A Brief Report

on

Five Years of Data Collection for

The Maputaland Marine Reserve

Shore Fishing Monitoring Programme.

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Resources Research Officer,
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23/6/94.

Dear Frank,

Further to our discussion the other day I'm including here copies of the last "Five year" reports on the Intertidal utilisation reports.

I'm now overdue for the six year report but my data entry has lagged a bit as I have been expecting a data entry assistant for some time but she is not here yet. I've included here a couple of figures that I prepared for the N.P.B. Research Meeting which brings some statistics up to date as far as the data has been entered. I hope this will be enough until the backlog can be entered.

Hope you're well.

Kind regards,

Scotty

Robert Kyle,
Resources Research Officer.

TREVOR HARRISON WHEN BACK

Contents.

1. Introduction:

This project has been running parallel to and as an integral part of the intertidal utilisation monitoring programme. The principal fundamental difference between the two aspects is that the utilisation of intertidal organisms is truly traditional while shore fishing is of recent origin. The first N.P.B. Ranger in the area, Mr R. Eglinton in the 1950's, reported seeing no shore fishing by local Zulus.

Shore fishing was to be addressed at the February 1992 workshop at O.R.I. about the intertidal project if time permitted but it did not.

Consequently the shore fishing has taken a "back seat" but it is of importance both in terms of food value to local people and impact on stocks. This report serves to summarise briefly the main statistics and trends apparent so far.

Clearly these will have to be evaluated in much the same way as the intertidal utilisation data. Few data are available on stocks of the principal target species in the area but staff at O.R.I. can undoubtedly comment, in broad terms, on the impact of utilisation of this order of magnitude.

The "bottom line" must be "is the utilisation sustainable?" and in terms of the answer to this the options for management are

1. Ban the fishing.

2. Enforce current fishing regulations such as minimum size and bag limits.

3. Legalise present fishing through the management plan.

2. Materials and methods:

As with the intertidal monitoring programme all the relevant facts on the anglers and their catch were recorded on data sheets completed by a team of women stationed on the coast daily.

Fish were identified and weighed and the data collected and summarised regularly. No law enforcement was carried out by the recorders and data are thus available on shad, despite much of this fishing being illegal due to catches exceeding the present bag limits.

3. Results:

The most important statistics overall are fishing effort and catch per unit effort. These are summarised in figures 1 and 2. It can clearly be seen that fishing effort declined throughout the period of monitoring. The catch per unit effort, however, has remained remarkably stable.

Table 1 presents the yearly totals of the species of fish caught plus the annual C.P.U.E. and effort. There are clear and pronounced changes in species abundance in catches from year to year, although the most important species have remained similar so far.

It is interesting to note that if the total numbers of anglers per year is related to the total number of women collecting intertidal organisms (Table 2.) then an R squared value of 0.97 is obtained. It thus seems likely that the same factors are influencing both methods of utilisation.

Figure 3 shows the monthly catch statistics for important "summer caught" fish and the annual cycle of abundance in catches is evident. Similarly Figure 4 gives the same data for stone bream and the pattern is not so clear.

Figure 5. shows a clear winter peak in shad catches with a marked increase in total catch throughout the survey in the most important month. Most of these fish are caught at Black rock and the effort there can be high when the shad shoals are present.

Maputaland Marine Reserve.

Shore Fishing by Zulus.

