

## **Kurzfassungen der Vorträge und Posterbeiträge**



**Abstracts of talks  
and posters**



## **Age structure and reproduction of the stone marten (*Martes foina*) in Upper Lusatia**

HERMANN ANSORGE and DIANA JESCHKE

A total of 1017 stone martens was collected during the winters 1981–83, mainly by trapping. Reproductive tracts of 479 vixens were screened for *corpora lutea*, embryos, and placental scars. Skull characteristics and annual growth lines of cementum of teeth were used for ageing of 865 animals. Mean litter size of 2.8 per vixen, according to embryo counts and placental scars, was within the range found in other studies. Litter size did neither vary significantly between one year old and older females nor among regions of Upper Lusatia. Among vixens older than two years, only 83% had reproductive signs, and 71% of one year old females participated successfully in reproduction. Embryos were found in four (=1.7%) vixens within their first year of life. Prenatal mortality was low (5%), as calculated by comparing *corpora lutea* and embryos or placental scars. The age distribution of the hunting bag appeared strongly biased towards juveniles (75%). Despite an intensive hunting pressure, older animals were evenly distributed up to eleven years of age. The age structure did not vary significantly across the diverse regional units in Upper Lusatia. Astonishingly, the sexes were evenly distributed (1.0: 1.0) in all age classes. The proportion of young of the year was greater in the hunting bag than in the real population, as concluded from the reproduction rate. A model of the structure of the living population was constructed from the reproduction data and the smoothed age distribution of the studied sample. According to this model, 44% of the animals in the population were young of the year. Numbers of older individuals continuously dropped with increasing age. These findings comply with the scarce data in available studies from the wild.

(transl. F. SUCHENTRUNK)

Authors' address:

Dr. Hermann ANSORGE, Diana JESCHKE  
Staatliches Museum für Naturkunde Görlitz  
PF 300154  
D - 02806 Görlitz  
Deutschland  
E-mail: smng.ansorge@t-online.de

## Stone marten feeding habits on Croatian islands Cres and Hvar

MARJANA BALTIĆ and DARKO KOVAČIĆ

The stone marten (*Martes foina*, Erxl. 1777) is a widely distributed species in Croatia; ranging from the Pannonian lowlands in the East, through mountainous parts of the Dinaric karst, along the whole Adriatic coastland and on major Adriatic islands from North to South. The diet of stone martens is insufficiently known, especially in particular climatozone habitats. Island ecosystems offer the possibility of research on differences in feeding habits in larger ecological units. The diet of stone martens on the islands of Cres and Hvar was studied through the whole year. The island of Hvar is in the southern part of the Adriatic Sea in the eumediterranean zone with typical forests of *Quercus ilex*, *Pinus halepensis*, macchia, rocky grounds, cultivated land and villages. The island of Cres is in the North Adriatic Sea and subdivided into a NW submediterranean part with forests of *Quercus pubescens* and pastures, and a SE eumediterranean part with forests of *Q. ilex*, macchia, rocky grounds with cultivated *Juniperus communis*, cultivated lands and villages. The opportunistic usage of feeding resources by stone martens is confirmed. The winter diet consists mostly of small mammals, and the summer diet of insects. In the eumediterranean part (Hvar and SE of Cres) the most important component of diet are fruits of *Juniperus communis* and *J. phoenicea*.

### Authors' addresses:

Marjana BALTIĆ  
Croatian Natural History Museum  
Demetrova 1, 10000 Zagreb, Croatia  
Phone: ++ 385 1 428 596  
Fax: ++ 385 1 424 998  
E-mail: mbaltic@hpm.hr

Dr. Darko KOVAČIĆ  
Lonjsko polje Nature Park  
Trg kralja Petra Sva i a b.b.  
44324 Jasenovac, Croatia  
phone/fax: ++ 385 44 672 080  
E-mail: darko.kovacic@zg.tel.hr

## Appearance of American mink – implications for the protection of birds

MAGDALENA BARTOSZEWICZ and ANDRZEJ ZALEWSKI

American mink, *Mustela vison*, first appeared in the Szoński Reserve at the end of the 1990s. It is the only species of the order Carnivora which occurs in the reserve all year round, even during times of high flooding.

The Szoński Reserve is located in western Poland, near the confluence of the rivers Warta and Odra. It consists of 50 km<sup>2</sup> of wetlands dominated by flooded meadows and channels and old river beds. Willow thicket is the dominant vegetation type; old willow trees are much rarer. Populations of migrating water birds can reach numbers of 250,000 and about 160 bird species nest in the area. The reserve is also the retention reservoir where the annual water level fluctuations reach four meters. Because of the highwater fluctuations, for many years artificial nests have been installed for the protection of nests against destruction by flooding. Wooden boxes and platforms made of straw are put high on willows. These nests are used by greylags, *Anser anser*, mallards, *Anas platyrhynchos*, and shelducks *Tadorna tadorna*.

The aim of this study was to determine the influence of American mink on the breeding success of birds in the Szoński Reserve. Artificial nests, natural coot nests, and breeding colonies of gulls and terns were controlled. Information about adult birds killed by mink during the breeding season was collected. Telemetry and capture-recapture techniques were used to collect data about mortality and the influx of new individuals. American mink and crow, *Corvus corone*, were the main causes of nest loss in artificial nests. At least 35%, and possibly as many as 77% of the nests on straw platforms (n=76), which were occupied mainly by greylag, were definitely destroyed by mink. In the case of wooden boxes (n=62) the loss was only 22–38%. Predation on natural nests was not as important because they were damaged by rising or falling water. In 1999, for the first time, eggs of the black-headed gull, *Larus ridibundus*, were destroyed by mink in mass numbers. Eighty-five killed adult birds were found in the stores of the mink. These were mainly coots (60 individuals), but also mallards, garganeys, tufted ducks, greylags, shelducks, great-crested grebes, starlings and sparrowhawks.

During the spring high water levels, the number of minks in the flooded area fluctuated between four and six individuals. Minks used wooden boxes and platforms as hiding places, but tree holes only sporadically. However, on the edge of the reservoir the number of minks was quite variable. Traps were set for seven

kilometers along the edge of the water and a total of 21 individuals was caught and followed using telemetry. The population of minks is quite transitory. Many minks are killed on the nearby road by passing cars, but their numbers are quickly replaced by influx of new minks.

This study confirmed that artificial nests protect eggs against the changes in water levels, but that the risk of damage by mink is very high. Long-term trends of the number of mallards and greylags confirm that low breeding success does not immediately influence the population of these species in the reserve, but it could be important for populations that are decreasing in other areas. Methods of active protection of birds used in the Szońsk Reserve should be modified to consider the American mink.

