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AND NATURAL HABITATS

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PRELIMINARY DOCUMENT

Draft European Action Plan For the conservation of the Common hamster (*Cricetus cricetus*, L. 1758)

Second Version – 12 September 2008

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INTRODUCTION

The Common hamster is a typical synanthropic species. Originating from steppe habitats it has lived nearby humans since growing crops has become more important than hunting and gathering. Over centuries *Cricetus cricetus* has been persecuted as a pest, being poisoned, drowned, trapped, its burrows dug out and looted and its fur traded for fashion. This small rodent contributed to the nutrition and wealth of mankind and its name even became a synonym for making provision for dire straits at least in the German speaking part of its range.

The relations between the Common hamster and men are age-old and comparable in their quality only to a few other mainly domestic species such as the dog, the horse, the cat or the wolf for example.

Today the historically numerous pest rodent has become a susceptible up to critically endangered species in eight out of 18 European countries. At least six countries possess no suitable data to classify the status of the species and only three countries estimate it as still common.

In its recommendation No 79 of 1999 the Standing Committee of the Bern Convention acknowledged the Common hamster as a fundamental part of the European natural heritage which is in need of urgent measures to prevent extinction. Since then only minor steps have been taken to accomplish this objective.

The following report includes information on the biology and habitat requirements but focuses mainly on the distribution and conservation status of and threats to the Common hamster and aims to give suitable recommendations for a longterm conservation strategy.

CONSERVATION STATUS

The conservation status of the Common hamster (*Cricetus cricetus*) in Europe is very heterogeneous and might generally be described as a descending gradient from its western distribution limit to the eastern one.

Within the European legislation the Common hamster is listed in Appendix II of the Bern Convention as strictly protected species and in Annex IV of the Habitats Directive (92/43/EEC) as strictly to protect. But on the overall scale of its vast palaearctic distribution range the IUCN Red List conservation category is Lower risk/least concern (AMORI 1996).

APPROACH

In order to give an up-to-date overall view of the distribution and status of the Common hamster in Europe, the existence of the International Common Hamster Workgroup proved to be very helpful. Initiated in 1994 by the author as a singular possibility for researchers and nature conservationists to share experiences and data on the species it immediately became a regular annual meeting, with a growing number of participants every year. Several publications have been produced since and some have been consulted regularly to fulfill this task (STUBBE & STUBBE 1998, GODMANN, O. 2001, MERCELIS et al. 2003, LOSINGER 2004).

So in addition to the obligatory study of scientific papers and publications, direct contact by email or letter was sought to the participants of the recent meetings of the International Common hamster Workgroup all over Europe.

With their co-operation it was possible to cross-check and update the available information on the distribution and status of the species for most of the countries. Unfortunately some did not response at all.

The order of the countries follows a North to South, West to East sequence.

GENERAL BIOLOGY

1. Appearance

Within the subfamiliy *Cricetinae* the Common hamster represents the largest specimen with a body length of 200 – 300 mm, tail 40 – 60 mm and weight of 200 - 650 g (even 1000 g have been recorded, GRULICH 1986). In comparison the smallest member is the Roborovski dwarf desert hamster (*Phodopus roborovski*) native to the Gobi desert in China and Mongolia, with a body length of just 40 -50 mm and and a body weight of 20 – 30 g.

The fur colour of *Cricetus cricetus* consists of a medium to pale brown on the back and sides of the body, a black belly, white paws and nose, cream coloured spots on the cheeks, neck and right behind the forelimbs. This combination makes the species one of the most colourful mammals in Europe.

Variation in fur colour is well known and has been studied thoroughly by PETZSCH (1936, 1949, 1950). Besides pale brown, yellowish and albino types which occur only on a small scale within populations (KAYSER & STUBBE 2000), the completely black or melanistic form is the most famous one. It is known from Thuringia (Germany), the Ukraine and Bashkortostan where it makes up between 15% - 80 % of populations (ZIMMERMANN 1969, VORONTSOV 1982).

2. Fossil records and taxonomy

Hamster-like rodents have been existing since the Oligocene (~ 36 million years ago) and hamsters of modern anatomy are known from the Miocene (~ 24 million years ago). The hamsters therefore form the evolutionary basis for all *muroid* (mouse-like) rodent families. Today these rodents make up roughly two thirds of all modern rodents (WEINHOLD & KAYSER 2006).

The origin of the modern Common hamster is believed to be in the steppe habitats of the Pleistocene (~ 1.8 million years ago). Its former distribution range was much larger than today. Fossil remains have been found in southern England, northern Spain, western France and Italy (WERTH 1936, NIETHAMMER 1982, PRADEL 1985, NECHAY 2000). Teeth and bone fragments of the genus *Cricetus* date back to the late Pliocene (~ 2.5 million years ago) (WERTH 1936, PETZSCH 1950, PRADEL 1985). The hamster was present throughout the Pleistocene in glacial and interglacial periods (WERTH 1936, PRADEL 1985).

The Common hamster is a member of the family *Muridae* and of the subfamily *Cricetinae* (table 1), which comprises at present some 400 mainly nearctic and neotropical species (NIETHAMMER 1982).

Typical attributes of hamsters are their vole-like stout body, relatively short limbs, internal cheek pouches and unspecialized bunodont molars.

Table 1: Taxonomic classification of the Common hamster

Kingdom	Animalia
Phylum	Chordata
Subphylum	Vertebrata
Class	Mammalia
Order	Rodentia
Suborder	Myomorpha
Family	Muridae
Subfamily	Cricetinae
Genus	*Cricetus*
Species	*cricetus*
Subspecies	*cricetus*

The former separation of three subspecies with *Cricetus cricetus canescens* as westernmost subspecies, *Cricetus cricetus cricetus* for Central Europe and *Cricetus cricetus nehringi* for southeast and eastern Europe, is no longer valid. Differences of fur coloration and of body and skull dimensions which were the basis of this taxonomic separation are of no statistical significance (HELL & HERZ 1969, NIETHAMMER 1982, GRULICH 1987, SPITZENBERGER & BAUER 2001). However within its huge Eurasian distribution range BERDYUGIN & BOLSHAKOV (1998) name seven subspecies for the former Soviet Union, which are also based on variation in body size and fur coloration. Recent studies on population genetics and phylogeography also support the existence of only one species *Cricetus cricetus cricetus* (NEUMANN et al. 2004, 2005)

3. Eurasian distribution

The distribution range of *Cricetus cricetus* includes western, central, southeast and eastern Europe (fig. 1) as well as large parts of western Asia mainly in Russia and Kasachstan (fig. 2). The species also occurs in the Chinese province of Xinjang. NIETHAMMER (1982) describes it as a belt between the latitudes 44° - 59° N and the longitudes 5° - 95° E. Within this range the Common hamster predominantly inhabits natural steppe-like habitats or alternatively artificial grass steppe habitats like cereal fields. The Common hamster is found mainly in lowland areas and rarely above 500 m above sea level. Deserts, marshland, woodland and alpine habitats in general exclude hamster occurrence.

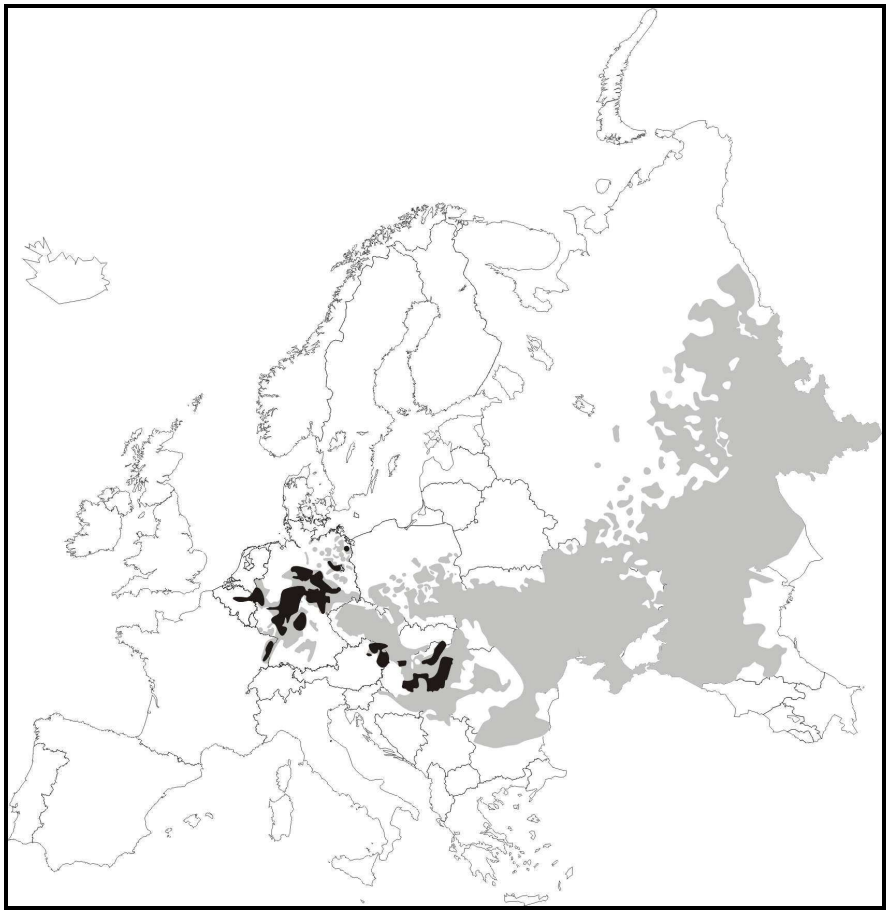

Fig. 1: European distribution of *Cricetus cricetus* (taken from WEINHOLD & KAYSER 2006, data derived from various authors). Grey = data from 1950 – 1990, black = data after 1990.

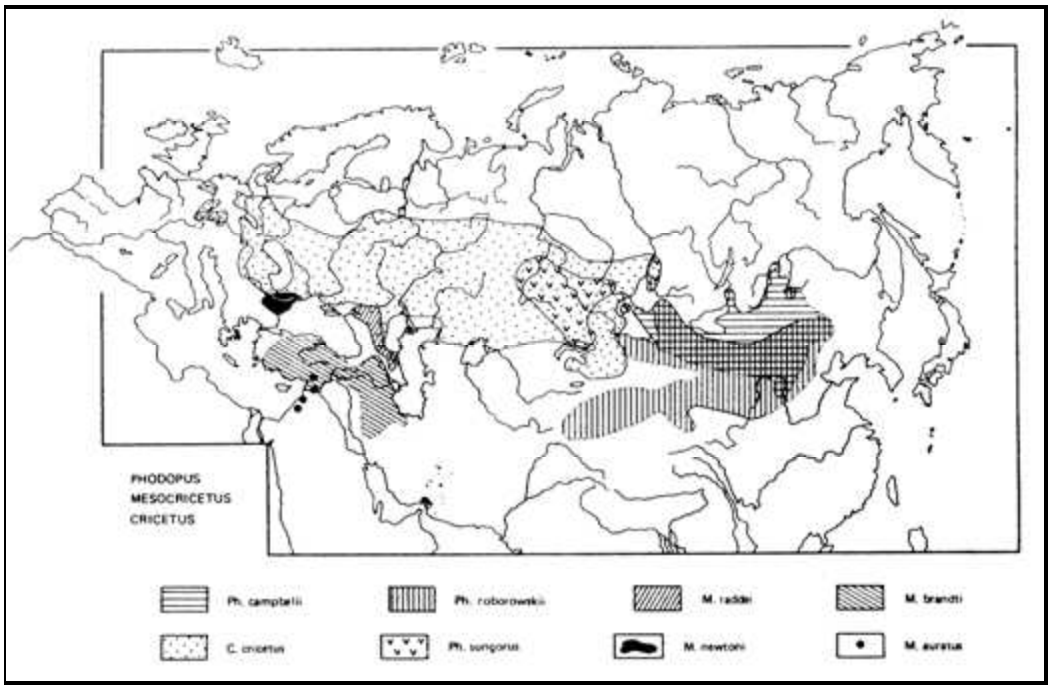

Fig. 2: Palaearctic distribution of *Cricetus cricetus* and other hamster species according to PANTELEYEV (1998).

