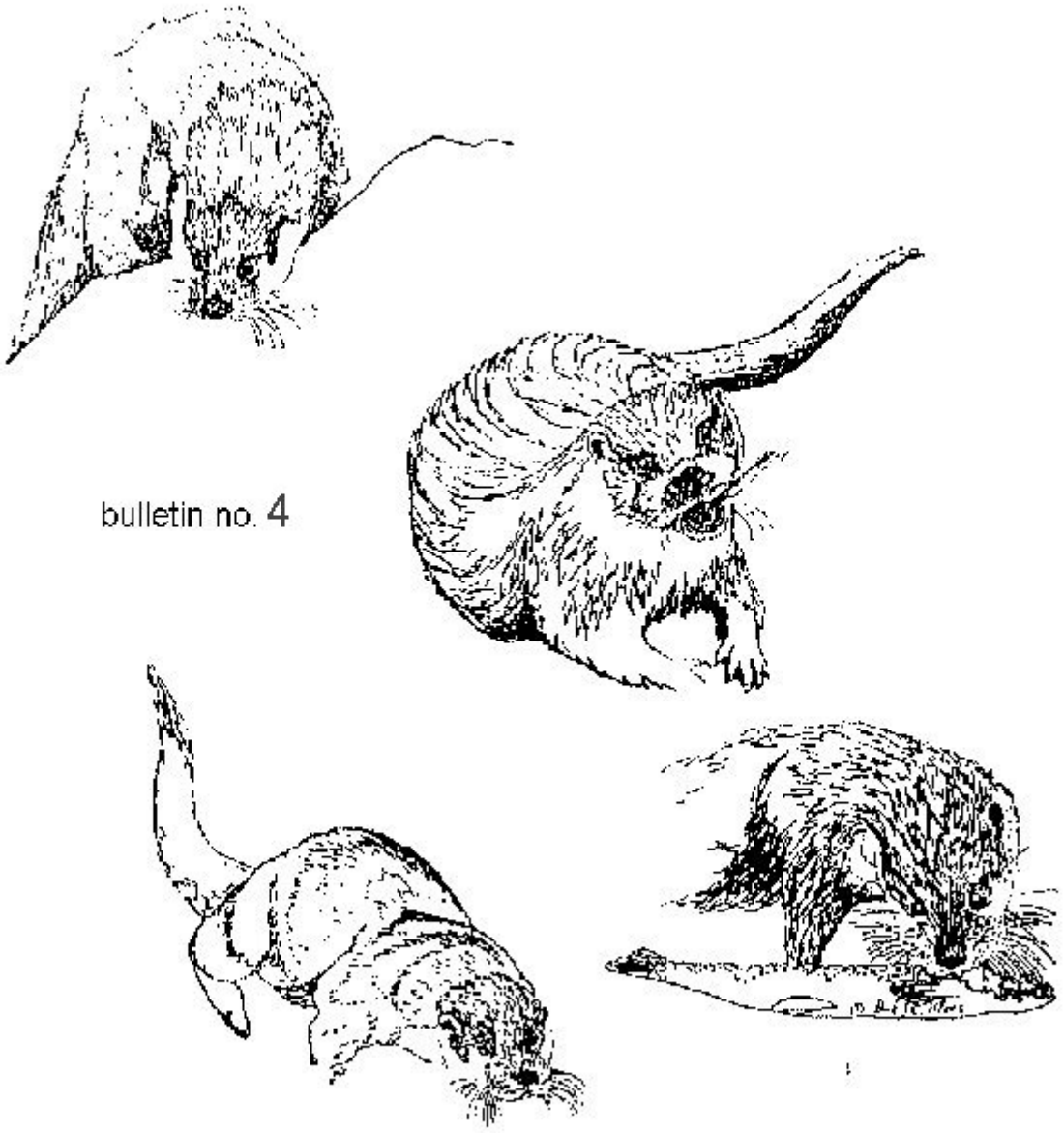
I.U.C.N. Otter Specialist Group



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CONTENT

REPORT

COASTAL OTTERS IN SOUTHWEST PORTUGAL

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INTRODUCTION

Otters are currently thought to thrive in Portugal, however only limited published information is available to assess the present status and distribution of the species (see Almeida, 1980, Macdonald & Mason, 1982, Simões-Graça & Almeida, 1983 and Reis, 1983). In particular, there is a dearth of information concerning coastal otters (but see Simões. 1977-1982).

It has long been speculated that a healthy population of coastal otters exists in southwest Portugal. The purpose of this work is to clarify the status of this population, as well as to contribute to the knowledge of the biology of coastal otters.

Besides the conservation significance of coastal otters, these populations also have a high scientific interest, since they seem to possess several peculiarities in relation to the inland populations. Coastal otters live in much higher densities, with differences in their spacing-out systems and territorial behaviour (Kruuk & Hewson, 1978; Macdonald & Mason, 1980; Erlinge, 1984; Mason & Macdonald, 1986). At this moment, only the Shetland population of coastal otters has been thoroughly studied (Kruuk et al, 1987).

In this report the preliminary results on the distribution and status of coastal otters in southwest Portugal are presented.

STUDY AREA

The present work has been carried out on an exposed coast where the shore consists of both rock outcrops and small shingle or sandy beaches. backed by small to medium high cliffs. Some stretches have no shore except at low tide.

Beyond both sides of Cape St Vincent, this coast extends over a straight lino distance of about 120 Km. The rocky coastline is only broken by the mouth of small streams, several of them fishless, except for a few eels, and drying out in Summer. There are also a few larger rivers, generally associated with small estuaries, coastal lagoons or marshes. The main catchment basins are those of the rivers Mira, Aljezur and Seixe, all having otters (pers. unpublished observ.).

Inland topography is dominated by an extensive plain mostly occupied by crops and pastures, with pine or eucalyptus windbreaks and scattered pinewoods. This plain is sided by hilly country - "serras" of Cercal, Monchique and Espinhaço de Cão. The latter extends westwards to the sea between the villages of Aljezur and Vila do Bispo, resulting in a broken country, cut. by deep stream ravines and covered by dense mediterranean scrub. Small native woods of cork and lusitanean-oak (*Quercus suber* and *Quercus faginea*) can be found in some protected slopes.

Long left aside, while most of the south Algarvian coast was being invaded by crowds and massively built up, the southwest coast started to be thought as a touristic alternative a few years ago. This resulted in an increase of tourism, with some areas starting to be threatened by large touristic facilities.

Fortunately, human pressure did not go too far and it is to be expected that recently issued protective legislation will prevent further disturbance in most of the area.

Apart from touristic pressures, the southwest coast is a well preserved area, very rich in wildlife (Costa et al, 1983)

METHODS

The use of spraints to monitor populations of otters has been recently challenged, with studies in Shetland by Kruuk et al (1986), Kruuk & Conroy (1987) and Conroy & French (1987) casting doubt on the reliability of this technique. Jefferies (1986) and Mason & Macdonald (1987) have vigorously defended the use of spraints as a survey and conservation tool, and demonstrated the reliability of this technique in habitat evaluation. Further comparisons between known otter populations and their spraint distributions seem to be needed.

In the study area otters are shy and elusive, being almost exclusively active by night and, due to the rocky nature of the substrate, leaving almost no footprints. This faced us with the question of how to assess otter distribution and habitat requirements. Since these kinds of data are urgently needed for the development of environmental policies, a steady but expeditious methodology had to be designed. A survey for otter signs and an inquiry to the local population was carried out in order to obtain a map of otter distribution with the location of the areas where otters are more likely to occur. In this way, it was expected to overcome some of the potential shortcomings of spraint surveys.

Between December 1987 and March 1988, and less regularly throughout 1988, the coast was walked from Sines to Cape St. Vincent. Signs of otters were looked for (spraints, anal secretions, footprints) with particular attention paid to areas of boulders and to the mouth of small streams where signs seem to be concentrated. Streams were followed upstream for at least 100 m. Most of the areas were checked at. least twice at intervals during the period of the survey to confirm otter presence or absence; frequently the absence of signs was related to the rise in the water level in streams, further surveys revealing the presence of otters. During the surveys, inquiries were made to local professional anglers, who generally are aware of otter presence and behaviour, in order to ascertain whether the animals were resident or transient n each area where signs had been found. The results of the inquiries were generally in good agreement the signs survey.

The south coast, from Cape St. Vincent to Lagos, was prospected during the same period, with 7 sites visited. Stations were chosen for ease of access and for likelihood of otter presence. At each station, a minimum distance of 200 m was searched for otter signs and the species assumed absent, if these were not found after 600 m had been searched. This was only a preliminary survey, since all this coast is to be walked during 1989.

Spraints were collected from sites distributed throughout the study area, with a. special interest in 7 pilot sites where monthly collections have been performed. The study of the otter diet in the area is now in progress.

RESULTS

The distribution of the otter en the Portuguese southwest coast is shown in Figure 1. Signs of otters were found at. 30 sites on the west coast, and in 6 out of 7 sites prospected on the South Coast.

From a consideration of continued scarcity of positive sites and a continued scarcity of positive signs of otters between sites, as well as on the results of the inquiries, it is preliminarily suggested that there were located twenty-five to twenty-seven areas on the west coast where otters are resident. Doubtful areas are those where information is not enough to decide whether the otters are resident or transient, and those where a very short gap between sites does not allow a clear separation between areas. The site indicated in Figure 1 with a black arrow is an area where otters probably occur but that was not checked because of a lack of access by land.

On the south coast 85.7% of the sites proved positive for otter presence. This number is clearly biased since sites were chosen for likelihood of otter presence rather than randomly or systematically.

Up to the moment, the habitat features related to otter presence have not been quantified. However, it was already noted that most of the spraint sites were found in boulder areas, where some holts in use were found, and in streams where water is present throughout the year. Streams that fall high from the cliffs seem not to be used by otters. An exception is one site where a man made access to the beach make the stream suitable for otters (nevertheless, no data existed before the access was built). Bankside cover was also noted to be important in the otters' use of streams, but the extent in which this is likely to affect otter distribution was not investigated.

In summer, large piles of spraints were found in association with small freshwater pools, especially in long, dry stretches of coast.

