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## A STUDY OF OTTERS IN LAKE MIKRI PRESPIA, GREECE

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### INTRODUCTION

Greece is one of the few European countries where otter (*Lutra lutra*) populations are, despite decreases over the last decade. still thriving. The aims of our study were to investigate the food habits of otters in Lake Mikri Prespa in relation to season and to try to determine the status of the population in the area.

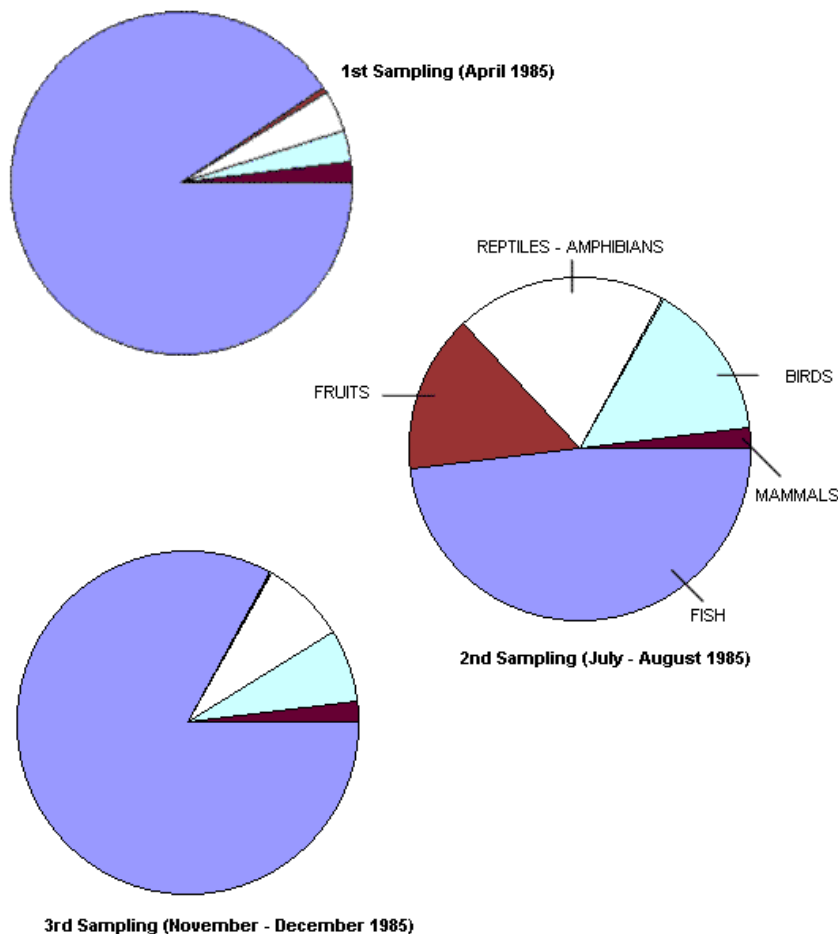
Lake Mikri Prespa is situated in north-west Greece at an altitude of 853 m. It is mesotrophic but is rapidly becoming eutrophic. The total length of shore-line is 46 km and water passes from the lake into Lake Megali Prespa. It is one of the most important wetlands in Europe for its fauna and flora and, in 1974, was declared a National Park.

Our study was carried out between April 1985 and August 1986. Spraint collections were made in April, July-August and November-December 1985 and in July-August 1986.

### RESULTS

#### Otter diet

Fish comprised 50% of the diet in Mikri Prespa during June-September and 90% in other months (see Fig. 1). Due to hibernation, amphibians and reptiles may be less available in winter and birds are not so numerous from mid-autumn to late spring. On an annual basis fish formed 75% of the otters' diet.



**Figure 1:** The participation of the major prey groups in otter diet in Lake Mikri Prespa

Cyprinidae were the most common prey items since, of the 13 species of fish found in Mikri Prespa, 10 belong to this family. Table 1 gives the percentage frequencies for each species. Fish species were taken in proportion to their relative abundance in the lake, with *Alburnus alburnus*, the most numerous fish, occurring most frequently in spraints. *Rutilus rubilio* is also common and is frequently eaten.

