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BULLETIN

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CONTENT

IUCN
The World Conservation Union

Species Survival Commission

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. A floppy (winword, wp or ASCII) is strongly recommended. Articles should not exceed 2000 words in length, i.e. not to exceed four printed pages, including diagrams and tables. Diagrams, maps and tables should be included as a photocopy ready for reprint.

Submit material for publication to:
Arno C. Gutleb
Institute of Medical Chemistry
University of Veterinary Medicine
Linke Bahngasse 11
A-1030 Vienna
Austria
Fax.: ++43-1-7136895

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Front page: European Otter (*Lutra lutra*)-

NOTE FROM THE EDITOR

This is the first issue of the IUCN Otter Specialist Group Bulletin which is edited in Austria. It was a great honour for me to get the chance to follow Chris Mason and Dave Rowe-Rowe in this position. It was their labour and effort that leads this publication to its 10th issue. I hope that I will be able to fulfil all the different expectations in this journal and that new ideas will strengthen its special status as a specific publication concerned with all aspects of the different otter species.

One problem is the number of requested copies, which are send free to the steadily increasing number of participants in the mailing This issue will be send to all on the mailing list, but nevertheless we are far beyond the absolute maximum of free copies. For the future we should think about a construction that everyone, who is able to do so, pays the prime costs for a copy (as for example the Martes Working Group in North America does with its bulletin). In the meantime every contribution is welcome. Details on any change will be published in the next issue or by a separate leaflet.

I encourage everyone not only to send summaries but also articles in full length. I will do my best to enclose them in full length.

I tried to cover the recent publications, which you will find in the last section. As everyone knows a lot of publications belong to the class of the so called grey-literature, which means that most reports to local governments, WWF sections, etc. are not available via electronic media, current contents, etc. Therefore it would be very helpful for the international exchange of information to send me a short notice (including addresses and costs) or a copy of these publications. These publications will be announced separately in the forthcoming issues.

Please note that the following issue will not be send to anyone not answering the enclosed leaflet and subscribing thereby for further issues.

I would like to thank Mag. Barbi Buchacher for the assistance in retyping some of the manuscripts.

IUCN/SSC OSG GROUP

FROM THE CHAIRMAN'S DESK

I wish to extend my sincere thanks to the outgoing Chairperson of the Otter Specialist Group (OSG), Dr. Pat Foster-Turley for her untiring efforts in the past to make the OSG one of the most active Specialist Groups in the IUCN. It was on Pat's recommendation that I was able to step into her shoes and become the Chairperson for the OSG during the triennium commencing from July 1994. All the members of the OSG are extremely grateful to Pat for the excellent work she did during the past, first as the Vice-Chairperson (1987-1989) and then as the Chairperson (1990-1993). On behalf of the OSG, I would like to wish Pat all the very best in her new career as the coordinator of the United States - Asia Environment Program, based in Washington DC.

It was Pat as the Chairperson of the OSG who was instrumental in drawing up the Otter Action Plan with the view to enhancing the conservation of otters and their habitats on a global scale. The Action Plan turned out to be a most useful document in identifying the current status of the otter species and the threats facing them in the wild. It also identified areas of darkness where hardly any recent information exists as far as the status of the otters is concerned. However, despite this valiant effort on the part of Pat and the members of the OSG, the Action Plan could not be implemented in the absence of funds. This is just another example of the well known principal that scientific and technological expertise is worthless in the final analysis, if the money, manpower and material required to implement the expertise is absent.

Nevertheless, not everything is doom and gloom in the OSG. Despite all odds, the OSG was able to hold the VI. International Otter Symposium in Pietermaritzburg, South Africa in 1993 which was attended by over 40 participants from 12 countries. It was largely due to the patient efforts of Dr. Dave Rowe-Rowe that made this symposium a reality. Pat was sadly missed at this symposium as she was kept busy in her new position in USA. Her absence considerably hindered the OSG's efforts at seeking ways to raise funds. The task has fallen on my shoulders now and I am determining to do my best to seek funds from any source to implement parts of the OSG Action Plan in the coming years. In this endeavour, I will certainly need your help and I will rely on your goodwill and support to achieve some degree of success. I am sure everyone will do his/her best to help me in this difficult task.

There is in fact some money left from Sir Peter Scott fund at the IUCN which could be used to run some projects on a priority basis. At the Symposium in Pietermaritzburg, it was felt that much remains to be done in the developing world and hence there is an urgent need to identify the projects and the personnel in the countries so that a number of projects on modest funding could be carried out. In the guise of development, the attended environmental problems such as pollution, deforestation, wetland conversion etc. are undermining the conservation of otters and their habitats, especially in the developing world. Human population growth and the genuine aspirations of the poor for an enhanced life style are also leading to the erosion of otter habitats across much of the developing countries. In countries such as Cambodia, Burma, Vietnam and Laos, there is a paucity of information on the status of otters. Here much of the basic research needs to be carried out in order to assess the status of otters. Members of the OSG in South America and Africa too will need substantial funds to carry out management-orientated research on otters and their habitats.

At present, I am exploring the possibility of holding a workshop on the Asian otters. The first circular that was sent to the OSG members referred to the Huay Khaeng Wildlife Sanctuary in Thailand as a possible venue for this workshop, scheduled for February 1995. However, the venue has been changed and it is proposed to hold this workshop in Dehra Dun, Uttar Pradesh (India) at the Wildlife Institute of India (WII) given the facilities available here. Members will be informed of the new date. It is hoped that many OSG members would be able to participate at this workshop and make it a success.

Padma K. da SILVA

Department of Zoology,
University of Peradeniya,
Peradenyia,

Sri Lanka

hi the course of the Leeuwarden meeting of the European section of the IUCN/SSC Otter Specialist Group the membership list of this group was reviewed and actualised for the 1994-1996 triennium. The list includes the addresses, phone and fax numbers of all members of the group. A copy of the list can be ordered from the re-elected coordinator under the address:

Claus Reuther,Aktion Fischotterschutz e.V., OTTER-ZENTRUM, D-29386 Hankensbüttel,Germany

REPORT

INTERNATIONAL OTTER SURVIVAL FUND

Paul Yoxon

International Otter Survival Fund, Broadford, Isle of Skye, IV49 9AQ,, Scotland

Abstract: The IOSF was set up in 1993 to safeguard areas of otter habitat, and also to support people working in research and rehabilitation of otters worldwide. They have also set up a rehabilitation centre for otters in Scotland. The major current threat to otter habitat in Scotland is the proposed development of superquarries, and this is reviewed.

The International Otter Survival Fund was set up in November 1993 to safeguard areas of otter habitat and also to support people working in research and rehabilitation of otters worldwide, its centre is based in the heart of otter country on the Isle of Skye, where they organize an ongoing research and rehabilitation programme.

The future of the species lies in protecting the remaining populations and then-habitat and it is therefore vital that we fully understand what features are essential for good otter habitat so that we can indeed protect them.

They have developed contacts with otter specialists in many countries and have to date regional representatives in Spain, Turkey and Russia, and are working closely with scientists in Brazil to understand the full impact of mercury poisoning in the Amazon basin and its effects on the Giant otter population. On a local level, the otter centre for the Highlands and Islands has been established to treat injured and orphaned otters locally, and have been campaigning extensively about the proposed superquarries in Scotland. A report published in January, on the threat of Coastal Superquarries to otters concludes that the effect of the Eurasian otter population from these developments will be severe. Already one of the largest of these quarries is planned at Lingarbay on the Isle of Harris in the Outer Hebrides, and planning consent for this is due to be announced this month by the secretary of state for Scotland. This development alone will threaten 22 otters and destroy a large area of habitat for a minimum of 50 years, by extracting some 600 million tonnes of aggregate in an area about 3 miles x 2 miles and actually removing a mountain.

IOSF Director, Paul Yoxon, states "This is only the tip of the iceberg with regard to superquarries and their impact on otter populations in Western Europe. The ARUP report commisioned by the Department of the Environment, identifies between 15 and 22 coastal superquarries sites in Western Europe and nearly all of this zones are situated in prime otter habitat; in fact many are to located in Norway, where the last remaining healthy otter populations occur in this coastal zone; five superquarries are planned in the Highlands of Scotland, the stronghold of otters in Britain."

The International Otter Survival Fund urges European governments not to pay mere lip species conservation, but to act in support of European law protecting endangered species. Little was done when the Skye road bridge threatened the local otter population, and it is time that the legal protection given to the otter in the form of three laws in Europe was actually proved to be effective. They go on to state that if governments are serious about the conservation of the otter in Europe then steps must be taken to safeguard the last remaining areas where viable otter populations exists and such uncontrolled development should be checked. The Isle of Harris superquarry will be a test case not only for otter conservation but to see just how serious we are about conserving our native fauna and flora.

If you would like further information on IOSF write to:

International Otter Survival Fund
Broadford, Isle of Skye, IV49 9AQ UK, Tel/Fax: 0471/822 487

SHORT COMMUNICATION

MARINE OTTERS (*lutra felina*) NEED HELP

Gonzalo Medina

IUCN/SSC Otter Specialist Group Coordinator for Latin America, Representitive for Chile

Dear Friends,

The National Committee for Protection of the Fauna and Flora (CODEFF)-CHILE, through its branch in Valdivia, a city located 800 km South of Santiago, has started a public work in order to get funds to buy a Farm land of approximately 45 hectares.

The land is a marine shoreline in which still survive approximately 10 families of Marine otters (Lutra felina).

Until 1983 the area was naturally protected but now the council of Valdivia is working on a road to the area, this makes these otter families be in an extremely dangerous situation.

It is extremely important to protect this group of Marine otters, one of the last in the South of Chile and the easiest for study and show in school education programs.

There is great possibility that forestry companies can buy this shoreline due its geographical situation and forests, if this happened would be the end of the otter families.

CODEFF, Valdivia branch has to collect approximately USS 27000 to buy the land.

For more information please contact:

Sr. René Monsalve Alarcon
CODEFF VALDIVIA
PHONO FAX:
0056/63/222710
Casilla 191
Valdivia
CHILE

Mr. Gonzalo Medina
P.O-Box 233
Lincoln University
Canterbury
New Zealand
FAX: 0064/3/3253844

SHORT COMMUNICATION

OTTERS IN BELGIUM

Christiane Linet

WWF - Belgium, Chaussee de Waterloo 608, B-1060 Bruxelles, Belgium

With more than 350 inhabitants by square kilometer, Belgium has one of the highest human densities in the world. Human pressure is ubiquitous and makes cohabitation with other living creatures extremely hazardous for the latters. The dwindling of the otter (Lutra lutra) population initiated in the last century with the purpose to rid the anglers of a clever competitor could not be stopped during the last decade of the present century despite the newly aquired status of protected animal. Less than three dozens of individuals remain in our country. In cause:

1) the disturbance of the habitats mainly
   a) by hydraulic works (dredging, filling, drainage, rectification of banks, etc...)
   b) by the extension of human habitat
   c) by recreational and turistical activities
2) the pollution of the waters mainly by industrial, agricultural and domestic effluents
3) the lack of food supply caused by the aforementioned pollutions and also by the unlawful, but still practiced habit, of planting resinous trees to close to the streams.

WWF - Belgium's action for the otter:

1) Habitat rehabilitation has been identified as the first objective. In two river basins where otters are still spotted, we contribute to the purchase and to rent of pieces of land and to the plantation of suitable tree species. The two rivers being the Yser in Flanders and the Sure in Wallony. Our friends of Oekofonds, in Luxembourg, also work on the Sure and have initiated many interesting activities there which make our work complementary.
2) We lobby at the regional, national and European level against the mismanagement of the river basins. We plead for the adoption of environmentally friendly engineering techniques, and for an active policy of water epuration, especially with regards to the polychlorobiphenyls.
3) We work at building an otter friendly attitude among the different nature users (hunters, hikers, anglers,...). We inform our fellow citizens about the otter, we upgrade the mustelid's image from the past "nuisance" conception to a new "asset" image. Otters are proposed as valuable biological indicators (and as very lovable ones!).

Any reintroduction of otters in Belgium is premature and could be contemplated only when substantial progresses are achieved in the three above mentioned areas of activities.