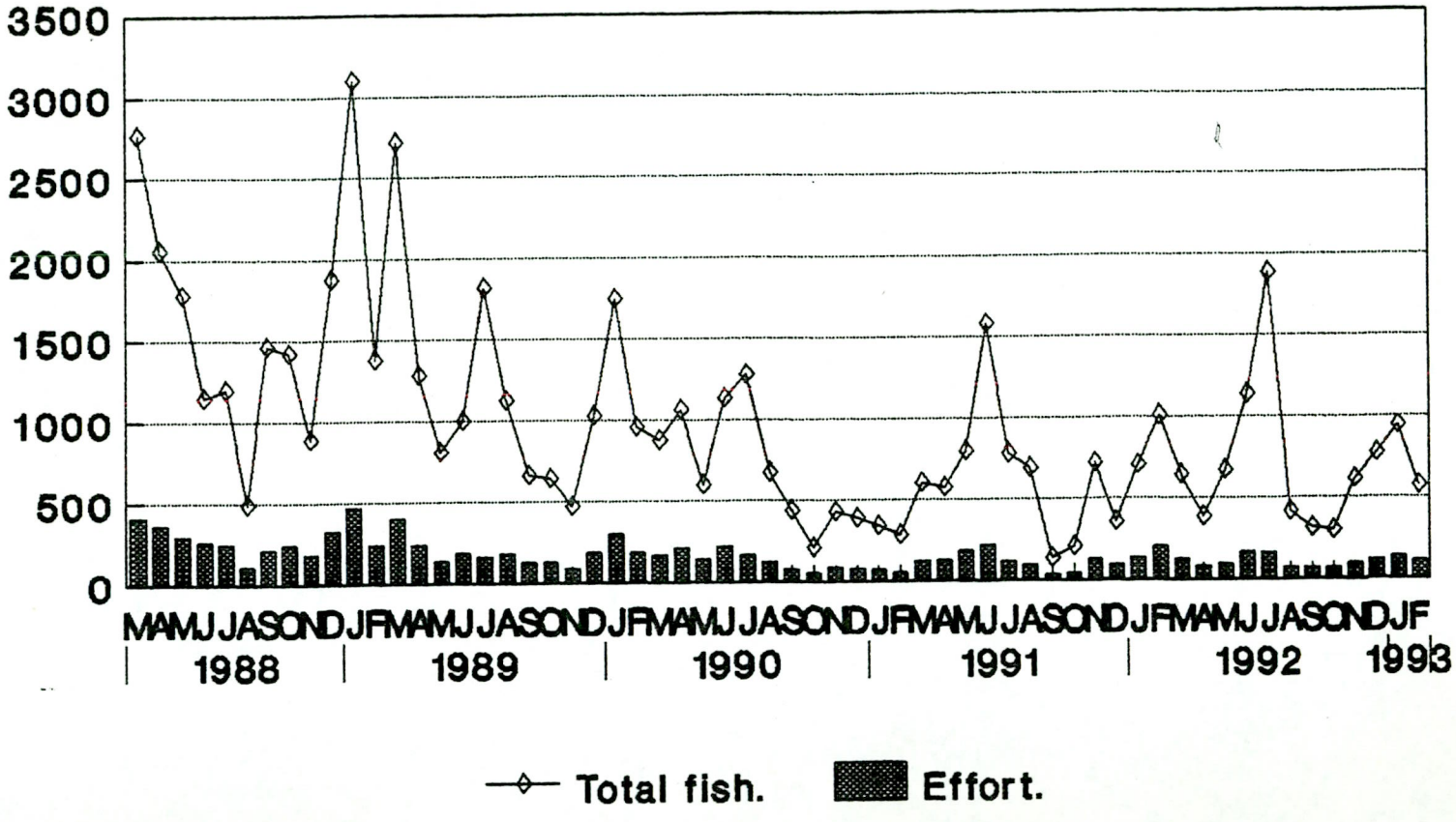


Figure 1.

Data are monthly effort and total fish caught.

Maputaland Marine Reserve.

Shore Fishing by Zulus.