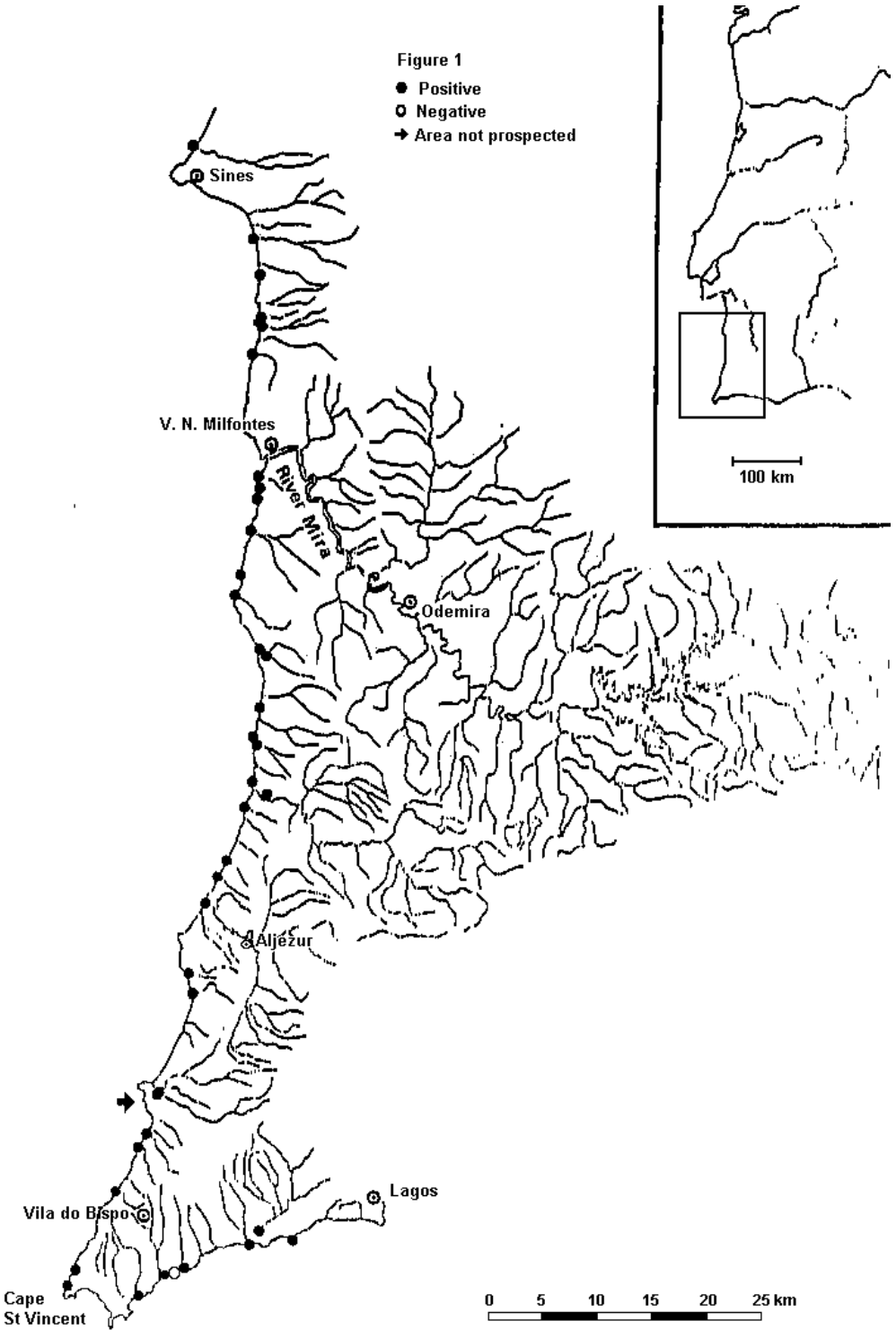

Figure 1: Results of Otter Survey in Southwest Portugal

DISCUSSION

As was previously thought, southwest Portugal seems to hold a good population of coastal-dwelling otters.

On the west coast, over a straight line distance of about 100 Km, twenty-five to twenty-seven areas that otters use permanently were identified. These, with the remaining site that has not yet been prospected, but. where otters are likely to occur regularly, accounts for an average of one otter area per 3.6 Km to 1.0 Km of coast.

These so-called otter areas cannot be thought as individual otter territories since the home-ranges of coastal otters overlap considerably (e.g. Kruuk & Hewson, 1978). Knowing that in marine habitat the intensity of sprainting is positively correlated with the presence of holts (Kruuk & Hewson, 1978, Macdonald & Mason, 1980 and Conroy &. French 1987, but see also Trowbridge, 1983), it is preliminarily suggested that our otter areas are places where holts are located. In fact, in most of the boulder areas, heavily marked holts were discovered. However, holts were never found in streams, probably because they were deep inside the shrubs (mostly *Rubus* spp.) that make up the thick bankside cover of most of them.

It is not known how many otters are based on each otter area or whether individuals used more than one area. Therefore , it. is not currently possible to make any estimate of the absolute number of otters in the study area .

Aknowledgements: Thanks are due to Dr Luís Palma for his help during the first steps of the field work. This work has been carried out under a research contract to the Direcção Geral da Qualidade do Armbiente.

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REPORT

SOCIAL ORGANISATION AND BEHAVIOURAL ONTOGENY OF OTTERS (*Lutra canadensis*) IN A COASTAL HABITAT IN NORTHERN CALIFORNIA

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The following notes summarize on ongoing series of observations of the behavior of a coastal population of the Nearctic otter, *Lutra canadensis*. Study of this population began in June 1983. and became a graduate thesis project in May 1986. The study site is a boat harbor in the fishing village of Trinidad (41º3'N,l24º8'W) on the north coast of California. The harbor is located in the westernmost portion of a l.5km-wide ocean bay, sheltered by the mainland on the north and east and a peninsular headland on the west. The otters occupy dens in the dense woody brush on the headland. From 1986 to 1988, total population ranged from ten to fourteen. Otters are present in the harbor year round but are most commonly seen during salmon fishing season (May through September), when they feed on fish remnants discarded off the pier. The otters are popular with the villagers and are valued as a scenic resource. Because the otters are seldom harassed, they display a remarkable indifference to the presence of people and the attendant bustle of a commercial fishing port. The otters' high visibility here greatly facilitates observation of their daily and seasonal activities, allowing for continuous, longitudinal study. Since 1986,I have logged over 1,200 hours of direct observations.

The focus of my thesis research is to document the behavioral ontogeny of the pups, and to follow changes in the pups' relationships with their mother and the other otters over time. Observations of the social organisation of the otter population are also being recorded. It will be helpful to review some of the salient characteristics of this social structure before discussing the behavior of individuals.

Social Organisation

The most consistent finding of this study is that Trinidad otters are segregated into two distinct social groupings. One group is a family unit consisting of a maternal female, her pups, and adult female offspring. The other social group is a clan (*sensu* Arden-Clark, 1986) comprising the remaining six to eight of the population, and consists entirely of males. Because the otters are frequently observed out of the water at distances of less than 10m, secondary sexual characteristics and urine stream orientation are discernible. As a result, determining the sexual composition of those groups is a fairly straightforward task. During this study, I have never seen an adult female in regular, daily association with the male clan Among adult members of this population, sexual segregation forms the foundation of the breeder social structure.

The most striking feature of this system of sexual segregation is the degree of gregariousness exhibited by members of the male clan. The clan occupies a common den. During much of their daily activity cycle, the males maintain a close association with other clan members. Episodes of group foraging, food sharing, mutual grooming, social mounting, and vigorous play are common. Clan males remain gregarious throughout the year, even during the females' estrus periods.

Within the clan, no dominance hierarchy is evident, though some group movements and activities appear to be initiated by older individuals. In terms of overall social rank, however, the males are subordinate to the adult females of the family group. The maternal female holds the highest social rank.

In keeping with the "rule" of sexual segregation, adult members of the clan and family avoid each other or interact with perfunctory brevity; consort relationships are the sole exceptions. Incidental encounters between the sexes are usually non-agonistic, but sometimes, especially when the pups are very young, the females may respond to the males' presence with aggressive attacks, and serious fights have

resulted. Although they may initially engage the females, the males usually flee within a few seconds. Subsequent to such an attack, the entire clan may leave the harbor for several days. The behavior of the socially dominant adult females, then, appears to influence whether the clan is present in the harbor at any given time The males may therefore be more properly regarded as temporary residents.

The clan's sporadic presence impedes detailed study of its internal dynamics, but over time, some general behavioral patterns can be discerned. A consistent observation is that, for most daily activities, clan members form affiliational subgroups, or "parties", of two or more individuals Although the clan usually dens as a whole group and sometimes forages as a whole group, it is more common to see the males emerge from their den and travel about in parties of three to six. In many instances, these excursionary parties appear to be fortuitous in composition and transient in duration. Males may drift away from a party to forage alone or to join another party, or smaller parties may merge together.

At other times, however, a party's composition seems to reflect specific affiliational preferences among its members. For example, a male separated from his party will sometimes emit chirping contact calls which are attended to by his fellows but ignored by males from another party. Similarly, a lost male in search of his party may encounter other males along his path, yet continue searching until he rejoins his original companions.

Some of these affectional parties have been seen to recur over periods of weeks or months One such party is a closely-knit trio of younger males who repeatedly attempt to board and investigate pleasure boats in the harbor. Another is a more sedate party of four older males can sometimes be seen resting and grooming together on a particular dock Such affiliational preferences are noted with regularity among clan members, as well as among members of the family group.

As might be expected, affiliational bonds tend to be stronger within the family. With few exceptions, family members remain in close proximity to one another throughout their daily activity cycle. The family's internal stability, along with its tendency to maintain a day to day presence in the harbor, provide the observational continuity necessary for detailed study of otter family life.

The Maternal Cycle

The term "maternal cycle" refers to the sequence of behavioral events in the female's reproductive cycle, and the concomitant behavioral development of the pups from birth through maturation to independence. At Trinidad, the maternal female, F' ("F-prime"), is approximately six years old. and has produced one litter each spring since 1986. The maternal cycle of F' has a period of twelve months.

For F', the maternal cycle comes full circle in the latter half of February. At this time, the actively gestating F' leaves her previous offspring in the harbor and establishes a natal den elsewhere. This finding corroborates Woollington (1986), who reported that, among coastal *L. canadensis* in Alaska, the maternal female utilizes a natal den outside her usual home range, away from other otters. In the present study,, I do not know where F' goes during her natal period, only that she is very rarely seen in the harbor until June, when the new litter is brought from the natal den to the nursery den adjacent to the pier.