Author's addresses:

Magdalena BARTOSZEWICZ  
„Water River Mouth“  
Landscape Park  
Chyrzyno 1  
69–113 Górzycza  
Poland  
E-mail: slonsk@go.home.pl

Andrzej ZALEWSKI  
Mammal Research Institute  
Polish Academy of Sciences  
17–230 Biżowieża  
Poland  
E-mail: zalewski@bison.zbs.bialowieza.pl

## **First Evidence of Histoplasmosis in a Badger (*Meles meles*) in Austria**

BARBARA BAUDER, THEODORA STEINECK and ANNA KÜBBER-HEISS

Histoplasmosis is a disease of the MPS of humans and animals caused by the fungus *Histoplasma capsulatum*. Infection happens through inhalation of spores, which reach the respiratory tract, where they are phagocytized by alveolar macrophages. After the development of intracellular yeast forms and reproduction by budding haematogenous dissemination can lead to the involvement of other organs followed by occurrence of foci of granulomatous inflammation. Histoplasmosis is endemic in Africa, America (especially in middle and southern parts), Asia and in some Mediterranean countries, but is a rare disease in Europe. We

describe the first case of histoplasmosis in a badger (*Meles meles*) in Austria, which was shot by a hunter in Lower Austria because of abnormal behaviour and necropsied at the Research Institute of Wildlife Ecology of Vienna Veterinary University. Macroscopically the female badger (6,4 kg) showed multiple nodules and ulcers in the skin of head, chest, abdominal wall, all limbs as well as enlargement of lymph nodes. Apart from multiple traumatic lesions in the thoracic region caused by the penetration of shotgun pellets the other organs appeared normal at cross examination. Histologically lots of yeast-like organisms, approximately 3 mm in diameter, were found within macrophages in the lymph nodes. The skin lesions consisted of partly necrotic granulomas heavily infiltrated with macrophages packed with *Histoplasma*. On account of the massive infection followed by rupture of affected cells the fungi were not only localized intracellularly, but also diffusely scattered all over the interstitial space. The fungi stained moderately with HE and Giemsa, but well with Grocott silver stain and PAS, whereas they did not stain with Alcian Blue and Mucicarmine thereby excluding confusion with *Cryptococcus neoformans*. Immunohistochemically the organisms revealed positive reactions after incubation with antibodies against *Histoplasma capsulatum*. The diagnosis was confirmed by immunofluorescence examinations performed by the Center of Disease Control, Atlanta.

Authors' addresses:

Dr. Barbara BAUDER,  
Dr. Anna KÜBBER-HEISS  
Institute of Pathology and Forensic Veterinary Medicine  
University of Veterinary Medicine, Vienna  
Veterinärplatz 1  
A-1210 Vienna  
Tel.: ++43/1/25077/2403 or /2414  
Fax: ++43/1/25077/2490  
E-mail: [barbara.bauder@vu-wien.ac.at](mailto:barbara.bauder@vu-wien.ac.at)  
[anna.kuebber@vu-wien.ac.at](mailto:anna.kuebber@vu-wien.ac.at)

Dr. Theodora STEINECK  
Research Institute of Wildlife Ecology  
University of Veterinary Medicine, Vienna  
Savoyenstr. 1  
A-1160 Vienna  
Tel.: ++43/1/4890915/40  
Fax: ++43/1/4890915/59  
E-mail: [theodora.steineck@vu-wien.ac.at](mailto:theodora.steineck@vu-wien.ac.at)

## **Badger (*Meles meles*) sett use and characteristics in a Mediterranean habitat**

VICTOR BONET-ARBOLI, RODRIGUEZ TEIJEIRO, JOSE DOMINGO  
and LLIMONA FRANCESC

Burrows (“setts”) are a key resource for badgers as they enable them to breed and provide shelter against predators and adverse climatic conditions. Some of these setts (usually one per territory) are more important than others, are inherited from generation to generation, and enlarged periodically; thus becoming huge constructions. According to some authors, setts are an important factor promoting group-living for this species. Here we present the first results on sett use and features of a wider, ongoing project on badger ecology in the Collserola Park, in the environs of the city of Barcelona.

A long-term survey carried out with the help of volunteers in different parts of the area showed a high density of setts (0.12 setts/ha). Setts were usually small (mean = 3.4 entrances), but large setts were also recorded (up to 20 entrances). From 1997 onward we have been studying the sett use pattern of four badgers from three different territories by means of radio-tracking. Badgers used only a small fraction of all available setts in their home ranges, but were highly mobile between them. They changed setts on average every 2–4 days, depending on the individual, the season, and the year. In summer, badgers tended to abandon the setts that were otherwise used during winters and spring to sleep in small setts within the part of their ranges at lower altitude, and generally in sites with dense vegetation cover.

The level of sharing setts is low, the usual number of badgers sleeping in the same sett at a time being one. Two animals sharing setts were recorded only occasionally, and never in summer. These results were discussed in connection with the current hypothesis on the function of setts, in the light of the geographical variation in badger ecology available from the literature.

Authors' addresses:

Victor BONET-ARBOLI  
Rodríguez TEIJEIRO  
Jose DOMINGO  
Departament de Biologia Animal  
Universitat de Barcelona, Fac. de Biologia  
Av. Diagonal 645  
08028 Barcelona, Spain  
E-mail: bonet@porthos.bio.ub.es

Llimona FRANCESC  
Parc de Collserola



## **Beurteilung des Raubfeinddruckes durch Mauswiesel (*Mustela nivalis*) und Hermelin (*M. erminea*) auf Junghasen (*Lepus europaeus*) und Rebhühner (*Perdix perdix*) im Rahmen der Bewertung von ökologischen Maßnahmen bei Kommassierungsverfahren in landwirtschaftlich intensiv genutzten Gebieten**

LEOPOLD CECIL

Der länger anhaltende Trend rückläufiger Niederwildstrecken läßt sich durch natürliche, populationsdynamische Prozesse nicht erschöpfend erklären. Ein großer Anteil der Rückgangsursachen wird dabei der Landwirtschaft, insbesondere auch der Flurbereinigung im Zuge von Kommassierungen, zugeschrieben. Im Rahmen einer Studie zur Qualität von Niederwildhabitaten im landwirtschaftlich intensiv genutzten Raum, soll neben den Auswirkungen von Naturraumausstattung, Wettereinflüssen, und Raubfeinddruck auf die Niederwildarten Hase und Rebhuhn auch der spezifische Raubfeinddruck durch Mauswiesel und Hermelin in die Habitatbewertung einfließen.

Um den Raubfeinddruck dieser beiden Musteliden-Arten auf unsere Niederwildarten beurteilen zu können, wurden im Untersuchungsgebiet Leithaprodersdorf (nördl. Burgenland) in den Jahren 1998 bis 2000 umfangreiche Wieselfangaktionen durchgeführt. In jedem Jahr wurde eine standardisierte Methode der Universität Gießen (20 Wipfbrettfallen 15 Tage lang täglich kontrolliert) zur Berechnung der Wieseldichte herangezogen.

In den Jahren 1999 und 2000 wurden bei 97 Mauswiesel und bei 37 Hermelinen Magen- und Darmtraktanalysen durchgeführt. Anhand der Analyseergebnisse soll der Einfluss der Wiesel (der später im Lebensraumbewertungsmodell Niederschlag finden soll) auf die Niederwildarten bewertet werden. Bei 97 Mauswieseln (Geschlechterverhältnis weiblich : männlich = 1 : 6) konnten weder Hasenhaare noch Federn von Hühnervögel nachgewiesen werden. Es wurden ausschließlich Maushaare im Magen- und Darmtrakt vorgefunden. Bei den 37 Hermelinen (Geschlechterverhältnis weiblich : männlich = 1 : 1,2) konnten bei einem Hermelin Federkiele nachgewiesen werden.

Aufgrund der Untersuchungen kann der Raubfeinddruck des Mauswiesels auf unsere Niederwildarten als vernachlässigbar, und der des Hermelins (aufgrund seiner geringen Dichte) als sehr gering eingestuft werden.

