IUCN OTTER SPECIALIST GROUP BULLETIN
VOLUME 19 ISSUE 2 PAGES 75 - 86

***Citation**: Noordhuis, R.. (2002) The River Otter (Lontra canadensis) in Clarcke County (Georgia, USA) - Survey, Food Habits And Environmental Factors. IUCN Otter Spec. Group Bull. **19**(2): 75- 86*

THE RIVER OTTER (*Lontra canadensis*) IN CLARCKE COUNTY (GEORGIA, USA) - SURVEY, FOOD HABITS AND ENVIRONMENTAL FACTORS

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(received 19th March 2002, accepted 16th June 2002)

Abstract: The status of the river otter (*Lontra canadensis*}. was surveyed in and around Clarcke County (Georgia, USA). Although nearly extinct in the nineteen fifties, the otter population appears to be well developed today. Food habits were analyzed through spraint analysis using spraints collected in winter and summer. Sunfish and crayfish were found to be the most important food items. An attempt was made to find out if otters in the study area are affected by environmental pollution. Literature data and heavy metal analysis showed that the exposure to chemical pollution has been relatively low. The siltation of the rivers and creeks does not appear to harm the river otter or change it's food habits.

INTRODUCTION

In the early 1950s, river otters (*Lontra canadensis*) were considered rare in the Georgia Piedmont area (JENKINS, 1953). No records are known from Clarcke and surrounding counties from those years, though the original distribution included the whole of Georgia. The most probable cause of their decline and subsequent eradication was over-trapping (JENKINS, 1983). However, by 1970 river otters had recolonized the Georgia Piedmont area (JENKINS, pers. comm.). This recovery took place while pollution was dramatically affecting ecosystems all over the world.

In 1993, the status of otters in Clarcke county was assessed through a survey of local rivers for presence (tracks and spraints, and a survey of pollution status through analysis of spraints and locally caught fish for heavy metals (Hg and Pb). Data on organochlorine and polychlorinated biphenyl (PCBs) loading was assessed from previous studies. The results were compared to reports in literature to see if food habits and pollution status have changed over time. In addition, a comparison was made with food habits of river otters in the nearby Smokey Mountains, where the rivers are clear, to see how water with a low transparency affects their food habits and the possible role of underwater scent in searching for food in turbid water is discussed

MATERIALS AND METHODS

The study site comprises most of Clarcke County and parts of the surrounding counties in the Piedmont area of Georgia. Most otter spraints were collected in and around the town of Athens. Athens is a medium sized town with approximately 80,000 inhabitants. The North and Middle Oconee River both run through Athens and join south of the town. The rivers and creeks are provided everywhere with a dense riparian vegetation, also within the town limits. According to ODUM (pers. comm.) a lot of this riparian vegetation has been restored in the last forty years to prevent erosion. Large trees, such as sycamore (*Platanus occidentalis*) and river birch {*Betula nigra*), are abundant along the rivers and creeks. Rapids, rocks and logjams are common. All these structures are known to be important to river otters (MELQUIST and HORNOCKER, 1983; MACDONALD and MASON, 1983). Beavers are abundant everywhere in the study area. It is well known that river otters benefit from the activities and dens of beavers (TUMLISON et al., 1982)

The soil type is sandy loam and the pH of the North Oconee River is 7.35, total Organic Carbon content in summer is about 2.6ppm, and the total calcium concentration is about 5.2ppm. All year round, but especially in winter, the rivers and creeks are loaded with silt. Underwater visibility usually does not exceed 20cm.

In order to get an impression of the status of the river otter in the study area, the rivers and creeks were searched for signs of this animal. About 16 stretches of approximately 100m of river or creek bank were surveyed. Sand strips, rocks, rapids, logs and banks were checked for tracks and spraints. Looking for 'positive sites' of otters is one mean of surveying an otter population (MASON and MACDONALD, 1987). When footprints were found, the prints of the hind foot were measured. By doing this it became possible to estimate if there was more than one individual present at a certain site. Adult male footprints are usually much larger (wider than 7cm) than female or subadult male footprints (MASON and MACDONALD, 1986).

Spraints, not older than about two weeks and non-weathered, were collected from January through the end of March and from July until the end of September 1993. After collection, they were dried and stored. Two hundred and fourteen spraints from nine different sites in the study area (of which four were situated within the city limits) were collected on visits every fortnight. These were used to determine food habits. The spraints were shaken in water containing commercial washing powder and then rinsed on sieves with mesh sizes of 2 and 0.5mm resp. and all the food remains of each sample were than collected from the sieves and dried.

