

# *Reithrodontomys raviventris*, a Literature Review

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## 1 Introduction

The salt-marsh harvest mouse, also known as *Reithrodontomys Raviventris*, is an endangered species endemic to the San Francisco Bay Area, California. They are able to survive in environments whose water and vegetation contain a relatively high concentration of salt. (Shellhammer, 1989) There are two subspecies of salt-marsh harvest mice: the northern *Reithrodontomys raviventris halicoetes* and the southern *Reithrodontomys raviventris raviventris* (Shellhammer, 1982) This paper will give a cursory overview of all literature regarding the salt-marsh harvest mouse, including physiology, habitat, ancestral lineage, reproduction and diet.

## 2 Physiology and anatomy

The salt marsh harvest mouse is small, only 2.75 to 3 inches lengthwise. Its fur is buff to brown, and may have a dark stripe running down its back (epa.gov, 2015). Despite its name, *Reithrodontomys raviventris* often do not have any red coloration. They weigh 7.6 to 8.5 grams (Shellhammer, 1982).

There are some differences between the physical characteristics of the two subspecies, *R. r. raviventris* and *R. r. halicoetes*. The *R. r. raviventris* is of a darker hue, while the *R. r. halicoetes* is lighter. The ears of both subspecies are dark, and some may have tufts of hairs behind the ears (Shellhammer, 1982).

## 3 Reproduction

Unlike many other mammals, both subspecies of *R. r. raviventris* employ an unusual reproductive strategy. Breeding seasons are significantly longer for male members than female members. Males are active between April and September. Female *R. r. halicoetes* are active March to November, while their *R. r. raviventris* counterparts are only active from May to November. In general, there also seem to be more male *R. raviventris* than female *raviventris*—about 60% of each subspecies of the salt-marsh harvest mice are male. It is also likely that these two facts are related; with more males, the *raviventris* are able to breed even when a female is fertile at an unfavorable time (as there will likely be one or more males also ready at the same time). (Fisler, 1971)

Salt-marsh harvest mice are both solitary (Fisler, 1971) and nocturnal (Smith *et al.*, 2014), although they are sometimes active during the day.

## 4 Habitat and diet

The *raviventris*' persistence in salt marshes is indicative of its ability to survive on a diet high in salt, a quality considered unusual for a mammal. They are able to consume highly salinated water without any adverse effect on body weight or any occurrences of diarrhea. In particular, the *R. r. raviventris* is able to consume sea water, whereas the *R. r. raviventris* drinks water with salt content between fresh and sea water (Haines 1964, Shellhammer 1982) The *R. r. raviventris* prefers to have salt in its diet, but cannot survive on water with higher salt concentrations for extended lengths of time. The *R. r. halicoetes* prefers fresh water, but is able to survive for up to 13 months on sea water. The kidney of the *raviventris* produces a concentrated urine, a requirement for survival on salt water. It is able to process both with equal efficiency, and thus, the salinity of its water source does not appear to negatively affect lifespan (Haines 1964)

The *R. r. raviventris* can be found in salt marsh habitats, whereas the *R. r. halicoetes* can be found in brackish marshes. It is worth noting that the former subspecies is afforded an advantage over their relatives by this difference—salt marshes offer better coverage, and thus, better protection from predation and other environmental risks (Fisler, 1971). Specifically, the greatest non-predatorial, environmental risk for the *R. raviventris* is flooding. 99% of the time, harvest mice will use vegetation to escape (vertically) from floods. Only in the remaining 1% of cases do harvest mice travel upland to escape flooding. (Smith *et al.*, 2014)

Predatorial threats include the red fox (*Vulpes vulpes*), grey fox (*Urocyon cinereoargenteus*), domestic cat (*Felix domestica*), skunk (*Mephitis mephitis*) and racoon *Procyon lotor*. (Sacramento Fish and Wildlife Office staff, 2010)

The salt marsh harvest mouse subsists on seeds, flowers, cactus fruit, green sprouts and various invertebrates. It is very likely that the diets of both subspecies of *R. raviventris* consist of mostly vegetation (Shellhamer 1982), which may very well be why they have longer intestines than their forebears, the *R. megalotis*. Both subspecies appear to thrive in presence of halophytic vegetation, specifically, a mixture that is mostly of pickleweed and some alkalai heath, a smaller percentage of other marsh vegetation. (Geissel *et al.*, 1988; Bias *et al.* 2006) In addition, their fur does not collect water as quickly as that of the *megalotis*, which might make them better swimmers.

Its status as a critically endangered species is an aggregate of many factors, many of which are environmental. Changing environment due to diking, rising seawater levels, and expanses of open ground with no cover.

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