

Tourists in
Visitor use
Angling

Fish

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A REPORT ON

TOURIST AND VISITOR ANGLING TRENDS AT KOSI BAY

1981 to 1990.

An analysis of and discussion on the visitor statistics at the Kosi Bay campsite during the last ten years, with particular reference to overall trends in visitor numbers, angling success and overall impact on the fishery.

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1.

Introduction:

Data have been collected on the catches of anglers visiting the Kosi Bay campsite since 1981 and figures are available on the total numbers of people staying there annually. In this report these are blended together to give a useful insight into some important trends over this period. These include, firstly the trends in visitor numbers and secondly angling success and these lead to estimates of total catches and thus to impact on the fishery.

During the period covered there have been two important changes in the management of the area. The campsite was taken over from Natal Parks Board in 1982 and the Kosi Bay Nature Reserve was proclaimed in 1987.

Kosi campsite was thus the first major tourist facility run by KwaZulu and the Reserve the first KwaZulu nature reserve in which extensive consumptive utilisation was allowed by tourists. Both of these mean that Kosi can, and will, be used as an example of how we run areas under our control. Our "track record" at Kosi is thus important in this respect.

It is the function of this report to objectively outline what has happened at Kosi and to give figures on the changes. We must show that the necessary information on the impact of tourism has been collected in our areas and we should be judged on this and not on peoples perceptions of what has happened. Utilisation, as is stated in our policy, can only be allowed on a sustainable yield basis and this applies to all forms including tourist angling.

Methods:

Data on tourist numbers were obtained from the Natal Parks Board and our tourist records for the relevant periods. Fish catch information was obtained from questionnaires completed by anglers and interviews but principally from Oceanographic Research Institute catch cards. The cards are completed voluntarily by anglers and they are analyzed and summarised annually by O.R.I..

Much of the information on visitor numbers is precise but the angling data are, by the nature of them, estimates. The accuracy of the estimates varies from species composition where exact figures are used to total catch where several assumptions have to be made.

Results:

In this section results are given in graphical form in Figures and then these are discussed in the text. Since all is related to visitor numbers these are dealt with first and thus the results following can be viewed in the light of the changing visitor scenario.

Visitor Statistics:

Figure 1 shows the overall number of "campnights" occupied yearly. (A "campnight" is simply when a camp is occupied for one night. All camps are treated equally and from 1987 on Lodges are included and treated as camps.) It is clear that tourist use of Kosi bay has increased markedly over the period. The trend is one of continued increase but Figure 2, that of percentage occupancy, puts the increase into context.

Percentage occupancy is the proportion of available accommodation which is actually taken up. On an annual basis complete occupancy is unattainable and indeed the rates attained over the past five years are approaching the maximum. Figure 2 shows that current visitor numbers are close to the maximum possible on an overnight basis at present accommodation levels.

In 1987 the amount of accommodation available was increased by the opening of three lodges and this accounts for the apparent discrepancy between Figures 1 and 2.

The above are the only visitors for which useful figures are available. Day visitors are now counted but in the past accuracy was not possible as the gate was not controlled.