Fish bones and scales and remains of other vertebrates were identified with the help of the bone collection of the Museum of Natural History in Athens and with LEE et al. (1980). Skeletal remains or gastroliths indicated the presence of crayfish. Crayfish were keyed out according to HOBBS (1981).

The importance of the different types of food item is expressed as frequency of occurrence and relative frequency. The frequency of occurrence was calculated by dividing the number of occurrences of a particular food item by the total amount of spraints. The relative frequency was calculated by dividing the number of occurrences by the sum of the occurrences of all food items.

During January, February, and March, a total of 40 spraints, containing mainly crayfish remains, and a total of 11 spraints, containing mainly fish remains, were collected from 8 different sites in the study area. These spraints were selected from spraint sites for heavy metal analysis. Four of these were situated within the city limits; one site was upstream, and three sites downstream of Athens. Three to eight spraints per site were dried and ground in a glass mortar and analyzed for Pb and Hg. For the analysis of Pb, 1g dried spraint was muffled and dissolved in 10ml 30% HCL and 10% HNO_3. The Pb concentration was determined with a Thermo Jarrell-Ash 965 Inductivity Coupled Argon Plasma (ICAP) with a detection limit of 1ppb for Pb. For the analysis of Hg, 1.5g was muffled and dissolved in 20ml 15% HCl and 5% HNO_3 and analyzed with an AVA800 Thermo Jarrell-Ash mercury analyzer with a detection limit of 1ppb.

Fifteen crayfish and three small catfish were caught in 'minnow traps', baited with catfood, in the North Oconee river. Five *Procambarus spiculifer* were caught just north of Athens. Five *Procambarus spiculifer*, five *Cambarus bartonii* and three small snail bullheads *Ameiurus brunneus* were caught close to the center of Athens. From the crayfish and the catfish, the muscle, intestine and fat bodies were freeze-dried. Five samples (5 *P. spiculifer* from north of Athens; 5 *P. spiculifer* from Athens; 5 *C. bartonii*; 1 larger catfish and 2 small catfish) were analyzed for mercury in the same way as described for spraints.

RESULTS

Signs

The distribution of signs of river otters is given in Fig. 1. Most of the signs were found in winter. Footprints were always found on sand strips that were often freshly deposited after heavy rains. It appeared that animals preferred to go on land on these coarse sand strips or on rocks, as prints on muddy sediment were never found. The map shows that river otters are also present within the city limits. Prints of adult males (width hind foot larger than 7cm) were hardly ever found within the city limits, but were very common outside the city. Activity of otters within the city limits was found both in summer and winter.

Twelve of the sixteen surveyed river or creek stretches (75%) showed signs of otters. In the study area, nine spraint sites were found. Sprainst were collected repeatedly from these sites. The average amount of spraints collected on the visits to the sites was 5.3.

