

**IUCN**

# **OTTER SPECIALIST GROUP BULLETIN**

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**Aventis Pasteur MSD**

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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.

Submit material for publication and requests for copies to:

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## **NOTE FROM THE EDITOR**

In the last issue there was a very big mistake for which I have to apologise to the authors of the manuscript. I cannot explain how it happened but in the end we printed the draft version and not the revised version of the manuscript 'Records of the Giant Otter, *Pteronura brasiliensis*, from Guyana'. On page 64 of this issue you can find the erratum written by the authors (A. Barnett, B. Shapley, S. Lehman, E. Henry and P. Benjamin) and to which I have nothing more to add. Starting on page 65, the final version is included.

This brings me to a general point of concern - many manuscripts sent to the Bulletin are written in a very slovenly way, with missing tables, missing or extra references, etc. This causes a lot of extra work to both the reviewers and to me. I therefore strongly ask all authors to check their manuscripts before (!) sending them to me, and not to send me the first erratum some minutes after the draft version has been sent. I know this can happen in the hectic turmoil of daily life, but when I have several versions with only small differences it makes my work definitely harder.

Thanks to Dave Rowe-Rowe, Silke Hauer, Lionel Lafontaine and Andreas Kranz who sent me information on recent publications.

The printing of this issue was sponsored by Aventis Germany.

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) translated some of the abstracts into Spanish. I have to thank the 'Otter Bulletin Team' - Barbara Gutleb-Rainer (Oosterbeek), Hans van den Berg (Wageningen), Els Hoogsteede-Veens and Erwin Hellegering (GRAFISCH SERVICE CENTRUM VAN GILS, Wageningen) - for their continuing help. Tobias and Helena once again arranged the envelopes.

**IUCN/SSC OSG GROUP**

**FROM THE CHAIRMAN'S DESK**

When this issue of our Bulletin will be published the VIII International Otter Colloquium in Valdivia/Chile will be in progress or will already be finished. We all hope for a fruitful meeting and hope it reaches one of its main targets, i.e. to give an impetus for otter work in Latin America.

One of the topics for this meeting of otter people from all over the world will be a discussion on the future membership structure of the OSG. Those who are interested in membership should be aware that the OSG is not an independent organisation. It is part of the Species Survival Commission (SSC) of IUCN - The World Conservation Union. The framework for the expectations of, and the preconditions for, those who want to join this unique network of scientists and conservationists is described on the SSC website:

<http://www.iucn.org/themes/ssc/species/spec30/memguide/engmem.htm>

More information about OSG membership regulations will be available from March 2001 through the Chair of the OSG.

Since the OSG is serving the SSC, knowledge about the work and the targets of the SSC should be mandatory for everybody who wants to be part of the OSG. Three documents were recently published which are recommended for further information.

The Strategic Plan of the SSC for the period 2000-2010

(<http://www.iucn.org/themes/ssc/news/stratplanintro.htm>)

shows (i) how the Commission is contributing to the wider biodiversity conservation agenda of IUCN, (ii) sets measurable priority targets, (iii) provides a rationale for the choices of additional priorities, and (iv) provides guidance to the Specialist Groups. This Strategic Plan was ratified at the World Conservation Congress held in October 2000 in Amman. As part of this congress, a two-day working meeting of the SSC took place, which I attended. A short report about this meeting is available at

<http://www.iucn.org/themes/ssc/memonly/amman.htm>.

A more detailed report, with summaries of all presentations, is available from the OSG Chair ('SSC report'). An overview of the SSC's work over the last three years is given in the triennial report for 1997-99, available at:

<http://www.iucn.org/themes/ssc/memonly/trienreport9799.htm>.

The most important information about the 2nd World Conservation Congress in Amman for OSG members might be the publication of the new 2000 IUCN Red List, available at:

<http://www.iucn.org/redlist/2000/index.html>,

and the introduction of the Species Information Service – SIS, available at:

<http://www.iucn.org/themes/ssc/programs/sisindex.htm>.

It is planned that the latter will be available for Specialist Groups by 2001.

A very successful workshop was held in November for the OSG and Aktion Fischotterschutz (Germany) at the German otter centre in Hankensbüttel. Forty-two participants from all over the world tried to answer the question 'How to implement the Otter Action Plan?'. In the opening session, the structure of the new Otter Action Plan (OAP), and the expectations from this plan for the different

regions, were introduced. In four very intensive discussion workshops, recommendations were prepared as to how the OAP could be implemented on the international, the national, the scientific, and the public level. The proceedings of this workshop will be available in March from Aktion Fischotterschutz.

Another successful workshop, attended by several OSG members, was organised in September by Paul Yoxon (International Otter Survival Fund) and Jim Conroy (ITE Banchory) on the Isle of Skye. The meeting brought together experts in the field of toxicology who tried to standardise methodologies and provide meaningful data for comparative purposes. The proceedings of this workshop will be published soon. One outcome of this meeting was also the setting up of a toxicology list server. Those interested in joining this list are asked to contact Paul Yoxon ([iosf@otter.org](mailto:iosf@otter.org)).

It was at this meeting that Arno Gutleb and Jim Conroy agreed to finish the preparation process for the proceedings of the VII International Otter Colloquium, held in Třeboň. We all should thank these colleagues for their efforts. It is hoped that, through the financial support of Aktion Fischotterschutz, the proceedings will be published in early spring of 2001.

Another recent publication (autumn 2000) has already had a very positive response: the report 'Surveying and Monitoring Distribution and Population Trends of the Eurasian Otter (*Lutra lutra*)', written by 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. and Trindade, A. The report has been published as issue no. 12 of HABITAT, the scientific journal of Aktion Fischotterschutz. This book of 148 pages contains the evaluation of a great number of survey reports. The conclusions drawn from this process form the basis for an update of the operational guidelines for the 'Standard Method' for surveying and monitoring distribution and population trends of the Eurasian otter. From my point of view, this cooperative effort of 13 authors from 8 European countries forms a remarkable step forward towards standardising and making comparable data for the whole of Europe.

The Hankensbüttel workshop in November was also connected with a meeting of the board of editors of the OAP. On the basis of more than 400 pages of manuscripts prepared so far, the board decided on some alterations to the structure of the OAP. For me, as chairman of this board, it was a pleasure to experience the constructive and forceful atmosphere of this meeting. As a result of this meeting, the membership of the board was restructured. It now consists of Michaela Bodner, Rosemarie Green, Arno Gutleb, Syed Hussain, Marcela Kucerova, Gonzalo Medina, Jan Nel, Janice Reed-Smith, Kevin Roche, Christof Schenck, Tom Serfass, and myself. Some other colleagues have been, or will be, asked to join this board. It is hoped that this meeting, and the new structure of the board, will give this important project a new impetus.

This is also what I expect for the work of the OSG for the year 2001. The VIII International Otter Colloquium, a new membership structure for the OSG, and the Otter Action Plan, should form a good basis for increasing the efficiency of the OSG still more. I would like to thank all otter people who supported the work of the OSG in the year 2000, especially those who contributed to a remarkable extent to the preparation process of the OAP. I hope that this enthusiasm can be kept (and possibly increased) over 2001, and may act as a model for others who are invited to contribute to the work of the OSG and to join the worldwide 'otter family'.

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## ERRATUM

**Records of the Giant Otter, *Pteronura brasiliensis*, from Guyana.**

**A. Barnett, B. Shapley, S. Lehman, E. Henry, P. Benjamin**

**IUCN Otter Specialist Group Bulletin 17, 46-51, 2000**

Changes were made to this text without the knowledge of the authors, who did not see a final galley proof. There are substantial differences between the published version and the submitted text. A number of errors have crept in which were not in the submitted version. These include:

- p. 46, abstract: for 'Pteronura' read '*Pteronura*'
- p. 47, para. 1, line 2: for "Bellany" read 'Bellamy'
- p. 47, para 2, line 13: for 'approximatly' read 'approximately'
- p. 47, para 3, line 1; for 'Subsequenly' read 'Subsequently'
- p. 48, para 1, line 1: for 'despite', read 'Despite'
- p. 48, para 1, line 2: for 'approximatly' read 'approximately'
- p. 49, para 4, line 1: for '(Lehman, 1998)' read '(Lehman, 1999)'
- p. 49, para 4, lines 7 & 8: for ' ... its skin for for food.' read 'its skin nor for food.'
- p. 50, acknowledgments, line 3: for 'Engstron' read 'Engstrom'
- p. 50, acknowledgments, line 4: insert 'Bill Saul (Academy of Natural Sciences, Philadelphia),'
- p. 50, references: insert: **Lehman, S.M.** 1999. The Biogeography of the Primates of Guyana. Ph.D Dissertation, Washington University, St. Louis, MO.

There are also several errors of punctuation - but to correct these now is considered a bit too pedantic.

A copy of the original ms. can be obtained by e-mailing Adrian Barnett at: [infovore@wombat.net](mailto:infovore@wombat.net)

## REPORT

### RECORDS OF THE GIANT OTTER, *Pteronura brasiliensis*, FROM GUYANA

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**Abstract:** The results of interviews and surveys of status of the giant otter are presented. These include information on *Pteronura brasiliensis* on the upper Potaro River and other rivers in Guyana. Suggestions are made for future work on giant otters on the Potaro Plateau. These include monitoring the effects of mining, studies of mercury poisoning, ecotourism feasibility studies and autecological studies.

#### Introduction

As one of the Neotropics largest piscivores, the giant otter *Pteronura brasiliensis* is an apex predator and a good indicator of the health of the riverine ecosystems it inhabits. The 1996 IUCN Red List categorizes *P. brasiliensis* as vulnerable: VU A2cd\* (BAILLIE and GROOMBRIDGE, 1996). In a recent review of the biology of the species, CARTER and ROSAS (1997) called for the species to be placed in the 'endangered' category. The IUCN-SSC Otter Action Plan (FOSTER-TURLEY et al., 1990) considers the species to be severely threatened (p. 64) and call for more field surveys and refined distributional data (p. 82). Within Guyana, they consider distribution and status surveys to be conservation priorities for the species (p. 70).