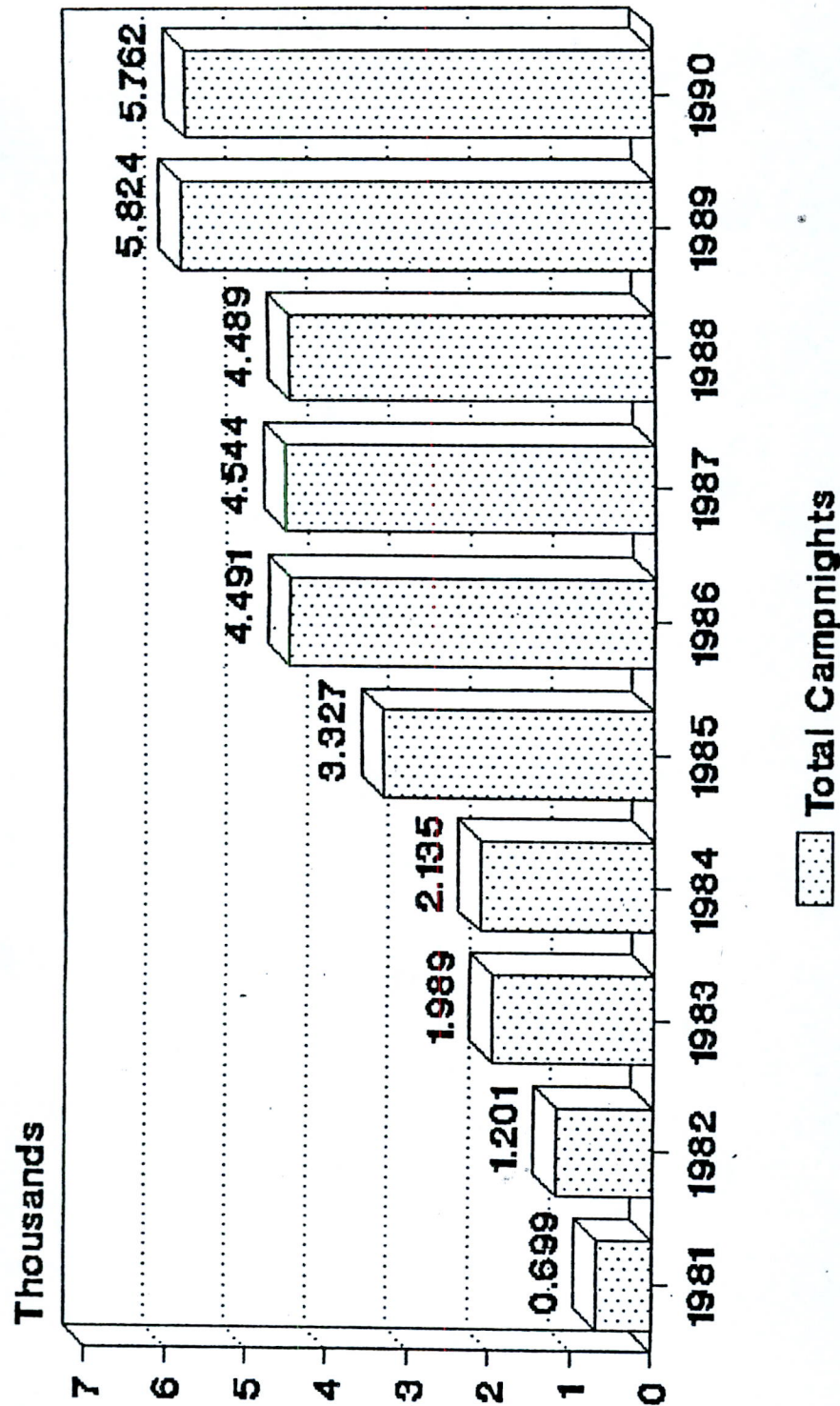
The Star of the Sea shack, "Health camp" and police facility also accommodated numbers of visitors who angled but estimates are of little use. It is necessary, however, to indicate the volume of visitors using these facilities in relation to the official camp as these visitors fish and thus are part of the utilisation within the reserve.

In the last year, from observations, estimates of the visitors to the facilities are as follows;

Star of the Sea	150 campnights.
"Health camp"	150 campnights.
Police facility	100 campnights.
Total	400 Campnights.

Figure 1.

Visitor Statistics at Kosi Bay. Total "Campnights" occupied.

