

## REPORT

# CAPE CLAWLESS OTTERS (*Aonyx capensis*) AS INDICATORS OF WATER POLLUTION BY HEAVY METALS AND PESTICIDES IN ZIMBABWE

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**ABSTRACT:** This project aims to determine the level, type and sources of pollution from agricultural pesticides and industrial heavy metals in Lake Chivero, Zimbabwe, along with the extent of bioaccumulation and the effect on otter populations. As a control, we will also analyze data from the relatively unpolluted eastern highlands. The project is expected to be completed in September 1995.

## INTRODUCTION

The role that otters can play as indicators of the 'health' of the wetlands that they inhabit has been emphasized by the IUCN Otter Specialist Group. As the dominant predator in many aquatic ecosystems chemical pollutants will accumulate in their bodies, causing death or reduced breeding success and their ultimate local extinction (FOSTER-TURLEY et al., 1990). Most of the studies relating otter distribution to water pollution have been carried out in Europe, and the Eurasian otter *Lutra lutra* has been the indicator species concerned (e.g. MASON, 1989; MASON et al., 1992; MASON, 1993; MASON and MACDONALD, 1993; GUTLEB, 1994; ELMEROS and LEONARDS, 1994; MACDONALD and MASON, 1994). The monitoring, regulation and control of water pollution from agriculture and industry in most European countries is feasible, and consequently has been included as a major aspect of the proposed IUCN Action Plan for European Otters (FOSTER-TURLEY et al., 1990). In Africa, however, where economic development is often of higher priority than the conservation of the environment, the control of water pollution and the protection of wetlands is rarely considered, and often the legislative and administrative framework necessary to implement pollution control has yet to be developed.

## QUESTIONS

The project aims to answer three questions:

- 1) What are the pollutants present in Lake Chivero, and what are their sources?
- 2) What is the extent of the bioaccumulation in the food chain of Lake Chivero?
- 3) What are the levels of toxic pollutants in the Cape clawless otter population of Lake Chivero relative to clawless otters inhabiting an unpolluted area of Zimbabwe, and what threats do these toxins pose to the lake's otter population?

## METHODS

To sample the levels of bioaccumulation at different stages within the food chain, both producers and consumers are being collected and analyzed for the presence of polychlorinated biphenyls (PCBs) and heavy metals. Phytoplankton (*Microcystis spp.*), oligochaetes (*Limnodrilus spp.*), benthic invertebrates (predominately Chironomidae) and four fish species (green-headed bream *Oreochromis macrochir*, dwarf bream *Haplochromis acuticeps*, spot-tailed bream *Alestes imberi* and catfish *Clarias gariepinus*) will be trapped in different areas of the dam and at the mouths of the tributary rivers. Comparisons will be made between the sampling sites to determine the different pollutants present, and therefore their possible sources according to the presence of agriculture and industry on each tributary.

To determine the bioaccumulation of pollutants in the dominant consumers of the food chain, white-breasted cormorants *Phalacrocorax carbo lucidus* will be shot wherever possible and their body tissue will be analyzed. In the absence of a ready supply of clawless otter carcasses, scats (spraints) will be collected from scat sites around the lake and deep frozen prior to analysis. Scats contain chemical residues and have proved suitable indicators of the presence of toxins in otters by other workers (e.g. ELMEROS and LEONARDS, 1994; GUTLEB, 1994; MACDONALD and MASON, 1994). As a comparison of 'normal' levels of chemical present in Zimbabwean clawless otters scats are also being collected from the Kairezi River located in the eastern highlands, where otters exist in a national park and a subsistence agricultural area, and the only possible source of pollution is organophosphates from cattle dipping (BUTLER, 1994; BUTLER and DU TOIT, 1994). The analyses of all samples should be completed by September 1995.

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