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Poster text is presented in alphabetical order of first author

POSTERS

EVIDENCE OF SHOTGUN WOUNDED OTTERS IN SWEDEN (*LUTRA LUTRA*).

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INTRODUCTION
An incidental finding of shotgun pellets embedded in the lumbar area of a road-killed otter (*Lutra lutra*) prompted a three-year x-ray screening of all otters submitted to the National Veterinary Institute (SVA) for necropsy. The aim was to document the frequency of gunshot wounds, indicating illegal hunting of this protected species.

METHODS
Radiographs were systematically taken of all otter carcasses found dead in Sweden and sent for necropsy at SVA, between 2012 and 2014.

RESULTS
The study found that three of 120 examined otters (2.5%) had embedded shotgun pellets. All three otters with pellets had died of other causes than shotgun wounds; two road-kills and one by drowning in fishing gear.

DISCUSSION
The prevalence of otters with embedded shotgun pellets in this study in Sweden is lower compared to a Danish study of 144 otters collected 1993-2011, where the prevalence was 6.9%. Otters are usually not x-rayed and besides the three otters in the present study, several shotgun pellets were found incidentally in the right hind leg of one juvenile otter sent directly to the Swedish Museum of Natural History in 2014. In another otter, a bullet from an air rifle was found behind the eye of a road-killed otter in 2013. This otter was not x-rayed and the finding of the embedded bullet was incidental. The number of otters actually killed by gunshot trauma is unknown, but can probably be estimated to be at least as high as the number of gunshot wounded otters that survive, but are later killed of other causes. This study shows that otters are occasionally shot at, possibly due to mistaking otters for non-native American mink (*Neovison vison*). To minimize accidental otter shootings, information directed to hunter associations and the hunting community can be made, especially as the otter population increases throughout the country and may appear in areas where previously only mink were sighted

SCREENING OF SALMONELLA IN SWEDISH OTTERS (*LUTRA LUTRA*)

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INTRODUCTION

Salmonella bacteria are uncommon in farmed animals in Sweden, compared to the amount found in production animals within Europe in general. A specific Swedish legislation regulates the controlling and eradication of salmonella in production animals on farms in which Salmonella is detected. Spillover of salmonella bacteria to or from wildlife is possible, and a general screening for salmonella is done on wildlife submitted for necropsy at the National Veterinary Institute (SVA).

METHODS

All otters submitted from 2007 to 2014 and a smaller number of samples from otters studied at the Swedish Museum of Natural History, in all 126 otters, were sampled from the small intestine for salmonella screening.

RESULTS

The otters originated from all but one of the 21 counties in Sweden. Three otters were found to carry salmonella bacteria in the small intestine. All three were diagnosed in 2014, but came from three different areas in two counties. Two otters carried Salmonella enterica subspecies diarizonae, but not the serovar which has been found in sheep in Sweden. The third otter carried *Salmonella typhimurium*, which is most commonly found in wild passerine birds. All three otters were killed by traffic and there was no apparent inflammation in the gastrointestinal tract.

DISCUSSION

This screening study shows that wild otters in Sweden only very occasionally are carriers of salmonella bacteria. The serovars found are not typically found in domestic or production animals. A study of possible salmonella in prey species in the vicinity of the sites where positive dead otters were found, would probably be needed to establish possible pathways for the spread or spillover between species.

COMPARISON OF EVALUATION METHODS FOR OTTER MITIGATION MEASURES AT ROADS: SIMPLE METHOD AS GOOD AS LABOR INTENSIVE ONE.

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INTRODUCTION

Evaluation of mitigation measures for otters at roads are important, but can be costly and time consuming. It is of great importance to use a cost effective method that gives a correct result.

METHODS

We compared two methods for evaluation of the use of mitigation measures by otters. The first method was a one-visit to look for otter tracks or spraints at the construction. The second method included preparation of the construction to easier find tracks from the otters. In this method each place was visited every four days in a 16 day period and tracks were noted each time and then erased.