Tabelle 1: Dichtevergleich Hermelin, Mauswiesel und „Maus“ (Arvicolidae und Muridae zusammen)

Dichtevergleich der gesamten Fangperiode: Jahre 1998 – 2000			
	1998	1999	2000
Hermelin/100 Fangtage	0.98	0.09	3.9
Mauswiesel/100 Fangtage	14.13	6.79	13.2
„Maus“/100 Fangtage	12.44	6.71	9.7

Anschrift des Verfassers:

DI Leopold CECIL  
Technisches Büro für Umweltschutz  
Marienweg 9  
A-2443 Leithaprodersdorf  
Tel.:02255/7163; 0676/5309133  
E-mail: cecil@surfeu.at

## **Building-up of a captive breeding stock for the European mink (*Mustela lutreola*) in cooperation with scientists and wildlife parks**

WOLFGANG FESTL

Today, the European mink (*Mustela lutreola*) is considered one of the most endangered mammal species in Europe, and is listed as particularly endangered by EU and IUCN; it was once quite common and ranged from eastern Spain to the Ural. The decline of European minks started early: it was reported “very rare“ in northern Germany already by 1800. The decline continued steadily since the mid of the last century. Recently, even the Russian populations, that appeared stable for long time, are substantially declining. According to recent reports, no viable populations can be found in these Russian regions (MARAN, T. 1997: Mitt. D. Zool. Ges., Arten- und Populationsschutz 13: 7–9). This acute danger for European minks necessitates an action plan for survival of this species, regarding both natural populations and ex-situ conservation measures.

The primory goal of the “Verein zur Erhaltung des Europäischen Nerzes – EURONERZ e.V.” is to establish an ex-situ breeding stock, which is linked to the “Europäisches Erhaltungszuchtprogramm“ (EEP, coordinated by T. MARAN, Tallin, Estonia). A concomitant information campaign is necessary not only because of the danger of extinction. “EURONERZ e.V.” intends to increase cooperation with the scientific community of this species but also because this species’ existence is virtually unknown and contribute to research on biology and ethology of the European mink. Furthermore, it assists with preparations for scientific conservation projects. A long-term goal is the reintroduction and to help with protection of remaining populations of European mink.

According to experience, a successful breeding program cannot be based on one or two pairs on the long run, because of the high aggressiveness and the individual behaviour of minks. Focusing on a higher number of individuals in the breeding program in a central institution will increase the chances of breeding success.

The concept of “EURONERZ e.V.” combines captive breeding and public relation actions. In this context, breeding has to be carried out in a central breeding station for the first time in an EEP project. Subsequently, gravid vixens will be loaned to wildlife parks, zoos, and similar institutions. They should present the attractive mother-young groups to the public and help draw attention to the situation of European minks. The cooperating institutions will take advantage in this way but will not be concerned with the tedious and costly breeding procedure. All individuals will belong to “EURONERZ e.V.” but might be loaned by partners for annual dues. In this way, there will be no negative consequences by commercializing the captive breeding program.

The central breeding station will be furnished with adequate cages with chances for behavioural observations. Thus, it will offer opportunities for research programs. Moreover, a loaning program of individual minks for research institutions is planned and dead minks will be provided to researchers. In addition, cooperations with projects in the wild will be offered.

(transl. by F. SUCHENTRUNK)

Author’s address:

Wolfgang FESTL  
„EuroNerz e.V.“  
Borglohere Str. 13  
D-49176 Hilter  
Germany  
E-mail: [seebass@cip.biologie.uni-osnabrueck.de](mailto:seebass@cip.biologie.uni-osnabrueck.de)

## **Evaluation of phenetic variability and level of stress in the range of the European mink (*Mustela lutrola*)**

JULIA V. GLUSHKOVA and PAVEL N. KORABLEV

A study of phenetic variability in European minks was carried out in the face of the dramatic reduction of the range and numbers of this species. Thereby, information on the characteristics of the population decline could be obtained. A total of 78 skulls that were collected during 1983–1996 in the Central Forest Nature Reserve, Nelidovo district, Tver region, Russia, was examined morphogenetically. The study region comprises the centre of the remaining range. One hundred sex-independent variants of 28 non-metric skull characters were used to describe the internal population structure and the level of fluctuating asymmetry of minks in comparison to 14 populations of other mammalian species of distant systematic positions (*Alces alces*, *Canis lupus*, *Castor fiber*).

The results indicated that the population decline has not yet reached a critical state and has not resulted in a decrease of epigenetic diversity. The level of epigenetic diversity of the mink population (2.86%) exceeded the range of the other species (1.98–2.56%). But the raised level of fluctuating asymmetry (39.4% compared to 8.5–28.1% for the other three species) suggested increased stress in the mink population. It probably results from competition with American minks (*Mustela vison*) due to niche overlap in areas of sympatry (KORABLEV, P., KORABLEV, N., GLUSHKOVA, J., KORABLEVA, V.: “The comparative analysis of phenofond of populations of the systematically remote species“ – *Reports of VI Theriol. Congr. Moscow, April 13-16, 1999, page 127*).

Two samples of skulls from regions separated from each other by approx. 100 km did not reveal significant different levels of epigenetic variability or fluctuating asymmetry and the parameter of similarity indicated absence of phenetic differentiation when averaged over all traits. But the peripheral regional sample had a higher level of minute phenodeviations. The fraction of rare phenotypes amounted to 0.207+/- 0.01 and 0.250+/-0.02 respectively.

Authors' address:

Julia V. GLUSHKOVA  
Pavel N. KORABLEV  
Central Forest Nature Reserve  
Zapovednik, Nelidovo distr.  
Tver region, 172513 Russia  
E-mail: ju.shtirlits@usa.net

## The European mink in the Danube Delta

VALER GOTEA and ANDREAS KRANZ

The European mink (*Mustela lutreola*) is considered the most threatened terrestrial carnivore in Europe. This species may have one of the last strongholds in the Romanian Danube Delta. However, until recently, its existence there was not acknowledged by the scientific community. There are minks in the Delta, which could be American minks (*Mustela vison*). In order to prove the presence of the European mink, preliminary field investigations are being carried out since 1998. The evidence gained so far indicates that the European mink inhabits the Delta. However, this evidence does not indicate the presence of the American mink. The status of both species, threats to their existence and basic ecology shall be investigated systematically in a comprehensive study during the following year. The basic questions and methodological approaches were outlined and discussed in the presentation.

### Authors' addresses:

Valer GOTEA  
Silva – The Forestry Student's Organisation  
Str. Republicii, nr. 1A  
RO-4281 Gurghiu, Jud. Mures  
Romania  
E-mail: vgotea@yahoo.com

Dr. Andreas KRANZ  
Dept. of Wildlife Biology and Game Management  
BOKU-Wien  
Peter Jordanstrasse 76 A  
A-1190 Vienna, Austria  
E-mail: wild.oekologe@jagd.stmk.at

## **Monitoring the genetic variation of the European common otter (*Lutra lutra*) – an indispensable precondition to any long-term conservation measure**

SVEN HERZOG

Genetic diversity is representative of the biodiversity at population level. It forms the basis for stability and adaptability of populations to recent as well as to future environmental conditions. Regarding endangered species, this factor, naturally, bears particularly importance. As the basis of any evolutionary progress the preservation of genetic diversity does not only play a decisive role within the framework of species protection, but also within the framework of any anthropogenic impacts in natural populations and life communities (biocoenoses, see e.g., RISSER 1995: Cons. Biol. 9, 742-746).

Anthropogenic influences on the biocoenoses often result in uncontrolled changes of genetic diversity parameters. To minimize or control, respectively, these uncontrolled influences is an essential task of genetics in view of management measures for species protection. In this connection, a genetic monitoring is becoming compulsory, so that within the framework of the ongoing project, methods provided for the assessment and quantification of genetic diversity, i.e., of its manifestation relevant at population level, are to be elaborated, regarding the European common otter (*Lutra lutra*) as an endangered vertebrate species.

The development of genetic indicator and monitoring systems as predictors of a long-term survivability and the ability to evolutionary progress seems to be an indispensable prerequisite of any future conservation efforts. These are to function as analytical and controlling tools in the scope of management measures for species protection. They are to facilitate the survey and supervision of genetic structures as a mirror image of long-term adaptability and thus survivability of endangered populations, hence enhancing the prospects for success of various management measures.

