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Longevity Record For A Wild Allegheny Woodrat (*Neotoma magister*) In West Virginia

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ABSTRACT

The Allegheny woodrat (*Neotoma magister*) is found throughout much of the central and southern Appalachians and adjacent portions of the Interior Highlands. Allegheny woodrats have declined in the northern portions of their range and are state-listed as threatened, endangered or sensitive species of concern in every state where they occur. Until recently, biologists have had to rely on biological data collected from the closely related eastern woodrat (*N. floridana*) because of limited research on the Allegheny woodrat. We have been studying the ecology and natural history of woodrats in Virginia and West Virginia since 1990. On 8 August 1997 we caught and ear-tagged a juvenile female woodrat. She was caught a total of 24 times in the same outcrop from 1997 through 2002. A conservative estimate of her age on 25 January 2002 was 1,734 days or 57.8 months. This extends the record longevity for a wild Allegheny woodrat by 70 days or 2.3 months. Regardless, her known time alive (from first capture to last) of 1,630 days still surpasses previous estimates of longevity for the Allegheny woodrat

INTRODUCTION

The Allegheny woodrat (*Neotoma magister*) is found throughout much of the central and southern Appalachians and adjacent portions of the Interior Highlands. It is widespread but uncommon in Virginia and West Virginia (Mengak, 1998). It is a habitat specialist closely associated with rock outcrops, cliffs, talus slopes, boulder fields and cave entrances. Allegheny woodrats are tolerant of a wide range of macrohabitats but select specific habitats based on microhabitat features (Castleberry *et al.*, 2002b). The Allegheny woodrats' natural history and role in the local food web and in forest dynamics is unclear. Fungi and mast (hard and soft) are major components of the woodrats diet (Castleberry *et al.*, 2002a) but it is not known what role woodrats play, if any, in the distribution of mycorrhizal fungi and forest regeneration. In this ecoregion, the rough and inaccessible areas inhabited by woodrats generally have not been subject to direct, large-scale disturbances from human activities such as logging, agriculture, or second-home development. The long-term effect of disturbances to

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adjacent habitats on woodrat populations is unclear even as regional land use activities such as forest management and mining continue to increase in intensity. Natural history information on woodrats is needed to assess population status and recommend actions to ensure the long-term survival of this species.

Allegheny woodrats have declined in the northern portions of their range and are state-listed as threatened, endangered or sensitive species of concern in every state where they occur (Beans, 1992; Laerm *et al.*, 2000; Castleberry *et al.*, 2002a). Nonetheless, they still appear to be abundant in appropriate habitat in the central Appalachians of Kentucky, Virginia and West Virginia. Reasons for decline are unclear and are the subject of debate but likely include severe weather (Nawrot and Klimstra, 1976), increased avian and meso-mammal predation (Balcom and Yahner, 1996), reduced hard mast production brought about by the elimination of the American chestnut (*Castanea dentata*) and gypsy moth (*Lymantria dispar*) infestation in oak (*Quercus* spp.) forests (Hall, 1985), vegetation change from white-tailed deer (*Odocoileus virginianus*) herbivory (Hassinger *et al.*, 1996), raccoon roundworm (*Baylisascaris procyonis*) parasitism (McGowan and Hicks, 1996) and habitat fragmentation (Balcom and Yahner, 1996).

Until recently, biologists have had to rely on biological data collected from the closely related eastern woodrat (*N. floridana*) because of limited research on the Allegheny woodrat. However, numerous recent reports have addressed the ecology and natural history of the Allegheny woodrat including studies on landscape characteristics (Balcom and Yahner, 1996), population genetics (Castleberry *et al.*, in review), effects of timber management (Castleberry *et al.*, 2001), summer microhabitat selection (Castleberry *et al.*, 2002b), food habits (Castleberry *et al.*, 2002a), ectoparasites (Castleberry *et al.* in review), reproduction and juvenile growth (Mengak, 2002), and longevity (Mengak, 1997; 2000). With this note, we extend the record for longevity in a wild Allegheny woodrat and comment on reproductive strategy.

Previous records for longevity by a wild Allegheny woodrat were 1,468 days and 1,502 days (Mengak, 1997). An additional record for longevity was reported as 1,664 days (Mengak, 2000). Prior to the work by Mengak (1997; 2000) reported lifespans for Allegheny woodrats were up to 48 months in captivity (Poole, 1940). Other reports for the genus include 991 days for wild eastern woodrats (Fitch and Rainey, 1956), 67 months for captive desert woodrats (*N. lepida*; Landstrom, 1971) and 60 months for captive white-throated woodrats (*N. albigula*; Landstrom, 1971).

A juvenile woodrat (#607) was first caught on 8 August 1997 on Mead-Westvaco Corporation's Wildlife and Ecosystem Research Forest (WERF) in Randolph County, West Virginia (38° 42'N, 80°3'W). The WERF is a 3360 ha area reserved for the study of industrial forestry impacts on ecosystems and ecological processes in an Appalachian setting (Ford and Rodrigue, 2001). The WERF has been described in detail in previous reports (Castleberry *et al.*, 2001; Castleberry *et al.*, 2002a; Castleberry *et al.*, 2002b). Mengak (1997; 2000) described the capture and marking methods. She was caught in a large rock outcrop in the Rocky Run drainage at an elevation of 920 m. The 2.5-3 ha site's vegetation primarily was a small sawtimber-sized northern hardwood forest with an abundant rhododendron (*Rhododendron maximum*) and greenbrier (*Smilax* spp.) shrub layer. Her weight at initial capture was 150 g. She was caught a total of 24 times in the same outcrop from 1997 through 2002. At her most recent capture on 25 January 2002, she weighed 285 g. Assuming a birth weight of 17 g (Mengak 1997; 2000) and an average weight gain of 1.26 g/d (Mengak, 2002), her estimated birth date was 25 April 1997. Therefore, a conservative estimate of her age on 25 January 2002 was 1,734 days or 57.8 months. This extends the record longevity

for a wild Allegheny woodrat by 70 days or 2.3 months. Regardless, her known time alive (from first capture to last) of 1,630 days still surpasses previous estimates of longevity (Mengak 1997; 2000).

Because we were conducting intensive studies of woodrats in this area, this individual woodrat has contributed a great deal to our general knowledge of the species. She was radio-tagged for three months during the summer of 1998 as part of a telemetry study (Castleberry *et al.*, 2001). An ear biopsy was taken in October 1997 and used in a study of population genetic structure (Castleberry *et al.*, in review). Fecal pellets were collected from her monthly from autumn 1997 to autumn 1998 to assess food habits (Castleberry *et al.*, 2002a). Ectoparasites were collected from her on multiple occasions (Castleberry *et al.*, in review). She was known to be lactating on 25 May 1999 and thus is presumed to have had offspring.

The Allegheny woodrat is a poorly known faunal component of the central Appalachians. Information on most aspects of woodrat natural history is unclear or controversial (Mengak, 2002). Longevity information is important in understanding long-term trends in capture data and presence/absence surveys. The slow reproductive rate (Mengak, 2002) and long potential lifespan of woodrats suggests that this rodent is functioning more like a K-selected rather than a r-selected species as normally would be attributed to most small mammals in this environment. Accordingly, conservation strategies designed to protect imperiled rodent species may not be applicable for Allegheny woodrats. We suggest that additional research examining Allegheny woodrat population demographics with emphases on reproduction and survivorship are critical for formulating future management plans for this problematic species.

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