RESULTS AND DISCUSSION

Tracks from otters were found in as large extent in the one-visit method as in the more labor intensive and time consuming method. However, a lower number of tracks were found from other species that could also use the constructions (e.g. red fox, badger, American mink, and domestic cat). Additionally, a lower number of species could be found by the simple method compared to the more labor intensive one. The reason for this is probably that the constructions are designed to attract otters, offering good opportunities to scent mark. Spraints were the most common evidence of otters found on the constructions. Other species do not leave droppings at the constructions to the same extent as otters do. Hence, the simple method is as good as the more labor intensive one for evaluating use of mitigation measures by otters.

NEW SIGHTINGS OF *Lutra lutra* IN ALGERIA

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INTRODUCTION

North African otter populations are under strong pressure due to the huge demand for fresh water, exponential increase in pollution and still possible persecution. The natural environment is under continuous transformation and human development. This is particularly true for Algeria where information about the species are uncertain. In the past Macdonald (1985) found signs of presence in 10 sites out of 52 searched in Oued Sebaou in Grand Kabilie. De Smet (1987) found a few sites in El Kala and obn the plain close to the Moroccan border, but not on the Tassili plateau. Later Kowalski and Rzebik-Kowalska (1991) report presence in Ain Cheraia, Oued Berd in the Babor Mountains, Bordj Mira near Kerrata, Mikhada, Oued Sefiourn at Youb and the lakes Melah, Oubeira and Tonga at El Kala. In this scenario of limited available information, we began to collect new information about *Lutra lutra* presence in Algeria

METHODS

We collected all available sightings and photos, videos, footprints and spraints/scat in order to have a better picture of the actual situation. Field trips were done at the main lakes in north Algeria in Annaba, El Tarf and El Kala provinces. The region contains important Ramsar areas such as Lac de Fetzara, Marais de la Mekhada, Réserve Naturelle du Lac des Oiseaux Oum Lâagareb, Tourbière du Lac Noir, Marais de Bourdim (Wilaya d'El Tarf), Réserve Intégrale du Lac El Mellah, Réserve Intégrale du Lac Oubeïra and the Réserve Intégrale du Lac Tonga. A few other direct observations were done in humid environments in other areas of Algeria. All possible stakeholders in the area were interviewed to achieve information, and photos and videos of otters were collected from them and the web.

RESULTS AND DISCUSSION

Sightings were collected from 2008 to 2015. Otters were found in 8 localities in northern east of the country: in Annaba province at El Alalig, El Oued and Berahal; in El Tarf province at Oued Mefragh; La Mekhada, Mellah, Bougous; in Skikda province at Guerbas; and in Oum el Bouaghi province at Timerganin. In Alger province an observation was made in Oued el Harache. Also there are 3 new localities that have to be added for central Algeria in Bechar region where otters were observed in Djorf al Torba, Abadla and Bni Abas in the main wadis. This observation re-opens the question of possible relict populations along the main wadis in northern Sahara. Sightings can classified as direct observations (70%), caught in fish traps (10%) and death from unknown reason (20%). The observation sites are wadis (40%), lakes (20%), freshwater marshes (13%), temporary ponds (13%), lagoons (7%) and flooded woods (7%).

Despite otters being protected by law, no effort is actually made to really preserve the species and we have evidence of some cases of poaching and animals drowned in fishing nets as well as a possible couple of car fatalities. The local population of otters are extremely endangered and we hope to be able to promote a future accurate survey and awareness actions aimed at local people.

THE EURASIAN OTTER (*Lutra lutra*) IN SWEDEN: DISTRIBUTION, TREND AND THREATS

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In Sweden otters have increased in both numbers and distribution since the mid 1990s. In the national red list (2015) otters have been downgraded from Endangered to Near Threatened. With the increase of the otter population the national action plan adopted in 2005-2010 has not been renewed. The only range wide systematic survey was conducted during this time period. Since then data used to update otter distribution derive from regional surveys. Seven counties run otter surveys in 2014. The results show a more widespread distribution of otters, were otters are found in most rivers. Still there are slow reestablishments of otters in the southwest parts of the country.

Despite the positive current trend otters in Sweden are still threatened by pollutants, traffic, traps and fishing gears. Various pollutants (e.g. PCB, PBDE and PFOS) are regularly analyzed on dead otters from different part of the country. These otters showed extremely high concentrations of PFOS.

