



Salt Marsh Harvest Mouse Survey Bias at China Camp State Park

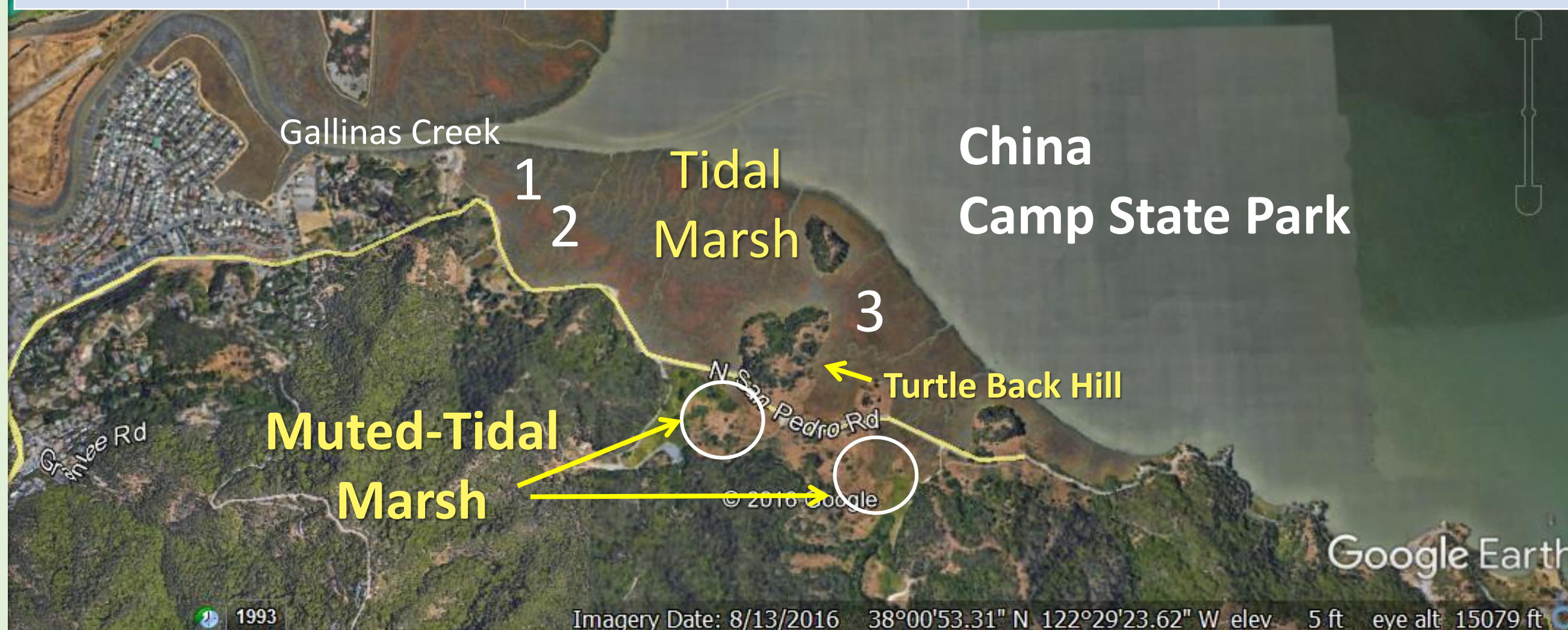
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Introduction

