Point Reyes jumping mouse, *Zapus trinotatus orarius*

Paul W. Collins

Description: This is a small (211-238 mm TL), long-tailed (112-155 mm), dark yellow-brown mouse with an indistinctly bicolored dorsum, white ventrum, faintly tinged with yellow, sparsely haired bicolored tail, enlarged hind legs and feet (30-36 mm) adapted for jumping, internal cheek pouches, grooved upper incisors, wide pterygoid fossae, large oval infraorbital foramen, and baculum with a spade-shaped tip (Howell 1920c, Ingles 1965, Hall 1981, Gannon 1988, Jameson and Peeters 1988). The pelage of the Point Reyes jumping mouse is tricolored; the upper parts are dark to cinnamon-brown (ochraceous) overlaid with black hairs forming an indistinct dark dorsal band; the sides are lighter (orange-yellow flecked with coarse black hairs) than the back; and the underparts are mostly white, faintly tinged with yellow (Howell 1920c, Krutzsch 1954, Ingles 1965, Gannon 1988). The sparsely-haired tail is dark brown above and white to yellowish-white below (Krutzsch 1954). TL is 224.3 mm (range 222-249 mm), TAL is 129.4 mm (range 121-148 mm), and HF is 31.6 mm (range 30.0-34.0 mm) (Howell 1920c). It is distinguished from *Z. t. eureka* by its brighter coloration; shorter hind foot and tail (58% of TL); smaller skull with a narrower interorbital width; narrower interpterygoid fossa; shorter incisive foramina and molar tooth row; smaller, less inflated auditory bullae; and longer palatal bridge (Preble 1899, Howell 1920c, Krutzsch 1954).

Taxonomic Remarks: The Point Reyes jumping mouse is the southernmost population and smallest subspecies of the Pacific jumping mouse (Gannon 1988). Originally described as a monotypic species (*Z. orarius*) (Preble 1899, Howell 1920c), Hooper (1944) arranged it as a subspecies of *Z. trinotatus*, a conclusion later supported by Krutzsh (1954), based on morphological data.

Distribution: The Pacific jumping mouse occurs along the narrow, fog zone in coastal forests west of the Cascades, from southwestern British Columbia south along the coasts of Oregon and Washington to Marin County, California (Krutzsch 1954, Hall 1981). The Point Reyes jumping mouse is restricted to the Point Reyes Peninsula in southern and western Marin County (Krutzsch 1954). The elevational range of *orarius* is from 10 ft at the west end of Elk (=Tennessee) Valley to about 300 ft at Ledum Swamp 3 mi (4.8 km) west of Inverness (Williams 1986). The nearest known record for its conspecific, *Z. t. eureka*, is from Albion River, 0.5 km east of MacDonald's Ranch, Mendocino County, 115 km from the northernmost record for *orarius* (Lidicker in review).

The Point Reyes jumping mouse is known from five localities on the Point Reyes Peninsula in western Marin County and two localities on the Marin Headlands Peninsula in southern Marin County (Williams 1986 and Evens 1988). Four skulls were recovered from barn owl pellets collected from the Lewis Dairy at the west end of Elk (=Tennessee) Valley in extreme southern Marin County (Smith and Hopkins 1937). Hooper (1939) failed to capture any Point Reyes jumping mice in Elk Valley despite trapping areas of suitable-looking jumping mouse habitat. Recent trapping efforts at Point Reyes National Seashore and the Golden Gate National Recreation Area failed to capture a single jumping mouse (G. Fellers pers. comm.). According to Evens (1988:147), it is "probably distributed throughout the swales of the outer peninsula." There have been no intensive range-wide trapping programs for this taxon; as a result, its present distribution is poorly known.