4. Habitat preferences and hamster burrows

The Common hamster evolved in the steppe habitats of the Pleistocene and is adapted to a continental climate within the 17°C-July-isotherm in the North and the 2°C-January-isotherm in the South (WERTH 1936). Humidity either caused by a high ground water level or annual precipitation above 600 mm are further parameters which do not meet the demands of a permanent hamster habitat.

The habitat preferences concerning the soil are closely related to the fossorial way of life of *Cricetus cricetus*.

Their burrows are found predominantly in deep layers of loam and loess mainly of the black (chernozem) or brown earth soil type which offer a suitable stability. Additionally the underlying bedrock has to be well permeable to avoid waterlogging. These soils also represent the most fertile ones and have extensively been turned into arable land for growing crops throughout the distribution range of *Cricetus cricetus*.

Typical hamster burrows in general consist of a diagonal tunnel and one or more vertical ones with a diameter of 40 – 100 mm depending on the age and size of the inhabitant (fig. 3, EISENTRAUT 1928, GRULICH 1981). These tunnels have a variable length of several meters and lead to a nesting chamber in a depth of up to 2 m. Food chambers are usually directly connected or near to the nest. Short, dead end tunnels are often used as latrines. The complexity of a hamster burrow depends on its age as well as the continuity of inhabitation and underlies a permanent change due to the fossorial activity. GRULICH (1981) found on average 29.9 kg of excavated soil per burrow, with an outstanding maximum of 300 kg.

Simple shallow burrows with only one or two tunnels are typical for juveniles. Later on the burrow becomes more and more structured, deeper and complex (EISENTRAUT 1928). The maximum tunnel length observed was 26.2 m (GRULICH 1981).

During its period of activity *Cricetus cricetus* uses several burrows (KARASEVA & SHILAYEVA 1965, GORECKI 1977, WEIDLING 1996, WEINHOLD 1998). Depending on the time of year hamster burrows are commonly classified as winter burrows and summer burrows. Winter burrows are inhabited solitarily from September/October to April/May and are in general deeper as the so called summer burrows. They serve for hibernation and contain the winter food supply stored in one or more

chambers. In spring the hamsters often leave their winter burrows and occupy summer burrows which are used for reproduction and shelter until autumn. KARASEVA (1962) observed average distances between winter and summer burrows of 373 m for adult females and 800 m for adult males. The pedogeographic requirements of summer burrows are less demanding than for winter burrows. Summer burrows may therefore be found in less suitable sandy or stony soil types and localities like road verges, gardens, parks and dams.

During spring and summer males may inhabit up to 9.6 burrows and females up to 3.6 burrows consecutively (KAYSER 2002). Common hamsters do not necessarily dig new burrows each time, they often use existing burrows which have previously been dug by themselves or even by a conspecific (WEINHOLD & KAYSER 2006).

Therefore burrow density is not correlated directly with population density. The best population estimate in this context can be drawn from the winter burrow densities in spring. Later on in the year capture-mark-recapture studies are required to obtain sound data on population strength.

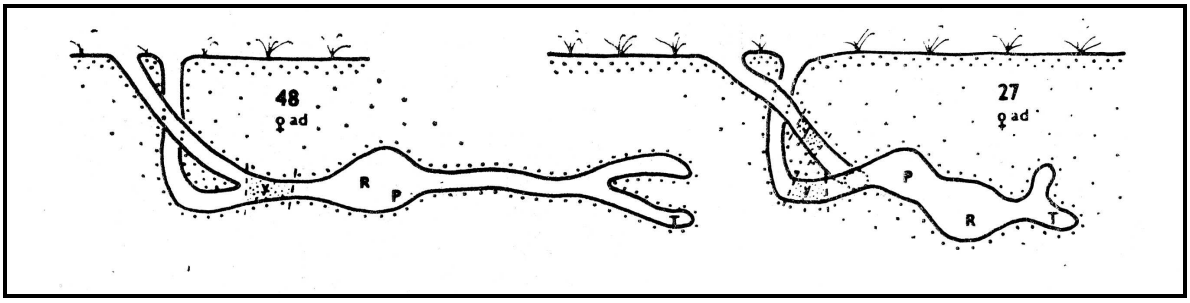

Fig. 3: Typical composition of Common hamster burrows with a diagonal and vertical tunnel, nesting and food chamber and dead end tunnels according to GRULICH (1981). The burrows were between 55 and 65 cm deep. (R = nesting material/bedding, P = fresh herbal mulch (food), y = soil plug, ad = adultus, t = litter, faeces, urine; 48, 27 = number of burrow studied)

BIHARI & ARANY (2001) observed in Hungary that populations of *Cricetus cricetus* in farmland habitats strongly depend especially on lucerne fields and also edge habitats like road and field verges which serve as refuge. Lucerne fields were of main importance as they harboured the source populations which spread out into other field crops but returned after harvest. During spring and summer *Cricetus cricetus* forms subpopulations in the different field crops according to their availability. BIHARY & ARANY (2001) stress the importance of the existence of lucerne fields and edge habitats in combination with seasonally available field crops as basic habitat requirements of *Cricetus cricetus*.

5. Reproduction

Cricetus cricetus is a polygamous species. Males do not participate in rearing the young and try to mate with as many females as possible (FRANCESCHINI & MILLESI 2001). Depending on the geographic distribution within the range, the reproduction period starts after hibernation as early as March but usually in April/May and ends in August, but no later than September (NECHAY et al. 1977, GRULICH 1986, BERDYUGIN & BOLSHAKOV 1998). Male hamsters show a seasonal *descensus testiculorum* synchronized with the onset of the breeding season and females a postreproductive closure of the vagina.

Females produce on average two litters per breeding season, sometimes three. But according to GRULICH (1986) up to nine litters are theoretically possible under favourable environmental circumstances. Litter size varies between three and twelve, the mean sex ratio is 1:1. On average six young per litter are born. Gestation lasts between 17 – 20 days for the first litter and up to 37 days for the following litters (VOHRALIK 1974). Females may be covered again postpartum (VOHRALIK 1974, GRULICH 1986, FRANCESCHINI & MILLESI 2001).

Newborn hamsters weigh around 3-5 g, they are naked, blind and their ears are sealed (VOHRALIK 1975). The development is rapid. The fur begins to grow at an age of four to five days and the typical pigmentation can already be seen. On the sixth day after birth they start to consume fresh food although their main diet still consists of milk. Eyes and ears open at an age of 12 days and agility increases considerably.

The young are weaned when they are three weeks old and start leaving the maternal burrow at an age of around 25 days (EIBL-EIBESFELD 1953, VOHRALIK 1975). The famliy bonds split up over a period of three to five weeks, intraspecific aggression increases steadily and consecutively the young separate (EIBL-EIBESFELD 1953). The mother is usually one of the first to leave and occupy another burrow for further reproduction (WEINHOLD 1998, KAYSER 2002). Females reach sexual maturity at around 80 days of age (MOHR et al. 1973, VOHRALIK 1974) and males according to REZNIK-SCHÜLLER et al. (1974) with two months. But usually participation in reproduction does not take place until the following spring (SZAMOS 1972, GORECKI 1977, GRULICH 1986).

The average life span of *Cricetus cricetus* is 34 month for females (maximum 5 years) and 31 month for males (maximum 4 years) (ERNST et al. 1989).

6. Food

Cricetus cricetus is a predominatly vegetarian species eating all sorts of green plants, seeds and roots. Verified forage crops are for example lucerne, clover, peas, beans, vetches, sugar beet, turnips, wheat, barley, rye, oat, maize, rape, potatoes, carrots, onions, spinach, cucumbers, pumpkins, lettuce and various wild herbs including toxic ones like bittersweet (MÜLLER 1960). 10 – 13 % of the diet consist of animal protein mainly from earthworms, snails and insects and occassionally from small vertebrates. *Cricetus cricetus* can also be cannibalistic especially during mass population outbreaks and associated with hibernation (EIBL-EIBESFELD 1953, HOLIŠOVÁ 1977, GRULICH 1980).

A typical behaviour of all hamster species is to collect food in their cheek pouches and transport it to the burrow's food chambers. EIBL-EIBESFELD (1953) observed that Common hamsters seldom eat outside their burrows. *Cricetus cricetus* became commonly famous for collecting and storing considerable amounts of crops. This behaviour is especially expressed prior to hibernation in late summer and beginning of autumn, whereas during the reproductive period only small amounts of food are stored (PETZSCH 1950, NECHAY et al. 1977). If available *Cricetus cricetus* is capable of collecting and storing several kilos of food. WENDT (1980) found 34 kg of peas, earlier authors report up to 65 kg of potatoes, corn and lupin (HAMAR et al. 1959). In general these findings are single incidents not representing the average amount of food supply collected by Common hamsters, which is in the range between 2 – 3 kg (WENDT 1989, SELUGA 1996). Based on feeding experiments in the laboratory WENDT (1991) estimated the average minimum food supply for winter survival to be 1 – 1.5 kg/individual.

7. Hibernation

Cricetus cricetus hibernates solitarily from October to March/April. Winter burrows are up to 2 m deep, should be well drained and contain enough food supply to guarantee winter survival (see also chapters habitat preferences and hamster burrows and food).

The onset of hibernation is synchronized photoperiodically but controlled endogenously. Between May 15 and July 15 *Cricetus cricetus* is generally sensitive to short day signals (SABOUREAU et al. 1999). Receiving a short day signal initiates the gonadal regression with a delay of around four weeks (MONECKE 2001). Under natural conditions it is presumed that *Cricetus cricetus* perceives the short day signal around July 15 and that gonadal regression beginns in mid August (MONECKE 2001). These findings correlate well with the end of the reproductive period and the transition to the pre-hibernation period observed in field studies.