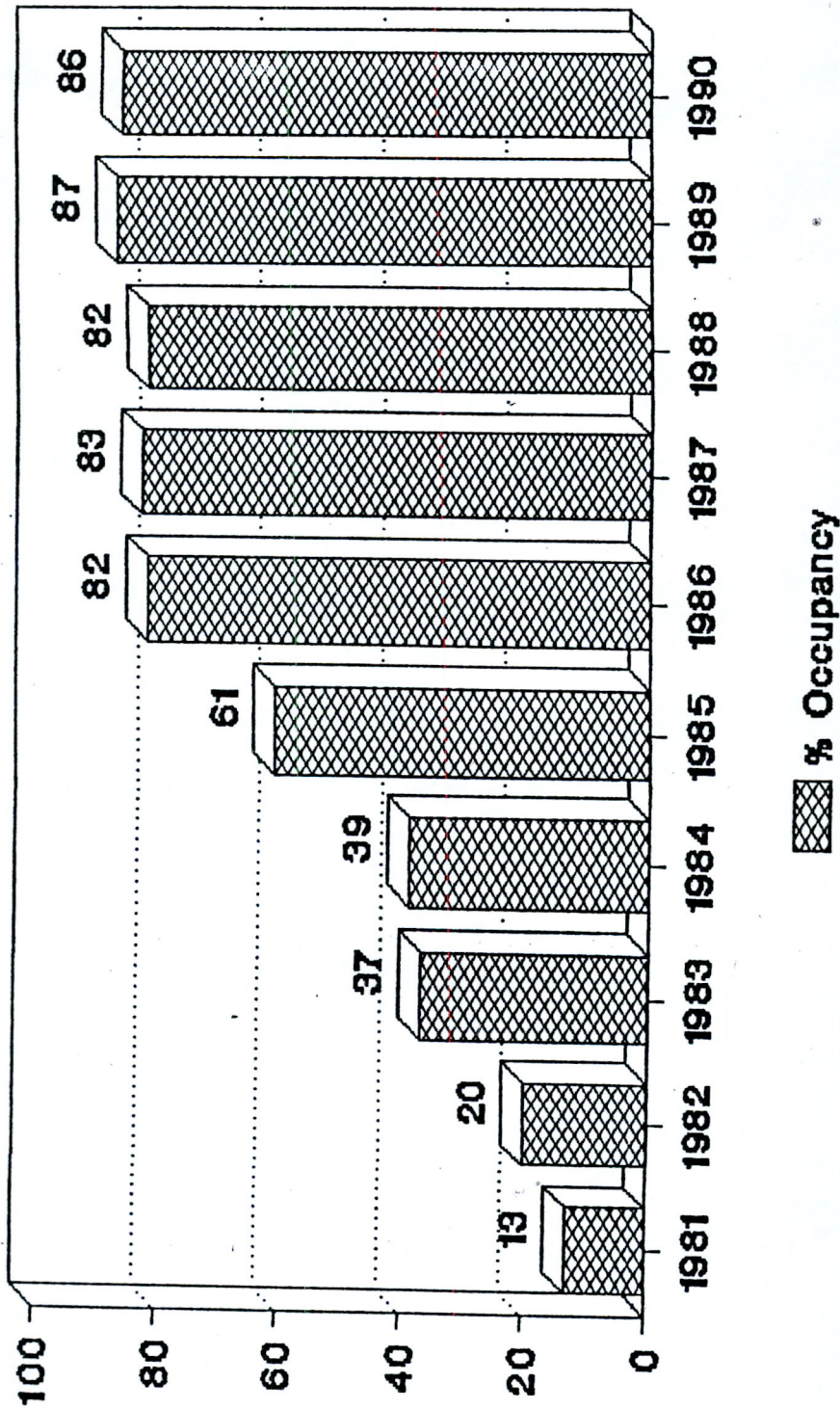


** Data for 1982 are an estimate.

1992 333 21

Figure 2.

Visitor Statistics at Kosi Bay. Percentage Occupancy.



** Data for 1982 are an estimate.

The above are conservative estimates and it is probable that these facilities accounted for about another ten percent on top of the official campsite figures. These units of accommodation have developed erratically, are uncontrolled and have an uncertain future. They have, however, increased visitor access and fishing pressure significantly and so have a place in this report.

Since information on them is scanty, little further can be said about the unofficial facilities except that it must be borne in mind that angling pressure and so fish offtake is probably about ten percent higher than is stated in the rest of this report.

At present no new tourist development, which would significantly increase the fishing impact on the reserve, is envisaged. This means that the graphs will both even out at near current levels and that visitor angling pressure will thus probably remain near current levels for some time.

The implication is thus that visitor angling catches and total offtakes in the future will be related to fishing success alone as effort should remain fairly stable.

Anglers' Catch Success:

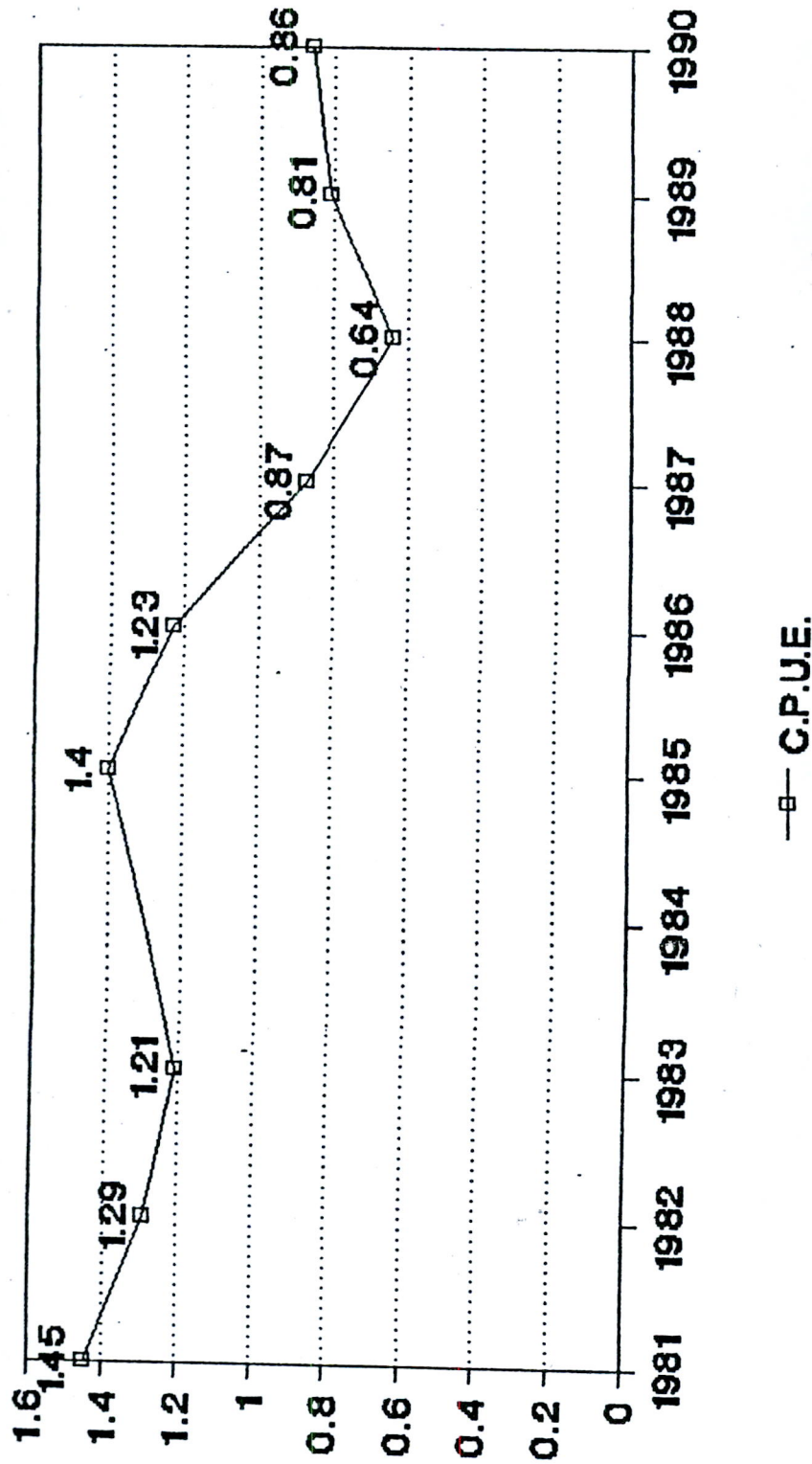
Figure 3 shows the trend of catches during the last ten years. The statistic used is the Catch Per Unit Effort (C.P.U.E.) and is an estimate of the mean number of fish caught per angler per day. The estimate is calculated from catch returns and represents a good estimate from a large data base. (Insufficient data were available for some months in 1984 and so no estimate was made.)

As in most similar areas, such as St. Lucia, catches are generally decreasing but the rate of decrease is important as are year to year changes. Many statements are made by members of the public about the fishing at Kosi in relation to past success. Usually these statements are subjective and based on selected memories and as such are unreliable. Figure 3 shows the actual trend in a standard manner and serves to put the decrease in perspective.

According to Figure 3 anglers were catching less than half as many fish per day in 1988 as they were in 1981. Since then, however, there appears to have been an increase in catch success.

Figure 3.

Angler's Estimated Daily Catch. Kosi Bay Camp Site 1981 to 1990.



Data From Catch Returns.
Units are fish per "angling day".

Mean Fish Mass:

The estimated mean fish mass (as recorded by the anglers themselves) is given in Figure 4. Little can be said about this statistic except that there is no clear overall trend. What this suggests is that the mean fish size has shown a considerable degree of constancy throughout the period covered in spite of other factors changing. This is in contrast to similar statistics for most other estuarine systems, and coastal fishing in general, where mean fish mass has usually decreased.

Total Annual Catch Estimates:

Estimates of the total annual catches of visiting anglers have been calculated using visitor figures, fishing intensity and C.P.U.E.'s and these are shown in Figure 5. Clearly, although individual anglers are catching less fish than they were in 1981, the total catch of the visitors has increased markedly.