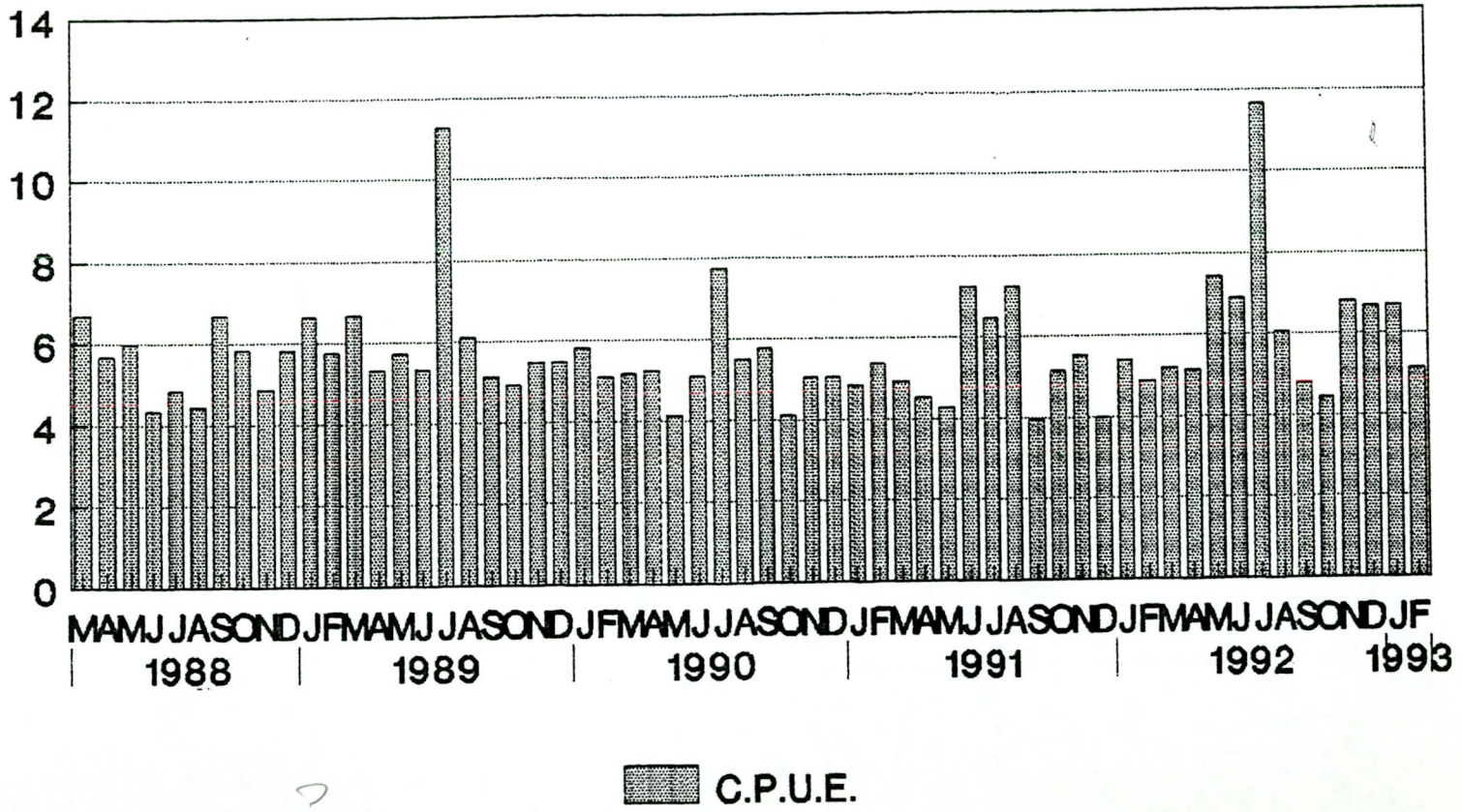


Figure 2.

Data are mean number of fish caught per angler day.

Table 1.

Maputaland Marine Reserve Fish Catch Monitoring.

Yearly summaries.

	1988.89	1989.9	1990.91	1991.92	1992.93
Striped Grunter	5684	4756	1302	1551	1118
Spotted Pompano	3179	1218	994	1090	1389
Stone Bream	2686	1666	710	773	1506
Stumpnose Bream	1474	1182	1416	1122	484
Wrasses	616	350	101	100	152
Blennies	1610	1275	269	295	473
Pest of St. Lucia	1341	305	180	144	151
Blacktail	574	440	114	100	161
isinqueque	196	168	107	273	94
Shad	299	1186	1953	2239	2324
Kingfishes	172	23	25	25	11
Ipangele	10	11	14	32	14
Remainder	1707	1711	530	484	1209
Totals	19548	14291	7723	8194	8682
Effort	3367	2342	1450	1512	1281
C.P.U.E.	5.8	6.1	5.32	5.42	6.78