The hibernation behaviour of *Cricetus cricetus* has a strong endogenous component. Physiologically the circannual clock is imitated by the hormone melatonin which is produced only at night by the pineal gland (PÉVET et al. 1990, CANGUILHEM et al. 1993). Short "summer" nights result in a small level of melatonin whereas during long "winter" nights a high melatonin production takes place. Strikingly, melatonin is completely absent in the pineal gland or blood of *Cricetus cricetus*

around the summer solstice (PÉVET et al. 1990, VIVIEN ROELS et al. 1992), probably serving as an internal trigger for the transition between the reproductive and the hibernation period (MONECKE 2001).

During hibernation Common hamsters have no information on the actual day length but are also sensitive to long photoperiods from mid November to March/April. Thus the end of hibernation must be triggered by an internal timer. Gonadal development can be experimentally induced by a photoperiod longer than 13 h of light with a delay of 2 – 4 weeks (MONECKE 2004). Under natural conditions this correlates with the day length at the beginning of April which marks the end of the hibernation period. According to the studies of MONECKE (2004) Common hamsters would then be sexually active again around mid to end of April, which also is in accordance to the empiric results of various field studies (see also chapter reproduction).

8. Mortality

Today the main mortality factors for *Cricetus cricetus* especially in the western part of the distribution range are predation and hibernation. Road casualties and diseases are of minor importance (KAYSER et al. 2003). Pest control and fur trapping, historically important mortality factors, have lost their influence in many areas of the distribution range due to the protection status of the species.

The Common hamster is a prey species for small to medium sized carnivores like the weasel (*Mustela nivalis*), stoat (*Mustela erminea*), polecat (*Mustela putorius*), pine marten (*Martes foina*), badger (*Meles meles*) and red fox (*Vulpes vulpes*) (PETZSCH 1950, EIBL-EIBESFELD 1953, MÜLLER 1960, GRULICH 1980).

Within the birds of prey mainly the buzzard (*Buteo buteo*), red kite (*Milvus milvus*) and black kite (*Milvus migrans*) prey upon *Cricetus cricetus* (WUTTKY 1968, STUBBE et al. 1991). The eagle owl (*Bubo bubo*) is the only owl which preys regularly on the Common hamster (GÖRNER 1972, GRULICH 1980, NICOLAI 1994). If abundant *Cricetus cricetus* may represent up to 50 % of the diet of those species.

The list of occasional predators is much longer and includes species like domestic cats and dogs as well as the white stork and grey heron which both hunt mainly for voles but also juvenile hamsters especially after harvest.

Present monocultural farming supports the predation pressure on *Cricetus cricetus* as there is a lack of cover in early spring and after harvest. Losses due to predation are at a peak in spring and after harvest (KAYSER et al. 2003). A complementary field study showed that in May the discrepancy between the amount of winter burrows recorded and hamstes caught in live traps was up to 52 % (PLUSKOTA & WEINHOLD 2003 unpubl.). This indicates that the spring population has to cope with considerable losses already at the beginning of the reproduction period.

During hibernation between 50 – 60 % of the population may not survive (WENDT 1991, KAYSER et al. 2003). The main cause of a non-successful hibernation is the lack of food supply, but old age, flooding of the burrow and diseases can also be responsible. Modern agriculture especially the exhaustive harvest immediately followed by ploughing considerably decreases the chances of *Cricetus cricetus* to collect enough storable food for hibernation. WENDT (1991) observed that only 15.4 % of 13 animals studied had a sufficient food supply of at least 1.5 – 2.5 kg in August and September.

Road casualties have been recorded by KEMPER (1967) in Austria, NICOLAI (1994) in Germany and GRULICH (1996) in the Czech Republik and Slovakia. They are seen as an indicator for high population densities correlated with the seasonal population peak in late summer. KEMPER (1967) counted up to 200 roadkills/km of *Cricetus cricetus* in September and NICOLAI (1994) a maximum of 32/km in August.

For humans *Cricetus cricetus* is also of some epidemiological importance as the species may be host to various zoonoses like tularemia, listerioses, leptospirosis, salmonellosis, rickettiosis and rabies (MÜLLER 1960, POPP 1960, NECHAY et al. 1977, GRULICH 1980, ŠEBEK et al. 1987, PELZ & PILASKI 1996).

Several endo- and ectoparasites have been reported for *Cricetus cricetus* (tab. 2, NECHAY et al. 1977).

Tab. 2: Endo- and ectoparasites of *Cricetus cricetus* (NECHAY et al. 1977)

Endoparasites		**Ectoparasites**	
Cestoda	**Nematoda**	**Siphonaptera**	**Acari**
Hydatigera taeniaeformis *Heligmosomoides travassosi* *Aprostatandrya macrocephala* *Catenotaenia pussila* *Taenia tenuicollis* *Hymenolepis diminuta,* *H. straminea* *Physocephalus quadrialatus* *Paranoplocephala omphalodes*	*Strongyloides ratti* *Capillaria annulosa,* *C. muris-sylvatici*	*Ceratophyllus fasciatus,* *C. martinoi, C. penicilliger,* *C. turbidus* *Ctenopthalmus assimilis,* *Ct. obtusus, Ct. rettigi,* *Ct. secundus*	*Dermacentor marginatus,* *D. pictus, D. daghestanicus* *Eulaelaps stabularis* *Haemogamassus nidi* *Haemolaelaps glasgowi* *Hirstionyssus criceti* *Ixodes redikorzevi, I. ricinus,* *I. persulcatus, I. apronophorus,* *I. laguri* *Macrocheles matrius,* *M. decoloratus* *Myacarus arvicolae* *Myocoptes criceti* *Myonyssus rossicus* *Neoschoengastia rotundata,* *N. angusta* *Nothrolaspis decoloratus* *Rhipicephalus turanicus,* *Rh. rossicus* *Trombicula autumnalis*

9. Population dynamics

The population dynamics of *Cricetus cricetus* follow the r-strategy. Common hamsters invest in a high reproductive output to compensate for natural losses mentioned before. According to NIETHAMMER (1982) a female is theoretically capable of producing 30 offspring a year, on the premises that the litter size is six, the sex ratio 1:1 and the females of the first litter also reproduce before hibernation. Depending on the seasonality of the life cycle of *Cricetus cricetus* the population density is lowest in early spring and increases to an annual peak in August at the end of the reproductive period. At this time of year a population consists of adults, subadults and juveniles. Afterwards, prior to hibernation and during hibernation the population decreases again. The annual increase of a population is steered by various environmental components. Climate and weather conditions, seasonal food supply and predation pressure may be mentioned as the most obvious and important ones. If these components trigger a maximum survivability, the population growth can be exponential and lead to a mass population outbreak as described by GRULICH (1986). On average up to 300 individuals per hectare were found during such an outbreak in eastern Slovakia in 1971/72 (GRULICH 1978). NECHAY et al. (1977) studied historical and contemporary data on such mass population outbreaks and postulated a possible cyclic nature of 10 – 15 years.

However a mass population outbreak is self-regulating as the animals deprive themselves of their resources. GRULICH (1986) observed non-hibernating hamsters due to the absence of any food supply in the winter following the mass population outbreak in eastern Slovakia in 1971. In addition, cannibalism, diseases, high intraspecific aggression and a reduced reproduction are characteristic features of such overcrowded populations (GRULICH 1980, 1981, 1986).

Today such mass population outbreaks belong to history together with the high economic losses they caused in agriculture. Average population densities generally seem to be much lower than during the last decades and centuries. Therefore the basis for mass reproduction is not given.

POPULATION GENETICS

NEUMANN & JANSMAN (2004) and NEUMANN et al. (2004, 2005) studied the genetic profile and relationships of *Cricetus cricetus* in Europe. According to their findings the European source population of *Cricetus cricetus* originated in the Siberian and Ukranian lowlands from where it expanded repeatedly westward during the late Pleistocene (Fig. 4). Two major genetic lineages developped along the migration routes. The "Northern" lineage, including all German and Western European populations and the "Pannonian" lineage which comprises populations from Austria, Croatia, the Czech Republic, Hungary, Poland, Romania, Serbia and Slovakia (see also BANASZEK et al. 2007). Eastern European populations are of intermediate character.

Populations at the western boundary lack genetic diversity and have been isolated from a central German source population since the last glaciation. In comparison the extant central German populations are still highly polymorphic and maintain their genetic diversity. This indicates that the loss of polymorphism and genetic diversity in the westernmost populations of *Cricetus cricetus* is not a result of recent population breakdowns due to pest control measures and habitat loss and/or fragmentation but of historical bottlenecks caused by small founder populations during the westward range expansion. Furthermore the close genetic association of the westernmost populations to the central German ones does not support the existence of a western subspecies *Cricetus cricetus canescens*.

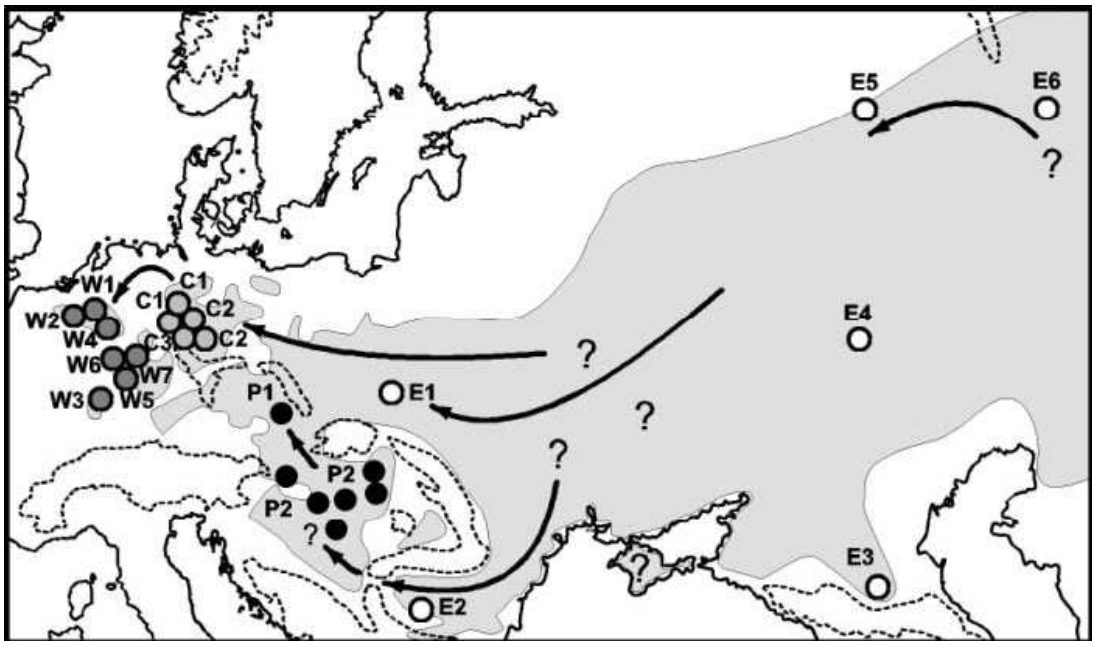

Fig. 4: Geographical distribution of *Cricetus cricetus* samples (circles) and proposed expansion routes (arrows) according to NEUMANN et al. (2005). Grey areas refer to the recent distribution range according to PANTELEYEV (1998) and MITCHELL-JONES *et al.* (1999). Question marks indicate potential glacial refugia deduced from fossil records (MARKOVA et al. 1995).
Legend: circles (dark grey): West; light grey: Central; black: Pannonia; white: Poland, Romania, Russia.

