Eastern chipmunk (*Tamias striatus*)

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Abstract—*Tamias striatus* (Linnaeus, 1758) is a sciurid commonly called the eastern chipmunk. *Tamias striatus* is solitary, diurnal, omnivorous, and undergoes winter torpor. Individuals establish solitary home ranges centered around extensive burrows. Diseases and parasites that affect *T. striatus* include West Nile Virus, Cuterebrid bot flies, and Baylisascaris procyonis. Tamias striatus is abundant throughout its range in eastern North America, inhabiting hardwood forests. It is 1 of 25 species within the genus *Tamias*, and the only member of subgenus *Tamias*. The species is considered non-threatened, and is commonly seen throughout its range.

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*Tamias striatus* (Linnaeus, 1758)

**CONTEXT AND CONTENT**

Order Rodentia, suborder Sciuromorpha, family Sciuridae, subfamily Xerinae, tribe Marmotini. *Tamias* is not monotypic.

**GENERAL CHARACTERS**

*Tamias striatus* is a small rodent, weighing between 73 and 136 g. Total body length is 205 to 299 mm. Tail length is 69 to 115 mm. Dorsal pelage is reddish brown, with five dark stripes alternated with two light buff stripes. Stripes are also found on the sides of the head. The tail is somewhat flattened and fully furred. Ventral pelage is whitish; sometimes buff (Fig. 1; Sealander 1979). *Tamias striatus* is not sexually dimorphic (Elliot 1978).

**DISTRIBUTION**

*Tamias striatus* is widely distributed throughout its range in eastern North America (Rowe et al. 2006). The northern extent of their range is the southern tip of James Bay Canada, and the southern limit is the Gulf of Mexico (Fig. 2; Elliot 1978).

**FORM AND FUNCTION**

The skull of *T. striatus* is superiorly flattened with a shallow brain case (Fig. 3). The upper incisors are slightly recurved and short, molars are low crowned with wide
spaced cusps, and there may be subsidiary cusplets between primary cusps (Howell 1938). Dental formula is i 1/1, c 0/0, p 1/1, m 3/3, total 20 (Sealander 1979).

ONTOGENY AND REPRODUCTION

*Tamias striatus* reproduces in spring and summer, though individual females may only have one litter per year. Estrus lasts one day, and most females within an area will go into estrus within a few days of each other. Both sexes mate multiple times with multiple partners, copulating in cavities. Gestation length is approximately 30 days (Elliot 1978). Litter size ranges from 1 to 8, averaging 4 to 5 young. The neonates are altricial and are reared in a nest chamber within the burrow (Sealander 1979). Juveniles emerge from the burrow at about 40 days of age and disperse about 1 to 2 weeks later (Elliot 1978). Females begin reproducing at one year of age (Sealander 1979).

ECOLOGY

**Population characteristics.**—Dispersal of juveniles varies between sexes, with males dispersing up to 345 m from the natal burrow. Females disperse approximately 85 m and may overlap home ranges with their mothers (Burke da Silva et al. 2002). Potential lifespan of *T. striatus* may be as long as eight years; however, longevity in the wild is generally 2 to 3 years (Sealander 1979).

**Space use.**—*Tamias striatus* is adapted to mature deciduous forests with sparse understory vegetation. Forest fragmentation is not a large concern to the chipmunk, especially if there are forested travel corridors. Individuals have been documented crossing open fields >220 m wide (Reunanen and Grubb 2005).

The eastern chipmunk establishes a solitary home range of approximately 0.5 to 1 acre, with a central home burrow maintained from season to season. Home ranges may overlap slightly, but only in the less used outer regions. Individuals do not usually travel more than 45 m from their burrows. During breeding season males will occasionally move from 60 to 90 m from their burrows in search of females in estrus. A single female’s home range may be visited by up to 12 different males while she is in estrus (Elliot 1978).

**Diet.**—Although *T. striatus* is omnivorous, the species feeds primarily on seeds, buds, and berries (Reunanen and Grubb 2005). Other components of the eastern chipmunk’s diet include songbird eggs (Schmidt et al. 2001) and invertebrates (Mahan and Yahner 1998).

