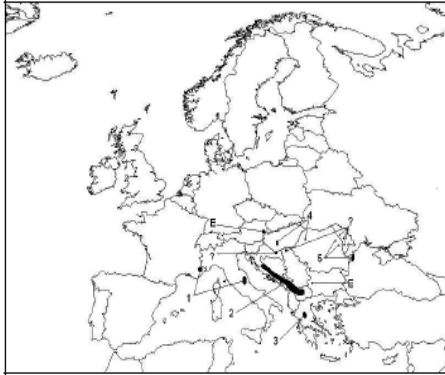


Meadow viper *Vipera ursinii*

Habitats Directive – Annex II & IV



Vipera ursinii extends from Western Europe to Russia and Kazakhstan and beyond through the Asian part of Russia.

	AT	BE	BU	CY	CZ	DE	DK	EE	EL	ES	FI	FR	HU	IR
Present														
	IT	LV	LT	LU	MA	NL	PL	PT	RO	SL	SV	SE	UK	
Present														

SPECIES INFORMATION

ECOLOGY

- The meadow viper is a mildly venomous snake. It is the smallest European viper with a slender body and a length of 400-450 mm (recorded maximum of 630 mm);
- Females are larger than males. The species is grey to brownish with a wavy band that is black, brown or reddish. There are dark spots along the sides that are usually lighter in color dorsally;
- Meadow vipers are almost exclusively diurnal, but will undergo different periods of hibernation in winter. For subspecies in mountain areas the hibernation period can be up to 6 month long. Hibernation is from October/November to March/April;
- The main period of reproduction depends on the subspecies, but mating is typically in April/May. The species is ovoviviparous meaning that the females retain the eggs throughout gestation and give birth to live young;
- The young snakes are born in August-September-October, but there are also records suggesting that there could be prolonged gestation where young are being born the following year;
- The females give birth to 2 - 20 young, sometimes only every second or third year;
- They have many natural enemies including birds of prey, mustelids, wild cats, and other snake species;
- The meadow viper feed to a large extent on insects, sometimes with a seasonal shift to lizards and small mammals which are eaten early in the season.

HABITAT REQUIREMENTS

The meadow viper has a restricted distribution in Europe with populations of different subspecies in six Member States. The subspecies prefer quite different habitats covering a spectrum from lowland steppe grasslands to alpine meadows.

Well-drained alpine and subalpine meadows between 900 and 3000 m in altitude:

- The montane populations are invariably found on warm, sunny south or east facing slopes, often on limestone. An unshaded structurally diverse cover of grasses and other low herbaceous plants is crucial, as this provides both basking areas and adequate shelter in close proximity of each other. High densities are often found where dwarf juniper *Juniperus nana* occurs in abundance, the low spreading mats of this plant providing excellent protection;
- Most of the montane sites occupied by meadow vipers lie at or above the tree line, where natural grazing has been sufficient to control succession and maintain an open, structurally diverse vegetation sward. Light livestock grazing and haymaking may also create and maintain suitable habitat.

Dry or mesic meadow-steppe grasslands, usually below 300 m, occasionally up to 800 m.

- Lowland populations are found in open meadow-steppe grasslands without shrubs or trees. The vegetation must be physically diverse, and a particularly essential feature seems to be the presence of grass tussocks. To suit the requirements of the vipers throughout the year, two different habitat components must normally be present: (1) Low-lying damp areas, often prone to winter flooding, that provide humid, relatively cool habitats used by the snakes in summer. (2) Higher areas, often on dry sandy substrate, used for hibernation;
- On the lowland steppes, winter flooding, aided by grazing, has been important in preventing viper habitats from overgrowing. In recent centuries, traditional forms of management by humans (e.g. hay cutting, occasional burning) have also had considerable influences.

THREATS

Loss of habitat is the principal cause of decline. Human persecution and illegal collection are also very important and may now be major threats in areas where at least the habitat is safeguarded.

