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ALTERRA
GREEN WORLD RESEARCH

CONTENT

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IUCN OTTER SPECIALIST GROUP BULLETIN

The IUCN Otter Specialist Group Bulletin appears biannually. Articles, reports, symposium announcements and information on recent publications are welcome. All submissions should be typed double-spaced. The submission of an electronic manuscript on diskette or by e-mail is strongly recommended. Reports should not exceed 2000 words in length, i.e. not to exceed four printed pages, including diagrams and tables. Articles may be longer. Diagrams, maps and tables should be included as a photocopy ready for reprint! A short abstract for translation into Spanish and French has to be included!
Articles will be fully reviewed. Authors are requested to add a notice as to whether they submit an article or a report.

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NOTE FROM THE EDITOR

Another IUCN OSG Bulletin is printed and send out, This is already issue 14, which has been produced since I took over the duty as an editor, and I have to admit that on one hand it is still a pleasure to do it, and on the other hand sometimes I feel tired of all struggling with organizing funding and all the little details around manuscripts. The greatest disappointment is the low response I had to my last leaflet. I can understand that people are unable or unwilling to contribute but at least the return of the leaflet should demonstrate some interest. Why do I send out 350 copies when only 50 persons send back the leaflet. This I want to ask the 300 of you who did not respond? Are you not interested anymore? It will safe a lot of money and energy to produce less copies. This is the last issue I will send to the whole list. Those of you who have not responded this year or who have not been active for the Bulletin by either sending information on publications, submitting a manuscript or having done a review will not receive any further issues. This is the last chance to send me a notice that you still want to receive forthcoming issues.

It was the initiative of Lionel Lafontaine, France that in future we will always have a French Summary for all articles and reports.

The printing and postage of this issue was sponsored by Alterra Green World Research, Wageningen, The Netherlands. I want to thank Hugh Jansman who organised the contact!

Thanks to Claudio Chehébar, Jutta Jahrl, Sisco Mañas, Claus Reuther and Fernando Rosas who sent me information on recent publications.

I would like to ask everybody to think about possible new sponsors for the Bulletin. It is quite a task to organise the money for printing and postage twice a year and any help would be welcome.

Kevin Roche (Trebon) again functions as a reader for those contributions which have not been reviewed by at least one native speaker. Alvaro Soutullo (Uruguay) and Lionel Lafontaine (France) translated the abstracts into Spanish and French. 1 have to thank the 'Otter Bulletin Team' - Mans van den Berg (Wageningen), Els Hoogsteede-Veens and Erwin Hellegering (GRAF1SCH SERVICE CENTRUM VAN GILS, Wageningen) - for their continuing help.

IUCN/SSC OSG GROUP

FROM THE CHAIRMAN'S DESK

In writing this note, and looking back at the activities since the last issue of the Bulletin, I realise that more than three months have already past since I met many of you as participants of the VIII. International Otter Colloquium (IOC) in Valdivia/Chile. More than 60 otter specialists from 24 countries joined this event and I'm sure that all of you who attended will agree that it was a very useful and impressive meeting. Once again, I want to thank Gonzalo Medina, who prepared and organised this event. In Valdivia, we heard much new information, especially from the America's; we were able to establish or to renew many personal contacts, and we had very productive discussions. The latter are reflected in the Recommendations of this IOC, which I have already distributed via our listserver and which are also available from my office.

For the first time, we used the accompanying meeting of the Otter Specialist Group (OSG) to evaluate the realisation of the Recommendations of the last IOC, held in 1998 in Trebon/Czech Republic. It was impressive to see how much has been realised since then. However, some activities agreed in Trebon still remain unfulfilled, and still need our attention. In Valdivia, the OSG made progress on two important aspects. For the first time, the vision, objectives, goals, and the targets of the group have been defined and documented in a 'Manifesto'. This declaration will form the basis of our future work and for the preparation of detailed working plans. It is also unique in the history of this group that we now have a clearly defined membership structure. I am sure that this will increase the efficiency of the OSG's work and will guarantee the high scientific and conservation level required for a 'Specialist Group'.

After again being appointed by the SSC as Chairman of the OSG for the period 2000-2003, I have begun to use the new structure for the membership of the OSG. This means I have had to review the complete OSG and SSC database and to mail more than 150 letters of invitation to remaining or new members, as well as letters of thanks to retiring members. In the meantime, most invited members have already sent back the forms for the SSC, which are mandatory for membership and, therefore, the OSG is well prepared for the next IUCN triennium.

We also used the time since Valdivia to initiate the first follow-up of the activities agreed at our last meeting. Together with Addy de Jongh and Alfred Melissen, I prepared a first draft for the 'Guidelines for release projects (re-introductions, translocations, reinforcement or supplementation) for the Eurasian Otter (*Lutra lutra*). This forms part of the revival process of the Re-introduction Advisory Committee (RAC) of the European section of the OSG. As soon as we have finished the revision of the first draft we will send it to interested OSG members and to the Re-introduction Specialist Group of IUCN/SSC for comments.

A further initiative is the new focus on African otters. It became obvious in our workshop 'How to implement the Otter Action Plan?', held in November 2000 at the German Otter Centre, that Africa needs our special attention. By the way, the proceedings of this workshop have been published as volume 13 of HABITAT, the scientific journal of 'Aktion Fischotterschutz', in February and are available now (see announcement in this issue of the Bulletin).

As part of the 8th International Theriological Congress to be held in August 2001 in South Africa Jan Nel and I prepared a workshop on 'African otters - How to increase knowledge of their biology, distribution, and threats to survival?'. This workshop will offer the opportunity for all participants interested in otters, or involved in research or conservation projects related to wetland habitats, in Africa to discuss the possibilities of increasing knowledge on African otters. Two initial presentations will give an overview on the state of present knowledge regarding African otters, and will introduce examples of activities in other continents that led to an increase in research and conservation activities. Ideas will be presented as to how these experiences could be applied in Africa. Participants will have the opportunity to discuss these suggestions, the possibilities for co-operation, regional and thematic priorities for future work on African otters, and the contribution of these activities to wetland conservation in Africa.

In parallel with the above workshop, Hélène Jacques, Jan Nel, and I have started an initiative to collect data and samples from African otters in zoos and museums that can be used for genetic analysis. The results will support the development of a specific field guide, the testing of survey methods, and the preparation of training courses in Africa. It is my hope that these activities will also be a great help in our search for *Aonyx congicus*, and will result in a success story similar to that which recently occurred in Asia with *Lutra sumatrana*.

From Latin America I have information from Helen Waldemarin, from Brazil, that she has prepared a course on 'Research and Conservation of Otters', that will be offered to students at various Brazilian universities, and is aimed at increasing the interest of biologists in this region for otters.
Good news can also be announced from Asia. Motokazu Ando and Hiroshi Sasaki have just published a book that should not be absent from any otter conservationists' library. Entitled 'The Wetlands Ambassador - Education and Public .Awareness Methodologies for Otter Conservation', this 56-page book contains many 'best practice' examples from all over the world. I am sure that it will become an important source of ideas for initiating public awareness activities. I want to congratulate Motokazu and Hiroshi for this excellent initiative and I want to thank all authors who contributed to this collection.

Priorities for our activities in the coming months will be given to the revision of the IUCN Red List, to the continuing revision process of the Otter Action Plan, to the establishment of the OSG Task Forces agreed in Valdivia and, hopefully, to the preparation of the OSG website. After having reconstituted the organisational basis of the OSG, I welcome all remaining and all new members of OSG and I invite all of you to contribute to these activities.

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A R T I C L E

MONITORING THE USE OF ARTIFICIAL LOG PILE OTTER HOLTS USING HAIR ANALYSIS FROM BEDDING

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Abstract: Nineteen, approximately ten year old log pile holts (LPH) in mid-Wales, UK, were dismantled prior to reconstruction and any bedding from couches removed for analysis. The plant material making up the bedding was identified and animal guard hairs contained within it were determined to species. The bedding material simply consisted of opportunistically available material with little evident selection. Hairs of cow and sheep were clearly brought in with the bedding but it is suggested that hairs of otter, badger, fox, dog, cat, American mink and polecat indicate use of the LPH by the species concerned. A possible pine marten record is also considered.

INTRODUCTION

Artificial log pile holts (LPH) for use by otters, have been in use in Wales for well over a decade and, in consequence, some of the first ones to be erected are now in need of refurbishment. It is usually the forest brash, often used to cover them, which decays first and needs replacing. After removing the old covering the inner chambers of the LPH are exposed and Geoff Liles and Louise Midgley of "Otters in Wales" and their co-workers took the opportunity to remove all bedding from couches in the chambers of 19 refurbished holts. This material was taken to Cardiff University's Field Centre at Llysdinam in mid-Wales where both the botanical make up of the bedding and, in particular, the identity of any mammal hair incorporated into the bedding were determined. Although clear from the evidence of spraints which LPHs had been entered by otters, identification of hair in bedding would confirm if otters would lie up there and which other species may have made use of the holts.

MATERIALS AND METHODS

The bedding from each chamber of each holt was collected separately, and, where the bedding was apparently layered, each layer was separately bagged. Each sample was loosely sealed into a polythene bag and appropriately labelled. The samples were then stored in a dry place until required for analysis. Prior to analysis the samples were stored for a few days in a deep freeze in order to kill any insects within the bedding.

Using a powerful desk lamp, each bag of bedding was searched thoroughly for mammal guard hairs which were usually easier to see when the light source came from behind. The guard hairs from each bag were put into a wide necked screw topped jar to await identification and the bedding material re-bagged for botanical analysis. The finer underhairs were not collected as they could not be identified. The bedding material from each sample was separated into its component parts by species and plant part (e.g. *Quercus robur* and *Salix cinerea*, leaves and twigs). Each component was then weighed.

Analysis of the hairs is a far more exacting process than that of sorting the plant material in the bedding. Conventional methodologies generally require that observation of the three layers of the hair, the cuticle, the cortex and the medulla, each need separate and often intricate preparation (HAUSMAN, 1930, 1932; MATHIAK, 1938; WILLIAMSON, 1951; WILDMAN, 1954; FORD and SIMMENS, 1959; SHORT, 1978; TERRINK, 1991).

The key to the hair of West European Mammals by TERRINK (1991) was useful but techniques in several keys advocated cutting up to ten cross section slides and ten cuticular slides per hair and this

was unnecessary for most hairs considered and impractical in terms of time, equipment and the quantity of material for identification. Two of the present authors devised a specific hair key for this project (COWELL and THOMAS, 1999) and fast and simple histological techniques for mounting and identifying hairs, based on a reference collection of hair compiled by Cardiff University and The National Museum of Wales.

After trials of a range of techniques two were developed which proved adequate for the purpose providing sufficient information to identify the range of species we were likely to find in otter holts in Wales.

a) Cellulose acetate cast technique (permanent fix - 3 mins to carry out).

The best techniques for observing the cuticle of hairs are generally based on making a cast in a suitable medium (e.g. gelatin or nail varnish) (WILDMAN, 1954; WILLIAMSON, 1951; TERRINK, 1991). Our technique involved the use of cellulose acetate sheet, which was used for casts but initially used to observe the medulla. A 5mm wide strip of cellulose acetate sheet was cut to a length slightly shorter than a microscope slide. Using a pipette, acetone was thoroughly coated along the length of the slide and the cellulose acetate strip immediately laid in the liquid lowering it on from one end of the slide. Superfluous acetone was poured or blotted off. The acetate strip was then attached to the slide. The hair was then laid lengthways on the acetate strip securing the tip with a drop of acetone. The hair is then stretched using forceps and the base fixed with acetone, as at the tip, then the entire length of the hair is flooded with acetone. Another cellulose acetate strip of approximately the same dimensions is placed on top of the hair. The hair is then sandwiched between two fused strips of acetate allowing the medullary structure to be seen. The technique can be used with several hairs at a time and takes about three minutes to carry out. To get a cast of the hair do not use the second acetate strip but after fixing the hair with acetone wait two minutes, gently peel the hair away avoiding damage to the distal end, then refix the hair alongside the cast for future reference.

b) The "Sellotape" method - semi-permanent. Time taken - 30 seconds.

A simple and fast technique for making semi-permanent mounts involved the use of clear adhesive tape (Sellotape). The hairs were arranged along the length of a glass slide and a length of Sellotape the same length as the slide was held at each end and very rapidly put on to the slide to avoid hair movement due to static electricity. The tape was pressed and rubbed firmly down over the hairs to avoid air bubbles. For most species cuticular and medullary structures can be seen. Using TERRINK (1991) and our own key (COWELL and THOMAS, 1999) the hair samples were individually identified.

RESULTS

a) **Bedding materials**:
For each chamber of each holt, and, where appropriate, each layer of each couch of bedding, a species list of plant material present was constructed and quantified by weight. Detailed results would be inappropriate and repetitive but several general observations can be made. Many couches consisted of fine twigs and leaves of the brash species used to cover the LPH. These were probably collected within the holt. As the covering brash is usually of local origin some of the material such as *Salix*, *Alnus* and *Quercus* leaves could have been brought in from outside the holt.

Other bedding material reflected the location of the holt. Where wetland with *Phragmites* or *Phalaris* was nearby these two grasses frequently predominated in the bedding. Where the surroundings were grassland *Agrostis*, *Holcus* and the rush *Juncus effusus* were frequent. In some cases the mosses *Rhytidiadelphus squarrosus* and *Thuidium tamariscinum* typical of deciduous woodland floors in mid-Wales were abundant. Occasionally other debris was found in the bedding including black polythene silage wrapping, clear polythene sheet, red polystyrene baler twine and expanded polystyrene cup fragments. In many cases the lower layers of the couch were well rotted with fresher material above indicating fairly long continued use of that site.

b) **Hairs**:

The types of hairs found in the 19 holts examined are listed in Table 1. A number of holts were unused by otters but all contained some hairs although the dog (*Canis*) hairs probably came from

the animal owned by one of the authors, which was generally present when holts were refurbished. Similarly human (*Homo*) hair is probably contamination during holt demolition and sample collection process.

Table 1. Hair types found in the 19 holts examined

Holt No.	Hair present of
1	*Lutra, Vulpes, Bos. Canis*
2	*Lutra. Bos*
3	*Lutra, Bos, Canis, Muridae, Homo,* feathers
4	*Meles, Bos, Canis, Muridae, Ovis, Oryctolagus*
5	*Lutra, Bos, Felis, Oryctolagus*
6	*Bos,* minimal bedding
7	*Lutra, Meles*
8	*Lutra, Bos, Oryctolagus*
9	*Lutra, Bos, Meles,* feathers
10	*Felis, Canis, Mustela putorius, Vulpes*
11	*Lutra, Bos, Canis, Felis, Homo, Mustela vison*
12	*Lutra, Bos, Mustela vison, Canis*
13	*Felis, Bos*
14	*Lutra, Bos, Canis, Muridae, Ovis*
15	*Lutra, Bos, Ovis*
16	*Ovis, Canis, Oryctolagus, Martes martes*
17	*Canis*
18	*Lutra*
19	*Lutra, Bos*

DISCUSSION

The provision of LPHs for otters has almost certainly been an aid to their recovery in England and in Wales (ANDREWS et al., 1993; STRACHAN and JEFFERIES, 1996) providing refuge particularly in places where natural holts are scarce. Although several of the authors are familiar with otter couches in open cover e.g. *Phragmites* beds, little is reported of their couches within holts in general and LPHs in particular. Our results suggest that the otter might first utilise the plant fragments which originate from the brash used to cover the LPH and which subsequently fall inside accounting for the frequent use of coniferous leaves and fine twigs where these are LPH construction materials. Because the bases of some couches are well rotted with fresher material above, it would suggest that these couches are renewed as necessary. Clearly much of the material comes opportunistically from the immediate environs of the holt as evidenced by the presence of cattle (*Bos*) and sheep (*Ovis*) fibres. The source of the dog hairs has been suggested as belonging to the LPH reconstruction crew. Cat (*Felis*) hair probably represents the fact that cats are the commonest larger mammal to be seen in the countryside by both day and night even at distances of over a kilometre from the nearest house (SLATER, 1994) and might therefore be expected to explore most areas in the course of time.

