

Salt Marsh Harvest Mouse Workshop

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Taxonomy & Identification



Salt marsh
harvest mouse

General Info

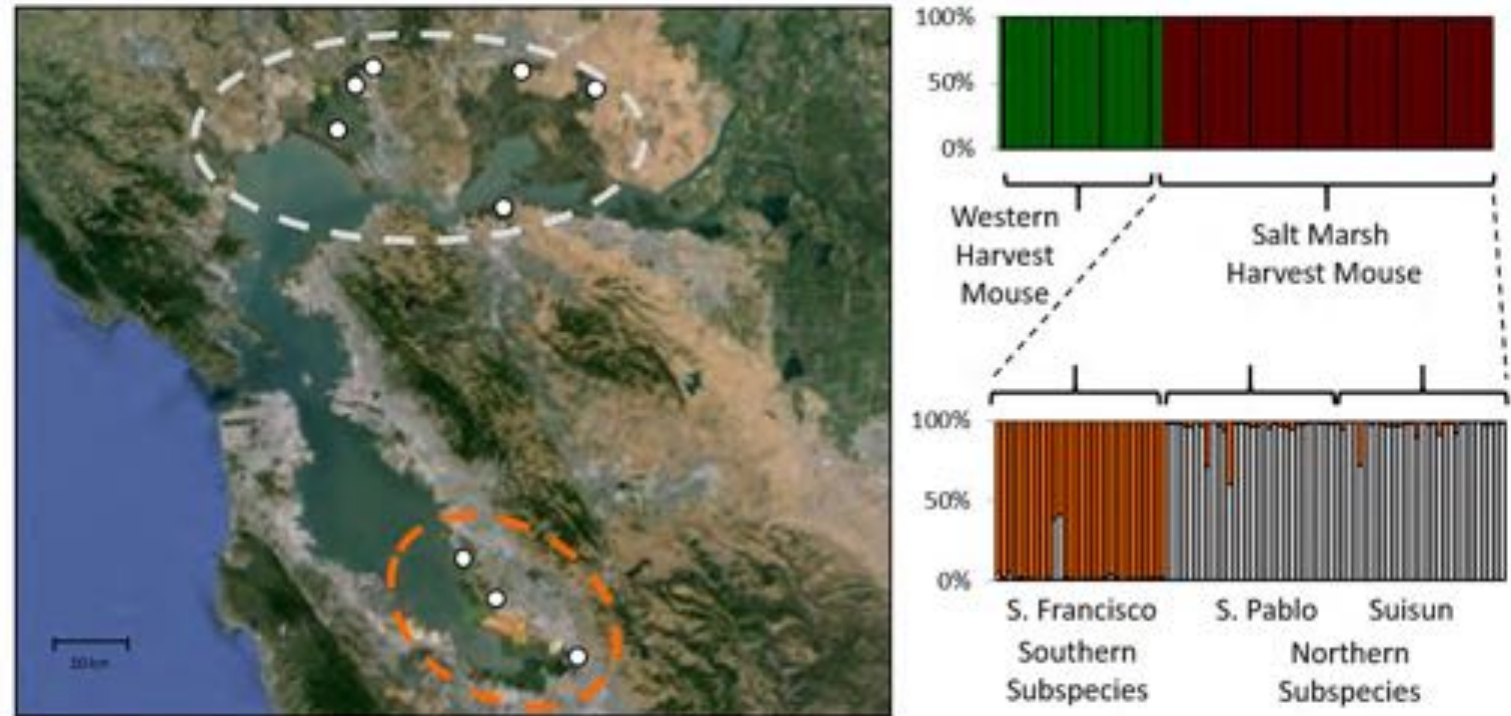
Reithrodontomys raviventris= grooved-toothed mouse with a red belly

- Northern salt marsh harvest mouse
(*Reithrodontomys raviventris halicoetes*)
- Southern salt marsh harvest mouse
(*Reithrodontomys raviventris raviventris*)



Evolutionary History

- No hybridization between westerns and salties
- Strong division between northern and southern subspecies



Bay	<i>n</i>	Haplotypes	Haplotype diversity	SD	Nucleotide diversity	SD
San Pablo	29	11	0.89	0.03	0.0076	0.0040
Suisun	29	14	0.94	0.02	0.0066	0.0033
San Francisco	29	3	0.49	0.07	0.0014	0.0009