SHORT COMMUNICATION

AKTION FISCHOTTERSCHUTZ E.V. (GERMAN CAMPAIGN FOR OTTER PROTECTION): ACTIVITIES 1993/94

Claus Reuther

Aktion Fischotterschutz e.V., OTTER-ZENTRUM, D-29386 Hankensbüttel,Germany

RESEARCH IN CAPTIVITY

At the research station in Hankensbuttel, the following main studies were completed, continued or started:

- an ethological study on the marking behaviour *of Lutra lutra* in cooperation with the Russian Academy of Sciences (ROZHNOV and ROGOSCHIK, 1994)
- an ethological study on the prey catching behaviour *of Lutra lutra*
- a longterm study on the ontogeny of otter cubs born in captivity
- a longterm study on the immobilisation of otters by drugs

RESEARCH IN THE WILD

- The telemetry study which was started in cooperation with the Ministry of Environment of Mecklenburg-Vorpommern (a federal state in the north of East-Germany) in 1992 was continued. So far two otters were caught and radiotracked.
- A study of Olaf Korbel for the Federal Ministry of Traffic on the mortality of otters caused by traffic accidents and the possibilities to reduce this threat was finished hi spring 1994. The results will be published soon.

SURVEYS

A two years survey of Udo Binner using the standard method in the federal state Mecklenburg-Vorpommern is still coming to the end. So far more than 800 sites were visited of which more than 60 % were found positive.

RIVER ISE PROJECT

The revitalisation of the river Ise network (more than 450 km long) makes good progress. Nearly 500 ha of property on both sides of the main river were bought and changed from industrial to alternative agriculture. More than 20 km of hedges and riparian forest were planted. A team of 6 full employed scientists and several students or external experts has done a lot of scientific studies within this project (REUTHER et al., 1993). In December 1993 the first tracks of an otter were found in the snow at the river Ise after more than 20 years.

OTTER CENTRE

In 1993 more than 110,000 people visited the Hankensbiittel Otter Centre. On December 2nd, 1993 the main building burned down because of a fire attack. The rebuilding will start in November 1994.

REFERENCES

Reuther, C., Borggrafe, K., Kolsch, O., Poseck, M., Posselt, T. & Stockmann, A. (1993). Revitalisierung in der Ise-Niederung Teil C: Grundlagenerhebung, Landschaftsbewertung und Szenarienentwicklung fur die Nebengewasser. *Habitat*, **9**: 245 pp
Rozhnov, V.V. & Rogoschik, B. (1994). The ability of the river otter *(Lutra lutra* L.) to distinguish fresh scent marks and longevity of conserved scent mark information. *Lutreola*, **3**: 5-9

P R O C E E D I N G S

PROCEEDINGS OF THE FIRST SYMPOSIUM ON OTTERS IN INDONESIA

List of English abstracts
Melisch, R., Asmoro P.B., Kusumawardhani, L.: Otters in Indonesia with special reference to West Java.
Djuangsih, N.: Impact of pollutants on top predators.
Giesen, W.: Habitat changes in wetlands of the Greater Sundas and implications for biodiversity.
Bastiawan, D., Rukyani, A.: The status of otters in fisheries.
Asmoro P.B., Melisch, R., Kusumawardhani L.: Interactions between otters and people.
Sumitro, Effendi, P., Seto, D.R., Sahir, T.: Otter rearing and breeding at Gelanggang Samudera Jaya Ancol.
Kusumawardhani, L., Melisch, R., Asmoro, P.B.: A review of otter species conservation efforts in Indonesia.
Ramono, W.S., Soehartono, T.R., Kusumawardhani, L.: Protection designation of Indonesian wildlife species.
Iqbal, A.: Crabs in the irrigated rice-field ecosystem.
Rudyanto, Melisch, R.: Two reports of otter hunting and trade from Sumatra.

For information please contact: Roland Melisch, c/o Schwind, M.-Grunewaldstr. 19, D-67346 Speyer, Germany

AUSTRIAN OTTER SYMPOSIUM

The proceedings of the 1993 Otter Symposium of the Austrian Otter Group are now published. A total of sixteen articles cover topics like status of the otter, conservation, feeding ecology and environmental contamination. The proceedings may be ordered (US $8 plus postage) from Arno C. Gutleb, Institute for Medical Chemistry, University of Veterinary Medicine, Linke Bahngasse 11, A-1030 Wien, Austria

LUTREOLA - INVESTIGATIONS OF MUSTELIDS AND OTHER CARNIVOROUS MAMMALS IN RUSSIA (ED. V.V. ROZHNOV)

This newsletter and journal which is to be issued twice a year, will feature the following materials:

- original studies of Russian specialists on mustelids and small carnivores
- translations of the most interesting papers appearing in the publications of Russia and other CIS countries
- comprehensive surveys of all Russian publications on this animal group
- other mformation concerned with mustelids and other carnivores

Additionally mformation retrieval, photocopying ($3 for ten pages) and translation of Russian literature on carnivores ($5 per page) will be available on order.

For further information please contact the editor:
A.N. Severtsov
Institute of Evolutionary Morphology & Animal Ecology
33 Leninski Prospekt
117071 Moscow, Russia

DER FISCHOTTER - LEBENSWEISE UND SCHUTZMAßNAHMEN

Claus Reuther

Naturbuch-Verlag. ISBN 3-89440-110-9.
Aktion Fischotterschutz Sudendorfer Allee 1, D-29386 Hankensbüttel, Germany

This new book provides a general overview on biology and ecology, possible threats and the efforts for the protection of the otter (Lutra lutra).

OTTERS IN EAST ANGLIA, PAST, PRESENT AND FUTURE
Proceedings of Symposium, University of East Anglia, Norwich, Norfolk

The contents of the proceedings include articles on the decline of otters in East Anglia, diseases and the effects of organochlorines and environmental changes.
The proceedings cost £ 2 (including VAT and P&P) and can be obtained from Ms. Sally Ward, The Norfolk Naturalist Trust, 72, Cathedral Close, Norwich, Norfolk, NR1 4DF, England

SECOND INTERNATIONAL MARTES SYMPOSIUM

Edmonton, Alberta, Canada August 12 -16, 1995

Sessions will deal with marten, fisher and sable populations, landscape ecology, habitats, timber harvest and fire effects, physiological ecology, evolution, ecology, biogeography, population and harvest management, monitoring.
For additional information please contact:
Gilbert Proulx, Alpha Wildlife Research & Management Ltd., 9 Garnet Crescent,Sherwood Park, Alberta, Canada T8A 2R7

REPORT

MEETING OF THE EUROPEAN SECTION OF THE OSG

Sheila Macdonald

Bramblings, Wrabness Road, Ramsey, Harwich, Essex, CO12 5NR, United Kingdom

Abstract: The European Section of the OSG met in June 1994 at Otterpark Aqua Lutra in the Netherlands. Reports from each country are summarised. The eight main recommendations are: all European countries that have not signed the Bern Convention should do so urgently; 1995 will be the Second European Year for Nature Conservation and the otter could be a good mascot for sustainable land use within whole water catchments; lifting the Iron Curtain provides a great opportunity because of the immense biodiversity in eastern Europe; it will be more cost-effective to protect this biodiversity instead of destroying it for short-term economic gain only to spend vast sums trying to restore it later; tithe current low economic base in eastern Europe means that money sent from the West now will have a disproportionately large effect in the East, so now is the time to act; knowledge should be transferred between east (which have undisturbed ecosystems) and the west (which has technology and experience of good and bad laws and regulations); to this end, publications should be made available in English and Russian, the main scientific languages throughout Europe; and better coordination is needed between IUCN specialist groups.

The European Section of the IUCN Otter Specialist Group met on 6th June 1994 prior to the otter seminar held at the Otterpark Aqua Lutra near Leeuwarden in the Netherlands. Representatives from 19 countries participated. Initially a representative from each country presented a brief account of the current state of otter conservation hi that country. A summary is given below.

In **NORWAY** an otter group has been formed but is not very active. The otter population is thought to be expanding and so ideas for reintroductions there may be unnecessary. Acidified rivers are being restored and restocked with fish but the otter is not welcomed in these projects. High levels of mercury have been found in some south Norwegian otters.

In **DENMARK** the population is expanding though it is still confined to mid and north Jutland. Stop grids are now compulsory on all fyke nets in Danish freshwaters. Fauna passages under roads are thought to reduce traffic mortality considerably. National field surveys will be carried out at 5 year intervals and studies on reproduction, contamination and hormone levels in spraints are planned. Lead pellets (gun shot) are now found in 5% of dead otters.

In **BRITAIN** otter distribution is increasing from the strongholds of the north and west. National field surveys are carried out every 7 years. The Government's Joint Nature Conservation Committee is drawing up a conservation strategy for Britain's otters but it is not clear if there will be financial support.

In **POLAND** the otter is a game species with all year protection but there are calls for full protection to be withdrawn due to problems of predation at fish farms. A national field has been completed with signs found at 79% of 2081 sites. The species is absent only in Silesia and central Poland. A major problem has been created by the privatization of fish farms and plans to make the River Vistula a major channel for heavy boat traffic may also pose threats.

In **GERMANY** most otters are found in the former GDR e.g. in Brandenburg and Mecklenburg-Vorpommern. In Saxony a stable population occurs close to the Czech Republic and otters have been recorded on the River Elbe at Dresden. The Otter Zentrum is still open to the public despite the fire and subsequent further attacks.

In **THE NETHERLANDS** occasional signs of animals have recently been recorded but the species is still considered as extirpated. Eels from around the country have been monitored for PCBs showing that only parts of the north are free from this type of contamination. Studies have been initiated on co-planar PCBs and dioxins. The Dutch Government has financially supported the restoration and re-creation of wetlands with the final goal of reintroduction but remaining suitable habitats also require protection.

In **FRANCE** the otter population seems to be expanding from its stronghold in the Massif Central towards the east and into the Rhone. Feasibility studies are being carried out for possible reintroductions in the north east and near Strasbourg.

In the **CZECH REPUBLIC** three main areas remain as otter strongholds. Field surveys are being carried out together with investigations into PCB levels and an otter station is being built for captive research and breeding.

In neighbouring **SLOVAKIA** some regions still hold viable populations.

Otters occur throughout **BELARUS** but more signs are found on natural rivers than on canals. The presence of beavers is thought to have a positive influence on otter numbers.

SLOVENIA offers a wide range of habitat types but the otter population appears now to be divided into 2 with about 70% of waterways being severely polluted. A field survey is planned for next year.

In **CROATIA** the northern rivers such as the Drava and Sava hold good populations but in the south of the country the situation is serious. Some of the best otter areas have been combat zones in the war and many mines have been laid in wetlands.

Viable populations can be found in **AUSTRIA** adjacent to the Czech Republic, an area of fish ponds. The population is spreading south towards the Danube. A central collection point for otter bodies has been set up, a radio-tracking study has just been completed and experiments are to be carried out on sex hormone levels in spraints and on food choice.

In **ITALY** the Gruppo Lontra is now virtually nonexistent. The only regular monitoring of a last wild population is carried out in the south (Sele - Galore Rivers) and other remnant populations may now be extinct. There are four otter centres for captive breeding but with so few otters left in Italy it may be more important to concentrate on strong protection of existing populations and habitats rather than to prepare for reintroductions.

In **SPAIN** populations are thought to be increasing in Catalonia, Galicia and Andalucia but in the drier parts of the country numbers may be declining. Over abstraction of river water and a lack of any central hydrological plan pose serious problems. Reservoirs may be causing fragmentation of populations. Several groups in Spain are now working on various aspects of otter biology and conservation.

A field survey is planned in **PORTUGAL** next year and information is currently being collated on distribution, corpses etc. A drought over the last two years has led to rivers drying and studies are needed to assess the real effects of this on otters but no finances are available. Dam building in Spain on rivers flowing through both countries may have a serious effect on water flow in Portugal.

The representative from **TURKEY** had collected data from the N-E of the country based on past hunting records. There are an estimated 2 million illegal hunters and 5 million gun owners in Turkey so poaching may be a serious problem.

Dams and reservoirs on the Euphrates may produce knock-on effects for otter populations in **SYRIA**.

The representative from the Council of Europe advised the OSG to make use of the Council of Europe as an ambassador willing to pass on our views to governments throughout Europe, not only those within the European Union. He also stressed the need for eastern European countries to sign the Bern Convention. (It should be noted that **ROMANIA** has now signed and so the open season for otter hunting has closed).

The rest of the OSG meeting was taken up with general discussion and a review of membership. Claus Reuther was re-elected unopposed as Chairman of the European Section, Eladio Fernandez-Galiano was elected to represent the Council of Europe and names were sought for countries currently not represented in the group

In view of the emerging importance of eastern European countries as harbourers of widespread otter populations and because currently even limited financial support is sufficient to initiate conservation projects, it was decided that a fund should be set up to provide seed corn finance. The German Otter-Zentrum and the Dutch Otterpark offered to make donations and a group of five regional representatives formed a committee to decide which projects would receive funding.