Otters clearly used most LPHs and if dog, cattle and sheep hair are excluded as coming from external sources, several holts were used exclusively by otters. Although the bedding was generally free of spraints, the occasional occurrence of broken amphibian bones might suggest occasional faecal contamination and might account for the small quantities of "mouse" (Muridae) and rabbit (*Oryctolagus*) hair and unidentified "feathers." Having accounted for the presence a range of possibly non-resident species, the presence of fox (*Vulpes*), badger (*Meles*), mink and polecat (*Mustela* sp.) suggested that LPHs offer sanctuary to most of the larger carnivorous mammals found in Wales. The record of pine marten (*Martes martes*), one of the rarest mammals in Wales, is one which needs reconfirmation. It was recorded from a part of Wales where the species has been recorded in recent times and, if the record proved to be correct, then the use of LPHs might be targeted into other non-riparian habitats for the benefit of other vulnerable species.

REFERENCES

Andrews, E., Howell, P. & Johnson, K. 1993. Otter Survey of Wales. 1991. Vincent Wildlife Trust, London.

Cowell, D. & Thomas, G. 1999. A key to the guard hairs of British canids and mustelids. *Brit. Wildl.* **11**, 118-120.

Ford, J.E. & Simmens, S.C. 1959. Fibre section cutting by the plate method. *J. Text. Inst. Proc*. **50**, 148-158.
Hausman, L.A. 1930. Recent studies of hair structure relationships. *Scient. Monthly*. **30**, 258-277.
Hausman, L.A. 1932. The cortical fusi of mammalian hair shafts. *Am. Nat*. **66**, 461-158.
Short, H.L. 1978. Analysis of cuticular scales on hairs using the scanning electron microscope. *J. Mamm*. **59**, 261-267.
Slater, P.M. 1994. Wildlife Road Casualties. *Brit. Wildl*. **5**, 214-221.
Strachan, R. & Jefferies, D.J. 1996. Otter Survey of England 1991-1994. Vincent Wildlife Trust, London.
Terrink, B.J. 1991. Atlas and Identification Key to Hair of West European Mammals. Cambridge University Press. Cambridge.
Wildman, A.B. 1954. The microscopy of animal textile fibres. Wool Industry Research Association. Leeds.
Williamson, V.H.H. 1951. Determination of hairs by impressions. *J. Mamm*. **32**, 80-85.

Résumé :Étudier l'Utilisation des Catiches Artificielles en Rondins par l'Examen des Poils de Litière

Au Pays de Galles, 19 caliches artificielles en empilements de rondins (LPH), construites environ 10 ans auparavant, ont été démantelées avant reconstruction, et à cette occasion la totalité des litières a été prélevée pour analyse. Le matériel constitutif de ces litières a été identifié, y compris les poils de mammifères pour diagnose spécifique. Le matériel de base semble être amassé de façon opportuniste par l'occupant, sans sélection nette. Des poils de bovins ou de moutons sont distinctement apportés et nous suggérons que la présence, dans la litière, de poils de loutre, blaireau, renard, chien, chat, vison américain ou putois est un indice d'utilisation du gîte concerné par l'espèce en question. Un cas possible de martre a été aussi envisagé.

Resumen: Monitoreo del Uso de Madrigueras Artificiales De Nutrias Utilizando Análisis de Pelos del Lecho

En Gales UK, 19 madrigueras artificial de madera (LPH) de aproximadamente 10 años de edad fueron desmanteladas antes de ser reconstruidas y todo lecho en las madrigueras fue recogido para ser analizado. Se identificó el material vegetal constituyente de los lechos y los pelos guardianes de animales contenidos dentro de este fue determinado hasta el nivel de especie. El material de los lechos consistió simplemente en el material disponible oportunamente, con poca evidencia de selección. Los pelos de vacas y ovejas fueron claramente acarreados con el lecho, pero se sugiere que los pelos de nutrias, tejones, perros, zorros, gatos visones americanos y turones indican el uso de los LPH por estas especies. Un posible registro de marta también es considerado.

A R T I C L E

MONITORING OTTER POPULATIONS BY DNA TYPING OF SPRAINTS

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Abstract: To monitor mammals by direct observation is often very difficult. Therefore a new technique based on DNA typing of droppings has been developed. DNA typing of otter spraints can potentially provide estimates of population size, home ranges, dispersal, genetic diversity and which species are present. This article gives a set of guidelines based on two feasibility studies on how to use the spraint DNA typing method. There are three main points. First, a sample of the study population must be typed to check that levels of genetic polymorphism are high enough for individual identification. Second, spraints must be collected and stored correctly because DNA extracted from spraints is typically of poor quality and quantity. Spraint collection should take place within 12 hours after deposition and before 10 a.m., and spraints should be stored at -20°C in a solution to stop DNA breakdown. Third, laboratory technique must be meticulous in carrying out repeat assays of the same sample and in avoiding contamination among samples. The results of the feasibility studies suggest that spraint DNA typing shows promise for monitoring of otter populations. Further progress will depend on achieving higher success rates, lower cost, and developing more highly variable microsatellites and species-specific PCR assays. DNA typing of endangered and poorly known otter species could provide important information on their distribution and status. We therefore recommend that skin, tissue or DNA samples from all endangered otter species be archived for future genetic analysis.
Keywords: DNA typing, spraints, monitoring, otter

INTRODUCTION

Habitat loss has created fragmented populations in many species of animals. Such populations can suffer from reduced mating opportunities and inbreeding depression. Conservationists have responsibilities to monitor such species to ensure that populations remain viable. Unfortunately, such species are usually elusive and their numbers low, so monitoring by direct observation is often difficult or impossible. The need for an alternative monitoring method has prompted scientists to develop genetic typing of DNA extracted from animal droppings (molecular scatology). Droppings of many species can be collected easily and in some cases they provide the only evidence that a species exists. Conservationists who attended the VIII International Otter Colloquium in Valdivia, Chile, 2001, expressed great interest in molecular scatology. The aim of this article is therefore to give guidelines based on two feasibility studies on how to apply this method to the Eurasian otter *Lutra lutra* and other otter species.

Two groups in Europe have experience of DNA typing of *L. lutra* spraints. A feasibility study in the UK was done to assess this method for surveying wild *L. lutra*. The study was a joint effort involving the Environment Agency, the Universities of Aberdeen and Exeter, the Somerset Otter Group and the Devon and Hampshire Wildlife Trusts, together with many volunteers, without whom the study would have been impossible. Over 600 spraints were collected from four river catchments during 18 months and analysed. The study is published (COXON et al, 1999) and summarised at www.ex.ac.uk/mammals/dna/. The Alterra group subsequently acquired the DNA typing method from

the Aberdeen group to monitor the success of the future reintroduction of *L. lutra* in The Netherlands. Hair and spraint samples were collected from captive otters at the breeding station Aqualutra and Ouwehands Zoo, and reference samples of Scottish otters were included.

DNA TYPING

Spraints are easy to collect because otters deposit them at highly visible points near waterway margins. Spraints contain the DNA of their previous owner in the form of cells shed from the intestinal lining. In DNA typing, the owner is identified according to a genetic profile consisting of 6-15 highly variable microsatellites and one male-specific gene. The profiles are detected using the polymerase chain reaction (PCR). PCR primers for 13 *L. lutra* microsatellites and a male-specific *L. lutra* gene are available. These primers detect only otter DNA, not DNA from gut bacteria or prey species. Some of the microsatellite primers and the male-specific primer are equally applicable to representative species of all four otter genera (DALLAS and PIERTNEY, 1998; DALLAS et al., 2000).

DNA typing of wild *L. lutra* populations and other otter species could meet with two obstacles. First, populations with a long history of low numbers, reintroduced populations stemming from few founders and geographically isolated populations, could contain so little microsatellite polymorphism that many individuals will have identical genotypes. Good examples are the *L. lutra* population on the island of Shetland, UK, which contains less than half the level of microsatellite polymorphism found in populations in mainland Scotland (DALLAS et al., 1999), and the reintroduced *L. lutra* population in the River Itchen catchment in southern Britain (COXON et al., 1999). Second, some of the available *L. lutra* microsatellites could have low polymorphism in other species. Developing more microsatellites for *L. lutra* and other otter species could overcome both obstacles.

Spraint DNA typing has three parts. First, DNA is extracted from spraints. Because the quality and quantity of such DNA are typically low, DNA recovery must be efficient and PCR inhibitors must be excluded. Second, the otter microsatellites and SRY gene are amplified to yield detectable PCR product. Third, PCR products of different length are separated by electrophoresis and detected (Fig. 1). The resulting genetic profiles are subjected to population genetic analysis using computer programs.

Extraction of DNA from spraints has been done by two methods. The Aberdeen group used a CTAB/GITC/DIATOM/ VECTASPIN method (PARSONS et al., 1999) whereas Alterra used a commercial kit designed for DNA extraction from animal tissue (QIAgen; www.qiagen.com). A direct comparison of the PCR success rates of these methods remains to be done. Detection of PCR products was done using two systems. The Aberdeen group used standard sequencing gels and autoradiography whereas Alterra used a Licor DNA sequencer/fluorescence system. The Licor/fluorescence system is generally more sensitive than autoradiography and thus superior for spraint DNA analysis.
The Aberdeen group obtained a success rate of around 20% for typing at least seven out of nine microsatellites and the SRY gene, whereas Alterra obtained an approximately three-fold higher rate (50-60%; H. Jansman, unpublished) for typing 5 microsatellites and the SRY gene. Although the differences in DNA extraction and detection methods probably contributed to the difference, another important factor was probably the age and type of spraints. At Alterra, a few very fresh (approximately 1-6 hours old and immediately extracted) spraints from zoos were analysed whereas in the UK study over 600 wild-collected spraints that averaged 12 hours old were analysed. The success rate of DNA typing wild-collected spraints at Alterra could therefore be lower than 50%. We expect to find out if this is the case during summer 2001, when spraints from the Trebon population in the Czech republic will be analysed at Alterra.

A commercial company in the UK specialising in DNA analysis (Tepnel; www.tepnel.com) recently carried out a small study to improve the success rate of spraint DNA typing. It was found that a 504 bp portion of the mitochondrial DNA gene cytochrome B was detectable in approximately 80% of spraint DNA extracts. The success rate of microsatellite typing of these samples by multiplex PCR is presently being assessed. Commercial laboratories could therefore provide services for acquiring raw genetic data. University or research institutes could also provide the skills necessary for genetic data analysis and ecological interpretation. More detailed protocols and links will appear on the website: http://www.ex.ac.uk/mammals/dna/.

Figure 1. DNA typing of 8 otter samples

Lane	Otter	Sample
A	Sien (female)	Hair sample
B	Fleck (male)	Hair sample
C	Spyke (cub, male)	Hair sample
D	Fleck or Spyke	Fresh spraint from enclosure 'Fleck and Spyke'
E	Fleck or Spyke	Fresh spraint from enclosure 'Fleck and Spyke'
F	Fleck or Spyke	Fresh spraint from enclosure 'Fleck and Spyke'
G	Fleck or Spyke	Fresh spraint from enclosure 'Fleck and Spyke'
H	Fleck or Spyke	Fresh spraint from enclosure 'Fleck and Spyke'

In the figure three different DNA typings (lane A, B and C) are shown for the three different otters. Obvious is that the cub (lane C) has inherited one allele from the mother (lane A) and one from the father (lane B). Five spraints (lane D-H) have been collected in the enclosure from Fleck and Spyke. Three of them (lane D, E and G) were successfully typed and revealed that the spraints where deposited by Fleck.

INFORMATION FROM SPRAINT DNA TYPING

Low-intensity sampling and spraint DNA typing could yield data to distinguish most unrelated individuals present and estimate levels of genetic diversity in the population. High-intensity spraint sampling of populations containing high levels of microsatellite polymorphism could also yield estimates of individual home ranges and dispersal patterns. In areas where more than one otter species occurs, spraint DNA typing could also identify species. This method can distinguish among *L. lutra*, American mink *Mustela vison* and polecat *Mustela putorius* (HANSEN and JACOBSEN, 1999), and DNA sequences suitable for designing species-specific PCR primers for otters are available (KOEPFLI and WAYNE, 1998). Spraints also contain food remains and parasites, perhaps allowing diet and disease analysis by PCR (KOHN and WAYNE, 1997). Lastly, the reproductive status of individual otters (separation of juveniles/sexually-inactive females, pregnant females and adult males) can be studied by analysing hormone metabolites in otter spraints (TSCHIRCH et al., 1996).

PRACTICAL TIPS

We emphasise that otter DNA extracted from spraints is generally of poor quality and yields low typing success rates and high rates of potential errors in individual profiles (TABERLET et al., 1999). It is therefore necessary to standardise the practical aspects of the method.

Two important factors under user control are the age and storage conditions of spraints. Spraints should be collected as soon as possible after deposition. In the UK study, spraints were collected during the early morning and only those judged by then-fresh appearance to have been deposited during the previous night were collected. The success rate appeared higher for anal jelly samples than for normal spraints (COXON et al., 1999), and other analyses of spraints from captive otters suggested that typing success rate decreases from 60% at deposition to 15% after 24 hours (J. Dallas, unpublished). In confirmation, the Alterra group found very low success rates in typing of spraints over three days old (H. Jansman, unpublished). For monitoring studies, we strongly recommend collecting only fresh (<12 hours old) spraints, preferably before 10 a.m. in the morning. When spraints are rare and otter numbers are suspected to be low, it could be worth collecting older spraints, despite a much lower success rate.
Spraint storage conditions are important because correct storage retards or stops DNA breakdown. Ideally, a spraint (or a part of it) should be stored in a plastic vial containing a suitable solution, and DNA should be extracted as soon as possible. Suitable storage solutions are 95% ethanol and ATL buffer from the animal tissue DNA extraction kit (QIAgen). Irrespective of which storage solution is used, any storage of samples should be done at -20°C. Under less optimal field conditions, it could be effective to preserve DNA in spraints by drying with silica beads (WASSER et al., 1997). All samples should be well-documented (date, location, composition) using pencil to write on the vials.