To reduce road collisions risk, in 2014 the Swedish Road Administration built 81 fauna passages all over the country.

Main concerns for conservation of otters in Sweden are high concentrations of water pollutants, the increase of otters killed by traffic or in fishing gear (which is negative), and insufficient government funds to monitor otters in the future at the national scale.

EURASIAN OTTER (*Lutra lutra*) IN GEORGIA

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INTRODUCTION

In the past, the Eurasian otter (*Lutra lutra*) was widespread throughout the country. There has been no data on otter population since 1960s. The only expert evaluation was done in 2005, when the national red list was created. According to Georgian legislation, the otter is included in the red list and hunting is prohibited.

METHODS

The first National otter survey was conducted in 2013. The whole country was divided in 618 parts using 10 km square grid and at least two potentially good otter sites were identified. Sites were selected at intervals of about 5-8km along river systems, coasts or lake shores. In addition, the survey evaluated main threats and habitat conditions.

RESULTS

We have visited a total of 631 sites. Out of these, 39% had signs of otters. The highest percentage occurrence of otters - 75 % was recorded at lake/reservoir sites. Of the inspected sites 96.3% were managed by the government and only 3.65% were under private management and used as fishponds.

The main factors currently affecting the Georgian otter population are: degradation of habitats, decline of fish resources, and conflict with fish farm owners. During the last 10 years more than 30 hydropower stations were built or are under construction.

DISCUSSION

After the construction of new hydropower stations, annual flow in most rivers dropped to 10-18 % and the rest of water was diverted to pipes. We have found that otters more often moved to the fish ponds as a consequence of declining river fish stocks caused by poaching and habitat destruction.

Only 9.66% of the sites visited occur are located or partly located within protected areas. From these otter was detected only in 40.9% of the sites. We believe that having only up to 10% of the whole habitat protected cannot guarantee sufficient protection and conservation of Eurasian otter in Georgia.

Building of Emerald Network was launched by the Council of Europe as part of its work under the Bern Convention. The Natura 2000 sites are therefore considered as the contribution from the EU member states to the Emerald Network. In 2015, Georgia made a proposal for the adoption of 36 sites, where the protection of otter habitat will be fully covered.

ASSESSMENT OF POPULATION STRUCTURE IN HUNGARIAN OTTER POPULATIONS

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The Eurasian otter (L*utra lutra*) is widely distributed in Europe and has been down-listed from Vulnerable to Near Threatened in 2004 following successful conservation interventions. River otter recoveries were driven by active and passive protection of wetlands and a decrease in environmental pollutants. In Hungary, although otter populations have been stable in recent decades, there is little information available regarding genetic diversity, population genetic or phylogeographic structure and potential barriers affecting gene flow. This study, therefore, aimed to determine genetic diversity and structure across the range of this species in Hungary.

To achieve this we analysed 255 tissue samples collected since 2002, mainly from road kill incidents, in various regions of Hungary. We found a relatively high level of genetic diversity in Hungarian otter populations (expected heterozygosity: 0.69 to 0.74; mean number of alleles per locus: 6.8 to 7.7). At a regional level, we identified two distinct genetic clusters corresponding to two river basins (Danube and Tisza). We also identified isolation by distance and patterns of genetic differentiation that appear to reflect population divergence of otters that are spatially restricted to one of these two river basins. Our results show the strong influence of river networks on population structure and genetic divergence in otters, and provide a framework for the development of conservation management plans for otters in Hungary.

CITIZEN SCIENCE IN OTTER RESEARCH – SIGHTING REPORTS

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INTRODUCTION

In this study we have compiled reports of sightings of live and dead otters or tracks that the general public has reported to the Swedish Museum of Natural History between 2003 – 2014. These reports give important additional information to the surveys that are performed. In Sweden the otter belong to the State and otter carcasses are sent to the authorities. Most of the otters are killed in traffic or in fishing gear and originate from almost all parts of Sweden.