In their review of the status of *P. brasiliensis* CARTER and ROSAS (1997) note that Guyana is one of the species' last major strongholds (see also FOSTER-TURLEY et al., 1990). In Guyana, *P. brasiliensis* has been recorded from several river systems including the upper Mazaruni, upper Essequibo, Abary, Rupanuni and upper Potaro (CARTER and ROSAS, 1997). However, many of these records are more than a decade old. Here we report recent sightings of *P. brasiliensis* on the Potaro Plateau, western Guyana, and other localities within the country (Fig. 1).

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\* Vulnerable. Declining population. Population decline projected or suspected based on, decline in area of occupancy/quality of habitat, actual or potential levels of exploitation.





Figure 1: Sightings of *P. brasiliensis*

## MATERIALS AND METHODS

### Interviews:

i) As part of a country-wide primate survey conducted between November 1994 and August 1997 (LEHMAN, 1999), interviews were conducted with forty local people during surveys along rivers. Interviews consisted of:

- 1) having people identify local aquatic mammals from pictures,
- 2) asking for local names of aquatic mammals,

- 3) asking people to distinguish between aquatic mammals that occur in the immediate area versus those that occur elsewhere in Guyana,
- 4) asking for physical descriptions of each species,
- 5) asking about the relative abundance of aquatic mammals in the area [i.e., not found, sometimes seen, abundant, very abundant], and
- 6) requesting information on hunting techniques. The main occupation of the interviewees was ascertained whenever possible (e.g. hunter, logger, pork knocker [miner], farmer).

Pictures were laminated plates from EMMONS and FEER (1990) and laminated photographs of non-neotropical mammals.

- ii) Between June 20 and August 4 1998, zoological surveys were conducted on the southwestern portion of the Potaro Plateau as part of the Potaro Plateau Zoological Expedition (PPZE). Questions relating to otters were also included as part of a broader interview about the region's mammals (BARNETT and SHAPLEY, 1999; BARNETT et al., 2001; BARNETT et al., in press; SHAPLEY, et al., submitted; SHAPLEY et al., in prep.).

Questioning was oral, informal, did not follow a rigid questionnaire and centered on laminated colour photocopies of the plates in EISENBERG (1989) and REID (1998). These included those of canids, procyonids and felids as well as Neotropical Mustelidae. The PPZE conducted twenty-seven such interviews in the Patamona indigenous villages of Chenapou and Tiger Bay and at Kaieteur Falls with the staff of the Kaieteur National Park. Question protocol followed that used by CUNHA and BARNETT (1989) and, following BELLAMY (1993), was designed to avoid leading questions. Most interviewees were older men, each considered within the community to be of good character and well-informed about the region's animals. All were long-term residents of the Plateau. Interviews consisted of:

1. having interviewees identify local mammal species from the laminates;
2. asking for physical descriptions of various species;
3. asking about the relative abundance of selected mammal species (primates, giant otters etc.) in the area (i.e., not found, rare, sometimes seen, abundant, very abundant); and
4. requesting information on hunting techniques (if any).

#### Surveys:

- i) One of the authors of this article (S. LEHMAN [SL]) recorded encounters with *P. brasiliensis* that occurred opportunistically during the countrywide primate survey mentioned above. During this, a total of 596 km of river was surveyed by canoe. Surveys were conducted along the following rivers: Abary, Berbice, Mahaicony, Madewini, Wikki, Wairuni, Canje, Pomeroun, Arunamai, and Sebai. Rivers were surveyed by paddling slowly (1.5-2.0 km/h) along riverbanks, either alone or with the assistance of local guides. During surveys, data were recorded on:

- 1) species of aquatic mammal,
- 2) time of day,
- 3) weather,
- 4) riverbank habitat,
- 5) number of animals in group,
- 6) cue by which animals detected,
- 7) activity, and
- 8) location using a Magellan NAV 5000D global positioning system.

*Ad libitum* notes on behaviour, vocalizations, and group composition were made whenever a group of *P. brasiliensis* was encountered.

- ii) Between July 28 and 1 August 1998 (wet season), paddling canoes, the other authors actively searched for *P. brasiliensis* at two locations, Muri-muri Creek and Anamuri Creek in the eastern part of the Potaro Plateau. Both creeks are left bank tributaries of the Potaro River. Choice of these locations followed the advice of local fishermen. Both are small creeks (no more than 4m wide), less than 3m deep, and fallen trees frequently block passage on them. The creek banks are of mud and white sand and, at the time of the survey, were between 0.5 and 1.5m above water level. Because of the black-water nature of the river, aquatic plant biomass is low (GOULDING et al., 1988; JUNK and FURCH, 1985). Searching began shortly after dawn and continued until mid-afternoon each day. An estimated total of 18 km of creek was paddled during the survey period.

## RESULTS

### Guyana-wide, surveys:

A group of four adult-sized *P. brasiliensis* were observed on April 20, 1995, near the headwaters of the Mahaicony River (6°9' 54" N, 57°, 56', 13"W). The animals were extremely shy. The first individual to see the approaching boat gave an alarm call that sent the entire group diving and swimming for cover under trees overhanging the riverbanks. Attempts to approach the group failed and the animals swam quickly away. *P. brasiliensis* (N=3) were seen on December 31, 1995, near the headwaters of the Canje River in NE Guyana (5° 12' 54" N, 57°30' 04"W). The group appeared to be composed of two adults and a juvenile or sub-adult. All animals were extremely shy and swam away from the boat quickly and quietly.

That giant otter on the upper Berbice have little experience (or fear of) humans is illustrated by an encounter on June 6, 1996, with a group of *P. brasiliensis* near a natural dam known as The Gate (5° 6' 54"N, 58° 13' 4"W). During the evening whilst camped alongside the river, SL heard a noise coming from the boat. Investigating with a flashlight, SL startled an adult *P. brasiliensis* that had climbed into the boat! The animal jumped into the water and, with seven other *P. brasiliensis*, spent the next twenty minutes vocalizing and barking, apparently chastising him for disturbing them. There are no permanent human settlements in the region of The Gate, although there are small groups of gold miners who work in the area.

Terry HENKEL (pers. comm.) reports that giant otters were recently seen along the Sipu River and they are very abundant along the Kuyuwini River (south-east of Aishalton). WARREN (1971) reported giant otters to be abundant on the Kato and lower Waruma rivers (though not recent, this record is mentioned since it is not included in CARTER and ROSAS [1997]).

### Guyana-wide, interviews:

Whether or not *P. brasiliensis* was reported as being hunted varied locally and seemed strongly influenced by the people's cultural precepts. Overall, most informants reported that *P. brasiliensis* was hunted neither for its skin nor for food. There were two exceptions: one apparently well-travelled informant, interviewed at Kaieteur Falls, said that otters were hunted near some of the bauxite mines in eastern Guyana, and interviews conducted with Bush Negroes (N=5) along the Canje River revealed that giant otters- as well as manatees and river otters- were hunted (no otters were seen along this river). In addition, there were persistent, but unsubstantiated, reports from the Rupanuni District of pelt collecting and subsequent shipment to Brazil. On the Mahaicony River, most people along the river's northern half are Hindus whereas the southern half of the river is used almost exclusively by Amerindians. Hindus interviewed during surveys (N=8) informed SL that giant otters are not hunted for food due to Hindu religious taboos. (Amerindians along the Mahaicony River were not interviewed due to lack of permits).

### Potaro Plateau, surveys:

On July 28 two giant otters were seen entering the water as we approached an otter campsite on Muri-muri Creek. The site had a holt entrance (approximately 60cm high and 40cm wide), amongst the roots of a large tree (DBH > 60cm). This lay within 3m of a very gently sloping muddy bank that led to a small shallow embayment. The site, estimated at 10m long and 3m wide, contained a fresh spraint and several identifiable piles of fish scales and bones. Samples were collected, washed and dried. Based on scales and teeth these have been identified by William SAUL (Philadelphia Academy of Natural Sciences) as (probably) *Aequidens*, *Guianacara* or *Geophagus* (all Cichlidae). On the Potaro Plateau fish of these species are rarely longer than 15 cm (EIGENMANN, 1912; BENJAMIN, pers. obs.; HENRY, pers. obs.). Fish reported in the otter diet are generally much larger than this (DUPLAIX, 1980; LAIDLER, 1984; CARTER and ROSAS, 1997).

Subsequently four giant otters were seen some 200m upstream beneath dense overhanging vegetation. They showed little fear of us, supporting the statements of local people that they did not hunt them. The otters stayed low in the water much of the time. When they did elevate their bodies, intervening vegetation meant that we were unable to record any of the individually characteristic throat patterns.

Three individuals appeared to be approximately the same size, the fourth animal appearing a little larger and with a bigger head. This may indicate a pair, accompanied by last year's young. Eleven more campsites were seen in a 5 km stretch of the creek. None were in use, all being overgrown to some extent with vegetation or sprouting seedlings, indicating that the creek had been a favoured otter habitat for several, possibly many, years.

On July 30, two adult-sized giant otters were seen on Anamuri Creek 9.5 km upstream from Muri-muri. The two creeks are more than 1 hour apart by motor boat and, from available maps (and BENJAMIN, pers. obs.) do not appear connected. As the sighting here and on Muri-muri Creek were only two days apart it is difficult to believe that the animals on these two creeks are from the same group, even though the distance lies within the reported group home range size for *P. brasiliensis* (3 km by DUPLAIX, 1980; 32 km by LAIDLER, 1984).

Again, the creek showed evidence of prolonged usage by the otters, with 8 former campsites being counted in the 4 km stretch surveyed. An old, disused, holt with an entrance some 50x30cm, was found. It was dug beneath the roots of a large tree, on a steep muddy bank, less than 1m from the river. The surveyed portion of the creek is probably the only part that is habitable by otters. After this, the banks become very steep and rocky as the creek flows over a ridge system and the scant soil is very sandy.

Prior to the sightings by the PPZE, SL had visited Muri-muri Creek on foot in March 1995 (dry season) from Kaieteur Falls. Two *P. brasiliensis* were seen and a number of bank-side resting spots were found.

#### **Potaro Plateau, interviews:**

All interviewees knew the giant otter well. In each case, individuals clearly distinguished between *Pteronura brasiliensis* and *Lutra longicaudis* and between these and the region's other carnivores (plus a number of spurious alternatives). In all cases, *P. brasiliensis* was considered common in small creeks, but rare on the main river. It was reported to be present in the creeks in the dry season, while in the rainy season the species was considered to range more widely through the wet and flooded forest. Though local knowledge of the region's waterways was extensive and detailed, all seven interviewees who expressed an opinion on the matter gave the same four creeks as supporting otters (of which those surveyed are two). This indicates some degree of habitat specificity. In interviews at Kaieteur Falls, informants reported that *Pteronura* was common nearby, particularly along some of the more remote streams. The Patamona name for the giant otter is turáclá.