*Tamias striatus* relies on food stores cached in the fall to survive winter torpor. These food stores consist primarily of acorns, beechnuts, and sugar maple seeds (Humphries et al. 1998).
Red oak acorns are the preferred food for winter larders because of their higher lipid content (Wood 2005).

**Diseases and parasites.**—The eastern chipmunk is parasitized by Cuterebrid botflies (also called warbles—Jaffe 2005). Bot flies lay their eggs at the entrance to burrows; the hatched larvae enter the host’s eyes, nose, or mouth. The larvae then move beneath the skin to the inguinal region where they mature and burst through the skin of the host. Infection of the lesion after the larvae leaves its host can cause death if the infected individual was heavily parasitized (Elliot 1978).

West Nile Virus is prevalent in *T. striatus*, and is contracted from mosquitoes. The disease can be passed both from mosquitoes to *T. striatus* and vice versa. West Nile Virus causes brain, kidney, and liver lesions; neurological symptoms such as head tilting, lethargy, and lack of coordination; and death in *T. striatus* (Platt et al. 2007).

*Tamias striatus* is also parasitized by *Baylisascaris procyonis*, a lower-intestine dwelling nematode. Individuals are infected when foraging in raccoon feces. The larval cycle includes migration within the body, often into the central nervous system. *Baylisascaris procyonis* causes fatal or severe neurological disease in over 50 species of mammals and birds (Page et al. 2001).

**BEHAVIOR**

**Grouping behavior.**—*Tamias striatus* is solitary, aggressive, and intolerant of other individuals. No long-term social bonding occurs. Social interactions between adults outside of the breeding season consist primarily of aggressive chases, usually when one individual ventures too close to the center of another’s home range. The greatest extent of social cooperation in *T. striatus* is the use of alarm calls to alert other individuals to the presence of predators. (Elliot 1978).

**Reproductive behavior.**—Females stay within their home range during estrus. Many neighboring males will journey to her home range in order to mate. Both males and females mate multiple times with multiple partners. There is no pair bonding between males and females. *Tamias striatus* is diestrous, with breeding seasons in spring (February through April) and summer (June through August). Juveniles stay in the burrow for approximately 40 days, emerging in late spring (April through June) or early fall (August through October) depending on the breeding season. Juveniles disperse between 1 to 2 weeks later (Elliot 1978).

**Communication.**—*Tamias striatus* uses three distinctive alarm calls to alert other chipmunks to the presence of predators: a chuck, a chip, and a trill. A chuck is used when an individual spots an aerial predator, a chip for terrestrial predators, and trills when a predator is pursuing an individual. Individual response to these alarm calls varies depending on call rate and number of individuals calling (Weary and Kramer 1995).

**Foraging.**—*Tamias striatus* creates hoards to store food. Scatter hoarding is much less prevalent than larder hoarding since individuals use their burrow hoards during winter torpor. In the autumn, chipmunks use their expansive cheek pouches to carry seeds and acorns gathered both on the ground and in the crowns of trees. (Elliot 1978).

During winter months, *T. striatus* uses burrow hoards gathered in the fall as the primary source of energy. Individuals create several hoards within their burrows, storing surplus food to last the entire winter. When *T. striatus* emerges from hibernation in the spring, overwintered seeds and acorns are the primary source of food (Elliot 1978).

*Tamias striatus* raids songbird nests for eggs (Schmidt et al. 2001). *T. striatus* also forages for undigested berry seeds and corn in raccoon feces (Page et al. 2001).

**Winter Torpor.**—*Tamias striatus* is a food-storing hibernator. Rather than storing fat, *T.
*striatus* creates a larder of various tree seeds in its burrow. Individuals are solitary, and remain in their burrows for 4 to 7 months (Humphries et al. 2003). During bouts of torpor, individuals rouse every 3 to 4 days to eat from their hoards (Elliot 1978).

**CONSERVATION**
*Tamias striatus* is not endangered, and is considered a species of least concern by the International Union for Conservation of Nature and Natural Resources Red List (IUCN 2007).

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