POPULATION DECLINE AND ENDANGERING FACTORS

Decreasing fur trapping success of Common hamsters in the former German Democratic Republic initiated an extension of the trapping season (BÜNNING 1976). As a consequence PIECHOCKI (1979) analysed hamster fur statistics of the preceding 25 years and revealed a steady decline, which did not correlate with natural population dynamics. WENDT (1984) even suggested a close season for weakened populations and both authors already mentioned the developments in modern agriculture as a possible key factor for the decline.

In recent years various authors pinpointed modern monocultural farming as today's main threat for the Common hamster, accompanied by habitat loss and fragmentation due to building projects (VOITH 1991, WEINHOLD et al. 1995, ZIMMERMANN 1995, WENCEL 1998, GODMANN & EL KASABI 2001, LOSINGER 2001, SCHREIBER 2001). Pest control measures (e. g. poisoning) as well as over-exploitation by fur trapping also contributed considerably to the decline until the end of the 20th century especially in France and Germany which together comprise the largest part of the westernmost distribution range (WEINHOLD 1997, WEINHOLD & KAYSER 2006).

The indigenous populations mainly of the western distribution range in the Netherlands, Belgium, Germany and France and most recently Poland in Central Europe (ZIOMEK & BANASZEK 2007) are critically endangered and some are close to extinction. Population sizes are small and are most likely not vital enough to recover autonomously (fig. 5).

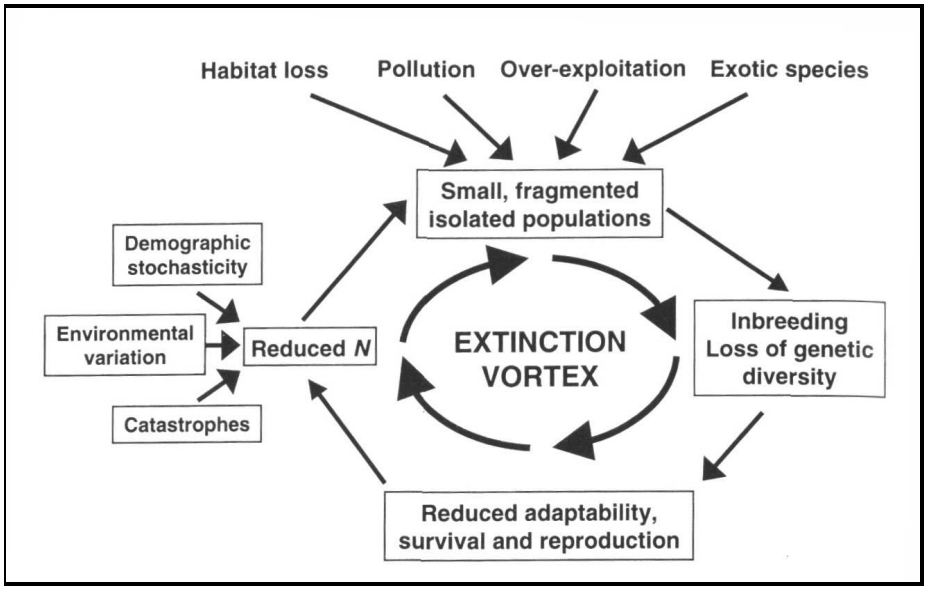

Fig. 5: The so called "Extinction vortex" according to FRANKHAM et al. (2002). Small, fragmented and isolated populations are fragile and sensitive to various threats which may cause either further decline or spontaneous extinction. This figure quite accurately describes the current situation of most western populations of *Cricetus cricetus*.

Besides the commonly accepted threats like monocultural farming, habitat loss and fragmentation some authors also presume that global climatic changes may be responsible for a range shift from West to East (NEUMANN et al. 2005).

DISTRIBUTION AND STATUS IN EUROPE

Table 3 presents a summary of the current situation in Europe and of the following country reports.

Table 3: Current situation and conservation status of *Cricetus cricetus* in Europe

Country	Official conservation status	Legal status	Conservation measures	Population trend estimate	Source of information
Netherlands	critically endangered	strictly protected	conservation breeding, reintroduction and habitat management	increasing*	Alterra Wageningen UR (NL)/La Haye pers. comm. 2008
Belgium	critically endangered	strictly protected	restocking and habitat management	decreasing	Natuurpunt/Flemish Agency for Nature and Forest
France	endangered	strictly protected	conservation breeding, reintroduction and/or habitat management	decreasing	Burget pers. comm (Sauvegarde Faune Sauvage, NGO), Wencel (ONCFS, 2001)
Germany	endangered	strictly protected	conservation breeding, reintroduction and/or habitat management	stable - decreasing	Nature conservation agencies of federal states
Poland	data deficient	strictly protected	none	decreasing	Nechay (2000), Ziomek (2007)
Czech Republik	common	protected	none	stable - increasing	Nechay (2000), Tkadlec pers. comm. 2008, Andera pers. comm. 2008
Austria	vulnerable	strictly protected	none	data deficient - stable	Universität Wien, www.umweltbundesamt.at, Hoffman pers. comm. 2008
Slovenia	susceptible	protected	none	data deficient	Nechay (2000)
Croatia	susceptible	protected	none	data deficient	Nechay (2000)
Slovakia	data deficient	not protected	none	data deficient	Nechay (2000)
Hungary	listed as pest species	not protected	none conservation plan to be accepted in 2008 by Ministry of Environment Conservation	data deficient	Nechay (2000), Bihari pers. comm. 2008/ Bihari Z. (2007) Hörcsög (*Cricetus cricetus*). KvVM Természetvédelmi Hivatal, FAJMEGŐRZÉSI TERVEK, 21pp. (official report, manuscript)
Serbia	least concern - near threatened	not protected	none	data deficient - decreasing	Nechay (2000)/Paunovic pers. comm. 2008
Belarus	unknown	not protected	none	data deficient	Berdyugin & Bolshakov (1998), Nechay (2000)

Ukraine	unknown	not protected	none	data deficient	Nechay (2000)/Tovpinetz pers. comm. 2008
Moldova	unknown	not protected	none	data deficient	Nechay (2000)
Romania	common	protected	none	data deficient - recovering	Nechay (2000), Murariu pers. comm. 2008
Bulgaria	endangered	protected	none	data deficient	Nechay (2000), Markov pers. comm. 2008
Russia	unknown	not protected	none	data deficient	Nechay (2000)

* refers to reintroduced population only!

1. Netherlands

The Common hamster is native in the Netherlands to the province of Limburg only (HUSSON 1949, LENDERS & PELZERS 1982, KREKELS & GUBBELS 1996). Since 1994 it has been included in the Red List of endangered species of the Netherlands as critically endangered ("ernstig bedreigd") (LINA & VAN OMMERING 1994). Between 1970 and 1997 the species suffered an average decline in range of at least 74 % (KREKELS 1999). In 1998 it was concluded that the Common hamster population was no longer vital and would face extinction, which happened in 2002 when the last burrow of a wild hamster was found near the city of Maastricht. To prevent the complete extinction of the species in the Netherlands 14 (7,7) wild hamsters were caught in 1999 to provide the founderstock for conservation breeding and reintroduction (DE VRIES 2003, LA HAYE pers. comm.). A feasibility study in 1998, followed by a conservation plan in 1999 had been worked out, listing possible reintroduction sites and corridors to connect them (VAN APELDOORN & NIEUWENHUIZEN 1998, KREKELS 1999). Since 2000 more then 950 hamsters have been bred in captivity and in the period 2002-2007, 600 of these captive-bred hamsters were reintroduced in the wild in the Netherlands (ca. 540) and Belgium (ca. 60). Reintroductions in the Netherlands have taken place at seven different sites at Sibbe (2002), Amby (2003), Heer (2004), Sittard (2005), Koningsbosch (2006), Puth (2006) and Wittem (2007). To increase the genetic fitness of the Dutch breeding stock, the hamsters have been crossbred with German (North-Rhine Westfalia) and Belgian hamsters (1 resp. 3 hamsters) all of which belong to the same 'genetic' population west of the river Rhine (NEUMANN et al. 2005; LA HAYE pers. comm.). Population growth is currently in a range between 50% – 90% each year (LA HAYE pers. comm.). The population size was estimated to reach more than 1200 burrows in the autumn of 2007. In the areas of Sittard and Koningsbosch the population has spread into Germany (North-Rhine Westfalia), but no protection measures were taken on the German side (STRAUBE pers. comm.). The Ministry for Agriculture, Nature and Fisheries of the Netherlands and the province of Limburg are sharing project costs for conservation breeding, reintroduction and hamster friendly management agreements for farmers. The reintroduction sites have sizes of 30 to 60 ha and are managed by farmers with a "hamster-agreement" or managed by nature conservation organisations. The fields are farmed according to the specific needs of the Common hamster. Project management, regular monitoring and field work is carried out by the dutch research institute Alterra, Wageningen UR, the Radboud University of Nijmegen and the Province of Limburg.

2. Belgium

In Flanders and Wallonia, the Common hamster range stretches from the dutch border westward on a small belt roughly between the latitudes 50 33' N and 50 54' N, east of the outskirts of Brussels (HUSSON 1949, MERCELIS 2003). According to LIBOIS & ROSOUX (1982) the oldest fossil records in Belgium date back to the late Pleistocene but the species was missing since to re-appear again in the mid of the 19th century. High densities in the early 20th century led to pest control measures (LIBOIS & ROSOUX 1982) followed by a continuous decline which already invoked the appeal for conservation measures by LIBOIS & ROSOUX (1982). A conservation plan exists for the Flemish part of the distribution range (VALCK et al. 2001). An updated conservation plan from 2006 includes habitat protection on 38 ha and restocking measures with hamsters from the dutch breeding stock (VERBIST 2007). The conservation plan focusses on two so-called key areas at Bertem (Vlaams-Brabant) and Heers-Tongeren (Limburg), but hamsters also occur at Bilzen-Riemst (Limburg) (VERBIST 2007) and Hoegaarden (Vlaams-Brabant) (VERBEYLEN et al. 2007). In 2008 an expansion in protection measures is planned by the Flemish government.

In Wallonia yearly surveys have been carried out to update the knowledge on remaining populations since 2001 by the NGO Aves-Natagora. Burrows were found in three areas, one near Jodoigne and Beauvechain, one around Waremme and one around Bassenge. In 2002 only the area around Waremme could be confirmed. Since then efforts were made to contract farmers for hamster friendly management. So far only three famers could be contracted to manage combined lucerne and wheat strips of 12 m width and two farmers to abandon the use of rodenticides. 18 burrows have been counted in the Waremme area in 2007. The project is supported by the government of the Walloon region with € 15.000,- per year (DEROUAUX pers. comm.).

3. France

The Common hamster is indigenous to the Departements Haut Rhin and Bas Rhin in the Alsace. It is officially protected on a national scale since 1996 (l'arrêté ministériel 10. Oct. 1996, WENCEL 2001). Before then several hundreds of hamsters were caught each year in spring for scientific research at the Louis Pasteur University Strasbourg.