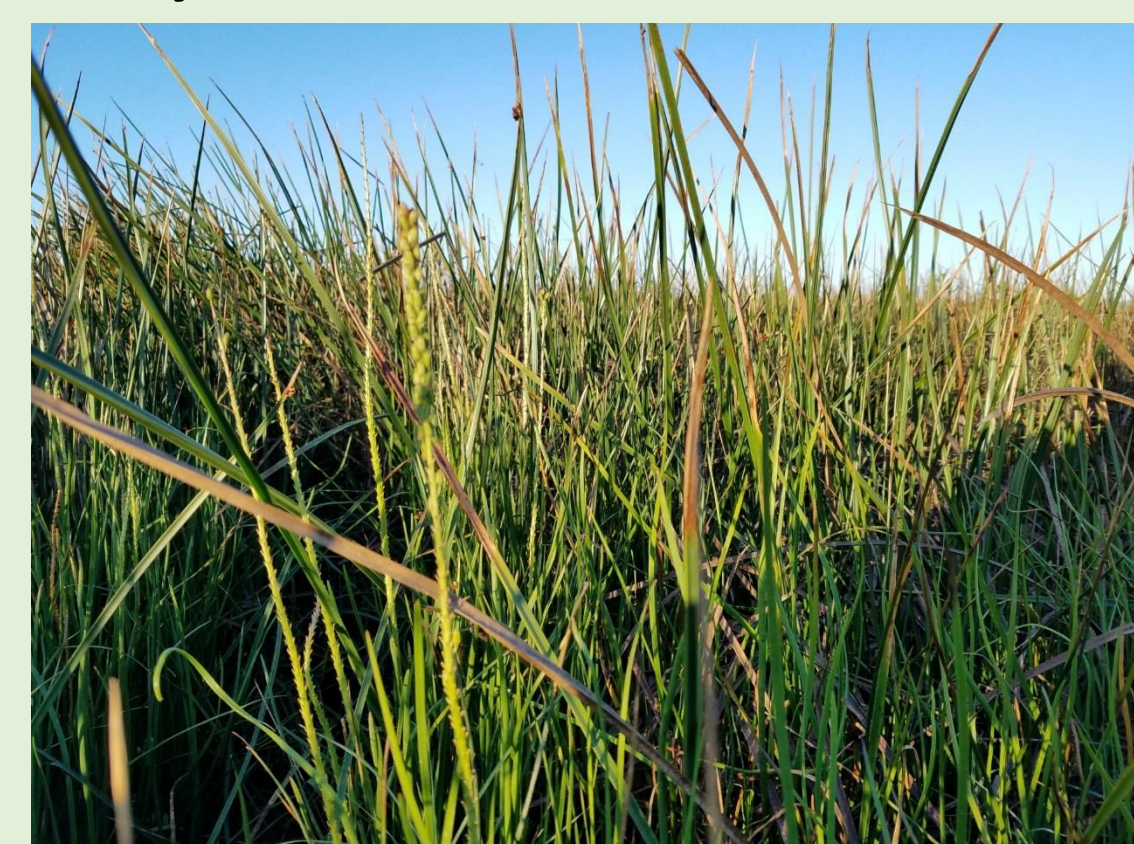
The marshes of China Camp State Park consist of broad expanses of marsh plain which were historically thought to be important to Salt Marsh Harvest Mice (SMHM; *Reithrodontomys raviventris*). Through a literature review, we identified three previous survey efforts that show declining SMHM captures; however, we believe that this may be due, in part, by a sampling bias to target tidal marsh and Pickleweed (*Salicornia*) dominated areas.

Location	Year	# SMHM	# Traps	Surveyor
1. Gallinas Creek	1960's	24	unknown	Fisler
2. Gallinas Creek	1975	1	100	Cummings
3. Turtle Back Hill	1980	2	200	Shellhammer & Simmons



Biologists believed that the muted tidal wetlands on the south side of the road could provide “escape cover” from extreme tide events due to taller vegetation, but the road was considered a potential barrier to SMHM movement. In Suisun Marsh SMHM are typically found in tall thick vegetation not just areas dominated by shorter *Salicornia*.

For China Camp we hypothesized SMHM would occur in the taller, thicker vegetation on the muted wetland side of the road that had not been surveyed in the past.



During high tides up to 90% of the available habitat can be temporarily lost. This reduction in habitat cover can lead to increased predation risk.