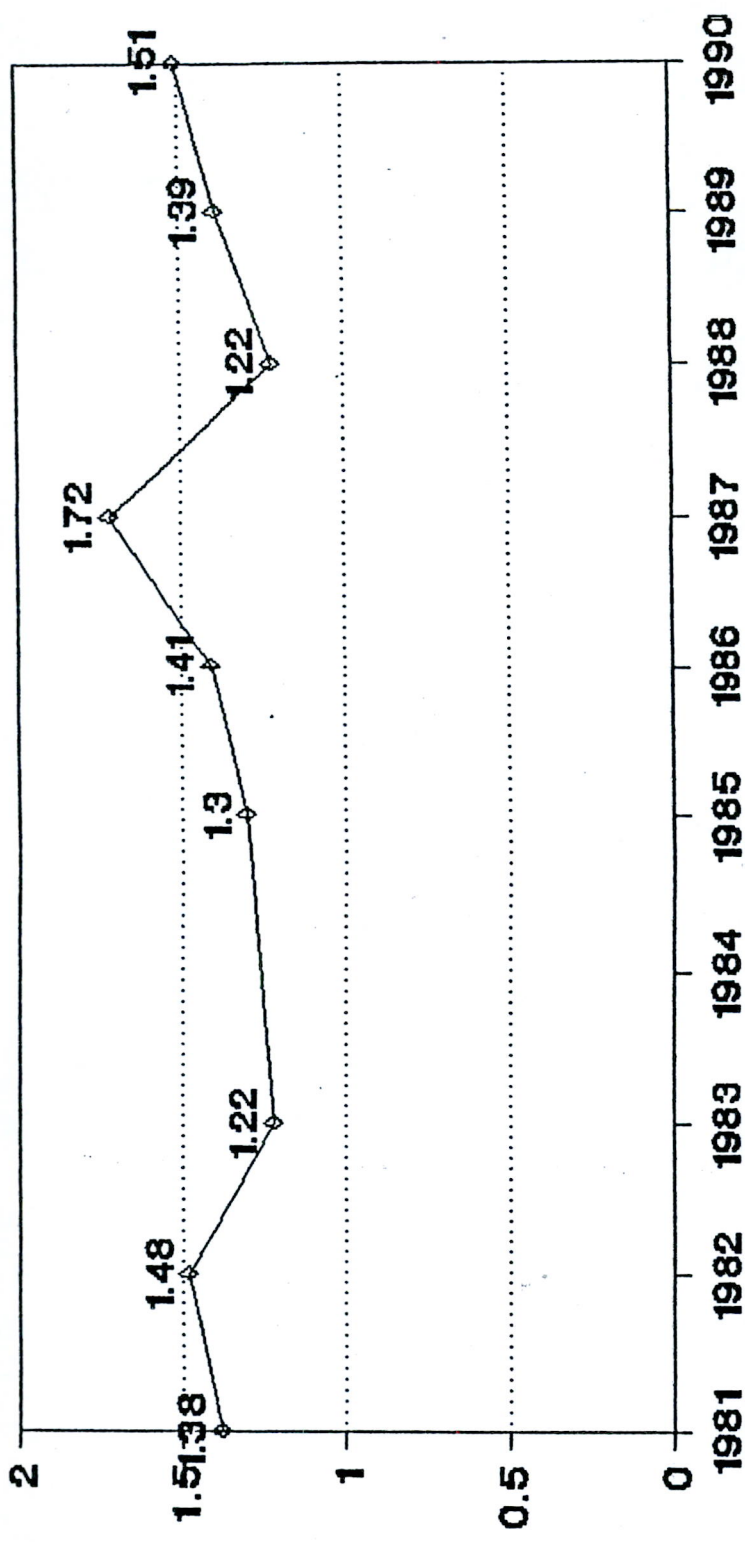
A statement by an angler such as "fishing is worse than it was in 1981" is simplistic and misleading as the visitors, as a group, are catching many times more fish than they were ten years ago. The Kosi lakes are thus producing considerably more fish than they were for the visiting anglers while the mean mass is still similar. The reduced C.P.U.E. is to some extent a simple function of increased fishing pressure and disturbance in the lakes. Kosi fish are no longer as "naive" as they were and there are now regularly ten to twenty boats fishing in Mankawulani whereas in 1981 there were only relatively few. C.P.U.E.'s will inevitably decrease as disturbance increases in a clear, shallow lake like Mankawulani.

Catch Analysis (Species composition) for Visitors:

Figure 6 shows the species composition of the visitor catches over the last ten years. Several points are immediately obvious and important. These are as follows.....

1. Spotted grunter was numerically (and by mass) consistently the most important species to the anglers, usually accounting for over half the landings.
2. Stumpnose bream was often the second most commonly caught fish but its small mean mass reduced its importance in terms of "sport" as well as food value. Data not included here suggest that its mean mass has decreased considerably over the last ten years, possibly as a result of declining salinities.

Estimated Mean fish Mass. Kosi Bay Campsite 1981 to 1990.

