

Fig. 7 : (A) Monthly variation of air temperature and (B) number of snow cover days at Iezer weather station (1961-2000)

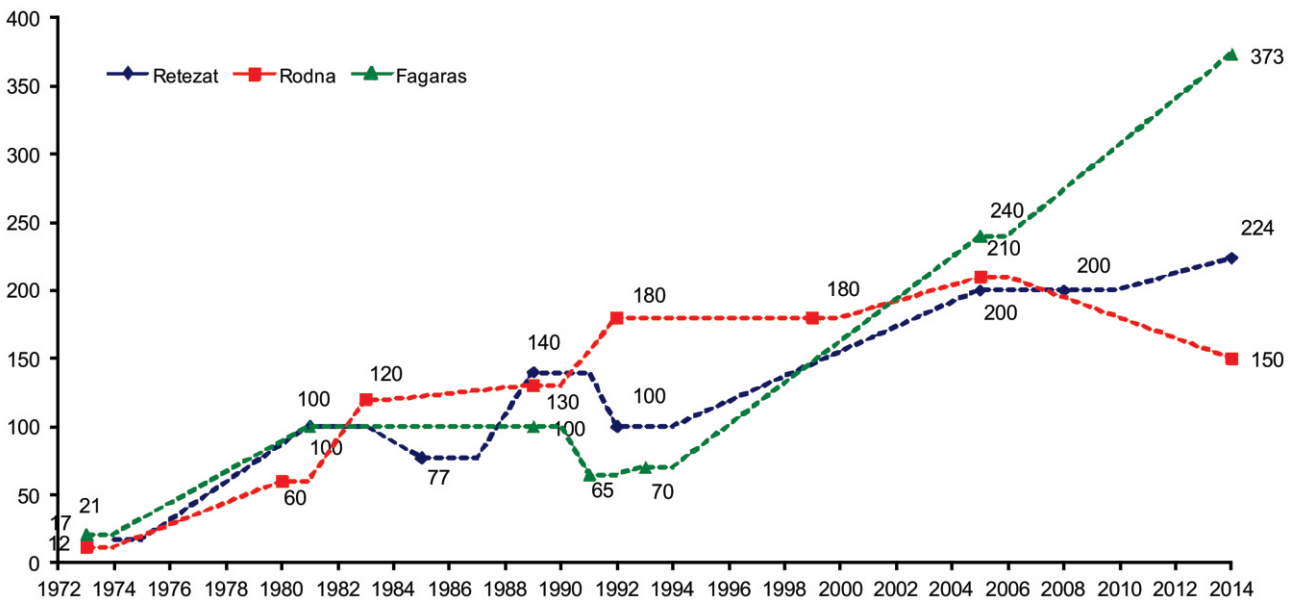


Fig. 8 : Alpine marmot population dynamics in the three Romanian Carpathian ranges (1973-2014)

development benefitted from the support of the former Bucharest-based Inspection for Game Economy.

In the beginning, Reserve guards would build the animal galleries. But, introducing, species introduction was considered to be a failed attempt given that the galleries had been deserted. However, two years later, in 1975, a first alpine marmot colony was detected at some distance (from the early place of release), namely in Zănoaga Mare glacial cirque on the northern side of Mount Pietrosu (Pânzariu, 1993). It appeared that the alpine marmots had settled from 1,700, m a.s.l. (the initial introduction site) to 1,800-2,000 m, some individuals were observed at 2,200 m a.s.l.

In June 1977, the species extended its territory eastwards, to Bistrița-Năsăud County, alpine marmots being seen in the direction of Gărgălău Mount (2,159 m a.s.l.). In 1980, the Rodna Mountains alpine marmots numbered 60 individuals (grouped into 8 colonies), the population nearly doubling till 1983. In 1989, they counted 130 individuals (120 specimens in the Maramureș County sector and only 10 in Bistrița-Năsăud). The year 1992 registered 180 alpine marmots, 165 in Maramureș and 15 in Bistrița-Năsăud County.

In 1993, some individuals were signalled out east of the Puzdrele Peak (2,191 m a.s.l.), in the Negoiescu Valley. In 1999, the Rodna Mountains alpine level numbered 180 specimens and

around 210 in 2005. Most entrances are oriented to the East, South, South-East and South-West (Szabo, 2010). In 2011, 150 specimens were observed, all of them on northern slopes in Maramureş County.

The species was seen in the glacial cirques Zănoaga Mare, Iezer and Buhăescu, in the Pietrosu Mare and Piatra Neagră mountains, reaching as far as Gărgălău Mount to the east. The guards of the Rodna Mountains National Park name Zănoaga Mare glacial cirque « The Marmot Pit ». The expansion of the species' area towards the Corongiş (1,987 m a.s.l.) and Ineu (2,279 m a.s.l.) Mountains, which means by some 20 km east was reported (Kucsicsa, 2013). In addition, the presence of marmots was also indicated in the surrounding areas, in the north-bordering Maramureş Mountains, more precisely just below the Torioaga Peak (1,930 m a.s.l.) situated towards the southern end (Nădişan, 2000).

The life of these animals (very fond of quiet) was disturbed by grazing and tourism, some of them being occasionally killed, e.g. one in 1977 by shepherd dogs close to Buhăescu Lake, and another in 1978 near the Gărgălău Peak (both in the Rodna Mountains).

Although proposals for the introduction of this species in Romania's fauna had been made as early as 1949, it was only in 1965 that the Făgăraş and the Retezat mountains were chosen as population sites. In the early 1970s some would suggest the Rodna Mountains, as well.

Despite the fact that galleries to shelter them had been built in all the three massifs, the alpine marmots quickly deserted them, digging themselves new ones, closer to, or remoter from those made by man, the new environment was seemingly better and more propitious.

The alpine marmot sites are shared also with the chamois (*Rupicapra rupicapra*) and although both species are herbivorous, yet the wealth of food makes them live in ecological « harmony », as it were. Thereby, in case of danger, alpine marmots would warn the chamois of an enemy approach by emitting more sonorous and powerful signals than the latter do.

The three populations introduced in 1973 increased fifteen times over the last four decades, from 50 to 747 individuals, namely 50% in Rodna, 30% in Retezat and 20% in Făgăraş mountains (Fig. 8).

A typical alpine rodent, the alpine marmot got perfectly integrated into the new habitats of alpine landforms and alpine meadows of the three mountain zones, each mountain range hosting several alpine marmot colonies. They would extend their areas (up to 20 km) in other favourable zones, most often being seen in the screes adjoining the alpine meadows where they found shelter and food.

Newly reintroduced in the Carpathian Mountains, and in Romania for that matter, alpine marmots have been protected all along in the Retezat Mountains National Park, the Pietrosul Rodnei Nature Reserve and Arpăşelului Valley Nature Reserve, the first sites of their release. Under Law No. 13, 1993 on Romania's adherence to the Convention for the Conservation of Wildlife and Natural Habitats, adopted in Bern in 1979, the alpine marmot becomes a protected animal. Thus, alpine marmot areas in the Retezat and the Rodna Mountains are nowadays part of the homonymous National Parks established in 1935 and 1990, respectively (Buza *et al.*, 2005). Protection of the alpine marmot species is stipulated also by Law No. 462, 2001, on the regime of protected areas and conservation of natural habitats, of wild flora and fauna.

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