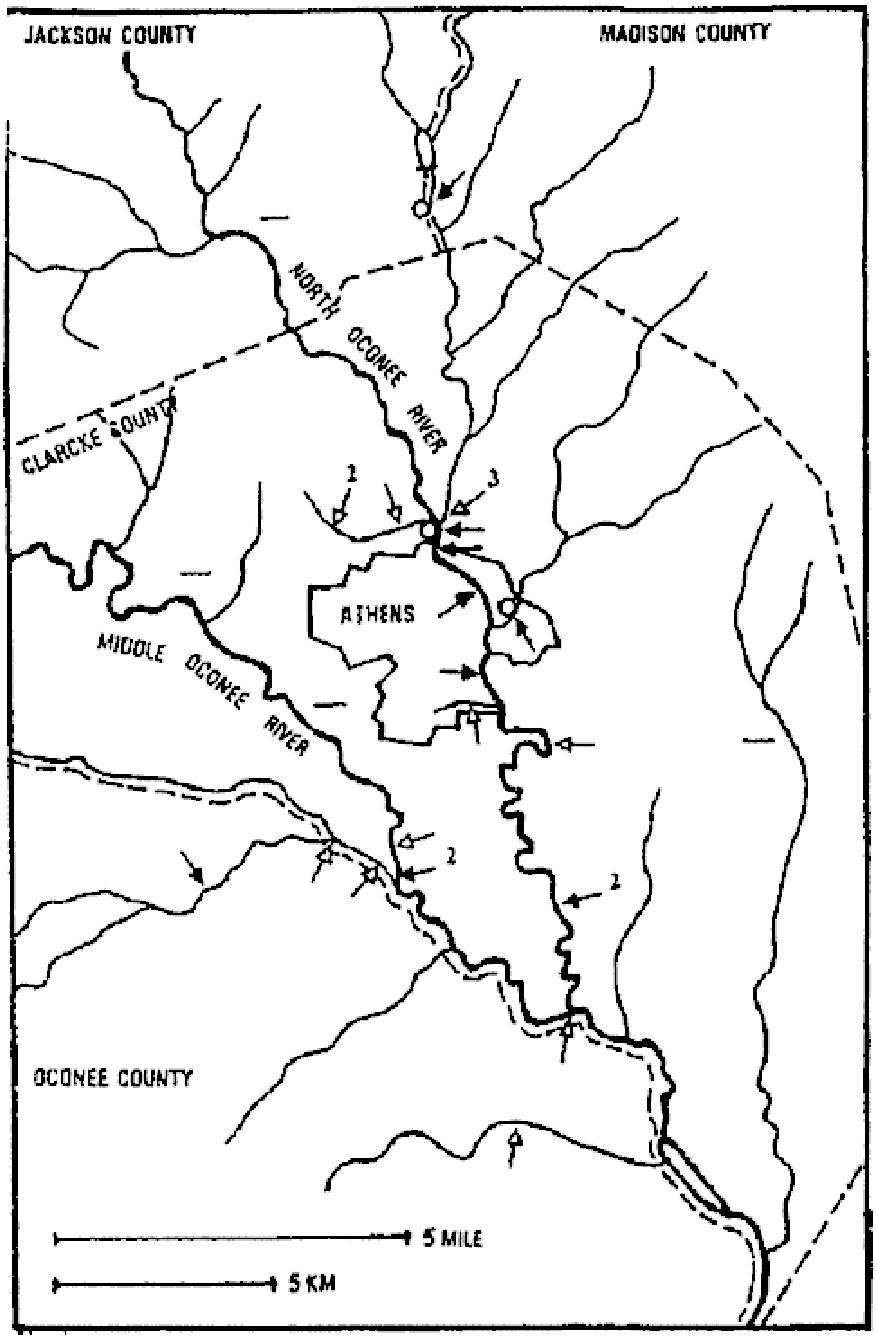

Figure 1: Signs of river otters found on 100m stretches of river/creek in the study area.
Open arrows = footprints only;
closed arrows = spraint site (often accompanied by footprints and other signs);
\- = no signs found on a 100m stretch;
O = beaver den used by otters.
If more than one individual was suspected on the basis of footprint size, then the estimated number is indicated.

At eight spraint sites otter prints could be found as well. Four spraint sites were on sand strips; four were on banks on the forest floor and one was on rock.

The sprainting activity was higher in winter than in summer; four spraint sites regularly used in winter were abandoned in the summer. One spraint site sparsely used in winter was more frequently used in summer and another one was moved 50m in summer. At four spraint sites, signs of heavy rolling in coarse sand were observed. At three of these places sliding trails were also found on the sandy banks.

One winter site was on a creek in a park close to the center of Athens. Spraints were found at the entrance of a simple beaver den. The measurements of prints from the hind foot were the smallest measured during the study (5.3cm).

Two large beaver dens in banks outside the city limits appeared to have been used by otters. One den was heavily sprainted upon but the spraints were old when found. The second one had a spraint site very nearby and trails led from and to the den. The site was frequently used in winter and irregularly in summer.

Food habits

In winter, 149 spraints were collected for food analysis, whilst in summer only 65 could be collected, a total of 214. The results of food analysis are given in Table 1.