- Habitat destruction: This has been particularly important in lowland populations, where most of the suitable habitat is now converted to agricultural monocultures or forestry plantations. Large areas of habitat have also been lost to urban expansion and infrastructure development. Habitat destruction has generally been less severe in montane areas, but conifer plantations and the construction of tourist resorts, ski runs, dams etc. have caused some loss of habitat;
- Habitat fragmentation: Habitat destruction leads to habitat fragmentation, limiting population size and preventing re-colonization and genetic interchange. Small isolated populations are not only vulnerable to catastrophic chance events but also to the loss of genetic diversity;
- Change of habitat management: Adverse changes of habitat may occur as a result of changes in land use or in the management regimes which are sometimes, ironically, introduced for nature conservation purposes. Generally, some (often traditional) level of management is necessary to prevent the habitats from overgrowing, whereas more intensive use is detrimental;
- Overgrazing: While light grazing is beneficial, heavy grazing by livestock such as cattle or sheep may within weeks totally destroy the diverse tussocky vegetation structure needed by the snakes, eventually leading to local extinction. Overgrazing is a concern at a number of montane sites in Greece, France, Italy and even lowland sites in Hungary;
- Burning: Occasional, controlled burning is often practiced in traditional pastoral systems to promote the growth of fresh vegetation, and this practice has helped to prevent the areas from overgrowing. Excessive burning is highly damaging to meadow viper microhabitats;
- Hay cutting: Traditional hay cutting by hand has helped keep viper habitats open, but cutting is now largely performed mechanically. When carried out too frequently and/or with the cutting blades set too close to the ground, mechanised cutting destroys the tussocky vegetation structure essential for snakes and may even kill the animals hiding in the tussocks during the operation;
- Removal of unwanted plants: Dwarf juniper *Juniperus nana* is an extremely valuable habitat feature for montane meadow viper populations. However, juniper is not consumed by sheep or horses and is therefore considered a nuisance by shepherds that sometimes grub out the bushes or fire areas;

- Abandonment: The decline of traditional pastoral farming has caused loss of open grasslands to succession;
- Water level increase: As part of the intensification of agriculture, drainage has caused the loss of large areas of lowland meadow viper habitat. However, reinstatement of water tables can also be a problem if not thought out as it risks drowning snakes, or freezing them during hibernation;
- Persecution: Despite its strict protection under EU law, the meadow snake is still persecuted in places by people who mistakenly consider it highly venomous. The small, isolated populations surviving today are unable to sustain even small levels of persecution or collection;
- Illegal collection: A trend for owning venomous reptiles and the increasing rarity of the species has led to it being highly sought after by reptile keepers. Both commercial dealers and individual snake enthusiasts engage in illegal collection, which poses a serious threat to the survival of many small populations, especially of the endangered (and therefore highly desirable) lowland subspecies;
- Pollution: Isolated fragments of natural vegetation, surrounded by intensive agriculture, are extremely vulnerable to airborne nitrogen, spray drift of pesticides and surface run-off of fertilizers and other agrochemicals. These agents may bring about significant changes in grassland ecosystems, and the habitat and prey of the meadow viper may suffer as a result;
- Predation and competition: Native predators and competitors are part of the natural ecosystem and should not be considered an extrinsic threat. However, when an imbalance occurs (almost always due to human activities) other wildlife species may pose a serious threat to a meadow viper population. For instance, an over-population of wild boar has caused significant damage to viper habitats in Hungary and Italy, and the boars may also prey on the snakes. Intensive rearing and release of pheasants for shooting may also be a problem. Pheasants can consume juvenile snakes and are a major threat to the species in the Danube delta.

FARMING PRACTICES FAVOURABLE TO MEADOW VIPERS

Because the meadow viper populations are so isolated and reduced in size, the priority has to be to maintain existing core areas in a favourable condition and to enable the species to expand in range and reconnect with other isolated populations. Potentially favourable farming practices include:

- Preventing further loss or damage to existing habitats: by avoiding inappropriate land use changes resulting from new infrastructure, urbanization, or intensification in and around existing meadow viper areas;
- Maintaining appropriate levels of livestock grazing: Light grazing is beneficial as it maintains an open vegetation structure and prevents scrub invasion;
- Hay cutting by hand: Traditional hay cutting by hand helps keep viper habitat open and tussocky, but must not be carried out too frequently or be too closely cropped. Mechanised cutting destroys the tussock vegetation structure and should be avoided where possible;
- Maintenance of dwarf juniper bushes: although junipers are not consumed by sheep or horses, farmers should be persuaded to keep them in suitable meadow viper habitats;
- Prevent inappropriate changes in water level: that either drain the area as part of agricultural intensification or reinstate water tables to the detriment of the snakes;
- Prevent persecution and illegal collections: through greater awareness of the snake's shy behavior and only mild venom and greater surveillance;
- Restrict use of pesticides, fertilizers and other chemicals: in or near to meadow viper habitats;
- Create or preserve wildlife micro refuges: In particular grass strips have a positive effect, especially if they are located along fixed landscape elements (forests, waterways etc.). Also hedges and field margins cultivated in an extensive way or sowed to promote biodiversity are beneficial. Fallow is another biodiversity friendly practice;
- Control of game species: such as wild boar and pheasants. If there are too many of them they may cause significant effects on local viper populations.