Patamona interviewees at Chenapou, and miners at Kaieteur Falls, all reported that giant otter steal fish from nets. However, all were adamant that they took no punitive action and that the giant otter was hunted on the Plateau neither for food nor for its pelt.

At several locations on the Plateau's rivers, dredging operations occur, seeking to extract diamonds and gold from the riverine sands. These activities cause considerable sedimentation to the waters (Carol KELLOFF, pers. comm.; authors, pers. obs.). Interviewees reported that such operations cause the giant otters to shift their range. One river, the Ireng, where *P. brasiliensis* were formerly considered common, was now said to be too polluted by mining activities to be habitable by them. But other rivers were said to have been recolonized by giant otters after mining operations had ceased.

Though the species was not sighted, we had frequent reports of Neotropical river otter *Lutra longicaudis* in the region. In contrast to the giant otters, these were considered to live almost exclusively in the main river and rarely, if ever, enter the creeks. By contrast, SL, working mostly with miners in the Kaieteur Falls region of the park, did not receive any reports of *L. longicaudis* in the region. The Patamona name for this species is saró.

## DISCUSSION

Though subject to some detailed botanical work (MAGUIRE et al., 1948; HENKEL, 1994; KELLOFF and FUNK, 1998), the Potaro Plateau has been little studied by zoologists (BARNETT and SHAPLEY, 1999; LIM and ENGSTROM, in press). Only one previous published record of giant otter exists for the Plateau, a sighting of a family of six on the Kwitaro River by Elizabeth and Keith LAIDLER in 1981. This brief visit, an adjunct to the former's PhD fieldwork, was reported only in the popular book *The River Wolf* (LAIDLER and LAIDLER, 1983, p. 162) and did not appear in her thesis (LAIDLER, 1984). CARTER and ROSAS (1997) cite the record, but they do not give the locality. The Kwitaro is some 7.5 land km/ 17.75 river km upstream from the current localities. The LAIDLERS considered the Plateau's *P. brasiliensis* population to be "healthy". Though both surveyed creeks showed evidence of long use by giant otters, our survey was too brief and too restricted confirm or deny the LAIDLERS' subjective optimism.

The apparent lack of hunting, the absence of commercial (as opposed to subsistence) fisheries in the region and the proximity of the observed sites to the airstrip near Kaieteur Falls, would make the site a promising one for future fieldwork. This might also be important for the conservation of the Plateau's giant otters. The two creeks are less than 15 km from the commercial community of Menzies' Landing, which is itself close to the airstrip at Kaieteur Falls. The proximity of an airstrip at Kaieteur Falls would facilitate the logistics of any future detailed studies of the giant otters of the Potaro Plateau. Such studies could address a number of conservation-related issues:

- **Clarifying the conservation status of *Pteronura* on the Potaro Plateau:**

This could include studies of the effects of sedimentation from dredging on the giant otters distribution and a study the levels of mercury in both the food fish and in the otters themselves (see, e.g. EVANS et al., 1998; HARDING et al., 1998). Up to 45% of mercury used in small-scale gold mining can enter adjacent rivers as metallic mercury (GROENENDIJK et al., 2000), and is a potential threat to giant otter populations far from the contamination source (GUTLEB et al., 1997).

- **The potential impact of ecotourism:**

Several thousand tourists visit the Falls every year (ANDERSEN, 1996; WORLD BANK, 1998) and it must be considered a strong possibility that ecotourism, offering visits to see the giant otters, could develop without regulation. Ecotourism, especially when unregulated, has been shown to be a potent source of stress for *P. brasiliensis* in Peru (STAIB and SCHENCK, 1994a), causing loss of litters (STAIB and SCHENCK, 1994b) and abandonment of traditional localities (SCHENCK et al., 1999; GROENENDIJK et al., 2000). Base-line ecological studies of the Plateau's otters could establish the feasibility of ecotourism operations and study, and perhaps recommend, acceptable limits for the frequency of such visits.

- **Comparative ecological studies:**

1. Few *P. brasiliensis* have been recorded at higher altitudes: OCHOA et al. (1993), working in Venezuela's Canaima National Park, over the border from the Potaro study site, records giant otter only from its lower altitudes. EMMONS (1993) records *P. brasiliensis* from Guyana's Kanuku Mts., but does not give an altitude. Given the social and behavioural plasticity of this species (CARTER and ROSAS, 1997), the great rarity of fish longer than 20 cm on the upper Potaro and its affluents (EIGENMANN, 1912; BENJAMIN, pers. obs.; HENRY, pers. obs.) could have effects on the otters social ecology. It would be interesting and instructive to compare the ecology of Plateau's otters with those of The Gate, on the upper Berbice River.
2. the Plateau has three aquatic carnivores: the two otters and the yapok (*Chironectes minimus*). Synecological studies could focus on the interactions between them.

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**Résumé: Registros de nutria gigante *Pteronura brasiliensis* de Guyana**

Se realizaron relevamientos en la Meseta Potaro, O de Guyana, y otras localidades. Como parte de una entrevista mayor sobre los mamíferos de la zona, se realizaron preguntas sobre nutrias en las villas indígenas de Chenapou y Bahía del Tigre, y en las cataratas de Kaieteur, al SO de la meseta. Entre el 28 de julio y el 4 de agosto de 1998 (estación húmeda) se procuró localizar activamente a ejemplares de *P. brasiliensis* en 2 localidades en la región E de la meseta, siguiendo el consejo de pescadores locales. Se registraron varios animales, que demostraron poca aversión hacia los observadores, lo que concuerda con la aseveración de los habitantes locales de que ellos no cazan a estos animales. Aunque no se registró a ningún ejemplar de nutria neotropical, existen reportes de la especie en la región. La población de *P. brasiliensis* en la meseta parece ser saludable, aunque podría haber problemas vinculados a la explotación minera y el ecoturismo en la zona. La especie está ampliamente diseminada en Guyana, excepto cerca de zonas urbanas y costeras.



ARTICLE

RESULTS OF AN INITIAL FIELD SURVEY FOR OTTERS (*Lutra lutra*) IN JORDAN

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**Abstract:** An initial field survey for signs of the Eurasian otter, in accordance with the 'Standard Method', was carried out between September and October 2000 in four of the eight permanent watercourses of Jordan. At 7 of the 13 sites surveyed, signs (spraints, footprints) of the otter were found. The results indicate that at least the Rivers Yarmuk and Jordan host an otter population over most of those stretches forming the borders to Syria, Israel, and Palestine. The importance of this population is discussed in the light of its position at the southeastern border of the Mediterranean-Arab range of the Eurasian otter. First agreements for further activities to study the ecology of the otter in this area are introduced.

Keywords: Eurasian otter, *Lutra lutra*, Jordan, distribution

## INTRODUCTION

Little knowledge has been available so far about the distribution of the Eurasian otter (*Lutra lutra*) in the Hashemite Kingdom of Jordan. The IUCN/SSC Otter Action Plan (FOSTER-TURLEY et al., 1990) classifies the species in this country as threatened and as "restricted to the rivers Jordan, Yarmouk, and Zarqa, the only permanent waterways in the Kingdom". Information about the otter in the most recent publication on the mammals of Jordan (AMR, 2000) is based mainly on anecdotal data: "it was observed in the upper reaches of the River Jordan and the Yarmuk River".

The II World Conservation Congress of IUCN, held in Amman on October 4-11, 2000, offered the opportunity to carry out a first field survey in Jordan. This took place from September 29 until October 2, 2000.

## MATERIAL, METHODS AND STUDY AREA

The survey technique used followed the guidelines for the 'Standard Method' for otter surveys recommended by the IUCN/SSC Otter Specialist Group (REUTHER et al., 2000). Stretches of riverbank of up to 600m were investigated for signs (spraints, footprints) of otters. Since the rivers Jordan and Yarmuk form the border to Israel and Syria, access to the rivers was not possible for regular distances of 3-5km between the survey sites. However, a special permit for these restricted military areas made it possible to investigate the banks on the Jordanian side of these watercourses at several places.

Localisation of ten survey sites was undertaken using a GPS receiver (Magellan Blazer 12) using the geodetic datum WGS 84 and measuring the geographic coordinates as recommended by REUTHER et al. (2000). Coordinates for another three survey sites were taken from a topographic map. The data were processed using the Information System for Otter Surveys (ISOS) of Aktion Fischotterschutz and transferred to a 10x10km UTM grid, which forms the basis of ISOS. The watercourses of Jordan were superimposed on digitised maps using GIS ARCView (ESRI®) software.

The watercourses surveyed covered four of the eight rivers of Jordan that permanently have water (SALAMEH and BANNAYAN, 1993). The River Yarmuk, forming the border to Syria and Israel, and

which flows from east to west, was investigated at three sites between the village of Aqraba and the Al 'Adasiha reservoir, close to its confluence with the River Jordan. The River Jordan, forming the border to Israel and the Palestinian territories, was surveyed at six sites between the confluence of the River Yarmuk in the north and its river mouth at the Dead Sea. The River Zarqa, forming the border between the Jordanian administrative regions of Irbid and Al Balqa, flowing from east to west, was investigated at three sites at its lower and middle stretch only. One survey site was investigated in the Mujib Nature Reserve in the Wadi al Mawjib, located approximately in the middle of the eastern shore of the Dead Sea and flowing from east to west.

The River Yarmuk is mainly a mountainous stream following the very steep valley formed by the Golan Heights. Large parts of its banks are covered by dense vegetation consisting of *Salix* sp., *Tamarix* sp., *Phragmites australis*, *Arundo donax*, and *Typha* sp. Its floor is mainly rocky. A number of dams form reservoirs for storing drinking water and for the irrigation of adjacent farmland (mainly for the production of citrus fruits). Because of the border situation, agricultural utilisation in the river valley is at a low level so far, but is increasing since access to the valley for residents was recently increased. Despite the agricultural use, no other sources of pollution are visible. The water is very clear and, as earlier studies have shown (KRUPP and SCHNEIDER, 1989), numerous fish species are to be found.