Table 2

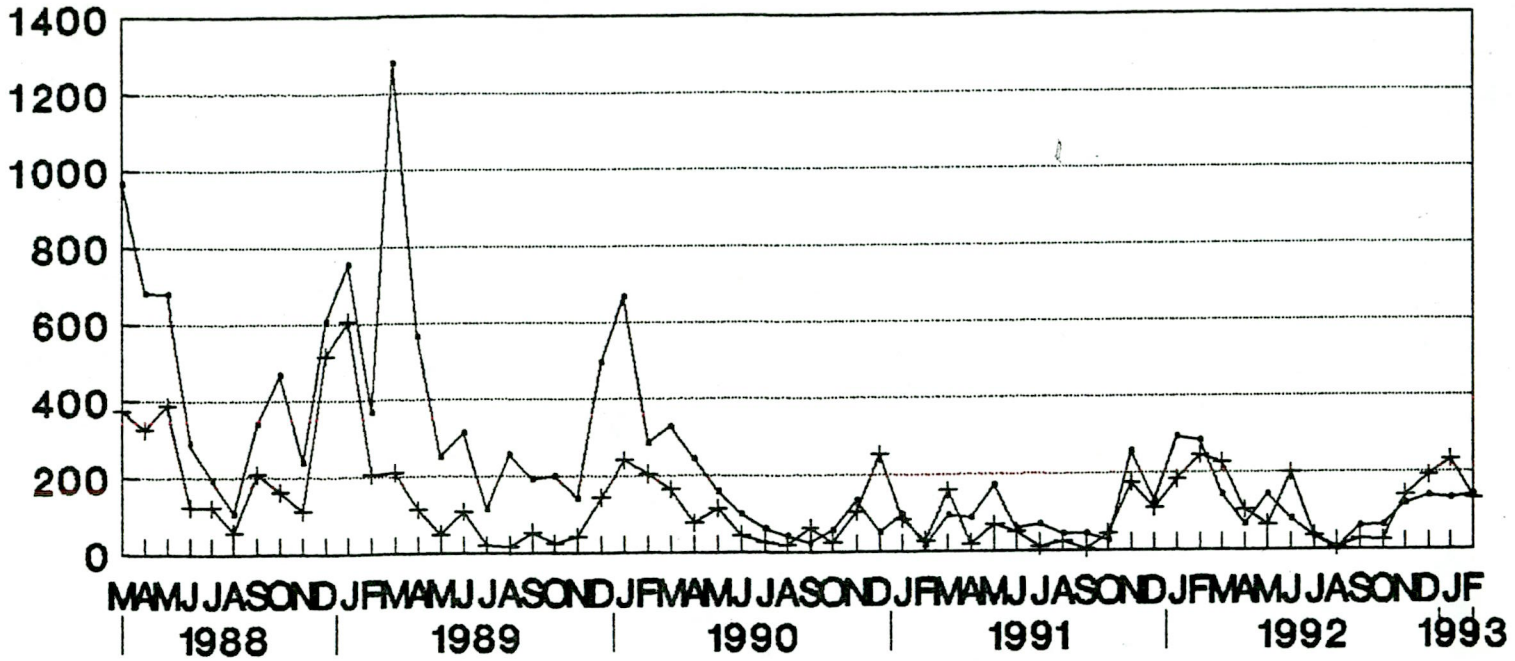
	Fishing Effort.	Intertidal Effort.
1988	3367	9155
1989	2342	6125
1990	1450	4374
1991	1512	4400
1992	1281	4589

Regression Output:

Constant	1128.581
Std Err of Y Est	425.8255
R Squared	0.967613
No. of Observations	5
Degrees of Freedom	3
X Coefficient(s)	2.311103
Std Err of Coef.	0.244115

Maputaland Marine Reserve.

Shore Fishing by Zulus.



"Summer species."