Characteristics

- Diverged 3.9 +/- 0.7 MYA (Statham et al. 2014)
- Only mammal worldwide entirely restricted to coastal marshes (Greenberg et al. 2006)
- Historically found in the tidal marshes of the San Francisco Estuary (Dixon 1908)
- Managed as specialist (USFWS 2013)



Life History

- Combined head and body length is approximately 14 centimeters (5.5 inches)
- Average weight of less than 10 grams (0.353 ounce)
- Live about 8-12 months
- Nocturnal
- Swim and Float
- Drink salt water
- Eat salty plants



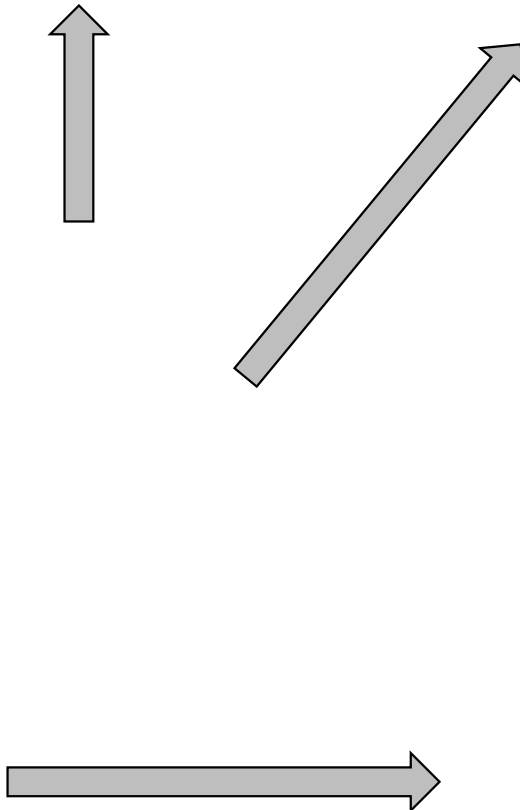
Characteristics

Western Harvest Mouse

California Vole (*Microtus*)

Upland Associated

Salt Marsh Harvest Mouse





Other Small Mammals

Insectivores

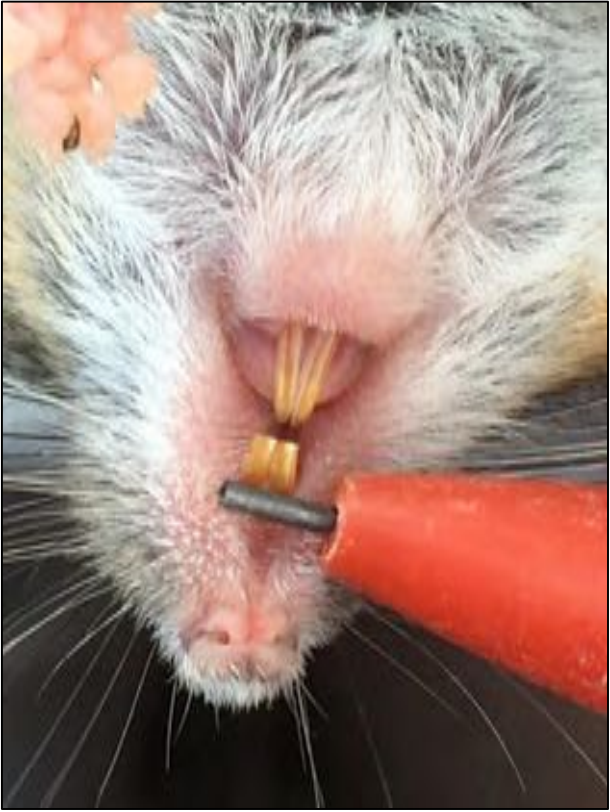


Photo Credit:
USFWS

Small Bodied Mice



Large Bodied Mice



Large Rodents

NORWAY RAT (aka Brown Rat)

Color:

Black or brown, with a lighter gray or brown underside.

Diet:

Norway rats will eat nearly anything they can get their paws on. This includes small birds, eggs, all types of plants and small invertebrates.



Appearance:

Ranging anywhere from 15 to 20 inches total, including the tail. Short ears.

Common Diseases:

Leptospirosis. Also a carrier of the parasite that causes toxoplasmosis - a disease that results in muscle pain, fever, and headaches in humans.