METHOD

The Swedish Museum of Natural History has a webpage were the general public can report sightings of otters. This study includes 1147 sightings of live otters or tracks (mostly spraints and footprints) and 701 reports of dead otters. Each sighting of live animal has been reviewed to exclude possible mink or beaver observations. The reports were divided into: winter: December-February, spring: Mars-May, summer: June-August and autumn: September-November.

RESULTS

Most reports of live otters were received during winter and spring, and the lowest number during autumn. In contrast, dead otters were mainly found during autumn, the numbers then decrease until summer. Observations of tracks were highest during winter, then decrease until autumn.

Of total 274 reported otter sightings during winter 70% were single otters, 16% were of two individuals and 14% were three to five individuals. During spring we received 323 reports of live otters. 89% of them were reports of single otters, 8% were two individuals and 3% were three to five individuals. From June to August 234 otter sightings were reported. 91% of them were sightings of single otters, 6% were two individuals and 3% were three to five otters. Finally, total 103 otter sightings were reported during autumn, 80% of them were single otters, 8% two otters and 13% were three to five individuals.

DISCUSSION

Otters are easiest spotted during winter and spring due to snow cover, therefore most sightings during that period. However, it seems like they are more mobile during autumn, since more otters were killed in traffic during that time compared to other seasons. Traffic is the dominant cause of death but it is probably an overestimate, since otters that have died from natural causes are not as likely to be found. The frequency of reported groups of 3-5 otters is highest during winter, but groups are also reported during the other seasons. This is consistent with that the otters in Sweden give birth the whole year around. The positive thing with citizen science is that it creates engagement and interest for the species and data is collected at a low cost. A problem with this method is that it can be difficult to determine if the reported observation is correct and for the right species. Additional questions to the reporter may help to exclude incorrect reports, but it is most likely that some of the observations are incorrect.

THE EURASIAN OTTER (*Lutra lutra*) iN ITALY: DISTRIBUTION, TREND AND THREATS.

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Like in many other European countries, in Italy the Eurasian otter is currently recovering from the sharp decline occurred in the last decades of the 20th century, likely following legal protection and banning of PCBs. Consequently, in 2013 the species was downgraded from Endangered to Near Threatened in the most recent National Red List, and its status has changed from U1+ (unfavorable-inadequate) to FV (favorable) in the revised Habitat Directive (art. 17) . Recently, otters expanding from Slovenia and Austria have been recorded in two areas of Northern Italy (Friuli and Trentino-Alto Adige regions), while a small population of reintroduced free-ranging B-line otters has been established in northwestern Italy (Ticino River) since XXXX. Nonetheless, the Italian otter population is still mainly confined to the southern regions of the peninsula, and is characterized by a disjoint range even within its stronghold. In XXX [YEAR], this southern population has been estimated at 300-400 individuals through non invasive genetic sampling.

Despite the National Otter Action Plan (2011) recommending national otter surveys at five years intervals, up to now only one local survey has been carried out by the Molise region in the south. The only range-wide systematic survey of the southern population was conducted in 2002-2004, before the National Otter Action Plan of 2011. Since then, to update the otter distribution and evaluate its population trends only regional or opportunistic local surveys have been carried out.

To understand and quantify otter distribution trends in the southern otter population of Italy, we compared the results of the range-wide survey of 2002-2004 with the most recent available distribution data (2008 and 2013) and summarized occupancy data into 10x10 Km UTM grid cells. Data comprise both surveys

for signs and otter casualty data, for which there is a system of reporting in Italy since 1999. New occupied squares were detected especially at the northern range boundary suggesting that there is a current expansion trend for otters from the south to central Italy. Newly colonized areas are also filling the gap between the disjoint portions of the southern range. Despite the otters becoming a stable presence in Friuli and Alto Adige, their fate in northeastern Italy is still uncertain. The current main threats to the Italian otters, especially

the ones in the south, are probably habitat degradation, especially the loss of riparian vegetation, local pollution events in rivers, and illegal killings. The recent spreading of mini hydroelectric power stations and the effects of freshwater pollution from EDT compounds will deserve future attention and impact evaluation. A new national survey and actions to support the expansion in central Italy, foster the establishment of a viable population in northern Italy, and fill the gap among the disjoint southern ranges, are of outermost importance for long-term conservation of the otter in Italy

STATUS, HUNTING VALUE AND THREATS FOR EURASIAN OTTER IN RUSSIA

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INTRODUCTION

In Russia, the Eurasian otter is classified as a traditional commercially harvested fur species. Significant differences of this area of the species distribution are the high conservation of natural ecosystems, low-density of human population, poor infrastructure and primarily resource-based economy orientation. These factors define the otter conservation status and its difference in various regions of the country, human attitude to the animal, threats to its survival.