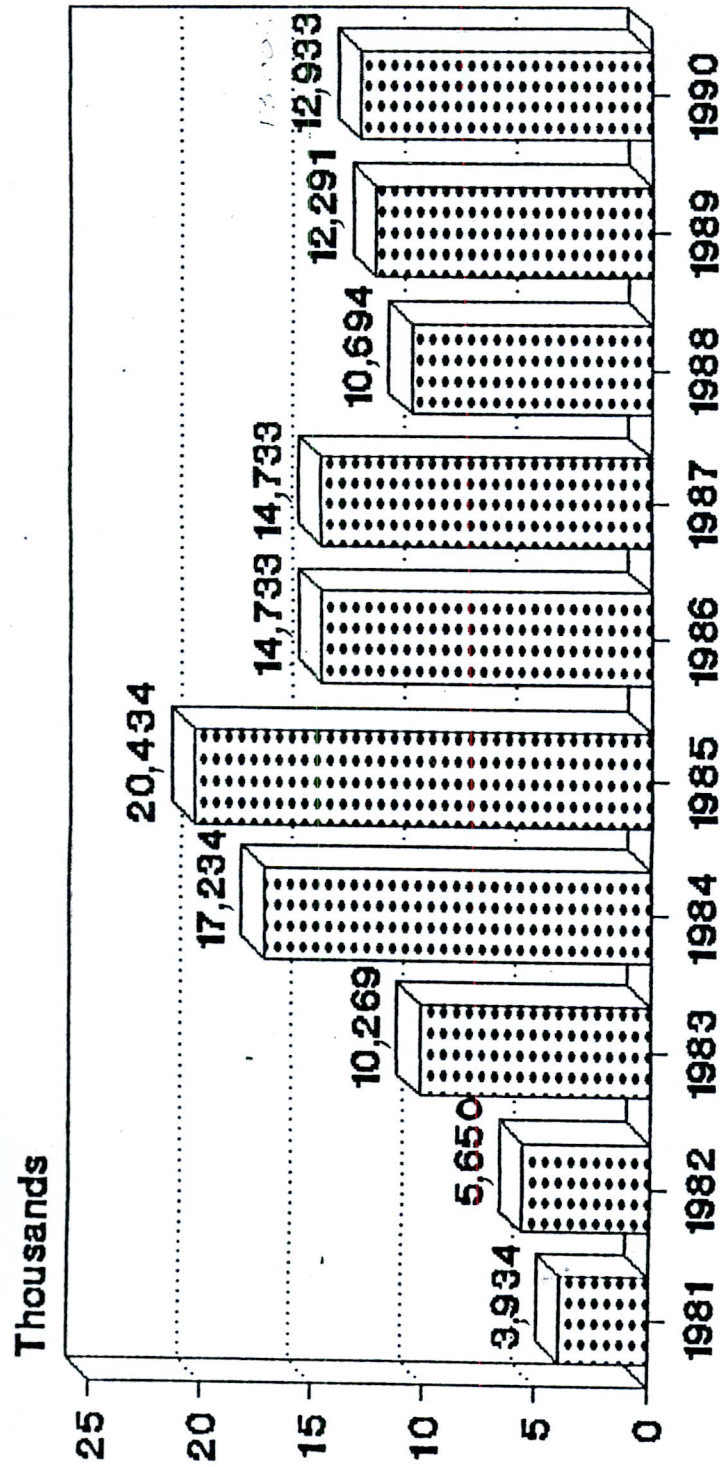


—◇— Mean Fish Mass.

Data from catch returns (in Kg.).

Figure 5.

Total Annual Catch Estimates. Angling From Kosi Bay Campsite.