Before starting a monitoring program based on spraint DNA typing it is important to verify that levels of microsatellite polymorphism in the population are high enough, at least for individual identification. A representative sample of 10-20 otters from the population should therefore be analysed by DNA typing. Suitable samples are hair (>30 for each individual, including roots), blood, or tissue from dead otters. The UK study showed that when average expected heterozygosity per locus (H_e) is below 0.40, and the average number of alleles per locus (N_{all}) is below 3.0, even unrelated individuals can have identical genotypes for up to nine microsatellites. In this case, population size can be underestimated owing to this "shadow effect" (MILLS et al., 2000) and home range sizes overestimated.

The number of microsatellites used, and levels of polymorphism of each locus, is also important. The more loci are typed, the more likely different individuals can be discriminated, but the more likely false genotypes will arise through typing error. Six microsatellites (Lut 701, 715, 717, 832, 833 and 902; DALLAS and PIERTNEY, 1998; DALLAS et al., 1999) were used for spraint DNA typing in the UK study, and a further three (Lut 435, 457, 615) were typed subsequently (J. Dallas, unpublished). In highly polymorphic populations ($H > 0.6$, $N_{all} > 4.0$) the use of six loci is probably sufficient for individual identification and monitoring levels of genetic diversity. Intensive individual-level analyses, and any analyses of genetically depauperate populations will require 10-15 loci.

It is essential that all DNA samples be typed up to seven times (TABERLET et at., 1996; 1999; BAYES et al., 2000; GOOSSENS et al., 2000). Only individual profiles that are consistent in such replicate typing should be considered reliable. When the profiles of two spraints match, it is important to calculate ratio of the probabilities that they represent the same individual or two individuals having a given level of relatedness. Lastly, standardisation of methods among groups will be important for reliable comparisons of DNA typing data.

CONCLUSION AND RECOMMENDATIONS

Spraint DNA typing shows promise as a tool for monitoring of otter populations. This method can already identify different individuals and thereby provide estimates of sex ratio and minimum population size. Further progress will depend on achieving higher success rates, lower cost, and developing more highly variable microsatellites and species-specific PCR assays. One recommendation from the IUCN otter specialist group to participants at the VIII international otter colloquium in Valdivia, Chile was to document the distribution and status of all 13 species of otters globally. The use of DNA typing in endangered and poorly known otter species could make an important contribution to this goal. We therefore recommend that skin, tissue or DNA samples from all endangered otter species be archived for future genetic analysis.

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REFERENCES

Bayes, M.K., Smith, K.L., Alberts, S.C., Altmann, J. & Bruford, M.W. 2000. Testing the reliability of microsatellite typing from faecal DNA in the savannah baboon. *Cons. Genet*. **1**, 173-176.

Coxon, K., Chanin, P., Dallas, J. & Sykes, T. 1999. The use of DNA fingerprinting to study the population dynamics of otters (*Lutra lutra*) in southern Britain: a feasibility study. Environment Agency R&D Project WI-025.

Dallas J.F. & Piertney S.B. 1998. Microsatellite primers for the Eurasian otter. *Mol. Ecol*. **7**, 1248-1251.

Dallas J.F., Bacon P.J., Carss D.N., Conroy, J.W.H., Green, R., Jefferies, D.J., Kruuk, H., Marshall, F., Piertney, S.B. & Racey, P.A. 1999. Genetic diversity in the Eurasian otter, *Lutra lutra*, in Scotland. Evidence from microsatellite polymorphism. *Biol. J. Linn. Soc*. **68**, 73-86.

Dallas J.F., Carss D.N., Marshall F., Koepfli, K.P., Kruuk, H., Piertney, S.B. & Bacon, P.J. 2000. Sex identification of the Eurasian otter *Lutra lutra* by PCR typing of spraints. *Cons. Genet.* **1**, 1 181-183

Goossens B., Chikhi L., Utami S.S., de Ruiter J. & Bruford M.W. 2000. A multi-samples, multi-extracts approach for microsatellite analysis of faecal samples in an arboreal ape. *Cons. Genet.* **l**, 157-162.

Hansen, M.M. & Jacobsen, L. 1999. Identification of mustelid species: otter (*Lutra lutra*), American mink (*Mustela vison*) and polecat (*Mustela putorius*), by analysis of DNA from faecal samples. *J. Zool*. **247**, 177-181.

Koepfli, K.-P. & Wayne, R.K. 1998. Phylogenetic relationships of otters (Carnivora: Mustelidae) based on mitochondrial cytochrome B sequences. *J. Zool.* **246**, 401-416.

Kohn, M. & Wayne, R. 1997. Facts from feces revisited. *Trends Ecol. Evol.* **12**, 223-227.

Mills, L.S., Citta, J.J., Lair, K.P., Schwarz, M.K. & Tallmon, D.A. 2000. Estimating animal abundance using noninvasive DNA sampling: Promise and pitfalls. *Ecological Applications*, **10**,283-294.

Parsons K.M., Dallas J.F., Claridge D.E., Durban, J.W., Balcomb, K.C., Thompson, P.M. & Noble, L.R. 1999. Amplifying dolphin mitochondrial DNA from faecal plumes. *Mol. Ecol*. **8**, 1766-1768.

Taberlet, P., Griffin, S., Goossens, B., et al. 1996. Reliable genotyping of samples with very low DNA quantities using PCR. *Nucleic Acids Res*. **24**, 3189-3194.

Taberlet, P., Waits, L. & Luikart, G. 1999. Noninvasive genetic sampling: look before you leap. *Trends Ecol. Evol*. **14**, 323-327.

Tschirch, W., Hempel, G., Rothman, H., Schipke, R. & Klenke, R. 1996.
Fäkalsteroiduntersuchungen. In: Artenschutzprogramm Fischotter in Sachsen. Landesamt fü Umwelt und geologie, p32-34.

Wasser, S.K., Houston, C.S., Koehler, G.M., Cadd, G.G. & Fain, S.R. 1997. Techniques for application of faecal DNA methods to field studies of Ursids. *Mol. Ecol*. **6**, 1091-1097.

Résumé : Étude des Populations de Loutres Grâce au Test ADN sur les Épreintes

Suivre les mammifères par observation directe est généralement très difficile. C'est pourquoi une

technique nouvelle reposant sur un test ADN sur les fèces a été mise au point. Sur épreintes de loutres, cette technique peut potentiellement donner des informations sur la taille des populations, des domaines exploités, la dispersion, la diversité génétique, ou évaluer le nombre d'espèces différentes. Cet article présente un ensemble de recommandations issues de deux études de faisabilité testant la technique d'empreinte génétique sur les épreintes. Trois étapes préalables sont nécessaires:

1) un échantillon de la population étudiée doit être testé pour s'assurer que les niveaux de polymorphisme génétique sont suffisamment élevés pour une identification individuelle.
2) les épreintes doivent être collectées et stockées avec soin, car l'ADN extrait des épreintes est par nature de mauvaise qualité et en faible quantité. La collecte d'épreintes doit avoir lieu au plus tard 12 heures après leur production et avant 10 heures du matin, et les épreintes stockées a -20°C pour interrompre la fragmentation de 1'ADN.
3) au laboratoire, la technique pour répliquer un même échantillon et pour éviter les contaminations croisées doit être rigoureuse.

Les resultats obtenus durant les études de faisabilité suggèrent que le test ADN sur épreintes s'avère prometteur pour l'étude des loutres in situ. Les progrès ultérieurs seront liés ` un meilleur taux de réussite, des moindres coûts, et au développement d'une plus grande variabilité microsatellitaire et d'essais PCR propres à l'espèce. Les tests ADN sur une espèce menacée et peu connue pourront foumir d'importantes informations concernant sa répartition et son statut. C'est pourquoi nous recommandons que tout échantillon, fragment de tissu, peau...etc., de toute espèce de menacée de loutre soit archivé en vue d'analyses génétiques ultérieures

Resumen: Monitoreo de Nutrias Mediante Identificación de Fecas por ADN

A menudo es difícil monitorear mamíferos mediante observación directa. For eso se ha desarrollado una nueva técnica basada en la identificación por ADN en fecas. La identificación por ADN de fecas de nutrias puede potencialmente brindar estimaciones de tamaño poblacional, áreas de acción, dispersión, diversidad genética y determinar que especies están presentes. Este artículo brinda un conjunto de recomendaciones basadas en dos estudios de viabilidad sobre como usar el método de identificación por ADN en fecas. Hay tres puntos principales. Primero se debe identificar una muestra de la población estudiada para chequear que los niveles de polimorfismo genéticos son lo suficientemente grandes como para permítir la identificación de individuos. Segundo, las fecas deben colectarse y almacenarse adecuadamente porque el ADN extraído de fecas es típicamente escaso y de poca calidad. La colecta de fecas debe tener lugar dentro de las 12 horas posteriores a la deposición y antes de las 10 a.m.. Las fecas deben ser almacenadas a -20°C en una solución que detenga la degradación del ADN. Tercero, las técnicas de laboratorio tienen que ser meticulosas en repetir análisis de las mismas muestras y evitar la contaminación entre muestras. Los resultados de los estudios de viabilidad sugieren que la identificación por ADN en fecas es prometedora para el monitoreo de nutrias. El progreso future depende de alcanzar mayores tasas de éxito, menores costos, el desarrollo de microsatélites más variables y análisis de PCR especificos para cada especie. La identificación por ADN de especies de nutrias amenazadas o poco conocidas puede brindar información importante sobre su distribution y estado. Por lo tanto, recomendamos que se archiven pieles, tejidos o muestras de ADN de todas las especies amenazadas para futures análisis genéticos.

R E P O R T

OBSERVATIONS ON THE DISTRIBUTION AND CONSERVATION STATUS OF THE NEOTROPICAL RIVER OTTER (*Lontra longicaudis*) IN THE COASTAL LAGOONS OF THE URUGUAYAN ATLANTIC BASIN AND THEIR MAIN TRIBUTARIES

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Abstract: There are very few studies on Neotropical river otters (*Lontra longicaudis*) in Uruguay. However, the species is nowadays considered to be fairly common in the country. This paper reports on its distribution and current conservation status in the Uruguayan Atlantic basin. It provides some information on activity patterns, diet, and interactions with fishermen. The presence of otters was evaluated through interviews with fishermen and local people, and through field surveys in 1999 and 2000. Otter presence was recorded in every lagoon and tributary surveyed. Local people consider that Neotropical river otters are currently more abundant than they were 10 years ago. This recovery is probably the consequence of the ceasing of commercial hunting. Otters are both day and night active, though foraging takes place more during the night. All year round, otters are frequently seen in small groups, which may indicate that they are more social than generally thought. Most of the dietary items recorded were fish and crustaceans, but preying on mammals, birds, and reptiles were also recorded. Interactions of otters with fishermen go far beyond preying on fish trapped in nets. Local fishermen do not perceive these animals as competitors, but as sympathetic companions.
Keywords: *Lontra longicaudis*, conservation status, diet, interaction with man

INTRODUCTION

There are very few studies on the Neotropical river otter (*Lontra longicaudis*) in Uruguay. The first study on the distribution of the species was published in 1998 (SOUTULLO et al., 1998) and the only study dealing with any aspect of their ecology was carried out between 1989 and 1991 at one locality in the southeast (SE) of the country (BARDIER, 1992). This study provided some information on the characteristics of the habitat used by these otters as well as their diet.

According to SOUTULLO et al. (1998), Neotropical river otters are considered to be fairly common in Uruguay today and no obvious habitat preferences have been detected. Otters can be found in many different kinds of wetlands and watercourses, from large rivers and lakes to small streams and ponds, with or without abundant plant cover, and even in rice fields (BARDIER, 1992; SOUTULLO, unpubl. data).

This report is the result of a preliminary study on the distribution and current conservation status of the Neotropical river otter in the Uruguayan Atlantic basin and it also provides information on some behaviour patterns of the species. Data were collected through field trips carried out during the development of other projects. Given the lack of information on this species' biology throughout its range (CHEHEBAR, 1990), and the lack of information available in Uruguay in particular, we thought it worthwhile to communicate these observations, even in the absence of a strictly planned methodology for the gathering of data.

STUDY AREA, MATERIALS, AND METHODS

The Uruguayan Atlantic coast is around 220 km long, whilst the Atlantic basin has an area of ca. 600 000 hectares. It is characterised by the presence of a system of coastal lagoons, which conform to the sub-basins of Laguna José Ignacio, Laguna Garzon, Laguna de Rocha, and Laguna de Castillos. Their tributaries mainly run from North to South and are of small to medium length and water volume. The area studied also includes the sub-basin of Laguna Negra, which is part of the basin of Laguna Merín. The study area includes the UNESCO Biosphere Reserve 'Bañados del Este' and is partially included within a Ramsar site. The coastal lagoons and their associated wetlands, as well as other natural sites within the area, have been declared National Parks (PROBIDES, 1999), however, with a few exceptions, conservation management in most of these parks is ineffective, or does not exist at all.

The system of coastal lagoons increase in size as one moves eastwards, with a size ranging from 1300 hectares for Laguna Garzón to 17 000 ha for Laguna Negra (Fig. 1). Laguna José Ignacio, Laguna Garzón, and Laguna de Rocha, are occasionally connected with the ocean, when their sandy pit-bars are opened due to heavy rains and wave action. Laguna de Castillo and Laguna Negra, however, are more distant from the ocean, the first draining to the ocean through Arroyo Valizas, whose bed sometimes allows interchange of water with the ocean. The second has suffered severe human modifications to its water regime, resulting in a reduction in its size.

The weather in the study area is considered subtropical and wet ('Caf' in Trewartha's weather classification), with warm summers. The annual medium temperature is 16° C, with a maximum of 21.5° C and a minimum of 10.8° C. The relative humidity is ca. 80% and the precipitation, which does not show a differential seasonality, annually ranges between 1100 and 1200 mm.

The main processes and impacts that affect the wetlands of the eastern region of Uruguay are drainage and transformation of natural areas for rice fields, the spilling of waste waters from urban and agricultural activities, fragmentation and loss of habitat due to human settlement, and the occupation of rivers and lagoons for tourism (PROBIDES, 1999).

Over the last two years (1999 and 2000), the five large coastal lagoons, their main tributaries, and secondary lakes were surveyed in order to detect the presence of otters. The presence of otters was evaluated through interviews with fishermen and local people, and through our own field surveys. In those sites (i.e. lagoons, lakes, or watercourses) where local people provided no record, one point was selected to start a field survey. A maximum of 300 metres along one bank was searched in any direction in order to record otters or their signs. In addition, local people and our own observations provided some information concerning diet and behaviour.

RESULTS

Otter presence was recorded in every lagoon, lake, and tributary surveyed. Table 1 and Figure 1 show the sites of these records. The people interviewed reported that, in some areas, otters are seen almost every day. Animals are seen throughout the year, mostly alone but frequently in groups of two, three, or even more individuals. All reported sightings were diurnal. Otters are seen throughout the day, but mainly at dawn and the first hours of the morning. Fishermen consider that otters mainly use the lagoons for foraging, and return to the tributaries, where vegetation cover is more abundant, for resting. They believe that these movements to and from the lagoon occur mainly at dawn and dusk, although some animals do remain in the lagoons during daytime. Foraging seems to take place more during the night, as the otters appear to take a higher quantity of fish from the fishermen's nets at night, though this also occurs during the daytime. Fishermen recognise remains of fishes eaten by otters because they only consume the posterior part of the trapped fish, leaving the head in the net; however, this does not cause major damage to the nets.