**Table 1:** The percentage frequency of otters' prey items in Lake Mikri Prespa at three seasons in 1985

Food Items	April	July-August	November-December
<i>Barbus prespensis</i>	3.39	22.22	6.98
<i>Alburnus alburnus</i>	54.24	33.33	62.02
<i>Rutilus rubilio</i>	25.42	11.11	20.93
<i>Chondrostoma nasus</i>	61.02	4.17	10.85
<i>Phoxinellus adspersus</i>	3.39	3.47	18.60
<i>Alburnoides bipunctatus</i>	1.69	5.56	8.53
<i>Cyprinus carpio</i>	0	0.69	3.10
<i>Leuciscus cephalus</i>	1.69	2.78	8.53
<i>Carassius auratus</i>	0	2.08	3.10
<i>Anguilla anguilla</i>	0	0	0.78
<i>Cobitis taenia</i>	0	0	0
<i>Alburnus X Rutilus</i>	8.47	9.73	16.28
Unidentified Fish spp.	16.95	16.67	27.91
Amphibians	0	11.11	0.78
Lizards	10.17	12.50	2.33
Fruits	3.39	17.36	2.33
Insects	15.25	27.78	4.55
Mammals	1.69	4.17	1.55
Birds	1.69	19.44	5.43
Watersnakes	0	28.47	4.65
Molluscs	0	2.08	3.10

The occurrence of some species in the diet varied with season. For instance, the percentage frequency of *Chondrostoma nasus* in spring was 60% but only 4 and 10% in the summer and autumn/winter respectively. This difference may be explained by the fact that *C.nasus* breeds from mid-April to the end of May when they are abundant and easily caught round the rocky coasts of the lake. Most of the spraints we collected in the spring were found along the rocky shores. *Barbus plebejus prespensis* was similarly found commonly in spraints during its breed season (July-August). The results indicated that the otters fed mostly close inshore even though the lake has a maximum depth only 7.5 m.

Most of the fish taken by otters were 10-25 cm in length. Very few large fish like *Cyprinus carpio*, *Leuciscus cephalus* or *Carassius auratus gibelio* were eaten. *Anguilla anguilla* was almost absent from the diet but we have little information on eel populations in the lake. When schooling species such as *Alburnus* or *Phoxinellus adspersus* were the prey, then the remains of more than one individual (often 2-4) were usually found in each spraint.

As can be seen from Table 1, water snakes (*Natrix natrix* and *N. tessellata*) and birds (mostly *Fulica atra*) were important components of the food during the summer. Surprisingly, fruit was also eaten in the summer, especially fruits of *Cornus mas*, *C. sanguinea* and *Prunus mahaleb*.

### Signs of Otters

During our periods of field work, spraints and other signs were searched for daily. Most evidence of otter activity was found along the rocky shores of the lake especially in areas where rocks or vegetation offered ample cover (areas A, C and D in Fig. 2). Flat shores with cultivated areas behind and with dense reed beds contained fewer signs except at openings to the lake.

