

Le Berre 1998. INTAS-93-0161. Ecological basis for the management of marmot biodiversity in Eurasia [Bases écologiques de la gestion de la biodiversité des marmottes en Eurasie].

INTAS-93-0161

Ecological basis for the management of marmot biodiversity in Eurasia

This project is related to conservation biology and developmental ecology. The purpose is to define ecological and biological data such as population dynamics, space utilisation and gene flow, in order to establish a sustainable exploitation of the marmot species considered as natural resources and to prevent the extinction of the most fragile species. It will combine the activities of specialists in various fields such as ecology, socio-ecology, ethnobiology and socio-economy.

The research will produce data enabling the preservation of the biodiversity of Eurasian wildlife, and will contribute to organizing a sustainable economic use of marmots by man according to the different kinds of socio-economic demands in the countries where the marmot is found. It will also allow for the checking of current hypotheses in population dynamics as well as in behavioural ecology in view of the great latitudinal and altitudinal range and ecological diversity of the experimental areas.

Results:

The main objectives of the project were:

- 1 the drawing up of the inventory of marmots in the different countries;
- 2 analysing the dynamics of the resource from field stations;
- 3 preserving the genetic diversity of Eurasian marmots *in situ* and *ex situ*.

Six species of marmots were studied (*Marmota bobac*, *M. baibacina*, *M. camtschatica*, *M. caudata*, *M. marmota*, and *M. menzbieri*). Two of them are considered as locally endangered (*M. camtschatica*, Red Book of Yakutia; *M. menzbieri*, Red Book of Kazakhstan).

To set long term monitoring, 11 field stations were created, two in forest-steppe zone (*M. Baibacina*); five in steppe zone (*M. Bobac*); one in tundra (*M. Camtschatica*) and three in the Alps (*M. Marmota*). Capture-Marking-Recapture programmes were initiated.

Six expeditions were carried out for collecting marmot tissue and ecological, behavioural and abundance data, three in bobac range (Orenburg region and Barkortosan republic), one in Kazakhstan (*M. Baibacina*), and one in Yakutia (Ust-lenky reserve). Distribution maps were actualised in Kazakhstan and in Russia. *M. Bobac* population increased when *M. Camtschatica* and *M. Menzbieri* decreased steeply. *M. Caudata* needed protection. Data bases were developed.

The results obtained in two industrial husbandry (Moscow and Leningrad regions) were analysed. Three experimental farm were maintained (Kamchatka, Yakutia, Ukraine) and a new one is in development in the Moscow region. Re-introductions were realised in Russia (*M. Bobac*, Volga region; *M. Camtschatica*, Kamchatka), in Ukraine (*M. Bobac*), in Kazakhstan (*M. Baibacina*). The colonisation process of *M. Marmota* was monitored in three late re-introductions (Apennines, Italy; Spanish and

French Pyrenees) and in a recent one (Drôme, France).

Behavioural ecology data were collected on spatial and social organisation. Ecophysiologic and flea data were analysed in the maintenance of plague foci. Species and geographical variability in marmots were studied through morphometric, caryotypic, DNA and electro-acoustical analysis of alarm call. The existence of two sub-species of *M. Bobac* and three sub-species of *M. Camtschatica* was confirmed.

The research has produced, between 1994 and 1996, 174 scientific and technical publications. Results were exposed in two International conferences on marmots and three national seminars.

Publications:

- 1 Bibilov D.I. 1996. *Die murmetiere der Welt*. Westarp Wissenschaften, Magdeburg, 228 pp. (German). ISBN : 3-89432426-0.
- 2 Le Berre M., Ramousse R. & Le Guelte L. Eds. 1996. *Biodiversité chez les marmottes. Biodiversity in marmots*. International Marmot Network, Moscow, Lyon, 276p. (French and English with Russian abstracts). ISBN : 2-9509900-0-2.
- 3 Mashkin V.I. 1997. *Europeiskii baibak: ekologiya, sokhranenie i istpol'zovanie* (La marmotte bobac européenne: écologie, conservation et utilisation. The european bobac: ecology, conservation and use). Kirov Region Press, Kirov, 156pp. ISBN 5-88186-156-6 (Russian).
- 4 Ramousse R., & Le Berre L., eds. 1996. *Troisième journée d'étude sur la marmotte alpine (Third study day on the Alpine marmot)*. Réseau International Marmottes, Lyon, 95pp. (French, with English abstracts). ISBN 2-9509900-1-0.
- 5 Rumiantsev V.Yu. ed. 1994. *Actual problems of marmots investigation (Problèmes actuels de recherche sur les marmottes)*. Commission on Marmots investigation, Theriological Society of Russian Academy of Sciences, 256pp. (English with Russian abstracts).