Author's address:

Prof. Dr. Sven HERZOG  
Dozentur für Wildökologie und Jagdwirtschaft  
Technische Universität Dresden  
Pienner Straße 8  
D-01737 Tharandt  
E-mail: [herzog@forst.tu-dresden.de](mailto:herzog@forst.tu-dresden.de)

## **Life expectancy of the European badger (*Meles meles*, L. 1758) under natural conditions**

THOMAS HOFMANN and MICHAEL STUBBE

Studies of life expectancy of big/medium-sized mammals from the wild are often based on comprehensive series of individuals that died an unnatural death. Regarding badgers, such series are basically stemming from road casualties. This study examines the age distribution of skulls of badgers that died without anthropogenic influence. A great many of badgers die a natural death in setts. Subsequent generations dig out the remains, and particularly skulls are frequently found in the mounts of excavation material.

A total of 107 skulls of badgers was collected over several decennia from excavation materials of badger setts in the "Hakelwald", a forest with an area of approx. 1300 ha in the German province of Sachsen-Anhalt. Causes of death of the badgers could not be reconstructed but anthropogenic causes could be almost entirely excluded. Additional 59 skulls from sexed badgers were obtained from the same region by hunting. Based on the latter skulls, a discriminant function based on various skull measurements was calculated for sexing the excavated skulls. Classification of skull ages (badger in its first year, second year, third year, etc.) was achieved by cementum annuli counts in tooth sections. Skulls of age class 0 (i.e., badgers in their first year of life) were excluded from the analysis, because the high chance of decomposition would have reduced the frequency of this age class in the whole sample.

The maximal age of the excavated skulls was 14 years as compared to 15 years in the sample derived from the hunts. Only 5.6% of the excavated skulls stemmed from badgers older than eight years. Natural mortality is highest in younger age classes, as deduced from the age distribution of excavated skulls. Among females (n=60), 58.4% of the skulls are from individuals younger than three years, and among male skulls (n=47), 40.5% of the skulls stemmed from animals younger than three years. Basically, this high mortality in females (and to a lesser degree in males) within the first two years of life was due to death in the second year of life and not in the first year as expected. This might be a consequence of the start of participation in reproduction in the second year of life. Intrasexual aggression and poor body condition might raise mortality in this phase of life.

(transl. F. SUCHENTRUNK)

Authors' address:

Dr. Thomas HOFMANN  
Prof. Dr. M. STUBBE  
Institut für Zoologie

Martin-Luther-Universität Halle-Wittenberg  
Domplatz 4  
D-06108 Halle/S.  
E-mail: hofmann@zoologie.uni-halle.de

## **The threat for the European mink (*Mustela lutreola* L.) in the centre of its present range (Tver region, Russia)**

VLADIMIR A. KATCHANOVSKY

The European mink has practically disappeared in Western Europe and numbers are rapidly decreasing in Russia. The Tver region constitutes one of the last ranges of the European mink in Russia. It is the centre of its current distributional range. The American mink (*Mustela vison*) is aggravating the process of disappearance of this indigenous mustelid species. By now we do not have data on how far the introduced American minks have spread. To fill this gap data on numbers and distributional characteristics are required. Unfortunately, in regular all-Russian hunting surveys, both species are combined and addressed as "wild mink".

Having started in 1990, we are accumulating information on the two mink species in the Tver region. The following sources of information are collected: interviews with local specialists and hunters, inspection of their fur collections and dead animals, own trapping data, craniological diagnoses. Information on the distribution of the two species was presented for the areas of the following river basins: Upper Volga, Mologa (Volga basin), West Dvina (Daugava), Msta and Kunia (Ilymen basin). A map of distribution and data on relative and recalculated absolute numbers of either species for administrative units was also presented. These data indicated that in the Tver region the European mink is practically replaced by the American mink. The latter species has widely spread since 1948 and presently inhabits all parts of the Tver region. For 1997–1998, the calculated number of European mink in the Tver region amounted to 1200 individuals and the number of American mink was 6000.

Author's address:

DR. Vladimir A. KATCHANIVSKY  
Central Forest Nature Reserve  
Nelidovo district, p/o Zapovednik

172513 Tver region  
Russia  
E-mail: v.katchanovsky@usa.net



## Wie ist der Einfluss von Musteliden auf Niederwild zu beurteilen ?

ERICH KLANSEK

Mit der Industrialisierung der Landwirtschaft in den Ackerbaugebieten Österreichs kam es zu einer merklichen Veränderung von ehemals optimalen Lebensräumen für Feldhase (*Lepus europaeus*) und Rebhuhn (*Perdix perdix*). Einförmige Monokulturen gewährleisteten oft nur kurzzeitig ausreichend Nahrung und/oder geeignete Versteckmöglichkeiten. Die Auswirkungen vor allem von landwirtschaftlichen Arbeitsgeräten sowie der Einfluss von Predatoren ist heute differenzierter zu beurteilen als noch vor wenigen Jahrzehnten. Es ist anzunehmen, daß in der strukturarmen Feldflur der Jagderfolg von Beutegreifern höher ist als in vielfältigen und deckungsreichen Landschaften.

Jagdstreckenergebnisse sind für die Interpretation von Populationsentwicklungen nur bedingt geeignet. Oftmals sind sie jedoch die einzige Datenbasis, die längerfristig zur Verfügung steht. Auffällig dabei sind die Ergebnisse von Feldhasenstrecken, die seit zwei Jahrzehnten einen stark rückläufigen Trend aufweisen und das Rebhuhn, das seit Mitte der achtziger Jahre nur mehr in wenigen Gebieten in jagdlich nutzbaren Beständen vertreten ist.

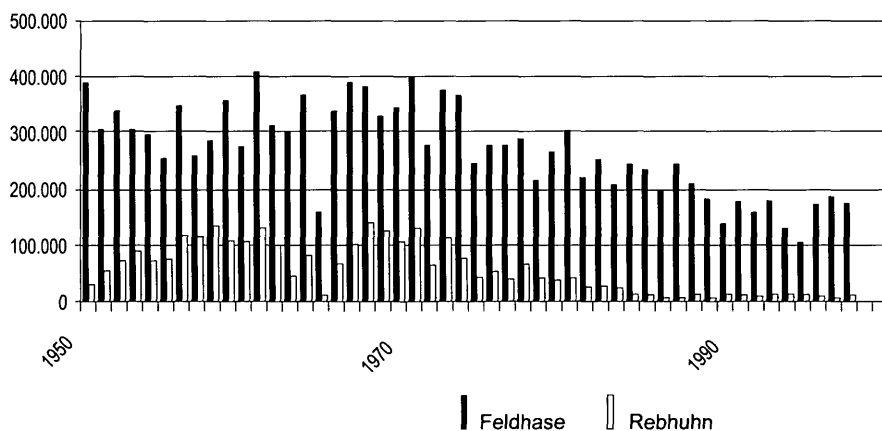


Abb. 1: Feldhasen- und Rebhuhnstrecken in Österreich (1950 bis 1999)

## Wie ist der Einfluss von Musteliden auf Niederwild zu beurteilen ?

ERICH KLANSEK

Mit der Industrialisierung der Landwirtschaft in den Ackerbaugebieten Österreichs kam es zu einer merklichen Veränderung von ehemals optimalen Lebensräumen für Feldhase (*Lepus europaeus*) und Rebhuhn (*Perdix perdix*). Einförmige Monokulturen gewährleisteten oft nur kurzzeitig ausreichend Nahrung und/oder geeignete Versteckmöglichkeiten. Die Auswirkungen vor allem von landwirtschaftlichen Arbeitsgeräten sowie der Einfluss von Predatoren ist heute differenzierter zu beurteilen als noch vor wenigen Jahrzehnten. Es ist anzunehmen, daß in der strukturarmen Feldflur der Jagderfolg von Beutegreifern höher ist als in vielfältigen und deckungsreichen Landschaften.