OTHER SPECIES BENEFITING FROM THESE CONSERVATION MEASURES

Like every species, the meadow viper has particular habitat requirements that are unique to its lifecycle. However, several of the measures mentioned above would also benefit other species protected under the Habitats and Birds Directives that are typical of these habitats:

Alpine habitats:

Black grouse, *Tetrao tetrix*
Ortolan bunting, *Emberiza hortulana*

Woodlark, *Lullula arborea*

Lowland habitats:

Red-footed falcon, *Falco vespertinus*
Roller, *Coracias garrulus*
Great Bustard, *Otis tarda*
Orchid species, *Orchidaceae* sp.
European Souselik, *Spermophilus citellus*
Insects i.e. grasshoppers, crickets, butterflies, beetles.

Saker falcon, *Falco cherrug*
Lesser grey shrike, *Lanius minor*
Corncrake, *Crex crex*
Sand Lizard, *Lacerta agilis*

OBLIGATIONS ARISING FROM THE HABITATS DIRECTIVE

The meadow viper is protected under the EU Habitats Directive 92/43/EEC and is listed in Annexes II and IV of the Directive. As a result, Member States must take the following measures to ensure its conservation:

General requirements

Member States must undertake measures that are designed to maintain or restore the meadow viper at a 'favourable conservation status' in the EU (cf Article 2).

The conservation status of a species is taken as 'favourable' when:

- populations are maintaining themselves over the long term and are no longer showing signs of continuing decline;
- their natural range is not being reduced;
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Protecting the species

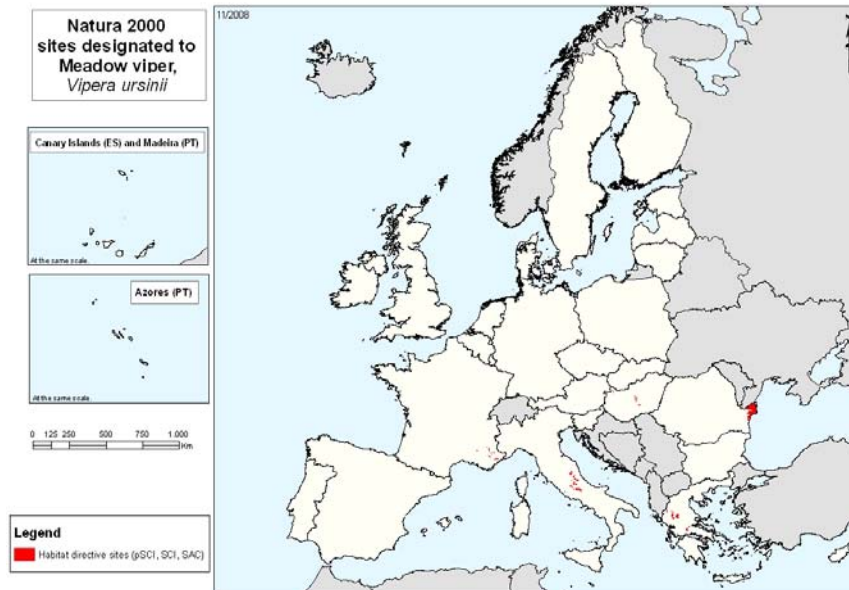
Member States shall take the requisite measures to establish a system of strict protection for the meadow viper, and in particular to prohibit the following (cf Article 12):

- deliberate killing or capture by any method;
- deliberate disturbance, particularly during breeding, rearing, hibernation and migration;
- deliberate destruction or taking of eggs in the wild;
- deterioration or destruction of breeding sites or resting places;
- the keeping, sale and transport of specimens taken from the wild.

