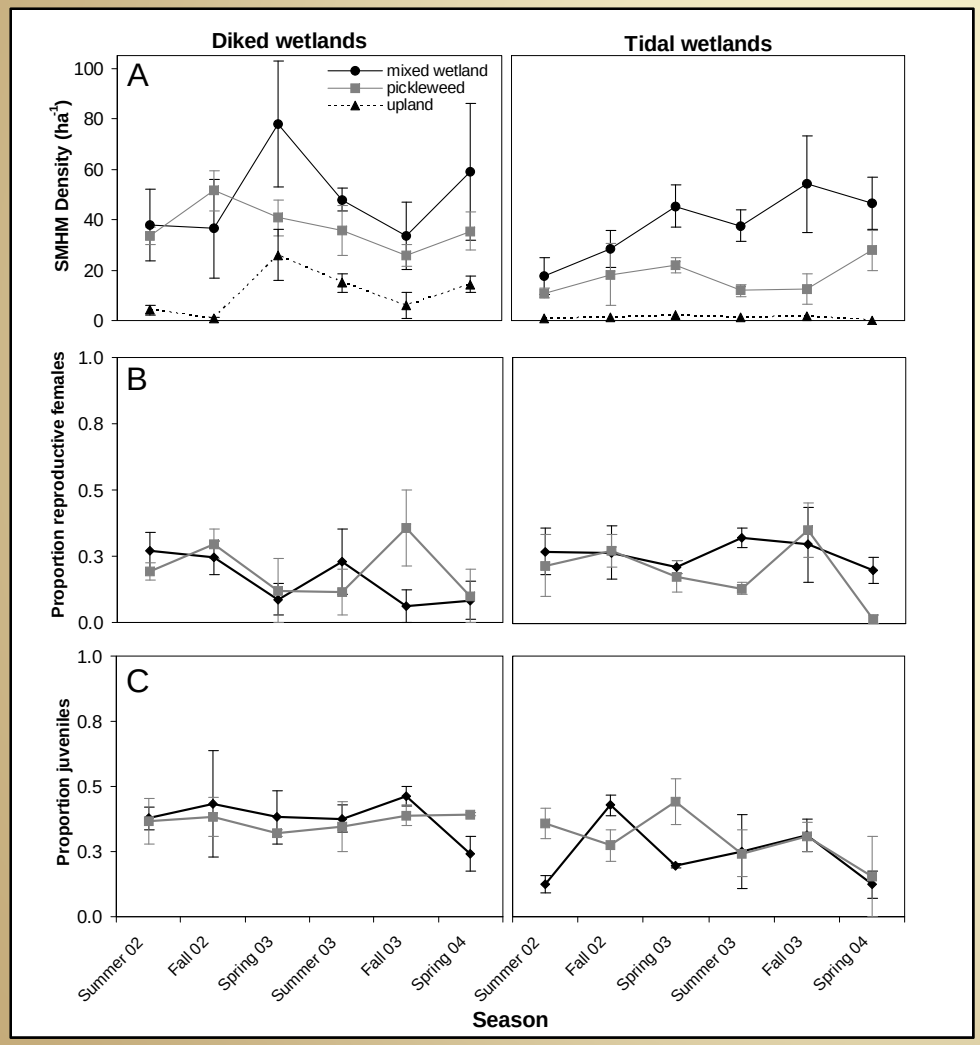
Juncus balticus

Distichlis spicata

Lactuca serriola

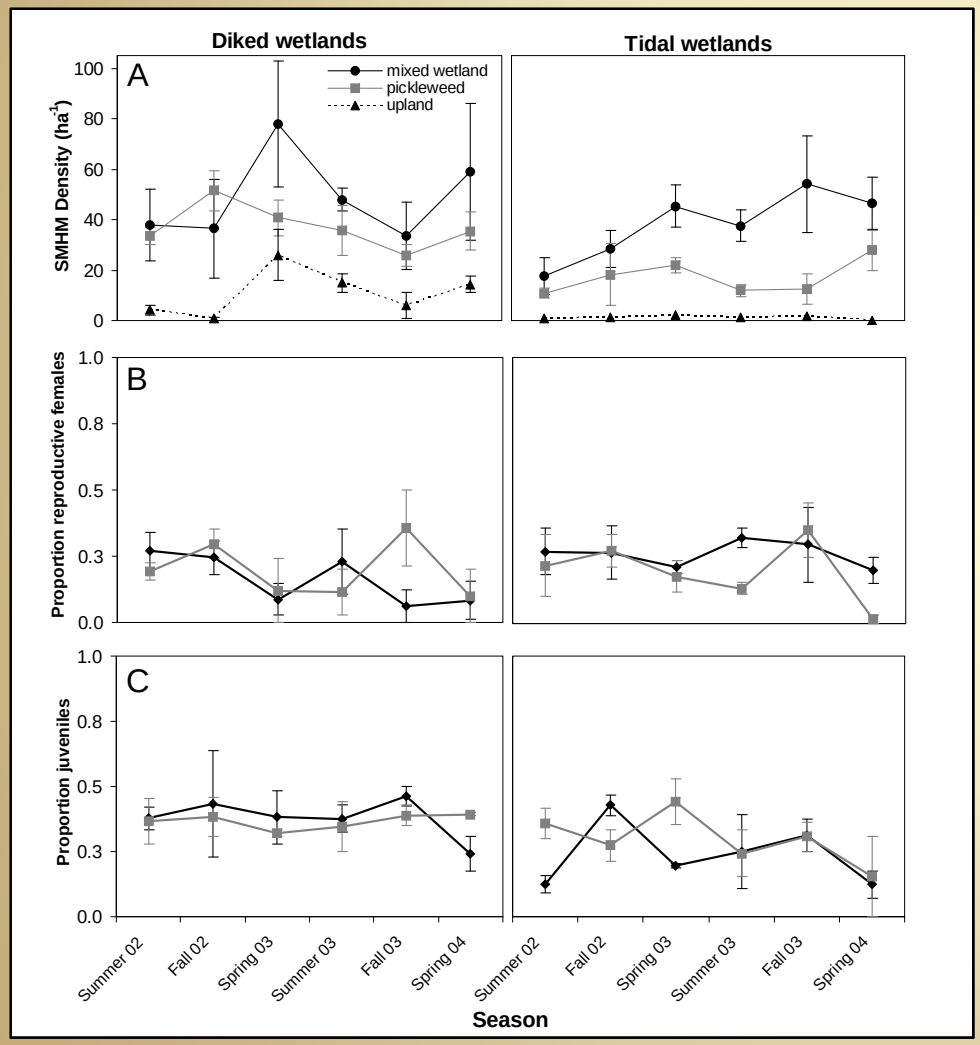
Salicornia pacifica

Study Results



- DENSITY by wetland type
  - diked = 32.3 ± 3.4 mice/ha
  - tidal = 18.9 ± 2.5 mice/ha
  - **DIKED > TIDAL**