Table 1. Food remains analysis from spraints collected in Clarcke County in 1993

	Winter (J, F, M 93)		Summer (J, J, A, S, 93)	
No. of spraints	149		65	
Estimated no. of prey (min)	745		227	
Total no. of occurrences	353		97	
	% occ	rel % occ	% occ	rel % occ
fish Pisces (total)	87.9	58.1	35.4	24.7
pickerel *Esox sp*.	4.0	1.7	3.1	1.0
minnow Cyprinidae total	26.2	11.0	3.1	2.1
Semotilus atromaculans	7.4	3.1	-	-
Nocomis leptocephalus	6.0	2.5	-	-
Unidentified minnows	14.8	6.2	3.1	2.1
sucker Catostomidae	17.4	7.3	3.1	2.1
catfish Ictaluridae total	23.5	9.9	9.2	6.2
Ictalurus punctatus	1.3	0.6	-	-
Ameiurus nebulosus	0.7	0.3	-	-
Ameiurus brunneus	1.3	0.6	-	-
sunfish Centrarchidae tot	66.4	28.0	20.0	13.4
Lepomis macrochirus	2.6	1.1	-	-
Micropterus salmoides	1.3	0.6	-	-
Unidentified sunfish	65.1	27.5	20.0	13.4
crayfish Carambaridae	79.8	33.7	98.0	66.0
frog Anuridae	4.0	1.7	7.7	5.0
salamander Caudata	1.3	0.6	-	-
snake Serpentes total	3.4	1.4	6.2	4.1
Nerodia sp.	1.3	0.6	3.1	2.1
pond turtle Testudines	0.7	0.3	-	-
bird Aves	0.7	0.3	-	-
mammals Mammalia	1.3	0.6	-	-
millipede Diploda	0.7	0.3	-	-
insect	7.4	3.4	1.5	1.0

One third of the winter food and two thirds of the summer food consisted of crayfish. Ninety percent of the crayfish remains could be identified as *Procambarus spiculifer*. This species can be seen and caught easily in the rivers and creeks around Athens where it is abundant. It is restricted to lotic habitats and can be found under stones, in litter and among roots. *Procambarus spiculifer* does not usually make burrows (HOBBS, 1981). About ten percent of the crayfish remains were identified as *Cambarus sp*.. Five species are known from the area (HOBBS, 1981), but *Cambarus latimanus* and *C. bartonii* are the species most likely to be caught. These two species only burrow under certain circumstances, while the remaining three spend all their lives in a burrow (HOBBS, 1981).

Fish are the most important source of food in the winter months. Fifty-nine percent (relative frequency) of the food remains were fish, against less than half of this in summer. Sunfishes (Centrarchidae) form the most important group eaten. It is hard to identify sunfishes to the species level; however, it was possible to identify bones and otoliths of the largemouth bass (*Micropterus salmoides*) and the otoliths of bluegill sunfish (*Lepomis macrochirus*) in this study. *Micropterus salmoides* was found rarely. About one third of the sunfish ototliths were bluegill and most of the remaining part was thought to be redbreast sunfish (*L. auritus*), considering its abundance in the area. Some spraints from winter consisted of only very small sunfish olotiths. They were of redbreasts or bluegills of the 0-generation. The largest redbreast found was estimated at about 20cm. Most sunfishes caught were relatively small.

Minnows were second in importance in the winter and the remains identified belonged either to creek chub {*Semotilus atriomaculans*) or bluehead chub (*Nocomis leptocephalus*). Because the otter eats pectoral spines of catfish, these bones can help to identify the species of catfish eaten and to estimate the fish length (PALOUMPIS, 1978). Most catfish caught were small, one brown bullhead (*Ameiurus nebulosus*) however was estimated at 28cm. Almost all suckers caught were large individuals, estimated to have been three to five years of age; judging from the annual rings of the scales found. The larger individuals were estimated at about 40cm. In 6% of the winter spraints small molluscs were found. These remains were usually associated with catfish remains and were therefore not counted as otter food.

Lead and mercury levels

The spraints with crayfish remains from eight different sites had a mean Pb concentration of 18.2 ±2.2 ppm. Spraints with fish remains, collected from two sites downstream of Athens, had a lower Pb content, at 11.9 and 12.9 ppm. The Hg-concentration of all the spraint samples was below detection and therefore lower than 0.07 ppm. The level of Hg in all freeze-dried crayfish and fish samples was below 0.07 ppm.