Derogations to the above are allowed in some special circumstances provided that no satisfactory alternatives exist and the derogation is not detrimental to the maintenance of the populations of the species concerned at a favourable conservation status. (Article 16).

Protecting core habitats for the species under Natura 2000

Because the meadow viper is listed in Annex II of the Habitats Directive, Member States must, in addition to the general provisions referred to above, designate sites under Natura 2000 to maintain and restore the species to a favourable conservation status (cf Articles 1 and 3). As of November 2008, a total of 45 Sites of Community Importance (SCIs) have been designated in the EU where the meadow viper is recorded as being present.



Managing Natura 2000 sites

Within these SCIs, Member States must take appropriate steps to avoid the deterioration of habitats of the meadow viper as well as its disturbance, in so far as such disturbance could be significant. Member States shall also take positive measures to conserve and restore the species to a favourable conservation status. This means establishing the necessary conservation measures corresponding to the ecological requirements of the species involving, if need be, appropriate management plans specifically designed for the sites or integrated into other development plans (Cf Article 6).

In practice management plans are very often developed for each SCI within Natura 2000. Management plans are useful documents in that they:

- identify the conservation needs of the habitats and species present in that site so that it is clear to all what is being conserved and why;
- analyse the socio-economic and cultural context of the area and the interactions between different land-uses and the species and habitats present;
- provide an open forum for debate amongst all interest groups and help build a consensus view on the long term management of the site;
- help find practical management solutions that are integrated into other land use practices.

Assessment and approval of plans and projects that may significantly affect Natura 2000 sites:

The EU Nature Directives support the principle of sustainable development. Their aim is to set the parameters by which the economic activities can take place whilst safeguarding Europe's biodiversity. Thus, any plans or projects that may affect the species and habitats for which the sites are designated must be first assessed to determine whether the project is likely to have a significant effect on the species and habitat types for which the site has been designated.

If the impact is not considered significant the project can go ahead. If the effect is expected to be significant then alternative less damaging options must be fully explored and selected. In exceptional cases, if no viable alternatives exist, projects with significant negative impact on Natura 2000 sites can still go ahead if they are considered to be of overriding public interest. In such cases, compensation measures will need to be taken in order to ensure that the ecological coherence of the Natura 2000 Network is not compromised (cf Articles 6 (3) & (4) of the Habitats Directive).

Protecting and managing landscape features outside Natura 2000

With a view to improving the ecological coherence of the Natura 2000 Network, Member States shall endeavour, in their land use planning and development policies, to maintain and restore landscape features which are of major importance for wild fauna and flora (cf Article 10). Such features could be linear structures (e.g. small rivers with their banks, hedgerows or rough herbaceous vegetation at field boundaries) that act as dispersal corridors or small ponds etc acting as stepping stones. Preservation and proper management of these landscape features could be of great value for the migration, dispersal and genetic exchange of species with such isolated population as the meadow viper.

MEADOW VIPER CONSERVATION THROUGH MEASURES UNDER CAP/RDPs

Obligations arising under the Birds Directive can be integrated into the CAP measures in the following manner:

Cross compliance

Cross compliance is a horizontal CAP tool and applies to all direct payments (Pillar I), Pillar II payments (Less Favoured Area payments, Agri-Environment, Natura 2000 compensatory payments, and certain wine payments). The cross compliance requirements consist of 19 Statutory Management Requirements (SMR), and the requirements set to keep land in good agricultural and environmental conditions (GAEC).

One of the 19 Statutory Management Requirements (SMR) concerns the respect of the following articles of the Habitats Directive which are relevant for the meadow viper:

- Article 6: Within Natura 2000 sites take the necessary conservation measures to restore and maintain the species and habitat types for which the site is designated and prevent their deterioration, destruction or significant disturbance.

In addition to meeting the SMRs, farmers must also keep farms in good agricultural and environmental conditions (GAEC) which requires a minimum level of maintenance through compulsory standards for:

- Retention of landscape features including where appropriate, hedges, ponds, ditches, trees (in line, in group or isolated) and field margins;
- Avoidance of encroachment of unwanted vegetation on agricultural land;
- Protection of permanent pasture;

Member States can also voluntarily set standards for¹:

- Minimum livestock stocking rates or/and appropriate regimes;
- Establishment and/or retention of habitats;
- Prohibition of the grubbing up of olive trees;
- Maintenance of olive groves and vines in good vegetative condition.