The final recommendations emerging from the general discussion are:

1. All European countries which have not yet signed the Bern Convention are requested to do so as soon as possible, since this convention forms an important basis for the protection of European fauna, flora and habitats.

2. The Council of Europe has declared the year 1995 as the second European Year for Nature Conservation. The special theme is "Nature conservation outside protected areas". The otter is an excellent symbol for this theme because the successful protection of the otter (and its habitats) is not possible exclusively within protected areas. One of the most important preconditions for protecting otter habitats is a sustainable land use within the whole water catchment area. Therefore IUCN as well as the Council of Europe, the European Union and national governments are requested to use the opportunities offered by this 2nd. European Year for Nature Conservation to encourage a sustainable land use within water catchments and to use the otter as a symbol for this campaign.

3. All European countries should be aware of the great opportunity for a real European nature conservation policy which is arising from the lifting of the Iron Curtain. The western as well as the eastern European governments should be aware of the immense biodiversity in eastern Europe and of the responsibility resulting from this for all economic development activities in the eastern parts of Europe. The eastern European countries should be brought to a position which allows them to conserve this rich biodiversity and to serve as a core area for recolonization of the western parts of Europe by many species, including the otter.

4. A European nature conservation policy should recognize that it is much more effective - and cost effective - to give the top priority to the protection of existing habitats and populations rather than to destroy them because of economic interests, only to spend vast resources in restoring them in the future.

5. To ensure this policy it is necessary to give considerable funds for nature conservation to eastern Europe now. Because of the current low economic base in these countries this money could be used very effectively. An increase in the economic level in the east European countries, and the movement towards a free and private market, as well as private landownership, will make such support much more expensive in the future.

6. Besides these economic aspects it is of great importance to ensure a complete transfer of knowledge between east and west. Scientists and conservationists from the east European countries should have the opportunity to learn about western technology and the advantages and disadvantages of western laws and regulations. They should also be shown management and fund-raising techniques. Scientists and conservationists from the western European countries should have the opportunity to learn more of the undisturbed or little disturbed ecosystem in east Europe.

7. One positive step towards information transfer is the translation of publications into the main scientific languages (Russian and English).

8. We need better co-ordination between the different IUCN Specialist Groups. In particular the Captive Breeding Group is encouraging efforts to breed and release animal species to the wild while the Otter Specialist Group is, in general, not in support of this aspect of nature conservation.

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REPORT

HINDERING OTTER *Lutra lutra* ROAD KILLS PART 1

Olaf Körbel

Aktion Fischotterschutz e.V., Otter-Zentrum, Sudendorfer Alle 1, D-29386 Hankensbüttel, Germany

(received 22nd May 2001, accepted 10th June 2001)

Abstract: On commission from the Federal Ministry of Transportation, the Aktion Fischotterschutz e.V. began the research and development project "Otter on the Road". The intent was to collect and analyse data on otter deaths, the conditions under which the otters died as well as constellations of the death sites having an impact on the danger potential, for example, an increase. This paper presents the results of analysis of otter road deaths, road type and adjacent watercourses. A subsequent paper will cover mitigation measures.

INTRODUCTION

Even before the reunification of Germany it was evident that road kills have become the number one cause of otter deaths. Today, it is estimated that three-fourths of all discovered dead otters were killed on roads.

Road kills have increased of late so dramatically that KUBASCH (1992) has suggested that already 10% of the total otter population in Saxony has fallen victim to road kills.

In order to minimise further danger of road kills to the remaining otter population in Germany, there are a number of recommended measures to be undertaken for the future. On the one side, current accident hot spots need to be ameliorated in order to protect the local population from a total collapse due to death factor "roads". On the other side, otter protection requires a number of measures to be taken during road construction measures. Only in conjunction with other protective measures is it possible to save this species.

On 01.02.1993, and on commission from the Federal Ministry of Transportation, the Aktion Fischotterschutz e.V. began the research and development project "Otter on the Road". The intent of this research and development project was to collect and analyse data on otter deaths, the conditions under which the otters died as well as constellations of the death sites having an impact on the danger potential, for example, an increase.

Based on the knowledge gained on death sites to date, the first recommendations for conservation measures ought to be worked out which can be carried out when building or maintaining roads and applicable for various sites.

METHODS

The area under investigation was restricted to three Federal States that show a healthy otter presence: Brandenburg, Mecklenburg-Vorpommern and Saxony. Although there was documentation of road kills in Lower Saxony, Saxony-Anhalt and in Bavaria, due to the overall isolated and very low population numbers in these Federal States data on the death sites were not representative of typical individual death site points.

The time period researched ran from 01.01.1985 until 31.03.1993. Letters and questionnaires were used to collect and analyse data complete as possible on all otter road kills during this time period.

Inclusively, 92 death sites were mapped illustrating characteristics of the street, waters (to the extent given), as well as immediate surroundings.

RESULTS OF THE ANIMAL SPECIFIC DATA

A total of 303 otter road kills were reported during the time period between January, 1985 and March 1993.

An increase in road kills is apparent since the time of the German reunification (see Table 1). For the years 1985 to 1988, an average of 16 road kills were reported. In 1992 alone, there were 81. This is an increase of more than 500%.

Table 1: Numbers of deaths between 1985 and 1992

Year	Number
1985	9
1986	18
1987	15
1988	23
1989	39
1990	50
1991	57
1992	81
Total	**292**
1-3/1993	11

Looking at the monthly distribution of deaths, the possibility that an otter could fall victim to traffic is greatest between September and December (see Table 2). ZINKE (1991) has suggested that the increased mortality rate for these months, among other things, could correspond with fishery activities.

Table 2: Distribution of all road kills according to month

Month	Number	%
January	26	9.00
February	17	5.88
March	27	9.34
April	17	5.88
May	13	4.50
June	18	6.23
My	17	5.88

Month	Number	%
August	17	5.88
September	32	11.07
October	44	15.22
November	29	10.03
December	32	11.07
Total	**289**	**100.00**
?	14	

230 of the 303 otters could be sexed. 57% of these were male (see Table 3). The sex ratio is, therefore, 1.3 : 1.

Table 3: Sex of traffic victim

Sex	Number	%
m	131	56.96
f	99	43.04
Total	**230**	**100.00**
?	73	

CHARACTERISTICS OF ROAD KILL SITES

Distinguishing characteristics of those sites where otters were run over comprised aspects on the road, waters, bridge(s) or ducts.

For all otter deaths reported, a categorisation of the road type was conducted. This was carried out independent of the mapping of the specific locations where dead otters were found. Given that nearly all sites were located in the new Federal States, Table 4 shows the respective percentages for the road types with respect to the total road network in East Germany, and Table 5 the road type where a death occurred with respect to the total road network of East Germany only.

[Translators note: in the first position are highways and the like, characteristically fast moving traffic on two or more lanes generally connecting highly frequented goals, for example, larger cities. The following categories given are not accurate names, rather, an attempt to describe that the road type is increasingly narrower, quieter and typically connecting less frequented goals.]

Table 4: Road type of the road network in East Germany

Road Type	km	%
"highway"	1,850	1.50
"regional road"	11,300	9.10
"county road"	34,000	27.30
"district road"	77,400	62.10
Total	**124,550**	**100.0**

Table 5: Road type at road kill site

Road type	Number	%
"highway"	7	4.40
"regional road"	96	60.70
"county road"	33	20.90
"district road"	17	10.80
other roads	5	3.20
Total	**158**	**100.0**

The tables show that "highways" are clearly over represented as road types on which road kills occurred. The reason is probably due to a heavier volume of traffic in combination with a higher speed limit. Regional roads were named as frequently as corresponds to their overall abundance in East Germany. County roads and other smaller roadways make up over 60% of the road network, however, only 25% of all road kills occurred on these road types. The reason for this is probably the poor conditions under which these roadways were maintained and an associated lower volume of traffic

CHARACTERISTICS OF WATERS NEAR THE ROAD KILL SITE

It is important to keep in mind when considering the following mapping data that it was not an objective of the research and development project to determine comparative parameters for the road kill sites such as the general frequency of road kills within a particular biotope structure or specific road construction structure. It is, however, possible that the results mirror the frequency of such parameters. In the following tables the results of the above mentioned evaluation method are listed according to individual road kill sites (IRS, n = 53) and multiple road kills sites (MRS, n = 39) as well as total sites (n = 92). It is then possible to make a direct comparison between IRS and MRS as well as characteristics of the sites with respect to the numbers of otters killed there (n = 158) and the characteristics of the site as such (n = 92).

Within the framework of the mapping of road kill sites, particular effort was made to collect data on water sources nearby the site (Table 6).

Table 6: Number of road kills and the site according to water source type in the immediate vicinity

Water source	Number	%	IRS	%	MRS	%	Total	%
no crossing with water	74	46,84	25	47,17	17	43,59	42	45,65
river > 5 m in breadth	8	5,06	1	1,89	3	7,69	4	4,35
canal	2	1,27	0	0,00	1	2,56	1	1,09
stream	42	26,58	13	24,53	13	33,33	26	28,26
lake drainage	23	14,56	9	16,98	4	10,26	13	14,13
drainage ditch	9	5,70	5	9,43	1	2,56	6	6,52
Total	**158**	**100,0**	**53**	**100,0**	**39**	**100,0**	**92**	**100,0**

IRS = individual road kill site, MRS = multiple road kills site

It was surprising to see that 47% of the otter road kills occurred on roads crossing no water sources. Characteristic of these sites were that ponds, lakes or running water existed at a distance from the road on which an otter was killed. In addition, it became evident that road kill sites were not isolated to a single water source type. Even seemingly insignificant water sources such as drainage ditches, or dried up stream beds were sites of road kills.

CHARACTERISTICS OF BRIDGES AND DUCTS AT ROAD KILL SITES

Not all construction measures allowing water to flow underneath roadways appears suitable for the passage of otters. Tunnel passages reduce the width for water flow and, as a rule, and result in an increased water velocity. The same holds true for box shaped tunnels depending on their height and width. Bridges or very wide (rectangular) tunnels where there exists a natural strip of bank extending the length of the tunnel appears to enable the passage of otters. Table 7 shows the percentages of the various construction types with respect to numbers of road kills.

Table 7: Number of road kills according to construction type of the bridge or duct at the site

Construction type	Number	%	IRS	%	MRS	%	Total	%
raised bridges	4	4.76	2	7.14	1	4.55	3	6.00
rectangular ducts	33	39.29	10	35.71	8	36.36	18	36.00
tunnel shaped ducts	47	55.95	16	57.14	13	59.09	29	58.00
Total:	**84**	**100.0**	**28**	**100,0**	**22**	**100.0**	**50**	**100.0**

IRS = individual road kill site, MRS = multiple road kills site

In addition to the bridge or duct construction type, there are other structures such as dams that hinder the passage of otters and force them to leave the water and cross the road. This is also the case for road maintenance measures when a new bridge is built alongside the old one. Even if the new bridge has a wide enough span to ensure a strip of bank underneath, if the span of the remaining old bridge is restrictive, then it is most likely that the otter will leave the water and cross the road. This was the case in two of three raised bridge sites.

ROAD KILL SITES NOT CROSSING WATER

It was already mentioned above that about 47% of the otter fell victim at sites not in the immediate vicinity of water.

An important factor for the development of preventative measures at potential road kills sites of this sort is the distance to the nearest water source (Table 8). The mapping results clearly show, as expected, that the risk of an otter road kill decreases with the increasing distance between road and water source. The data is especially supportive of this trend for MRS. Over one-half of MRS were sites where the nearest water source was not more than 100 m away. This is similar when looking at the number of road kills, too. Close to one-half of all road kills occurred within less than 100 m from a source of water.

Table 8: Number of road kills and the site type according to distance from water source

Distance	Number	%	IRS	%	MRS	%	Total	%
up to 100m	35	47.30	8	32.00	9	52.94	17	40.48
up to 250m	19	25.68	6	24.00	5	29 .41	11	26.19
up to 500m	7	9.46	7	28.00	0	0.00	7	16.67
up to 1000m	8	10.81	2	8.00	2	11.76	4	9.52
> 1000m	5	6.76	2	8.00	1	5.88	3	7.14
Total	74	100.0	25	100.0	17	100.0	42	100.0

IRS = individual road kill site, MRS = multiple road kills site

EVIDENCE FOR OTTERS

Simultaneous to the mapping of road kill sites, evidence for otters was searched for. Due to time restrictions it was not possible to conduct the search following the IUCN standards. Only the immediate vicinity of the road kill sites were searched for evidence of otters. The results are shown in Table 9.