Because the pups' actual date of birth is unknown, their age when they leave the natal den must be estimated. In 1988, I last saw F' with her offspring on 23 February. F' was not seen in the harbor until 3 April when she was observed scent marking in front of a den entrance. It was noted that F' had distended mammae. The next day an adult male was seen displaying physical signs which I have come to associate with mating activity, these being the presence of small wounds on the face and extremities. Findings by Liers (1951), and Hamilton and Eadie (1964), suggested females of *L. canadensis* have a post-partum estrus. Assuming F' had returned to the harbor on 3 April to mate after the birth of her new litter, the pups were probably born sometime the previous week. If so. the pups would be in their eleventh week of life when they made their first appearance in the harbor on 7 June. This is consistent with Liers (1951). who noted that otter pups were ten to twelve weeks old when they left the natal nest.

Before giving an account of the behavioral ontogeny of the pups, it is necessary to introduce the two females born to F' in the spring of 1986: F86A and F86B. In 1987, after F' produced her next litter, the F86 sisters returned to the family, and have since served as companions to their mother's 1987 and 1988 litters. At the present time (December 1988), despite being thirty-two months old (and

reproductively active adults themselves), F86A and F86B continue to maintain a close familial bond to F' and her offspring.

Abbreviated summary of behavioral ontogeny data

Results are for the 1988 litter only. Observations made daily during last four to five hours of daylight.

Week 11 (7-13 VI) - Three pups moved from natal den to nursery den adjacent to pier. Swimming movements awkward. Pups paddle on surface using all four legs for forward propulsion, and can swim only 0.5m below surface for forward distances of 2 - 3 m. Deep-dives not attempted, frequently try to ride upon back of F' when swimming. F86 sisters loiter around nursery den. F' aggressively drives them away. F' often leaves pups alone in den for over an hour while foraging for herself. Day 1-4: One pup hesitates to enter water; must be dragged in. Pups display inconsistent interest in food. Begin self-exploration of surroundings. Play with other pups and F': wrestling, open-mouthed face-sparring on land, flurry-wrestling in water. May shake water off fur but make no attempt to rub dry in dirt as adults do. Day 5: All enter water readily. F86 sisters meet pups when F' away getting food. Rudimentary auto- and allo-grooming. One pup mounts and neck-bites another pup. Day 6: First see a pup soliciting food by sniffing at mouth of F'. F86A briefly interacts with F' and pups; F' bites her. One pup homes back to den from pier alone (approx. 70m). Day 7: Play with inanimate object.

Week 12 (14-20 VI) - Pups can swim below surface for forward distances of 3-5m; no deep-dives seen yet. Follow and try to imitate F' as she fishes and grubs along edge of headland Regularly eat provided food. Dry fur by rubbing in dirt, though incompletely. F' and pups begin to play "pinning game"- F' pins pup to substrate by lying on top of it; "object" is for pup to squirm free. Day 1: Another mount and neck bite by pup. F86 sisters attempt to enter den, F' chases them out. Day 2: First vocal squabble over possession of food. One urinates in response to olfactory cues on rocks. Day 3: Amicable interaction between F' end F86B in presence of pups. Day 4.: Several brief vocal squabbles over food. F' and pup allogroom. One autogrooms flank, belly. Day 5: All urinate in response to olfactory cues. All play with F86 sister in presence of F'. Day 6: F' drives clan from nursery den. Day 7: F' and both F86 sisters amicable; sisters mount F' and each other. All pups home back to headland from pier without F'. All autogroom most of body.

Week 13 (21-27 VI) - Pups swim with improved body and limb coordination, and dip below surface with proper arching of back. First deep-dives seen (approx 1m). Pups accompany F' on most foraging excursions. Begin chasing rockfish fry which school under docks and in kelp. Nibble-groom fur like adults; rub dry most of body.. Nursery den used less often, primarily use main den 125m to the south. Day 1-3: Both F86 sisters spending more time with F' and pups, but F' still drives sisters from den. Day 4: F86 sisters officially rejoin family; sisters share den with pups, but may be bitten by F' if try to eat pups' food. Day 5: F86 sisters stay with pups while F' forages. Pup and elder sister allogroom. Day 6: F' catching rockfish fry and releasing in shallows for pups to chase; first fish capture seen. F' leaves pups with F86 sisters again. F86 sisters attack clan males. Day 7: First active refusal by a pup to share food with another.

Week 14 (28 VI - 4 VII) - Pups make serious attempts to capture own fish; at least one successful. Swim underwater with well-coordinated body undulations and rear feet kicks. Front legs used less for forward propulsion. Can swim below surface for forward distances of 5-10m and dive to depths of 1-2m. Mammae of F' becoming less pendulous. Day 1: First solo fish capture. One bites another in squabble over food. Day 2:One swims alone from nursery den to main den and back (approx. 250m). Day 3; One stays out to explore after rest of family goes into den; returns to den on own. Day 4: All dive to bottom in shallows by beach (depth approx. 2m).

Week 15 (5-11 VII) - Three solo captures observed; all have probably caught first fish. Swimming movements and coordination functionally adult-like: swim on surface as fast as adults, and can swim underwater for forward distances of over 10m. Apparently not diving deeper than 3-4m, however, probably because of buoyancy of fur relative to body weight. Pup sexes confirmed: two males, one female. All groom, rub dry like adults. Begin treading back legs when eliminating. F86 sisters sharing food with F' and pups. Day 1: One leaves den alone, eats leftover fish, F' finds pup and scolds, F86 sister responds to a lost chirping pup. Day 4 One swims alone from beach to main den and back (approx. 450m). Day 7: Female pup (F88) stays out to forage on own, catches a fish in shallows by beach, F' retrieves her after 18 min.

Week 16 (12-18 VII) - F' takes pups on first foraging excursions beyond core area around pier (0.75-1.25km round trips). Scrotum discernable. Day 2: F86 sisters attack clan again. Day 7; Pup mounts F' with neck bites and pelvic thrusts.

Week 17 (19-25 VII) - The pups meet the clan. Day 1: Chirping pup and chirping male cross paths; brief but relaxed interaction. Day 3: Pups and six clan members interact in presence of adult females; no intersexual aggression. Pups mount adult males and vice versa. Day 4: Two males attempt interaction with pups: F' tolerates one, chases and screams at other, F86A "stands guard" between den and pups on dock. Pups participate in attack on common murre (*Uria aalge*). Day 6: One swims below surface for forward distance of approx. 20 m (as far as F86B).

Week 18 (26 VII-1 VIII) - Pups deep-diving as adults: first fish remnants and crabs retrieved from under pier (5m depth). F' continues to provide virtually all food, however. Mammae distension of F' less than half that of observed maximum.

Week 19 (2 - 8 VIII) - Day 1,2: F' takes pups on two-day excursion out of harbor, possibly to a den approx. 2.5 km down coast. Day 3: First hear pups emit affiliational "chuckle" vocalization.

Week 20 (9 - 15 VIII) Day 2: F88 leaves den alone, forages around pier area, returns to den after 40 mins. Day 3: - F88 injures right eye, keeps eye closed, reacts in pain when touched. Day 6: Family to northeast harbor to forage. F88 gets separated from others, finds own way back to main den (approx. 0.6km) with one good eye.

Week 21, 22 (16 - 29 VIII) - Pups remain clearly dependent on provided food; still occasional squabbles and refusals to share with siblings. F86 sisters increasingly solicitous: retrieve chirping pups, share food, family leaves on another two-day excursion. Male pups often mount F', F' rolls over on back in response. F88 opens injured eye occasionally but swims with eye closed, eye has bluish film.

Week 23, 24 (30 VIII- 12 IX) - F' still provides most food, but sometimes refuses to share her own food: may push at pup's face with paw or turn away. Foraging excursions out of core area at least three times a week. Mammae of F' flat. Eye of F88 apparently healed.

Week 25, 26 (13-26 IX) - Foraging excursions out of core area almost every day. End of daily observations; sessions held four days a week (or as weather permits) until next spring.

At six months, otter pups are efficient and dextrous swimmers, but they remain observably inefficient foragers. Considerable additional learning and refinement of fishing skills is required before self sufficiency is attained. Currently (Week 37), F' continues to provide supplemental food to pups.

In this study, "Independence" is arbitrarily defined as having occurred when a pup is seen living apart from F' for one week. From data obtained thus far, the pups of F' appear to achieve independence between 46-48 weeks of age. No pups have yet satisfied the Independence criterion by voluntary dispersion, however. In all cases, independence was the result of abandonment by F' when she led the harbor to begin her new maternal cycle. From the 1986 litter of four, a male, M86, joined the clan at independence; F86A end F86B, as stated, rejoined the family. From the 1987 litter of four, only M87B survived to independence At thirteen months, M87B was still denning with the F86 sisters when he suddenly disappeared from the population.

Postscripts

Continued study of this population is planned. Compilation of data for the present thesis project will be completed in the spring of 1989 when the F86 sisters would be expected to produce their own first litters (F86B was observed copulating on 18 April 1988). Some interesting changes may be in store.

Highlights of sessions from the spring and summer of 1988 are recorded on video tape.

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REPORT

SOUTHERN SEA OTTER, THE PROCESS TO TRANSLOCATE AND THE RESULTS OF THE INITIAL YEAR, AUGUST 1987 - AUGUST 1988

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The relatively small size and limited range of the California (southern) sea otter population, and the otter's vulnerability to mortality from oil spills, were the main factors that resulted in its being listed as "threatened" under the provisions of the Federal Endangered Species Act in 1977. Since that time, the population has not increased in size, and appears to have declined from 1976 to 1982. Deterioration in the status of the California sea otter population is believed to have been a result of entanglement mortality in gill nets. From June 1982 to June 1984, the California Department of Fish and Game (Department) estimates that an average of 80 otters were drowned in gill and trammel nets each year. This source of mortality has been reduced however, by action of the State of California to close waters of the sea otter range to large-mesh gill and trammel net fishing activities, and recent surveys show encouraging signs that population growth has resumed as a result. However, entanglement mortality still is occurring within the sea otters' range and State legislation is being pursued to provide additional closures to eliminate this source of mortality.

The need to take action to promote the recovery of the population is still urgent, as the potential for serious oil spills resulting from accidents of tankers and Outer Continental Shelf (OCS) oil and gas development near the sea otter range continues to increase. The Southern Sea Otter Recovery Plan, approved in 1982, identified the establishment of at least one additional colony within the otters' historic range as a primary action needed to promote recovery of the southern sea otter.