Life History: The life history of the Point Reyes jumping mouse is not well known, but is expected to be similar to other subspecies of the Pacific jumping mouse (Maser et al. 1981, Gannon 1988, Zeiner et al. 1990). Pacific jumping mice are mainly nocturnal but show some crepuscular activity. Pacific jumping mice accumulate subcutaneous and visceral fat during the summer and fall to sustain them during winter hibernation (Gannon 1988). *Z. trinotatus* breeds from May to late September, and gives birth to one or two litters of five (range 4-8) young following an 18 to 23 day gestation

(Bailey 1936, Maser et al. 1981, Gannon 1988). During the summer, this species constructs a grass nest on the ground in lush, fine grass and vegetation (Mossman 1979). Young are born and reared in this well-hidden, fragile, spherical grass nest (Maser et al. 1981). Burrows are dug and used during winter hibernation (Maser et al. 1981). *Z. trinotatus* is primarily granivorous, preferring seeds of forbs, grasses and grass-like monocots (Jones et al. 1978). It also eats fruits, berries, certain fungi, and insects (Krutzsch 1954, Jones et al. 1978). Pacific jumping mice forage mostly at ground level in moist places where they cut plant stems in order to reach ripening seed heads (Bailey 1936, Gannon 1988). Predators include foxes, coyotes (*Canis latrans*), bobcats, house cats (*Felis sylvestris*), hawks, owls, snakes, and fishes (Gannon 1988, Zeiner et al. 1990).

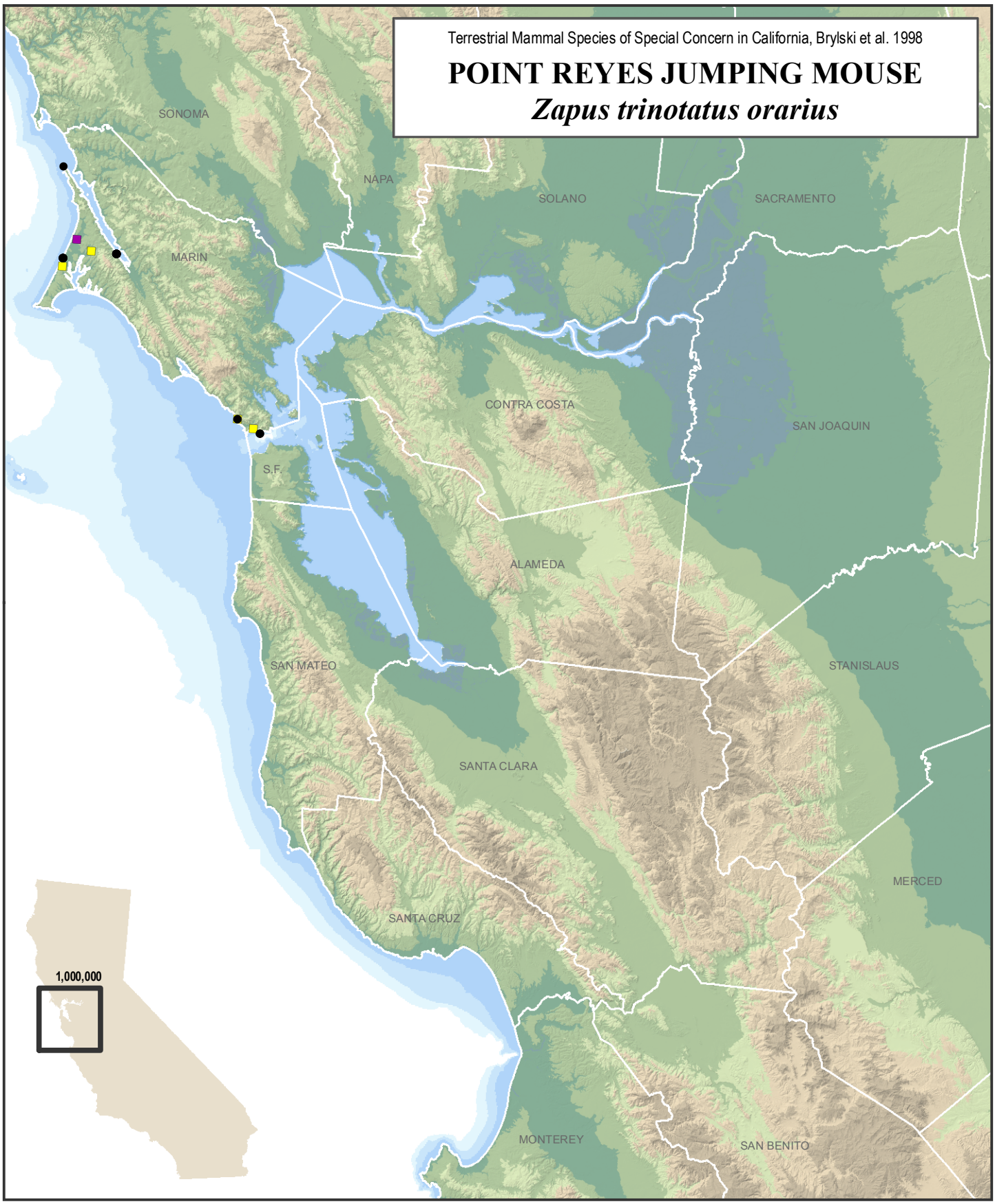
Habitat: In California, *Z. trinotatus* occur in wet, marshy coastal meadows (Jameson and Peeters 1988), loose, humus-filled dark soils associated with coast redwood forests (Gannon 1988), thickets of deciduous woody vegetation along streams and seepage areas, and, less frequently, in grassy areas beneath open-canopied coniferous forests (Zeiner et al. 1990). The species may require areas to burrow that are safe from winter floods (Krutsch 1954), moist areas overgrown with grass or weeds, and grassy habitats which have little or no grazing and some ground litter for adequate protection of their ground nests (Mossman 1979).