Study Results



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  - PW = 27.2 ± 2.5 mice/ha
  - UP = 6.1 ± 1.5 mice/ha
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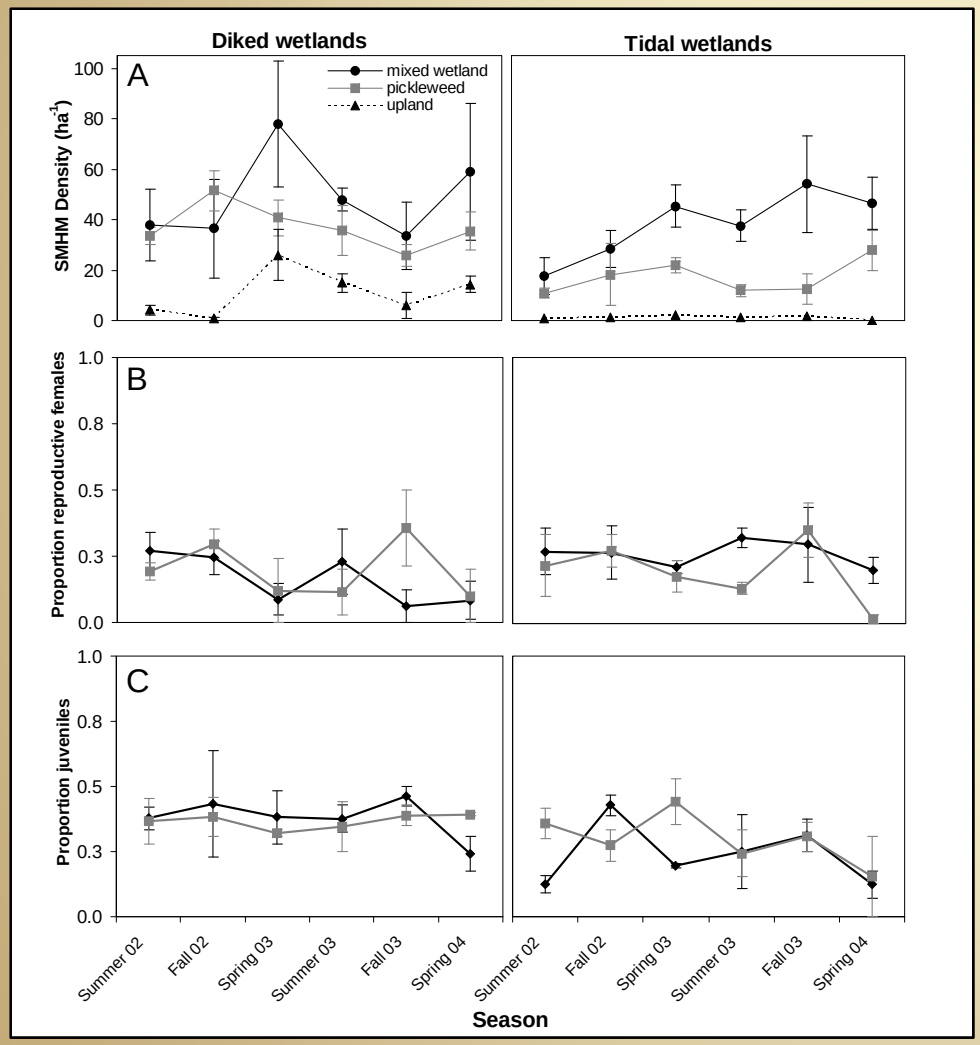
Study Results



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  - **MV & PW > UP**
- REPRODUCTION
  - **MV ≈ PW**
- SURVIVAL
  - **MV ≈ PW**

Veg Height and Structure

Veg Height and Structure

- Height
  - **DIKED > TIDAL**
  - **MV ≈ PW ≈ UP**
  - **+ w/ SMHM density**

Veg Height and Structure

- Height
  - **DIKED > TIDAL**
  - **MV ≈ PW ≈ UP**
  - **+ w/ SMHM density**
- Structural Diversity
  - **DIKED ≈ TIDAL**
  - **MV > PW & UP**
  - **Ø w/ SMHM density**