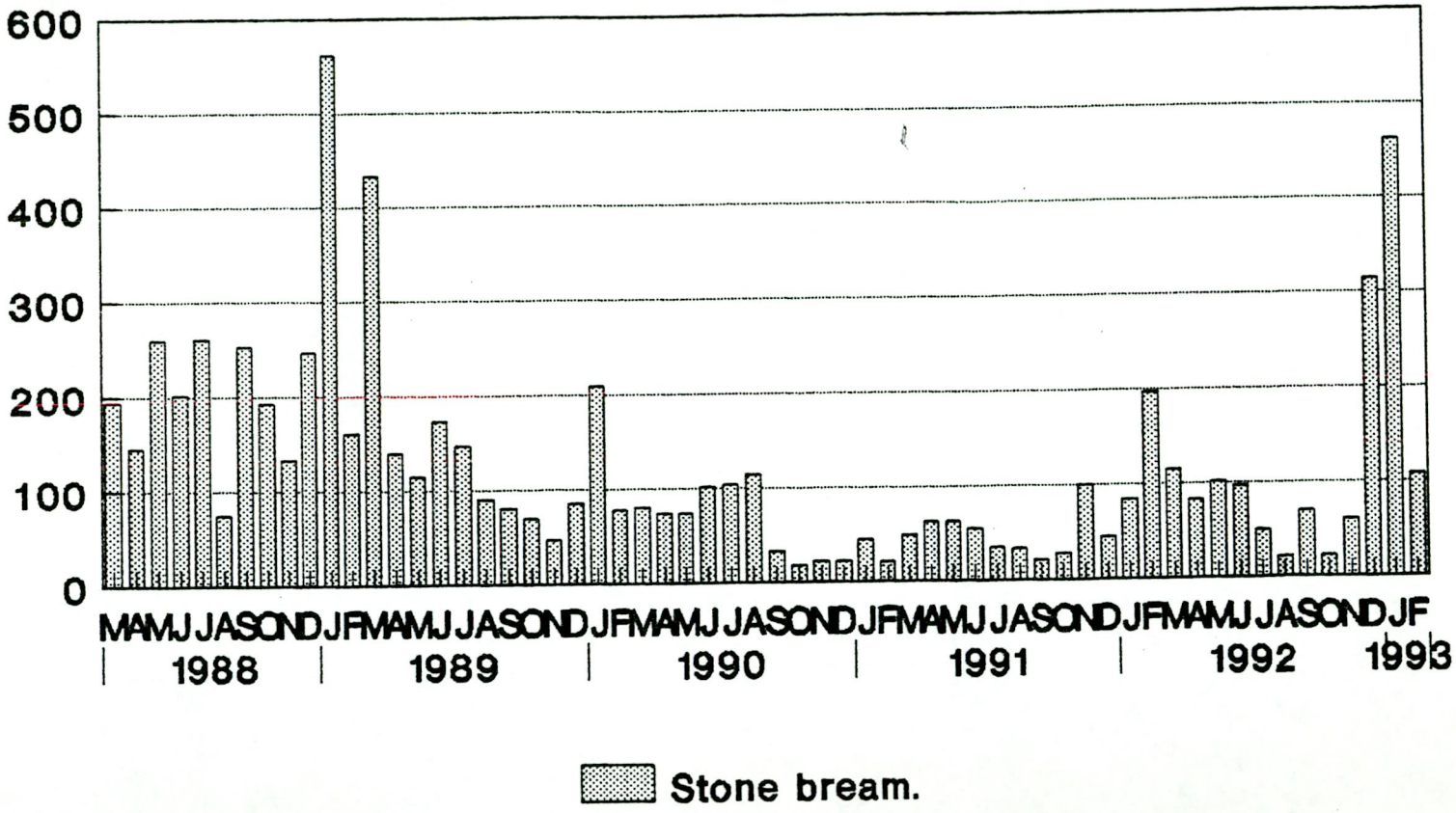
Striped grunter. Spotted pompano.

Data are total numbers caught each month.

Figure 3.

Maputaland Marine Reserve.

Shore Fishing by Zulus.

