

Anastasia Island Beach Mouse 'At Home' at Fort Matanzas National Monument

By Philip A. Frank

Fort Matanzas National Monument (FMNM) is a small park on the southern tip of Anastasia Island, a slender 14 km long barrier island on the Atlantic coast of NE Florida. Its featured attraction is a beautifully preserved 16th century fortification built by the Spanish to control access from the south to the town of St. Augustine. Less well known is its status as a prime example of coastal strand--one of Florida's rarest and most imperiled natural communities. The dune communities there are home to a wide variety of wildlife, including several threatened and endangered species, most notable of which is the Anastasia Island beach mouse (AIBM, *Peromyscus polionotus phasma*), a small mammal endemic to the Island.

Beach mice are coastal forms of the more common and widespread oldfield mouse that occurs throughout the southeastern United States. These mice inhabit coastal dunes along the

Atlantic coast of Florida and the Gulf coasts of Florida and Alabama. Beach mice are habitat specialists, preferring primary dunes and adjacent coastal strand and scrub. They are entirely nocturnal and pale in coloration, closely matching the light beach sands they inhabit.

Because of beachfront development throughout Florida, the loss of beach mouse habitat has been extensive, and much of the remaining habitat is fragmented, disturbed, and occupied by exotic cats and house mice. As a result, 6 of the 8 subspecies of beach mice are listed as either threatened or endangered, and one subspecies formerly found on the barrier island to the south of Anastasia Island is believed to be extinct (Humphrey and Barbour 1981).

The AIBM was listed as endangered in 1989, and I have been conducting field research stressing basic ecology in order to guide management for the beach mouse. Research has been funded

by the Florida Game and Fresh Water Fish Commission's Nongame Program, with additional support from the University of Florida and the Florida Museum of Natural History.

Anastasia Island is developed over most of its length; only 2 parcels of land remain essentially undisturbed. Fortunately, both are publicly owned, and are managed with the needs of the beach mouse in mind. Anastasia State Recreation Area (ASRA), located at the island's northern end, is managed by the Florida Park Service and has approximately 6.5 km of linear dune habitat. FMNM at the southern end is considerably smaller, with about 1 km of linear dune habitat. Because of the protected status of FMNM and ASRA, these locations are critical to the long-term persistence of the AIBM.

The primary method used to study the beach mouse was live trapping--on a series of grids located at FMNM and ASRA, and on transects

located over the entire length of the island. The grids were trapped quarterly from January 1989 to January 1991, and the transects were trapped during the summers of 1989 and 1990. Information from the grids was used primarily to estimate beach mouse density and predator (feral cats) abundance, while the transects provided data on island-wide distribution. The main study sites were FMNM and ASRA, although beach mice also were studied in a variety of conditions including severely degraded habitats adjacent to development.

Beach mice are distributed over nearly the entire island, with the exception of an area where the natural vegetation has been replaced with concrete reinforcement to deter erosion. The mice occupy sites with conditions ranging from relatively pristine (ASRA and FMNM) to severely degraded. Their population levels were found to be extremely variable, both in space and time. In high quality habitat, densities may range from 2 mice/ha to 90 mice/ha, with an average density of around 30 mice/ha. Over the 2 years of trapping, no seasonal pattern in abundance was obvious, although there was a tendency for populations to be at high levels in winter. Densities in the disturbed habitat adjacent to development were generally much less, compared to ASRA and FMNM. Habitat availability, habitat quality, and the presence of large numbers of domestic cats may have caused this difference.

Although separated only by a short distance and appearing superficially similar, population dynamics at FMNM and ASRA were quite different, suggesting different ecological factors are operating at these locations. One striking difference was the presence of large numbers of feral cats at ASRA, whereas cats were quite rare at FMNM. Data collected at ASRA over the 2 year study suggest a negative correlation between cat abundance and beach mouse density (Fig. 1). That cats are capable of deplet-

ing wildlife populations is common wisdom among field biologists (Churcher and Lawton 1989), but field documentation is usually lacking.