THE CURRENT STATUS AND THREATS

In Russia, otter was intensely hunted in the 20th century. In the late 1990s, the demand for otter skins in Russia increased. Most skins harvested in Russia were illegally exported and over 98% of the confiscated fur stock was intended to be exported to China. A total of 978 contraband otter skins were confiscated in 1999–2006 in the Russian Far East. Overhunting was observed in some areas easily accessible to hunters in the commercially exploited regions of the Russian Far East and Siberia in 1990–2006. The demand for otter fur has declined since 2006-2007 and the otter harvest rate decreased

Today, some of the quota licenses remain unpurchased; harvesting intensity is low. The average officially reported hunting rate makes approximately 0.5% of the available resources of this species. However, the real number of otters harvested in Russia is several times higher.

In the regions occupied by sporadic otter populations or where its population has reduced because of anthropogenic factors, the species has been inscribed into the Red Data Books of 48 (57%) entities of the Russian Federation and otter hunting has been prohibited. In 2007–2010, the otter was harvested in 21 administrative areas of Russia. The Caucasian otter (*L. l. meridionalis*) has been included into the Red Data Book of Russia. The main cause of otter mortality is fur hunting (45%) according to data obtained in 2002-2014 in the South of the Russian Far East (total 73 cases). A significant number of otters (26%) is killed by stray dogs. Only 11% of individuals died because of natural causes.

CONCLUSION

Current status of otter population in Russia mainly depends on international demand for its fur. This species is in Red Data Books of the most regions of the country. Taking into account resource-based economy orientation, there is probability of increase of some threats: habitat destruction, water pollution, and deterioration of forage resources

ANTIMICROBIAL RESISTANT *Aeromonas* ISOLATED FROM EURASIAN OTTERS (*Lutra lutra* Linnaeus, 1758) IN PORTUGAL.

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Emergence of antimicrobial resistant bacteria represents a serious problem for human and animal health. Since the emergence, selection and dissemination of antimicrobial resistant bacteria are mainly attributed to antibiotic misuse and abuse, wildlife animals represent an excellent source for evaluating environmental contamination by resistant bacteria, since they are hardly ever in direct contact with humans or subject to antibiotic administration. Consequently, resistance traits found are most probably acquired from the environment, effluents or production animals.

Since otters are free-range animals that occupy a wide diversity of aquatic environments, they constitute ideal models for evaluating the role of wild animals as potential vectors of antimicrobial resistance bacteria to the environment and vice-versa. Eurasian otters (*Lutra lutra* Linnaeus, 1758) are free-range predators (*Carnivora, Mustelidae*) that evolved the ability to swim and forage in aquatic environments, being important elements of biodiversity.

This work aimed at characterizing antimicrobial resistant *Aeromonas* from otter faecal samples collected in river stretches from Sado river basin (Alentejo, south Portugal). Aeromonas are ubiquitous gram-negative bacteria also found in a broad range of aquatic environments, being associated with human and animal diseases.

Eight sampling stretches of 8km were selected, and from each, 6 to 8 sampling sites were visited, allowing the collection 31 samples. *Aeromonas* were isolated from 15 samples and identified as *Aeromonas hydrophila, A.hydrophila/caviae* and *A.sobria*.

Susceptibility to 15 antimicrobials belonging to different drug classes was evaluated by the disk diffusion method according to CLSI guidelines, including amoxicillin/clavulanic acid(AMC), ampicillin(AMP), chloranfenicol(C), cephalexin(CL), cephotaxim(CTX), clindamycin(CLI), erythromycin(E), enrofloxacin(ENR), gentamicin(GEN), nalidixic acid(NA), penicillin G(P), streptomycin(S), sulphametoxazole/trimethroprim(SXT), tetracycline(TE) and vancomycin(VAN).