Table 9: Number of sites according to the type of evidence found for otters

Evidence type	DEIS	%	MRS	%	Total	%
none	32	60.38	11	28.21	43	46.74
scat or foot print	21	39.62	28	71.79	49	53.26
Total	53	100.0	39	100.0	92	100.0

IRS = individual road kill site, MRS = multiple road kills site

At more than 50% of the road kill sites actual evidence for otters was found. Noteworthy here is the marked distinction between IRS, for which evidence was found in only 40% of the cases, and MRS, for which scat or a foot print was found in 70% of the cases. These numbers impressively underline the emergency in implementing preventative measures at the existing road kill sites as well as for potential risk sites during road construction.

Descriptions of the preventative measures follow in part 2 of the report appearing in the next OSG Bulletin

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R E P O R T

MAJOR STEPS TAKEN TOWARDS OTTER CONSERVATION IN INDONESIA

Roland Melisch[1], Priyo Budi Asmoro[2], Listya Kusumawardhami[3]

1Institute of Zoology, University of Hohenheim PO Box 700562, D-70593 Stuttgart, Germany
2Asian Wetland Bureau-Indonesia, PO Box 254/BOO, Bogor 16002, Indonesia
3Directorate General of Forest Protection and Nature Conservation (PHPA), Jl.Ir.H. JuandaNo. 15, Bogor 16002, Indonesia

Abstract: A cooperative project on otters of West Java undertaken by the Indonesian Directorate General of Forest Protection and Nature Conservation (PHPA) and Asian Wetland Bureau- Indonesia is nearing completion. Fieldwork was carried out and data collected in 15 representative wetland areas between July 1993 and May 1994 to determine which otter species occur, and their distribution and habitat use in West Java. Final reports are in preparation and will be available by the end of this year (1994). The conclusions are presented, translated from Indonesian, which identify threats (wetland conversion to rice fields, settlements, aquaculture, pollution, prey reduction due to pollution and direct conflict as pests), summarise the role of otters (enrich Indonesian biodiversity, a matter of national pride, ecological health indicators, control of pests in rice fields, public entertainment) and suggest follow-up (immediate listing as protected, guarding of hybrids to prevent escape into the wild, improving public awareness, foundation of an Indonesian Friends of the Otter group, standardisation of otter names).

A cooperative project on otters of West Java undertaken by the Indonesian Directorate General of Forest Protection and Nature Conservation (PHPA) and Asian Wetland Bureau- Indonesia is nearing completion. Fieldwork was carried out and data collected in 15 representative wetland areas between July 1993 and May 1994 to determine which otter species occur, and their distribution and habitat use in West Java. Final reports are in preparation and will be available by the end of this year (1994).

Two otter species, the Asian Small-clawed Otter *Aonyx cinerea* and Smooth-coated Otter *Lutrogale perspicillata* occur on Java. *A. cinerea* occurs in a range of habitats from coastal and other lowland wetland types up to 2000 metres above sea-level, whereas *L. perspicillata* is restricted to coastal wetlands. Both species are threatened by wetland pollution, especially by the misuse of pesticides in agriculture and aquaculture, by conversion of natural habitats and, to a lesser extent, by hunting. The Smooth-coated Otter is especially endangered, with only a few small, isolated populations remaining. One main scientific question, the possible occurrence on Java of Hairy-nosed Otter *Lutra sumatrana* and Eurasian Otter *Lutra* /M/ra,both very rare in Southeast Asia, was answered: earlier records of *Lutra lutra* and *Lutra sumatrana* for Java were found to have been misidentifications, and during field work and museum collection analyses no evidence of either of these two species was found.

Both the otter species that do occur play a significant role in everyday farming life in West Java: *A. cinerea* has been found to be a predator of certain rice-field pests, but both species also have bad reputations for raiding fresh-water and brackish-water fishponds. Predation by otters may locally severely affect small-farming pond schemes, but during this survey traditional methods which prevent otters from pond-raiding without causing them harm were observed. During the West Javan Otter Project a total of 85 people from Indonesia, including forestry officers and rangers, three scientists and three students were trained in otter survey techniques.

Another major step towards raising awareness and attention for the species in Indonesia was the implementation of a first national symposium on otters. On 7 April 1994, about 150 participants gathered in Bogor, West Java, for the "First Symposium on Otters in Indonesia"; they included key government officials from nature conservation departments and agencies, mammalogists, fisheries and agriculture experts, NGO representatives, university students and other interested parties. Ten contributions were presented and discussed by the participants, all of which were observed and well-

documented by the Indonesian press, radio and TV. Topics ranged from the natural history of Indonesian otters to applied problems such as wetland pollution and conversion, fishpond raiding, otters as pest control, rearing otters in zoos, otters as bioindicators, nature conservation efforts, conservation legislation and otter hunting.

One of the most important outcome of the Symposium was the proposal that all four otter species be protected under Indonesian law, and this proposal was presented to the Indonesian Ministry of Forestry, the authority responsible for species conservation legislation. At the time of writing, the Minister of Forestry has just agreed to the legal protection of all otter species in Indonesia, The Proceedings of the First Symposium on Otters in Indonesia have been published in Indonesian with English abstracts and are available from AWB-Indonesia (PHPA & AWB-Indonesia 1994).

***ACKNOWLEDGEMENTS** - The West Javan Otter Project received joint support from Artists United for Nature, German Agency for Technical Cooperation - Flanking Programme for Tropical Ecology (GTZ-TOB), Vater-und-Sohn Eiselen Stiftung, Leica Camera GmbH, Kodak, Metropolitan Zoo Toronto, Carl Zeiss, Aktion Fischotterschutz, British Airways Assisting Nature Conservation, Singapore Airlines, University of Hohenheim, University of Veterinary Medicine, Vienna and Zoological Society for the Conservation of Populations and Species. The symposium was generously supported by Artists United for Nature, the Indonesian Directorate General of Forest Protection and Nature Conservation (PHPA) and Asian Wetland Bureau-Indonesia. The authors are grateful to everybody who was so supportive during field and office work and to Rosie and Mike Ounsted for comments and editing.*

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APPENDIX:

The following conclusions have been translated from a legal document in the Indonesian language. In the event of disputed interpretations, the Indonesian version will always be the final version [translation by Roland Melisch, Asian Wetland Bureau-Indonesia]

CONCLUSIONS OF THE FIRST SYMPOSIUM ON OTTERS IN INDONESIA

The participants of the First Symposium on Otters in Indonesia, which took place on Thursday, 7 April 1994 at Jalan Juanda 15 in Bogor, West Java, agreed the following conclusions:

A. INTRODUCTION

1. Indonesia harbours the highest diversity of otter species in the world. The four otter species occurring in Indonesia are the Asian Small-clawed Otter *Aonyx cinerea*, Smooth-coated Otter *Lutrogale perspicillata*, Eurasian Otter *Lutra lutra* and Hairy-nosed otter *Lutra sumatrana*.

2. All four otter species occur on three of the larger islands in Indonesia: Java, Sumatra and Kalimantan [Indonesian Borneo], and on smaller adjacent islands.

3. All the aforementioned otter species are listed under CITES Appendix I or II, but are not yet listed as protected wildlife species under Indonesian law.

4. Because of the lack of information and research, the otter is not widely known in Indonesia. In rural areas otters are perceived to be a pest in fisheries.

B. THREATS TO OTTER SURVIVAL

Otters are threatened because:

1. The designation of wetlands for functions such as rice-fields, settlements and brackish-water pond schemes is leading to a decline ini suitable otter habitat;

2. Habitats are being degraded by pollution caused by the uncontrolled use of toxic and hazardous substances in the agriculture and fishery sectors;

3. Prey species are being poisoned by the chemicals mentioned above, thus leading to a declining in otter populations in the wild;

4. Otters are still generally perceived to be pest species and efforts are frequently made to exterminate them.

C. THE ROLE OF OTTERS IN THE ECOSYSTEM AND THEIR BENEFITS FOR THE PEOPLE

1. Otters are wetland wildlife species that enrich Indonesian biodiversity, which is a source of national pride.

2. As top predators in wetlands, otters are very important in safeguarding a balanced ecosystem. They can also act as indicators of wetland habitat conditions.

3. One of the acknowledged agricultural benefits of otters is their role in helping to control destructive crabs in rice-fields.

4. Otters are highly intelligent and may be trained for public entertainment.

5. Extinction of otters would not only reduce Indonesia's wildlife diversity which forms part of the national pride, but also disturb the equilibrium of wetland ecosystems.

D. FOLLOW-UP

1. **Initial Attempts At Species Conservation**

    a. Because of declining populations the otter should be listed immediately as a protected species.

    b. Hybrids between Asian Small-clawed Otters and Smooth-coated Otters in captivity at Gelanggang Samudera Ancol should be closely guarded and monitored to prevent the escape of hybrid offspring.

2. **Improvement Of Public Awareness**

    a. Information extension is urgently needed about the otter's role in wetlands, practical methods to limit otter attacks on fishponds and the use of appropriate pesticides. Information should be directed towards the community in general, with special emphasis on forestry and agricultural [including fishery] officers,

    b. The foundation of an "Indonesian Friends-of-the-Otter Group" should be encouraged. The group could include students, high-school students and other people with an interest in following-up efforts for otter conservation.

3. **Proposed Standardization Of The Indonesian Names Of The Four Otter Species**

    A proposal should be made to LIPI [The Indonesian Institute of Sciences] for the standardization of the names of the four otter species, such as

for *Aonyx cinerea*	Berang-berang cakar kecil
for *Lutrogale perspicillata*	Berang-berang bulu lichi
for *Lutra lutra*	Berang-berang utara
for *Lutra sumatrana*	Berang-berang hidung berbulu

Signed on behalf of the participants by the Director of Nature Conservation, Dwiatmo Siswomartono
Bogor, 7 April 1994

SHORT COMMUNICATION

THE REAL OTTERS FROM ARGENTINA

Aníbal Parera

FVSA, Defensa 245 6 K, 1077 Buenos Aires, Argentina

This is a Fundacion Vida Silvestre Argentina's recent publication. The title is related to the people's big confusion about the native false-otter (*Myocastor coypus*). Argentina is one of the few countries in the world with four species of otters, and this publication refers to advances in what is known about them. The author has been working with *Lutra longicaudis* and *Pteronura brasiliensis* in the country during the last three years.

The price of this publication is $ 9.- mail costs $ 12.-.

SHORT COMMUNICATION

STUDIES ON OTTER IN KWAZULU-NATAL, SOUTH AFRICA

David Rowe-Rowe

Natal Parks Board, FOB 662, Pietermaritzburg, 3200 South Africa

The first stage of a project on South African otters in the mountainous Natal Drakensberg Park has been completed. The basic aim was to obtain indications of area requirements and relative abundance along three rivers within the park, as well as on farmland immediately outside the park. The two species involved were Cape clawless otter *Aonyx capensis* and spotted-necked otter *Lutra maculicollis*. Caterina Carugati, who completed the first stage of the project (one year of fieldwork), has now been joined by Ilaria D'lnzillo Carranza. They are limiting their study area to one of the rivers surveyed by Caterina, the Mooi River in the Kamberg area of the Drakensberg. More refined techniques will be employed, such as radio telemetry and the injection of isotopes, and the study has been expanded to include the water mongoose *Atilax paludinosus*. The aims are to obtain data on area requirements, social organisation, and niche overlap of the three amphibious carnivores. To date three spotted necked otters have been captured and fitted with radio transmitters. As far as is known, this is the first telemetry study on this species.

SHORT COMMUNICATION

OTTER WORK IN THE WESTERN CAPE PROVINCE, SOUTH AFRICA

Michael J. Somers

Department of Zoology, University of Stellenbosch, Private Bag X5018, 7500 - Stellenbosch, South Africa

The work being done by the University of Stellenbosch investigating otters as biological indicators of freshwater ecosystem in South Africa is progressing well. The first aim of the project is to assess the role of both species of otter (spotted-necked otters *Lutra maculicollis* and Cape clawless otters *Aonyx capensis*) in freshwater ecosystems, and the factors and mechanisms responisble for limiting their populations (their role as biological indicators will be inferred from these results) and secondly, to contribute to our understanding of carnivore behavioural ecology.