Table 1: List of surveyed localities and coordinates of record sites

Locality	**Coordinates**	**Record**
Laguna Negra	34° 04' S 53" 42' W / 33° 57' S 53° 36' W 33° 56' S 53° 36' W / 33° 58' S 53° 36' W 33° 57' S 53° 34' W	otters, food remains, tracks, spraints
Arroyo Valentín	34° 00' S 53° 46' W	spraints
Laguna de Castillos	34° 17' S 53° 56' W / 34° 1 5' S 53° 56' W 34° 20' S 53° 55' W / 34° 19' S 53° 54' W	otters
Arroyo Valizas	34° 20' S 53° 49' W	otters
Arroyo Don Carlos	34° 34' S 54° 07' W	spraints, tracks
Arroyo Chafalote	34° 20' S 54° 02' W	spraints, tracks
Arroyo del Consejo	34° 14' S 53° 57' W	spraints
Laguna de Brioso	34° 16' S 53° 46' W	otters
Laguna de los García	34°15'S53°45'W	otters
Laguna La Encantada	34° 14' S 53° 45' W	otters
Laguna de Rocha	34° 36' S 54° 20' W / 34° 39' S 54° 1 5' W 34° 35' S 54° °17' W / 34° 34' S 54° 18' W 34°35'S54°16'W	otters
Arroyo de Rocha	34° 31' S 54° 18' W / 34° 32' S 54° 17' W	otters, spraints, food remains
Arroyo de Las Conchas	34° 32' S 54° 14' W / 34° 29' S 54° 14' W	otters
Arroyo de Las Palmas	34°33'S54°13'W	otters
Arroyo del Sauce	34°30'S54°19'W	otters
Laguna Garzón	34° 46' S 54° 35' W / 34° 44' S 54° 33' W 34° 43' S 54° 32' W / 34° 43' S 54° 30' W	Otters
Arroyo Garzon	34° 38' S 54° 32' W	spraints
Laguna de José Ignacio	34" 46' S 54° 42' W / 34° 49' S 54" 40' W	otters
Arroyo José Ignacio	34° 43' S 54° 41' W	Spraints, tracks
Laguna Blanca	34° 51' S 54° 50' W	otters

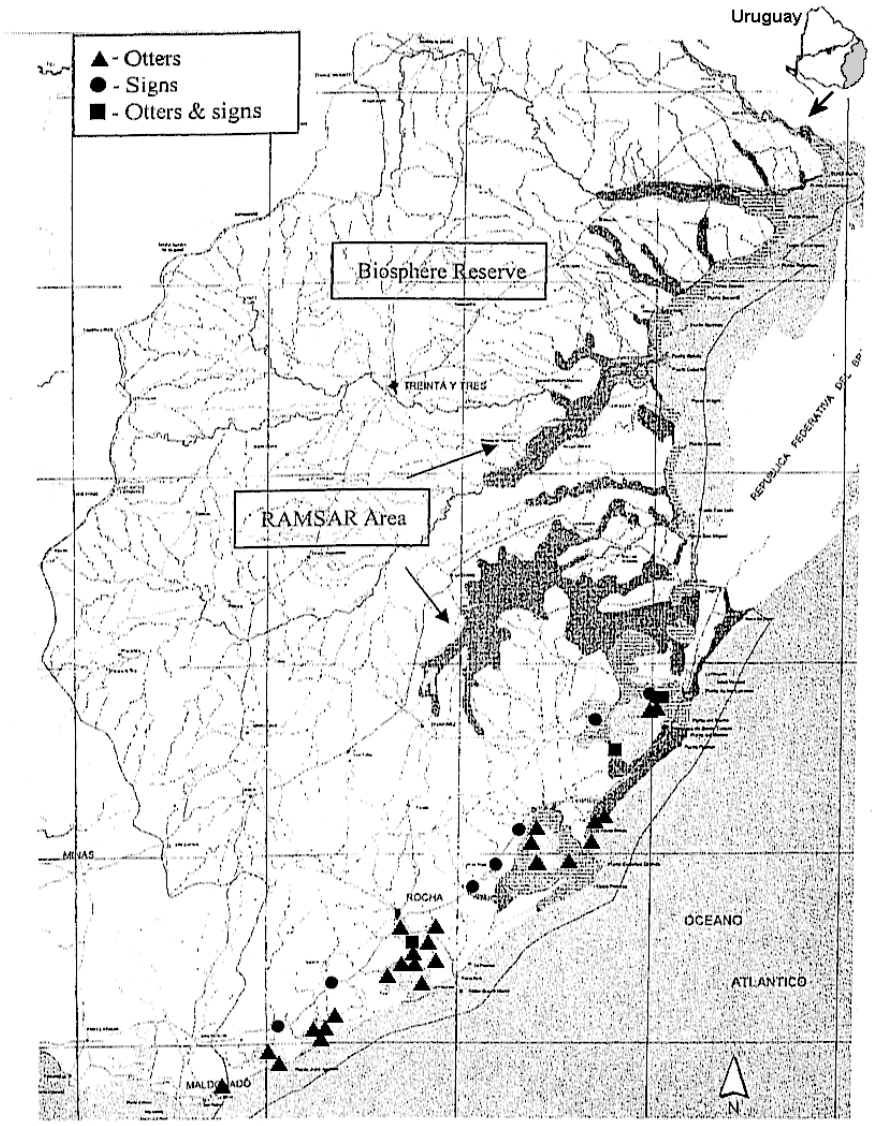

Figure 1: Sites where otters or their signs were recorded by the authors, or by people interviewed between 1999 and 2000. The different symbols indicate the type of record. Click image for larger version.

In the northern part of Laguna de Rocha, fishermen reported that otters seem to prefer 'bagres' (Siluriformes, Pimelodidae), since they leave other fish in the nets untouched. In the southern part of that lagoon, which probably has a different diversity of fish, as water salinity is higher due to the narrow, and sometimes nonexistent, pit-bar, they prey on any fish trapped in the nets. Fishermen also reported visual observations of otters occasionally preying on black-necked swans (*Cygnus melancoryphus*), wood-rails (*Aramides* spp.), and on nutria (*Myocastor coypus*). The latter took place during low water levels in Laguna de Rocha. One of us had the opportunity to observe a couple of sub-adult otters trying to catch a water snake (*Helicops infrataeniatus*), which an adult carried in its mouth. In some otter spraints we found duck feathers (probably of *Amazonetta brasiliensis*). Most spraints found had remains of both fish and crustaceans. Accumulations of fish remains (mostly 'bagres') were also found on the bank side, showing clear signs of having been eaten by otters.

During the course of this study, two otters skins, with a total length of more than 1.60 m, were found. These animals were therefore larger than those reported elsewhere (REDFORD and EISENBERG, 1992; PARERA, 1996; LARIVIÈRE, 1999).

DISCUSSION

The high frequency of otter sightings by fishermen, and the fact that Neotropical river otters were detected at every locality sampled (despite the small sampling effort), suggests that otters are very common in the study area. Similar surveys should be carried out every two years to monitor the situation of otters in this important wetland.

Between the 1950s and 1970s, Neotropical river otters were heavily hunted for their fur throughout their geographic range and, as a result, otters became locally extinct (BARDIER, 1992; PARERA, 1996; LARIVIÈRE, 1999). By the end of the 1980s, the hunting of otters stopped and, since then, otter numbers seem to have recovered. Today, in Rocha, local people consider that Neotropical river otters are more abundant than ten years ago. Indeed, it seems otter numbers are recovering over the whole country (SOUTULLO, unpubl. data).

PARERA (1996) and LARIVIÈRE, 1999 both described the Neotropical otter as being mainly solitary. Our records suggest a higher degree of socialisation, since otters were frequently seen in small groups all year round. However, whether these groups are mainly formed by adults, or by females with cubs, remains unclear.

LARIVIÈRE, 1999 reported that Neotropical river otters forage throughout the day, but that it is more common in the middle or late afternoon. He also reported that nocturnal activity is rare, but may become more common with human disturbance. PARERA (1996) suggested that, although these animals are mainly diurnal, they may become completely nocturnal if their habitat is continuously disturbed; whilst BARDIER (1990) reported that, in Uruguay, otters are mainly crepuscular due to human persecution. Our observations, as well as those of SOUTULLO et al. (1998), strongly suggest that otters are currently active during the day in Uruguay, but also that foraging is more important at night. The fact that otters are commonly seen during the day nowadays may be seen as a response to the cessation of hunting pressure and the current activity pattern may, indeed, be the 'normal' one, i.e. the animals are mainly nocturnal or crepuscular but remain active during daytime if not disturbed. Other patterns may be the result of disturbance, which forces otters to change their habits to avoid harmful encounters with humans.

The observations of otters preying on species other than fishes and crustaceans coincides with previous reports, i.e. that otters occasionally include in their diet birds, mammals, and reptiles (LARIVIÈRE, 1999). Therefore, although otters seem to show a preference for fishes and crustaceans, it also seems that they are able to prey on other items if they need to, or have the opportunity.

Today, interactions of otters with fishermen go far beyond preying on fish trapped in nets. During the winter of 1998, when the water level of Laguna de Rocha was high, otters used to rest on the top of fishing nets in warehouses. Fishermen even feed otters with fish remains, and some otters even approach fishermen when called. This is in contrast to the attitude of fishermen in Europe, who consider *Lutra lutra* more as a competitor or pest species (KRUUK, 1995).

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REFERENCES

Bardier, G. 1990. Ficha Zoológica N^{o} 19. *Noticias de la Sociedad Zoológica del Uruguay* **32**.

Bardier, G. 1992. Uso de recursos y características del hábitat del "Lobito de rio" *Lutra longicaudis* (Olfers, 1818) (Mammalia, Carnivora) en el arroyo Sauce, SE de Uruguay. *Boletín de la Sociedad Zoológica del Uruguay (2^{a} época)* **7**, 59-60.

Chehébar, C. 1990. Action Plan for Latin American Otters, pp. 64-73. In: **Foster-Turley, P.,**

Macdonald, S., Mason, C. (eds.) Otters: An Action Plan for their Conservation. Otter Specialist Group/IUCN.

Kruuk, H. 1995. Wild Otters: Predation and Populations. Oxford University Press. Oxford, New York and Tokyo.

Larivière, S. 1999. *Lontra longicaudis*. *Mamm. Spec*. **609**, 1-5.

Parera, A. 1996. Las "nutrias verdaderas" de la Argentina (2° ed.). *Boletín Técnico* **21**. Fundación Vida Silvestre Argentina, Buenos Aires.

PROBIDES 1999. Plan Director. Reserva de Biosfera Bañados del Este/Uruguay. PROBIDES. Rocha.

Redford, K. H. & Eisenberg, J. F. 1992. Mammals of the Neotropics. The Southern Cone. Vol. 2. Chile, Argentina, Uruguay, Paraguay. The University of Chicago Press. Chicago and London.

Soutullo, A., Pereira-Garbero, R. & González, E. M. 1998. A preliminary survey on the status of otters in Uruguay. *IUCN Otter Spec. Group Bull*. **15**, 47-55.

Résumé : Observations sur la Répartition et le Statut de Protection de la Loutre de Rivière Sud-Américaine (*Lontra longicaudis*) sur les Lagunes Côtières du Bassin Atlantique Uruguayen et de ses Principaux Cours d'Eau

Peu d'études sur la loutre de rivière sud-américaine (*Lontra longicaudis*)ont été réalisées en Uruguay, bien que l'espéce y soit actuellement considérée comme assez commune. Get article apporte des informations concernant l'espéce sur le bassin atlantique uruguayen en matière de répartition, statut actuel de protection, patterns d'activité, régime alimentaire et interactions avec les pêcheurs.La présence de la loutre a été attestée a l'aide d'interviews auprès des pêcheurs et des populations locales, et de missions de terrain en 1999 et 2000, où celle-ci a été confirmée sur n'importe quelle lagune ou rivière prospectée. Les populations locales considèrent actuellement que la loutre de rivière sud-américaine est plus abondante qu'il y a 10 ans. Ce regain est sans doute imputable à l'arrêt de la chasse à des fins commerciales. Les loutres sont actives de jour comme de nuit, mais les déplacements sont plus fréquents la nuit. Tout au long de l'année, on observe souvent de petits groupes de loutres, ce qui peut indiquer qu'elles soient plus sociales qu'on ne le pense habituellement. La plupart des proies capturées sont des poissons et des crustacés, mais mammifères, oiseaux et reptiles composent aussi leur menu. Leurs rapports avec les pêcheurs vont au-delà de quelques poissons dérobés dans les filets. Les pêcheurs locaux ne considérent pas les loutres comme des rivales, mais comme de sympathiques compagnons.

Resumen: Observaciones Sobre la Distribución y el Estado De Conservación de aa Nutria Neotropical (*Lontra longicaudis*) en las Lacunas Costeras de la Cuenca Atlántica Uruguaya y sus Principales Tributarios

Existen muy pocos estudios sobre la nutria Neotropical (*Lontra longicaudis*) en Uruguay. Sin embargo, la especies es actualmente considerada bastante común en el païs. Esta nota reporta su distribución actual y el estado de conservación en la cuenca atlántica uruguaya. También brinda información sobre patrones de actividad, dieta e interacciones con Pescadores. La presencia de las nutrias entre 1999 y 2000 fue evaluada a través de entrevistas con Pescadores y habitantes locales y relevamientos de campo. Se registró la presencia de la especie en todas las lagunas y tributaries relevados. Los habitantes locales consideran que la nutria Neotropical es actualmente más abundante de lo que lo era hace 10 años. Esta recuperación es probablemente consecuencia del cese de la caza comercial. Las nutrias son activas tanto durante el dia como durante la noche, aunque el forrajeo es más importante durante la noche. A lo largo de todo el año las nutrias son vistas frecuentemente en pequeños grupos, lo que podria indicar que son más sociales de lo que generalmente se cree. La mayor parte de los items alimenticios registrados fueron peces y crustáceos, pero también se registró predación sobre mamíferos, aves y reptiles. Las interacciones entre nutrias y Pescadores van más alia de predar sobre peces atrapados en redes. Los Pescadores locales no perciben a estos animales como competidores, sino más bien como simpáticos compañeros.

