



Global Re-introduction Perspectives: 2013

Further case-studies from around the globe
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IUCN/SSC Re-introduction Specialist Group (RSG)





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Re-introduction of Hungarian meadow viper in Hungary

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Introduction

Hungarian meadow viper (*Vipera ursinii rakosiensis* Méhely, 1893) is an inhabitant of steppe remnants. Recent populations occur on grasslands formed by a mosaic of drying marsh-meadows and sandy pastures, where the relatively diverse features of terrain and grass cover provides high prey-abundance and several different microclimatic options. Recent populations only occur on two places in Hungary: two populations in Hanság and less than 10 in Kiskunság. The total population was estimated under 500 individuals. Hungarian meadow viper is protected in Hungary since 1974, strictly protected since 1988, and was raised to the highest conservation category since 1992, with a conservation value of 1,000,000 Ft (approx. US\$ 4,660). Its critical situation was recognized internationally as well, as it had been included in Bern Convention Appendix II, it is listed in CITES Annex I and IUCN categorized as 'threatened' The Bern Convention approved a European Action Plan on *Vipera ursinii* in 2005. The species is listed in Annex II of the Habitats Directive therefore all occurrences were included into Natura 2000 Network. A Species Conservation Plan was approved in 2004 in Hungary and complex conservation project was started co-funded by European Commission's LIFE and LIFE+ funds.

Goals

- Goal 1: Cover locations of all surviving populations and describe them, estimating their size, demography and describing genetic background, habitat characteristics and local threats. All these information were included in the Species Conservation Plan.
- Goal 2: Secure long-term survival of the species on known habitats, by applying



Hungarian meadow viper

Reptiles



Juveniles marked for outdoor terrarium release

appropriate management and increase of suitable habitats through land-purchase and grassland reconstruction.

- Goal 3: Start captive breeding of the species in 2004 with the aim of future re-introduction and population re-inforcement. Techniques were described in the so called Breeding Protocol. The aim was to build up a breeding stock of several generations through successful breeding, which will reliably provide

annual needs of re-introduction effort.

- Goal 4: At the start of the re-introduction in 2010, the so called Reintroduction Protocol set a target of altogether 400 released vipers on two sites over a four year period on reconstructed grassland in Kiskunság. The possible release in Hanság by the end of the period, depending on the state of the reconstructed grassland by that time.
- Goal 5: Learn information on the fate of the released individuals with continuous monitoring on release sites, through regular surveys and use of remote sensing tracking.

Success Indicators

- Indicator 1: Size of known viper habitats and spatial information on their management.
- Indicator 2: Size of increase and reconnection of fragmented viper habitats with grassland reconstruction on hills, providing hibernation sites safe from high water-table in winter.
- Indicator 3: Number of vipers born in successful breeding of multiple generations following pedigree and genetic screening.
- Indicator 4: Number of individuals released per site or over years.
- Indicator 5: Number of re-introduced or reinforced populations with estimated surviving number of released individuals. Successful overwintering, breeding and recruitment can be considered as milestones and final proof of conservation effort's success.

Project Summary

Feasibility: The severe decline of the species was mainly caused by habitat-loss. Previously unpredictable water movements were diminished by building of drainage canals, making those sites suitable for agricultural cultivation, meaning ploughing of most of the grasslands. Remaining grasslands were mowed intensively, which was intolerable for the species. Collection for trade purposes

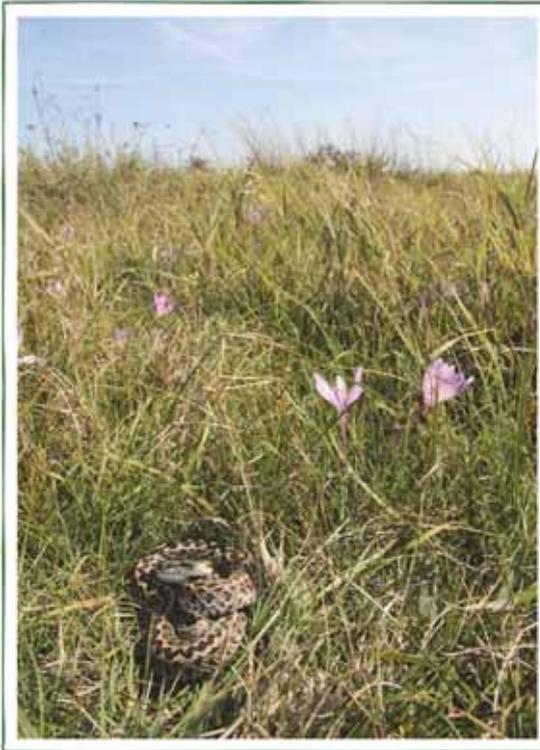
and intentional killings further reduced its numbers. Remaining small and fragmented populations became vulnerable and small, local catastrophes could fully destroy them (Nilson & Andrén, 2001; Újváry *et al.*, 2001). A Population and Habitat Viability Assessment organized by IUCN Captive Breeding Specialist Group and Budapest Zoo in 2001, the approved Species Conservation Plan (Dankovics *et al.*, 2004) and the European Action Plan (Edgar & Bird, 2005) all came to the conclusion that complex conservation effort is needed with inclusion of additional elements to ongoing conservation measures, like habitat reconstruction and enlargement and captive breeding and re-introduction.