The first stage in determining the distribution and status of spotted-necked otters and Cape clawless otters, in South Africa, and possible effects of environmental variants have, is almost complete. A detailed autecological study of Cape clawless otters in two rivers is now the main focus of the project. Six otters have had radio transmitters implanted: MP/300/L, implantable transmitter, 40g 80 x 20 mm diameter cylinder (Telonics Inc., Arizona, USA). Since implanting, one male has died of unknown causes. A post mortem revealed total healing from the operation. Much new behavioural and ecological information has been gained by the use of the radio tracking. One adult male has a home range of at least 45 km, much more than first expected for the species. Work has also been done in the Eastern Cape Province determining the diet of three coexisting carnivores, spotted-necked otters, Cape clawless otters and water mongoose (*Atilax paludinosus*). This work is about to be submitted for publication. We thank the Southern African Nature Foundation (WWF), for providing funds, and Mazda Wildlife Fund for providing a vehicle for the project.

R E P O R T

THE OTTER (*Lutra lutra*) IN CENTRAL FINLAND

Risto Sulkava

Lampilantie 8, Fin - 42800 Haapamäki, Finland

Abstract: The otter population on the upper tributaries of the Kokemäenjoki-river system was carefully surveyed by snow-tracking in 1985 - 1993. The otter population in the study area increased in the last eight years. All otters appear to be born in summer. The otters travel in their large home range all year round. Traffic (cars), fish traps and fish hatcheries caused the most of otter deaths. The diet is 60% small fish, with frogs and toads being seasonally important.

The otter population on the upper tributaries of the Kokemäenjoki-river system was carefully surveyed by snow-tracking in 1985 - 1993. The study area was about 2800 km^2. The home range, activity, reproduction and food of otters were studied at the same time. Results of the short surveys were compared with the known number of otters in the area.

The otter population in the study area increased in the last eight years (Figure 1). In 1985 there were about 25, and 1993 about 40 otters, and now the otter population is rather dense. From 3 to 5 litters are born per year in the area with 1-3 cubs in each of them. All otters appear to be born in summer. The otters travel in their large home range all year round. The signal activity of otters varies seasonally and scent marking intensity is highest in autumn. Traffic (cars), fish traps and fish hatcheries caused the most of otter deaths.

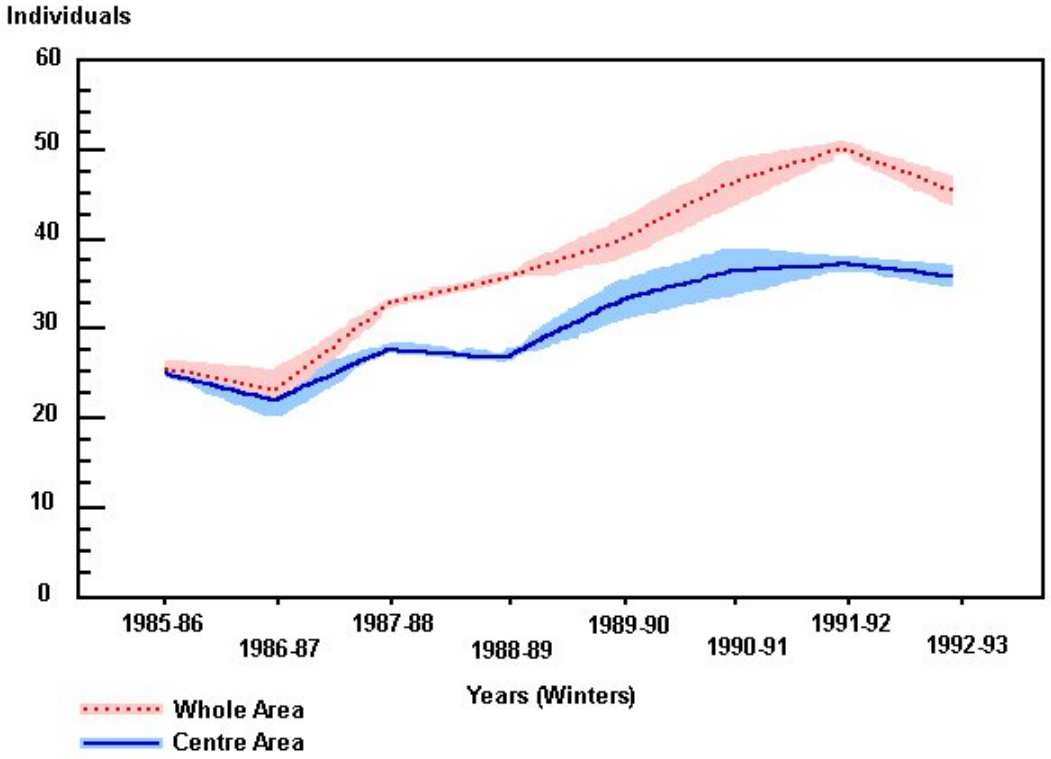

Figure 1. The number of otters in the study area in 1985-1993

The short snow-tracking method gives a good picture of the distribution of otters. It also gives some information of the number of otters in the study area. This kind of winter study provides the same information as the standard-survey method ini summer, but far less work is needed in winter.

The diet of otters consists mostly (63%) of small fish (10 - 15 cm in length). The diet varies seasonally, in winter frogs *(Rana sp.* and *Bufo bufo)* are very important food items (33%), especially in small streams, where most otters live in winter.

R E P O R T

OTTERS INCREASING - THREATS INCREASING

Andreas Kranz

Institut für Wildbiologie und Jagdwirtschaft, Peter Jordanstr. 76, A-1190 Wien, Austria

Abstract: In some parts of Central Europe populations of otters are apparently increasing. Until recently, no research was being conducted on the ecology of otters in mainly artificial habitats like fish farms. Otters are not only a new source of conflict requiring species management, but appear once again threatened by illegal hunting. Austria is dealing with this problem using compensation for otter damage, electric fencing and translocation of problem otters. Despite a rise in illegal killing, Austria does not formally recognise this as a threat.

In some parts of Central Europe populations of otters *(Lutra lutra L)* are apparently increasing. In Austria the species currently inhabits 15% of its original habitat (Gutleb, 1992). The number of dead otters found here increased from one in 1984 to thirteen in 1993 (Gutleb, 1994). Claimed damage caused by otters in fishfarms increased from 42,000 AS in 1984 to more than 1,200,000 ATS in 1992 (Bodner, 1994). Both the increased traffic victims and damages can only partly be explained in terms of more public interest in this species. No data from adequate surveys are available from former years. However, there is a consensus among fishfarmers, conservationists (Schnogl, 1994), hunters and scientists that otters have increased in terms of number and area inhabited as well. The situation seems similar for parts of the Czech Republic and of Hungary.

Until recently, no research was being conducted on the ecology of otters in mainly artificial habitats like annually drained ponds for carp *(Cyprinus carpid)* production. Since a few years, Austrian, Czech and Dutch research activities are attempting to fill this gap. In this pond area, fish, the most common food for otters, is abundant. Direct observations revealed that otters, well known as a solitary single-living species (Sandell, 1989), can form groups of up to eight animals (Kranz, in prep.). Groups occur either along streams when access to fish in ponds is restricted by ice, or at ponds with very high stocking levels of fish.

In Lower Austria a spraint survey was carried out six times a year (1992 -1993) in an area of 36 km^2 including 140 artificial ponds. Otters never visited 55 of these ponds and another 27 ponds only once, indicating that suitable habitat remains. Moreover, an average of one illegal trap (mostly leg-hold traps) per 9 km^2 was found. They were obviously set for otters.

X-rays taken of two otters killed by traffic revealed shotgun pellets (Gutleb, 1994), and one of two radio-tagged otters was shot by a poacher in the Czech Republic in 1992 (Miller et al., 1994).

Obviously, otters are not only a new source of conflict requiring species management, but appear once again threatened by illegal hunting. How is Austria dealing with this problem?

1. Damage presumably caused by otters is reimbursed by WWF Austria, local hunter and nature conservation associations, and by the governement (Bodner, 1994).

2. Electric fences are tested to keep otters away from most valuable ponds (Bodner, 1994).

3. Translocation of otters from pond areas is in a first stage of discussion (Schnogl, 1994).

4. Illegal killing has not yet been recognized as a severe threat.

The present situation is both unsatisfactory and difficult. (If you have any good ideas as to how this problem can be solved, please write to me !

ACKNOWLEDGEMENTS: I am very grateful to H. Gossow for critical comments on the manuscript.

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R E P O R T

HEAVY METALS, OCPS AND PCBS IN SPRAINTS OF THE OTTER FROM SLOVENIA

Arno C. Gutleb

Department of Toxicology, Landbouwuniversiteit Wageningen, Tuinlaan 5, NL-6703 HD Wageningen, The Netherlands

Abstract: The otter has declined in most of its former European range. Little attention has been paid to the problem of pollution in the former east European countries. This study surveyed the parts of Slovenia that were adjacent to Austria, and where positive otter signs were found. Otter numbers and distribution seems to have changed little since 1984, being restricted to certain watercourses. In the rivers where otter sign was found, pollution levels of heavy metals, organochloropesticides and PCBs were low enough to cause no problems. Further investigations are recommended.

The otter *(Lutra lutra)* has declined in most parts of its former range in Europe. Much attention is paid to the contamination of otters and their habitats but little information is given on that problem in former east European countries. Furthermore little information is available on the distribution of the otter in these countries. Hönigsfeld (1984) gives an overview on the occurrence of the otter in Slovenia. No data are available on the contamination of otters from Slovenia.

STUDY AREA AND METHODS

Only the parts of Slovenia adjacent to the areas in Austria with positive otter signs were surveyed. The samples were collected in 1992 and 1993 as part of a study on the contamination of various contaminants in Austria and some neighbouring countries (Gutleb, in prep). A total of 39 sites was surveyed for otter signs following the method of Macdonald (1983).

All samples were kept deep frozen prior to analysis. Heavy metals were detected in single spraints by using AAS. For the analysis of organochloropesticides and PCBs up to ten spraints from the same place were put together and contaminants were determined with a GC-ECD-system. All details on the methods will be given in Gutleb (in prep.).

RESULTS AND DISCUSSION

33,3 % of the controlled sites were positive (see Map 1). The otter seems to be widespread along River Pesnica and River Ledava. No spraints were found on River Scavnica, River Drava, River Dravmia and its small tributaries coming from the mountains east of Maribor. Otter signs were also observed on small fish ponds near the border with Styria/Austria and local fishermen complain on the damage occuring in the cold months of the season (Kraus, pers. comm).