Because of the small size of the sea otter population, its restricted geographic distribution, and the physiological sensitivity of sea otters to the effects of oil contact, successful establishment of a second, or reserve, breeding colony of sea otters at a location separate from the existing population could substantially reduce the impacts on the population as a whole if a major oil spill were to occur. Furthermore, it would minimize the possibility that such an event would jeopardize the continued existence of the southern sea otter. The translocation is also viewed as an experiment in establishing a new colony as well as providing an opportunity to conduct research to obtain data helpful to understand the optimum sustainable population (OSP) size consistent with the maintenance of the health and stability of the marine ecosystem.

In 1984 the U.S. Fish and Wildlife Service (Service) initiated development of an Environmental Impact Statement (EIS) to assess the environmental consequences of the proposal by the Service to translocate and maintain an experimental population of southern sea otters. This EIS described and analyzed the consequences of a translocation to one of three potential sites: San Nicolas Island off southern California; coastal northern California; and coastal southern Oregon. Also described were the consequences of: 1) no action, 2) greater protection to the existing sea otter population without translocation, and 3) translocation combined with partial containment of growth and range expansion of the existing California sea otter population. As suggested by the Council on Environmental Quality, an Interagency Project Review Team (IPRT) was established to participate in scoping and provide suggestions for the content of the Draft EIS. Meetings of the IPRT were open to the public and were attended by individuals from Federal and State Agencies, and private interest groups representing a variety of environmental and economic interests.

During the drafting of the EIS, special legislation was proposed before Congress to permit long-term management of a translocated colony which otherwise is prohibited by the Federal Marine Mammal Protection Act. In November 1986, Public Law 99-625 was signed into effect. This law specifically

authorized the translocation and management of an experimental population of California sea otters and establishment of Translocation and Management Zones. The translocated population is afforded essentially the same protection as the present population in the central California range, but these protections apply only within the Translocation Zone, delineated to include the sea otter habitat and a surrounding buffer zone to further the conservation of the species. Within the Translocation Zone both incidental and intentional killing is prohibited and the sea otters are fully protected under both the Endangered Species Act and Marine Mammal Protection Act.

The Management (otter-free) Zone is maintained around the Translocation Zone to prevent dispersal and establishment of the experimental population in surrounding areas where serious conflicts with fisheries and other human activities might occur. To accomplish this, the Service has been authorized under PL 99-625 to use all feasible non-lethal means to capture and remove sea otters from the Management Zone. And because this Management Zone is set up to prevent, to the maximum extent feasible, conflict with other fishery resources, any sea otter mortality that occurs incidental to otherwise legal fishing activity is not a violation of either the Endangered Species Act or Marine Mammal Protection Act. Therefore, within the Management Zone, sea otters do not have the same stringent protections as do otters in the Translocation Zone.

In May 1987, the final EIS was released and by August, the Service received the necessary Federal and State permits to proceed with the translocation.

Capture operations were initiated August 24, 1987. Teams of biologists from the Service and the Department effectively coordinated and conducted the capture of sea otters and their transport and release at San Nicolas Island. Capture teams carried out their activities over the southern third of the sea otter range, from approximately Point Buchon north to Lopez Point. Three techniques were used: dip nets, underwater Wilson traps operated by SCUBA divers, and floating tangle-nets. The first sea otters were captured on August 24 , 1987, and by mid-July 1988, 124 sea otters had been caught along the central. California coast. About 40% of these were immediately released at their capture site because of sex or size limitations. .Seventy -four of the otters were transported by van to the Monterey Bay Aquarium, tagged on the rear flippers, screened for health abnormalities, and prepared for shipment to San Nicolas Island. Four died while at the Aquarium and a fifth sea otter was returned to its original capture site and released. The remaining 69 sea otters (16 males, and 53 females) were flown to San Nicolas Island in 13 groups of one to 24 sea otters.

By the end of the first year of translocation , late August 1988, 14 sea otters were routinely sighted around the island and appeared to be doing well. Censusing the sea otters at the island has been difficult because of poor weather and sea conditions, access limitations, and the difficulty of seeing the color-coded flipper tags. Censuses have not only been hampered by winter storms, including one of the worst on record for southern California, but also by San Nicolas Island closures during weapon tests (the island is part of the Navy's Pacific Missile Test Center at Point Mugu). When surveys are possible, each sea otter is observed until the unique color combination and position of the flipper tags is determined.

As of late August 1988, the disposition of 24 sea otters that were no longer at San Nicolas Island was known or suspected. Thirteen sea otters left the island and returned to the parent population. Another sea otter was found in the "no otter" Management zone in southern California in late December 1987. She was caught along with her newborn pup, and moved back to her original capture site off the mainland. Three males died at San Nicolas Island from "stress" related to their capture and transportation. Two females were found dead on beaches in southern California (one of these had been shot and the other cause of death was undetermined. Three sea otters are suspected of having died in fishing gear. Two radio-tagged sea otters probably died, based on their sudden disappearance. Thus a theoretical population of 45 sea otters (69 minus 24) remained at the island. During the last weeks of August 1988, 14 of the 45 sea otters were identified at the island.

Consequently, 31 sea otters were considered "missing" (45 minus 14), including 7 that were never sighted after their release at the island. Although the whereabouts of the remaining 31 missing sea otters is presently unknown, to assume that all are dead is premature. The 13 that returned to the parent population were also considered "missing", for periods of time between 26 and 208 days, until they were sighted on the mainland. Surveys for these missing sea otters continue and finding some of them back in the parent population is expected. However, some of the missing 31 sea otters may have lost their flipper tags, thus making 'identification impossible.

As a comparison, it is useful to review the history another reintroduction effort in Washington State. Fifty-nine were released during 1969 and 1970. At least 16 of 29 released in 1969 died within 2 weeks. No data are available on deaths after the second release of 30 sea otters 1970. Very few data on this reintroduction were recorded until 1977, when Service biologists conducted the first intensive survey. At that time only 19 sea otters, including 4 pups, were observed. However, population surveys during the 1980's suggest that the Washington population has been slowly increasing. Total counts in 1981, 1983, 1985, and 1987 were 36, 52, 65, and 94, respectively. Thus, barring any disasters, it appears sea otter population off Washington is established and should continue to grow.

If the Washington reintroduction is used as a model, it could take at least 5 years before the new colony at San Nicolas Island shows evidence of growth. However, for the San Nicolas Island reintroduction, Federal and State permits authorize the option to move up to 250 sea otters from the parent population over a 5 year period to assist in this effort.

The Service has trained two Wildlife Officers specifically for sea otter law enforcement and containment. Their activities include patrol work and contact with fishing vessels in the Translocation and Management Zones. Contacts are made to inform divers and boat operators of the laws concerning sea otters.

As of October 1, 1987, the Service's Ventura Endangered Species Recovery Office (Ventura, California) has been responsible for development and implementation of a containment proqram pursuant to PL 99-625. A containment contingency plan has been prepared which serves as a working guideline for the verification, monitoring and capturing of otters found in the Management Zone. Both Federal and State biologists are cooperating in the implementation of this program.

In summation, the success of the initial year's effort at re-establishing a founder population at San Nicolas Island is less than expected. However, based on the Washington State translocation example, it may take many years before the success of the translocation at San Nicolas Island can be determined. The results of the first year's experiment indicate that much can be done to enhance the establishment of a colony of sea otters on San Nicolas Island, particularly in reducing the tendency for translocated sea otters to disperse and in minimizing stress-related mortality. Physiological stress is suspected of being one of the primary factors contributing to sea otter mortality. As a result, future translocation methods have been modified to reduce stress and improve the likelihood of sea otter survival, primarily by minimizing the number of steps and time periods that sea otters are held or transported prior to their release at the island.

The experience of the first year of translocation has provided other useful information. The data indicate that adult sea otters are most likely to leave the island colony and attempt to return to the parent population, and that very young and very old sea otters are more susceptible to the stresses of translocation. Therefore, only sea otters within a weight range of 25 to 35 pounds will be translocated beginning the second year of the project. In addition, the rate of sea otter dispersal may have been partially related to the amount of boat traffic in the area. During the upcoming year the surveillance of boat activity, especially during lobster season, will be increased. Radio-telemetry technology has yielded less information than expected during this initiation year. However, as the project continues, and as new equipment such as the flipper tag radio transmitter is tested, the information obtained will no doubt improve.

Monitoring of the Translocation Zone has confirmed that the available habitat surrounding San Nicolas Island is capable of supporting a population of sea otters even under adverse weather conditions. In spite of one of California's worst winter storms on record, sufficient kelp beds have remained around the island in which the sea otters can raft and easily obtain prey items. However, experience during the first year has shown that a number of the sea otters have attempted to return to the parent range on the mainland. In order to so, the sea otters had to pass through the Management Zone, and their travels back to the mainland range probably account for the majority of sightings in this Zone.

Monitoring of the Management Zone has revealed that no sea otters are known to have remained in any given area in the Management Zone for more than a few days. Most importantly, no new sea otter colonies are becoming established in the Management Zone. California Department of Fish and Game biologists have been trained by the Navy and have subsequently developed a program for using rebreathers, instead of conventional SCUBA, for the capture of sea otters. This change in technique has

significantly improved their ability to capture sea otters, which will enhance the effectiveness of the containment and translocation efforts.

The Service capture team is currently seeking approval for rehreather training,.

A successful translocation programme requires success in research, law enforcement and containment efforts inclusively. If successful, the translocation will establish a second breeding colony of southern sea otters (contained within a designated zone) and accomplish certain goals and requirements of the Endangered Species Act and the Marine Mammal Protection Act. The second colony will : 1) reduce the probability that more than a small proportion of the population could be decimated by any single natural or man-caused catastrophe; and 2) allow additional data to be obtained for assessing translocation and containment techniques, population status, and the influence of sea otters on the nearshore marine community, which will facilitate a better understanding of the characteristics and impacts of a sea otter population at an optimum sustainable level.

REPORT

ASSESSMENT OF POLLUTION RISK FOR THE REMAINING OTTER POPULATIONS IN LOWER SAXONY, WEST GERMANY

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Because very little was known about hazards to West German otters due to toxic water-borne contaminants the Campaign for Otter Protection (Aktion Fishotterschutz e.V.) initiated a study having two objectives:

- to assess the pollution risk for the remaining West German otter populations in Lower Saxony (see Figure 1), thus following the recommendations of the IUCN Otter Specialist Group that an assessment of pollution risk is an essential part of any otter conservation program;

- to contribute further data to the continuing discussion on the interrelation between otter decline in Europe and the contamination of its habitats with persistent organochlorines and heavy metals, respectively.