The River Jordan, located between 200 and 400m below sea level, is a typical lowland river, in most parts not wider than 5-10m. Most of its banks are covered by very dense vegetation consisting of *Salix* sp., *Tamarix* sp., *Phragmites australis*, *Arundo donax*, and *Typha* sp. Since the water is very muddy the condition of the floor can only be estimated, but appears to consist mainly of mud and sand. Although a restricted military area, most of the adjacent grounds are utilised for intensive farming of oranges, other citrus fruits, and bananas. A large amount of water is taken from the river for irrigation purposes (and sometimes for fish farming) at numerous sites. Agriculture, water pumping (frequently connected with a high degree of pollution by oil and petrol), and wastewater from urban areas are obvious sources of pollution. Several species of fresh water fishes are common in the River Jordan basin, including *Acanthobrama lissneri*, *Barbus canis*, *Clarias gariepinus* and *Tilapia zilli* (KRUPP and SCHNEIDER, 1989).

The River Zarqa is also primarily a mountain river. A dam near the village Dayr Alla (Al-Rwyha dam), forming a small reservoir, destroys most of its lower part which is marked by very low water levels and intensive use of the river banks by domestic stock (mainly sheep and goats). Upstream from the dam the river is mainly natural, fast flowing with very clear water, and little agriculture use of the adjacent land for a stretch of 2-3km. River banks are mostly rocky and vegetation of *Nerium oleander*, *Phragmites* sp. and *Typha* sp. is limited to short sections. In the highest reach, in the mountain area of Jarash, another, very high dam, the King Talal Dam, forms the largest reservoir in Jordan, which is used for storing irrigation water.

A very narrow canyon of high sandstone cliffs forms the lower stretch of the Wadi al Mawjib. Because of its protected status as a Nature Reserve, the only human impact visible were visitors walking along the few, narrow riverbanks, or directly in the water. Visibility in the water is up to 2m and many fishes and crayfish could be observed. Vegetation is sparse and mainly rocks and rock walls form the riverbanks.

## RESULTS

Signs of otters were found at 7 of the 13 survey sites investigated (Figure 1), i.e. 54% of the sites were positive. Spraints only occurred at 3 sites, footprints only at 1 site, and spraints and footprints at 3 sites. On the River Yarmuk, all three sites surveyed were found to be positive whilst, on the River Jordan, four out of the six sites surveyed were positive. However, all three sites investigated on the River Zarqa, as well as the one site surveyed on the Wadi al Mawjib, were negative.

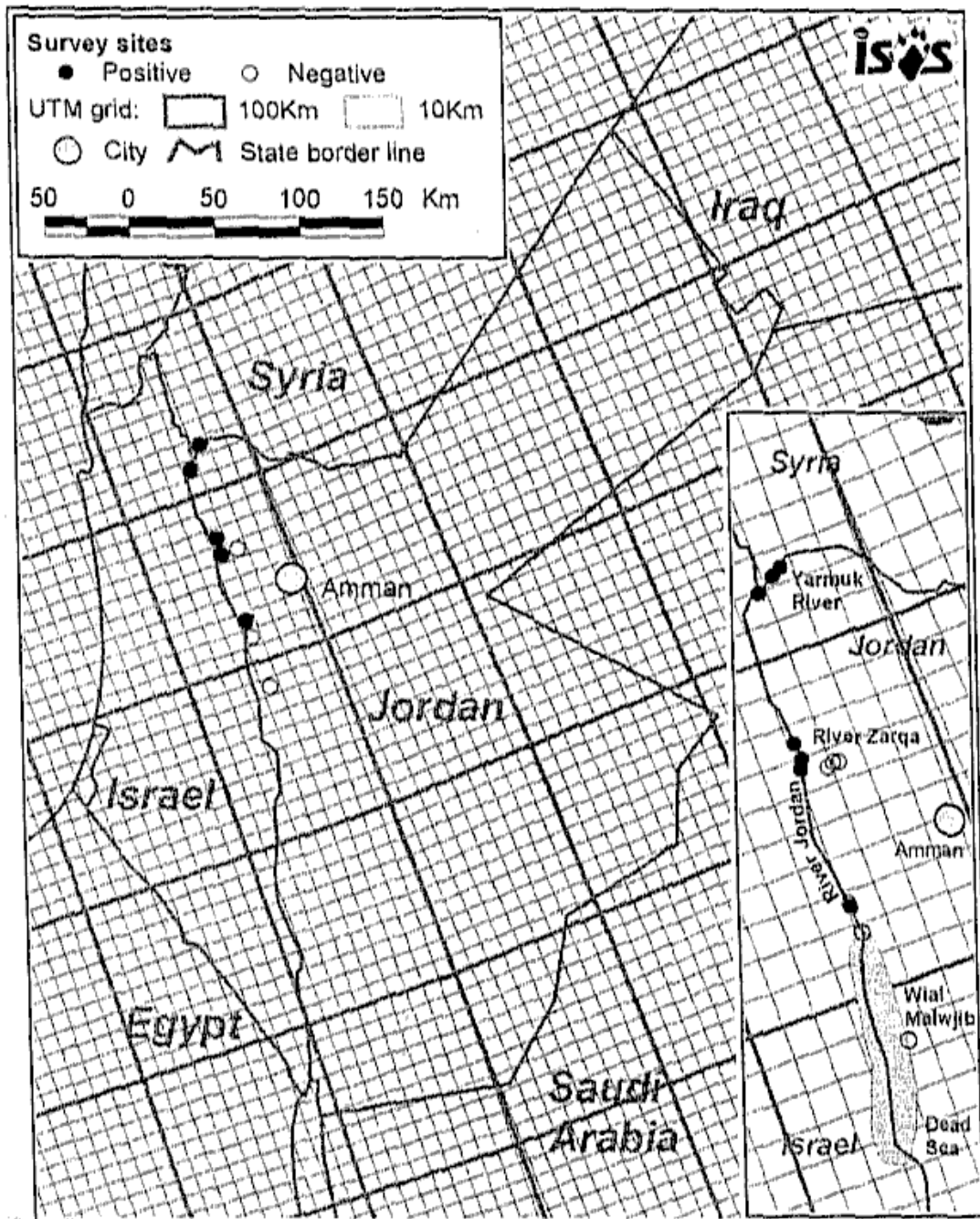


Figure 1. Result of the initial otter field survey in Jordan

## DISCUSSION

The overall result of 54% of positive sites should not be used for comparisons with other survey results because of the low number of sites investigated and because of the irregular distribution of the survey sites (see also REUTHER et al., 2000).

The Jordanian otter population is of great importance. Together with the Israeli otter population, which is mainly concentrated in the northern part of Israel (DOLEV, pers. comm.; REUTHER pers. obs.), it forms the southeastern border of the Mediterranean-Arab range of the Eurasian otter. Although nothing is known about otters in Egypt and Libya, it seems unlikely that there a connection exists with the otter occurrences observed in the west of the northern parts of Africa, i.e. in Morocco (MACDONALD and MASON, 1984, AULAGNIER, 1985), Algeria (MACDONALD et al., 1985), and Tunisia

(MACDONALD and MASON, 1983, REUTHER, pers. obs.). The same is probably true for the neighbouring southern areas of Saudi-Arabia, formed mainly of desert.

It will be important, therefore, to collect further information on otter distribution in Syria and the Lebanon as these countries could form a distribution bridge to the otter populations known to occur in Turkey (EROGLU, in prep.), and those assumed to occur in Iran (FOSTER-TURLEY et al., 1990). If such a connection is not found, the Jordanian-Israeli otter population would be ranked as an isolated population what this would further increase the importance of conservation measures.

As a result of this first field survey, and the points mentioned above, the possibility of a training course in Europe was agreed which will be offered to a student of the Jordan University of Science and Technology in Irbid and a member of the staff of the Jordanian Royal Society for the Conservation of Nature. They will be trained in the Standard Method for otter surveys, spraint analysis, and other research techniques for otters. The knowledge gained will be used for a more detailed survey and for studies to increase knowledge about the otter's ecology in its Mediterranean-Arab range. It is also planned to initiate a field survey in Syria and, if the political situation allows, in Lebanon.

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## Resumen: Resultados de un relevamiento primario de nutrias (*Lutra lutra*) en Jordania

Siguiendo la metodología standard entre Octubre y Setiembre de 2000 se llevó a cabo un relevamiento primario de signos de nutria europea en 4 de los 8 cursos de agua permanentes de Jordania. En 7 de los 13 sitios relevados se encontraron signos de nutrias (fecas, huellas). Los resultados indican que al menos los ríos Yarmuk y Jordán albergan una población de nutrias en la mayor parte de los límites con Siria, Israel y Palestina. La importancia de esta población se discute a la luz de su posición en el límite sudeste del rango árabe - mediterráneo de la nutria europea.

## REPORT

### NEW FINDINGS OF OTTERS (*Lutra lutra*) IN ISRAEL

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**Abstract:** Until the mid 20th century, otters were abundant in the coastal regions and long the Jordan River. Hunting by fish breeders, water pollution and drainage work has dramatically reduced the population. The authors found evidence of otters along the Jordan down to the Dead Sea, continuing the work done in Jordan. Because of arid conditions, this may be an isolated population. More work is needed to clarify this.

Up to the middle of the 20th century, otters were abundant in Israel in all coastal regions from the Lebanese border to Tel-Aviv region, and along the Jordan River from the initiation up to the Dead Sea including the Hula Lake and Lake Kinneret (Sea of Galilee). Connecting corridor between these regions consist on Harod valley and Israel valley which is found between Bet She'an and Haifa. However, hunting by fish breeders, water pollution and draining of streams in most of Israel, caused a dramatic decline in its populations (MENDELSSOHN and YOM-TOV, 1999).

Little information about the current distribution of the otter has been published since the first initial survey by MACDONALD et al. (1986). They summarised the situation as: "Virtually extirpated in the coastal regions. Good populations still exist in the Jordan River catchment, including Lake Tiberias (= Lake Kinneret or Sea of Galilee; author's remark), but because almost the entire population is concentrated in the one system, it must be considered threatened. Within the system, otters occur in uplands, agricultural lowlands, and fish ponds." (FOSTER-TURLEY et al., 1990).