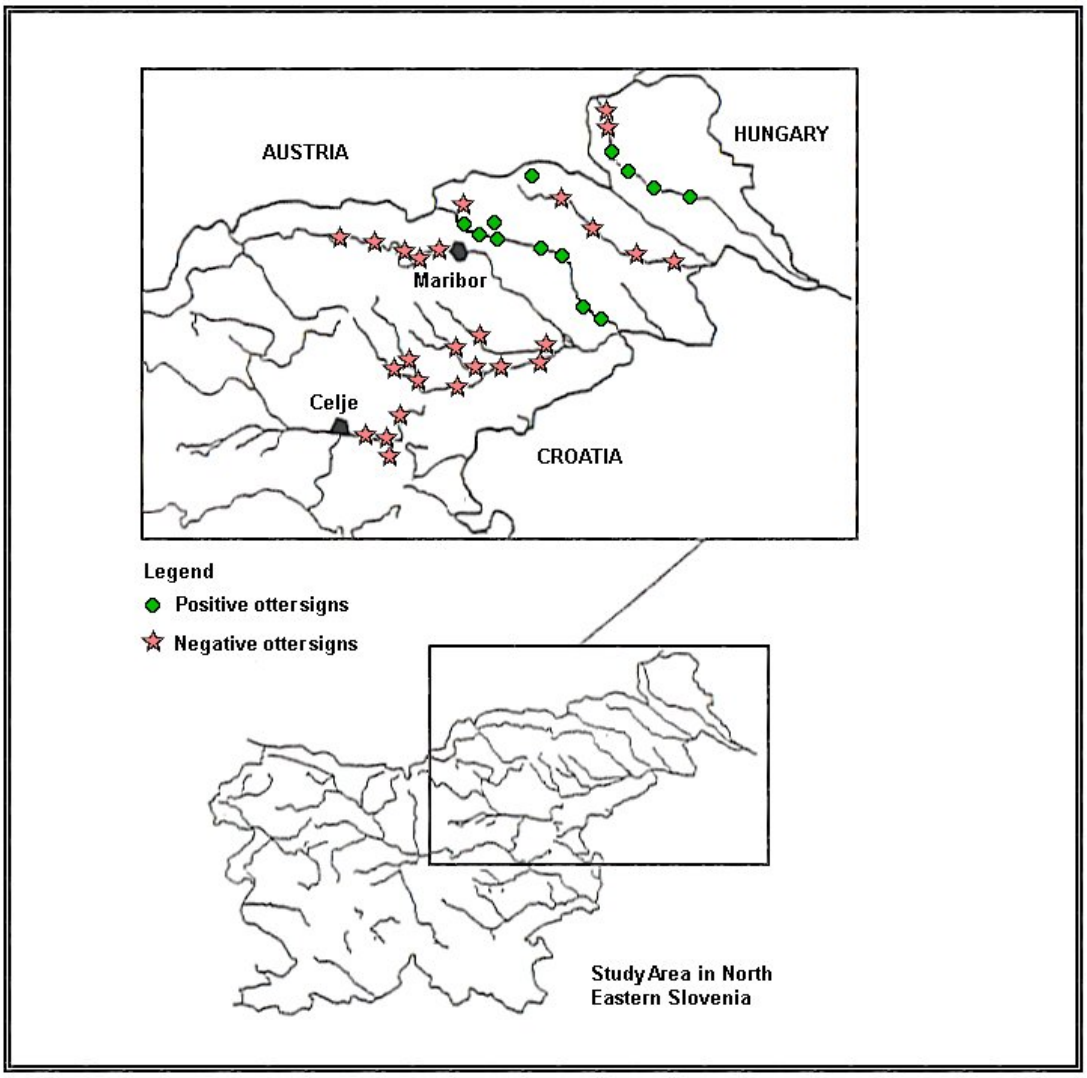

Figure 1: The area of investigation in north-eastern Slovenia

The mean concentrations of the various contaminants in spraints are given in Table 1 and Table 2.

Table 1: Heavy metals in otter spraints (Cd, Pb, Zn, Cu: mg/kg dry weight: Hg mg/kg fresh weight)

		Cadmium	Lead	Zinc	Copper
Pesnica	**X**	0.08	0.72	602.8	9.91
	n	22	22	22	22
	min-max	nd - 0.24	0.07-1.99	249.1 - 880.4	0.4 - 48.3
Ledaval	**X**	na	na	na	0.12
	n				5
	min-max				0.01 - 0.21

na = not analysed; up to three spraints were pooled for mercury analysis

Table 2 : Organchlorpesticides and PCBs in otter spraints (mg/kg fat weight)

		α-HCH	β-HCH	γ-HCH	HCB	DDD	PCBs
Pesnica	n	2	2	2	2	2	2
	min-max	nd - 0.02	0.03 - 0.1	nd - 0.8	nd - 0.05	nd - 0.016	0.223 - 0.634

Up to ten spraints were pooled. The PCB-data are summarized from the amount of seven congeners (IUPAC Nr. 28, 52,101, 118, 138, 153, 180).

The concentrations of heavy metals were lower or in the same range of magnitude previously found in other areas. These levels are assumed to be of no concern for otters (Mason and Macdonald, 1986; Mason, 1989).

Aldrin, dieldrin, endrin, heptachlorepoxid, DDE and DDT were not detected in the samples. The amounts of pesticides and PCBs in the spraints were low compared to data given for areas in England or Scotland (Mason et al., 1992; Mason and Macdonald, 1993a,b). The total value of organochloropesticides and PCBs was lower than the proposed no effect level of 4 mg/kg in spraints (Mason et al., 1992).

CONCLUSIONS

The otter population in the north-eastern parts of Slovenia is scattered and restricted to some watercourses, in general the situation seem to be unchanged compared to the conclusions of Hönigsfeld (1984). Pollution should to be no problem in the two rivers with positive otter signs.

Further investigations on the occurence and contamination of otters in Slovenia could give also important information for possible threats to the otter population in the south east of Austria and are therefore strongly recommended.

ACKNOWLEDGEMENTS - This publication is part of a study which was supported in various parts by Hoechst Austria, Hochschuljubilaumsstiftung Wien, Nationalbank Osterreich and Zentralstelle Osterreichischer Landesjagdverbande.

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R E P O R T

ASPECTS OF PCB LEVELS IN DANISH OTTERS (*Lutra lutra*) AND NOTES ON THE LEVELS IN STONE MARTENS (*Martes foina*)

Morten Elmeros[1] and Pim Leonards[2]

[1]*Biologisk Institut, Odense Universitet, Campusvej 55, DK-5230 Odense M, Denmark*
[2]*Instituut voor Milieuvraagstukken, Vrije Universiteit, De Boelelaan 1115,1081 HV Amsterdam, The Netherlands*

Abstract: The widespread decline of otters in most of lowland Europe has been linked to bioaccumulating toxic chemicals such as PCBs. The Danish population is become restricted to the North West of the country. Liver samples from otters collected between 1991 and 1994 were analysed for PCB content, and this was compared to levels from stone martens, which are found throughout and beyond the otter range. In general, PCB levels were below that thought to cause reproductive and physiological failures, except around Karup. Concentrations in eels was higher than in other fish sampled, especially in Karup, but were not selectively eaten by otters. A larger PCB survey in the otter range and adjacent catchments should be done to find out if PCB concentrations are preventing southward expansion of the otter population

INTRODUCTION

A number of factors have been linked to the widespread decline of otter populations *(Lutra lutra)* in most of lowland Europe.

The contamination with bioaccumulating toxic chemicals as PCBs are regarded as being at least partly responsible, and will process a continuous thread causing reproductive implications in the remaining otter populations (Mason and Macdonald, 1986; Olsson and Sandegren, 1991) and other mustelids. Information on contaminants in stone martens *(Martes foina)* are scarce (Gutleb and Leonards, 1991).
The Danish otter population became restricted during the last decades to the north western parts of the country which now holds a thriving population mainly around the western Limfjord (Madsen *et al*., 1992).

METHODS

From otters collected between 1991 and 1994 32 liver samples were selected for analysis from animals representing three areas, marine around the western Limfjorden, and two freshwater systems Skals and Karup Stream (Figure 1).

A small number of fish and spraints were collected at locations representing the three areas. 10 spraints from each locality were combined to one sample. Fish samples were made up by muscle tissues from 3-4 individuals, eel samples from the freshwater catchments 10.
Additionally two stone martens found within the distribution area of otters in Denmark were analysed.
Levels of 26 PCB congeners were determined on a GC-ECD Hewlett-Packard 5890 A against individual PCB standards. Reported are the preliminary results on the total PCB concentration (sum of 26 congeners).

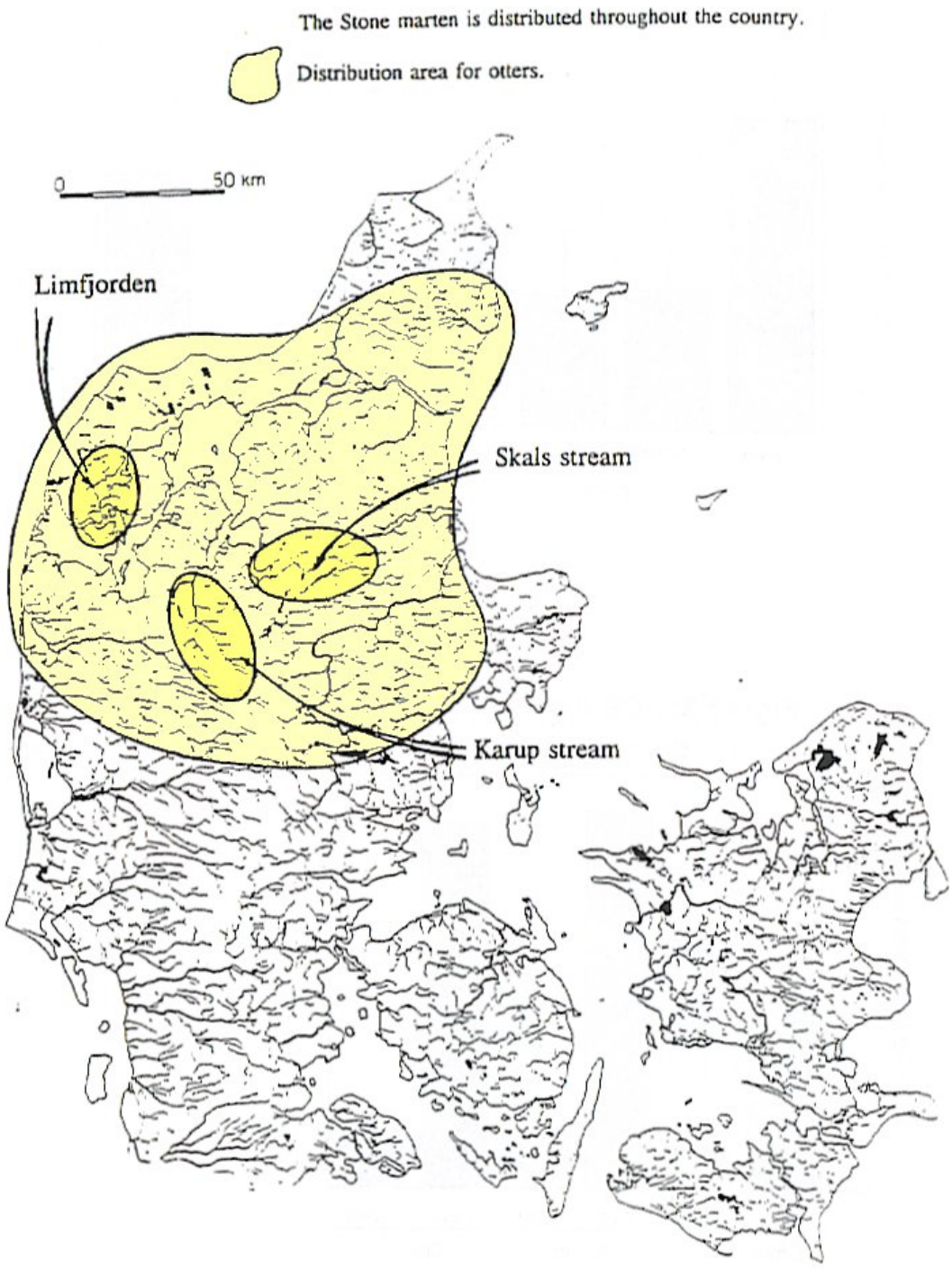

Figure 1. Catchments in Denmark from which samples were obtained

RESULTS AND DISCUSSION

Otter

The concentrations in otters (1.2-32.8 mg/kg lipid weight, see Figure 2) correspond with the reported generally low levels of PCBs in Danish otters collected from 1980 to 1990 and with levels in other stable European populations (Mason and Madsen, 1993; Olsson and Sandegren, 1991).