Location:

Throughout the U.S, particularly in the Northeast, Midwest, and Southwest.

ROOF RAT (aka Ship Rat, Black Rat)

Color:

Black, medium or light brown with a lighter underside.

Diet:

Seeds, fruit, stems, leaves, insects, and small animals such as birds. Especially attracted to dog and cat food left out for pets.



Appearance:

About 5 to 7 inches long, with a tail that measures up to 8 inches. Long ears.

Common Diseases:

Leptospirosis (aka Weil's disease), typhus, toxoplasmosis, and trichinosis.

Location:

Most common in coastal areas and tropical climates. They can also adapt to colder weather.



Small Mammals in Hand

Sampling



Salties and
Westerns



Photos:
USFWS

Western Harvest Mouse (L) & Salt Marsh Harvest Mouse (R)

Field ID



Identifying the mouse in hand



Identifying the mouse in hand



Identifying the mouse in hand



The Reality of Field Identification





Eden Landing



Order	Re	Mark/Tag	Species	Sex

Predators: _____
Date: ____/____/____

_____ Caps: _____
_____ of _____
_____ Page _____
_____ of _____

Handwritten: Smith, Thompson, Little



Eden Landing mice



Salty



Western



Eden Landing



Bothin Marsh 2017



LOCATION: Bothin Marsh

Date: 3/17 Start: 17:20 End: 19:30 Sunrise: _____ Moon Phase: _____ High Tide: _____ Low Tide: _____ Crew: C. Rose

Wind: 3 % Cloud: 0 Temp: 16.1 Precip: 0 # OF TRAPS IN GRID & CONFIGURATION: _____

Date: 3/17 Start: _____ End: _____ Sunrise: _____ Crew: 3 Field 5 Traps 1 Mouse 1 Backpack

Wind: 3-2 % Cloud: 0 Temp: 21 Precip: 0 TAKE W/ OF BAG: _____ CHECK COMMENTS: _____

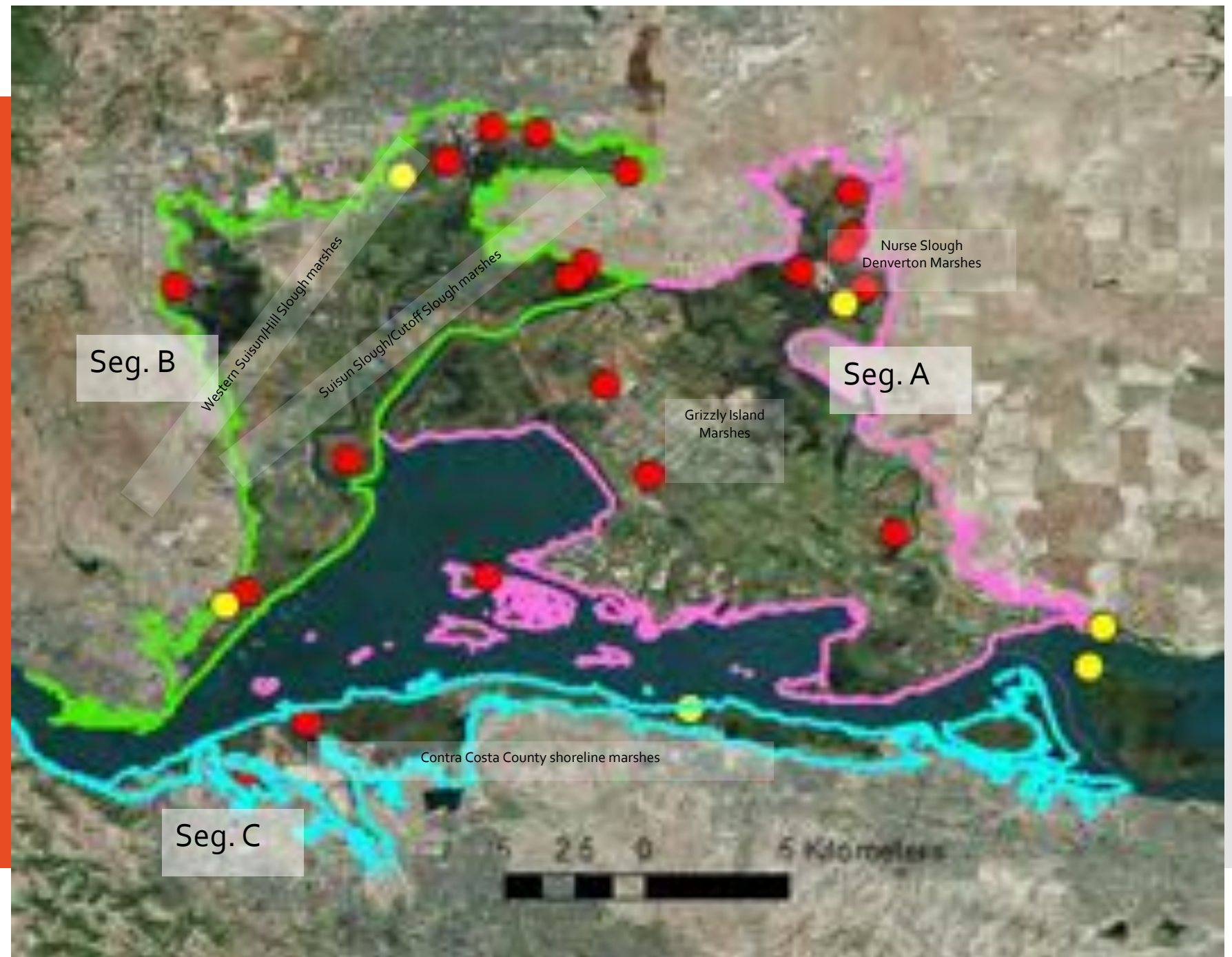
Trap	bait	Door trig % (2)	Sex	Sex w/	Mark/Tag	Species	Sex	Repro (3)	Reps (4)	Age	Weight + bag	Total length	Tail length	Tail Diam	SM or WP	Behavior (Active/Docile)/Color/Comments
100		<u>50%</u>	<u>♂</u>	<u>W</u>	<u>34</u>	<u>W</u>	<u>F</u>	<u>W</u>	<u>NA</u>	<u>SA</u>	<u>9.55</u>	<u>124</u>	<u>66</u>	<u>1.5</u>	<u>♂</u>	<u>MF-2020</u>