Few waters in the county of Schleswig-Holstein have been examined for organochlorines. Apart from a small spot east of Hamburg all areas in the F.R.G. with extant otter populations have been taken into consideration.

As a first step an appropriate (methodical concept had to be found.

With only small populations left in low densities, there was little chance of otters being found dead for analysis, or that sufficient spraints could be found in a reasonable time (see POPPEN, 1985; PRAUSER, 1985). The following possibilities were therefore considered :

- to calculate the daily pollutant intake of otters via prey and - subsequently

- estimate the average individual body burden within the population of concern (simulation model), or

- to survey the "otter-available" contamination of relevant freshwaters by using a suitable fish species as biological monitor (baseline study)

The latter was judged to he the most promising.

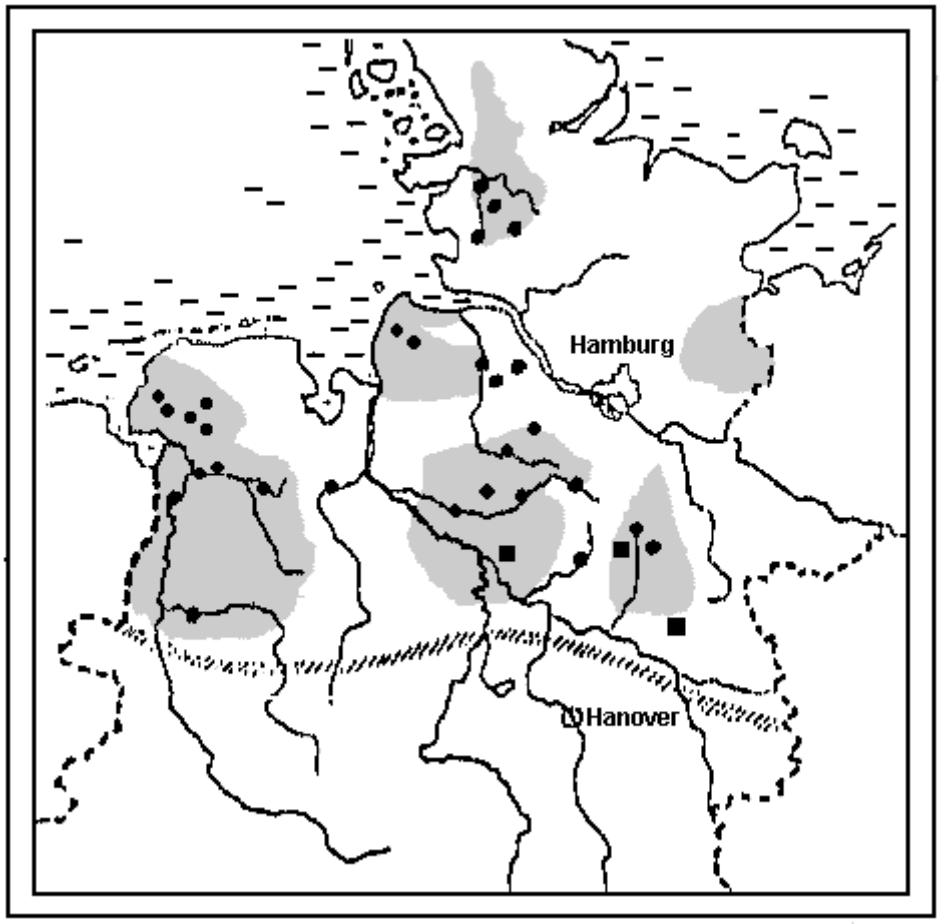

Figure 1: Distribution of the otter (Lutra lutra) in West Germany (after POPPEN, 1985) and sampling sites of roach (dots and squares). The squares indicate sites where roach with a high Cd-contamination were caught (see text). The stroked line marks the present distribution limit to the south

A. Heavy Metals

Roach Liver was analysed for Cd and Pb, muscle tissue for Hg.

Apart from Cd in roach fro some waters in the Lüneburger Heide (see Figure 1), all residues correspond with the usual background contamination of West German freshwaters, i.e. they are hardly to "normally" polluted. The ranges of concentrations were:

0.02	- 0.04	mg/kg	fresh wt.	(0.09	- 0.17	mg/kg	dry wt.)	for	Pb
< 0.01	- 0.04	mg/kg	fresh wt.	(0.01	- 0.17	mg/kg	dry wt.)	for	Cd
< 0.04	- 0.23	mg/kg	fresh wt.					for	Hg

Using the multiple comparison of means after Tukey - for baseline studies a very valuable statistical tool, I think - significant regional differences wer found for Cd and Hg. Fish from freshwaters in teh north-west were least contaminated, fish from freshwaters in the south-east showed the highest concentrations. The spatial distribution pattern could he explained by an interaction of :

- a continuous airborne pollutant inflow (the extent of emissions being dependent on the position of sources) and
- the availability of metals to fish, influenced mainly by
- the trophic conditions within the particular water system and

- the physico-chemical properties of the different metals within freshwater ecosystems.

However, the high to very high Cd-concentrations in roach liver from the three Lüneburger Heide streams showing 0.11; 0.15; 0.3 mg/kg fw (0.51; 0.60; 1.2 mg/kg dw) can be explained, assuming that the poor sandy soils within the catchment area are highly acidified. In that case the high Cd concentrations could be an alarming sign for a beginning of acidification of these waters. (There is further evidence from other studies.) What this would mean for otters doesn't need further explanation. Thus it is strongly recommended to keep an eye on the problem of water acidification which in Germany (and not only there) has seriously been neglected so far.

As far as direct toxic effects are concerned I doubt very much that heavy metals other than mercury can affect the survival of otherwise healthy otter populations, because Cd and Pb are hardly available for animals living on a diet that is absolutely dominated by fish. Mecury, however, doesn't seem to be a problem in the remaining West German otter-habitats.

B. Organochlorines

Muscle tissue was analysed for PCB, DDT and metabolites (-DDT) hexachlorocyclohexane-isomers (HCH), hexachlorobenzene (HCB) and octachlorostyrene (OCS). For financial limitations mixed samples had to be used for organochlorine analyses. To get an idea about variability, some fish samples from selected sites were analysed once again as single samples. Conclusions on regional differences of contamination, however, cannot be drawn, although - as a tendency - fish from freshwaters in the west seem to be less contaminated than those from sites in the east. If this was true, it most likely was due to different trophic condition of the waters (compare findings on heavy metals).

Compared with data from other West German freshwaters all residues are at the low edge of the concentration range that is typical for roach in this country. Concentrations (given in mg/kg extractable fat, all mixed samples) ranged from:

1 - 5	mg/kg	for PCB (few exceptions showed higher concentrations up to 26 mg/kg)
0.1 - 0.7	mg/kg	for ∑-DDT
n. det. - 0.2	mg/kg	for Lindane α and β were not detect.
n.det - 0.2	mg/kg	for HCB (being almost ubiquitous)
n.det.		for OCS

But there is no reason to feel relieved.

To come to an adequate interpretation in terms of risk for otters it is essential to refer to data from areas where both otters and roach have been analysed. Yet such a comparison is only possible with Swedish data. As there is strong evidence that the dramatic otter decline in the south of Sweden is - at least partly - caused by PCB (see OLSSON & SANDEGREN, 1983), the residues of roach from south Swedish waters can be used as a reference level suggesting a high risk for otter populations. In the Environmental Monitoring Programme of the National Swedish Environmental Protection Board (started in 1980) roach are regularly checked for PCB (and DDT). The PCB-concentrations (means over several years, based on extr. fat) in roach muscle tissue are (after ODSJÖ & OLSSON, 1987):

- 0.9 mg/kg and 1.2 mg/kg, respectively, in the very south of Sweden
- 0.3 mg/kg for roach from two sampling sites somewhat higher in the north (longitude roughly that of Stockholm).

As analytical methods have been intercalibrated beforehand the Swedish data can be directly compared to ours. This means :

- Otters in the F.R.G. today are restricted to freshwaters that compared to West German standards - show a low PCB-contamination (a finding that in itself is interesting enough).
- Still these low concentrations are highly alarming, because they reflect the southern Swedish PCB situation of the seventies (as can be extrapolated from Swedish long-term studies, see

ODSJÖ & OLSSON, 1987) and represent a pollution level that can be regarded as seriously affecting the survival of otter populations.

Thus - among other things - the governments of Lower Saxony and Schleswig-Holstein are urged to counteract the otter decline and reduce additional stress factors. Further habitat destruction must be stopped. A rapid and effective improvement of the remaining wetlands harbouring otters has to be realised as soon as possible. Once the environment is polluted with highly persistent substances like PCB the degree of contamination can only be monitored. Habitat improvements, on the contrary, can be started at once. For the otter to have a chance to .survive in the F.R.G. action has to be taken at once. To reinforce otter populations with captive-bred animals, however, would not be a good idea at all under the given circumstances.

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REPORT

CONTAMINATION OF AN OTTER FOUND DEAD IN THE F.R.G

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As a "by-product" of the assessment of pollution risk for the remaining otter populations in Lower Saxony (see previous article) muscle, kidney and liver tissue of a female otter (about one year old) was received and analysed for PCB, DDT and metabolites (∑-DDT), HCH-isomers, HCB and octachlorostyrene (OCS) (all muscle tissue), mercury (liver tissue), cadmium, and lead (liver and kidney tissue). The animal was killed in a road accident (July 1986) very near to the river Elbe (within 10 km) about halfway between the "disappearance" of the Elbe into the GDR and the town of Hamburg. This site is not reckoned to be part of the otter's present main distribution range.

Results:

	Liver		Kidney	
Cd	0.025 fr. wt.	0.09 dry wt.	0.080 fr. wt.	0.31 dry wt.
Pb	0.10 "	0.36 "	0.34 "	1.3 "
Hg	7.9 "	28.1 "		

Muscle Tissue (extr. fat)	
PCB	34
HCB	10.5
OCS	4.3
∑-DDT	1.3
γ-HCH	0.06

Exceptionally high were the Hg-, HCH-, and OCS-contaminations. This does not fit well into the results of the baseline Study (see article above) but absolutely reflects the pollution pattern of the river Elbe. Many studies showed that this river is badly polluted esp. with Hg and HCB (and with OCS) by industrial effluents. Thus the finding strongly suggests that the otter fed from fish out of the river Elbe. No otter population could possibly survive in a habitat as contaminated as this river is. Furthermore it indicates that there is an exchange happening between East and West German otter populations via the River Elve.