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REPORT

SOME RESULTS OF THE 1991 AND 1999 OTTER (*Lutra lutra*) SURVEYS IN THE RIVER ISE CATCHMENT, LOWER-SAXONY, GERMANY

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Abstract: As part of a river revitalisation project aiming at the re-connection of two otter occurrences in north-central Germany two surveys have been carried out to document the distribution of the otter in this region in 1991 and in 1999. This paper contains some of the results referring to 226 identical survey sites investigated in both surveys. Within eight years the percentage of positive sites increased by nearly five times from 2.2% to 10.2% and the number of 10x10km squares of the UTM (Universal Transversal Mercator System) grid increased by more than three times from 4 to 14 out of 32. 99.1% of the survey sites were located at running waters and 89.7% were connected with bridges. Of the 23 signs of otters found in the second survey 65.2% were found under bridges. Nearly three fourths of the survey sites were located at running waters of a width of 5m and less. However, there seems to be a tendency for a higher portion for the waters of a width of 6-10m for all positive sites as well as for the positive sites under bridges.
Keywords: Eurasian otter, Lutra lutra, Germany, survey

INTRODUCTION

The 450 km long river system of the Ise River with a catchment of 420 square kilometres represents the (habitat) bridge between the most eastern otter occurrence of the federal state of Saxony-Anhalt and the most eastern otter occurrence of the federal state of Lower-Saxony (Fig. 1). Within the last 100 years, this river system was canalised without any consideration of ecological aspects and the adjacent landscape was transferred to an extreme intensive agriculture utilisation. This resulted in a loss of structure and species diversity, the reduction of water and substances retention, a high pollution with fertilizers and pesticides, a reduction of dynamic processes - and the extinction of the otter between 1960 and 1970.

Since 1987 the German Association for Otter Conservation ('Aktion Fischotterschutz') is working on the revitalisation of this river system. There were four fundamental premises for the realisation: no reconstruction of a 'historical state' of the river system, no technical recreation of the river bed, no establishment of a protected area, and a realisation on a voluntary base for all persons and interest groups concerned (REUTHER et al., 1993).

The project should show if it is possible to initiate a (semi-)natural development of a canalised river system by utilising its own natural dynamics and by altering the agricultural practice in the river's lowland from intensive to extensive use. One of its main objectives was the re-connection of the above mentioned otter populations.

So far approximately 1,000 hectares of arable land were transformed into extensive pastureland, more than 20 kilometres of riparian woods and hedges were planted and more than 50 kilometres of marginal zones along rivers and roads form a "green net" in this area. Beside these more traditional conservation tools, great efforts have been invested in public relations and education activities (BORGGRÄFE and KÖLSCH, 1997; REUTHER, 2001).

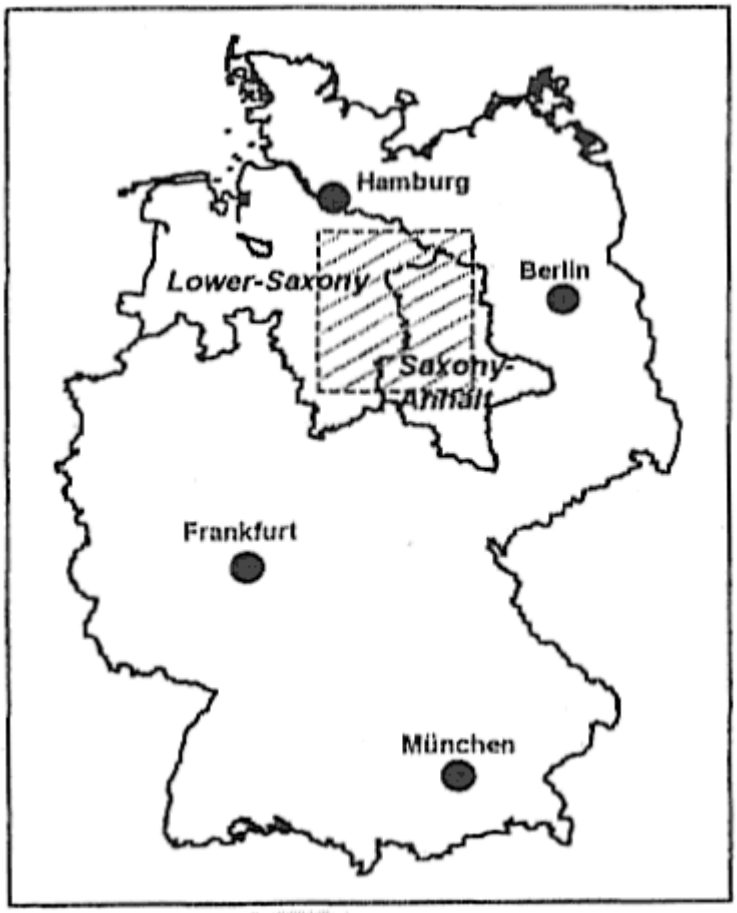

Figure 1. Location of the study area in Germany

As part of the scientific evaluation of the project, carried out parallel to the management activities also since 1987, two surveys have been carried out to investigate the distribution of otters. They covered an unequal study area and number of survey sites (both were higher in the second survey). To enable a comparison, all data and results presented here are related to the identical part of the study area and number of survey sites for both surveys.

STUDY AREA

The study area (Fig. 2) is located in the northern German lowland in the border area between the two German federal states of Lower-Saxony and Saxony-Anhalt. It covers the complete catchment of the Ise River and parts of the surrounding river and wetland systems Aschau and Lachte (western border), Aue and Dumme (northern border), Ohre and Drömling (eastern border) and Oker (southern border).
The running waters contain completely canalised watercourses as well as streams and rivers with low human impact. Most of the watercourses are typical slow running lowland rivers passing a mixture of forests, meadows and arable farm land. At the western border of the study area several large fish pond areas are formed by dammed watercourses or by groundwater ponds. The south-eastern part of the study area is dominated by a large spacious wetland area formed by wet meadows and numerous ditches and small canals.

The whole study area has a size of 2,736km^2. Its borders were adjusted to the German mapping system based on the topographic map 1:25,000. Each of these maps covers an area of approximately 124.4km^2. The study area contains 22 of the map sheets.

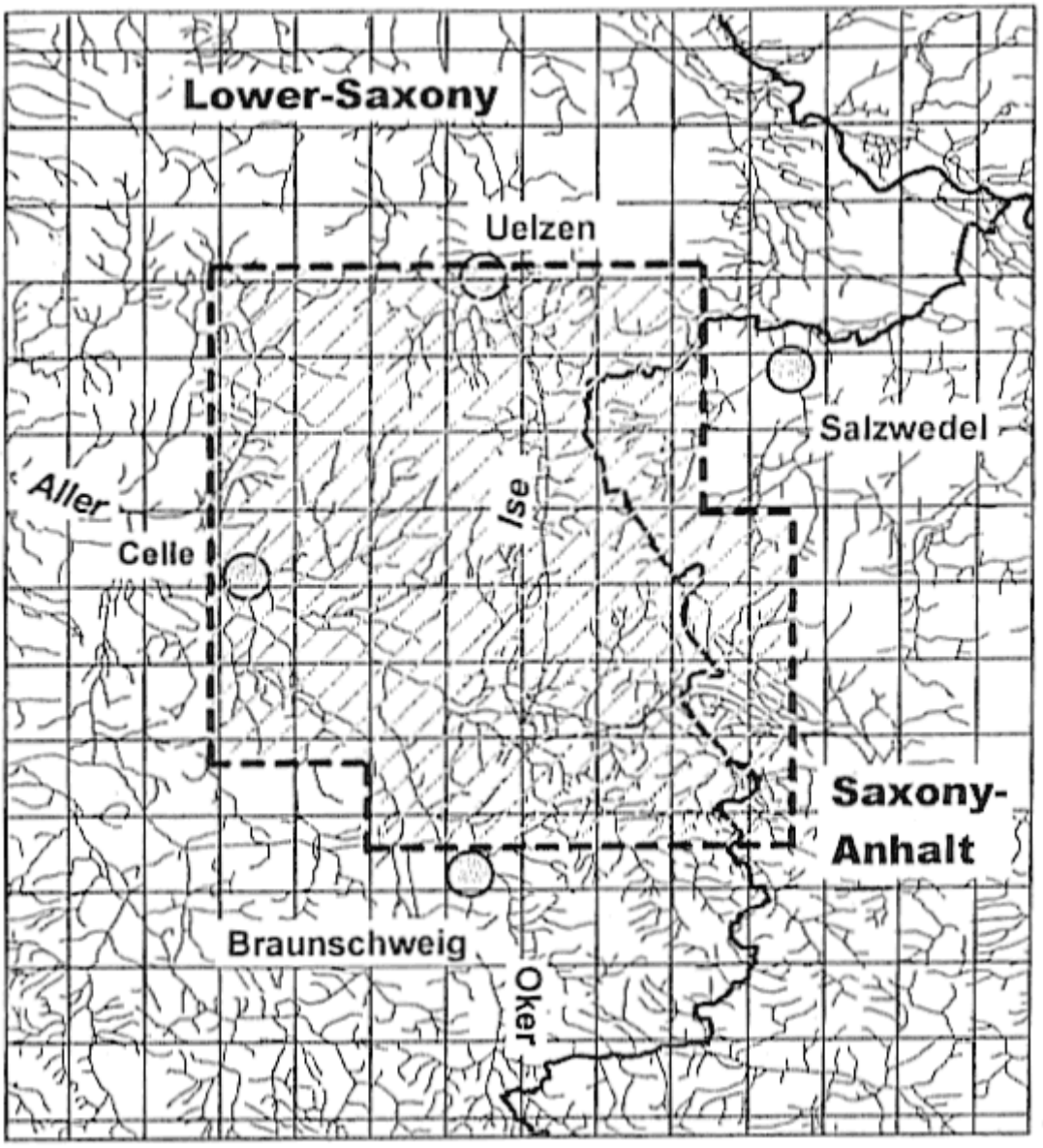

Figure 2. The main watercourses of the study area and the 10x10km UTM grid

MATERIAL AND METHODS

The first survey was carried out by Udo Binner from 1 October until 10 December 1991 (BINNER, 1991). He investigated 247 survey sites. The second survey was carried out by Anja Roy from 30 August until 5 October 1999 (ROY, 1999). She investigated 272 survey sites. 226 survey sites were identical in both surveys. They form the basis for this report.

Both surveyors were well experienced in identifying signs of otters. The average number of survey sites investigated per day was 10 in the second survey. For the first survey these data are not available.

The method used followed the standards for otter surveys recommended by the IUCN/SSC Otter Specialist Group (REUTHER et al., 2000) with the exception of the number and spreading of survey sites. All survey sites and their coordinates were identified on a topographic map 1:25,000 by trying to cover all waters in the study area. This resulted in an uneven spreading and number of survey sites as well in the grid of the (national) 1:25,000 topographic map as in the (international) 10x10km UTM grid (Table 1). The average number of survey sites was 10,3 per square of the national grid (11.15x11.15km) and 7.1 per square of the international grid (10x10km).

Table 1. Spreading of survey sites per square of the German 1:25,000 topographic map sheets and per square of the 10x10km UTM grid

No. survey sites per square	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Top. map 1:25,000					2	2	2	2	1	1	3	2	3	2	1	1
10x10km UTM	4	2	5	2	1	3		1	3	1	2	2	3	3		

Each survey site was investigated for a maximum distance of 600m for signs of otters exclusively. Only spraints and footprints were accepted as a proof. As soon as a sign of otters was found, the investigation of the site was stopped. Because the search direction was not documented in the first survey the direction was chosen in the second survey on the basis of highest portion of cover and potential number of sprainting sites visible at the starting point.

In the second survey for each survey site the weather conditions, water level, kind and density of vegetation, width of running waters, kind and number of proofs, and the spreading of proofs in 50m intervals for the search distance of 600m were documented. In both surveys all spraints were collected and all footprints were photographed and the proofs were stored by Aktion Fischotterschutz.

RESULTS

The number of positive sites and the kind of proofs for the two surveys are presented in Table 2. Within eight years the percentage of positive sites increased by nearly five times. Whilst having found in 1991 only each eighth 10x10km UTM square positive in 1999 this was the case for nearly each second 10x10km UTM square. It is also obvious that the relation of the kind of proofs changed remarkable.

Table 2: Number and percentage of positive sites, of positive 10x10km UTM squares, and of kind of proofs for 226 identical survey sites in 32 10x10km UTM squares in the 'River Ise Surveys' 1991 and 1999

Survey	Positive Sites		Positive 10x10 UTM squares		Spraints		Footprints		Spraints and Footprints	
	n	%	n	%	n	%	n	%	n	%
1991	5	2.2	4	12.5	1	20.0	4	80.0	0	0.0
1999	23	10.2	14	43.8	9	39.1	6	26.1	8	34.8

The following results refer to the second survey (1999) exclusively because the number of positive sites of the first survey was too low and the documentation of additional data was not sufficient.

224 of the 226 survey sites were located at running waters. The width of the streams and rivers was grouped in three classes. All positive sites were found at running waters. 89.7% of the 226 survey sites were connected with bridges. Of the 23 signs of otters, 15 (= 65.2%) were found under bridges and 8 (= 34.8%) away from bridges. The percentage of total survey sites, of positive survey sites, and of positive survey sites under bridges related to these three classes for the width of running waters is presented in Figure 3. As the results show, nearly three fourth of the survey sites were located at running waters of a width of 5m and less. However, there seems to be a tendency for a higher portion of positive sites located at running waters of a width of 6-10m.

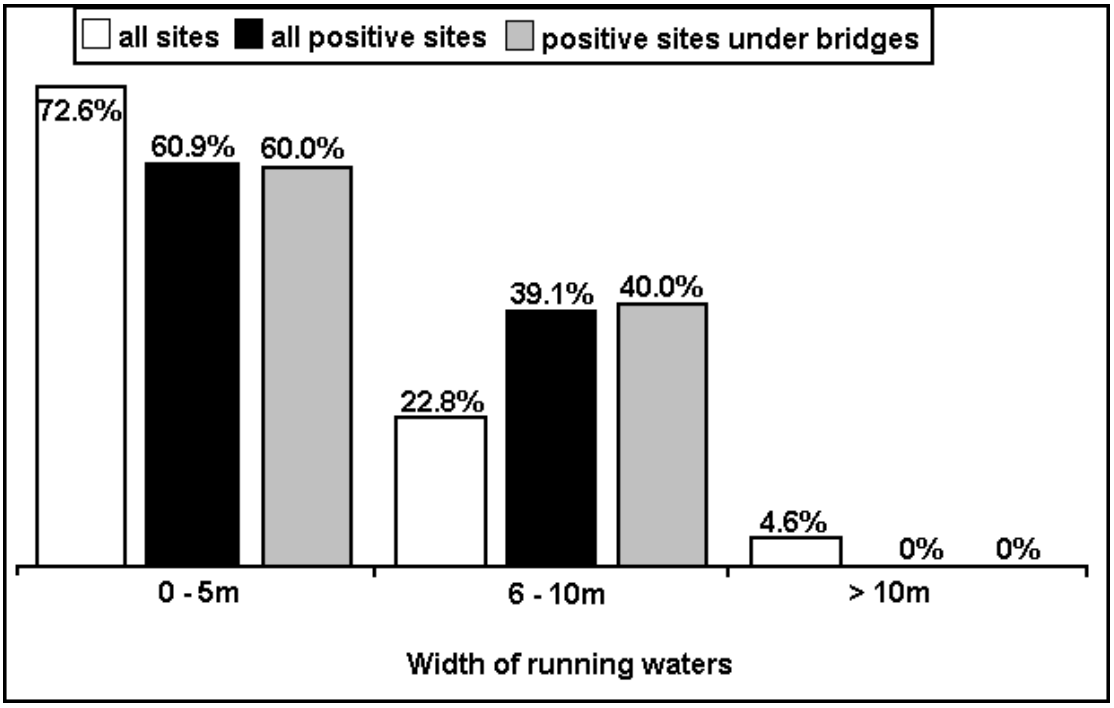

Figure 3: Percentage of all survey sites, of all positive survey sites and of positive survey sites under bridges in relation to the width of running waters.