From December 1999 until June 2000 DOLEV (in prep.) carried out a survey covering 153 sites. Of these, 56 sites (36,6%) were found positive. The detailed results will be published elsewhere. During this survey no signs of otters were found in the western parts of Israel and in the Jordan River catchment south of the Lake Kinneret (Sea of Galilee), accept sites near Bet She'an (Harod valley).

A field trip of both authors, carried out on October 6-7, 2000, offered the opportunity to re-survey several sites in these areas. Signs of otters were found at three rivers in the western part of Israel in the coastal region near Haifa. These observations confirm sporadic reports of local people that otters have been observed on the coast of the Mediterranean Sea. No signs of otters were found directly at the outlet of the Sea of Galilee. This area is intensively used for recreation activities. Possibly this is a reason for little chance in finding signs of otters. Two sites were found positive along the Jordan River between Lake Kinneret and the border to Jordan. These findings closed the gap in the findings made by REUTHER et al. (2000) at the river Yarmuk in the east and those parts of the Jordan River in the south which form the border between Israel and Jordan. Now we have new evidence of otter occupancy along all the southern Jordan River down to the Dead Sea. These data have been transferred to ISOS (Information System for Otter Surveys; REUTHER et al., 2000a) on the base of the UTM 10km-grid (Fig. 1).

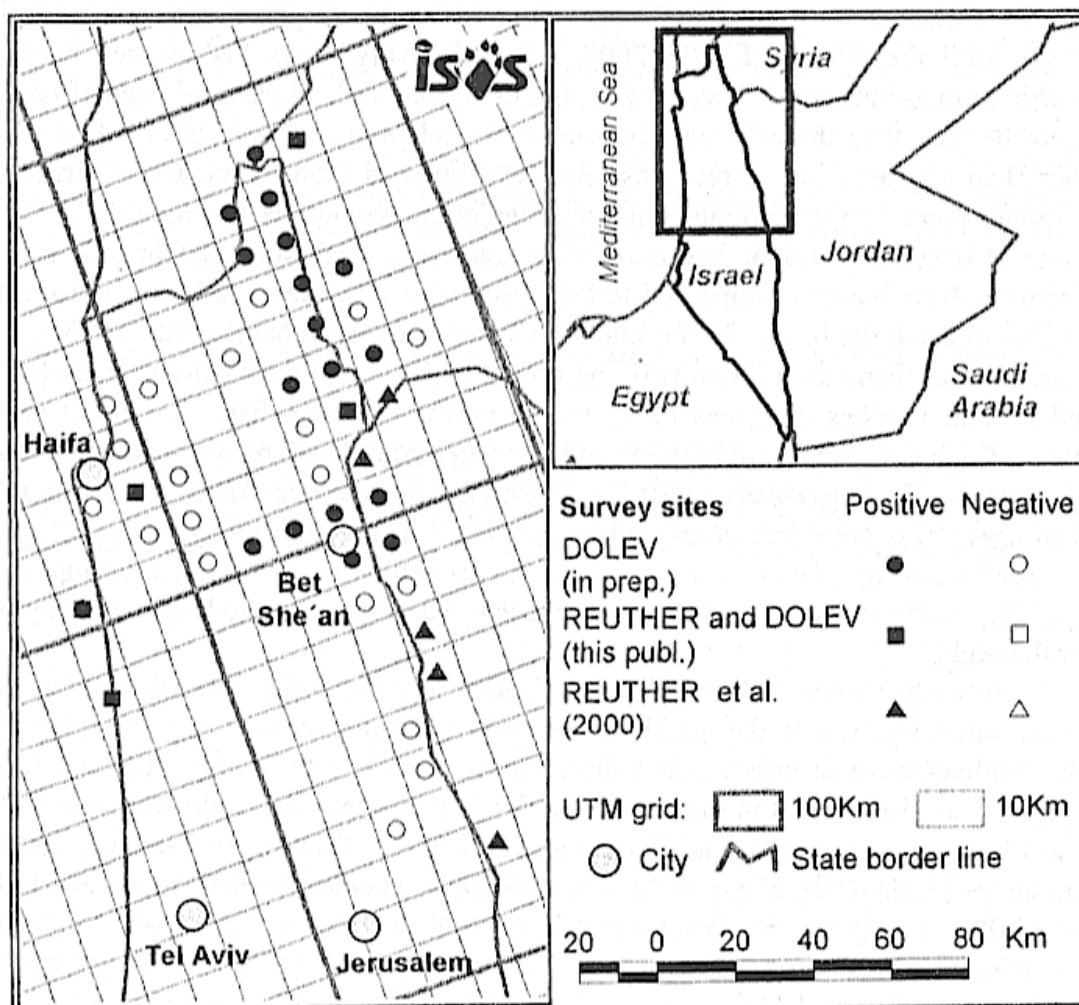


Figure 1. Otter distribution in Israel on the base of the UTM 10km-grid resulting from surveys of DOLEV (in prep.) and REUTHER et al. (2000b).

The Israel otter population is of great importance because of two reasons:

1. Together with the Jordanian otter population it forms the south-eastern border of the Mediterranean-Arab range of the Eurasian otter (REUTHER et al., 2000b).
2. Comparing the distribution of otters and the presence of permanent running or standing waters (including fish ponds) in Israel it is obvious that otters have to overpass long distances without any waters or to use the coast of the Mediterranean Sea migration - if the otter occurrences are connected. This phenomenon needs further investigation.

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## RESUMEN

### **Nuevos registros de nutrias (*Lutra lutra*) en Israel**

Hasta mediados del siglo XX las nutrias eran abundantes en Israel en todas las regiones costeras, desde el límite con el Líbano hasta la región de Tel-Aviv y a lo largo del Río Jordán, desde su inicio hasta el Mar Muerto, incluyendo los lagos Hula y Kinneret (Mar de Galilea). Sin embargo, la caza, la polución del agua y el drenaje de arroyos en la mayor parte de Israel causó una declinación dramática en sus poblaciones. En 1986 MacDonald *et al.* consideraban que las nutrias habían sido virtualmente extirpadas de las regiones costeras pero que mantenían buenas poblaciones en el Río Jordán, incluyendo el Lago Tiberias (Lago Kinneret o Mar de Galilea). Dado que toda la población está concentrada en un solo sistema, sugerían considerarla amenazada. Entre Diciembre de 1999 y Junio de 2000 se llevó a cabo un relevamiento que cubrió 153 sitios. Cincuenta y seis de estos (el 36,6%) resultaron positivos. Durante dicho relevamiento no se encontraron signos de nutrias en las zonas occidentales de Israel ni en el Río Jordán al sur del Lago Kinneret. Una salida de campo en Octubre de 2000 permitió relevar nuevamente varios sitios en esas zonas. Se encontraron signos de nutrias en 3 ríos en la zona costera de la parte occidental de Israel, cerca de Haifa, confirmando reportes esporádicos de registros en la costa mediterránea por parte de habitantes locales. No hubo registros en la zona del Mar de Galilea. Esa área es usada intensamente para actividades recreativas lo que posiblemente disminuye las probabilidades de encontrar rastros de nutrias. La población de nutrias de Israel es importante por 2 motivos: 1- junto con la población de Jordania constituyen el límite sudoriental de la distribución árabe - mediterránea de la nutria europea; 2 - comparando la distribución de las nutrias y la presencia de cursos de agua permanentes, para estar conectadas, éstas tienen que desplazarse largas distancias a lo largo de áreas sin agua, o utilizar el Mar Mediterráneo. Este fenómeno requiere ser investigado.

## REPORT

### AVIAN PREDATION BY CAPTIVE OTTERS

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**Abstract:** During fifteen years of keeping otters, no predation on birds was observed until the winter of 1999-2000. Freshly killed birds offered to otters had not apparently been recognised as food. In the winter of 1999, a sub-adult captive otter stalked and killed a variety of birds - two pheasants, two gulls, a thrush and a goose. Otters in the adjacent pen caught and ate a heron.

Predation on birds had not been observed in fifteen years of keeping captive otters, until the winter of 1999-2000, although many otters had proved adept at catching voles and amphibians. Before that time, road killed birds had been offered to otters to introduce them to the range of potential prey available after release. The otters had appeared not to recognise the dead birds as food, playing with them and dropping them into their pools. On occasions otters would chase songbirds or run at crows (*Corvus corone*) or herons (*Ardea cinerea*), which were stealing their fish. However these incidents appeared to be play or threat displays, rather than a serious attempt to catch the birds. Herons and crows had formed the habit of taking fish, with sometimes as many as six herons flying up the valley to the otter pens at feeding time and several families of crows being reared partly on stolen fish. The effect of the otters' digging and constant pressure of their feet within the pens was to create a plant community of annual weeds different from the surrounding fields. This attracted pheasants (*Phasianus colchicus*) and songbirds to visit regularly to take advantage of the seed bearing plants. On one occasion seven wintering wrens (*Troglodytes troglodytes*) were observed using the entrance tunnel of an occupied otter sleeping box for the night.

In early winter 1999 a sub adult female otter from the Scottish Borders was found one morning with the freshly killed body of a hen pheasant in her sleeping box. The feathers were disordered, but the skin was not broken. Vomit, full of chewed feathers was also present in the sleeping box. Over the next two nights the young otter learnt how to deal with feathered prey and consumed all but some feathers, the legs and larger bones of the pheasant. It was not known whether she had caught and killed the bird or simply taken advantage of a death from other causes. However, in the following winter months this otter was seen stalking other birds. She caught and ate another hen pheasant, a songthrush (*Turdus philomelos*), a herring gull (*Larus argentatus*), a black headed gull (*Larus ridibundus*) and a goose. The goose was so completely eaten that only one leg and a few wing feathers were left. It was tentatively identified as either a barnacle goose (*Branta leucopsis*) or a small Canada goose (*Branta canadensis*) (Paul COLLIN, pers. comm.). In the neighbouring pen two siblings from Shetland also caught and ate a heron, possibly having learned the behaviour from their neighbour's example.