The "moderate" PCB-contamination is not at all contrary to the interpretation of the risk assessment, because an enormous variability was found in all studies analysing otter tissues for PCB (see SANDEGREN et al, 1980; MASON et al., 1986; BROEKHUIZEN, 1987). One animal cannot be taken as being representative.

By using an analytical method developed by HEIDMANN (1986), it clearly could be shown that - due to metabolisation - the composition of PCB isomers is drifting towards the high chlorinated and biologically more stable ones in the predator.

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REPORT

OTTER SURVEY IN THE NORTHERN PART OF THE NETHERLANDS

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INTRODUCTION

In the Netherlands, the number of otters in the early 1960s was estimated at about 300. This estimate was based on indirect investigations by questionnaires and research of journals on hunting and fishing for reports of otters that were killed (van Wijngaarden & van de Peppel, 1970). Although the otter population in the Netherlands was never investigated by a field survey it was clear that the otter had declined dramatically since the early 1960s. Since 1980, signs of otters were only found regularly in the northern part of the Netherlands In the provinces of Gröningen, Friesland and Overijssel. It was generally accepted that a viable otter population was still present in this part of the country. However, the only records of otters found dead after 1980 have come from the province of Friesland (van Moll, 1980).

To Investigate the actual status of the otter in the northern part of the Netherlands a field survey was made in 1987 and 1988.

STUDY AREA

In the early 1960s two otter populations were present in the northern part of the Netherlands: one small population (estimated at about 30 animals) in the lake area of Gröningen and northern Drente, another population (estimated at about 120 animals) in the lakes and marshes of Friesland and the northwestern part of Overijssel. These are the two areas that were investigated during the field survey. In the province of Overijssel, the river Vecht (which could be regarded as a possible connection with otter populations in Western Germany) was also surveyed.

METHODS

The survey was based on a 5 x 5 km square grid. In total , 69 squares were surveyed: 6 in the lake area of Gröningen and Drente, 48 in Friesland, 9 in the northwestern part of Overijssel and 6 in the river Vecht area. In each square three sites were searched for otter spraints and footprints over 600 m. In Friesland, eight of the squares were surveyed much more intensively (over more than 600 in as well in different. seasons) in order to check the accuracy of the survey method and to find out whether or not otters were present at a very low density.

RESULTS

In the lake area of Groningen and Drents no signs of otters were found during the survey. The last signs of otters in this area were found in 1986.

In 1987, signs of otters were found within 15 squares in Friesland and only one square in northwestern Overijssel. In the same year an otter was killed by road traffic. In 1988, no new squares containing signs of otters could be added. Moreover, of the 15 squares in Friesland only seven adjoining squares were found to contain otter signs in 1988 although they were all visited again.

In September 1988 another otter was killed by road traffic and since then no further signs of otters were found in the seven adjoining squares nor in any other square.

DISCUSSION

In 1987, five or six otters must have been present within the study area. Only three permanent otter home ranges could be located overlapping nine squares in total. In 1988, otter activity was restricted to two areas which were situated 8 km from each other, each of them containing most probably just one otter. One of these two otters must have been the one which was killed by road traffic in September 1988, the other one just disappeared at the same time.

In the northern part of the Netherlands the otter can be considered extinct now. From other parts of the country no reliable otter signs were reported in 1987 and 1988. Whether there are otters still present in any other part of the Netherlands is very doubtful.

In 1987, water and sediment within three otter habitats in Eriesland were found to be polluted with PCBs and heavy metals. Analysis of the few otters found dead after 1980 showed alarmingly high levels of PCBs in liver and fat tissue (Broekhuizen & de Ruiter-Dijkman, 1980).

Considering the widespread water pollution, the highly fragmented otter habitat and the still growing traffic intensity, reintroduction of otters in the near future will not be responsible. Much work will have to be done on suppressing water pollution, improving the quality of otter habitats and restoring the ecological infrastructure until a well considered reintroduction of otters in the Netherlands will be possible.

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REPORT

BLINDNESS IN OTTERS

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Blind otters appear to have been relatively common in Great Britain during a period which coincided with their decline in numbers or even total disappearance in many areas. I first became interested after encountering three blind otters myself, and decided to run a small investigation to try to find out the extent of the problem. The three otters I encountered were all in the same area of England, and two were the same river system, but chance remarks led me to suspect that this form of blindness might be occurring in other areas as well. The first otter was a full grown adult which used regularly to hunt eels in daytime in the shallow waters of Leighton Moss, a large reedbed with lagoons well known as a wildfowl reserve. It hunted with two other otters, and appeared equally proficient, although both its eyes were completely white and apparently opaque. I assumed that this indicated blindness. This was confirmed when I saw two otters fail to evade a clearly 'visible' hound during hunts; one was opaque in both eyes, the other only in one. All three appeared in strong condition, although one had a major infestation of sheep ticks, a not uncommon occurrence in the northern hills.

My method was to appeal to anybody I thought might have such knowledge. I wrote letters to the main sporting periodicals asking for help, and I contacted personally as many people as possible. These could be summarised in three categories; those who frequently followed the packs of organised otterhounds to be found in most areas of Britain in those days, fishermen and casual naturalists, and those fully employed in surveying the otter population. All were very willing to help.

They gave me details of 26 blind otters, of which three were of little interest as they had been shot in the head. The rest all seemed to have the same sort of obviously visible milky white opaqueness except for one road casualty, which had one eye which had never unsealed after birth. Two were blind in one eye only, and one was described as 'nearly blind'. One which was blind on one side only was approached as it sat beside a noisy Scottish burn and prodded with a stick, when it made an alert and agile escape. Even those which were hunted by hounds seemed well able to cope in the water. So although many of the otters reported to me had been found dead or near death, there were sufficient instances of healthy but blind otters for it to appear certain that the blindness itself was not necessarily a direct cause of death. It is in fact entirely possible that the first otter that I saw in Leighton Moss was the same individual that was found dying there exactly ten years later having lived a full lifespan. Unfortunately we shall never know.

Ten of the twentytwo were described as in good condition. However three were in a very poor state; one was described as 'starving' and the other two were in fact dying from liver disorders. One was a very old otter indeed, so his reaching such an age can be counted as a plus than a minus, but the other was a young dog which should have been in his prime. Why he should not be coping as well as others in a similar plight would be perhaps knowledge of some conservational value. An even younger otter, quite a small cub, seemed perfectly fit despite its blindness although it would not have to catch its own prey.

Geographically there was a wide distribution; the records came from eleven different counties, although the most were from the South. The distribution of the cases in time may perhaps be more significant. The earliest record was in 1957, and cases occurred fairly regularly until 1971. They then became more infrequent, but there were three in 1980. In 1966 there were also three. There is only one instance of two cases from the same place at the same time, in 1959, on the River Itchen. So an epidemic or infectious disease seems unlikely to be the cause, more especially as several of the reports told of other apparently normally sighted otters living with the blind one.

But try as I might I could find no earlier records or rumours of a blind otter than 1957. I think this must be significant; 22 cases between 1957 and 1980, but none in the previous 800 years, which is the time that the pastime of otterhunting has been recorded in England. There is much literature about this sport, and many books recording the peculiarities of wildlife as sportsmen found them; they would certainly have recorded it if they had found a fit but blind otter. The recent generations of hunters seem to have been great diarists, and the hunts kept full and detailed records. That not one such case came to light must, in my opinion, make this a modern problem, and therefore probably of some indirect significance in the dramatic decline of the population of otters in Britain at that time. The fall-off in cases in the eighties is to be expected: there were by then far fewer otters. It is a great pity that only three of the twenty which were dead got into qualified hands for a proper post-mortem. An opportunity to learn much has been lost.

REPORT

CREATION OF NATURAL RESERVES TO PROTECT THE OTTER (*Lutra lutra*) IN CATALONIA (N.E. IBERIA)

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INTRODUCTION

The otter survey of Spain was carried out between July 1984 and January 1985 (Delibes, 1984). In Catalonia, virtually the whole region was surveyed for spraints and footprints. Additional field work was carried out and verified oral information on the presence of otters was collected. The results are shown in Figure l. Some of the ecological requirements of the species, its food habits and problems specific to the area were also studied (Ruiz-Olmo, 1985).