LOSINGER & WENCEL (2006) state that already in the 1960s a decline was observable. Until 1997 the hamster lost 77 % of its former distribution range (WENCEL 1998). Simultaneously the average burrow density dropped to 0,18 burrows/ha which is far below of the proposed viability threshold by WENDT (1989) of 0,5 - 2 inhabitet burrows/ha in spring (LOSINGER & WENCEL 2006). The remaining core areas are mainly in the Departement Bas Rhin west of the City of Strasbourg. A conservation plan was prepared by the Office Nationale de la Chasse et de la Faune Sauvage covering a period of five years from 2000 to 2004 (WENCEL 2001, LOSINGER & WENCEL 2006). The conservation plan focussed mainly on habitat conservation, monitoring of population trends, conservation breeding and increasing the acceptance of the species by the public and farmers especially. During this five year period the Common hamster population continued to decrease mainly due to road building projects on hamster core areas in the vicinity of Strasbourg, insufficient habitat restoration, funds and personnel (LOSINGER & WENCEL 2006).

Alongside the official conservation plan the NGO Sauvegarde Faune Sauvage runs a breeding centre at the Zoo of Mulhouse and reintroduces Common hamsters. These efforts lack a regular monitoring and scientific support so that few is known about the success of these measures.

According to LOSINGER & WENCEL (2006) a new conservation plan should have been validated for the period 2007 – 2011. It was unfortunately not possible to get an official statement or any other information from the Office Nationale de la Chasse et de la Faune Sauvage for this action plan.

Based on information made available by the Secretary of the Bern Convention, France currently implements an action plan for the Common hamster in Alsace with a duration from 2007-2011 and prepares a so called "second rescue plan for the Common hamster" with a duration from 2007-2013. Additionally agri-environmental measures dedicated to the protection of the Common hamster will be included in the French rural development plans for the period 2007-2013 with the aim to create 360 ha of farmland cultivated to the species specific needs.

The country authorities further aim to designate 3000 ha as priority action areas where the farming of crops favoured by the Common hamster will be promoted and habitat loss due to building projects is generally prohibited. Two of these action zones (Geispolsheim 800 ha, Piémont des Vosges 1615 ha) have already been approved. Until now around 50 farmers have been contracted to cultivate crops favourable for the Common hamster within the two priority zones. These contracts run for five years. Furthermore conservation breeding and reintroduction will be a part of the conservation plan to supplement remaining populations within the priority zones.

The measures proposed by the French authorities are criticized by NGOs to be insufficient as 70 % of the Alsatian hamster population remain disregarded. The Standing Committee of the Bern Convention therefore opened a case-file against France in November 2007 and the country also received the last warning of the European Commission in June 2008.

On the background of this information, the current situation in France still remains unclear and questions arise in terms of the long-term perspective of the French action plan, actual size of the fields and/or areas under contract, monitoring and reintroduction protocols, information flow and transparency.

4. Germany

Common hamsters used to live preferably in the fertile lowlands characterised by loamy and loessy soils from Bavaria and Baden-Württemberg in the southwest, Rhineland-Palatinate, Hesse and Northrhine-Westfalia in the west, Lower Saxony, Thuringia, Saxony-Anhalt and Saxony in Central Germany, up to Brandenburg and even Mecklenburg-Vorpommern in the north. The core range comprises of Lower Saxony, Thuringia, Saxony-Anhalt and Saxony, the area of distribution in the other Federal States is comparatively small and isolated. Until the mid of the 20th century hamsters

were quite abundant in nearly all Federal States mentioned above and pest control measures were carried out on a regular scale (SULZER 1774, HUBERT 1968, ZIMMERMANN 1995). Especially in Thuringia, Saxony-Anhalt and Saxony hamster trapping for the fur trade became an important business. MÜLLER (1960) mentions 1 – 2 million furs each year between 1952 – 1956 for Saxony-Anhalt only.

As early as between 1960 to 1970 the Common hamster populations started to decline in all Federal States, leading to an extension of the trapping season in the core range which had formerly been limited to the month of May (BÜNNING 1976). PIECHOCKI (1979) analysed the fur statistics of the former years and found a steady regression trend which did not correlate with normal population dynamics. WENDT (1984) therefore proposed measures supporting a recovery of weakened populations. Hamster trapping however continued until 1989. It is not yet possible to quantify the decline for Germany as the data available for the different Federal States is very heterogenous and not consistend enough to allow the calculation of a number or percentage. Near the end of the 20th century all Federal States had updated their knowledge on the distribution of *Cricetus cricetus* and verified its decline or extinction (GODMANN 1998, HUTTERER & GEIGER-ROSWORA 1997, KRÜGER & KRÜGER 1998, MEYER 1998, SELUGA 1998, SELUGA & STUBBE 1997, TEUBNER et al. 1996, THIELE 1998, VOITH 1990, WECKERT & KUGELSCHAFTER 1998, WEINHOLD 1998, ZIMMERMANN 1995). In the Red List of endangered animals of Germany, the Common hamster is listed in category 2 as endangered (BINOT et al. 1998) and in attachment 1 to § 1 of the so called Bundesartenschutzverordnung as especially protected. The hamster is also protected by the German Law of Nature Conservation (§ 42). But according to its considerable distribution range in Germany, the situation varies in the different Federal States. Each Federal State possesses its own Red List, specific Law of Nature Conservation and, not obligatory, its own conservation plan. Table 4 gives a summary of the conservation status and measures in the Federal States which are part of the distribution range of *Cricetus cricetus* in Germany.

Table 4: Conservation status and conservation measures in the Federal States of Germany for *Cricetus cricetus*. BY = Bavaria, BW = Baden-Württemberg, RP = Rhineland-Palatinate, HE = Hesse, NS = Lower Saxony, NRW = Northrhine-Westfalia, TH = Thuringia, SA = Saxony-Anhalt, S = Saxony, BR = Brandenburg.

Federal State	Red List Category	Conservation status	Source	Official conservation plan	Conservation measures
BY	2	endangered	Liegl, A., Rudolph B-U., Kraft, R. (2003): Rote Liste gefährdeter Säugetiere (Mammalia) Bayerns. - In: Die Rote Liste gefährdeter Tiere Bayerns. Landesamt für Umweltschutz (Hrg.), S. 33-38. Schreiber (pers. comm.)	yes, but expired	Habitat management/restoration - expired
BW	1	critically endangered	Braun, M., Dieterlen, F., Häussler, U., Kretzschmar, F., Müller, E., Nagel, A., Pegel, M., Schlund. W., Tumi, H. (2003): Rote Liste der gefährdeten Säugetiere in Baden-Württemberg. - In: Die Säugtiere Baden-Württembergs, Band 1, M. Braun/F. Dieterlen (Hrsg.). Verlag Eugen Ulmer GmbH & Co., S. 263-271.	yes	Habitat management/restoration and reintroduction as compensation for habitat loss due to building projects on regional scale
RP	4	threatened	Grünwald, A., G. Preuß, A. Bitz, M. Braun, W. W. Gettmann, H. Kettering, L. Simon & H. Wissing (1987): Säugetiere (Mammalia). - S.13-19. - In: Ministerium für Umwelt und Gesundheit Rheinland-Pfalz (Hrsg.) (1987): Rote Liste der bestandsgefährdeten Wirbeltiere in Rheinland-Pfalz (Stand 1984, mit wesentlichen Aktualisierungen 1987). - Mainz, 58 S. Simon pers. comm. (Landesamt für Umwelt, Wasserwirtschaft und Gewerbeaufsicht)	yes	Habitat management/restoration
HE	3	vulnerable	Kock, D. & K. Kugelschafter (1996 [1997]): Teilwerk I, Säugetiere (3. Fassung, Stand: Juli 1995). - S.7-21. -In: Hessisches Ministerium des Innern und für Landwirtschaft, Forsten und Naturschutz (Hrsg.) (1996 [1997]): Rote Liste der Säugetiere, Reptilien und Amphibien Hessens. - Wiesbaden, 55 S.	no	Habitat management/restoration by NGO on regional scale
NS	2	endangered	Heckenroth, H. (1993): Rote Liste der in Niedersachsen und Bremen gefährdeten Säugetierarten, 1. Fassung vom 1.1.1991. - Inform.d. Naturschutz Niedersachs. 13, Nr. 6 (6/93), S. 121-126, Hannover.	no	Habitat management/restoration by NGO on regional scale
NRW	1	critically endangered	Feldmann, R., Hutterer, R. & Vierhaus, H. (1999): Rote Liste der gefährdeten Säugetiere in Nordrhein-Westfalen, 3. Fassung. - Landesanstalt für Ökologie, Bodenordnung und Forsten Nordrhein-Westfalen (Hrg.), S.: 307-324.	expired in 2007	Habitat management/restoration incorporated in so called Kulturlandschaftsprogramme since 2007
TH	2	endangered	Knorre, D. von (1993): Rote Liste der Säugetiere (Mammalia) Thüringens (ohne Fledermäuse, Chiroptera), 1. Fassung, Stand 1992. - S.14-15. -In: Thüringer Landesanstalt für Umwelt, Abteilung Naturschutz und Landschaftspflege (Hrsg.) (1993): Rote Liste ausgewählter Pflanzen- und Tierartengruppen sowie Pflanzengesellschaften des Landes Thüringen. - Thüringer Landesanstalt für Umwelt, Abt. Naturschutz und Landschaftspflege (Hrsg.), Jena, 215 S.	no	Measures offered by so called Kulturlandschaftsprogramme
SA	1	critically endangered	Heidecke, D., Hofmann, Th., Jentzsch, M., Ohlendorf, B., Wendt, W. (2004): Rote Liste der Säugetiere (Mammalia) des Landes Sachsen Anhalt, 2. Fassung. - Berichte des Landesamtes für Umweltschutz Sachsen-Anhalt (39), S. 132-137. Trost, M. (2007): Zuarbeit zum Bericht zum Schutz des Hamsters (Cricetus cricetus) in Europa auf Anforderung des Sekretariats der Berner Konvention. Landesamt für Umweltschutz Sachsen-Anhalt, Fachbereich Naturschutz, Fachgebiet 44 - Tierartenschutz und Staatl. Vogelschutzwarte. Trost, M, pers. comm. 2008	no	Habitat management/restoration on 362,56 ha incorporated in so called Kulturlandschaftsprogramme
S	1	critically endangered	Rau, S., Steffens, S., Zöphel, U. (1999): Rote Liste Wirbeltiere, Freistaat Sachsen, 2. Fassung. - Materialien zu Naturschutz und Landschaftspflege, 24 S. Zöphel pers. comm. (Sächsiches Landesamt für Umwelt und Geologie)	no	Measures planned by "co-operative hamster conservation project"
BR	1	critically endangered (probably extinct)	Dolch, D., T. Dürr, J. Haensel, G. Heise, M. Podany, A. Schmidt, J. Teubner & K. Thiele (1992): Rote Liste. Säugetiere (Mammalia). - S.13-20. -In: Ministerium für Umwelt, Naturschutz und Raumordnung des Landes Brandenburg (Hrsg.) (1992): Rote Liste. Gefährdete Tiere im Land Brandenburg (1. Auflage August 1992). - Unze-Verlagsgesellschaft, Potsdam, 288 S.	no	-

5. Poland

According to ZIOMEK & BANASZEK (2007) the Common hamster's distribution range in Poland of 1971 lay between the latitudes 50° N and 53° N connecting the German populations in the West with the populations of the Ukraine and Belarus in the East. Until the end of the 20th century single records of hamster occurrence were still found within this range. In Poland, the Common hamster is strictly protected under the Nature Conservation Act of April 16th, 2004 and is listed in Appendix I of the ordinance to the act as a strictly protected species requiring active protection. Despite this legal framework, the official status of *Cricetus cricetus* in Poland is still data deficient (ZIOMEK &

BANASZEK 2007)

A recent study on the status und current range of this species by ZIOMEK & BANASZEK (2007) observed a substantial decline in comparison to its range of 1971. Today only 103 localities remain were the presence of *Cricetus cricetus* is verified and an additional 146 localities were it might still be present. According to PUCEK & RACZYNSKI (1983 cited in ZIOMEK & BANASZEK 2007) *Cricetus cricetus* occurred in 1.176 localities in Poland in 1971. This would account for a decline of between 80 % and 91 % according to the recent results of ZIOMEK & BANASZEK (2007). Due to this dramatic decline the population in Poland has lost contact to populations in the West (Germany), the South (Czech Republic) and the East (Belarus).