**Acknowledgement** - Paul Collin, RSPB is thanked for identifying the grisly remains.

#### RESUMEN

##### Predación sobre aves por parte de nutrias en cautiverio

Hasta el invierno de 1999-2000 no se había observado predación sobre aves en 15 años de mantenimiento de nutrias en cautiverio. Hasta entonces se les había ofrecido aves atropelladas para introducirlas al rango de presas disponibles tras la liberación. Estas no parecían reconocer a las aves muertas como alimento pero jugaban con ellas y las tiraban a sus piscinas. En ocasiones las nutrias perseguían aves canoras o corrían a los cuervos o garzas que les robaban pescado. Sin embargo, estos incidentes parecían ser juegos o despliegues de amenaza más que intentos serios de cazar a las aves. El efecto de escarbar y la presión constantes de las patas de las nutrias sobre el suelo de los encierros facilitó el establecimiento de una comunidad de malezas anuales distintas a la de los campos linderos.



Esto provocó las visitas regulares de faisanes (*Phasianus colchicus*) y aves canoras para aprovechar las semillas de dichas plantas. A principios del invierno de 1999 una nutria subadulta fue encontrada una mañana con el cuerpo fresco de un faisán. Las plumas estaban desordenadas pero la piel no estaba rota. También había un vomito lleno de plumas masticadas. A lo largo de las 2 noches siguientes la nutria aprendió a tratar a la presa emplumada y consumió toda la carcasa salvo algunas plumas, las patas y algunos huesos largos del faisán. No se supo si la nutria había cazado y matado a la presa o simplemente aprovechado una carcasa fresca, sin embargo, en los meses siguientes esta nutria fue vista acechando otras aves. Cazó y comió otro faisán, un tordo (*Turdus philomelos*), gaviotas (*Larus argentatus* y *L. ridibundus*), y un ganso. En un encierro vecino 2 hermanos también cazaron y comieron una garza, posiblemente tras haber aprendido el comportamiento de su vecina.

## REPORT

### OTTER *Lutra lutra* PREDATING ADULT DRAGONFLIES

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**Abstract:** In June 2000, the author found spraints and other signs indicating that at least one otter had been eating quantities of adult Four-Spotted Chasers (*Libellula quadrimaculata*) common at the location, on the coastal raised bog of Cors Fochno in west Wales.

One day in June 2000, whilst walking beside a shallow drainage channel on the coastal raised bog of Cors Fochno (Borth bog) in west Wales, I noticed a collection of dragonfly wings clustered on wet sphagnum moss at the ditch margin. On close inspection the wings, 16 in all, were identified from their distinctive markings as belonging to adult Four-spotted Chaser, *Libellula quadrimaculata*, a common breeder at the location.

The cluster of wings also lay on a route regularly used by Otter *Lutra lutra*, and clearly marked by a trail through the floating carpet of sphagnum moss which covers much of this ditch. Following the otter run beyond the ditch into an area of tall vegetation, dominated by Purple moor-grass *Molinia caerulea*, I found a second, smaller cluster of wings and close by, an otter spraint. The latter confirmed my suspicion that one or more otter were responsible for the predation since it contained fragments of glossy brown and black carapace matching the thoracic markings of *L. quadrimaculata*. It would seem likely that the otter had been reaping a seasonal harvest of dragonflies plucked from roosting sites beside a regular foraging route.

A few weeks later I observed a further collection of *L. quadrimaculata* wings in a similar situation but 2.5km away at the western-most edge of the Cors Fochno peatland. Whilst it is possible that the same individual otter could be responsible, this occurrence suggests that the observed feeding habit may be more widespread amongst the local otter population.

The diet of Eurasian Otter has been investigated in some detail but this appears to be the first recorded instance of adult odonata being predated.

#### RESUMEN

#### Predación sobre libélulas adultas por parte de nutrias *Lutra lutra*

En junio 2000 se observó una colección de alas de libélulas (*Libellula quadrimaculata*) junto a un canal de drenaje en Cors Fochno en el oeste de Gales. Esta colección se encontraba junto a una ruta regularmente utilizada por nutrias *Lutra lutra*. Siguiendo dicho el trillo se encontró un segundo grupo de alas junto a una feca de nutria, lo que confirmó la sospecha de que una o más nutrias eran las responsables de la predación ya que la feca contenía fragmentos torácicos de *L. quadrimaculata*. Aparentemente la nutria había estado colectando libélulas aprovechando la presencia estacional de

estas junto a una ruta regular de forrajeo. Pocas semanas después una colección similar de alas fue observada a 2.5 km del sitio anterior. Si bien es posible que el mismo animal haya sido el responsable, la observación sugiere que este hábito alimenticio puede estar más ampliamente extendido entre la población local de nutrias. La dieta de la nutria europea ha sido investigada con bastante detalle pero esta parece ser la primera vez que se registra predación sobre odonatas acechando otras aves. Cazó y comió otro faisán, un tordo (*Turdus philomelos*), gaviotas (*Larus argentatus* y *L. ridibundus*), y un ganso. En un encierro vecino 2 hermanos también cazaron y comieron una garza, posiblemente tras haber aprendido el comportamiento de su vecina.

## REPORT

### GEOLOGY AND OTTERS

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**Abstract:** Eight years research by IOSF into otter distribution on Skye has explored the relationship between geology and otter numbers to explain the differences in population density around the coast of Skye. 60% of the coastline was covered during this time. The Torridon sandstones support a higher density of otters than the Tertiary intrusives, because the sandstone is characterised by more freshwater pools, a gently sloping shoreline with a boulder intertidal zone and native woodland adjacent to the High Water Mark. Literature was reviewed to see if otter numbers could be correlated to geology elsewhere in Scotland, and this seems to be the case. The particular characteristic controlling numbers of coastal otters appears to be the number of freshwater pools adjacent to the coast.

IOSF has undertaken eight years' research on the otter populations of the Isle of Skye and below is a summary of the findings. For the purposes of the study the island was divided into seven geological coastal zones based on maps from the British Geological Survey.

In an initial survey of otter sightings in 1990 (YOXON and YOXON, 1990) it was found that certain coastlines favoured denser otter populations than others; it seemed that the geology of the coastline had an effect on this distribution with the Torridonian coastline having a much denser number than any other rock type. The island was divided into 500m coastal sections and the following variables were studied: coastal type, inland vegetation, slope of shoreline, width of the intertidal zone, otter activity per hour, number of holts, sprainting points, number of spraints and freshwater pools.

60% of the coastline was covered and data sheets completed for each section. Upon analysis of the data, certain predictable patterns emerged (YOXON, 1999): the Torridonian zone had a higher proportion of all the 'otter variables' than any other zone [mean numbers per 500m section (otters/hour = 2.4, holts = 0.4, sprainting points = 2.5, spraint numbers = 6.3 and freshwater pools = 1.4)] compared with the lowest numbers in the Tertiary Intrusive zone [mean numbers per 500m section (otters/hour = 0, holts = 0.04, sprainting points = 1.5, spraint numbers = 3, freshwater pools = 0.6)]. The increased activity on the Torridonian coastal zone is attributed to this zone having the greatest number of freshwater pools, a gently sloping shoreline with a boulder intertidal zone and native woodland adjacent to the High Water Mark. A map of otters per km is shown here together with the geology (Fig. 1).

Until now, little was known about the relationship between otter utilisation of the coastal zone and geology. On Shetland, MILNER (1978) categorised major coastal types and identified eight major coastal types using 81 physical and 18 geological attributes. CONROY and FRENCH (1985) classified the Shetland coast using over 200 attributes which were grouped into seven headings. Still on Shetland, KRUUK (1989) grouped the coast into six types based on evidence from maps, reports and prior knowledge of the area. He found a strong relationship between numbers of holts and peaty coasts with little agriculture and no high cliffs and a negative association between holts and tall cliffs.

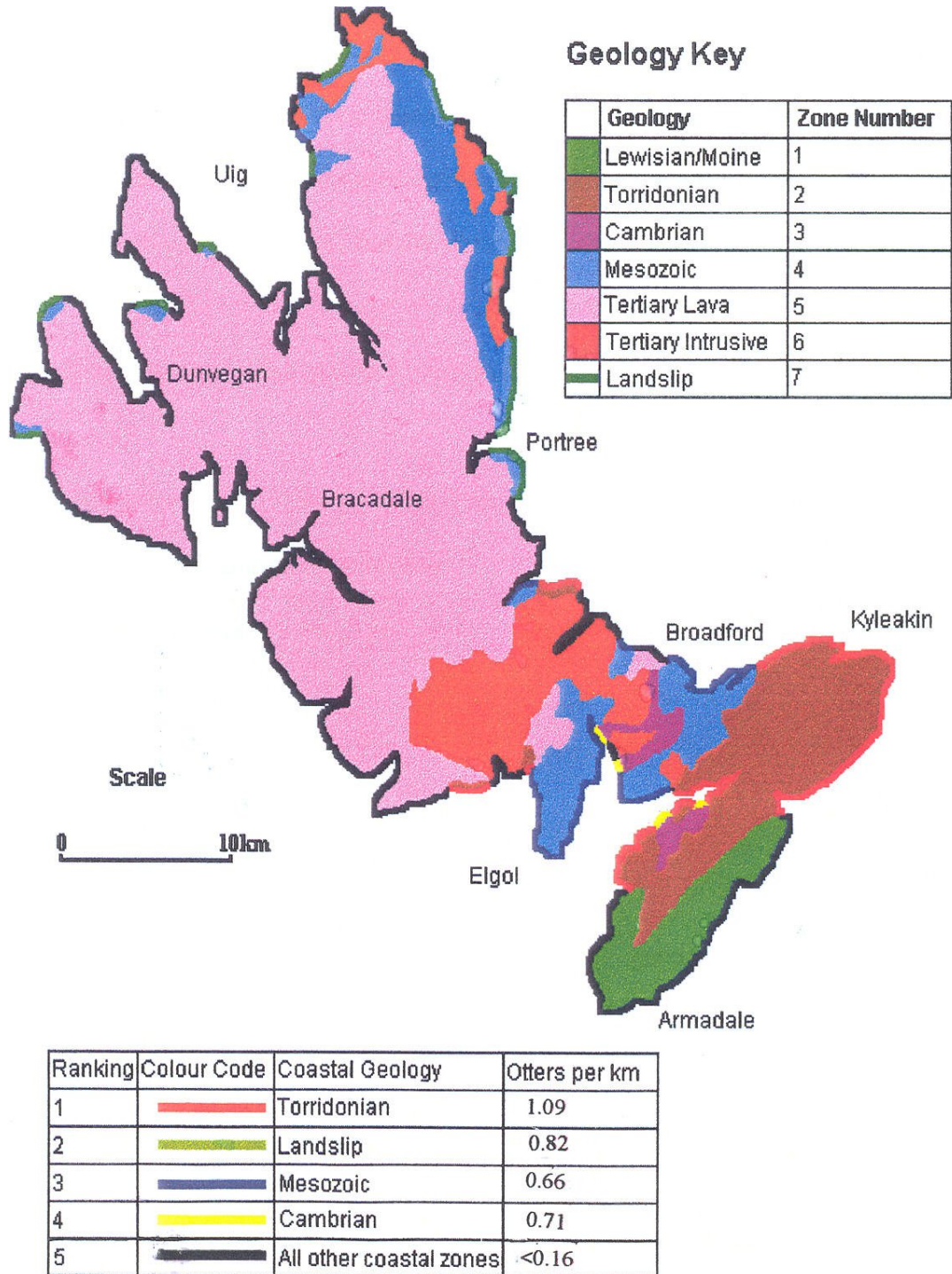


Figure 1. Geology on Skye and otter distribution

On Orkney there are few otters, in sharp contrast to Shetland, (KRUUK, 1995). This difference could possibly be attributed to distribution of prey species but it seems likely that Orkney shores are just as productive as those of Shetland. GREEN and GREEN (1997) stated, "that despite the productive nature of Orkney's fresh and coastal waters, the otter population was less dense than those of other island regions or parts of mainland Scotland". A more likely reason for the difference is the geology of the Orkney coast, which makes it a less suitable habitat for otters.