Low resistance levels were expected, as sampled animals were not likely to have been subject to antibiotherapy. However, none of the isolates was susceptible to all antimicrobials tested. Isolates showed resistance to AMC, CL, CLI, ERI, P, S and VA. Multiresistant profiles were also observed, suggesting that environmental exposure to antimicrobial agents may select for resistant bacterial strains. However, the occurrence of other resistance mechanisms, such as point mutations or acquisition of transmissible mobile DNA elements must also be taken into consideration.

Results confirm otter's role as potential *Aeromonas* carriers and the importance of environmental exposure to antimicrobial agents in resistant bacteria selection. Resistance profiles of isolates from otters' faecal samples may provide useful information to assess the potential of resistance transmission from the environment contaminated by humans, farm and wild animals, and vice-versa.

CONCENTRATIONS OF PERFLUOROALKYL ACIDS (PFAAS) IN OTTERS FROM NORTHERN SWEDEN

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INTRODUCTION

Perfluoroalkyl acids (PFAAs) are anthropogenic surfactants characterized by their polar functional group (typically CO2- or SO3-) and fully fluorinated alkyl chain (typically C4-C14). PFAAs have been widely used in commercial products and processes, including textile stain and soil repellents, grease-proofing for food contact paper (non-stick), processing aids in fluoropolymer manufacturing, and in aqueous film-forming firefighting foams. Owing to decades of use and resistance to natural degradation processes, PFAAs are widespread contaminants of the global environment. Concern over exposure to these substances centers on their chain-length dependent toxicity and bioaccumulation potentials. In Sweden, PFAA concentrations in otters from the south showed dramatic increases between 1972 and 2011 (Roos et al. 2013). Among the PFAAs detected at the highest concentrations was perfluorooctane sulfonic acid (PFOS). Contamination of drinking water with PFOS represents a considerable problem in Sweden, and several water resources in which PFOS was identified over the last few years were forced to close for remediation. Analysis of otters can be used for finding "new" hot spots; areas that later might have to be treated. Here we expand our prior monitoring efforts in the south to include analyses of otters from northern Sweden. The initiative for this study came from the County Board of Norrbotten.

METHODS

Livers from 24 otters from northern Sweden collected between 2004 and 2013 were subsampled and analyzed for PFAAs by ultra-performance liquid chromatography tandem mass spectrometry (UPLC-MS/MS). Here we present data on a sum of 7 perfluoroalkyl carboxylic acids (PFCAs; C8-C14 chain lengths) and PFOS.

RESULTS

Sum PFCA concentrations were between 108-637 ng/g ww (median 310 ng/g ww). Perfluorononanoic acid (PFNA) and perfluorodecanoic acid (PFDA) accounted for approximately ¾ of this sum. PFOS was observed at by far the highest concentrations of all PFAAs (46-1526 ng/g ww; median 248 ng/g ww).

DISCUSSION

Otters are good indicators for aquatic health. Similar to our previous findings in Southern Sweden, otters in the North also contained elevated hepatic PFAA concentrations. In fact, the median PFCA concentration in otters from northern Sweden (340 ng/g ww) was higher than that of otters in southern Sweden (240 ng/g ww). Furthermore, three of the highest PFOS concentrations (932-1526 ng/g ww) observed in the North were well above median concentrations in otters from southern Sweden (817 ng/g ww) during the same time span. This was unexpected since the south is considerably more populated compared to the more pristine northern Sweden. Ongoing monitoring efforts in otters throughout Sweden are clearly warranted to elucidate the source of this contamination.

MONITORING OF THE EUROPEAN OTTER (*Lutra lutra*) POPULATION IN THE SOUTHEAST OF BELGIUM AND THE NORTH OF LUXEMBOURG

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[6]*Parc naturel Haute-Sûre Forêt d'Anlier., Martelange, Belgium.*

INTRODUCTION

The last European otter population in Belgium and Luxembourg was found to be located in the southeast of Belgium and the north of Luxembourg. In order to provide evidence of the evolution of this population, a monitoring programme was initiated during the LIFE-Nature Otter project (2005-2011) and prolonged every two years by the "AFTER-LIFE" project.