Implementation: In 2004 the systematic and conceptual conservation program, running since 1993, has opened a new chapter in the story of Hungarian meadow viper with the start of a four-year LIFE-project named as “Establishing the background of saving the Hungarian meadow viper (*Vipera ursinii rakosiensis*) from extinction”, led by Hungarian Ornithological and Nature Conservation Society (MME BirdLife Hungary) with participation of Directorate of Kiskunság National Park (KNPI) and Directorate of Duna-Ipoly National Park (DINPI). The conservation effort was secured for the period between 2009 and 2013 thanks to funding by LIFE+ Fund. Beneficiaries of the “Conservation of Hungarian meadow viper (*Vipera ursinii rakosiensis*) in the Carpathian-basin” are MME, KNPI, Directorate of Fertő-Hanság National Park (FHNPI), Budapest Zoo (FÁNK), Compound Eye Film (T.HU), and from Austria Nationalpark Neusiedler-see und Seewinkel (NNSS), Schönbrunn Zoo Vienna (TSV) and Research Institute of Wildlife Ecology, Vienna (FIWI). The set of actions implemented in the conservation program can be categorized into four major groups: monitoring of the species and its habitats; defragmentation and enlargement of recent habitats through grassland reconstruction; captive breeding and re-introduction of the species; information of the public and public awareness campaign (Halpern, 2007).

The Hungarian Meadow Viper Conservation Centre was created in 2004 on a remote farmhouse in Kiskunság. The breeding of the snakes was started with 10 animals, which were collected from four different habitats of Kiskunság in 2004. During 2007 - 2008 we captured a further six snakes, representing other populations, including the two in Hanság. Vipers were placed in pairs or breeding groups in outdoor terraria, providing semi-natural conditions, each equipped with artificial burrows. These burrows were developed in the program, in order to provide safe hiding place and winter hibernacula for the vipers.

Through successful reproduction in each year since the start of captive breeding, until 2012 overall 1,392 vipers were born. Young vipers born at the Centre - thanks to prey-abundance and lack of predators - are reaching maturity in higher percentage than those in natural populations. Until 2008, newborn vipers spent their first winter in separate indoor terrariums, with continuous feeding. On average an annual mortality of 10% was observed in these cohorts. Since 2008, when we were able to include captive raised individuals in the breeding, number of offspring increased significantly. Meanwhile the testing of artificial burrows ensured us about its safe use for wintering of juveniles, therefore since the 2009

Reptiles



Meadow viper in natural habitat

cohort the juveniles are also wintering in outdoor enclosures. In these cohorts a higher first year mortality was observed (20% - 30%), which was compensated by the increase of breeding pairs, in order to ensure the possible release of 100 - 150 vipers of each cohort when they reach the age of 3 - 4 years.

The first re-introduction took place in 2010, when 30 vipers were released to reconstructed grassland in Kiskunság, in the vicinity of the breeding centre. During three re-introductions altogether, a total of 142 vipers were released to this site and another 45 to another site nearby in 2012. Artificial burrows were used as mediums for release, in order to provide the vipers safe and known hiding places, and a chance for a step-by-step discovery of their new home.

Timing of the release was chosen

with similar aim, speculating as after the end of winter, vipers generally spend time basking close to their burrow.

Post-release monitoring: Regular surveys were limited to once a week, in order to minimize disturbance. During 2010 and 2011, about 50 - 55 vipers were spotted using different methods. Most of the vipers were seen close to artificial burrows, checked visually by using a pipe-camera. Vipers spotted were not handled, just photos were taken for identification purpose. There were nine individuals identified in 2010 and further eight vipers in 2011, with observations of gravid females and births. The last released group contained six vipers that were previously implanted with VHF-tags, enabling their tracking over a period of 6 - 8 months. To monitor predator presence camera-traps were used in 2012.

Major difficulties faced

- Lack of information about optimal breeding conditions for the species.
- Grassland reconstruction was delayed significantly as removal of planted forests had to overcome many bureaucratic obstacles.
- Effective ways of removal of invasive and alien plant species (*Robinia pseudoacacia*, *Solidago canadensis* & *Pinus nigra*) had to be tested first.

- Small enough VHF-tags with long enough battery life were needed for tracking vipers. After many tested solutions, finally a technician at FIWI developed the ones we are using now.
- High densities of possible predators like wild-boar, fox and badger.



Baiting of rodent traps

Major lessons learned

- Grassland reconstruction seems simple when planning and proved really complex and difficult in the implementation phase.
- Despite some fears of genetic problems, Hungarian meadow vipers can reproduce annually with an average clutch size of 11, with a record of 27.
- Artificial burrows can be useful tool in providing semi-natural conditions and chance for regular checks. Even they can be used in translocating animals to new sites.
- Post-release monitoring needs reliable remote tracking technique. Camera-traps can provide additional information on presence of predators.
- Although the target species is a venomous creature, general public is neutral or supporting the project.

Success of project

Highly Successful	Successful	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- The complex approach of conservation effort tried to tackle each element that might be responsible for the detected decline of the target species, involving all stake-holders, NGOs, National Parks and state authorities who have connection to the subject. This effort was awarded by the European Commission by naming the LIFE-project as “Best of the Best” in 2009.
- Captive breeding technique of Hungarian meadow vipers evolved during the project to a level, that planning of any current or future repatriation can rely on.
- Habitat reconstruction effort and recent changes in management of viper habitats influenced positively overall state of remaining viper inhabited sites.
- It would be too early to claim re-introduction effort totally successful, but there are positive signs like observed reproduction in the wild. Hopefully in a few

years time we will have more proof of success in this field, and we can claim the project “Highly successful”.

- Public opinion is rather positive about the conservation effort, thanks to careful but widespread communication of project goals and results, e.g.. the regularly updated website of the project: www.rakosivipera.hu/en/

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