The Torridonian sandstone on Skye is impervious and has very low porosity allowing freshwater pools to build up easily on the coastal fringe. By contrast, Devonian sandstone has a high degree of porosity and permeability (many oil reservoirs are present in Devonian sandstone), and so it would be difficult for freshwater pools to build up on these rock types in the same numbers as on the Torridonian sandstone. The Orkney landscape is composed of Devonian sandstone and is well drained with rich farmland. The low density of otters from Dunnett Head to the Moray Firth could equally be a consequence of the geology of the coastal fringes, which also consist of Devonian sandstone.

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## Resumen: Geología y nutrias

Durante 8 años IOSF ha llevado a cabo investigaciones sobre las poblaciones de nutrias de la isla de Skye. En un relevamiento primario de avistamientos de nutrias en 1990 se encontró que ciertas costas favorecían poblaciones más densas de nutrias que otras. Parecía ser que la geología de la costa tenía un efecto sobre esta distribución, siendo la costa Torridoniana la que presentaba mayor densidad que los demás tipos de rocas. La isla se dividió en secciones de 500 m y en cada uno se estudiaron las siguientes variables: tipo de costa, vegetación terrestre, pendiente de la orilla, ancho de la zona intermareal, actividad de nutrias por hora, número de refugios, de defecaderos, de fecas y de piscinas de agua dulce. El 60% de la costa fue cubierto. La zona Torridoniana presentó una mayor proporción de todas las variables referentes a las nutrias que cualquier otra zona (promedios por cada 500 metros: nutrias por hora= 2.4, refugios= 0.4, defecaderos= 2.5, número de fecas= 6.3, piscinas de agua dulce= 1.4). La zona Terciaria Intrusiva presentó las menores proporciones (promedios por cada 500 metros: nutrias por hora= 0, refugios= 0.04, defecaderos= 1.5, número de fecas= 3, piscinas de agua dulce= 0.6). La mayor actividad en la zona Torridoniana se atribuye a que esta tiene el mayor número de piscinas de agua dulce, una inclinación suave de la línea costera, una zona intermareal más ancha y monte nativo adyacente. En claro contraste con lo que ocurre en Shetland, en Orkney hay pocas nutrias. Esta diferencia puede atribuirse a la distribución de las especies de presas, pero parece que ambas orillas son igualmente productivas. Una razón más adecuada para las diferencias puede ser precisamente las diferencias geológicas entre ambas costas. La de Orkney es mucho menos apropiada para las nutrias. La arenisca Torridoniana en Skye es impermeable y tiene una porosidad muy baja, lo que permite la formación de piscinas en la margen costera. En contraste, la arenisca del Devónico de la que está compuesto el paisaje de Orkney tiene un alto nivel de porosidad y permeabilidad, lo que dificulta la formación de piscinas.

## REPORT

### HELMINTHS OF THE EURASIAN OTTER (*Lutra lutra* L. 1758) IN BELORUSSIAN POLESIE

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**Abstract:** We present the results of helminthological examinations of 25 otter carcasses (14 males and 11 females) and 117 specimens of otter faeces (spraints), collected from both natural and transformed ecosystems of Belorussian Polesie between 1981 and May of 1999. Carcasses were collected from hunters, whilst the spraints were collected along riverbanks and adjoining channels. The rate of infection of otters by helminthes, determined by dissection, was found to be 76.0%.

The Eurasian otter (*Lutra lutra*) is a representative of the Mustelidae family (Order Carnivora) that swims well and forages mainly in the water. This carnivorous animal is present throughout the territory of Belarus, particularly in the southern part of Belarus (Polesie - the Brest and Gomel regions), where a wide network of channels attracts many otters.

In this report we present the results of helminthological examinations of 25 otter carcasses (14 males and 11 females) and 117 specimens of otter faeces (spraints), collected from both natural and transformed ecosystems of Belorussian Polesie between 1981 and May of 1999. Carcasses were collected from hunters, whilst the spraints were collected along riverbanks and adjoining channels. The rate of infection of otters by helminthes, determined by dissection, was found to be 76.0%. The results of our helminthological examinations are illustrated in Table 1. The otters were hosts to 15 species of helminths. The trematode *Isthmiophora melis* and the nematodes *Capillaria mucronata* and *C. putorii* were the most frequently detected parasites. The prevalence of these helminths in otter carcasses was 24.0%, 20.0%, and 28.0%, respectively. The number of parasites varied from 1 to 30 specimens.

Otters, which eat mainly fish, are commonly infected by four species of trematodes found in fish: *Apophallus donicus*, *Opisthorchis felineus*, *Pseudamphistomum truncatum*, and *Metorchis bilis*. *A. donicus* were found in the intestine and opisthorchiids, whilst *O. felineus*, *P. truncatum*, and *M. bilis* were detected in the liver. The rate of infection of otters by these helminths was determined to be 36.0%. Coproscopical investigations confirmed these findings. The eggs and larvae of helminths were found in 76.9% of the spraint samples. Eggs of *Capillaria* sp. (21.4%) and *I. melis* (12.0%), and larvae of *Strongylata* sp. (13.7%), were the parasite stages most frequently detected in otter spraints. Eggs of opisthorchiids were found in 7.7% of all faecal samples

Besides *I. melis*, *C. putorii*, *A. donicus*, and opisthorchiids, other parasites important in medical and veterinary science were also found at lower levels in the samples examined, including *Fasciola hepatica*, *Alaria alata*, *Spirometra erinacei*, *Mesocestoides lineatus*, *Trichinella spiralis*, and *Crenosoma vulpis*. These species of helminths are known to be parasites of humans as well as domestic and farm animals (e.g. dogs, cats, cattle, sheep, goats, pigs).

**Table 1:** Helminth infections of otters in Belorussian Polesie

Species of helminths	Number of Positive Findings	Prevalence (%)	Number of Helminths (min-max)
<i>Fasciola hepatica</i> (Linnaeus, 1758)	1	4.0	3
<i>Isthmiophora melis</i> (Schrank, 1788)	6	24.0	1-24
<i>Apophallus donicus</i> (Skrjabin et Lindtrop, 1919)	2	8.0	2-26
<i>Opisthorchis felineus</i> (Rivolta, 1884)	2	8.0	3-6
<i>Pseudamphistomum truncatum</i> (Rudolphi, 1819)	3	12.0	1-5
<i>Metorchis bilis</i> (Braun, 1890)	2	8.0	1-3
<i>Alaria alata</i> (Goeze, 1782), larvae	1	4.0	500
<i>Spirometra erinacei</i> (Rudolphi, 1819), larvae	2	8.0	1-3
<i>Mesocostoides lineatus</i> (Goeze, 1782)	1	4.0	2
<i>Capillaria mucronata</i> (Molin, 1858)	5	20.0	1-4
<i>Capillaria putorii</i> (Rudolphi, 1819)	7	28.0	1-10
<i>Trichinella spiralis</i> (Owen, 1835), larvae	1	4.0	3 in 1g muscle tissue
<i>Strongyloides martis</i> (Petrow, 1940)	1	4.0	4
<i>Crenosoma vulpis</i> (Rudolphi, 1819)	1	4.0	3
<i>Skrjabinogylus nasicola</i> (Petrow, 1927)	1	4.0	5

**Resumen: Helmintos de la nutria europea (*Lutra lutra* L. 1758) en Bielorrusia**

La nutria europea (*Lutra lutra*) está distribuida por todo Bielorrusia. Entre 1981 y 1999 se llevaron a cabo exámenes helmintológicos de 25 carcasas de nutrias (14 machos y 11 hembras) y 117 fecas provenientes de ecosistemas naturales y modificados del sur del país. Los animales fueron matados por cazadores y los excrementos recogidos por los autores en bancos de ríos y canales. La tasa de infección de nutrias por helmintos determinada mediante disección fue 76.0%. Se detectaron en total 15 especies de helmintos. El tremátodo *Isthmiophora melis* y los nemátodos *Capillaria mucronata* y *C. putorii* fueron los parásitos detectados con mayor frecuencia (encontrados en 24.0, 20.0 y 28.0% de las carcasas respectivamente). El número de parásitos varió de 0 a 30 especímenes. También se encontró *Apophallus donicus* en el intestino de las nutrias y en el hígado se encontraron *Opisthorchis felineus*, *Pseudamphistomum truncatum* y *Metorchis bilis*. La tasa de infección por estos tremátodos se determinó en 36.0%. Los estudios coproscópicos confirmaron los hallazgos mencionados. Se encontraron huevos y larvas de helmintos en el 76.9% de las fecas revisadas. No sólo *I. melis*, *C. putorii*, *A. donicus* y los opisthorchiidos son importantes en las ciencias médicas y veterinarias. *Fasciola hepatica*, *Alaria alata*, *Spirometra erinacei*, *Mesocostoides lineatus*, *Trichinella spiralis* y *Crenosoma vulpis* también lo son. Estas especies son tanto parásitas del hombre como de animales domésticos y de granja.