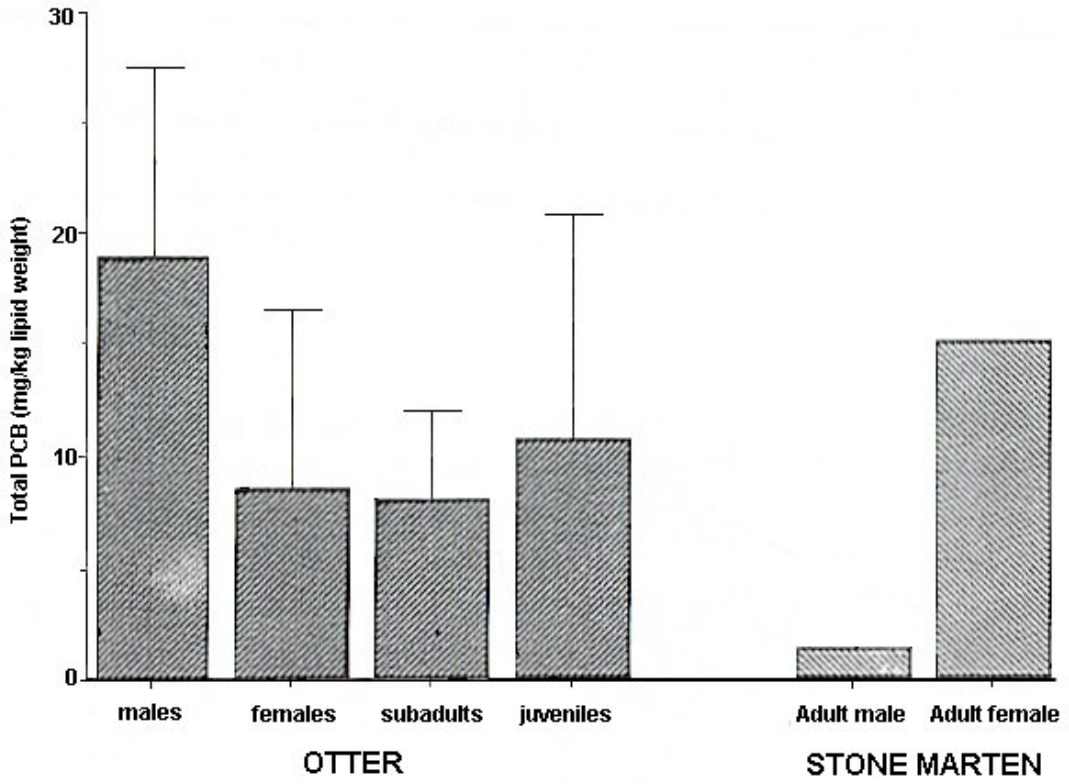

Figure 2. PCB levels in otter and stone marten

An annual decline in the PCB concentrations reported by Mason and Madsen (1993) is not evident in this study, but the total mean is lowered compared to the mean from otters collected in the 1980's. 47 % of the otters analysed in this study had concentrations greater than 10 mg/kg lipid weight the proposed no effect level (70 % in Mason and Madsen, 1993).

Only one otter not included in Figure 2 showed a PCB concentration exceeding the critical concentration 50 mg/kg (18 % in Mason and Madsen, 1993) used assessing threats to otter populations (Olsson and Sandegren, 1991). This was an adult male in very poor body condition with an exceptional high PCB burden of 225.36 mg/kg (lipid weight). It suffered hepatitic disorders, with a liver weight at 10 % of the total body weight skinned (Henriksen, National Veterinary Laboratory, pers. comm.).

Fish

The most important fish species show PCB levels below the no effect reproduction level of 0.025 mg/kg fresh weight in food for mink *(M. vison)* (Den Boer, 1984). PCB contamination in eels from the freshwater catchments Skals and Karup streams exceeds this level.

Figure 3 showed a higher level of PCBs in eel than roach or trout from the same area. Otters show no food preferences eating up to 10 % eels only in the surveyed catchments, hence the average PCB concentrations in food below must be considered under the no effect level.

On the islands in the southern part of Denmark where otter populations expired in the 1980's, higher levels of PCBs have been measured in fish (Anderson *et al*., 1986).

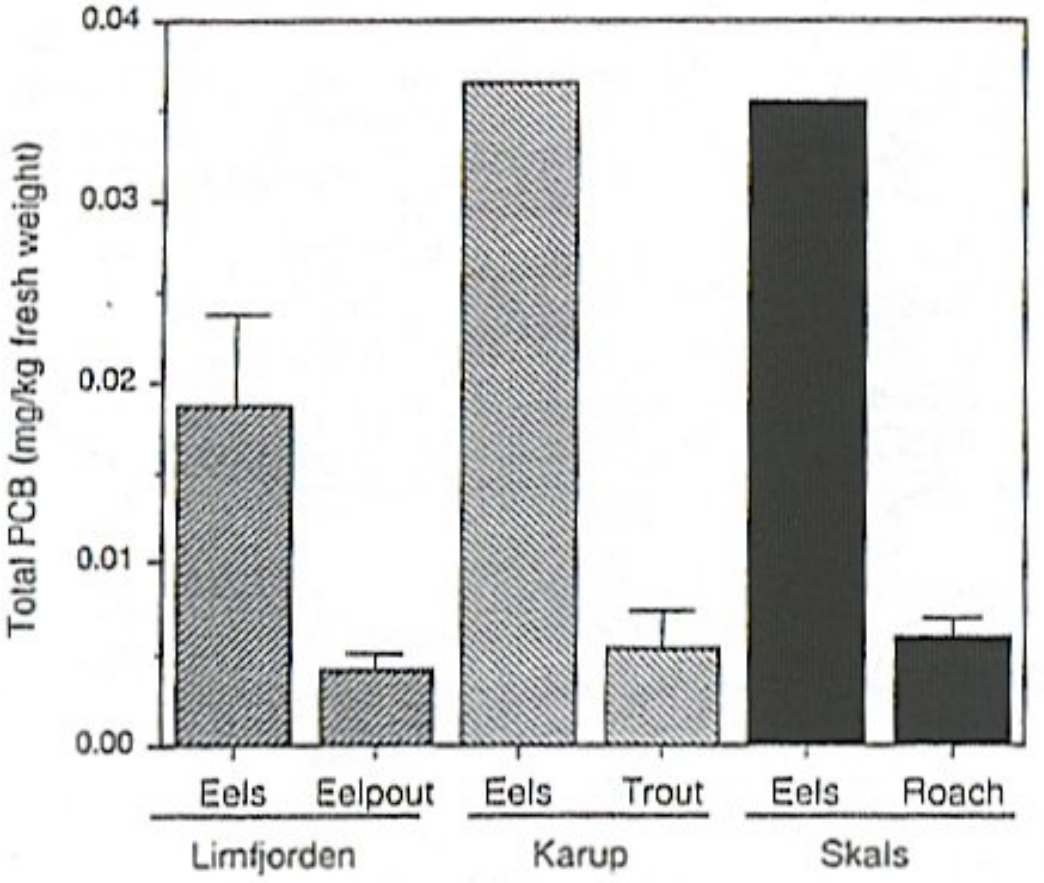

Figure 3. PCB levels in fish from different areas

Spraints

In 71 % of the spraints from the stronghold of the Danish otter population around the western Limfjord, the PCB concentrations were below the proposed no effect level of PCBs of 4 mg/kg lipid weight (Figure 4). None were above the level of concern at PCB concentrations higher than 9 mg/kg lipid weight proposed by Mason and Macdonald (1993), which are used as guidelines for levels in spraints. The spraints from the southern most site in this study Karup all exceeded this latter level.

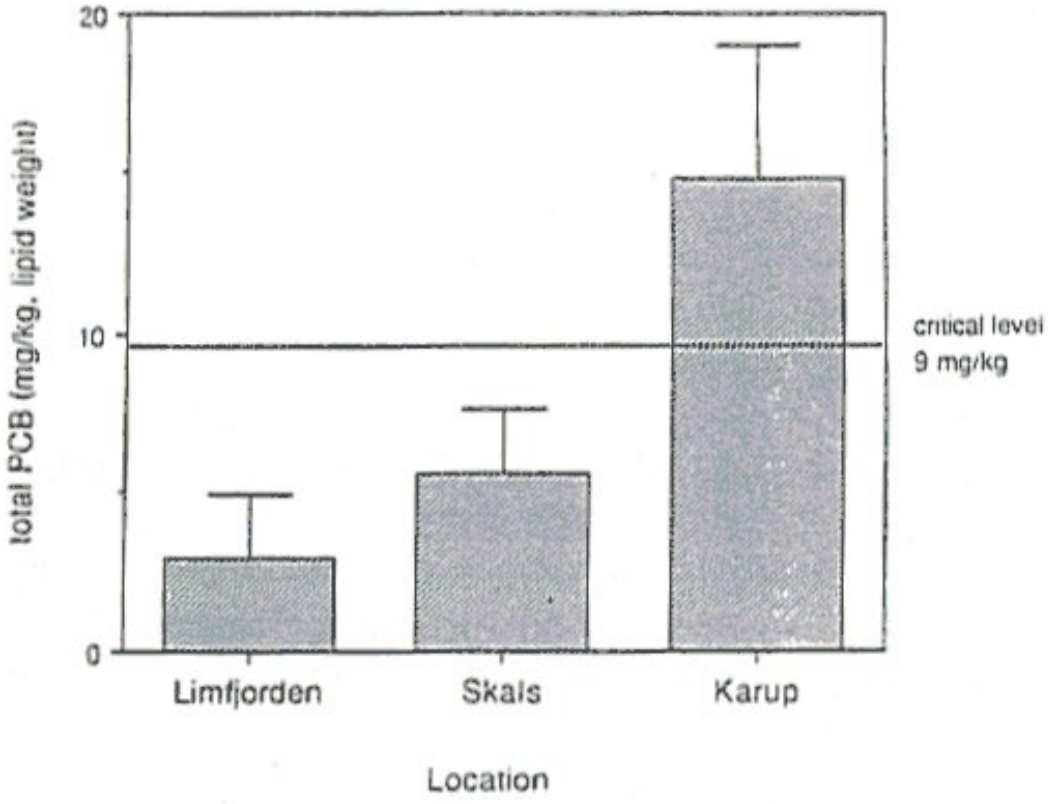

Figure 4 . PCB levels in spraints

Stone Marten

Gutleb and Leonards (1991) reported PCB concentrations in Austrian stone martens just below the no effect level for mink (3.9 to 9.0 mg/kg lipid weight). Low concentrations should be expected in stone martens due to their terrestrial habits. As shown in Figure 2, the male had a low PCB level at 1.3 mg/kg (lipid weight) but surprisingly high concentration of PCBs was found in the liver of a lactating female, 15.1 mg/kg. It had drained most of its fat deposits but with a body weight on 1.4 kg it must be regarded as in generally healthy condition. Identical concentrations were seen in subcutaneous fat from the male and mammary glands in the female (0.42 mg/kg lipid weight). The high PCB concentrations in the liver of the female reflects a higher metabolism and recirculating of the PCBs stored in the body fat and a differential distribution of PCBs among organs during reproductive stages as demonstrated in mink by Patnode and Curtis (1994).

The lipophilic character of PCBs allows them to be efficiently excreted during the lactation through the milk, as illustrate by a female otter killed together with her 3-4 month old cub (PCB concentrations 1.2 mg/kg; 5,7 mg/kg respectively) (Figure 5). A subadult male killed at the same location (11,8 mg/kg) and a juvenile from the Karup catchment had relatively high levels of PCBs, 27.7 mg/kg, indicating that young animals experience high PCB stress; 1. because of a relative higher PCB contamination in the milk, and 2. because of a limited elimination through anal gland secretion (Leonards *et al*., 1994).

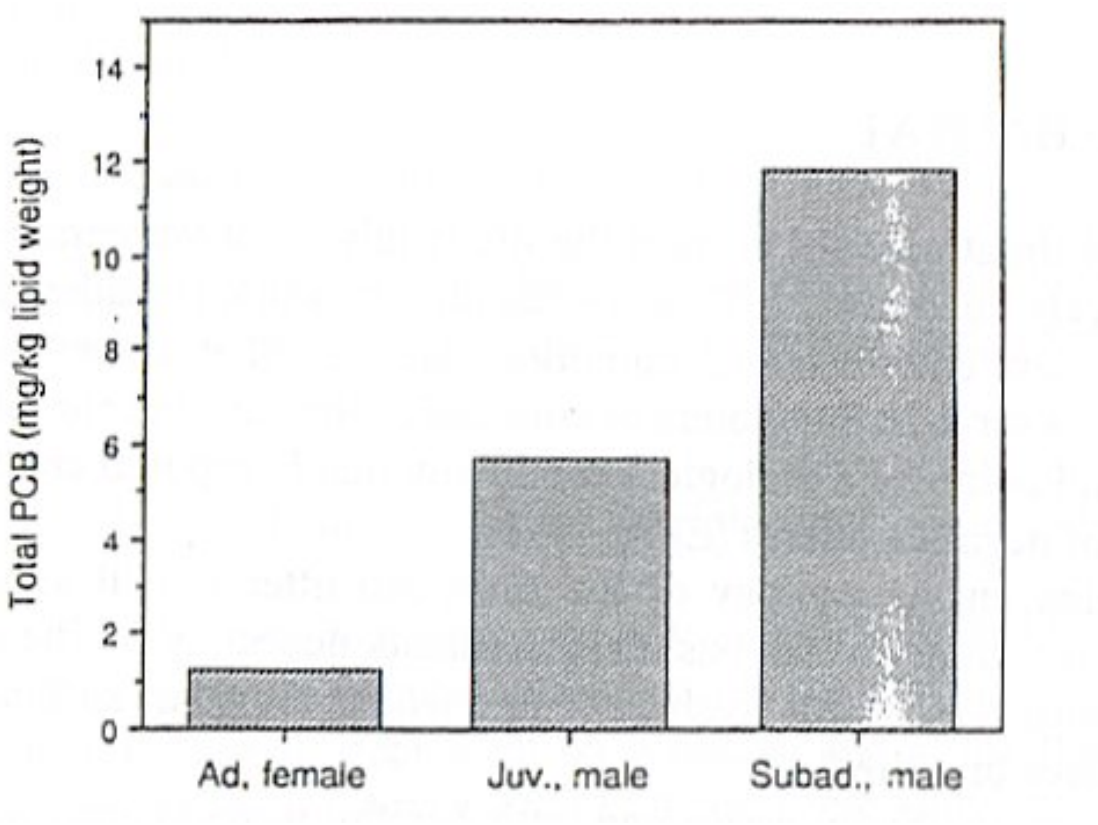

Figure 5 . PCB levels in mother and cub.