A MLR Example

Clip #	Trap #	Sex	Repro	Weight	Total Body	Tail	Body	T/B	Diam	Field ID	MLR	Genetic ID	
1	3	M	ssc	11.50	133	71	62	1.145	2.00	W	0.213		
1	13	M	ssc		132	71	61	1.164	2.10		0.504	0	MLR ID Color Codes
2	27	M-J	non	9.50	120	63	57	1.105	1.80	W	0.012		western
2	35	M-J	non		116	63	53	1.189		W	0.058		western/unknown
3	31	M-J	non	8.50	122	63	59	1.068	1.80	W	0.007		unknown
4	41	F-J	non	8.00	114	62	52	1.192	1.50	?	0.312		salt marsh/unknown
5	45	F	lac	15.00	142	69	73	0.945	2.10	W	0.107		salt marsh
6	48	F	lac	14.75	125	62	63	0.984	1.70	W	0.000		western/salt marsh
7	48	F-J	non	10.00	113	59	54	1.093	1.65	W	0.078		unknown with not enough information
8	62	F	lac	13.00	141	74	67	1.104	2.00	?	0.521		
8	61	F	lac/preg		141	76	65	1.169		?	0.866	Meg	
8	62	F	lac		140	74	66	1.121	2.00		0.600		
9	64	M	ssc	13.50	157	89	68	1.309	2.50	SM	1.000		
9	61	M	sc		158	87	71	1.225	2.40	SM	1.000	0	
12	65	M	sc	11.50	134	69	65	1.062	1.90	W	0.007		
12	65	M	sc		133	68	65	1.046	1.90	W	0.003		measured by KA
12	66	M	ssc		130	66	64	1.031	2.00	W	0.002	Meg	
13	54	M	sc	12.00	133	66	67	0.985	2.00	W	0.001		
13	55	M	sc		132	68	64	1.063	2.00	W	0.011	Meg	
14	55	M-SA	non	9.75	120	60	60	1.000	1.80	W	0.000		
15	72	M	sc	10.50	142	72	70	1.029	2.10	W	0.109		
16	56	M-J	non	12.50	120	60	60	1.000	1.60	W	0.001		
17	87	F	preg	10.75	125	61	64	0.953	1.95	W	0.003		
17	87	F	preg		123	67	56	1.196	1.80	W	0.053		
18	81	F	lac	10.50	133	69	64	1.078	1.65	W	0.000		
19	96	M	sc	11.00	131	68	63	1.079	2.10	W	0.039		
23	99	M	sc	12.00	136	75	61	1.230	2.10	SM	0.962		
24	20	F	red/plug	11.50	139	69	70	0.986	2.05		0.303		
25	62	M	non	10.50	145	82	63	1.302	2.10	SM	1.000	Rav	
26	31	F	red	13.50	134	71	63	1.127	2.00		0.830	Meg	
27	67	M	sc	10.50	133	71	62	1.145	1.90	W	0.089		
28	41	M	ssc	12.50	143	73	70	1.043	2.15		0.304		
29	90	F	post lac	10.75	131	68	63	1.079	1.90	W	0.047		
34	42	F	non	9.00	123	67	56	1.196	1.80		0.770		
35	91	F	lac	10.50	88	n/a	n/a	n/a	1.90	missing half of tail, old injury			
35	89	F	post lac		95	35	60		1.80	W	missing half of tail, old injury		