Furthermore the remaining populations in Poland are isolated from each other and belong to two different phylogenetic lineages, one of Pannonian origin and one of specific Polish origin. The viability of the Pannonian lineage is presumed to be very fragile and close to extinction, whereas the Polish lineage is considered less endangered and with better chances of survival (BANASZEK et al 2007).

According to their results ZIOMEK & BANASZEK (2007) and BANAZSEK et al. (2007) propose to change the status of *Cricetus cricetus* from data deficient to endangered and fear that without conservation measures the species will vanish within the next thirty years.

6. Czech Republic

Cricetus cricetus is a typical species of the cultivated farmland occuring in altitudes up to 650-770 m above sea level (GRULICH 1975, VOHRALÍK & ANDĚRA 1976, ANDĚRA & BENEŠ 2001). It is generally widespread throughout the Czech Republic and its range can be best described as a field between the latitudes 48°45' and 50°45' N and longitudes 12°34' and 18°45' E. At present, there are two strong hamster populations within the country territory (fig. 6). One in the lowlands of the Labe river (from northwestern to eastern Bohemia) and another in the lowlands of central and southern Moravia. Both Bohemian and Moravian populations are most likely not isolated from each other and a third, rather small population inhabits the lowlands in northeastern Moravia/Silesia (in the broader vicinity of the city Ostrava, ANDĚRA pers. comm., fig. 6).

According to its habitat preferences the Common hamster is restricted to areas with soils rich in loam, loess or clay and an annual precipitation not exceeding 650 mm. The species avoids woodlands and is found almost exclusively on farmland with sugar beet and potatoes as predominant cultivations especially in combination with wheat and/or barley (GRULICH 1975, VOHRALÍK & ANDĚRA 1976, ANDĚRA & BENEŠ 2001). The highest densities and core areas in the Czech Republik were found in the district Jihomoravský, South of the City of Brno between Zojmo in the West and Břeclav in the East (GRULICH 1978, 1980).

The common hamster was considered to be a rare and endangered species in the seventies and eighties of the 20th century (BARUŠ et al. 1988) and is still protected by law. Since then population levels have been rising again, especially in the intensely farmed lowlands. Therefore the species is not included in the actual version of the red list anymore (ANDĚRA & ČERVENÝ 2003).

7. Austria

Cricetus cricetus inhabits the Pannonian parts of the country represented by the Federal States Niederösterreich, Vienna and Burgenland (SPITZENBERGER 1998). It is listed as vulnerable in the Red List of endangered animals in Austria (SPITZENBERGER 2005) and depending on the Federal State in charge, is classified as fully protected (Lower Austria), especially protected (Burgenland) or strictly protected (Vienna) (www.umweltbundesamt.at). There is no official conservation plan or regular monitoring of the species. Research activities of the University of Vienna focus on urban populations of *Cricetus crictus* in the southern districts of Vienna, where it inhabits parks, gardens and cemetries (FRANCESCHINI & MILLESI 2001, HOFFMANN 2002). The population in the vicinity of Vienna is presumed to be stable but data from the other distribution areas is deficient.

8. Slovenia

In Slovenia *Cricetus cricetus* is presumably restricted to the plains of the Rivers Drava and Mura

in the northeast bordering Austria, Hungary and Croatia. The only records so far were obtained by KRYSTUFEK (1987 cited by NECHAY 2000) near the village Obrez between Ormož and Sredisce. *Cricetus cricetus* is a protected species in Slovenia and listed as susceptible (NECHAY 2000).

9. Croatia

In continuation to the Slovenian range the Common hamster is also found in the Croatian part of the Drava valley. NECHAY (2000) presumes that this small distribution area is an extension of the southern Hungarian populations. RUŽIĆ (1978) describes the existence of *Cricetus cricetus* in low densities in the Syrmian region of former Yugoslavia which now partly belongs to eastern Croatia and Serbia. Therefore it could also be possible that the Croatian population is a derivate of the Serbian one. According to NECHAY (2000) *Cricetus cricetus* is a protected species and listed as susceptible.

10. Slovakia

HELL & HERZ (1969) determined the main distribution range of *Cricetus cricetus* in the western und eastern Slovakian lowlands. The species also occurs in the southern part of Central Slovakia but to a much lesser extent. These results correlate well with the distribution range reported by GRULICH (1975) for the former ČSSR. The Slovakian populations of *Cricetus cricetus* together with the Austrian, Czech, Hungarian, Croatian, Serbian and Romanian populations form the genetic lineage of the Pannonian population according to NEUMANN et al (2005).

In 1971-72 Eastern Slovakia became the focus of pest control measures and intense research due to a mass population outbreak in the basin of Košice and the adjacent lowlands (GRULICH 1975, 1978, 1980, 1981, 1986, HOLIŠOVÁ 1977).

The distribution data presented above is over thirty years old and was predominantly collected in a period of high population densities. Unfortunately no up-to-date information is available to determine the current conservation status of this species. The information available on *Cricetus cricetus* must therefore be considered data deficient.

11. Hungary

The Common hamster is widespread in the Great Hungarian Plain east of the Danube River (NECHAY 1998, 2000) bordering Serbia, Romania and the Ukraine. Smaller populations also occur in the north-western part of the country bordering Slovakia in the basin of Györ and west of the Danube river including mainly the districts Fejér and Tolna. Although population densities have been declining within the last three decades (BIHARI 2004, NECHAY 1998, 2000), it can still reach high numbers regionally and is professionally trapped for its fur.

Cricetus cricetus is categorised as a "dangerous-pest" species in Hungary according to the order of the Minister for Agriculture No. 5/1988 (IV.26.) MÉM and therefore not protected. This order permits the control of hamsters, when their abundance exceeds a "dangerous threshold" of two inhabited burrows or hamsters per hectare in the spring. Therefore an exception was made for Hungary, on the basis of Article 22 of the Bern Convention in 1990 when the country became a party to the Convention (NECHAY 2000). After an outbreak in 2002 the species nearly disappeared from the traditionally best areas (BIHARI 2007). Until now (2008) only a few places have been re-inhabited. It is feared that the hamster may disappear on a large scale from agricultural areas. A species conservation plan has been worked out and will be adopted in 2008 by the Ministry of Environment Protection and Watermanagement (BIHARI pers. comm). In the absence of a regular monitoring and/or research on the Common hamster, the overall situation in Hungary has to be considered as data deficient.

12. Serbia

The range of *Cricetus cricetus* in Serbia is located mainly in the province of Vojvodina represented by the plains of the rivers Danube in the west and southeast, Tisa in the East and Sava in the south. It also stretches southward of Belgrade following the valley of the river Morava, Pek and Mlava (PETROV 1992, MILENKOVIĆ 1993). RUŽIĆ (1978) especially mentions the central and northern Bačka area (province of Vojvodina) containing the highest population density in former Yugoslavia. She also observed hamsters in the Serbian part of the Srem (Syrmian) area and southern Banat but in low densities. The Serbian population of *Cricetus cricetus* directly borders the Croatian, Hungarian

and Romanian ones and also belongs to the Pannonian population (NEUMANN et al. 2005). According to PAUNOVIĆ (pers. comm.) the population trend can be described as declining due to the loss of suitable steppe habitats being turned into arable land and the use of rodenticides in agricultural habitats, although it is currently still vital and fluctuating with the last population peak recorded in 2007 (PAUNOVIĆ pers. comm.).

Its official status in Serbia is not protected and the IUCN-status is Low risk/near-threatened (LR/nt) (SAVIĆ et al. 1995). According to VASIĆ et al (1991) *Cricetus cricetus* is included in the preliminary Red list of vertebrates in Serbia.

No profound data on the population status is currently available and hence the situation in Serbia should be considered as data deficient.

13. Belarus

BERDYUGIN & BOLSHAKOV (1998) describe the Northern boundary of *Cricetus cricetus* in Belarus as a line from the westernmost City of Brest bending southwards to Rovno in the Ukraine and going further East staying North of the region of Zhytomyr (Ukraine) to the Southeastern City of Gomel. According to NECHAY (2000) the range lies south of a rough line between Brest and Gomel. Data on population density is scarce and not very precise. KOPEIN et al. (1982 cited after BERDYUGIN & BOLSHAKOV 1998) found only 0,1 % of *Cricetus cricetus* in their rodent samples of the Zhytomyr-Poles'e region. NECHAY (2000) also speaks of low numbers not exceeding 1 burrow/hectare for the period between 1930-1939.

The situation, status and current distribution of the Common hamster in Belarus is not known at all. The status of the species has to be classified as data deficient.

14. Ukraine

According to GORBAN et al. (1998) *Cricetus cricetus* was once widespread and very abundant in the first half of the 20th century, especially in the east and south of the Ukraine. Even in the western part bordering Slovakia, Hungaria and Romania the hamster was a common rodent inhabiting dry meadows, cereal and potato fields.

Due to intense long-term pest control measures carried out predominatly by trapping and poisoning and the use of pesticides (e. g. 20 kg of DDT/ha on average between 1950-1960), the populations have declined constantly since the 1980's. It is now a rare species in the west and has completely vanished in some areas. In the south and east population densities are low (GORBAN et. al 1998).

SUROV & TOVPINETZ (2007) however report high densities of *Cricetus cricetus* on the Crimean Peninsula occupying a variety of habitats like steppe zones, foothills and even mountainous regions up to 500 m (fig. 7). Especially in and around Simferopol the Common hamster has invaded central urban habitats and is frequently found in front gardens, parks, greens and hedgerows alongside city roads. Urban densities might be as high as 136 individuals per hectare and are in general higher than in natural habitats outside the city. Accompanying its urbanization SUROV & TOVPINETZ (2007) found evidence that *Cricetus cricetus* also seemed to modify its behavioural pattern from strictly solitary to a more social level. At the end of the reproductive period in August they observed *Cricetus cricetus* living in aggregations and not avoiding each other as one would expect.