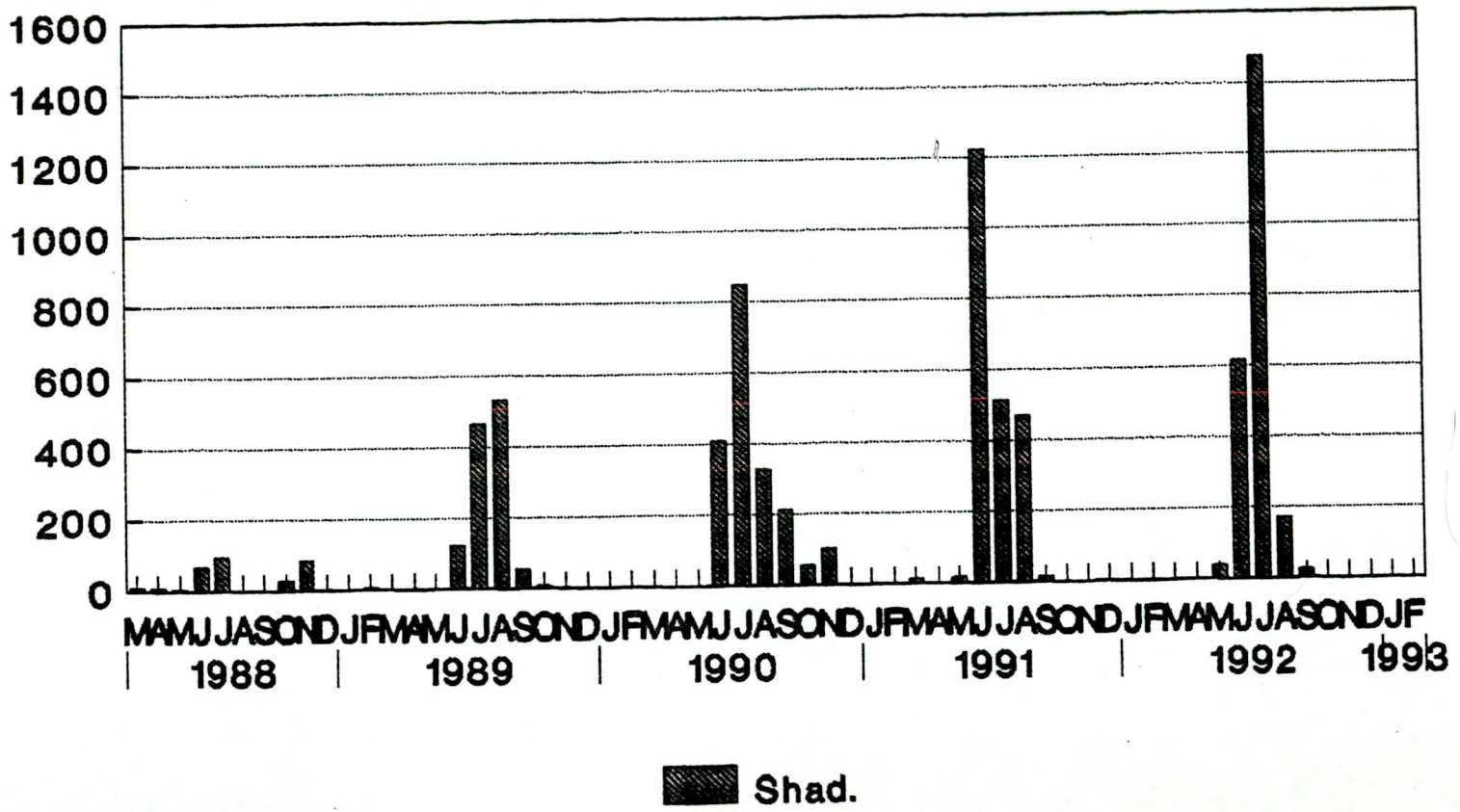


Data are number of fish caught per month.

Figure 4.

Maputaland Marine Reserve.

Shore Fishing by Zulus.



Data are total numbers caught each month.

Figure 5.