Relating the kind of proofs to the width of running waters and to the place of finding is not very predicative because of the low number of positive sites. However, there is an obvious tendency for spraints as the major kind of proof at waters of a width up to 5m (Table 3).

Table 3. Correlation of the kind of proofs to the width of waters and to the place of finding

All/Bridge/No bridge	**All signs**		**Under bridge**		**Away from bridge**	
Width of waters	**0 - 5m**	**6 - 10m**	**0 - 5m**	**6 - 10m**	**0 - 5m**	**6 - 10m**
Spraints	30.4%	8.7%	33.4%	13.3%	25.0%	0.0%
Footprints	13.1%	13.0%	13.3%	6.7%	12.5%	25.0%
Spraints & Footprints	17.4%	17.4%	13.3%	20.0%	25.0%	12.5%
Total	**60.9%**	**39.2%**	**60.0%**	**40.0%**	**62.5%**	**37.5%**

Because of the high percentage of survey sites which were connected with bridges and the high number of findings under bridges it is not surprising that the majority of the positive sites shows short distances which needed to be searched to find the first sign of an otter (Table 4).

Table 4: Spreading of the distances in 50m intervals to be searched to find the first sign of an otter

m	**0**	**<5**	**51-100**	**101-15**	**151-20**	**201-25**	**251-30**	**301-35**	**351-40**	**401-45**	**451-50**	**501-55**	**551-60**
n	15				1	1	2	1				1	2
%	65.2				4.4%	4.4%	8.6%	4.4%				4.4%	8.6%

To get an idea of a possible correlation between the structures of the search stretches and the finding of signs of otters a (subjective) 'potential sign probability1 was rated by the surveyor for 192 survey sites. This probability was ranked in five classes:

'Very good'	waters of high structure diversity with numerous potential places for finding signs of otters (sandbanks, flat muddy banks, stones, roots, etc.)
'Good'	some potential places for finding signs of otters, but mainly high or steep banks
'Medium'	a few number of potential places for finding signs of otters
'Bad except bridge'	nearly no potential places for finding signs of otters on the banks with the exception of suitable bridges
'Bad'	no potential places for finding signs of otters; mainly canalised streams and rivers with trapeziform profile and/or high vegetation on the banks.

As is shown in Figure 4 no signs of otters were found at search stretches which were rated 'bad' and more than half of the signs were found at search stretches which were rated "very good" or "good".

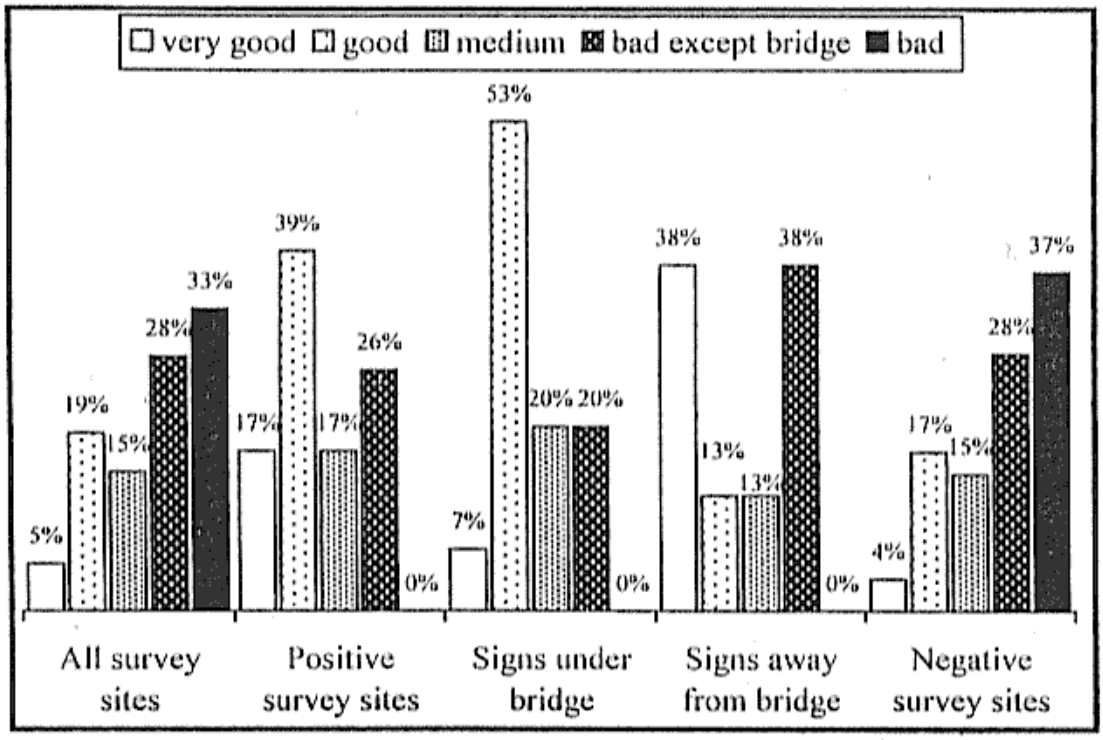

Figure 4: Percentage of all survey sites, positive survey sites, positive survey sites with signs under bridges or away from bridges, and negative survey sites in relation to the 'potential sign probability (definitions in text).

DISCUSSION

It needs to be underlined that the overall percentage of positive sites of this study is not comparable to the results of surveys carried out by the 'Standard Survey Method' (REUTHER et al, 2000), because the number and spreading of survey sites per square of the UTM grid is too uneven. This is a regional survey carried out to observe a possible recovery tendency of the otter on a local base.

Unfortunately it was not possible to carry out the surveys at the same time of the year because of organisational reasons. It is a fact that various surveys in different European regions show certain seasonality in finding signs of otters which can vary between regions, water systems and years (REUTHER et al., 2000). However, this seems to be more a problem if sign counts are used for estimation of population density. For surveys aiming mainly at distribution, this aspect can be largely ignored. As was shown by REUTHER et al. (2000), most decreases (or lowered levels) in sign numbers last for 1 - 2 months only before the number of signs increases again. Further, as has been shown by several studies, otter spraints can remain in the environment for a long time - depending on their position and the climatic conditions (JENKINS and BURROWS, 1980; KRUUK et al., 1986; MASON and MACDONALD, 1986; MACDONALD and MASON, 1988). In general at least 10% of spraints

remain collectable for more than 8 weeks and, at protected places (such as under bridges), they can remain for up to one year. Therefore in the interpretation of the results the fact is ignored, that the second survey was started one months earlier and was finished two months earlier than the first survey. The majority of the survey sites was investigated in October in the first survey and in September in the second survey. There was no flooding or high water level before or during both surveys, which could have eliminated spraints. The fact that 89.7% of the survey sites were connected with bridges also increases the probability that spraints remained long enough to be found, although a decrease of spraining activity of otters in this area might have happened.

Most of the methodical results of this study correspond to results of other surveys summarised by REUTHER et al. (2000). The percentage of 65.2% signs found under bridges is comparable to the results published by ROMANOWSKI et al. (1996) for Poland (56.9%) or by O'SULLIVAN (1993) for Ireland (62%). The proportion of the distances to be searched to find the first sign of an otter of 65.2% for the first 100m and 82.6% for the first 300m corresponds to the results summarised in REUTHER et al. (2000). As is shown in Table 5 the percentage of 65.2% for the first 100m is in the middle of the results published so far. However, the percentage of 82.6% for the first 300m is one of the lowest. There is no obvious explanation corresponding to the number of survey sites or to the percentage of positive sites of the different studies.

Table 5. The percentage of signs found within the first 100m and within the first 300m of the search stretch in comparison to the results of other surveys as summarised in REUTHER et al. (2000) (n = number of sites surveyed, % = overall percentage of positive sites of the survey).

Country /Region (ranked by the percentage for the first 100m)	**100m**	**300m**	**Country /Region** (ranked by the percentage for the first 300m)
NE Spain (n=97; %= 7.5)	51%	82%	Scotland (n=210; %= 94.4 - 98.6)
Scotland (n=210; %= 94.4 - 98.6)	53%	***82.6***	*This study* (**n= 226; %= 10.2**)
Wales (n=90; %= 75.0)	55%	85%	Wales (n=146; %= 44.0)
NE Spain (n=84; %= 22.0)	55%	86%	**NE Spain (n=97; %= 7.5)**
Wales (n=l 46;%= 44.0)	64%	88%	Germany (Meckl.-Vorp.) (n=844; %=61.7)
This study (**n= 226; %= 10.2**)	***65.2***	89%	NE Spain (n=84; %= 22.0)
Germany (Meckl.-Vorp.) (n=844; %=61.7)	71%	92%	Portugal (n=l,008; % - 89.1)
Portugal (n=l,008; % = 89.1)	72%	93%	Wales (n=90; %= 75.0)
Spain (n= 11 5;%= 95.8)	80%	95%	**Poland (n= 1 , 1 1 1 ; %= 7 1 . 1 %)**
Poland (n= 1 , 1 1 1 ; %= 7 1 . 1 %)	88%	96%	Spain (n= 11 5;%= 95.8)
Germany (Brandenburg) (n=l,371; %=81.8)	88%	97%	**Germany (Brandenburg) (n=l,371; %=81.8)**

As already documented by REUTHER et al. (2000) very few reports give detailed numbers for the kind of proofs for the positive sites. Comparing these data with the results of the Ise River surveys it is obvious that the percentage of spraints was very low in the 1991 survey and increased remarkable in the 1999 survey. However, if the categories 'spraints' and 'spraints & footprints' are combined and sum up to 73.9% for the latter survey, this value is much lower than for most other surveys (Table 6). Following the hypothesis supported by JEFFERIES (1986), MASON and MACDONALD (1991) or GREEN and GREEN (1997) that the number of spraints or the number of spraints per survey site could be used as an indication for the population performance this low percentage could indicate a low population density. However, this hypothesis- is disputed (KRUUK et al., 1986; KRUUK and CONROY, 1987; CONROY and FRENCH, 1991).

Table 6. Comparison of the relationship of the different kinds of proofs from different studies.

Country /Region	**Spraints**	**Footprints**	**Both**	**Source**
Spain	89.6%	4.7%	5.7%	RUIZ-OLMO in REUTHER et al., 2000
Spain - Catalonia & Aragon	73%	11%	13%	RUIZ-OLMO in REUTHER et al., 2000
Germany - Schleswig-Holstein	75%	8.3%	16.7%	FEHLBERG and BLEW, 1999
Germany - Northern Lower Saxony	66.7%	33.3%		BINNER and REUTHER, 1996
Germany - Mecklenburg- Vorpomrnem	79.5%	8.0%	12.5%	BINNER, 1997
Germany - Ise River survey 1991	20%	80.0%		This study
Germany - Ise River survey 1999	39.1%	26.1%	34.8%	This study

This difference in the relationship of the kind of proofs could also result from the structures at the survey sites. As is shown in Figure 4 more than half of the proofs was found at survey sites which were classified as Very good' or 'good' because of their positive supply of potential places for finding signs of otters (sandbanks, flat muddy banks, stones, roots, etc.). These structural circumstances combined with the fact that the water level at the time of the survey was low at most of the survey sites might be a reason for the fact that the portion of footprints as signs for the occurrence of otters was much higher than in most other surveys.

As is shown in Figure 3 the majority of the running waters in this study area has a width of 5m and less. This is also true for the portion of positive sites. Nevertheless the portion of positive sites at running waters of 6-10m width is nearly the double as for those of 0-5m width. In this study area no signs of otters were found at running waters of more than 10m width. The 'success rate' at running waters of 6-10m width (18.0% positive sites) was even more than the double as for those of 0-5m width (8.8%). This result does support the findings from Ireland, where "considerably fewer otter signs were found along small streams (<3m wide) than along larger watercourses" (O'SULLIVAN, 1993) or where "of the 124 negative sites located on running waters, all but 1 were situated on streams (<5m wide)" (CHAPMAN and CHAPMAN, 1982).

At running waters of 0-5m width 64.3% of the signs of otters were found under bridges. At running waters of 6-10m width this percentage is 66.7%. This result seems to be in contrast to the findings of ROMANOWSKI et al. (1996) in Poland, where a more or less linear decrease of the percentage of otter signs found under bridges was obvious by the increase of river width. Though in this study on the widest running waters (>10m wide) no signs of otters were found as was the case in Poland at rivers wider than 60m. However, the number of survey sites and the number of positive sites in this study are much lower than in the Polish study and therefore might offer a lower precondition for a differentiation.

Surprising is the fact that more than one third of the signs found away from bridges was found at survey sites which were classified as 'bad except bridge'. This means that, although the bridge seemed to be the only good place to find a sign of an otter, none was found there, but on the rest of the search stretch - which was classified as 'bad'. This indicates that a reduction of the survey sites to bridges exclusively increases the risk to miss signs of otters.

From the results it is obvious that there is an increase in the area inhabited by the otter. As is shown in Figure 5 in 1991 three of the four UTM squares occupied by the otter were located hi the eastern part of the study area at the border between the federal states of Lower-Saxony and Saxony-Anhalt. The fouth otter occurrence was located approximately 20km east of the city of Celle. Starting from these four more or less isolated points a re-connection and recovery tendency is obvious eight years later. The gap between the most northern and the most southern otter occurrence, representing a distance of nearly 50km, and the gap between the western and the eastern otter occurrence, representing a distance of more than 40km and characterised by a lower number of waters, was closed nearly completely.

The results of these two surveys cannot answer the questions arising from these tendencies referring to aspects as:

- Does the recovery start from the main river and continue into the tributaries or are the tributaries the starting point for the recovery of the main river?
- Does the recovery advance upstream or downstream?
- Is the impression correct that the medium sized rivers (in this case 6-10m) seem to be more important than the small streams and ditches (in this case 0-5m)?
- Of which importance are watersheds and which distances between river systems, without adequate waters, can have a negative impact on the recovery?

It is hoped to get an answer to these questions by more continuous surveys in the future.