Whereas GORBAN et al (1998) propose to list *Cricetus cricetus* as a protected species, SUROV & TOVPINETZ (2007) are more concerned about future epidemiological problems arising from the urban populations.

Apart from the Crimean peninsula there is no distribution map available and the overall situation of the Common hamster in the Ukraine still remains unclear and therefore has to be considered as data deficient.

15. Moldova

MUNTEANU (1998) states that *Cricetus cricetus* lives in low numbers throughout the country, avoiding only the central woodlands. Most commonly it is found in non-cultivated sites such as

meadows, pastures and road verges. Farmland is also inhabited but to a much lesser degree than in other countries (LOZAN 1971 cited in NECHAY 2000, MUNTEANU 1998).

Unfortunately more precise data is not available yet and the species is neither officially protected nor given any official conservation status. Therefore it has to be classified as data deficient.

16. Romania

The distribution of Common hamster is restricted to the western and southern lowlands of Romania. It is present in the counties of Bihor, Arad and Timisoara in the west connecting to the populations of the Great Hungarian Plain and the Vojvodina (Serbia). In the south *Cricetus cricetus* inhabits the Romanian plain including the counties Teleorman, Giurgiu, Calarasi and Prahova (MURARIU 1998, 2006 pers. comm.) directly neigbouring the Bulgarian distribution range. Between 1950 and 1970 the species was also present in Moldavia and Transylvania climbing up to 500 m above sea level and in the years 1996 and 1997 hamster skulls were found in the pellets of *Asio otus* at Vaidacuta and Ludus in the county Mures (MURARIU 1998).

Due to the communist modifications of land ownership carried out in the 1950's, resulting in large agro-collectives, considerable changes towards the intensification of land use and land management were made. This led to a loss of suitable hamster habitats and in the end to a decline of the Romanian hamster population (MURARIU 1998, 2006). During the post-communist period beginning in 1989, the land was partially returned to the farmers and agricultural land use became less intense again, due to the lack of suitable machinery and personnel. MURARIU (1998, 2006) observed a slight recovery of *Cricetus cricetus* which reclaimed former habitats and also invaded suitable new ones.

Cricetus cricetus first became officially protected when Romania joined the Bern Convention in 1993 and is furthermore protected by Law 103/1996, in Annex No. 2 and by the ordinance of the Romanian government Nr. 57/20 of June 2007 concerning the natural protected areas, natural habitats conservation, of wild flora and fauna, in Annex No. 4A (MURARIU 1998, pers. comm.). Despite its legal protection, neither an official conservation plan nor complete information on the population status for *Cricetus cricetus* exists.

17. Bulgaria

The Common hamster inhabits the Danubian plain and Fore-Balkan region most abundantly in the districts Ruse, Gorna Oriahovisa, Veliko Turnovo, Pleven and Vratsa (MARKOV 1998). Typical habitats are grassy plains, meadows, gardens, lucerne and wheat fields. Population densities are generally low and *Cricetus cricetus* is protected by the Bulgarian law of nature conservation (MARKOV 1998). No new information is currently available on the status of the species and it has therefore to be considered as data deficient.

18. Russian Federation

The Common hamster inhabits the eastern European Forest Region from the Belarussian border via Smolensk up to the latitude 59° N namely in the vicinity of the cities Yaroslavl and Vologda. In continuation it obviously avoids the woodland areas by going slightly southwards towards Gorkij and then again further north to Kirov and finally to Berezniki where it reaches the Ural mountains (BERDYUGIN & BOLSHAKOV 1998).

In the southwest *Cricetus cricetus* reaches the foothills of the Caucasus mountains and inhabits the so-called European steppe forest and steppe habitats and is also listed as a common rodent of the Caspian semi-desert (www.wild-russia.org).

Its distribution beyond Europe and the Ural mountains reaches further east where it inhabits the vast West Siberian Forest steppe and steppe regions in the south, connecting to the Kasachian population and the western Siberian Forest region between the latitudes 59° - 60° N. According to BERDYUGIN & BOLSHAKOV (1998) the northeastern borderline of *Cricetus cricetus* is marked by the city of Krasnoyarsk at the Jenisseij river. There it crosses to the eastern river bank and follows the Minusinski steppe southward to the city of Minusinsk, jumping back to the western river bank of the Jenissej further along the foothills of the West-Sayan mountains near the village Beya (BERDYUGIN & BOLSHAKOV 1998). In the southeast it reaches the Altai mountains near the city Gorno-Altaisk and

protrudes to the Tarbagatai mountains at the Chinese-Mongolian border.

BERDYUGIN & BOLSHAKOV (1998) name the Pre-Caucasus, Volga and Ural regions, as well as Bashkortostan (Bashkiria) and the West Siberian lowland between the Irtysh and Ob river to the Altai foothills as areas of highest population densities.

Taking into account the vast Russian distribution range covering a wide spectrum of different biotopes it is worth mentioning that *Cricetus cricetus* can inhabit various habitats. Forest-steppe, steppe and semi-deserts are named as main biotopes. But farmland, forest skirts, river valleys, bushland, thickets, hedges, grassland and meadows of various kind are also inhabited up to an elevation of 1500 m above sea level. The Common hamster has also often been registered living synanthropicly in gardens, on greens and parks like the Central Botanical Garden of Novosibirsk (BERDYUGIN & BOLSHAKOV 1998).

As BERDYUGIN & BOLSHAKOV (1998) summarize quite heterogeneous data collected by various scientists in the preceding decades, there is currently no profound up-to-date information available on the conservation status and population density.

The status of the Common hamster therefore has to be considered as data deficient.

CONSERVATION MEASURES

1. HABITAT RESTORATION

Cricetus cricetus has been living alongside humans for centuries as a very successful species. The steppe-like conditions in cereal fields became a suitable alternative to the original habitat. But especially the technical developments and modifications in agriculture taking place predominantly within the last 50 to 60 years seem to have outrun the species-specific survival strategies of the Common hamster.

Therefore habitat conservation and/or restoration in terms of preserving traditional small-scale agriculture with a variety of seasonally available crops are the key factors for long-term conservation.

Habitat restoration measures (see tab. 5) are often carried out by contracting farmers on a long-term basis. Contracts usually run for a specific period, e. g. five years, and are renewed automatically after that period for further five years and so on. Financial compensation should be calculated on the basis of the average profit which the farmer draws from the field or fields concerned. The disadvantages of contract-based habitat restoration is that it might be quite difficult to contract farmers in the first place and that each party has of course the opportunity to terminate the contract after each period. Experience has shown that increasing grain prices often induce the termination and complicate the conclusion of such contracts. This model is therefore susceptible in terms of long-term stability. More stability in this matter can be obtained if the party offering the contract owns the land and the farmer is in the position of a leaseholder.

Habitat restoration measures in general should increase the cover and food availability throughout the year and especially in the time prior to hibernation, when *Cricetus cricetus* needs to collect and store food. Furthermore, they are aimed at improving the overall habitat quality. Table 5 summarises the various possibilities of conservation measures which can be chosen from and which may be implemented in conservation contracts with farmers. It is also recommendable to further protect habitats where conservation measures are carried out by designating them as nature preserves.

Tab. 5: Conservation measures concerning habitat improvement/restoration and the different aspects of their conservation effects (+ = good conservation effect, ++ = very good conservation effect, - = no conservation effect)

Conservation measure	Conservation effect						
	1. Improvement of vegetation cover		2. Increase of food availability	3. Support of food supply for hibernation	4. Survivability	5. Improvement of habitat quality	6. Decrease of pollutants and/or harmful substances
	1.1 Spring	1.2 Summer/ Autumn					
Ploughing earliest in mid October	-	+	++	+	+	+	-
Ploughing depth max. 25 cm	-	-	-	-	++	+	-
Increase of proportion of cereals within crop rotation (e. g. three to four times within five years)	++	-	+	-	+	+	-
Promotion/restoration of perennial feed crops as key habitat (esp. lucerne & clover, average field size 1 ha)	++	++	++	++	++	++	-
Decrease of proportion of root crops within crop rotation (e. g. once within five years)	++	-	-	-	+	++	-
Leaving cereal strips (min. 20 m wide) unharvested	-	+	++	++	++	++	-
Decrease of field size in areas of large-scale agriculture (average field size > 5 ha)	+	+	+	+	+	++	-
Creation of herbal field boundaries (min. 12 m wide)	+	+	++	+	+	+	-
Increase of diversity of field crops within a small-scale succession	+	+	++	++	+	++	-
Reduction of biocides	-	-	-	-	+	+	++
No fertilisation with liquid manure or sewage sludge	-	-	-	-	+	++	++
Demand-actuated application of mineral fertilizer	-	-	-	-	-	++	+

Small fragmented populations require additional support and a close yearly monitoring of their survivability. Key criteria in this context required to be obtained are sex ratio, reproductive success and survival rates. These criteria are best obtained by monthly capture-mark-recapture studies. The following paragraphs describe what kind of additional support can be undertaken to save these populations.

2. MITIGATION OF FRAGMENTATION

Habitat fragmentation and isolation can be decreased by migration corridors or wildlife passages which re-connect populations wherever feasible.

Field edges, solitary or alongside hedgerows, between 10 – 20 m wide which consist of grasses, wild herbs and/or lucerne may serve as such corridors. In the Netherlands migration corridors consist also of cereal fields which are not harvested until October and which connect the different release sites.

The existence of species specific habitat elements in wildlife passages are of importance for the acceptance of overpasses and underpasses (GEORGII 2002).

A few wildlife passage tunnels built in underneath motorways exist in France and Germany but their functionality is questionable and no sound data exists on the attractivity for and use by *Cricetus cricetus*. Standard-sized underpasses for small terrestrial vertebrates have a width of at least 1 m on a length of 20 m in general (MAMS 2000), the height is around 0,7 m.

Overpasses generally used to connect game mammal populations may have better premises of acceptance by *Cricetus cricetus*, if habitat specific elements like cereal and/or lucerne fields are integrated.

Further general recommendations to improve the permeability of wildlife overpasses are (SCHULTE 2000):

- Specification on those species which are concerned especially by the fragmentation locally or with a view to desired recolonization of habitats.
- Careful choice of placement e. g. on frequently used tracks and pathways or adapted to the space use pattern of the species concerned
- A width of at least 30 – 50 m, providing enough room for habitat specific elements
- Design with habitat specific elements which are found in the nearby environment
- Being well adapted to and integrated in the environment e. g. with hedgerows as guiding structures to optimise the chances of detection and access by the animals

Fences and walls prohibiting road access and guiding small fossorial mammals to the passages should be impermeable over- and underground. Common hamsters are well known to be good climbers, and have been reported to climb maize plants, hazelnut bushes and even trees in search of food. Mesh wire fences are easily climbed over and therefore no real obstacle. An additional negative effect of the climbing is the cost of precious energy and exposure to predators.