DISCUSSION

Food habits

Studies that analyze spraints of otters to assess their food habits may contain a certain amount of error, however, comparative research in captive Eurasian otters (*Lutra lutra*) reveals that spraint analyses tend to show a reasonable match with the actual diet (CARSS and PARKINSON, 1996; JACOBSEN and HANSEN, 1996). The results of winter food habits are comparable to the data of LAUHACHINDA and HILL (1977). They investigated the winter food habits of the otter in Alabama and Georgia by analyzing 315 digestive tracts and 12 spraints, collected from 1973 to 1977 (siltation was already a widespread problem at this time). Unfortunately, the data from Alabama and Georgia were mixed, but most otters came from Alabama. Georgia otters were mostly collected from four counties just west of Clarcke County. The relative frequencies of fish from 5 families - Centrarchidae, Catostomidae, Ictaluridae, Cyprinidae, and Esocidae, and crayfish were 50.2; 27.7; 6.2; 5.4; 3.3; 2.6 and 37.7% respectively. Indeed, Centrarchidae, Cyprinidae, Catostomidae and Ictaluridae are the most commonly mentioned fish families in reports about the food habits of river otters. These results are not very different from the results presented in Table 1, although LAUHACHINDA and HILL (1977) found slightly more amphibians and insects. Although Cyprinidae were found less than in the present study, the authors found shiners in the tracts, four times more than they found creek chubs. Even though extra attention was paid to very small fish bones, shiners and darters may have been overlooked in the present study.

It could be concluded that there was little change in the food habits of the inland river otter in the southeast since the nineteen seventies.

Crayfish, as part of the river otter's diet, is reported in many food studies. In the Smokey Mountains National Park, 95% of the summer spraints contained crayfish (GRIESS, 1987). McDANIEL (1963) examined 63 stomachs from Florida otters caught in the trapping season and noted that crayfish had a relative frequency of 17.7%.

KNUDSEN and HALE (1968) found a higher percentage offish in winter than in other seasons, whilst crayfish was eaten less frequently in this season. PARK (1971) suggests that otters eat what is available and accessible in the aquatic habitat; but could crayfish be a preferred food item?

Because of the abundance and diversity of crayfish in the southeast (PENNAK, 1978), one could expect that crayfish would be eaten more frequently in this area than elsewhere. The occurrence of crayfish in otter food of, for example, New York State and the Great Lakes Area (HAMILTON, 1961; KNUDSEN and HALE, 1968) is indeed lower than in the research of LAUHACHINDA and HILL (1977), GRIESS (1987) and the present research. However, in the three former mentioned papers, crayfish is said to be an important food source.

Pond turtles are very abundant in the study area, but only once was a pond turtle found as food (Table 1). A similar observation was made by GREER (1955). It may be that turtles are eaten more frequently but that the shell, skin and bones are left behind. This may also be true with freshwater mussels. If the shells were not eaten, it would be hard to detect consumption without direct observation. Walruses feed largely on molluscs, but remains were never found in their stomachs (LOCKLEY, 1967).

Siltation and food habits

The major environmental problem of the rivers and creeks in the study area is siltation, causing widespread disruption to the ecology of these waters (BURKHEAD et al., 1992). The problem is as old as the erosion problem, but is nowadays mainly caused by road construction or maintenance. Especially in winter, the water is highly turbid due to silt. Underwater visibility may be limited to 20cm for most of the year (own observation, 1993). Despite this, the amount of otter signs indicates a well-developed otter population, compared to data from MASON and MACDONALD (1987, 1993). In Wales, these authors found an average of 3.1 spraints per spraint site (MASON and MACDONALD, 1993), compared to 5.3 in the present research. Both species are closely related and show very similar ecology and behaviour and, therefore, this comparison can be justified.

In areas with healthy otter populations in Spain and Greece, MASON and MACDONALD (1987) found, on average, about 75% of the searched stretches positive for otters. The river otters in our study area do not, therefore, appear to be limited by the heavy siltation.

Does turbid water change the river otter's food habits? The large amount of crayfish taken could be partly induced by the heavy siltation, since crayfish are easy to catch, even in turbid water. The research of GRIESS (1987) on Abrams Creek in the Smokey Mountains National Park showed that, from April to September, crayfish was the most frequently taken food item with a frequency of occurrence of 95%, compared to 98% around Athens. Fish was encountered in 90% and 35% of the spraints resp. The water of Abrams Creek is very clear (GRIESS, pers. comm.). It cannot be concluded that the high relative frequency of occurrence of crayfish during summer around Athens is induced by heavy siltation, although relatively more crayfish (66% compared to 40%) and less fish (24% compared to 38%) were taken in summer around Athens than on Abrams Creek. Data on the relative abundance of crayfish in both places are lacking, but it is clear that crayfish is an important food source at both locations. In the present research, the majority of fish taken were Centrarchids. Apart from Centrarchidae, the Cyprinidae, Catostomidae and Ictaluridae were also important, the majority of them bottom feeders. In the research of GRIESS (1987), otters showed a preference for Cyprinidae and Catostomidae amongst fish, the species taken of these groups being mostly bottom feeders.

