



EZEMVELO KZN WILDLIFE
Conservation, Partnerships & Ecotourism

Lake Sibaya Experimental Gillnet Fishery

**A report on the background, implementation, management, results and
recommendations of the fishery from inception to December 2003**

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1. Introduction

Lake Sibaya, situated north of Sodwana Bay and south of Kosi Bay, is the largest permanent natural freshwater body in southern Africa. It is also a Nature Reserve, Ramsar site and part of the Greater St. Lucia World Heritage Site (GSLWP). The proclamations all refer to the water surface and the land surrounding most of the west, north and much of the south of the lake is tribal land. The eastern shore is part of the GSLWP while some of the southern border is included in Mabaso Tribal Game Reserve. The lake has no outlet to the ocean and, despite a small relic estuarine floral and faunal component, the ecology is dominated by freshwater organisms. There are still significant numbers of hippo and crocodile in the lake as well as several rare fish species and large numbers of freshwater barble and tilapias. Through the issue of permits from EKZNW a small scale experimental fishery has been underway since 1995. This report serves to supply information on the fishery.

2. Background

In 1989, following repeated requests from local people to be allowed to gillnet in the lake, the Fisheries Research Officer of the KwaZulu Bureau of Natural Resources recommended that a small experimental gillnet fishery be established to determine the potential and impacts of gillnetting on the lake ecosystem. The recommendation was agreed to in principal but no action was taken until 1993, when a local person, supported by the local Tribal Authority, applied to gillnet in the lake. The application was reviewed and in October 1993 was approved so long as certain conditions including self-monitoring and management controls were implemented. Fishing began in late 1993, under a six-month experimental permit, and has continued intermittently and erratically since then. The permits were issued by the Regional Resource Ecologist Coast (RERU) to the EKNW Conservation Manager (CM) of Lake Sibaya who ensured compliance with the permit conditions.

The permit was issued in terms of the KwaZulu Nature Conservation Act with respect to freshwater fish. Netting conditions limited the length to 100 metres, a plastic identification tag had to be attached and catch monitoring by the fisher was essential.

The initial permit was issued through the Mabaso Tribal Authority for fishing in the western arm of the lake and was later supplemented by another permit through the Mbila Tribal Authority to fish in the southeastern area. Only a few people seemed interested in gillnetting in the lake and from time to time they went to Johannesburg or worked elsewhere and did not fish for extended periods. In the last two years one man from the Mabaso TA has fished fairly consistently and has supplied apparently reasonable catch returns.

3. Methods

The fishers are supplied with catch return forms and a scale through the EKZNW Conservation Manager. Completed forms are returned to the RERU and the CM ensures compliance with the permit conditions.

Results and conclusions derived from self monitoring are often inaccurate and misleading. There is, however, a considerable amount of information from earlier experimental fishing in Lake Sibaya and this tends to suggest that many of the catch returns from this experimental fishery may be a fairly true reflection of catches. The reality is, however, that there were few real checks on the monitoring and so only the most basic parameters of the fishery can be viewed with any confidence.

4. Results

Catch returns were very erratic, reflecting the fishing pressure, and some had to be discarded as unreadable due to incomplete data.

4.1 Species composition: As expected, the fishery is entirely dependent on the freshwater barble (almost exclusively *Clarias gariepinus*) and tilapia (almost exclusively *Oreochromis mossambicus*) (Table 1). Barble account for 94 % of the catch by number and 99% by mass, with the remainder being tilapia (Table 1 & Figure 1.)

Table 1. Statistics from the self monitoring of the Lake Sibaya experimental gillnet fishery.

Year	1995	1999	2000	2003	Total
Barble No	2324	261	1113	537	4235
Barble mean mass	1.26	1.5	1.38	1.2	1.3
Barble total mass	2933	390	1536	644	5503
Barble CPUE No.	10.01	7.25	4.99	11.9	7.8
Barble CPUE Mass	12.64	10.83	6.89	14.3	10.1
Tilapia No	94	0	0	169	263
Tilapia mean mass	0.29	0	0	0.3	0.3
Tilapia total mass	27.5	0	0	51	78.5
Tilapia CPUE No.	0.41	0	0	3.1	0.48
Tilapia CPUE mass	0.12	0	0	0.93	0.14
Total CPUE No	10.42	7.25	4.99	15	8.28
Total CPUE mass	12.76	10.83	6.89	15.23	10.24
Settings monitored	232	36	223	54	545
Estimate of total settings	232	36	223	180	671
Estimate of total catch No	2417	261	1113	2700	6491
Estimate of total catch mass	2960	390	1536	2741	7627