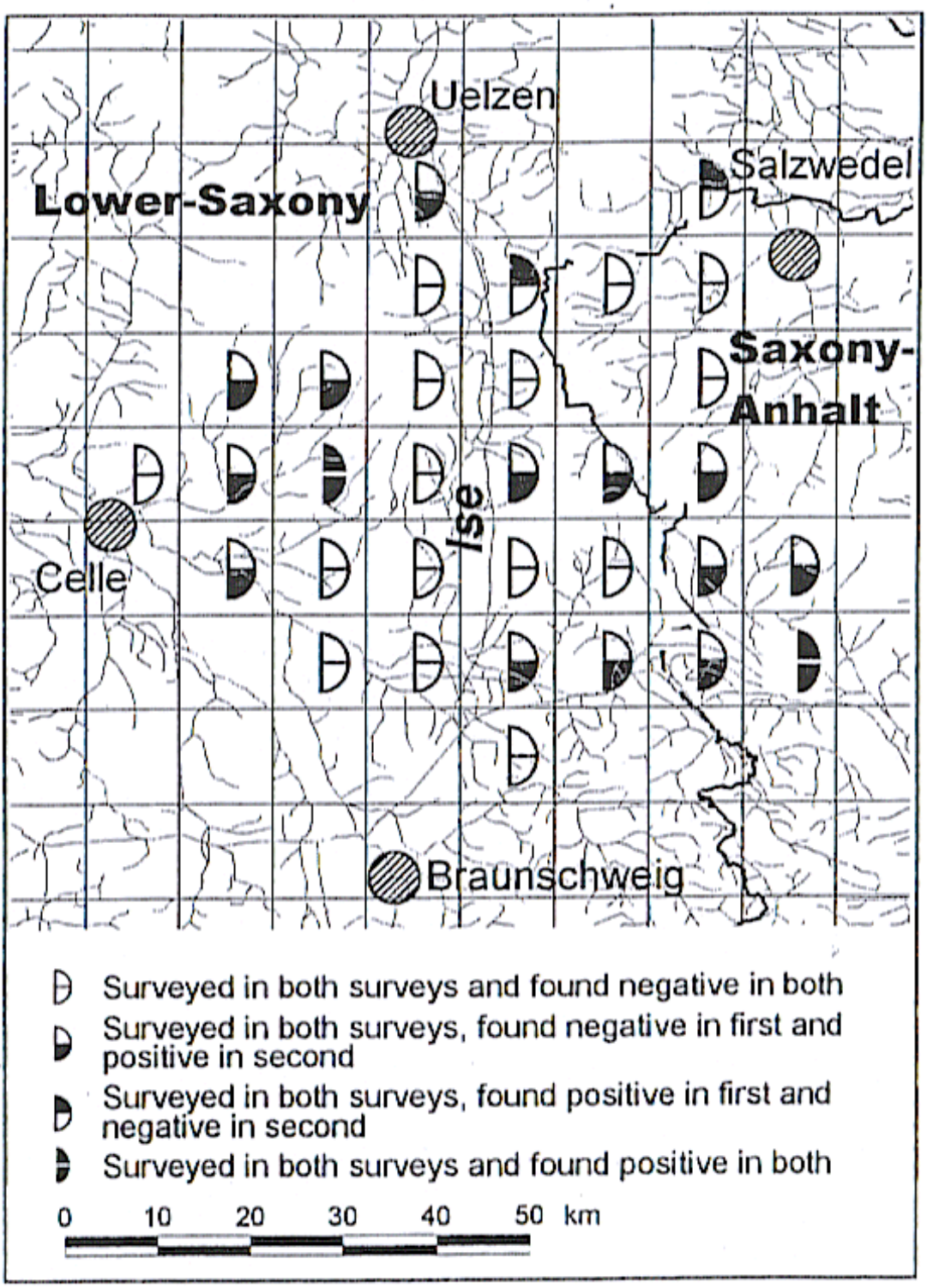

Figure 5: Comparison of the results of the two surveys on the basis of the positive/negative of the 10x10 UTM grid.

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REFERENCES

Binner, U. 1991. Untersuchung Zur Vemetzung der Fischotter-Population im Gebiet der Ise-Niederung Unpubl. report to Aktion Fischotterschutz, 57 pp.

Binner, U. 1997. Die Verbreitung des Fischotters in Mecklenburg-Vorpommern. *Natur und Naturschutz in Mecklenburg-Vorpommern* **33**, 3-41.

Binner, U. & Reuther, C. 1996. Verbreitung und aktuelle Situation des Fischotters in Niedersachsen. *Informationsdienst Naturschutz Niedersachsen* **16**, 3-29.

Borggräfe, K. & Kölsch, O. 1997. Naturschutz in der Kulturlandschaft - Revitalisierung in der Ise-Niederung. **Angewandte Landschaftsökologie 12**, Bonn-Bad Godesberg, 122 pp.

Chapman, P.J. & Chapman, L.L. 1982. Otter Survey of Ireland. The Vincent Wildlife Trust London 40pp.

Conroy, J.W.H. & French, D.D. 1991. Seasonal patterns in the sprainting behaviour of otters (*Lutra lutra* L.) in Shetland, pp. 159-166 in: **Reuther, C. & Röchert, R.** (eds.): Proceedings V. International Otter Colloquium Hankensbüttel 1989. *Habitat* **6**.

Fehlberg, U.H.W. & Blew, J. 1999. Verbreitung des Fischotters (*Lutra lutra*) in Schleswig-Holstein. Final report 'Arbeitsgruppe Fischotter', Kiel, 22pp.

Green, R. & Green, J. 1997. Otter survey of Scotland 1991-1994. The Vincent Wildlife Trust, London, 92pp.

Jefferies, D.J. 1986. The value of otter *Lutra lutra* surveying using spraints: An analysis of its successes and problems in Britain. *Otters - Journal of the Otter Trust* **1**(9), 25-32.

Jenkins, A.L. & Burrows, B.O. 1980. Ecology of otters in northern Scotland. III. The use of faeces as indicators of otter (*Lutra lutra*) density and distribution. *J. Anim. Ecol*. **49**, 755-774.

Kruuk, H. & Conroy, J.W.H. 1987. Surveying otter *Lutra lutra* populations: A discussion of problems with spraints. *Biol. Cons*. **41**, 179-183.

Kruuk, H., Conroy, J.W.H., Glimmerveen, U. & Ouwerkerk, E.J. 1986 The use of spraints to survey populations of otters *Lutra lutra*. *Biol. Cons*. **35**, 187-194.

Macdonald, S.M. & Mason, C.F. 1988. Observations on an otter population in decline. *Acta Theriol.* 33, 415-434.

Mason, C.F. & Macdonald, S.M. 1986. Otters: Ecology and Conservation. Cambridge University Press, Cambridge, 236 pp.

Mason, C.F. & Macdonald, S.M. 1991. Assessment of Otter (*Lutra lutra*) Survey Methods Using Spraints. pp. 167-170 in: **Reuther, C., Röchert, R**. (eds.): Proceedings V. International Otter Colloquium Hankensbüttel 1989. *Habitat* **6**, Hankensbüttel, 344pp.

O'Sullivan, L. 1993. Efficiency and limitation of the standard otter (*Lutra lutra*) survey technique in Ireland. *Proc. Royal Irish Acad*. **93b**, 49-53.

Reuther, C. 2001. Developing Win-Win-Situations: Return of the Otter to the Ise River (Germany), pp. 18-19. In: **Ando, M., Sasaki, H.** (eds.): The Wetlands Ambassador - Education and Public Awareness Methodologies for Otter Conservation: Otter Research Group Japan, Dazaifu (Japan), 56 pp.

Reuther, C., Borggräfe, K., Kölsch, O., Poseck, M., Posselt, T. & Stöckmann, A. 1993. Revitalisierung in der Ise-Niederung - ein E+E-Vorhaben. *Natur und Landschaft* **68**, 359-386.

Reuther, C., Dolch, D., Green, R., Jahrl, J., Jefferies, D., Krekemeyer, A., Kucerova, M., Madsen, A.B., Romanowski, J., Roche, K., Ruiz-Olmo, J., Teubner, J. & Trindade, A. 2000. Surveying and Monitoring Distribution and Population Trends of the Eurasian Otter (*Lutra lutra*) - Guidelines and Evaluation of the Standard Method for Surveys as recommended by the European Section of the IUCN/SSC Otter Specialist Group. *Habitat* **12**, Hankensbüttel, 148 pp.

Romanowski, J., Brzezinski, M. & Cygan, J.P. 1996. Notes on the technique of the otter field survey. *Acta Theriol.* **41**, 199-204.

Roy, A. 1999. Otter-Verbreitungserhebung im Einzugsbereich der Ise-Niederung. Unpubl. report to Aktion Fischotterschutz, 68 pp.

Résumé : Quelques Résultats des Prospections Loutre (*Lutra lutra*) Effectuées en 1991 et 1999 sur le Bassin Versant de l'Ise en Basse-Saxe, Allemagne

Espèce endémique, la loutre de Sumatra (*Lutra sumatrana*), la plus rare de toutes les loutres d'Asie, a été redécouverte au sud de la Thaïlande. Son habitat se compose de deux catégories de forêt marécageuses: les rives vierges à *Melaluca cajeputi* et les forêts sempervirentes à trois strates de végétation climacique et canopée continue. Les traces, épreintes et caractéristiques des sites de marquage ont été étudiées afin d'accroître les connaissances en matière d'observation indirecte pour recenser l'espèce. La composition des épreintes a été également analysée afin de comparer son régime alimentaire avec celui d'autres espèces de loutres.

Resumen: Algunos Resultados de los Relevamientos de Nutria (*Lutra lutra*) de 1991 y 1999 en el Río Ise, Saxonia Inferior, Alemania

Como parte de un proyecto de revitalización de un río para reconectar dos sitios con presencia de nutrias en el Norte-centro de Alemania, se realizaron 2 relevamientos con el objeto de documentar la distribución de las nutrias en esa región en 1991 y 1999. Este artículo contiene algunos de los resultados referidos a 226 sitios idénticos relevados en ambos relevamientos. En 8 años el porcentaje de sitios positives aumentó cerca de 5 veces, de 2,2% a 10,2%, y el número de cuadrículas UTM de 10x10 km aumentó más de tres veces, de 4 a 14 de 32. 99,1% de los sitios relevados estaban localizados en aguas corrientes, y 89,7% estaban conectadas con puentes. De los 23 signos encontrados en el segundo relevamiento, 65,2% se encontraron bajo puentes. Cerca de tres cuartos de los sitios relevados estaban localizados en aguas corrientes de 5 m o menos de ancho. Sin embargo, parece haber una tendencia por una mayor proporción de aguas de anchos de entre 6 y 10 m, tanto para los sitios positives como para los positives bajo puentes.

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HOW TO IMPLEMENT THE OTTER ACTION PLAN ? REUTHER, C.; SANTIAPILLAI, C. (eds.) Proceedings Workshop IUCN/SSC Otter Specialist Group Hankensbüttel 2000

Habitat No. **13**
ISBN 3-927650-19-6, Hankensbüttel 2001, 95 pp.

41 scientists and conservationists representing 18 countries met from 4 to 7 November 2000 at the Otter Centre in Hankensbuttel, Germany to discuss possibilities for an efficient implementation of the second edition of the IUCN/SCC Otter Action Plan. In 1999 the IUCN/SSC Otter Specialist Group started to revise the global Otter Action Plan which was first published in 1990. Action plans are an important tool for conservation. How much they can contribute to the protection of species and habitats will depend on the quality of their contents. Their implementation is most important. Experience with the 1990 Otter Action Plan has shown that it did not reach many decision makers on the national level, the scientific community, management authority or the media. Therefore it was found to be necessary to develop a strategy for an efficient implementation of the new Otter Action Plan as early as possible. This was the main objective of this workshop. The proceedings contain all the presentations given by invited speakers and the recommendations prepared by the participants.

They contain the introductory lectures by some of the well-known experts on international protocols, national conservation issues, scientific research, communication and awareness campaigns. Reports of the intense discussions, founded on these introductions, and of the recommendations prepared by the participants complete this documentation.

The contributions and recommendations published in these proceedings will not only assist in the preparation of the new Otter Action Plan but more importantly, help implement it as well. Undoubtedly they will also advance the work of the Otter Specialist Group and of the numerous national otter conservation initiatives. Last but not least, the experience and the ideas summarised in this report will become useful to the conservationists involved in the preparation and implementation of Action Plans for other species.

The book is available at
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L I T E R A T U R E

BEUCHAT, C.A. 1999. Kidney structure of a euryhaline mammal, the cape-clawless otter (*Aonyx capensis*). *South Afr. J.Zool*. **34**, 163-165.
(Univ. Arizona, Coll. Med, Tucson, AZ 85724 USA).

BODKIN, J.L., BURDIN, A.M. & RYAZANOV, D.A. 2000. Age- and sex-specific mortality and population structure in sea otters. *Mar. Mamm. Sci.* **16**, 201-219.
(US Geol. Survey, Alaska Biol. Sci. Ctr., 1011 E Tudor Rd., Anchorage, AK 99503, USA).

CARTER, S.K., ROSAS, F.C.W., COOPER, A.B. & CORDEIRO-DUARTE, A.C. 1999. Consumption rate, food preferences and transit time of captive giant otters *Pteronura brasiliensis*: Implications for the study of wild populations. *Aquat. Mamm*. **25**, 79-90.
(Instituto Nacional de Pesquisas da Amazônia, CP 478, Manaus, AM, 69011 -970, Brazil).

CASSENS, I., TIEDEMANN, R., SUCHENTRUNK, F. & HARTL, G. 2000. Mitochondrial DNA variation in the European otter (*Lutra lutra*) and the use of spatial autocorrelation analysis in conservation. *J. Hered*. **91**, 31-35.
(Univ. Kiel, Inst. Haustierkunde, D-24118 Kiel, Germany).

CHEHÉBAR & C. & PORRO, G. 1998. Distribución y estatus del huillín (*Lutra provocax*) en el Parque Nacional Nahuel Huapi, Argentina. *Vida Silvestre Neotropical*, **7**, 99-106.
(Delegación Regional Patagonia, Administración de Parques Nacionales, Vice Almirante O'Connor 1188, 8400 - San Carlos de Bariloche, Río Negro - Argentina).

DEAN, T.A., BODKIN, J.L., JEWETT, S.C., MONSON, D.H. & JUNG, D. 2000. Changes in sea urchins and kelp following a reduction in sea otter density as a result of the Exxon Valdez oil spill. *Mar. Ecol. Progr. Ser*. **199**, 281-291.
(Coastal Resources Assoc. Inc., Vista, CA 92083 USA).

DELIBES, M., FERRERAS, P. & BLAZQUEZ, M.C. 2000. Why the Eurasian otter (*Lutra lutra*) leaves a pond? An observational test of some predictions on prey depletion. *Rev. Ecol. Terre Vie* **55**, 57-65.
(CSIC, Estac. Biol. Donana, Avda Ma Luisa S-N, Apdo 1056, Sevilla 41080, Spain)

GOURVELOU, E., PAPAGEORGIOU, N. & NEOPHYTOU, C. 2000. Diet of the otter *Lutra lutra* in Lake Kerkini and stream Milli Aggistro, Greece. *Acta Theriol*. **45**, 35-44.
(Aristotelian Univ. Salonika, Dept. Forestry and Nat. Environ., GR-54006 Salonika, Greece).

HARMSEN, B. 2000. Herintroductie van otters in Nederland. [Reintroduction of otters in the Netherlands. In Dutch]. *Zoogdier*, **11**(3), 25-27.
(Univ. Oxford, Dept. Zool., Wildlife Conservation Research Init, South Parks Road, OX1 3PS Oxford, UK).