The routine monitoring

SCAM

Schoenoplectus americanus

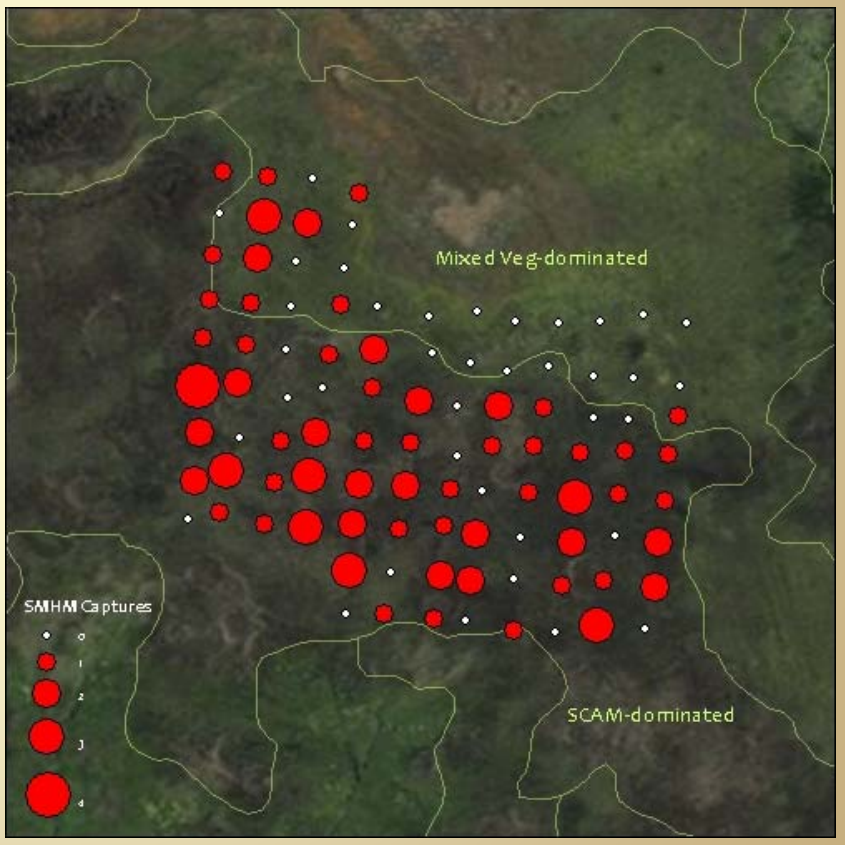
SCAM

Schoenoplectus americanus

SCAM Studies

GREY GOOSE UNIT

HILL SLOUGH EAST AREA 9



The telemetry study

Smith (2012)

Refuge Use and Movement of the Salt Marsh Harvest Mouse (*Reithrodontomys raviventris halicoetes*) in Response to Environmental Heterogeneity

Smith (2012)

Phragmites sp.

The conservation implications

Tidal Marsh Restoration

Draft Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California

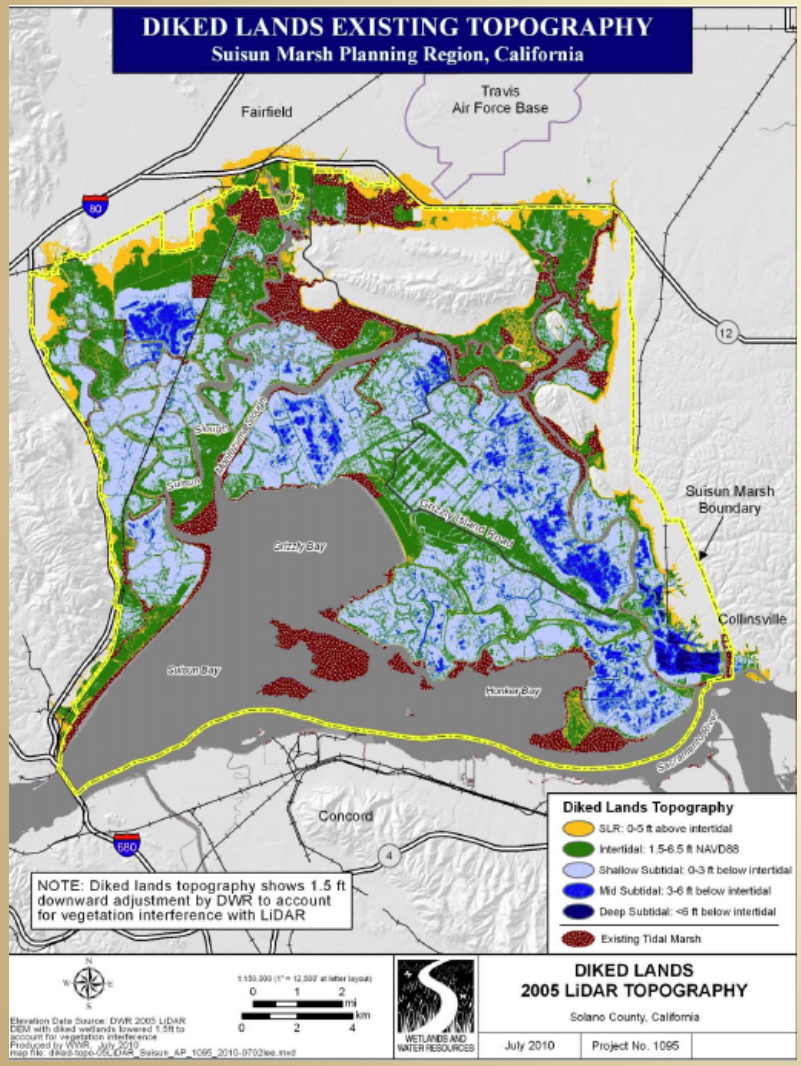
(January 2010)