METHODS

Otter tracks and spraints were searched for by using the Information System for Otter Surveys (ISOS) developed as a standardised European method. This method is used every 5 years and the simplified ISOS method which consists to intensify the number of visited points per square (with only 50 m of space investigation) has to be used every 2 years to intensify the search. These data are collected by volunteers and the observers' network created in 2008 by the LIFE-Nature project.

RESULTS AND DISCUSSION

All the data collected between 2008 and 2015 indicate that the last otter tracks were found in 2003 in Luxembourg and in 2014 in the southeast of Belgium. This seems to indicate that there is no more an otter population in our region and that just few individuals are yet there. Other interesting data emanating from the study area indicate that the beaver is coming back and that the racoon population has increased over the past ten years. The ISOS method appears to be useful for stable otter population but has to be adapted for low population or few isolated individuals. The assessment of the presence of other species like the racoon or the polecat confirms that this method is valuable.

Last decade, just few otter tracks were found in the southeast of Belgium and the north of Luxembourg. However, with the recolonization coming from Germany, Netherlands and maybe also from France, individuals from expending otter populations have to come back soon or later in our vicinity.

USING STABLE ISOTOPES TO STUDY FEEDING ECOLOGY OF EURASIAN OTTERS (*Lutra lutra*) IN FRESHWATER HABITATS: PRELIMINARY RESULTS

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European otters (*Lutra lutra*) are top predators in aquatic and semi-aquatic systems, feeding mainly on fish and other aquatic species. Their food habits often lead to conflicts between conservation and fisheries management. Detailed knowledge on feeding ecology, i.e. foraging strategies and diet composition, enables us to evaluate predator-prey-relationships and to understand inter- and intraspecific factors affecting otter populations.

Although the feeding ecology of otters has been examined previously, important issues like intraspecific and seasonal variation in food use or the determination of prey fish origin (e.g. wild or stocked specimen) remain poorly addressed. This is mainly due to the lack of adequate methodology. During the last years, stable isotope analysis has become a valuable tool to study ecological questions like food webs and dietary aspects of animal ecology.

Isotopic analyses can offer a useful proxy for dietary variation on individual and population level and therefore overcome some of the limitations and biases of classical approaches (i.e. scat and stomach analysis or observation) used in feeding ecology research. Hence, in a future project we will explore the use of stable isotopes (carbon, nitrogen, sulphur and strontium) to study otter feeding ecology in freshwater habitats and meet specific research questions not answered so far.

In a preliminary study we assessed the underlying isoscape by measuring natural abundance C and N signatures of all potential prey categories in two different habitats (a salmonid stream and a pond area) located in Austria. Our first results show a large range in isotope values of common prey taxa. Secondly, prey categories within one habitat differ significantly in their $\delta^{13}C$ and $\delta^{15}N$ values, meeting a necessary requirement to be able to determine relative contributions from each source in a diet.

Furthermore, we recorded C and N signatures of otter vibrissae segments. Using continuous growing, metabolically inert tissues, like whiskers of mammals, changes in a consumer´s resource use can be studied throughout the timespan of tissue growth. Otter whisker segments within individual vibrissae showed variability in isotopic composition: $\delta^{15}N$ values and $\delta^{13}C$ values ranged from 10.47 to 16.02 and from -25.95 to -22.58, respectively.

The preliminary data build the basis for a detailed study plan to answer important questions of otter ecology using a combination of conventional techniques and stable isotope analysis.

OTTER AND MAN - OH, THOSE CONFLICTS (NOTES FROM SLOVAKIA)

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INTRODUCTION

The Eurasian otter (*Lutra lutra*) is a native and fully protected animal species in the Slovak Republic. At present the otter occurs in most parts of the country (in all types of water bodies, channels, artificial reservoirs and mountain lakes), with the exception of parts of the Western and South-Eastern lowlands of Slovakia. The Slovak population is partly connected to the otter population in central and eastern Europe. Otter has become a "conflict species", by coming into conflicts with economic interests of man and this has become a major concern in conservation biology.

