

## The Heather Vole, Genus *Phenacomys*, in Alaska

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Four specimens of heather vole (genus *Phenacomys*) collected in the coastal mountains of Southeast Alaska document the first Recent records of this vole in Alaska. Alternative hypotheses on the relationship of these newly-discovered populations to extant and historical populations are outlined, and additional studies proposed.

Key Words: Heather vole, *Phenacomys* sp., Southeast Alaska.

Since publication of a synopsis of the land mammal fauna of Southeast Alaska (MacDonald and Cook 1996), new field and laboratory studies of the mammals of this region have resulted in new perspectives on the zoogeography of the North Pacific Coast (Conroy et al. 1999; Cook and MacDonald 2001; Cook et al. 2001). In our 1996 publication, we speculated that several mammal species found on the eastern side of the coastal mountains in Canada may occur along the Alaska coast. One species, the heather vole (*Phenacomys intermedius*), had previously been recorded within 2 km of the southern Alaska border in the subalpine near Salmon Glacier in British Columbia (approximately 56.17° N, 130.03° W), and Nagorsen and Jones (1981) reported its occurrence in the Chilkat Pass north of Haines and Southeast Alaska. Subsequent trapping efforts in Alaskan mountains near Salmon Glacier and elsewhere along the mainland coast resulted in the capture of four specimens of this vole (Table 1) from two widely separate localities (Figure 1). These specimens, deposited at the University of Alaska Museum (UAM), constitute the first documented records of extant populations of heather vole in Alaska.

On 11 August 1996, we captured a single heather vole (UAM 42371) above timberline in the glacially-isolated Chilkat Range at the northern end of Southeast Alaska near Excursion Inlet, Glacier Bay National Park (58.41° N, 135.43° W; elevation approximately 900 m). Also recorded in this alpine area were *Sorex monticolus* and melanistic *Marmota caligata*.

In 1999, three heather voles were collected from the far southern end of mainland Southeast Alaska, approximately 400 km south of the 1996 Glacier Bay record. On 23 September 1999, two male (UAM 64239, UAM 64240) and one female (UAM 50000) heather voles were found in subalpine habitat along the Titan Trail in the Reverdy Mountains, approximately 10 km north of Hyder, Alaska (approximately 55.83° N, 130.03° W; elevations between 1128-1220 m). *Synaptomys borealis* was also sampled at this site.

The distribution of the heather vole is poorly known throughout western North America (Figure 1) and geographic variation has been little studied (for overviews see McAllister and Hoffmann 1988; Nagorsen 1990; Musser and Carleton 1993). Some authorities (Anderson 1942; Cowan and Guiguet 1965; Peterson 1966; Hallett 1999) recognized the distinctiveness of western populations (*P. intermedius* of westcentral British Columbia south to California and New Mexico) and separated them from *P. ungava* in the north and east (southern Yukon Territory and northern British Columbia eastward to Newfoundland) (McAllister and Hoffmann 1988; George 1999); others considered all to comprise a single species (Crowe 1943; Youngman 1975; Honacki et al. 1982; Nagorsen 2004). Hall (1981) speculated that *intermedius* may be a composite of two or three allopatric species (see McAllister and Hoffmann 1988), but the lack of specimens from too few areas has prevented meaningful progress in resolving the problem. Reluctance of this species to enter traps may be the primary factor limiting sample size and study materials (McAllister and Hoffmann 1988).

The taxonomic affinities of newly-discovered populations of heather vole in Southeast Alaska are not immediately evident. Based on the map provided by Hall (1981: 787, as adjusted by McAllister and Hoffmann 1988 and Nagorsen 2004), Alaska's southernmost heather voles could share close kinship with the *P. i. intermedius* group of "western" heather voles occurring in the coastal mountain ranges of adjacent British Columbia. Heather voles from northern Southeast Alaska, on the other hand, might possibly have connection with the "eastern" populations (as *P. ungava mackenzii*) in northwestern British Columbia and southern Yukon Territory. Both of these scenarios presume relatively recent colonization from inland populations following the (ongoing) retreat of the last major glaciation from the region. A similar scenario has been proposed for American Marten (*Martes americana*) (Stone et al. 2002) and other mammals (Cook

TABLE 1. Summary of specimen data from collection notes and records at the University of Alaska Museum (UAM). Alaska Frozen Tissue Number refers to the cryogenic collection administered by UAM. Measurements and abbreviations are as follows: total length-tail length-hind foot-ear from notch (in millimeters)≡mass (in grams); t = testes (length and width in mm), plsc = number of placental scars on right and left uterine horn; F = female, M = male.