Jagdstreckenergebnisse sind für die Interpretation von Populationsentwicklungen nur bedingt geeignet. Oftmals sind sie jedoch die einzige Datenbasis, die längerfristig zur Verfügung steht. Auffällig dabei sind die Ergebnisse von Feldhasenstrecken, die seit zwei Jahrzehnten einen stark rückläufigen Trend aufweisen und das Rebhuhn, das seit Mitte der achtziger Jahre nur mehr in wenigen Gebieten in jagdlich nutzbaren Beständen vertreten ist.

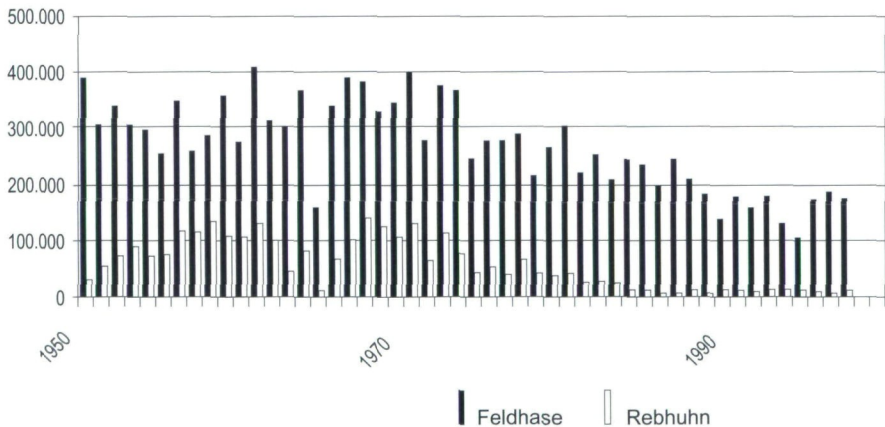


Abb. 1: Feldhasen- und Rebhuhnstrecken in Österreich (1950 bis 1999)

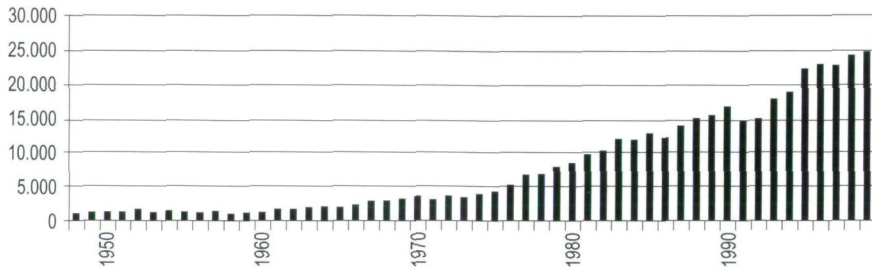


Abb. 2: Marderstrecken in Österreich (1948 bis 1999); in der Jagdstatistik werden Stein- (*Martes foina*) und Baummarder (*Martes martes*) nicht voneinander unterschieden

In weitgehend naturnahen Lebensräumen ist die Überlebenschance des Niederwildes ungleich höher als in ausgeräumten, lediglich von schmalen Heckenstreifen durchzogenen Feldlandschaften. Priorität bei Lebensraumverbesserungsmaßnahmen hat daher die Ergänzung bereits vorhandener Strukturelemente durch Einbringung naturnaher und an den jeweiligen Standort angepaßter Deckungsstrukturen, wie sie mittlerweile in Produktionsstilllegungsprogrammen der Landwirtschaft durchgeführt werden. Eine entsprechende Pflege dieser Flächen ist in der Regel notwendig, wenn sie für ehemalige Steppenbewohner wie Hase und Rebhuhn geeigneten Deckungswert besitzen sollen, das heißt einzelne größere Bereiche müssen einen niedrigen Pflanzenbestand aufweisen, damit neben den äußeren Randzonen auch innere Teile der Fläche dem Schutzbedürfnis entsprechen und somit genutzt werden können. Übersichtliche Deckungsstrukturen für diese beiden Niederwildarten bedeuten nämlich nicht hohen und üppigen Pflanzenbewuchs, sondern einen Pflanzenbestand, der bis zu neunzig Prozent Flächendeckung eine Wuchshöhe von fünfzehn Zentimetern nicht überschreitet, um einen entsprechenden Überblick zu gewährleisten. Vorhandene, unbewachsene Kahlstellen ergänzen die Strukturvielfalt und werden gerne als Huderplätze sowie zum Sonnenbad aufgesucht.

Fasan und Wachtel bevorzugen hingegen höhere Pflanzenbestände, die eine gute Einsicht von oben weitgehend verhindern. Im Bodenbereich sollten Lücken aber dennoch eine rasche Flucht zu Fuß gewährleisten. Die Pflege derartiger Pflanzenbestände ist unumgänglich, wenn sie erwähnte Aufgaben erfüllen sollen.

Der Einfluß von Musteliden auf das Niederwild ist gemäß den obigen Ausführungen somit wie folgt zu beurteilen:

- In von naturnahen Strukturelementen „befreiten“ Feldlandschaften gibt es keine nachhaltig bejagbare Niederwildart mehr. Die Populationsdichten befinden sich auf sehr niedrigem Niveau, das Zusammentreffen von Musteliden und Niederwild ist zwar die Ausnahme, eine Erhöhung der Population dennoch nicht möglich. Eine Nachstellung von Musteliden erfolgt – aufgrund fehlender Motivation – in diesen Revieren kaum.
- Gelege und Jungwild sind um so eher gefährdet, je weniger flächig ausgebildete und geeignete Deckungsstrukturen vorhanden sind. Lineare und zugleich schmale Strukturen werden sowohl vom Fuchs als auch von Musteliden regelmäßig auf Beutetiere abgesucht. Bei der Suche nach Kleinnagern treffen sie zwangsläufig auf Satzhasen, die noch nicht zu einer Flucht fähig sind oder auf Gelege, die ebenfalls dort häufiger sind, wenn es in der näheren Umgebung keine geeigneten Neststandorte gibt. Auch eine intensive jagdliche Nachstellung der Musteliden führt selten zu Verbesserungen der Niederwild-Populationsdichten, da bei sehr geringen Populationsdichten bereits relativ wenige Marder, Dachse, Iltisse und Wiesel einen jagdlich nutzbaren Zuwachs beim Niederwild wirksam verhindern können.
- Jagdliche Eingriffe in Beutegreiferbestände machen erst Sinn, wenn sie regulatorisch bzw. reduzierend erfolgen. Da dies unter Einhaltung gesetzlicher Auflagen kaum möglich ist, stellt sich die Frage, ob sich derartige Bemühungen lohnen, das erhoffte Ziel „Erhaltung nachhaltig bejagbarer Niederwildarten durch Raubwildregulation“ mit unverhältnismäßig hohem Aufwand zu erreichen.