Measures under Rural Development Programmes funded from EAFRD:

The following measures could be used to benefit the meadow viper:

- **Less Favoured Area payments**: (Article 37) linked to existing farming practices where they support upkeep of traditional low-input farming systems;
- **Natura 2000 payments** (Article 38 & 46): in order to compensate for costs incurred and income foregone resulting from maintaining farming practices that are important for meadow vipers and that are difficult to achieve through voluntary measures, such as not removing juniper bushes and refraining from activities that could be detrimental to the species;
- **Agri-environment and forestry-environment payments** (Article 39 & 47): linked to voluntary measures such as maintaining or re-introducing appropriate light grazing and mowing, removing scrub, restricting pesticide or fertiliser use, replanting juniper bushes or creating grass strips and other beneficial features;

¹ These standards are however compulsory for those Member States who had already set a minimum requirements for these standards before 1 January 2009 or where national rules addressing the standard are applied in the Member State.

- **Reimbursement of non-productive investments** (Article 41 & 49): can cover a range of expenses from investments linked to agri-environment schemes to measures identified in management plans for an SPA, such as the 're)creation of new suitable habitats for the meadow viper, or investments enhancing the public amenity value of a Natura 2000 area;
- **Conservation of rural heritage** (Article 57): can cover the cost of drawing up management plans for Natura 2000 sites hosting the species, restoring and upgrading the natural and cultural heritage, or launching awareness campaigns on the conservation of meadow vipers amongst farmers.

In addition the following could also be used:

- **Training and information** (Article 21): e.g. could help make AE schemes more effective and train farmers and experts in the Farm Advisory Services on conservation and management requirements linked to wildlife such as meadow vipers;
- **Farm Advisory Services (FAS)** (Article 24 & 25): to advise farmers on how to apply cross compliance rules, e.g. those set for the Habitats Directive that are beneficial, inter alia, for meadow vipers;
- **LEADER** (Article 61): integration of conservation of meadow vipers into area-based local development strategies and enhancement of dialogue and collaboration between farmers, conservationists and other rural stakeholders in the area concerned.

EXAMPLES OF MEADOW VIPER FRIENDLY MEASURES UNDER RDP

The following provide some examples of how different countries have introduced meadow viper friendly farming through the Rural Development Regulations for 2000-2006 and 2007-2013. Further details are provided in the outputs of the Wildlife and Sustainable Farming Initiative:

http://circa.europa.eu/Public/irc/env/swfi/library?l=/species_reports&vm=detailed&sb=Title

HUNGARY

In **Hungary**, currently occupied viper habitats were included in two national agri-environment schemes in 2002 and 2003. There was also a national horizontal scheme for maintaining grasslands outside ESAs. Contracts were taken for years. In the Rural Development Plan for 2004-2006, development of habitat for *Vipera ursinii rakosiensis* was specifically stated as one of the objectives of the agri-environment measure B.3.5, grassland management in meadows of the Turján region.

In the meadows of Peszéradacs, all 15 farmers are currently managing known meadow viper sites under the scheme. A total of 16,242 ha of grassland (c. 1,700 ha of which is proven viper habitat) were included in the scheme. The meadows were previously used for hay making, but the introduction of the agri-environment scheme resulted in a change of land use on at least 1,300 ha, as grazing herds of Hungarian grey cattle were purchased thanks to additional funding by the scheme for keeping traditional breeds. Because the natural water table is not allowed to be lowered according to the scheme, some previously ploughed lands also joined the scheme under reconstruction of grassland. Previous fragmentation of important viper habitats may be eliminated after these sites are turned into grassland – a very valuable outcome.

In general, habitat structure has improved significantly following the introduction of grazing instead of mechanical hay making practices. Long term effects of these changes should be monitored, but on short term the overall state of these grasslands seems more suitable for meadow vipers. A LIFE-Nature project (LIFE04 NAT/HU/000116) includes the obligation to monitor changes, and conclusions will be reported to the Ministry of Agriculture, in order to include and fine-tune viper friendly management practices in the National Rural Development Plan. Due to a certain flexibility of the system, management (e.g. stocking densities) can be adjusted to account for yearly differences in grass production.