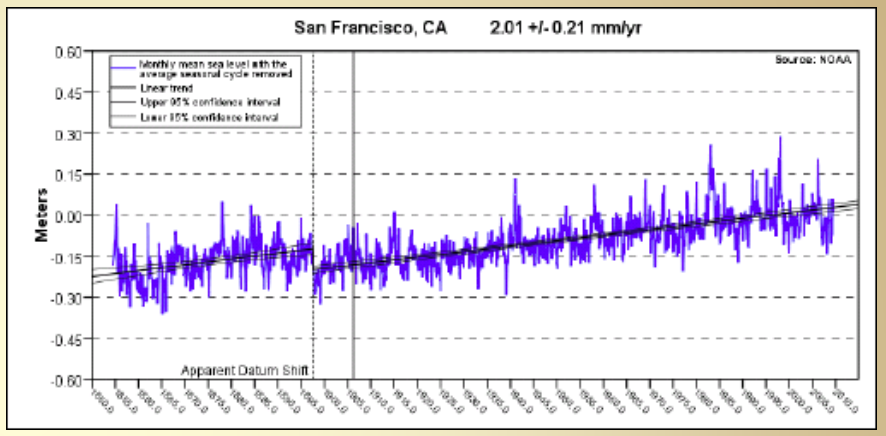
Suisun Marsh
Habitat Management, Preservation, and Restoration Plan

BDCP
BAY DELTA CONSERVATION PLAN

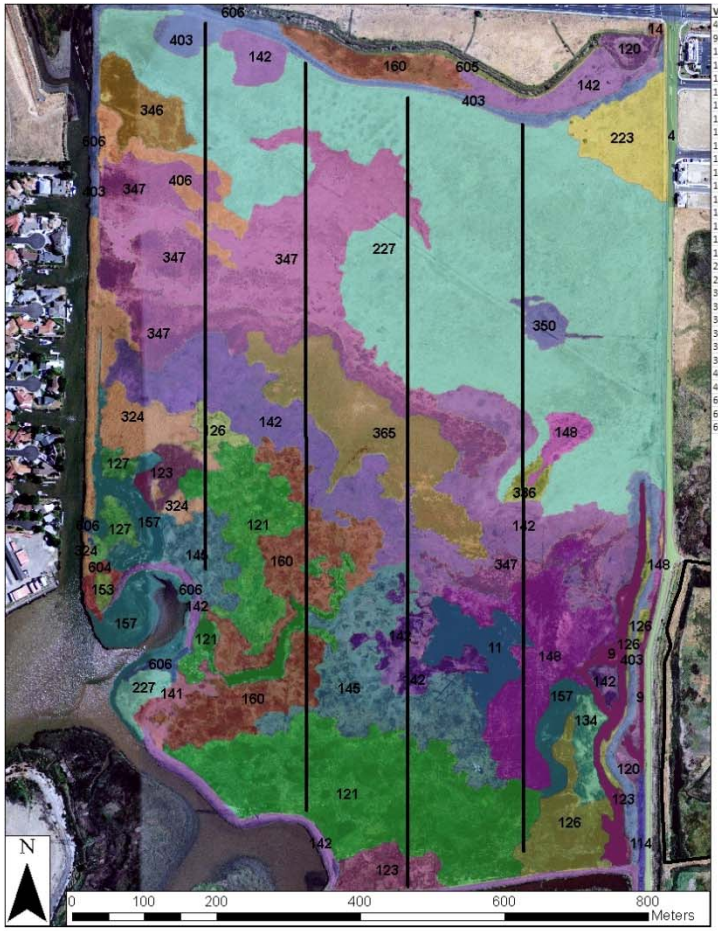
A Collaborative Approach to Restore the Sacramento-San Joaquin Delta's Ecosystem and Protect California's Water Supplies

