

## Chapter 1

# THE *MARTES* COMPLEX: A MONOPHYLETIC CLADE THAT SHARES MANY LIFE-HISTORY TRAITS AND CONSERVATION CHALLENGES

Gilbert PROULX and Keith B. AUBRY

**Abstract:** Recent phylogenetic, phylogeographic, and morphometric studies have established the genetic affinities of the American marten (*Martes americana*), Pacific marten (*M. caurina*), European pine marten (*M. martes*), stone (beech, house) marten (*M. foina*), Japanese marten (*M. melampus*), yellow-throated marten (*M. flavigula*), Nilgiri marten (*M. gwatkinsii*), sable (*M. zibellina*), fisher (*Pekania pennanti*), wolverine (*Gulo gulo*), and tayra (*Eira barbara*). In this chapter, we evaluate the extent to which species in the *Martes* Complex share ecological adaptations and biological traits, and how such commonalities may be used for the conservation of species. Historical biogeography and recent research findings have shown that landscape connectivity was essential for species in the *Martes* Complex to avoid habitat isolation, and to maintain genetic connectivity through dispersal. Most species in the *Martes* Complex are associated with forests with high basal areas and large-diameter trees that provide complex vertical and horizontal structure, including snags and decaying trees, high volumes of fallen deadwood, and a well-developed understory. Denning and resting sites for species in the *Martes* Complex consist of tree cavities in large dead or live trees, hollow logs, rock crevices, burrows of other animals, and buildings. All species have a relatively broad food niche, which varies seasonally and annually depending on environmental conditions and food availability. Most species are polygamous, but the yellow-throated and Nilgiri martens are monogamous, and the tayra is likely promiscuous. They have a well-defined breeding season except for the subtropical and tropical tayra and yellow-throated marten, which have at least 2 oestruses/year. With the exception of the tayra, all exhibit delayed implantation of the blastocyst. Habitat loss and fragmentation, which may be caused by climate change, is the major threat endangering the persistence of species in the *Martes* Complex. The development of a conservation program to counteract habitat loss must first aim at the retention of landscapes with a

network of corridors interconnecting forest mosaics. These mosaics will provide species in the *Martes* Complex with forest stands, woodlots, and hedgerows containing complex vertical or horizontal structure that provide protection from predation and extreme temperatures, a diversified and abundant prey base, and secure denning and resting structures that provide thermoregulatory benefits and security for mothers and their young. A comprehensive evaluation of the ecological similarities among these species will require additional research.