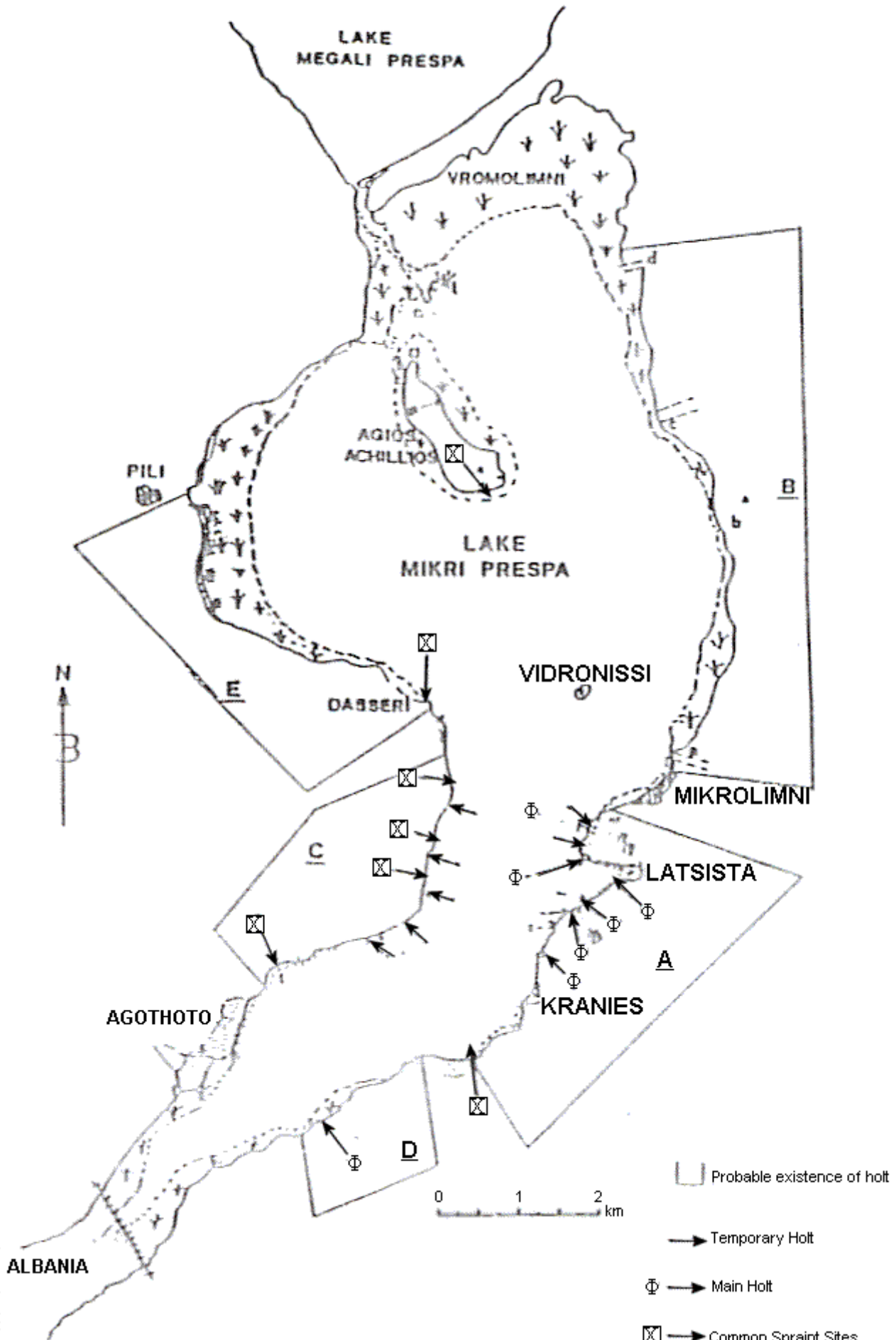


Figure 2: Lake Mikri Prespa showing study area and some results

In area A two main holts, thought to be used for breeding, were found 800m apart. Both were marked with large accumulations of spraints. These holts comprised large caves with several entrances and intercommunicating chambers and were protected behind

by 10m vertical rock faces. The holts were located close to rich inshore feeding areas. Thirteen other lying-up sites (temporary holts) were identified mostly in simply shaped rock caves, reed beds or amongst tree roots. In the proximity of holts or lying-up places the number of spraints found increased. In area C, high numbers of spraints were also found mid-way between neighbouring lying-up sites.

It is thought that the otters were not territorial except perhaps for the males during the mating period (early winter). Females with cubs do, however, appear to have priority in choice of range. The availability of shelter provided by vegetation or rocks appears to be a significant factor in determining which areas are used by the animals. *Phragmites*, *Rubra* and *Rosa* are important for cover as are fig and oak trees.

Twenty years ago otters were frequently seen by the local people and fishermen on the lake. Today this is rare. The decline seems to have occurred largely within the last ten years although food availability has not changed. Evidence suggests that the otter population is well below the potential carrying capacity. It is suggested that the misuse of fertilizers and pesticides may be to blame and that the resulting levels of pollution together with increased human disturbance have led to a decline which may well prove irreversible.