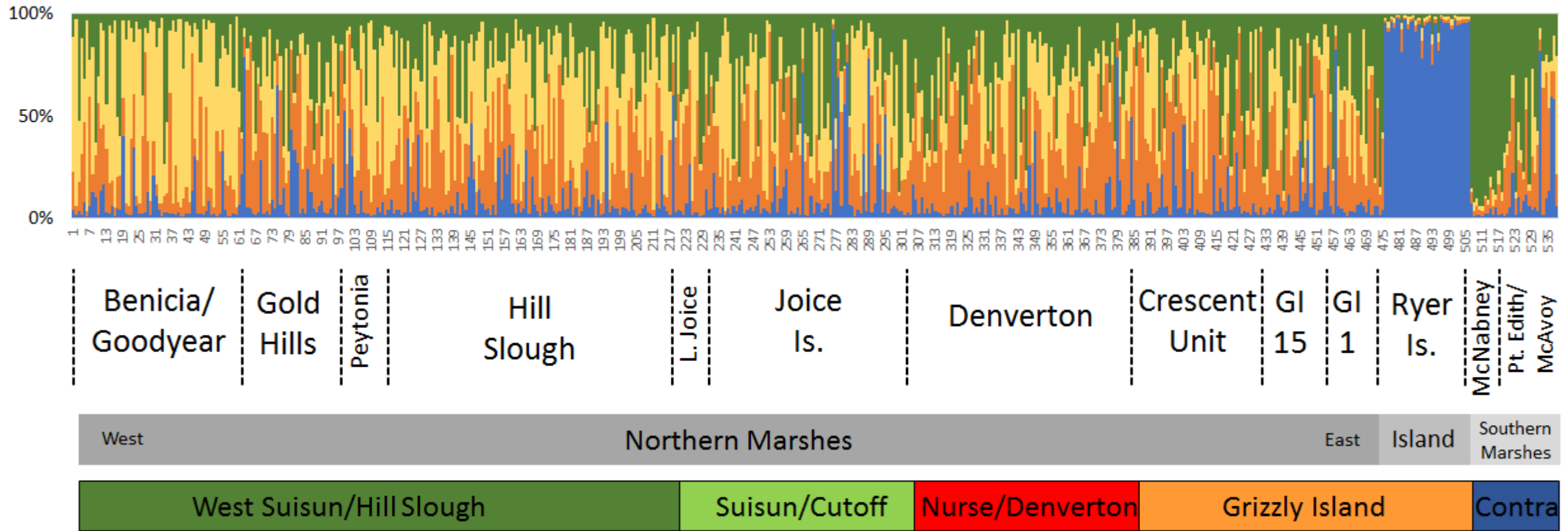
Genetics

Dr. Mark Statham
UC Davis
Veterinary Genetics Lab



Suisun Population Structure

Salt marsh harvest mice across the Suisun Bay Area Recovery Unit



Morphological investigation of southern harvest mice

- Aim: Improve field ID of southern subspecies
- Collected genetics and morph data from :
- Harvest mice = 210
 - (2016-2018)
- DNA = SMHM 51, WHM 159
- F = 80, M = 121, U = 9



Collecting Samples



- Genetic samples collected by trained techs
- Samples can be easily contaminated
- You can contribute!