## REPORT

### THE HAIRY-NOSED OTTER (*Lutra sumatrana*) IN CAMBODIA

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**Abstract:** With the change in the political situation in Cambodia, it has been possible since 1998 to undertake conservation activities in the country. During field work in the Cardomon mountains, a single hairy-nosed otter was seen in a market. The author requests information on the distribution of the hairy-nosed otter in Indochina and Thailand, and additional funds to support surveys in Cambodia in February and April.

In 1998 the hairy-nosed otter (*Lutra sumatrana*) was thought to be extinct but recently it has been discovered in the Phru Toa Dang Swamp Forest in the Narathiwat Province, Thailand and U Minh Thuong Nature Reserve in southern Vietnam.

Four species of otter are found in Indochina the Eurasian otter (*Lutra lutra*), Asian small clawed otter (*Amblonyx cinereus*), the Smooth coated otter (*Lutra perspicillata*) and the hairy-nosed otter. All species are regionally threatened due to hunting pressures driven by the trade in their pelts, habitat loss, pollution and disturbance.

General mammal surveys in Indochina often overlook otters so the distribution of these animals is not clearly understood. What is known, however, is that that suitable habitat for the hairy-nosed otter is very rare and more information is required on the distribution and habitat requirements for each of the species.

Between the two known populations of hairy-nosed otters are huge expanses of forest in southern Cambodia. Until 1998 the security situation in Cambodia has prevented biological work, but since then conservation organisations have been working in the area. Last year I was involved in surveys of the Cardamom Mountains in south-west Cambodia. During fieldwork three of the four otter species were identified and populations appeared to be more healthy than in other parts of Indochina. In addition a single hairy-nosed otter was seen in a market. Myself and Fauna and Flora International are very keen to work in the peat forests of southern Cambodia to assess the otter populations there and also to try and identify sites where the hairy-nosed otter still survive. The elusive otter civet (*Cynogale sp.*) may also be found in these forests.

I would be very interested to hear from anyone with information on the relevant species, especially in regards to their distribution in Indochina and Thailand. We are also looking for additional funds to support the surveys, which will occur in February to April. If anyone can help or would be interested in hearing more about our work in Cambodia please contact me on barneylong@mcmail.com.

## NEW BOOKS

### **SURVEYING AND MONITORING DISTRIBUTION AND POPULATION TRENDS OF THE EURASIAN OTTER (*Lutra lutra*)**

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.  
*Habitat 12*, Hankensbüttel, 148pp.

Constant availability of distribution data in a standardised format is an important tool in nature conservation. Species protection and habitat conservation programs are dependent on distribution data, whether on the international, national, or regional levels. This is also true for research programs, interventions against projects causing threats and evaluations of the impact of measures taken or of the efficiency of programs.

For those countries belonging to the European Union, there is a legal duty to collect distribution data for species such as the otter. On May 21, 1992 the European Union implemented the 'Directive on the Conservation of Natural Habitats and of Wild Plants and Animals, Directive 92/43/EEC [1992]', better known as the Fauna, Flora, and Habitat (FFH) Directive. This directive is obligatory in the sense of the contract of the European Union. The regulations enter into force directly if they are not transferred to national law. Sanctions are possible by the European Courts of Justice.

In article 11, the directive states that "member states shall undertake surveillance of the conservation status of the natural habitats and species referred to in Article 2". Article 2 declares:

"1. The aim of this Directive shall be to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies.

2. Measures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest."

Species of Community interest are listed in annexes II, IV and V. The Eurasian otter is listed in Annex II and IV. For species listed in these annexes, special protection measures have to be ensured.

Beside these general and legal aspects, efficiency is another aspect why distribution data should be made available in an optimal form as possible. Surveys are time and cost consuming and the data they deliver are more than only a scientific data pool. Since personal and financial resources in nature conservation are limited (and always lower than needed) everybody using these resources has a responsibility to ensure that this is done in the most efficient manner. From the international point of view, for instance, a lot of time and money could be saved for specific international surveys if national survey data would be prepared in a comparable and transferable form. The same is true from the national point of view where a standardised processing of regional survey data would considerably reduce efforts and costs to prepare nation-wide overviews. Lastly, the regional level would benefit from the availability of supra-regional data by enabling integration of regional activities into national or international objectives.

Finally, it needs to be recognised that, whilst surveys need to be undertaken on a scientific basis, they are more than only science. Surveys are a fundamental part of conservation and of the management of species (and their habitats) since, without survey data, reliable and efficient conservation or management is not possible.

Fortunately, otter specialists recognised this point very early. The consequences that have arisen from this, through pioneering methodical work, is the undisputed merit of British otter specialists. Many scientists and conservationists followed their example and, parallel to the increasing number of systematic surveys, knowledge and experience increased, along with the number of questions about methodical standards.

This was the reason for the organisation of a workshop entitled 'How to better standardise the 'standard' (IUCN/SSC Otter Specialist Group) method for otter surveys?' at the 3rd European Congress of Mammalogy 1999 in Jyväskylä (Finland). As a basis for this workshop, all available survey reports from Europe were evaluated. Discussions in the workshop showed that the necessity for a further



standardisation of our survey methods is undisputed, especially against the background of a changing European conservation policy. Conservation is becoming more and more an objective with an international scope. Referring to the adage 'Act local and think global', otter surveys need no longer to be seen as a 'local' tool of national conservation policy. They need to be understood as a contribution to the 'global' conservation of the species (in its total range). Another reason why this seems to be the right time to revise the standards of the survey method is the fact that there has been a remarkable change in geodesy and mapping techniques. Introduction of the 'World Geodetic System 84' and its coincident European counterpart 'European Terrestrial Reference 89' (see 7.2.1) has resulted in new geodetic references and a re-drawing of maps. In most European countries, this process has recently been completed or will be finished soon.

As a result of the preparation and discussions of the Jyväskylä workshop, this book was written and it was tried to establish the conditions for a standardised database for otter distribution in Europe using modern tools such as Geographic Information Systems. The experience of 13 authors from 8 European countries forms the background of this book. They all have been involved in at least one spacious otter survey, i.e. on the level of a state or of a federal state. Some of them have used and studied otter survey methods for more than 20 years.

As said in the foreword, authors are aware that these guidelines for the standard survey method do not represent a final state - and especially not a state of perfection. Compromises were needed to cover scientific demands (and different 'scientific philosophies!') as well as pragmatic reflections. Various initial positions, such as different levels of distribution or population trends of the otter, the number of surveys already carried out, and of interest in otter conservation in general, had to be considered. Lastly, it became obvious that the wide species range covered by the Eurasian otter, containing as it does such a high variety and extent of habitats used in areas both 'natural' and 'urbanised', does not make it easy to develop guidelines which cover all these circumstances perfectly. Development of survey methods is a dynamic process supported by realisations arising from each further survey carried out. Therefore, the authors hope for the support of all (otter) specialists involved in distribution mapping and biological research to increase efficiency of the methodology in the future.

However, it has to be stated that, so far, there is no other alternative to prepare a reliable base for otter conservation and, therefore, this report reflects the state of the latest methodical development. Indeed, when it comes to comparing this state to the level of survey methods and distribution data background for many other mammal species, otter conservationists have no reason to hide their results. This report will not only support the future development of the survey method, but also increase the quality of distribution data for the Eurasian otter in Europe. The report might also support surveys in the other regions within the range of *Lutra lutra* and the development of similar standardised survey methods for other otter species.

The book contains 86 figures and maps, many of them coloured. It is available from:

GN-Gruppe Naturschutz GmbH  
Sudendorfallée 1  
29386 Hankensbüttel  
GERMANY  
Fax +49-5832-980851  
e-mail: [gn@otterzentrum.de](mailto:gn@otterzentrum.de)

The price (inclusive postage) is 40 DM (out of Europe 50 DM). Payment:

- a. by credit card (VISA, MASTERCARD, AMERICAN EXPRESS - give card number, expiry date, name of card holder)
- b. by cheque payable in DM (in this case a bank fee of 15 DM needs to be added to the price of the book).

**LOBO DE RÍO**

*Pteronura brasiliensis*

Presencia, uso del hábitat y protección en el Peru

SCHENCK Christof

This is the Spanish version of the PhD-thesis of Christof Schenck.

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**WILDLIFE OF LAO PDR: 1999 STATUS REPORT**

J.W. DUCKWORTH, R.E. SALTER, K. KHOUNBOLINE (eds.)

for IUCN, WCS and CPAWM.

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**LAST MINUTE NOTES**

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The issues no. 1 and no. 2 have been published. The idea for such a Bulletin was first proposed at the 1998 International Symposium for the Conservation of the Giant Otter. The Bulletin shall evolve into a networking tool, to be published at least twice a year.

For further information please contact the editor at the address given above.



## **WILD MAMMALS OF NORTH AMERICA**

In 1982, the book WILD MAMMALS OF NORTH AMERICA, by Chapman and Feldhamer was published. Dale Toweill and Jim Tabor coauthored the chapter on river otters. I agreed to coauthor with Paul Polechla and Dale Toweill a revised chapter on river otter for a 2nd publishing of this book. Dale and I conveniently work in the same office here at Idaho Fish and Game.

The key chapter headings include: Nomenclature, Distribution, Description, Physiology, Reproduction, Ecology, Feeding Habits, Behavior, Mortality (including predators, parasites and diseases, and human impacts), Age Determination, Economic Status and Management, Current Research and Management Needs, and literature cited. We are emphasizing management, conservation, and research needs.

Obviously, a lot has happened in the river otter arena since 1982 (when the book was published and I finished my own work on river otters), and I need the collective knowledge of all of you experts to ensure this chapter includes the most up-to-date information about river otters in North America. This is a request to those of you who have information, reports, publications, etc. regarding river otters in the categories described above to please send copies of your work to me at the address below. Please let me know by e-mail or phone if you have pertinent information we should discuss. Several researchers have collected, but not published, information that would benefit those who are trying to learn about river otters - such as through this chapter. I urge you to contact me so we can discuss including enough information, perhaps through "personal communication", so that the reader knows new information is forthcoming.

If it is simpler for you to just respond to this e-mail plea, send me a phone number also so I can give you a call. Thanks for your cooperation and assistance. I look forward to hearing from all you otter experts and admirers.

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