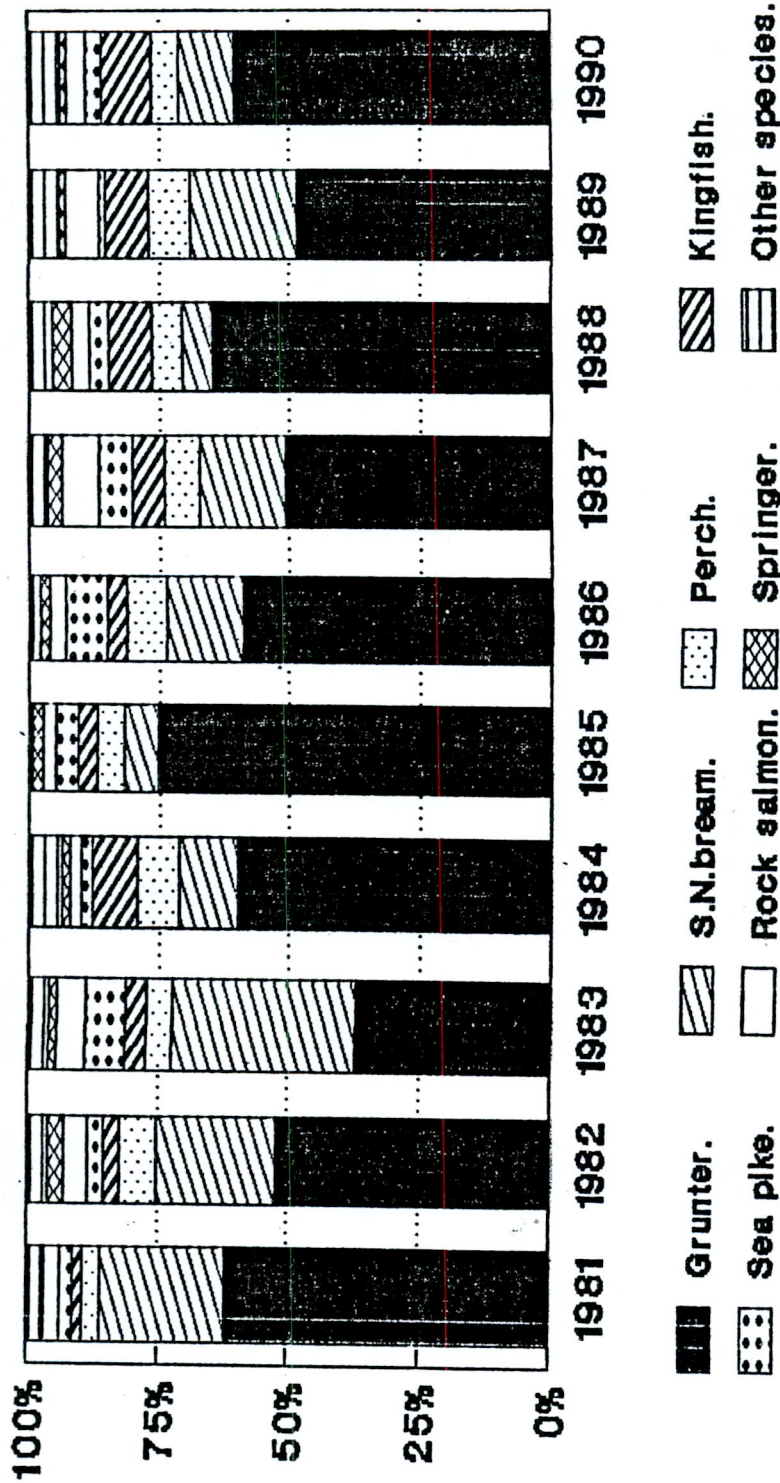


Est. of Total Catch.

Units are total number of fish caught.

Figure 6.

Catch Analysis from Visitors. Kosi Bay 1981 to 1990



This is the analysis of the catch species composition from catch card returns.

3. In all years the same two species of fish accounted for over seventy percent of landings, although the proportions of each varied.

4. There is a remarkable degree of constancy in the five most important fish species and together they always accounted for over ninety percent of landings.

5. All fish species well represented in catches at the beginning of the decade are still caught in fair numbers. Figure 7 shows the "minor species" in more detail but apart from indicating how relative abundances can fluctuate markedly from year to year there are no clear progressive trends apparent at this time. All the above tend to suggest an underlying stability in the fish population structure. The catches of the fish traps also suggest this underlying stability.

Fishtrap catches:

The Kosi bay fishtrap catches were monitored in detail from 1981 to 1984 and since then a known proportion have been recorded. Figure 8 shows the total and estimated total catches during the last decade. The reason for their inclusion here is twofold.

Firstly, there has always been controversy about the perceived negative impact of tourism on the catches of the traditional traps. Secondly, the traps, as a fairly stable and large offtake, serve to indicate the status of the Kosi lakes fish stocks and their species composition. Any serious decline or change in species composition would be reflected in trap catches and thus detected by the B.N.R..

As can be seen from the results there is no clear overall trend, although the last three years' estimated catches were the best three of the decade. There is no significant or even detectable relationship between visitor numbers or catches and fishtrap catches. It would appear that fishtrap catches are independent of tourism impact, at current levels. They depend on the fish population and are modified on a daily and annual basis by physical conditions outside the immediate control of man.

Discussion:

The facts about the extent of tourist development, angling and impact on the Kosi system are presented in this report. The principal reason for this is to enable a review of this information in the light of stated B.N.R. policy at a time when uninformed people are making sweeping statements in the press and elsewhere.