In der Jagd und im modernen Naturschutz wird vermehrt auf den Schutz von Lebensräumen abgezielt. Forschungsprojekte für Rote-Liste-Arten sowie ganzjährig geschonte, jagdbare Wildarten werden von der Jägerschaft unterstützt. In erster Linie bedeutet dies finanzielle Beteiligung an Maßnahmen, die zu einer Verbesserung von Lebensräumen führt. Eine begleitende und wirksame Predatorenreduktion kann eine Verbesserung von Lebensgrundlagen sowohl für jagdbare (Feldhase, Rebhuhn, Großtrappe, Brachvogel etc.) als auch für nicht jagdbare (Igel, Feldhamster, Wiedehopf, Feldlerche, Schwarz- und Braunkehlchen etc.) Tierarten gleichermaßen zugute kommen. Eine Neuorientierung in der Zusammenarbeit zwischen Naturschutz und Jagd im Sinne der Aufrechterhaltung eines gesunden und artreichen Wildbestandes sowie intakter Lebensräume wäre als Voraussetzung allerdings notwendig. Der klassische Naturschutz mit möglichst geringen Eingriffen seitens des Menschen kann kaum wirklich gefährdete Tierarten vor ihrer Ausrottung schützen. Eine Kombination zwischen generellem Schutz (Jagdverbot; Schaffung, Pflege und Schutz von Lebensräumen) und verträglicher, nicht artgefährdender Bejagung (Schutz durch Nutzung) könnte dabei richtungsweisend sein. Eine

Haltung, die diesen Anforderungen gerecht wird, hätte möglicherweise sowohl für Nutzer als auch für sämtliche Mitbenutzer von natürlichen Ressourcen eine längst überfällige Neuorientierung zur Folge. Denn bei weiterer Absenz notwendiger regulativer Eingriffe in die derzeit noch vorhandene mitteleuropäische Artenvielfalt wird diese zwangsläufig in ihrer Biodiversität rascher verarmen, als so manche naturschutz- und jagdlich orientierte Zeitzeugen es wahrnehmen werden.

Die vorangegangenen Bemerkungen sollen meine Ausführungen über „Wie ist der Einfluß von Musteliden auf Niederwild zu beurteilen?“ insofern relativieren, daß es mir unmöglich scheint, jemals generelle wissenschaftlich fundierte Aussagen über diese Frage zu treffen. Zu verzahnt und verschachtelt präsentieren sich uns „Beute-Feind-Beziehungen“. Wir sind nicht in der Lage, Ökosystemforschung in allen dafür erforderlichen abiotischen und biotischen Fragen ausreichend abzudecken. Die Ergebnisse werden daher immer nur Stückwerk für einen lokalen Gesamteindruck bleiben. Die Gefahren von Fehlbeurteilungen liegen somit bei der Bearbeitung eines Themas im Bearbeiter selbst, der sich in der Regel einer Lobby (Jagd, Naturschutz, Greifvogelschutz, Vogelschutz, Tierschutz, Artenschutz, Umweltschutz, Jagdgegner, Alpenverein, Angelsport, Land- und Forstwirtschaft, Freizeitsport bzw. Tourismus etc.) verpflichtet fühlt, ohne emotionslos in der Lage zu sein, die Thematik ausschließlich objektiv in seiner Arbeit zu berücksichtigen.

Der Grad des Einflusses von Musteliden muß daher im Umfeld weiterer Faktoren wie Lebensraumstruktur, Fuchsdichte, Krähendichte, Greifvogeldichte, Raubwild- und Raubzeugbejagung bzw. -bejagungserfolg etc. gesehen werden. Und sollten intensivste Studien bereits irgendwo und irgendwann erfolgt sein, so sind sie dennoch nur selten auf andere Gebiete – auch wenn sie weitgehend in ihrer Struktur und sonstigen Gegebenheiten übereinstimmen mögen – umlegbar.

Author's address:

Mag. Erich KLANSEK  
Research Institute of Wildlife Ecology  
Veterinary Medicine University of Vienna  
Savoyenstr. 1  
A-1160 Vienna  
Austria  
E-mail: [erich.klansek@vu-wien.ac.at](mailto:erich.klansek@vu-wien.ac.at)

## **How to fence in Stoats (*Mustela erminea*)?**

HANS-HEINRICH KRÜGER

Stoats are kept very rarely in zoos. Currently, as to our knowledge, there is no institution in Germany that keeps stoats. Hence, almost no information is available on how to rear stoats, how they can be displayed to visitors, and what kind of cages should be preferred. Commonly, stoats are reared in wire mesh cages. Rearing them in fenced areas was not considered so far. Such fenced areas, however, should be preferred when rearing stoats, because these animals are very active and have natural home ranges up to several tens of hectares.

A fenced area for stoats, totalling 360 square meters, is under construction in the "OTTER-ZENTRUM" at Hankensbüttel (Germany). Detailed data on jumping and climbing behaviour of stoats are necessary for the construction of external and internal fences, but are not available in the literature. Therefore, jumping experiments were carried out with reared stoats. Electric fences were also applied in the experiments. The results were presented in the colloquium contribution.

(transl. F. SUCHENTRUNK)

Author's address:

Dr. Hans-Heinrich KRÜGER  
Aktion Fischotterschutz e.V.  
Otter-Zentrum  
D-29386 Hankensbüttel  
Germany

E-mail: [Aktion.Fischotterschutz@t-online.de](mailto:Aktion.Fischotterschutz@t-online.de)

## **Dispersal behaviour of the pine marten (*Martes martes*), a simulation of movement patterns**

ANGELIQUE J. MARTENS

The pine marten in the Netherlands is a member of the Red List of mammals: approximately 300 adult individuals are living in a few regions. The most important habitat types are forests which, in the Netherlands, are highly fragmented. Therefore, an important question is whether the pine marten is able to reach the different forest patches scattered in (mainly) agricultural land and how his movements are influenced by landscape patterns and road barriers.

At the Institute of Forestry and Nature Research a simulation model is developed which is based on an individual approach of movement patterns, considering preferences for different landscape types. This model was used in a qualitative way, to estimate the outcome of dispersal behaviour in relation to the features of the landscape.

It turned out that the model gives a lot of possibilities to investigate the influence of the landscape on movement patterns. Unfortunately, there are still too few field data available to be able to validate the model in a proper way.

Author's address:

Angelique J. MARTENS  
IBN, p.o. box 23  
NL-6700 AA Wageningen  
The Netherlands

E-mail: [a.j.martens@ibn.dlo.nl](mailto:a.j.martens@ibn.dlo.nl)

## **Occurrence of European badgers (*Meles meles*) in Northern Moravia**

TOMAS MATYASTIK and VITEZSLAV BÍČEK

Habitat selection and population density of badgers in Northern Moravia were studied. In an area of 11.067 km<sup>2</sup> 499 setts with 1.306 badgers were recorded. Individual habitats are shown.

During 1996 – 98 we analysed the habitat selection and population density of badgers in Northern Moravia. The first step was the preparation of a detailed questionnaire which was sent to all hunting organizations. The received data from questionnaires was verified on the spot with members of the Czechomoravian hunting organization. We registered a number of badgers in the setts, characterized the type of badger setts in relation to the geology, their cubs, number of entrances to tunnels etc. Altogether 499 setts with 1.308 badgers were recorded in the area of 11 067 km<sup>2</sup> (195 main, 218 subordinate, 79 temporary and 7 abandoned). The prevailing portion of setts was situated from 300 to 700 m a.s.l. The highest sett was found at 860 m a.s.l. Most sets were in forest habitats (33,6% in mixed forest, 26,8% in coniferous and 15,9% in deciduous forest). Some setts were in rocky terrain (10,5%), fields (5,6%), meadows (2,2%), gardens (1,6%) and hedgerows (1,3%). A few setts were found in cellars, destroyed buildings, quarries, barns and drains. The highest density of badger setts was recorded in mixed and deciduous forests. The badger is protected, at present, throughout the year in the whole of the Czech Republic. In many regions, an increase of badgers has been noted. In some mountain and agricultural areas their number is relatively low.