UAM Catalog Number	Alaska Frozen Tissue Number	Sex (Reproduction)	Measurements
42371	17262	M (t=2X3)	120-31-19-11≡19
50000	30176	F (plsc: 4R, 0L)	156-37-18-14≡33.9
64239	30178	M (t=3X2)	129-32-17-13≡22.8
64240	30179	M (t=3X2)	115-26-16-10≡14.6

et al. 2001). An alternative hypothesis, however, is that one or more of these populations are remnants of a former coastal population whose origin in the region preceded the last glacial advance (MacDonald and Cook 1996; Fleming and Cook 2002).

The discovery of late Pleistocene fossil remains of *Phenacomys* in limestone cave deposits in the Alexander Archipelago of Southeast Alaska has added historical dimension to these hypotheses. Preliminary

analyses of thousands of rodent teeth recovered from *On Your Knees Cave* at the extreme northwest corner of Prince of Wales Island in Southeast Alaska (Figure 1) (Heaton 1995, 2004\*; Heaton and Grady 2003) indicate that Heather Voles had been present in the vicinity of this site during the Middle Wisconsin up to the start of, but not during or following, the last glacial maximum (between about 24 000 to 13 000 years ago) (Heaton 2004\*; Heaton and Grady 2003). Other

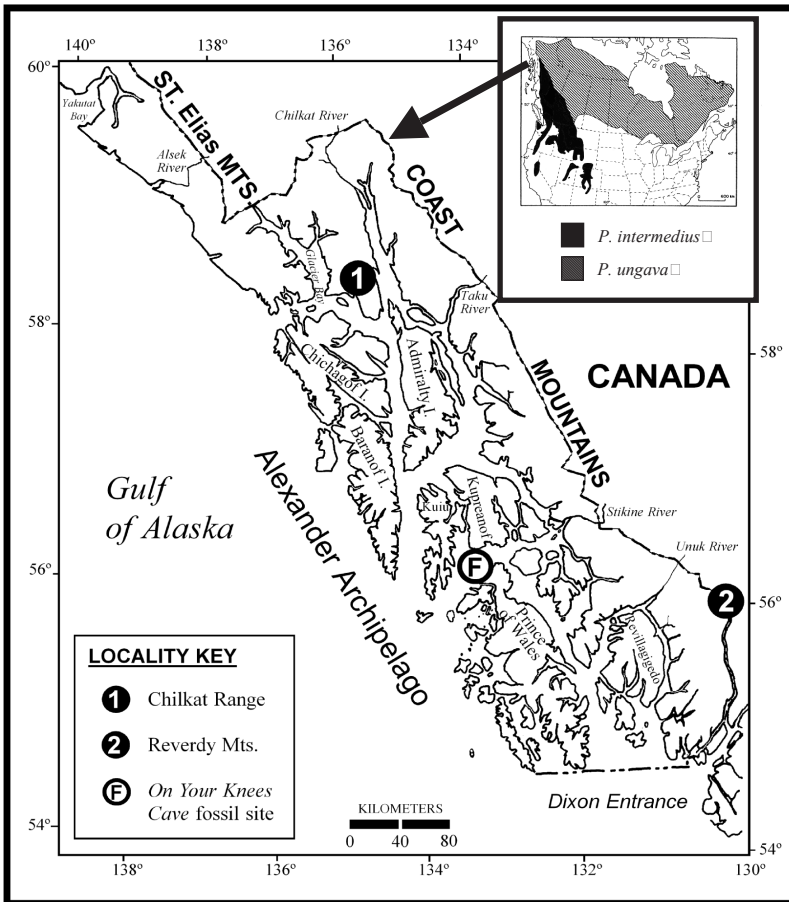


FIGURE 1: Localities of specimens of *Phenacomys* in Southeastern Alaska from Recent and Late Pleistocene sites. Inset range map modified according to McAllister and Hoffman (1988) following subspecific designations suggested by George (1999) and Hallett (1999).

rodent remains discovered in these same pre-glacial deposits were Brown Lemming, *Lemmus trimucronatus*, a species thought absent from the region but recently discovered by UAM in the mountains near Haines, and the Hoary Marmot, *Marmota caligata*, a species now restricted to mainland localities.

How the new records of *Phenacomys* from Southeast Alaska relate to extant and historical populations has yet to be determined. Analyses of samples using modern molecular and morphological techniques could help clarify these relationships and provide a test of alternate hypotheses on the origin and dynamics of the region's biota. Clearly, more samples from more localities are needed. An expanded effort to excavate fossils throughout the region, along with a continuation of survey efforts to further define the current distribution of *Phenacomys* and other mammals that share a deep history in the region (e.g., *Lemmus*, *Marmota*), as well as provide adequate samples for assessment, are needed. The alpine zone of Southeast Alaska is virtually unexplored and future inventories need to target sites above treeline along the mainland as well as on the more mountainous islands in the Alexander Archipelago.

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