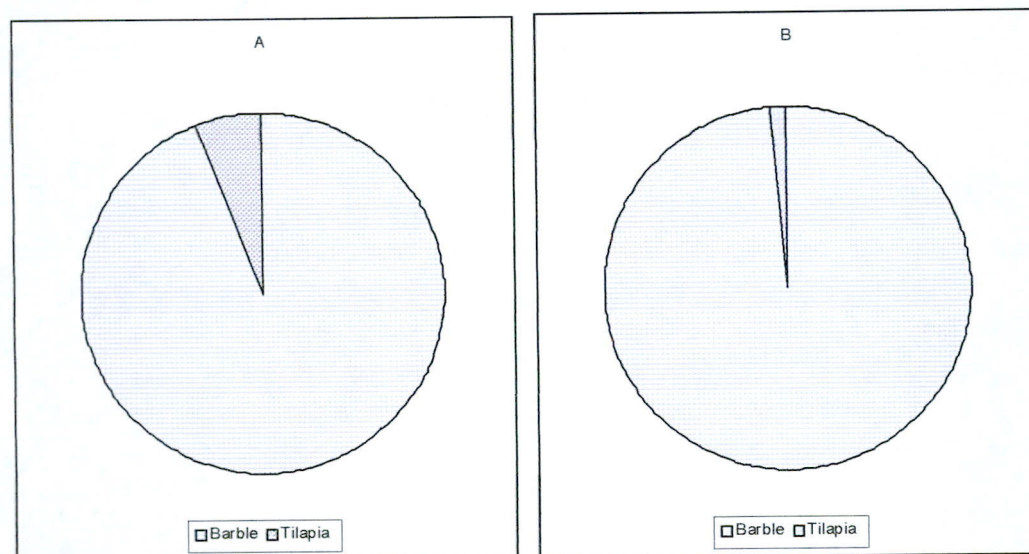


Figure 1. Overall percentages by number (A) and mass (B) of the Lake Sibaya experimental gillnet fishery from 1995 to 2003.

4.2 Sustainability: The available data show no overall trend either in catch per unit effort (CPUE) for mass or number. There is also no discernable trend in the mean mass of either of the main fish species (Table 1).

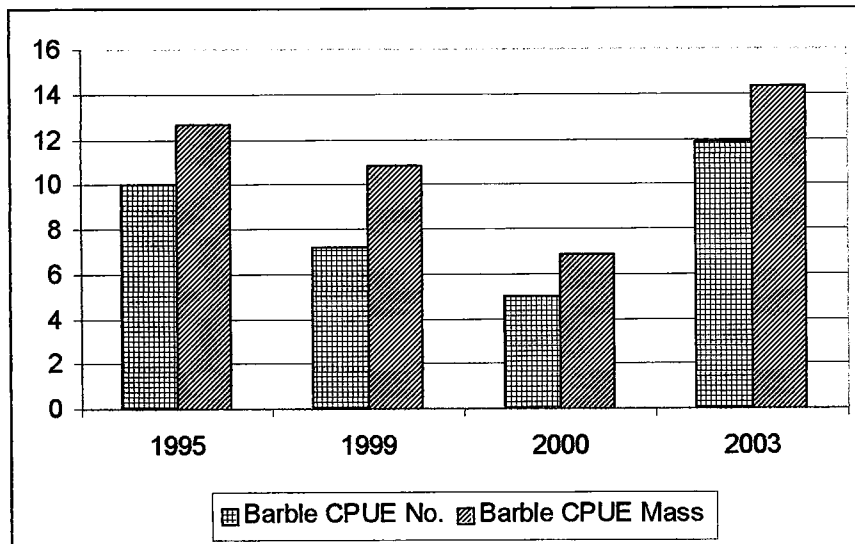


Figure 2. Catch per unit effort for barble by number and mass of the Lake Sibaya experimental gillnet fishery from 1995 to 2003.

4.3 Yields: The capture, on average over the study period, of about eight fish of a total mass of just over ten kilograms (Table 1) per net setting places the fishery just above subsistence level. It produces more fish than an average family could consume but does not raise the fishery to true commercial status. It is a small scale commercial fishery.

4.4 Impacts: The annual capture of around two thousand fish weighing approximately two metric tons from Lake Sibaya (Figure 1.) amounts to about one third of a fish or a third of a kilogram of fish per hectare.

4.5 Bycatch: Neither the self monitoring or management of the fishing gave any indication that bycatch or impacts on other species was a serious concern. No crocodile, hippo, birds or reptiles were reported caught in the nets.

5. Discussion. Due to the inaccurate nature of the monitoring it would be inappropriate to make any more than the most basic of comments on the fishery. It is a barble dominated fishery producing about ten kilograms per setting. It is not highly economic but produces more food than a family can eat most of the time. There are no indications of it being unsustainable and no serious bycatch or other problems have been yet identified. Few problems have been reported by management and there appears to be relatively little further pressure for more permits or longer nets. On the other hand illegal nets are occasionally taken out of the lake and destroyed.

6. Recommendation. Due to the lack of reported problems and apparent sustainability of the fishing there appears no reason to reduce or stop the present fishery. Lake Sibaya is a protected area but present policy can accommodate small scale commercial fisheries where they are deemed appropriate. The present fishery should continue but efforts should be made to carry out occasional spot checks on monitoring accuracy.