Recommendations for management of the AIBM include eliminating cats, both feral and free-ranging domestic types, from beach mouse habitat, preventing habitat damage from foot and vehicular traffic, educating the public on the plight of the beach mouse, and establishing a second population separate from Anastasia Island. This second population establishment is a high priority for the recovery of the AIBM, as it will reduce the potential for extinction caused by a catastrophic hurricane such as Hugo, which devastated the Carolina coast in 1989.

I am currently working on a reintroduction project in cooperation with the Florida Park Service, the National Park Service, and the U.S. Fish and Wildlife Service. The reintroduction would be to Guana River State Park, a prime site within the historic range of the subspecies located on a barrier island immediately north of Anastasia Island. Using methods like those used in a similar project (Holler et al. 1989), approximately 20 pairs of mice will be taken from several locations on Anastasia Island, including FMNM, so as to include the range of genetic variability into the founder population.

The reintroduction began in the fall of 1992, a time of maximum food availability and population densities, and the population will be monitored for 1 year, initially. Success of the reintroduction effort will be measured by growth and expansion of the population. If successful, this effort will significantly enhance the survival probability for this unique mammal.

I would like to acknowledge Wallace Hibbard, Brian Peters, and Rick Gushew of the NPS (FMNM) and Doug Carter, Paul Crawford, and Robin Huck of the Florida Park Service (ASRA), who provided valuable assistance, as well as Dr. Stephen Humphrey of U/FL who

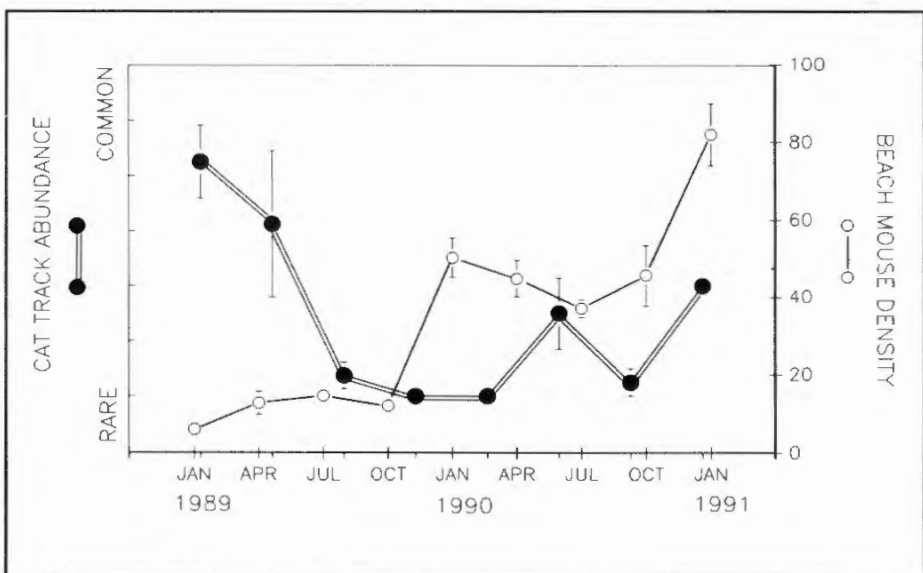


Figure 1. Beach mouse density (individuals/ha) at Anastasia Island State Recreation Area, St. Johns County, FL, compared to house cat abundance as determined through track counts indices. Cat numbers were reduced by park staff beginning in fall, 1989, followed by a significant increase in the beach mouse population.



The Anastasia Island Beach Mouse

initiated this research and gave ongoing advice and assistance. Rebecca Henson was invaluable in the field.

Frank is a Ph.D. candidate at U/FL, Dept. of Wildlife and Range Services.

Literature Cited

- Churcher, P.B. and Lawton, J.H. 1989. Beware of well-fed felines. *Nat. History* 7:40-46.
- Holler, N.R., D.W. Mason, R.M. Dawson, T. Simons, and M.C. Wooten. 1989. Reestablishment of the Perdido Key Beach Mouse on Gulf Islands National Seashore. *Conservation Biology*, 3:397-404.
- Humphrey, S.R. and D.B. Barbour. 1981. Status and habitat of three subspecies of *Peromyscus polionotus* in Florida. *J. Mammal.*, 62:840-844.