Tidal Marsh Restoration





Future Research



VEG_2009	NVCSNAME	MAPUNIT
4	Urban	Road
9	Lacustrine	Ditch
11	Open Water	Open Water
14	Urban	Urban Area
114	Schoenoplectus americanus	Schoenoplectus americanus
120	Typha (angustifolia, domingensis, latifolia)	Typha angustifolia-Polygonum-Xanthium strumarium-Echinochloa crus-galli
121	Typha angustifoliaÛTypha latifoliaÛTypha domingensis / Schoenoplectus americanus	Typha angustifolia-Schoenoplectus americanus
123	Typha (angustifolia, domingensis, latifolia)	Typha sp.
126	Typha angustifoliaÛTypha latifoliaÛTypha domingensis / Distichlis spicata	Typha angustifolia-Distichlis spicata
127	Schoenoplectus americanus / Lepidium latifolium	Schoenoplectus americanus-Lepidium latifolium
134	Juncus arcticus var. balticusÛLepidium latifolium	Juncus balticus-Lepidium latifolium
141	Distichlis spicata	Distichlis spicata
142	Distichlis spicata / annual grasses	Distichlis spicata-Annual grasses
145	Distichlis spicataÛJuncus arcticus var. balticus (J. arcticus var. mexicanus)	Distichlis spicata-Juncus balticus
148	Distichlis spicataÛSarcocornia pacifica	Distichlis spicata-Salicornia virginica
153	Distichlis spicataÛCotula coronopifolia	Distichlis spicata-Cotula coronopifolia
157	Arid West freshwater emergent marsh	Schoenoplectus (acutus, californicus)-Typha sp.
160	Distichlis spicata	Distichlis spicata-Juncus balticus-Triglochin sp-Glaux maritima
223	Phalaris aquatica	Phalaris aquatica
227	Mediterranean California naturalized annual and perennial grassland	Annual Grasses/Weeds
324	Lepidium latifolium	Lepidium latifolium (generic)
336	Western North America Wet Meadow and Low Shrub Carr	Rumex (generic)
346	Sarcocornia pacifica	Salicornia virginica
347	Sarcocornia pacifica / annual grasses (Polypogon, Hordeum, Lolium)	Salicornia virginica-Annual grasses
350	Sarcocornia pacificaÛCrypsis schoenoides	Salicornia virginica-Crypsis
365	Sarcocornia pacificaÛCotula coronopifolia	Salicornia virginca-Cotula coronopifolia
403	Foeniculum vulgare	Foeniculum vulgare
406	Brassica nigra and other mustards	Brassica nigra (generic)
604	Rosa californica	Rosa californica
605	Rosa californicaÛBaccharis pilularis	Rosa californica-Baccharis pilularis
606	Rubus armeniacus	Rubus discolor

Hill Slough Ponds 1 and 2 Veg Types and 2012 Trap Lines

Questions?

K. Smith