Authors' address:

Tomas MATYASTIK  
Vitezslav BÍČEK  
Dept. of Zoology and Anthropology  
Natural Science Faculty of Palacky University  
Tr. Svobody 26  
771 46 Olomouc  
Czech Republic  
Tel.: +420 68 5222451  
E-mails: matom@risc.upol.cz  
flagell@risc.upol.cz



## Contribution to the knowledge of the food spectrum of the European badger (*Meles meles*)

TOMAS MATYASTIK, VITEZSLAV BÍČÍK and VLADIMÍR BADAÝ

To evaluate the function of the badger in ecosystems, we obtained (with required permits) one young male from the wild and two young females from zoological gardens. After quarantine, preventive dehelminthisation, vaccination against rabies, and hepatitis we worked out a methodology for our ecoethological observations.

All three badgers, under study, were only partially adapted to the authors who could move close to them during observations and monitor their behaviour in the wild. Badgers showed quite natural patterns of behaviour during field work. We have also managed to change the natural night activity of all three badgers for daytime or twilight activities. Thanks to this fact it was possible to observe better their food intake, olfactory abilities, social behaviour and the most complete ethogram.

We recorded behaviour of badgers towards 45 animal and plant species which were available in natural habitats and to 73 animal and plant species which we offered to the badgers in experiments. The badgers preferred (consumation in more than 50% of contacts) 46 species of various taxons (e.g., Oligochaeta, Ensifera, Caelifera, Scarabeidae, Cerambycidae, Vespidae, Rodentia, birds and their eggs, *Prunus sp.*, *Rubus sp.*, *Zea mais*). Occasional food items (consumation in less than 50% of contacts) represented 48 species (e.g. Lepidoptera, Tenthredinidae, *Vipera berus*, *Anguis fragilis*, *Bufo sp.*, *Sambucus sp.*). The badgers refused such taxa as Arachnida, Heteroptera, Chrysomelidae, *Allium*, *Viscum*, Fungi. In feeding behaviour we observed individual differences between badgers. The male preferred plant food (fruits, corn), the older female insects and the young female small rodents. Our investigation showed that these badgers were typical omnivorous generalists. They usually ate food that was most easily available. Badgers can destroy very effectively the larvae and adults of overbred insect pests or forest and field rodents. They can look for food also in continuous vegetation that is difficult to access, e.g., bramble.

### Authors' address:

Tomas MATYASTIK, Vitezslav BÍČÍK, Vladimír BADAÝ  
Dept. of Zoology and Anthropology  
Natural Science Faculty of Palacky University  
Tr. Svobody 26  
771 46 Olomouc, Czech Republic

Tel. +420 68 5222451  
E-mails:  
maton@risc.upol.cz  
flagell@risc.upol.cz

## Investigations on the parasitic spectrum of otters (*Lutra lutra*)

STEFANIE REITTER

In the present study, stomachs and/or intestinal tracts of 313 otters (*Lutra lutra*) were examined for helminth infestation. Samples of both sexes and two age categories ("juveniles" vs. "non-juveniles") were taken from ten ecologically differing regions of eastern Germany (the territory of the former GDR) and Austria between 1990 and 1998.

18,6% of the otters were found to be infested with an average of 9,52 helminths of four different species (*Isthmiophora melis*, *Mesocestoides* sp., *Molineus patens*, *Uncinaria criniformis*). In addition, the following intestinal passengers were found: *Ligula intestinalis* larv., *Schistocephalus* sp., *Passalurus ambiguus*, *Pomphorhynchus laevis*, *Polymorphus minutus*, *Acanthocephalus anguillae*, *Acanthocephalus lucii*, *Acanthocephalus* sp.

The trematode *Isthmiophora melis* was the most common species (prevalence = 17,3%). Due to very low numbers of otters infected with parasites other than *I. melis*, tests of sex-, age-, season- and region-specific variation of prevalence and intensity data were performed only on *I. melis*. Both prevalence and intensity of infestation with *I. melis* were significantly higher in females than in males.

Body condition of otters was expressed by an index derived from body mass and body length. In adults with high levels of parasites (i.e., > 20 specimens of *I. melis*), body condition was significantly reduced.

(transl. F. SUCHENTRUNK)

Author's address:

Stefanie REITTER

c/o: Research Institute of Wildlife Ecology  
Veterinary University of Vienna  
Savoyenstr. 1  
A-1160 Vienna  
Austria

## **Hematologic and blood chemistry values of otters (Lutrinae)**

CLAUS REUTHER

Knowledge of heamatology and blood chemistry of animals is essential for assessing their well-being, especially when they are kept in captivity.

Reference haematological profiles and serum chemistry values are useful for those in disciplines such as biology, nutrition, toxicology and veterinary medicine in order to diagnose and treat diseases in unhealthy animals, as well as to provide routine care to captive animals.

Information on normal blood values in the Lutrinae is limited. So far among the 13 species of otters reference values have been published for the sea otter (*Enhydra lutris*), the North American river otter (*Lontra canadensis*), the neotropical otter (*Lontra longicaudis*), the giant otter (*Pteronura brasiliensis*), the cape clawless otter (*Aonyx capensis*), the small-clawed otter (*Amblonyx cinereus*) and the Eurasian otter (*Lutra lutra*).

For the latter species, 35 blood samples of 20 individuals have been collected in the enclosure of AKTION FISCHOTTERSCHUTZ and analyzed. By trying to compare these results with published data for the same or other otter species it became obvious that in many studies different parameters and units have been used. Many studies did not follow the international SI (Système International d'Unités) standard. Therefore it became necessary to use international conversion factors and to transfer the data based on the old units to the SI standards.

The resulting haematological and serum biochemical values of the above mentioned otter species, which were comparable, were shown in a table.

Author's address:

Claus REUTHER  
Aktion Fischotterschutz e.V.  
Otter-Zentrum  
D-29386 Hankensbüttel

E-mail: [aktion.fischotterschutz@t-online.de](mailto:aktion.fischotterschutz@t-online.de)

## Development of weight and length of otter cubs

CLAUS REUTHER

AKTION FISCHOTTERSCHUTZ has kept Eurasian otters (*Lutra lutra*) in captivity since 1979. In the period 1980 – 1984 14 litters were born, totalling 31 cubs. Measurements of weight and length could be taken over the first 107 days of life from up to 30 cubs.

Values for the weight, based on 229 measurements (153 male, 76 female), indicate a doubling of weight in each of the first ten days periods and thereafter an average increase of 300 grams per ten days. The increase in weight is very similar for the 17 males and 13 females. The trendline seems to indicate a slightly greater weight rise in males around the 40<sup>th</sup> and the 105<sup>th</sup> day of life.

146 measurements of total length (88 for males, 57 for females) were taken from 26 cubs. The curve of length increase is different from that of weight. During the first month the average increase in total length is approximately 7 cm per 10 day period, in the third month it is reduced to 4 cm per 10 days, and an increase of 2 cm per 10 days is indicated for the fourth month. There seems to be no significant difference between the increase of total length in the 15 males and 11 females on which these data are based.

Only 48 measurements (27 males, 21 females) of body length are available from 14 cubs from the first 66 days of life. There is little difference between the 8 males and 6 females measured.