JAHRL, J. 1999. Verbreitung des Eurasischen Fischotters (*Lutra lutra*) in Österreich. *Joannea Zool*. **1**, 5-12. (WWF Österreich, Ottakringerstr. 114-116, A-1160 Wien, Austria).

JAHRL, J. 2001. Der Fischotter in Oberösterreich. Öko-L 23, 3-9.
(address - see above).

JAHRL, J. 2001. Der Fischotter im Mühlviertel. Oberösterreichische Landesregierung, Naturschutzabteilung, Linz, Austria, 24 pp.
(address - see above).

KONAR, B. 2000. Limited effects of a keystone species: trends of sea otters and kelp forests at the Semichi Islands Alaska. *Mar. Ecol. Progr. Ser.* **199**, 271-280.
(Univ. Calif. Santa Cruz, Santa Cruz, CA 95064, USA).

KÖRBEL, O. 2001. Vermeidung der durch den Straßenverkehr bedingten Verluste von Fischottern (*Lutra lutra*) [Avoidance of losses of otters (*Lutra lutra*) due to road traffic. In German] Forschung Straßenbau und Straßenverkehrstechnik Vol *805*, Bonn, 56 pp., ISBN 3-934458-39-4
(available for DM 24,- plus postage) at: Bundesdruckerei GmbH, Südstraße 119, 53175 Bonn, Germany).

LAIDRE, K.L., JAMESON, R.J. & DeMASTER, D.P. 2001. An estimation of carrying capacity for sea otters along the California coast. *Mar. Mamm. Sci.* **17**, 294-309.
(NOAA, Natl. Marine Fisheries Serv. Alaska Fisheries Sci. Ctr. Natl Marine Mammal Lab., Seattle, WA 98115, USA).

LANSZKI, J., KORMENDI, S., HANCZ, C. & ZALEWSKI, A. 1999, Feeding habits and trophic niche overlap in a carnivora community of Hungary. *Acta Theriol.* **44**, 429-442.
(Pannon. Agr. Univ., Fac. Anim. Sci., H-7401 Kaposvar, Hungary).

LODE, T. 2000. Effect of a motorway on mortality and isolation of wildlife populations. *Ambio*, **29**, 163-166.
(UFR Sci, Lab Ecol Anim, 2Bd Lavoisier, F-49045 Angers Belle Beille, France).

MAÑAS, S., CEÑA, J.C., RUIZ-OLMO, J., PALAZÓN, S., DOMINGO, M., WOLFINBARGER, J.B. & BLOOM, M.E. 2001. Aleutian mink disease parvovirus in wild riparian carnivores in Spain. *J. Wildl. Dis.* **37**, 138-144.
(Grupo Nutria - SECEM, c/ Alexandre Gali, 2-1°, 08225 Terrassa - Barcelona, SPAIN).

MASS, A.M. & SUPIN, A.Y. 2000. Ganglion cells density and retinal resolution in the sea otter, *Enhydra lutris*. *Brain Behav. Evol*. **55**, 111-119.
(Russian Acad. Sci., Inst. Ecol. & Evolut., Moscow 117071, Russia).

MILLER, M.A., CROSBIE, P.R., SVERLOW, K., HANNI, K., BARR, B.C., KOCK, N., MURRAY, M.J., LOWENSTINE, L.J., & CONRAD, P.A. 2001. Isolation and characterization of Sarcocystis from brain tissue of a free-living southern sea otter (*Enhydra lutris nereis*) with fatal meningoencephalitis. *Parasitol. Res.* **87**, 252-257.
(Univ. Calif. Davis, Sch. Vet. Med., 1 Shields Avenue, Davis, CA 95616, USA).

PERTOLDI C., LOESCHKE, V., BRAUN, A., MADSEN, A.B. & RANDI, E. 2000. Craniometrical variability and developmental stability. Two useful tools for assessing the population viability of Eurasian otter (*Lutra lutra)* populations in Europe. *Biol. J. Linn. Soc*. **70**, 309-323.
(Aarhus Univ., Dept. Ecol. Genet., Bldg 540, DK-8000 Aarhus, Denmark).

REUTHER, C., KREKEMEYER, A. & VOWINKEL, C.-J. 2001. The project 'Otter Habitat Network Europe' (OHNE) - Method and Progress of an attempt to prepare a spacious standard of assessment for potential otter habitats. *Wiss. Mitt. Niederösterr. Landesmuseum* **14**, 67-83.
(Otter-Zentrum, Postfach 12 16, D- 29386 Hankensbüttel, Germany).

ROSAS, F., ZUANON, J.A.S. & CARTER, S.K. 1999. Feeding ecology of the giant otter. *Biotropica* **31**, 502-506.
(Institute Nacional de Pesquisas da Amazônia, CP 478, Manaus, AM, 69011-970, Brazil).

ROSELL, F. & CZECH, A. 2000. Responses of foraging beavers *Castor fiber* to predator odours. *Wildl. Biol.* **6**, 13-21.
(Telemark Coll., Fac Arts Sci., Dept. Environ. & Health Studies, N-3800 Bo, Norway).

ROSONKE, B.J., BRWON, S.R., TORNQUIST, S.J., SNYDER, S.P., GARNER, M.M. & BLYTHE, L.L. 1999. Encephalomyelitis associated with a Sarcocystis neurona-like organism in a sea otter. *JAVMA* **215**, 1839-1842.
(Oregon State Univ., Coll. Vet Medicine, Corvallis, OR 97331, USA).

SHIMALOV, V.V., SHIMALOV, V.T. & SHIMALOV, A.V. 2000. Helminth fauna of otter (*Lutra lutra*) in Belorussian Polesie. *Parasitol. Res*. **86**, 528.
(Brest State Univ., Blvd Cosmonauts 21, Brest 224665, Byelorussia).

SIDOROVICH, V.E. 2000. Seasonal variation in the feeding habits of riparian mustelids in river valleys of NE Belarus. *Acta Theriol*. **45**, 233-242.
(Institute of Zoology, F, Skoriny St. 27, Minsk - 220600, Byelorussia).

SUEDMAYER, W.K., JOHNSON, G. & LOVELL, M.A. 1999. Pulmonary silicosis in three North American River otters (*Lutra canadensis*). *J. Zoo Wildl. Med*. **30**, 564-572.
(Kansas City Zool. Gardens, Kansas City, MO 64132, USA).

TORRES, J., MIGUEL, J. & FELIU, C. 1999. Redescription of *Eucoleus schvalovoj* (Nematoda: Capillariidae), an oesophageal parasite of the Eurasian otter, *Lutra lutra*, in Spain. *Folia Parasitol*. **46**, 285-288.
(Univ. Barcelona, Fac. Farm, Avda Joan XXIII SN, E-08028 Barcelona, Spain).

TORRES, J., MODRY, D., FERNANDEZ, J., SLAPETA, J.R. & KOUDELA, B. 2000. *Isospora lutrae* n. sp. (Apicomplexa: Eimeriidae), a new coccidium from the European otter *Lutra lutra* from Spam. *Syst. Parasitol.* **47**, 59-63.
(address - see above).

TUL'SKAYA, O.L., DERENKO, M.V. & MALYARCHUK, B.A. 1999. Low level of mitochondrial DNA variation in sea otter populations from Kamchatka and Komandor islands. *Russ. J. Genet*. **35**, 11-15.
(Russian Acad. Sci., Inst. Biol. Problems N., Magadan, 685000, Russia).

WARNS-PETIT, E.S. 2001. Liver lobe torsion in an oriental small-clawed otter (*Aonyx cinerea*). *Vet. Rec*. **148**, 212-213.
(Hotel Gaudiche, CD92, F-35530 Noyal Sur Vilaine, France).

WEBER, H. 2000. Malignant melanoma in a Eurasian otter (*Lutra lutra*) *J. Zoo Wildl. Med*. **31**, 87-90.
(Erlenweg 38, 49808 Lingen-Ems, Germany).

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LAST MINUTE NOTES

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Are you struggling to get proper support for your conservation work? We may be able to help. Zoos Go Wild is an exciting new project that aims to assist zoos to develop closer links with and support conservation projects in the wild. The first phase of this project will start in South America in May 2001, specifically in the 'Biodiversity hotspots' of Ecuador, Peru, Bolivia, Colombia and possibly Brazil.
http://www.zoosgowild.com

In summary: "Zoos Go Wild" was launched at the 2000 EAZA Conference by project managers, Nan Swannie from Blackpool Zoo and Jens Sigsgaard from Aalborg Zoo and since then has gained much support from zoos and Zoo associations across Europe. Zoos Go Wild is funded 100% by sponsorship, Nan has given up her position at Blackpool Zoo (UK) to give her full attention to this initiative and neither Nan or Jens will be receiving a wage whilst in South America. The project aims to help European zoos make the links that will enable them to support in-situ conservation and meet the new European Zoo Directive. By enlisting and coordinating European zoo involvement, we believe we can provide significant support for conservation in South America. This support could take the form of funds, equipment, training and/or research. We also expect that the publicity (through the website and TV coverage) in Europe will raise the profile of the in-situ projects involved and the conservation issues they face. In return, we hope we can gain the support, establish good contacts and make use of the expertise from as many different in-situ projects as possible, to ensure our project is as effective as possible. Another important aspect of this project is our "Community Linking Initiative". Through which we want to link children and schools in South America (especially if they are associated with a conservation area, project or zoo) with children and schools in England and Denmark. We would like to run conservation education workshops and establish some email and snail mail contacts, so the children can exchange information about each others lives and environments (and in so doing gain some insight into the sustainability of their own world).

You Can Help Zoos Go Wild. To make this project as effective as possible we need your support and your questions. Do you know any in-situ projects (or zoos) in South America that would benefit from support from European Zoos? Do you know of any children or schools who would like to get involved? Do you have any contacts in South America who would be prepared to assist with this project? Do you have any questions you would like "Zoos Go Wild" to look into whilst in South America? If so please complete the response form below. We look forward to hearing from you soon and welcoming you to this exciting new project!

Best Wishes
Nan Swannie - nan@nswannie.freeserve.co.uk
Jens Sigsgaard - Jsi@aalborg-zoo.dk

[Quenidos Amigos en el area de conservación, Me nombre es Nan Swannie, Oficial Educativo del Zoológico de Blackpool en Inglaterra y junto con mi colega, Jens Sigsgaard, Zoológo del Zoológico Aalborg en Dinamarca, hemos planeado un proyecto Nuevo, "Zoos Go Wild", que víncula a los zoológicos y proyectos de conservación Europeos con los zoológicos y proyectos de América del Sur en particular Ecuador, Perú, Bolivia, Colombia y Brasil. "Zoos Go Wild" (zoológicos hacia lo salvaje) tiene el apoyo de la Televisión y de otras organizaciones a nivel Europeo. For medio del establecimiento de estos vínculos y conexiones esperamos poder ayudar a los organismos y zoológicos involucrados a alcanzar yreforzar sus objetivos de conservación. A continuación quisiéramos darles a conocer nuestro proyecto a través deun folleto explicative.
También pueden acceder al proyecto visitandonuestro website en
http://www.zoosgowild.com/

Esperamos que tengan el tiempo de estudiar nuestro proyecto. Nos daríamucho gusto responder a todas sus inquietudes. For favor enviar suspreguntas y propuestas a nuestro email:
nan@nswannie.freeserve.co.uk
Jsi@aalborg-zoo.dk
Quisiéramos incluirlos en nuestro aventuroso proyecto!! Esperamos escuchar pronto de Ustedes!
Saludos, Zoos Go Wild! ... Nan Swannie
Jens Sigsgaard,
O nuestra direccion de correo:
Blackpool Zoo, East Park Drive, Blackpool FY3 8PP UK, Fax: 0044 1253 830800
Aalborg Zoo, Mollenparkvej 63, DK - 9000, Aalborg, Denmark Fax: 0045 98 131933
Quisiéramos víncular a los niños y escuelas de su área (especialmente siestán asociadas con un área de conservación o proyecto) con niños yescuelas de Inglaterra. Quisiéramos desarrollar talleres y vincular a los niños a través del E-mail y el correo postal, para que de esta manera puedan intercambiar informaci&oacte;n sobre sus vidas y su medio ambiente. Conoce usted de niños oescuelas que quisieran formar parte de esta iniciativa? Si es así porfavor envíenos sus detalles.]

PROJECT PROPOSALS TO THE SMALL GRANTS FOR WETLANDS PROGRAMME (SWP) OF THE NETHERLANDS COMMITTEE FOR IUCN

Dear Madam / Sir,

The next deadline for the submission of project proposals to the Small grants for Wetlands Programme (SWP) of the Netherlands Committee for IUCN has been advanced from the 1st of July to the 23rd of May 2001. Please note that the final report, financial report included, of a funded project must be received by SWP before 31 July 2002. Also note that approved projects will be launched at the earliest two months after the deadline for proposal submission. Therefore, project duration and budget must be planned accordingly. The first following deadline is now planned on the 1st of October 2001 (instead of November). However, this may be modified in the coming months. This deadline will be confirmed, or a new one indicated, on our website no later than 31 July. Please also visit our website www.wetlands.nl for further information on proposal submission and the latest versions of our criteria for funding and model for project proposals. We would be most grateful if you could distribute this information among other organisations that may be interested in submitting a proposal to SWP.

Thanking you in anticipation,
we remain Sincerely yours,
Henri Roggeri and Esther Blom

V I R T U A L O T T E R S

http://www.giantotters.com

The idea is that this website becomes a tool for Giant Otter information dissemination and conservation. The emphasis of the site is on Peru and the work of the Frankfurt Zoological Society Giant Otter Project, but we would very much like the site to be useful for Giant Otter enthusiasts, researchers and conservationists from all over the world. With this objective in mind we would be very grateful if you could look at the site and let us know what parts you like, dislike, should be changed, should be added, are unclear, etc, etc.

We are currently also working on a twin Spanish site, as reaching South American people is a priority.

Frank and Jessica,
Frankfurt Zoological Society Giant Otter Conservation Project
fzsgop@terra.com.pe

http://www.ex.ac.uk/mammals/dna/

Web site with information about DNA fingerprinting of otters. I will add additional information as it becomes available but would welcome ideas from anyone else in terms of content, links, references etc. It would be helpful to have a list of who is doing what but since I can't put up any personal information without express permission (data protection laws) I have only given a list of names so far. If you wish to be removed please let me know. If you want to stay, please provide enough information for other people to know what you are doing, who you are and how to contact you.

Thanks
Paul Chanin
University of Exeter
P.R.F.Chanin@exeter.ac.uk

http://otters.net/development.html

Three years ago, I wrote a manuscript summarizing my findings on the behavioral development of otters. The manuscript was entitled: "Ontogeny of behavior and self sufficiency in free-ranging otters." I have uploaded the text of this paper to my website.

Although the manuscript was not accepted for formal publication, it contains a great deal of information relevant to the conservation and management of otters. The article also corrects a misquoting of my findings that appeared in the ASM Mammalian Species account for *Lontra canadensis*.

Comments and criticisms are welcomed.
J Scott Shannon
jss@otters.net