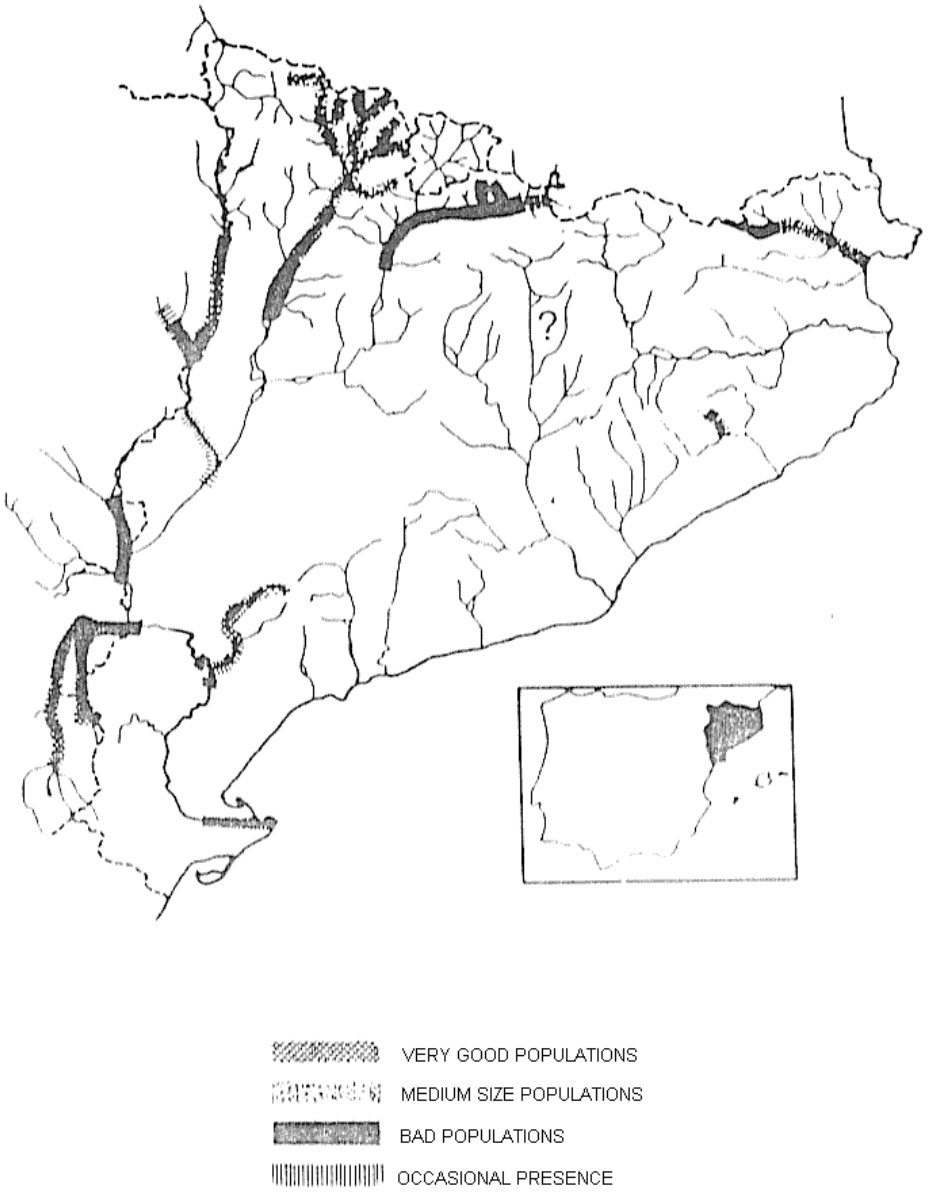

Figure 1: Otter population in Catalonia

LEGAL ASPECTS

The 12/1985 law for natural areas decreed by the autonomous government of the Generalitat of Catalonia provides the framework for nature conservation in the whole of Catalonia. Natural reserves have been created and can be of two types: Integral (RNI) and Partial (RNP). In the former, all use or exploitation of the reserve, which could damage or alter its special characteristics. The RNPs have begun to play an important role in relation to otter conservation in Catalonia especially since, in Spain, all rivers and natural waters are public property.

RNP DECLARATION .

Of the 15 RNPs designated by the Decret 123/1987 for the protection and preservation of fauna, 11 are for otter protection (Figure 2). By comparing Figures 1 and 2, it can be seen that nearly all the populations of *L. lutra* in Catalonia are afforded some protection by RNPs within their ranges. There are however two exceptions : The Montsant river, where proposals to build a dam have prevented the declaration of a RNP and the Riera de Merlès which, while having no evidence of otter presence, has

interesting natural characteristics and here the polecat (*Mustela putorius*) occurs. This species is endangered in Catalonia.

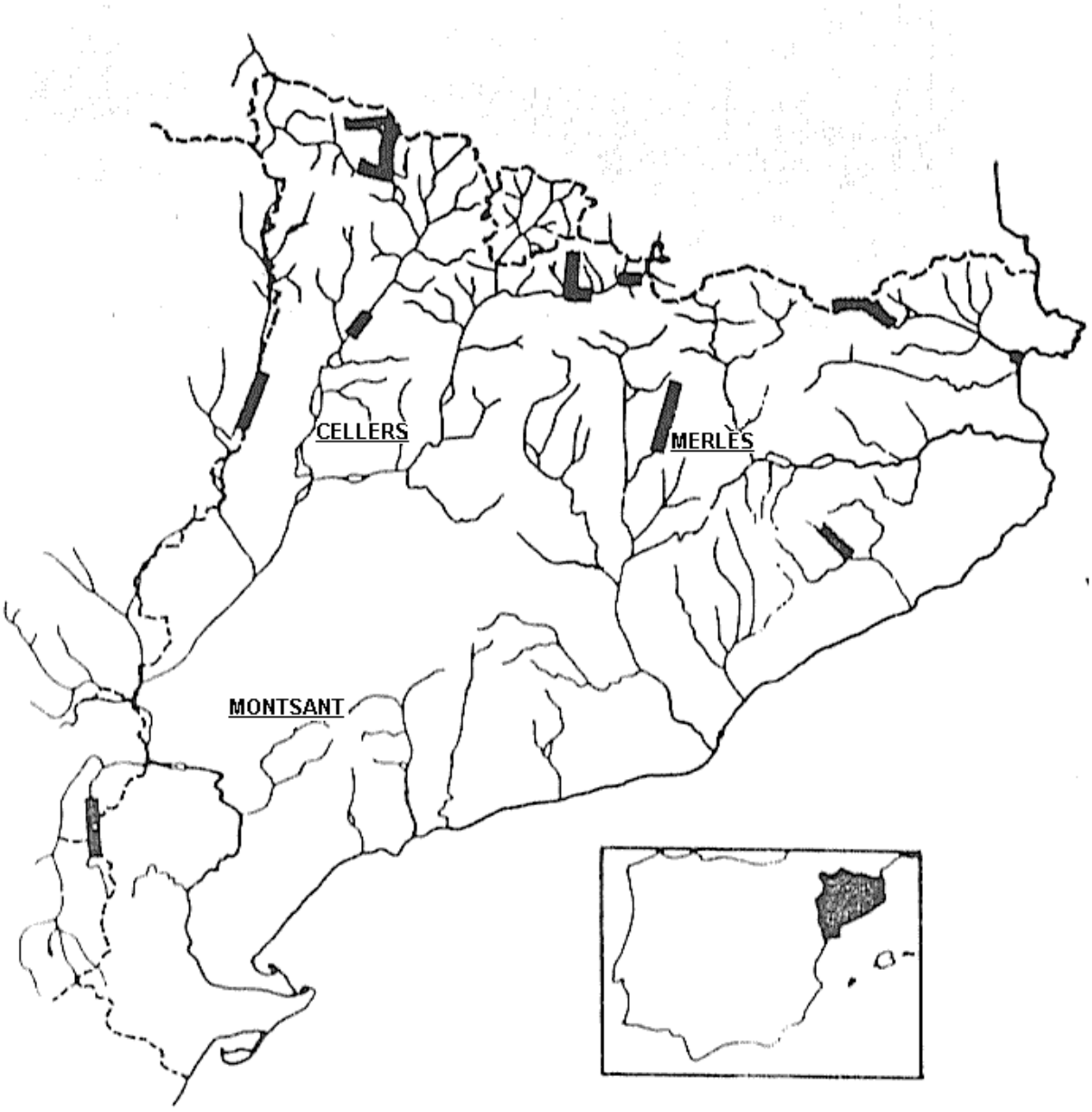

Figure 2: Otter Natural Reserves in Catalonia

In total, 163km of river are protected within the RNPs. Protected lengths vary between 2 and 45 km. (see Table 1). The characteristics of the RHPs are diverse and varied and they all contribute to the conservation of certain ecosystems and species typical of N.E. Iberia.

In these RNPs the following activities are regulated : it is prohibited to destroy or modify the bankside vegetation, to cause pollution or to affect in any way, the river bed. Exploitation of the water is regulated so as not to affect the otter.

Table 1: Survey of RNPs

Num	Name	Length (km)	Characteristics	Water Quality	Altitude (m)	Status	Other Species for Declaration
03	Merlès-Lluçanès	19.5	Uplands River	Oligotrophic	535 - 875	Unknown[2]	Polecat
04	Riera d'Arbúcies-Hostalric	10.0	River	Oligotrophic	70 - 270	Very bad	
05	Illa de Caramany	19.0[1]	River Island	Eutrophic	5	Very bad	Birds
06	La Muga-Albanyà	22.0	Uplands River	Oligotrophic	160 - 1180	Bad	
07	Segre-Isòvol	2.0	Wetlands River	Oligotrophic	1030 - 1040	Bad	Polecat, birds
08	Segre-Prullans	7.5	Wetlands River	Oligotrophic	980 - 1000	Bad	Polecat, birds
09	La Llosa	17.0	Mountains River	Oligotrophic	980 - 2500	Bad	Aquatic communities of mountains
10	Noguera Pallaresa-Bonaigua	45.0	Mountains River	Oligotrophic	980 - 1870	Medium	
11	Noguera Pallaresa-Collegats	5.0	Mountains River	Oligotrophic	520 - 650	Very good	
12	Noguera Ribagorçana-Montrebei	14.0	Mountains River	Medium/Oligo.	500 - 650	Very good	
13	Algars	23.5	Uplands River	Medium	310 - 440	Good	

[1] Hectares

[2] Otters' presence possible but not confirmed

PROVISIONAL CONCLUSIONS

The declaration of the RNPs has proved a useful tool in the conservation of otters in Catalonia. Certain road projects (in canyons), which could have had irreversible effects, have been stopped. The use of the rivers for hydro-electric power and for irrigation, which both have a very negative effect on rivers in N.E. Iberia, is regulated or prohibited . Bankside vegetation is respected. A new RNP in an area holding otters (Cellers on Figure 2) is sure to be created and other sites are being studied. However, there is still a lot to do, and these RNPs are not enough. This is why we are now carrying out a series of studies on the ecology of the otter.

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SHORT COMMUNICATION

STATUS OF THE OTTER (*Lutra lutra*) IN SCHLESWIG-HOLSTEIN (NORTHERN GERMANY)

Uwe Riecken

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In 1986 and 1987 the situation of the otter in Schleswig-Holstein was investigated using the field survey method as recommended by the IUCN Otter Specialist Group. A total of 356 sites were surveyed (at rivers, lakes, ponds etc.) and each site was assessed for its suitability as otter habitat. Only 8 valid records of otters were found, 262 (14%) of the sites were considered unsuitable for otters and only 46 (13%) as suitable.

In Schleswig-Holstein only very few otters survived the dramatic decline in their populations caused by habitat destruction, hunting, traffic and drowning in eel traps etc. during the last decades. We expect the remaining population to become extinct in the next few years.

The full results of this survey are given in the paper by Heidemann and Riecken (see Recent Publications).