Centrarchidae and Ictaluridae were not common in Abrams Creek; however, more bottom feeding fish were taken in the clear water of Abrams Creek than in the turbid water of Clarcke County. The preference for bottom feeding fish does not, therefore, appear to be related to turbidity.

Underwater scent as an adaptation to turbidity

Although sight is considered very important for some aquatic mammals (ERLINGE, 1968), they are capable of catching fish and other food without the use of the eyes. LOCKLEY (1967) describes a completely blind grey seal (*Halichoerus grypus*), living on a rocky coast, that didn't starve and even raised young. Also, he explains that the Weddell seal (*Leptonychotus weddelli*) often feeds in almost complete darkness under the ice. Vibrissae, according to LOCKLEY (1967), play an important role in navigation and feeding in murky or deeper water for aquatic mammals. GREEN (1977) showed that this was also true for otter, by cutting off the vibrissae of a European otter (*L. lutra*). He observed no difference in hunting success in clear water, but a significant loss of success in turbid water.

PARK (1971) points out that much of the river otters' food is caught by 'rooting around' in the mud or debris at the bottom of ponds and creeks. This behavior was also often observed in captive otters from local origin in a small zoo in Athens (own observation, 1993). PARK (1971) states that 'undoubtedly the vibrissae are important to locate food in the mud'.

In the present research, 34% of the diet from January through March consisted of crayfish, however, crayfish are not active during January and February (HOBBS, 1981) and may be very well hidden. MASON and MACDONALD (1986) state that otters in Great Britain forage for hibernating frogs in autumn and winter. KNUDSEN and HALE (1968) explained frogs and insects in the winter food by assuming that the otters did considerable digging in the bottom sediment.

Hidden immobile animals, such as crayfish in a layer of leaves or a hibernating frog, cannot be detected easily with the vibrissae. Scent may, therefore, play a major role to detect prey under these circumstances. De JONGH (1986) showed that otters could pick up chemical stimuli with their rhinarium ('wet nose') and he speculated that scent might play an important role in locating fish at close range. Threatened sunfish, chub, catfish, crayfish, etc. may also hide under stones where vibrissae cannot always reach. Such a hidden animal in turbid water may be rediscovered by scent rather than by touch. Scent seems to be generally underestimated or forgotten by several authors as a tool in hunting. The use of underwater scent may be of extra use in turbid water. The most conspicuous difference between the river otter and the European otter is that the river otter has a much larger rhinarium (MASON and MACDONALD, 1986). Because of this difference, it is possible that the river otter is better adapted to living in turbid water.

PCBs, organochlorines and heavy metals

Of the pollutants present in the environment, PCBs are the most threatening to otter populations, followed by organochlorines (MASON, 1988; BROEKHUIZEN and RUITER-DIJKMAN, 1988). HILL and LOVETT (1975), CUMBIE (1975) and HALBROOK et al. (1981) investigated pollutants in river otters in Alabama and Georgia. In Georgia (Piedmont and two areas of the Coastal Plain), levels of PCBs and organochlorines were moderately low. Only about 50% of the 94 otters from the Coastal Plains had detectable levels of PCBs and only about 24% of the 34 Piedmont otters. Average concentrations are low compared to data from European otters (MASON and MACDONALD, 1986), and are well below the level of concern of 30ppm, and even below the level of no effect (13.3ppm), as defined by de VRIES (1989). However, some individuals had levels higher than the critical level of 50ppm. Of the organochlorines, only DDE was high and was detected in more than 50% of the otters. Mercury levels were a little elevated in the Coastal Plain area (CUMBIE, 1975), but still below the levels that caused reproductive failure in mink, as found by WOBESER et al. (1976). The nineteen otters from small rivers in Alabama examined by HILL and LOVETT (1975) had even lower levels of organochlorines and PCBs than those found by HALBROOK et al. (1981).

The levels of lead in the spraints analyzed in the present research were comparable to, or lower than, that from the 450 spraints collected in four different areas in Great Britain (MASON and

MACDONALD, 1986). The mercury levels in the spraints of the present research were much lower. In the crayfish and fish analyzed no elevated Hg-levels could be detected.