CONCLUSIONS

The general picture of the contamination of PCBs in Danish environment must be regarded as low, under the critical reproduction level to the remaining otter population in Denmark (and indeed other mustelids).

More research should be focused on a larger survey of PCB levels in spraints and the contamination in fish from different water systems where the otter is already resident and in adjacent catchments to determine the importance of PCB in inhibiting the Danish otter population from expanding further south.

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R E P O R T

MONITORING *Lutra lutra* HABITATS IN PORTUGAL: A CONCEPTUAL PLAN

Anabela Trindade

ICN, Rua Filipe Folque n°46, 1°, 1000 Lisboa, PORTUGAL

Abstract: The Eurasian otter is widespread in Portugal but their range may be reducing. Its survival depends on protecting its habitat. A method for monitoring the quality of otter habitat by regularly assessing certain habitat descriptors is proposed. If carried out over several years in the same conditions, this would enable habitat quality changes to be assessed

THE STATUS OF THE OTTER IN PORTUGAL

In Portugal *Lutra lutra* occupies a wide range of freshwater habitats (estuaries, marshes, dams, rivers, streams) as well as the rocky SW coast. The species is widespread throughout the country, in oligotrophic upland streams, lowland rivers, near rice-fields, fish farm ponds, "canalised" rivers among others, but there is evidence that its range is probably becoming restricted in some areas.
Since 1974 it is a legally protected species in Portugal.

The Portuguese population is usually considered as one of the most important in Europe.

The future of *Lutra lutra* in Europe depends on safeguarding the individuals and its habitats in those countries where the species is still widespread and thriving. Conservation of currently viable population must be given top priority (Mason, 1990 in: Foster-Turley, MacDonald and Mason eds.).

OTTER AND HABITAT

The types of habitat required to meet the life requisites of vertebrate species have been extensively documented. Thus, vertebrates are often considered to be useful indicators of how environmental conditions are changing within those habitats. Vertebrates can serve as integrators of cumulative impacts, because they are often the trophic end points of a biological continuum that is exposed continuously to a broad range of negative effects (EPA, 1991).

Our knowledge on the ecology of the European otter is still scarce, in many aspects, but we do know the basic requirements necessary for its survival. We know that *Lutra lutra* needs freshwater throughout the year, sufficient food and shelter, and breeding sites.

Otters' presence is usually associated with healthy wetlands and a strong otter-good habitat quality relationship exist. As otters are at the top of a food chain, they can be important indicators of environmental change.

MONITORING WILDLIFE HABITATS

Inventory and monitoring of wildlife habitats is based on the assumption that measurements of a set of habitat attributes can be used to predict presence or abundance of wildlife species.

Wildlife habitat monitoring consists of repeatedly measuring habitat variables to infer changes in the capability of the land to support wildlife. It provides the essential data on how systems are changing and how fast. The purpose is usually issue-oriented, i.e., to determine how human activities, such as industry or gravel extraction, are affecting a wildlife habitat and ultimately a wildlife population. Otters are shy, elusive and largely nocturnal thus being an difficult study object. It is widely accepted that field surveys can provide the most accurate and objective results on otter distribution and relative status within a country or region.

Typically, a monitoring programme consists of measuring habitat variables that are required by key species or which correlate with the presence or abundance of such species.

The presence or absence of mammalian carnivores, which occupy the higher trophic levels, may serve as warning signs that habitat conditions or pollutant loads are reaching critical levels. For example, clearing riparian vegetation in a river bed can thus be assumed to cause a reduction in the number of otter signs. Otters disappear, maybe temporarily, from areas where no suitable habitat remains.

Having this in mind, we have designed a conceptual plan for monitoring *Lutra lutra* habitats in Portugal.

PURPOSE - What is the aim of monitoring *Lutra lutra* habitats?

It is aimed at analysing current wetland status, providing a basis for the detection of changes and trends through time in wetland habitats and, consequently, on otters distribution.

METHOD - What is to be monitored? How can this aim be achieved?

Although no national survey has been carried out, data collected recently (1990-1993) indicate that otters are distributed all over the country (Figure 1). The 0tter is one of the native mammals most dependent on wetlands and given the impossibility of monitoring all Portuguese wetlands we must choose some sampling sites.

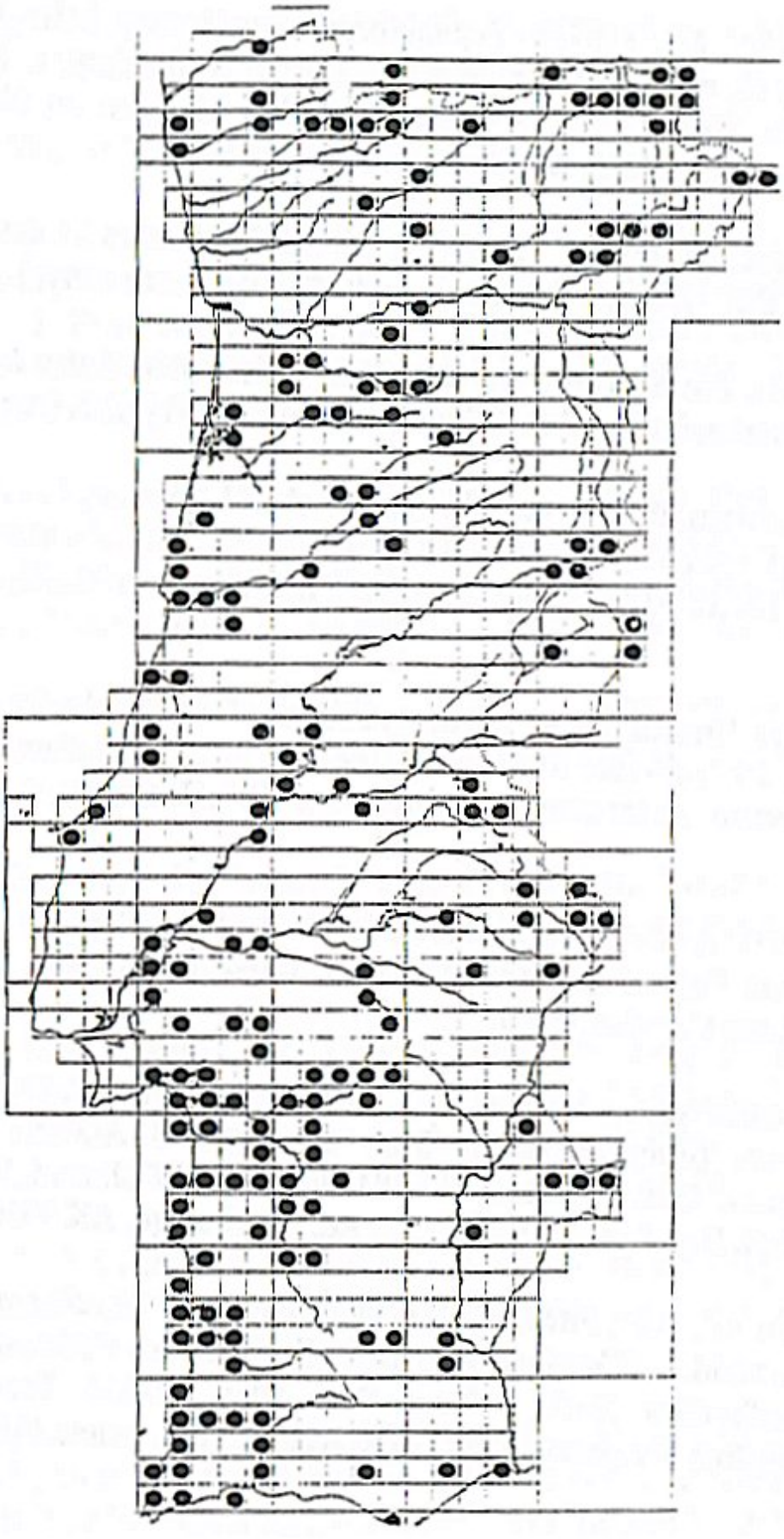

Figure 1. Otter distribution in Portugal (presence confirmed after 1990).

Site selection

Sites will be selected in order to assure a national geographical coverage and the "representativeness" of the multiplicity of habitat types (river, stream, marsh, dam, etc.). All catchments will be considered (Figure 2). In larger catchments one site per 1000 km^2 of catchment total area will be analysed and in smaller catchment areas at least one site would be considered Sites are not randomly selected but weighed in terms of representativity of each catchment characteristics.

Figure 2 . Main catchment areas in Portugal

Indicators of ecological condition of the wetland site which included physical, chemical and biological descriptors (habitat variables and otters presence) are measured.

A data sheet is completed at each survey site and the scores are summed. An essential component of monitoring is the repeated collection of data over time The frequency of monitoring must be at 2-3 years intervals. It is advisable to survey the same regions in the same season and ideally once when the water level is minimal (dry season) and once when it achieves its maximum (rainy season).
Descriptors (Table I)

Table 1: Some physical, chemical and biological descriptors

Water Colour	Condition of habitat
Water Smell	Layers of vegetation
Visible water pollution	Water presence
Turbidity	Cover
Water quality	Availability of potential prey
PH	
BOD	Main threat factors
Presence of PCBs, heavy metals, etc	Amount of Human disturbance
Mean water temperature	Type of human disturbance
Mean depth	Land use and impacts
Mean river width	Man-made features
Flow (velocity)	Distance to the closest village
Bank slope	Accessibility
Substrate	
Geology	Area of the catchment area
	Weather and climate (rainfall, evaporation,
Geomorphological features	temperature, etc.)
Habitat description	Altitude
List of plant species	Distance to the riverhead
	Total length (river, stream, coastline) or area
List of animal species	(dam, marsh, etc)
	Otter signs
	Otter's historical occurrence

Habitat Variables - It is not possible to measure everything - choice is imperative. Habitat variables are chosen to represent elements of habitat structure, including cover, quality of water and human disturbance, among others. Each variable will be scored according to a scale of values. Despite physical and chemical variables being relatively easy to measure they provide little information about the response of ecosystems or species. As living organisms integrate the impact of many variables and their biological efficiency, productivity or balance within the ecosystems, they indicate the overall health of a system (Holdgate in Spellerberg, 1991). Thus the direct surveillance of biological characteristics should also be considered. The descriptors should be strictly comparable.

Otters' Presence - The presence of the species is normally assessed by signs (spraints, smears, anal jellies and footprints). At each site a maximum of 600m is searched for otter signs, and in their absence the site is considered negative for otter presence (standard survey methodology in Macdonald 1983) The same author stressed that there is no known direct relationship between the number of signs found and the number of animals present. Field surveys can only provide some indication of the relative status of otter population.

Data Analysis - How can the data be analysed? Development of data analysis procedures will be an ongoing activity of the program. The data analysis could be conducted in order to quantify the current status and condition of wetlands on a national scale, detect trends in wetland condition through time and diagnostics for identifying plausible causes of declining or improve wetland conditions.
Attempts are made to find appropriate index that incorporate a set of information. Similarity index and cluster analysis can be used to quantify differences between successive samples from each site. Multivariate and discriminant analysis could quantify differences between sites where signs of presence are found and those where signs absent and identify the variables responsible for such differences.

Data Interpretation - What might the data mean? - Its results can be as difficult to evaluate as any other scientific data about complex systems. The collected data will provide periodic assessment of wetland status and trends. The rate of change considering the presence/absence of otter in one site can be quantified and used along with habitat variables, giving a fairly detailed but informative account of the changes which took place, as a basis for evaluating the threatened status of *Lutra lutra* in Portugal.

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