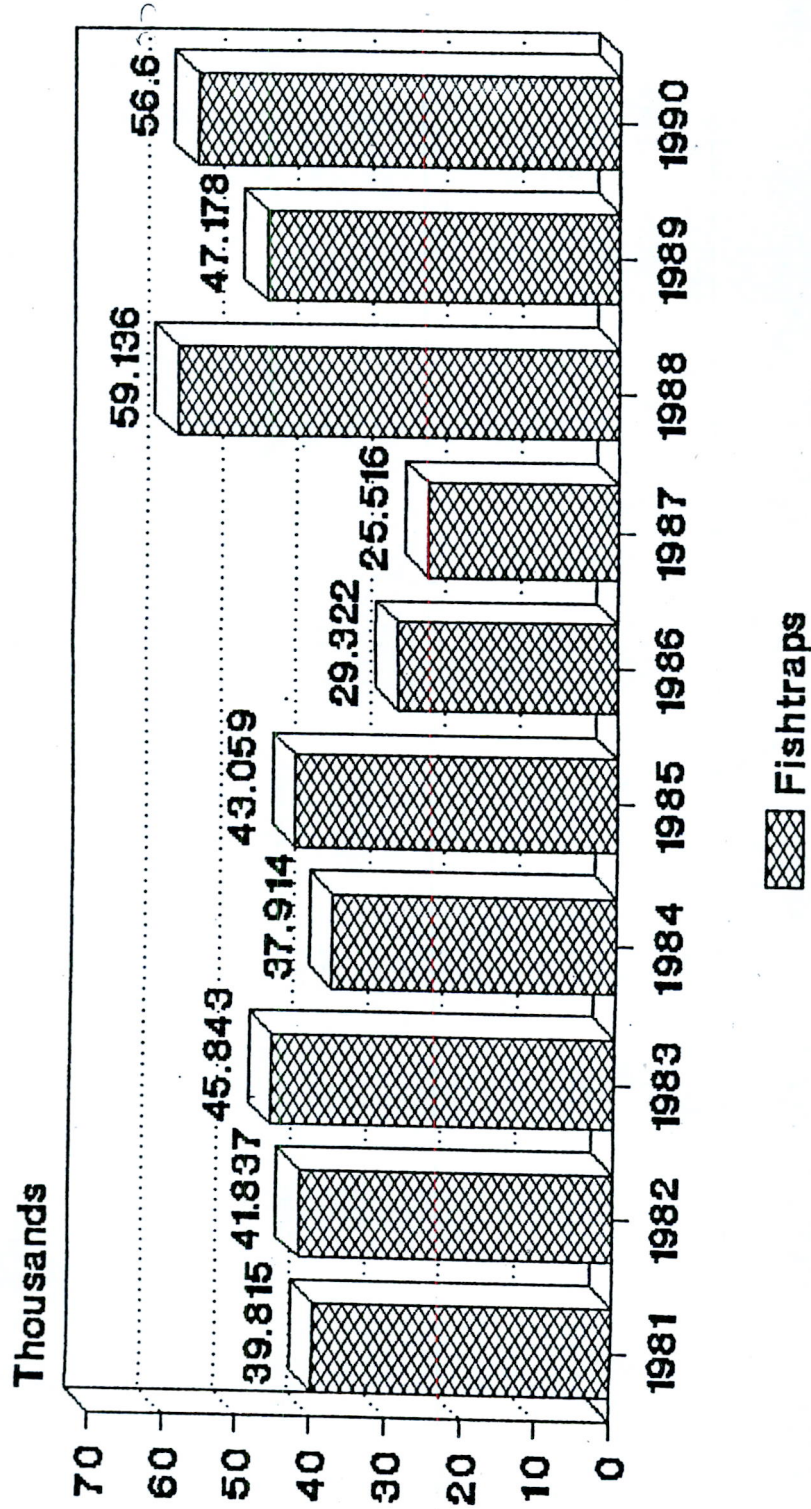
Figure 7.

Composition of "Minor Species" Kosi Bay 1981 to 1990



This is the analysis of the catch species excluding grunter and stumpnose.

Kosi Bay Fishtraps - Total catch. 1981 to 1990.



1981 to 1984 from total counts.
1985 to 1990 sample of 12% extrapolated.
Units are fish caught, mean is 42,622.

Tourism and visitor access and fishing pressure have increased greatly over the last ten years. They have, however, virtually "peaked" and little significant change is currently envisaged.

Data on the impact and implications has constantly been collected and presented in order that development was not counter to the policy of wise utilisation and sustainable yield. Results confirm that development has been safely within the policy goals for the area.

As time went on the situation progressively improved with regard to control and data collection. With the exception of the unofficial facilities there is now good control over visitor access and angling. A policy decision has been made that all consumptive utilisation within reserves should be monitored and data collection is being geared up to attain this.

Research has shown that tourism development has not been at the expense of the catches of the traditional fishing methods. On the contrary there are firm indications that traditional catches have improved recently, probably as a result of better management of the area and fishery.

Wastage, such as excessive bait collection and the capture of undersize fish, have been reduced by strict control over visitors to the official campsite. Positive input by visitors, such as fish tagging and fishing information, has increased and been encouraged.

Summary:

Facts are presented on visitor access and impact on the Kosi lakes and fishery during the last decade. These are discussed and the implications stated. Results showed that tourist access has increased markedly but is currently around maximum. Individual angler catches have decreased to a degree but total tourist offtake has increased greatly. The species composition of angler catches has varied from year to year but the principal species are represented in similar orders of importance throughout. Visitor angling and tourism impact have not had any perceptible influence on trap catches which currently appear to be increasing. Visitors are progressively being better controlled and data collection is becoming more complete.

Concluding Remarks:

Kosi Bay Nature Reserve probably has more extensive, intensive and diverse utilisation than any other similar reserve. It also has a more complete and comprehensive data collection system than exists elsewhere. At Kosi we can prove that our development and management are in line with our policy goals and aspirations while in reserves elsewhere, at best, other organisations assume or hope that they are.



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