RESULTS AND DISCUSSION

The most important negative factors affecting otters are road kills, destruction and fragmentation of habitats, illegal hunting and killing, water pollution, the use of hydrological resources etc.

Systematic monitoring of otter road mortality is not carried out. There are recordings of otters killed in traffic, but cases of collisions and their causes are evaluated only in some areas. For example on the roads in and around the Malá Fatra National Park, we registered 33 killed individuals between 2005 – 2015. In March 2013 we registered 4 killed otters in the 32 km long section of the second class road Šahy – Veľký Krtíš along the Ipeľ River.

Despite the general prohibition of hunting protected animals in Slovakia the cases of shooting, striking to death or catching of the otters in traps or in fyke nets are considerable and indicate insufficient awareness. Compensation of damages caused by otters in the Slovak Republic is legally established in the Act on nature and landscape protection. According to this Act the state is responsible for damages caused by otters on the fish raised for commercial purposes in fishponds or in aquaculture facilities but not on fisheries in open waters Communication between authorities and general public is because very important.

CONNECTING THE DUTCH OTTERS TO THE WEST-EUROPEAN POPULATION

Johan Bekhuis[1], Gijs Kurstjens[2], Ellen van Norren[3], Hugh Jansman[4], Bart Beekers[1], Bram Houben[1]

[1]Ark Nature
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[3]Dutch Mammal Society
[4]Alterra-WUR

INTRODUCTION

Otter recolonization in The Netherlands is proceeding well since its reintroduction in 2002. Recently inbreeding is identified as a serious issue, due to limited founder stock and lasting isolation of the Dutch population. Temporarily enforcing the population with new blood might overcome inbreeding risks on the short term. To meet this objective ARK has been officially licensed to release a limited number of otters (additional founders) to establish satellite populations for genetic reinforcement. For the long term promoting the connection with the West-European population and reducing roadkills to improve a safe interconnectivity of current population, are major topics. In 2012, ARK Nature and its partners carried out a feasibility study to find out how to anticipate and facilitate those future developments.

METHODS

The Gelderse Poort & Oude IJssel (area 1) and Central Limburg (area 2) were identified as target regions (fine otter habitats) to enhance the connection of the Dutch population with the Belgian, German and French hinterland, following the historical otter routes of the rivers Rhine and Meuse. In 2013 and 2014, after natural colonization started here, four otters were released to area 1. It is planned to release additional otters in area 1 in 2015, and in area 2 in 2016.

RESULTS & CONCLUSIONS

Otters already started exploring the wetland habitats of the river IJssel, a side stream of the Rhine and its tributaries, and a first reproduction was noticed already. The cooperating partners* set up a coordinated strategy to minimize roadkills. Several studies have been made to map potential roadkill hotspots in the target regions, the most riskfull places have been made save on advance thanks to a strong commitment of local and regional authorities. Also, implementation of the Water Framework Directive and nature development (Room for the River) work pays off. Water quality is improving considerably. Residue levels contaminants in Dutch otters show quite some variation. However, no lethal effects or growth abnormalities have been registered yet. Apparently contaminants did not limit the Dutch otter expansion.

REQUEST: CALL FOR HELP

Results suggest that new founder otters released in the already established population did adapt well and are contributing to otter expansion in the Netherland. However, the reintroduction project is limited by the low availability of A-line type European otters in the

EEP network and in otter (rehabilitation) centers in Central Europe.0 Please contact ARK Nature if you could help the project by providing suitable otters to The Netherlands (email: johan.bekhuis@ark.eu).

*Partner organizations:

ARK Nature, WWF-Netherlands, Province Gelderland, Province Limburg, Staatsbosbeheer, Stichting Twickel, National Department of Waterways and Public Works, Regional Water Boards of Rivierenland, Rijn & IJssel and Peel & Maasvallei, Alterra-WUR, Dutch Mammal Society

https://www.ark.eu/natuurontwikkeling/natuurlijke-processen/predatie/otter
http://www.zoogdiervereniging.nl/otter