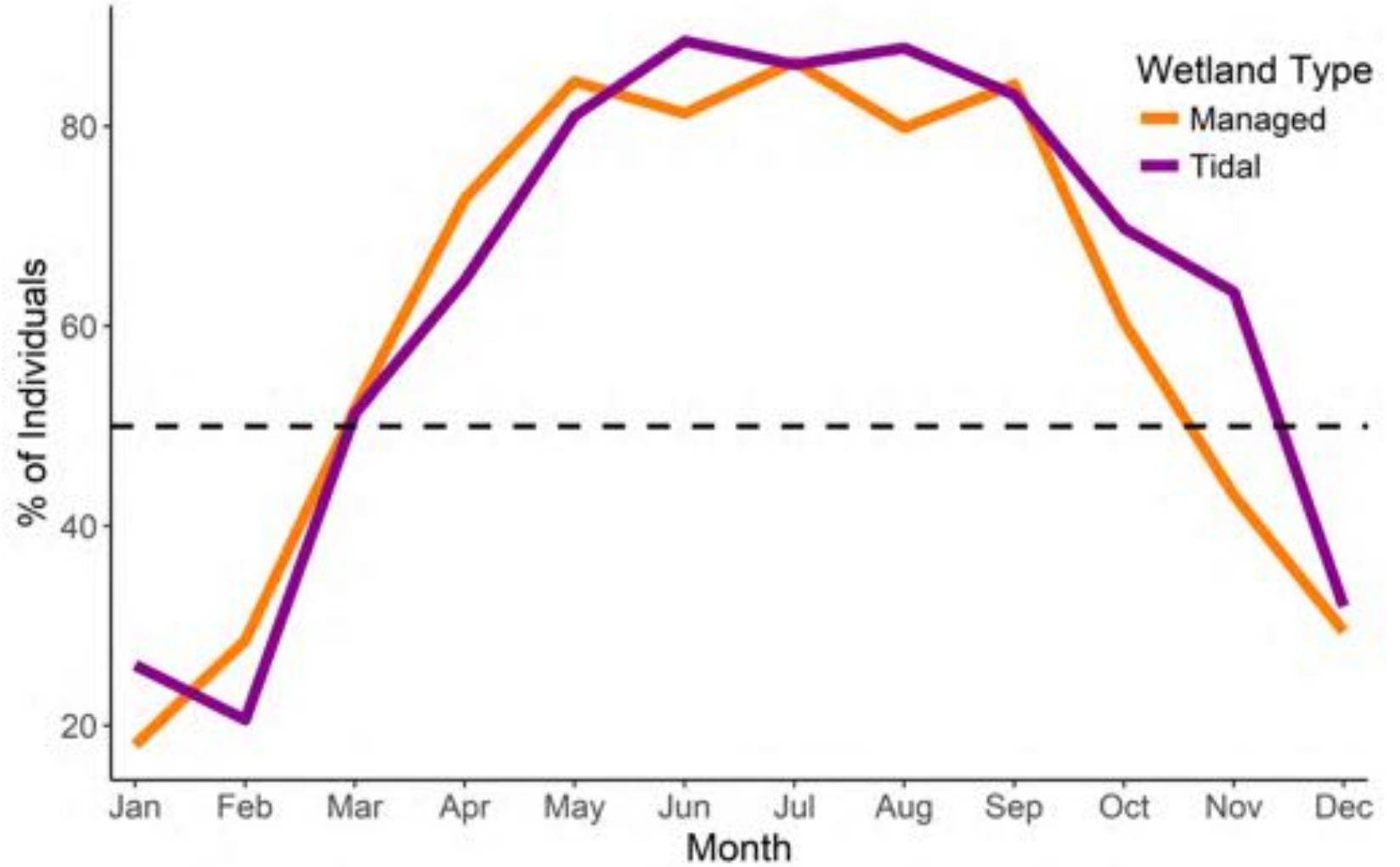


Biology & Life Cycle

Reproduction



Breeding Season for SMHM



Post Lactating



Post Lactating
And
Post Partum



Young

- Young Litters: 3 to 4
- Older Litters: 2 to 3