REPORT

THE SITUATION OF THE OTTER IN FLANDERS, BELGIUM

Dirk Criel

National Campaign for the Protection of small Carnivores, Gansstraat 1, B-9760 Huise-Zingem, Belgium

During the last three years the National Campaign for the Protect ion of Small Carnivores (NCBR) worked on a survey of the otter in the Flemish region of Belgium. Research has been completed and is published in a detailed report in which an attempt is made to give an overview of the historical and recent spread of the population of the otter. The report contains all important information on recent and former distribution of the otter in Belgium and will serve as the basis of a detailed action programme for the conservation of otter habitats in this country.

Attention is focussed primarily on the timespan between 1889, the year the authorities started a subsidized campaign for the elimination of the otter, and 1987. Despite the fact that a lot of information regarding the 'success' of this campaign has been irretrievably lost, it has been possible to provide a satisfactory reconstruction of the development of the otter's population during the last century on the basis of a number of diverse sources.

In overall terms it can be stated that otters were present all over the Flemish territory, but that their numbers diverged in accordance with local conditions of the environment. Important early breeding grounds were : the basin of the Yser, the environs of Bruges, Antwerp and Ghent, the region of the creeks, the upper Scheldt, Dender, Zenne and Grote Gete, Dyle, Demer, the basin of the Nete, the Albert and Kemp Canals, the Antwerp North Kemp and Limburg Kemp regions.

As a result of severe persecution (about 300 otter were killed each year by the beginning of the century) the formerly dense otter population was reduced to spectacularly small numbers during the first half of this century, so much so that the otter was well on its way to becoming an extinct species as early as the 50s and 60s. In spite of the subsequent loss of many through water pollution and the continuing (now

illegal) persecution, certain modest populations seem to have remained in existence in some areas until the beginning of the 80s. The following places should he noted : the region of the Yser around Diksmuide, the creek area, the Scheldt valley around Gavare, the swamps of Berlarebroek, the Dyle valley with the environs of Mechlin, Bornem, Lier, Antwerp, and also the Meuse valley and especially the Bree-Kinrool area. It must be understood, however, that since then and for the time being, permanent occurrence (with reproduction) has nowhere been observed or established with any degree of certainty.

So the otter has become an endangered species in Belgium on the extinction. Probably nothing can be done to save the last otters, because water pollution, habitat destruction and disturbance are still rife. All future efforts will concentrate on the re-establishment of a healthy otter population, although this will take a very long time. Plans are made for an ecologically orientated approach to water management and first steps are set to create so called 'otter reserves' in some of the areas mentioned above. These are chains of wetlands and waterways connected to each other in a way that they can hold small otter populations. In such areas parts are reserved for total protection whilst elsewhere attempts are made to reconstruct the natural habitat and to purify the water. In the meantime the zoological garden of Planckendael (Muizen) has started breeding European otters in captivity. All activities are co-ordinated by the 'Otteroverleggroep' (OOG): a commission in which national and regional authorities, organisations and specialists are represented. In the near future they will take charge of funds to support projects on the protection of otter habitats.

Address of the Otteroverleggroep : c/o Nadine Thiebaut, Secretary, Gildestraat 3, B-9000 Ghent, Belgium. More information can be obtained from the author.

SHORT COMMUNICATION

CONTAMINANTS IN BRITISH EELS

Chris Mason

The first national survey of pollutants in eels in the UK, 62 rivers being surveyed, revealed widespread contamination. The results have not been officially released by the government but were leaked to F.O.E, Mean concentrations of dieldrin from 39 sites exceeded the 0.1 mg/kg fresh weight level above which the Department of Health recommends that eels should not be consumed. Concentrations of dieldrin up to 1.18 mg/kg fresh weight were found. Unexpectedly high levels of DDT, HCH and PCBs were found at a number of sites. At 10 sites, mercury level exceeded the 0.3 mg/kg safety limit laid down by the E.E.C. Source : Environmental Data Services Report October 1988.

It had earlier been reported that 25% of 85 eels from Britain exceeded the E.E.C. standard (*Chemosphere* **16**, 901-906, 1987). We await the government report with interest (if it ever appears!). It seems unlikely that British results are unique to Europe. Does anyone have comparable figures?

OBITUARY

LT. COL. FATESINGHRAO GAEKWAD OF BARODA

In India they called him "His Highness". On paper his name was "Lt. Col. Fatesinghrao Gaekwad of Baroda". But we IUCN Otter Specialists just called him "Jackie". Our friend Jackie died on September 1st, 1988, a loss felt in many circles around the world.

Born in 1930, Jackie was the last in a long line of titled Maharajas of Baroda, one of the richest princely states of India. His multifaceted public life included a reign as Maharaja of Baroda, a later career in Indian politics as a Member of Parliament and an active role in the sport of cricket first as a player, then as Manager of the Indian cricket team. Author of the book, "Palaces of India", gourmet

cook, art collector, diplomat, corporate chairman, all these roles and more were filled simultaneously throughout Jackie's busy life. Along the way, around the world, Jackie acquired friends. His annual personal newsletter was eagerly awaited by "3000 of his closest friends", as he once explained to me.

In the last decades of his life, Jackie was an active conservationist. He delighted in telling people the story of his conversion to conservation, when as a young man he went on a hunting safari to Africa and ended up wishing to shoot these animals instead with film. He became dedicated to conservation work to ensure that the wildlife he knew as a child in India still retained a place on earth. These activities included directing an advisory committee on population control for the Smithsonian, serving as President of World Wildlife Fund India, and participation in numerous conservation groups including the Snow Leopard Trust, the Otter Trust, the ICBP, and a handful of IUCN Specialist Groups, including ours.

Jackie's introduction to the IUCN Otter Specialist Group was at the 1981 Second International Otter Colloquium in Norwich, England. As Chairman of the zoos 1n India, he succeeded in collecting data for our group on the status of captive otters in India. At the 1985 fourth International Otter Symposium in Santa Cruz, California, Jackie proposed that the next meeting be held in India. For the ensuing three years, Jackie worked diligently to see this goal realized. He activated his impressive network of Indian government and conservation connections who all pitched in wholeheartedly to make the conference a success. Jackie, sadly, never lived to see the fruits of his labours.

The International Asian Otter Symposium opened its inaugural session with a moment of silence in Jackie's honour and the Proceedings will be dedicated to him. We will personally miss our friend Jackie, but we will always have his legacy, the initiation of otter conservation work in Asia. "Our Maharaja" has left us this gift of incalculable value and it remains our task to realise its full worth.

Pat Foster-Turley

REPORT

REPORT ON THE FIRST INTERNATIONAL ASIAN OTTER SYMPOSIUM

Pat Foster-Turley

Co-Chairman, IUCN Otter Specialist Group

The first International Asian Otter Symposium, held 1n Bangalore, India from October 17-22, 1988 was a great success. Sixty-six participants were fully registered from more than 15 nations, including the Asian Countries of Sri Lanka, Bangladesh, Nepal, Malaysia, Thailand, Japan and Indonesia. In addition, papers were received from China, Bhutan, Vietnam, and the Philippines. India was well represented with status reports presented on otters in 15 states by the respective Chief Wildlife Wardens. Other Indian agencies and NGOs represented included the Zoological Survey of India, the Wildlife Institute, the Bombay Natural History Society, the Indian Institute of Technology and others. The sponsoring agencies, the IUCN, the government of India and the government of Karnataka were also well represented. Students from throughout India and other interested parties were also present. The press, including television, radio and newspaper reporters covered the entire conference. In all, some sessions had more than 120 people in attendance.

The inaugural session was opened by the Hon. Minister for Agriculture and Forests, Government of Karnataka, Shri B. Rachaiah, who lit the "eternal torch". This very formal session also included speeches by Dr. Ranjitsinh (Director of Wildlife Preservation, Govt. of India), Mr. M.K. Appayya (Chief Wildlife Warden, State of Karnataka), Shri Parameswarappa (Karnataka Chief Conservator of Forests) and by myself, representing the IUCN Otter Specialist Group. A moment of silence and respect was given to commemorate Lt. Col. Fatesinghrao Gaekwad, the initiator of this conference in India.

The enthusiasm of all participants blossomed all week. Many contacts were made and conservation projects were generated. A move to make otters the symbol of wetlands in India is being spearheaded by Dr. Ranjitsinh, Govt. of India, and a survey plan for otters throughout the country is being handled

by the Indian Wildlife Institute under the direction of Dr. Panwar. An Action Plan for Asian otters was generated by the entire group, led by Dr. Ranjitsinh and myself. This plan was typed up by Ranjitsinh's staff arid given to all participants at the closing session. An official move to accept the Action Plan was made, seconded and voted on by the entire assembly. Parts of the plan were later quoted by the press.

Now that otter conservation projects have been initiated in Asia, there is also some follow-up planned to keep up the momentum. An Asian section of the IUCN Otter Specialist Group is being formed, and will be chaired by Dr. Charles Santiapillai of WWF Indonesia. He has already produced an Asian Otter newsletter for continued communication with symposium participants and others after the conference. The next Asian Otter Symposium 1s being planned and will be hosted by Japan in 1991. Otter surveys are now also being initiated throughout Asia.

The Proceedings will be edited by Dr. James Estes, US Fish and Wildlife Service, Santa Cruz, CA. The Indian papers will he co-ordinated by Dr. Ranjitsinh and the other Asian papers by Dr. Santiapillai.

All in all, this conference was a great first step towards conservation of otters and their habitats in Asia. The ball is rolling, the excitement is high and lots of connections and information was exchanged by all. I am pleased to have been involved in this effort and look forward to seeing the fruits of my labour develop further as the conservation work begins in earnest by Asians throughout the region.

I am very grateful for the strong financial and personal support given me in this project by the Marine World Foundation, the U.S. Fish and Wildlife Service and the Chicago Zoological Society. I am also grateful for the financial support for select conference participants provided by the IUCN, WWF, WS, WWF Indonesia, Wildlife Fund Thailand, UNEP (Bangkok), US AID, Bombay Natural History Society and the Institute of Marine Sciences, Santa Cruz. Without the support and encouragement of these organizations this meeting would not have been possible. Thank you, one and all.

CONGRESS ANNOUNCEMENTS

FIFTH INTERNATIONAL OTTER COLLOQUIUM

This will be held from 4th-8th September 1989 in Hankensbüttel , West Germany. Further details from Ralf Röchert, Otterzentrum, D-3122 Hankensbüttel, West Germany.

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Note: All publications on otters (or references thereto) will be gratefully received for future issues of the Bulletin to maintain this section as complete as possible - Editor.

ADDRESSES

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