A hamster-specific and quite successful solution chosen in Germany was a PVC-fence placed 30 cm deep in the soil and 90 cm above ground. The fence had one-way cat flaps to enable small mammals to get out of the fenced off area.

Alternatively concrete barrier walls may be used to prevent trespassing and guide the animals to the passages.

However these measures are costly and sound data on their efficiency is scarce and absent for *Cricetus cricetus*. Therefore their potential benefit should be weighed against possibly favouring measures which mitigate environmental impacts, habitat destruction and further habitat loss.

Instead of building a variety of wildlife passages, which, in the absence of any sound species specific field data, may or may not work, a population management programme decreasing the population fragmentation by trapping and translocation of hamsters would be an alternative option.

3. MITIGATION OF HABITAT LOSS

A major threat especially in the densely populated western distribution range is ongoing habitat loss and fragmentation due to building projects. **It is strongly recommended to thoroughly assess alternative building sites if hamster habitat is affected and to involve experts at an early state during the planning of a building project.**

Basic requirements are a study on the status of the hamster population affected, an impact assessment and the evaluation of the feasibility as well as the possible success of compensation and mitigation measures. Field studies can only be carried out during the period of activity of *Cricetus cricetus*, therefore timetables of building projects should be adjusted to this.

The size of the study area has to be based on the spatial requirements of the Common hamster population and not on the size of the building site. Therefore the size and range of the population concerned needs to be known.

4. CONSERVATION BREEDING AND REINTRODUCTION

Conservation breeding to allow supplementation and/or reintroduction should be considered where populations are endangered, critically endangered or facing extinction. These measures ought to follow the IUCN Guidelines for Reintroduction (1995) which describe the aims, objectives, scientific, governmental and public activities necessary during all three phases (pre-release, release, post-release) of a reintroduction project.

Conservation breeding is currently carried out in the Netherlands at Rotterdam Zoo and Gaia Park Kerkrade, in France at Mulhouse Zoo and Hunawihr and in Germany at Heidelberg Zoo. Research colonies exist at the University of Stuttgart (Germany) and at Strasbourg University (France). Apart from the Dutch breeding stock, all other colonies are of Alsatian origin. It is therefore strongly recommended to increase the genetic basis of the breeding groups, especially those which belong to the conservation breeding programmes.

The Dutch conservation breeding and reintroduction programme running since 2000 has already proved that this "ex situ measure" works succesfully for the Common hamster and is a real conservation option.

PUBLIC AWARENESS AND EDUCATION

The historically based reputation of the Common hamster as a pest species is a major obstacle for the implementation of conservation measures. Therefore efforts should be made by every country to inform and educate the public and especially the factions affected by the conservation measures.

RESEARCH REQUIREMENTS

Although the first monograph on the Common hamster was published in 1774 by SULZER, the knowledge on the species still remains incomplete with regards to ecology, population dynamics, adaptability, survival strategies and population genetics. Efforts should be taken by every country to increase this knowledge which is crucial for the conservation of *Cricetus cricetus*.

Also there is a need of more detailed information on the efficiency of conservation measures and the use of wildlife passages or tunnels.

Very few is also known about viable population densities and population dynamics in original steppe habitats.

Equally the range shift theory due to climatic changes mentioned above (NEUMANN et al. 2005), should be part of current and future research.

RECOMMENDATIONS ON CONSERVATION STRATEGIES

The conservation of the Common hamster is not possible without the support of politicians, governmental authorities, local communities, conservation organizations and especially the co-operation and acceptance of the species by the farmers and land owners. A conservation programme should be based on a multidisciplinary team ideally consisting of scientists, farmers, hunters, politicians, governmental authorities, economists, NGOs, teachers and journalists each group responsible for their part of expertise.

The conservation measures need to be adapted for each country as the agricultural methods and peculiarities may differ considerably within the huge distribution range of *Cricetus cricetus*.

The overall strategy should be to focus on the long-term conservation of the key habitats like lucerne and clover fields (BIHARY & ARANY 2001) in combination with traditional small scale agriculture. Especially in those countries (Czech Republic, Hungary, Romania, Ukraine, Russia) were *Cricetus cricetus* is still abundant these measures ought to be taken in advance preferably in areas which are not liable to future habitat loss and fragmentation due to building activities.

In 13 out of 18 countries belonging to the European distribution range either the conservation status and/or the population trend estimate has been evaluated as data deficient (compare also with table 3). These countries (Austria, Belarus, Bulgaria, Croatia, Hungary, Moldova, Poland, Romania, Serbia, Slovakia, Slovenia, Ukraine and Russia) should update their knowledge on the distribution and status of *Cricetus cricetus*.

The recent results of the population decline in Poland show that even a "pest" species may vanish within a few years. A species that was traditionally frequent is apparently often mistakenly presumed to be abundant still. It is therefore important to thoroughly assess the status of *Cricetus cricetus* especially in the eastern part of its range.

Representatives of each country should meet on a regular basis to exchange experiences and

report the status of the action taken and to promote co-operation between countries. The International Hamster Workgroup offers an already existing platform but would need more support to securely plan and organise the meetings and to enable the participation of experts from Eastern European countries.

Countries which belong to the westernmost distribution range were *Cricetus cricetus* is critically endangered (Netherlands, Belgium, France, Germany) should generally continue with and intensify their conservation efforts and reduce further habitat loss.

Especially the **Netherlands** seem to be on a good path to re-establish a vital indigenous hamster population within the next 10 – 20 years.

Belgium is still at the beginning of its conservation efforts and should intensify them as well as financially secure the measures long-term.

In **France** the situation is currently not very transparent as the opinions about the quality of the current conservation plan and the measures proposed are quite different. In addition France has just recently received the final warning from the European Commission and the Standing Committee of the Bern Convention has opened a case-file in 2007. Unfortunately it was not possible to get a reply from the ONCFS (Office Nationale de la Chasse et de la Faune Sauvage) which has been officially responsible for the preceding conservation plan. However, the remaining populations are highly threatenend and require close observation and continuous intense conservation measures.

In **Germany** the situation is very heterogeneous concerning the quality, committment and financial support of hamster conservation. Frequently the only conservation actions result from compulsory compensation measures due to building activities on hamster habitats. In general the efforts ought to be intensified and financially secured. Official conservation plans should be carried out independently of building projects and designed for long-term perspectives. Conservation breeding exists only in Baden-Württemberg but should be supported on a national scale to preserve the genetic profile of the species and increase its fitness.

Poland urgently requires a conservation plan and needs to take action. The remaining populations need to be studied and monitored closely. This country is a good example for the danger of data deficiency on species which are presumed to be abundant because they have been in the past. Conservation breeding of both genetic lineages is strongly recommended.

Table 6 shows the current conservation measures and gives recommendations on actions to be taken for each European country.

Table 6: Current conservation measures and recommended actions to be taken for each European country.

Country	Current conservation measures	Recommended actions
Netherlands	conservation breeding, reintroduction and habitat management	Continue and secure project until vital and stable populations are re-established. Devise long-term conservation strategy of reintroduced populations. Increase co-operation between with adjacent countries.
Belgium	restocking and habitat management	Intensify efforts, secure conservation measures financially, devise an overall "Belgian" recovery plan for long-term conservation, increase co-operation between Flanders and Wallonia and with adjacent countries. Designate core areas as nature preserves to increase their conservation status. Reduce further habitat loss.
France	habitat management, conservation breeding and reintroduction	Intensify efforts immediately, update information on the status and distribution of the species within the next two years, secure conservation measures financially, devise recovery plan for long-term conservation, work out sound monitoring scheme to evaluate success of conservation and reintroduction measures. Designate core areas as nature preserves to increase their conservation status. Reduce further habitat loss. Promote conservation breeding and co-operate with NGO. Increase genetic basis of breeding stock. Increase co-operation with adjacent countries.

Country	Current conservation measures	Recommended actions
Germany	habitat management conservation breeding and reintroduction (one federal state)	Intensify efforts, secure conservation measures financially, devise recovery plans for long-term conservation, increase co-operation between federal states, update information on the status of the species every two years for each federal state, assess viability of wild populations and their core areas. Designate core areas as nature preserves to increase their conservation status. Reduce further habitat loss. Support conservation breeding on a national scale, to increase genetic fitness and preserve the genetic profile of indigineous populations (e. g. melanistic form of Thuringia). Increase genetic basis of breeding stock. Increase co-operation with adjacent countries.
Poland	none	Design recovery plan for long-term conservation and start with conservation measures immediately. Continue updating information on the status and distribution of the species. Work out sound monitoring scheme to evaluate success of conservation measures and secure conservation measures financially. Start conservation breeding of both genetic lineages. Assess viability of wild populations and their core areas. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Czech Republic	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and work out preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Austria	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and work out preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Slovenia	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Croatia	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and work out preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Slovakia	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and work out preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Hungary	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Serbia	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Belarus	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Ukraine	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Moldova	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Romania	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.

Country	Current conservation measures	Recommended actions
Bulgaria	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.
Russia	none	Update information on the status and distribution of the species within the next two years. Assess viability of wild populations and their core areas. Analyse current and future threats and devise preliminary conservation plan within the next five years. Designate core areas as nature preserves to increase their conservation status. Increase co-operation with adjacent countries.

SUMMARY

The Common hamster (*Cricetus cricetus*, L. 1758) was once widespread and numerous throughout Europe between the latitudes 44° - 59° N and the longitudes 5° - 95° E (NIETHAMMER 1982). Its distribution is generally limited by climatic conditions and the existence of cohesional, well drained soil. Hamsters hibernate and store food in their burrows as supply for times of activity between torpor bouts.

In the last four decades a continuous population decline has been observed especially at the westernmost distribution range in the Netherlands, Belgium, Germany and France, but in Poland also a decline of at least 80 % has been documented recently. In eight out of 18 European countries *Cricetus cricetus* is currently classified from rare up to critically endangered. In six countries no suitable data was available to classify the status of the species and only three countries estimate it to be still common.

In seven countries (Slovakia, Hungary, Serbia, Belarus, Ukraine, Moldova and Russia) the hamster is not protected and may still be pest controlled and/or trapped for its fur. These are the same countries which possess no profound data to determine the conservation status or the future population trend.

The main threats for the Common hamster are habitat loss and fragmentation and modern, monocultural agriculture.

Therefore the overall conservation strategy should be:

- Update the knowledge on the distribution, population density and vitality especially in the eastern part of its range within the next two to five years.
- Intensify and support research on population ecology, dynamics and genetics as well as the efficiency of conservation measures.
- Devise long-term conservation plans on the basis of above results for every country.
- Undertake efforts to educate and inform the public to increase the acceptance of the species
- Increase the co-operation between countries through regular meetings to exchange information and experiences.
- Wild populations should be protected by means of habitat conservation. Especially in those countries (Czech Republic, Hungary, Romania, Ukraine, Russia) where *Cricetus cricetus* is still abundant these measures should be taken in advance preferably in areas which are not liable to future habitat loss and fragmentation due to building activities.
- To maintain the Common hamster in the western part of its range an intensification of the efforts in terms of habitat protection, restoration and management, reduction of future habitat loss, conservation breeding and reintroduction is necessary.

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