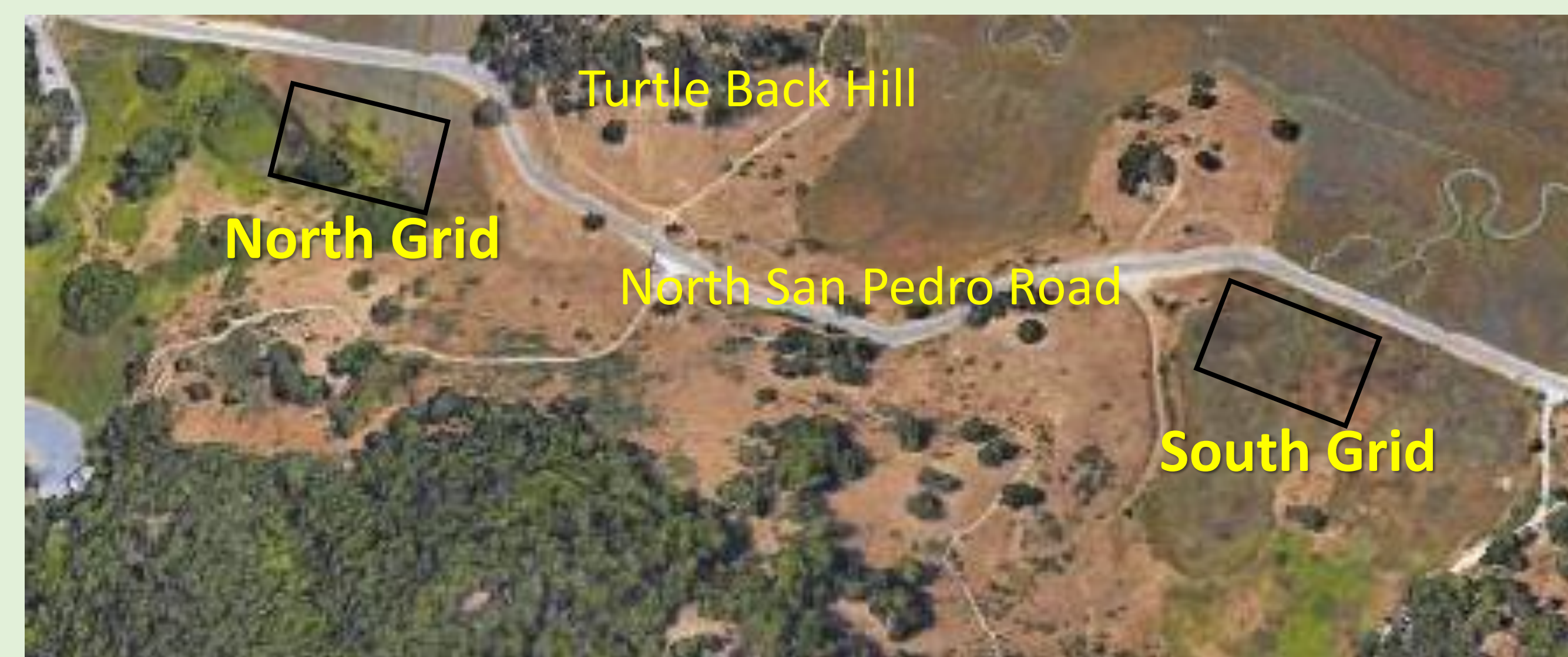


In a muted tidal system the area floods more slowly providing more time for mice to move with potentially more habitat remaining.

Methods



In September 2014 DFW and DWR staff surveyed China Camp State Park in order to collect genetic samples for the UC Davis Veterinary Genetics lab SMHM study. Due to the restriction of the road and culverts the tides are reduced in the two areas we chose to survey.



- Two grids of 50 traps were set south of N. San Pedro Road.
- North grid was immediately adjacent to the upland edge.
- South grid was closer to the road and lacked an upland edge.
- Vegetation in both grids consisted of *Salicornia*, *Distichlis*, *Frankenia*, *Grindelia*, *Juncus*, *Schoenoplectus*, and *Typha*.
- 100 traps were set for 3 nights = 300 trap nights.

Results

- A total of 32 *Reithrodontomys sp.* were captured
- Field staff correctly identified 18 of 19 SMHM, and all 11 *R. megalotis*. 3 mice were identified in the field as unknown *Reithrodontomys* and later genetically confirmed as SMHM
- All *R. megalotis* were captured in the North Grid
- Capture Efficiency equaled 7%.

Species	# of Individuals	North Grid	South Grid
<i>R. raviventris</i>	21	9	12
<i>R. megalotis</i>	11	11	0
<i>Microtus californicus</i>	8	6	2
<i>Peromyscus maniculatus</i>	8	8	0
<i>Mus musculus</i>	6	6	0

Implications



- When surveying for SMHM all vegetation types should be considered, especially tall vegetation.
- Upland edge habitat adjacent to tidal wetlands should be considered potential SMHM habitat especially in areas of high inundation.
- Muted tidal wetlands should be incorporated into tidal restoration project design to promote resilience from sea level rise threats.