Author's address:

Claus REUTHER  
AKTION FISCHOTTERSCHUTZ E.V.  
OTTER-ZENTRUM  
D-29386 Hankensbüttel  
Germany

E-mail: [aktion.fischotterschutz@t-online.de](mailto:aktion.fischotterschutz@t-online.de)

## Nischen-Analyse in der Familie Mustelidae

R. SCHRÖPFER and M. JORDAN

Mit zwölf endemischen Arten sind die Mustelidae in Europa die artenreichste rezente Carnivora-Familie. Die meisten Arten kommen sympatrisch vor, häufig auch syntop. Zönotisch ist das nur so zu verstehen, daß konkurrenzmindernden Mechanismen vorhanden sind, die dafür sorgen, daß die Ressourcensortimente dieser relativ anspruchsvollen Raubtierarten gegenseitig hinreichend separiert sind. Kompliziert wird der Erklärungsversuch noch dadurch, daß sich bei einigen Arten ein starker Sexualdimorphismus in der Körpergröße findet, der förmlich zu Teilpopulationen der beiden Geschlechter mit differenzierten Ansprüchen führt. Mit-hin müßte bei den Mustelidae der Fall einer intra- und interspezifischen Konkurrenzmeidung vorliegen. Ist unter diesen Gegebenheiten überhaupt eine Syntopie dieser Kleinraubtierarten möglich; oder gibt es tatsächlich derart große Unterschiede im „Können“ und in den Ansprüchen, daß Koexistenz vorkommen kann?

Wir versuchen darauf Antworten zu erhalten, zumal wir interessiert sind herauszufinden, ob z.B. die allochtone Art *Mustela vison* Einfluß nehmen könnte auf das Überleben endemischer *Mustela*-Arten, und ob für den Europäischen Nerz *Mustela lutrola* eine Chance besteht, sich weiterhin zu behaupten.

## Niche analysis in the family Mustelidae

With 12 species the family Mustelidae is the most species-rich carnivore family in Europe. The distribution areas of most species overlap. Some species also live syntopically. So far there is no explanation for this coexistence. We shall look for answers to these questions with the help of a niche analysis having an ethomorphological approach.

This is also important for us since we want to find out how much influence *Mustela vison* has on the endemic species and whether *Mustela lutreola* has any chance to survive.

Authors' address:

Prof. Dr. R. SCHRÖPFER  
M. JORDAN  
Universität Osnabrück  
FB Biologie/Chemie: Ethologie  
Barbarastr. 11

D-49069 Osnabrück, Germany  
E-mail:  
schroepfer@biologie.uni-osnabrueck.de

## **Heavy Metals and Organochlorines ( Pesticides and PCB) in Otters (*Lutra Lutra L.*, 1758) in Germany**

FRIEDA TATARUCH and MARIA EILENBERGER

Organ samples (liver, kidney) of 60 otters from four different regions (Oberlausitz, Brandenburg – Süd, Brandenburg – Nord and Mecklenburg – Vorpommern) in Germany were analysed for the concentrations of the potentially toxic trace elements lead, cadmium and mercury. Liver samples were also checked for residues of organochloro pesticides Benzenhexachloride, Gamma-Hexachloro-cyclohexane, pp'-DDT and pp'-DDE as well as those of 10 congeners of PCB (PCB – 28, 52, 77, 101, 118, 126, 138, 153, 169 and 180).

In comparison with results of investigations of otters from other regions the contamination of the animals in the study areas proved to be low, for heavy metals as well as for organochlorines. Regional differences were found for some of the analysed pollutants.

Authors' address:

Prof. Dr. Frieda TATARUCH  
Mag. Maria EILENBERGER  
Research Institute of Wildlife Ecology,  
Veterinary Medicine University Vienna  
Savoyenstrasse 1  
A-1160 Vienna  
Austria  
E-mail: [frieda.tataruch@vu-wien.ac.at](mailto:frieda.tataruch@vu-wien.ac.at)

## **Population size, groupal aspects, feeding ecology of Giant Otters (*Pteronura brasiliensis*) in the low Bitá River (Vichada, Colombia) with notes on rehabilitation of cubs**

RICARDO VALBUENA and JUAN RICARDO GOMEZ

Between October 1997 and July 1998, seven groups and several transient individuals of giant otters were contacted 51 times in an area of 105 km<sup>2</sup> in the low basin of the Bitá River (tributary of Orinoco River, Vichada, Colombia). Basic ecological data were obtained during a total of 17 hours and 47 minutes of direct observation and from campsites. Within 70 km along the river, the population size was 39 otters, distributed in groups from three to nine individuals, with an average composition of adults/juveniles/cubs being 2/2/2. A total of 59 campsites were discovered during the field study. Population size and density were suitable indicators of a healthy population in the lower Bitá River. The hydroclimatic periods, the kind of aquatic habitat, the kind of observations and numbers of otters per observation were analysed as possible factors that might have an influence on the observations themselves and thus the methods of census. During the study 126 samples of remains of vertebrates were collected in latrines of otters and analysed. The results showed the high preferences of otters for fish (96.4%), despite being opportunistic animals. Twelve families of fishes were identified, with Erythrinidae, Pimelodidae, Cichlidae, and Serrasalminidae being the most important ones that were consumed by Giant otters. Twelve direct observations of feeding individuals support these results. A reference collection of fish remains was established for identification of remains from latrines. A couple of otter cubs were rehabilitated and released, with high chances to survive.

Authors' contact address:

Ricardo VALBUENA  
Juan Ricardo GOMEZ

Fundación Omacha, Colombia  
(E-mail: [rival77@hotmail.com](mailto:rival77@hotmail.com))  
authors have no permanent mail address or phone number at this time)

## **A Markov-chain model of the development of gene pool variability in a central European otter (*Lutra lutra*) population**

RUDOLF WILLING and FRANZ SUCHENTRUNK

Based on population genetic data from 104 otters (SUCHENTRUNK, unpubl.), the future development of allozyme frequencies and heterozygosity was modeled in the otter population from Upper Lusatia (Germany) using a Markov-chain model approach of individual chances of transmitting alleles from generation to generation. The “effective population size“ was estimated by different approaches based on combined observational data from the wild (H. ANSORGE, R. SCHIPKE, O. ZINKE) and data of reproductive ecology (ANSORGE et al. 1997: Z. Säugetierkunde 62, 143–151). In spite of high demographic population size (max. estimate = 600 otters, min. estimate = 300 otters), the “effective population size“, i.e., the fraction of the successfully reproducing otters, was quite small in this source population. This fact generated a fairly high probability of extinction of one or more alleles with low frequencies ( $Pgi^b = 1.0\%$ ;  $Acp-1^b = 1.5\%$ ;  $Acy-1^c = 7.6\%$ ) in the population over 500 or 1000 years of simulation, under the premise of no selection and no gene flow into the population. Loss of allele diversity and reduction of heterozygosity would be even more marked under fluctuating reproductive success in different years or diminishing census population size. Absence of significant gene flow into the population from neighbouring regions is likely because of the high population density within the Upper Lusatia population. Rather, the likely saturated population should cause dispersion of otters, and possible immigrating otters might have very little chance of establishing a territory. Moreover, even assuming scarce immigration into the Upper Lusatia population, there should be little chance of bringing in the revealed rare alleles, because they are rare in the neighbouring regions too. Thus, given no marked population reductions that increase the chance of immigrating otters to reproduce, the “ecological source population“ might on the long run develop into a “genetic sink population“.

Authors' address:

Rudolf WILLING and Franz SUCHENTRUNK  
Research Institute of Wildlife Ecology  
Veterinary Medicine University Vienna  
Savoyenstr. 1  
A-1160 Vienna, Austria

E-mail:  
[rudolf.willing@vu-wien.ac.at](mailto:rudolf.willing@vu-wien.ac.at)  
[franz.suchentrunk@vu-wien.ac.at](mailto:franz.suchentrunk@vu-wien.ac.at)



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Jahr/Year: 2001

Band/Volume: [14](#)

Autor(en)/Author(s):

Artikel/Article: [Kurzfassungen der Vorträge und Posterbeiträge. \(N.F. 436\) 193-223](#)