The habitats recorded for the species include bunch grass marshes on the uplands of Point Reyes Peninsula (Howell 1920c); meadows or marshlands with sedges or rushes, and occasionally with rather open low-growing chaparral (Hooper 1944); moist areas that are safe from continuous inundation (Krutsch 1954); and "wet, grassy meadows adjacent to coniferous forests, marshlands with high growth of sedges or rushes, or low-growing chaparral" (Evens 1988).

Status: Class II. The principal causes for concern are its restricted range, small population size, and the absence of captures in recent surveys. In addition, native habitats within a large portion of this taxon's historic range in Marin County have been degraded through a century or more of intensive livestock grazing, and conversion to agricultural uses (Evens 1988). Native perennial grassland and marshland habitats suitable for *Z. t. orarius* still occur at the Point Reyes National Seashore. Although grazing pressure from introduced herbivores has been reduced in the Point Reyes area since the establishment of Point Reyes National Seashore, over 5,000 head of cattle, an unknown number of feral pigs, 300-500 axis deer, and over 900 fallow deer continued to degrade native habitats as of 1988 (Evens 1988). Although current park policy is aimed at further reducing grazing pressure in sensitive areas (Evens 1988), there are no policies or action plans in place that will protect habitat occupied by jumping mice from grazing. The recent Mount Vison fire destroyed habitat, but its impact on the Point Reyes jumping mouse is unknown, in part owing to the uncertainty of whether the species hibernates like other populations of *Z. trinotatus* (G. Fellers pers. comm.).

Management Recommendations: The National Park Service and other responsible public agencies should develop and implement policies to protect remaining areas of native habitat that either contain or could contain this species, and should evaluate possible impacts to this taxon from any future developments or changes in land use practices proposed for lands they administer. The National Park Service should evaluate the impact of grazing on *orarius* at Point Reyes National Seashore, and mitigate these impacts as appropriate. Perennial grasslands, wet grassy meadows, and grassy margins of freshwater marshlands, streams and seepages should be intensively surveyed for this taxon and, if found to support extant populations, should be protected from further degradation due to introduced herbivore grazing and feral pig rooting. Studies are needed to gather information on the species' distribution and status, habitat requirements, home range, density, dispersal distance, food habits, reproductive biology, and the effects of feral herbivore grazing and fires. Field surveys

should be conducted for *orarius* to determine its current distribution, including suitable habitat outside its historic range, especially to the northeast (e.g., Mount Tamalpais State Park) (Lidicker in review).


Terrestrial Mammal Species of Special Concern in California, Brylski et al. 1998
POINT REYES JUMPING MOUSE
Zapus trinotatus orarius
SONOMA
NAPA
SOLANO
SACRAMENTO
MARIN
CONTRA COSTA
SAN JOAQUIN
S.F.
ALAMEDA
SAN MATEO
STANISLAUS
SANTA CLARA
MERCED
SANTA CRUZ
MONTEREY
SAN BENITO
1,000,000
RESOURCES AGENCY
CALIFORNIA
DEPARTMENT
FISH & GAME
Locations verified by authors
(captures, observations, museum records)
CNDDB 1979 - 1998
CNDDB 1978 and before
Wildlife Branch:KFien12109