OSOWSKI et al. (1995) examined trapped mink from 1989 -1991 in North and South Carolina and Georgia. They suggest that mink from the Coastal Plain had suffered population declines because of elevated mercury levels. Also, PCB levels were elevated compared to the controls. Mink from the Piedmont area were used as controls. Average PCB levels in 14 mink from three different counties just west of Clarcke County were 0.005 ppm (wet weight liver) while mercury levels were 0.57 ppm (wet weight in kidney). The level of organochlorines and PCB's was recently measured in a dam lake fed by the Oconee River south of Athens (Department of Natural Resources, EPA, Atlanta; personal communication). The levels of these pollutants were very low. The Oconee rivershed is known to be more pristine than many other riversheds in Georgia (Freeman, pers. comm.).

From the above it could be concluded with some optimism, that river otters in the study area were, and are presently, not exposed to critical levels of organochlorines, PCB's, lead and mercury. Micropollutants were probably not a real obstacle for the recovery of the river otter in the area. The restoration of riparian forests, reduced trapping and the return of beavers, however, may have facilitated the return of the otter.

CONCLUSIONS

At present, the river otter population in Clarcke County in the Piedmont area is well developed. The food of the river otter in the study area consists mostly of crayfish and sunfish. Especially in the summer, crayfish is very important. When comparing food habits in winter in the 1970s (LAUACHlNDA and HILL, 1977) in Alabama and Georgia (when siltation was already widespread) with data of the 1990s, little difference was found. Food habits of the river otter are similar in both clear and turbid water. The problem of siltation does not, therefore, appear to affect the river otter population or change its food habits. Micropollutant levels in river otters in the area have been relatively low in the past, and remain so presently, as the exposure to micropollutants still seems to be below critical levels.

ACKNOWLEDGEMENTS *- This study would not have been possible without the cooperation of the Museum of Natural History in Athens. Special thanks goes to Dr. E.J Reitz, Amy Lynn Edwards and Tracey Jones. Thanks go to Becky Auxier of the Chemical Analysis Laboratory for giving me the opportunity to analyze samples, Terry Moore for helping me with the direction of the research and the fieldwork, Prof. Jenkins who gave me information about otters in the past, Jane M. Griess for being so helpful and sending me her thesis and other literature, and to Bud J. Freeman for helping me with fish distribution.*

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RÉSUMÉ: LA LOUTRE DE RIVIÈRE NORD-AMÉRICAINE (*Lontra canadensis*) DANS LE COMTÉ DE CLARCKE (GEORGIA, USA): ÉTUDE DU RÉGIME ALIMENTAIRE ET DES FACTEURS ENVIRONNEMENTAUX

Le statut de la loutre de rivière nord-américaine (*Lontra canadensis*) a été étudié dans et aux environs du Comté de Clarcke (Georgia, USA). Bien qu'ayant presque disparu dans les années 50, la population de loutres apparaît florissante actuellement. Le régime alimentaire a été étudié par l'analyse d'épreintes en hiver et en été. Perches (Centrarchidae) et écrevisses sont les proies majoritaires. Nous avons cherché à tester si les loutres de ce secteur sont affectées par les pollutions environmentales. Des données de la littérature et la recherche de quelques métaux lourds suggérent que l'exposition aux pollutions chimiques est relativement faible. La sédimentation des rivières et ruisseaux n'apparaît pas porter atteinte à la loutre ni modifier ses habitudes alimentaires.

RESUMEN: LA NUTRIA DE RÍO (*Lontra canadensis*) EN EL CONDADO CLARCKE (GEORGIA, USA): UN RELEVAMIENTO, HÁBITOS ALIMENTICIOS Y FACTORES AMBIENTALES.

Se relevó el estado de la nutria de río (*Lontra canadensis*) en y alrededor del condado Clarcke (Georgia, USA). A pesar de haber estado casi extinguida en los años cincuenta, la población de nutrias parece actualmente en buenas condiciones. Se estudiaron los hábitos alimenticios a través de un relevamiento de fecas en verauo e invierno. Se encontró que los items alimenticios más importantes son cangrejos y langostas de rio. Se intentó evaluar si las nutrias en el área de estudio son afectadas por polución ambiental. Datos de la literatura y algunos análisis de metales pesados mostraron que la exposición a polución química ha sido relativamente baja. La silvatación de ríos y cañadas no parece dañar a las nutrias o modificar sus hábitos alimenticios.