

Ecology of Two Apollo Butterflies (*Parnassius apollo* Linnaeus, 1758 and *Parnassius nomion* Fischer de Waldheim, 1823) of the Khentii Mountain Range in Mongolia

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Abstract

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Determining habitat characteristics and quality is important for conservation planning for threatened species of butterflies. We determined the vegetation in two Apollo butterfly habitat types and recorded the species richness and abundance of vascular plants in 12 randomly chosen plots within our study site in the “Baruun Burkh” Mountains of the Khentii Mountain Range. We also recorded the movements of adult Apollo butterflies (*Parnassius apollo* and *P. nomion*) using mark-recapture methods. Apollo butterfly habitats were heterogeneous within alpine shrub communities and meadows. Recapture results showed significant differences between mean total distances moved by *P. apollo* (200.31 ±38.19 m; median = 125 m) and *P. nomion* (218.17 ±77.35 m; median = 131 m). The number of recaptures influenced mean total distance moved, with significantly longer total movements for animals recaptured more times. The single largest movement between subsequent recaptures was 484 m for *P. nomion* and 543 m for *P. apollo*, whereas the largest total distance traveled (between all recaptures) was 728 m for *P. nomion* and 1,024 m for *P. apollo*. More research is required to conserve effectively these threatened butterflies.

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Introduction

The Mountain Apollo (*Parnassius apollo* Linnaeus, 1758) is distributed throughout Europe and parts of Asia, from the Cantabrian Mountains in northwestern Spain in the east to the Lena River basin in Yakutia, Russia in the west and south to Mongolia and northern China (Xinjiang, Sinkiang) (Collins & Morris, 1985; Miroslaw *et al.*, 2007). Listed on Appendix II of CITES and in the Mongolian Red Book as a rare species (Shiirevdamba *et al.*, 2013), the Mountain Apollo occupies many different habitats within its range,

including rocky plains in high mountainous areas, heaths, scrublands, grassland communities in lowlands, and alpine meadows in forested landscapes (Miroslaw *et al.*, 2007; Chuluunbaatar, 2005). The Nomion Apollo (*Parnassius nomion* Fischer de Waldheim, 1823) is a forest-steppe butterfly found in eastern Russia (Irkutsk, Buryat, Amur, Khabarovsk and Altai), Mongolia, China (Gansu, Qinghai, Shaanxi (Shensi), Heilongjiang, Liaoning), and North and South Korea (Collins & Morris, 1985). This species prefers various