4 Discussion on certain aspects:

4.1 Fishing tackle.

It was anticipated that local people's fishing tackle was rapidly being modernised and improving in quality. Data were and are collected on all the tackle and this modernisation has not taken place. There has been no overall improvement in the angling equipment and most of the tackle is still rudimentary.

Figure 6 summarises a breakdown of a sample of fishing equipment.

Black Rock is where most modern tackle is used and this is often used to catch shad. In the north most fishing tackle consists of a simple stick and a length of nylon and hook. Occasionally a nylon bobbin is attached to the rod. Modern fishing tackle is expensive, generally not robust and maintenance is beyond the means of most local anglers.

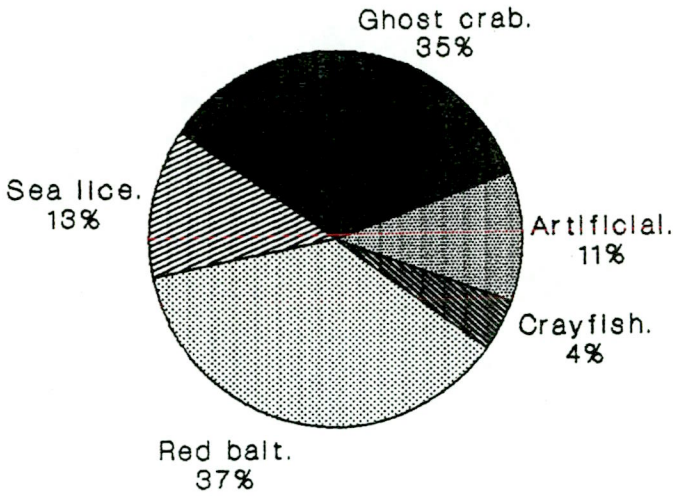
4.2 Bait:

Figure 6 also shows the breakdown of bait used by a sample of anglers. Patterns vary with locality and time of year but are fairly stable. Most bait is collected virtually as it is needed and the proportion of bought bait is almost nil. The use of artificial lures is related almost exclusively to angling for shad at Black Rock. Included in the "artificial" category are a number of sand prawns collected in the lakes of Kosi but used in the ocean, usually north of 15 North.

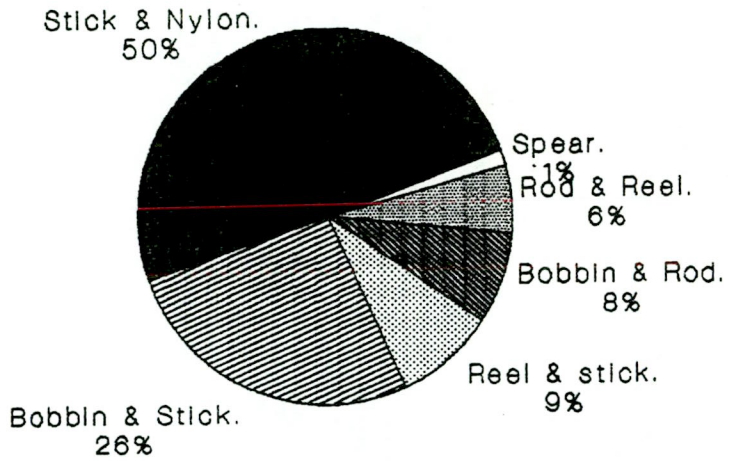
Most bait organisms are collected by the angler immediately prior to angling and are caught in small numbers at a time. Ghost crabs and sea lice are caught by hand (and foot) while redbait is usually collected by knife or cane knife.

Crayfish are used rarely and principally at Black Rock and Dog Point. This use, however, outweighs that for consumption (the intertidal survey) in terms of numbers killed. Most crayfish are caught by one or two individuals who catch them with goggles. They are rarely sold.

Maputaland Marine Reserve
Coastal fishing.



Bait use.
n = 2 391.



Equipment.
n = 1 448.

Figure 6.

4.3 Fishing patterns:

Figure 7 shows the overall fishing intensity by locality while Figure 8 breaks this down into summer and winter scenarios.

Fishing effort is spread throughout the study area but there are a few important trends which have come to light. Black Rock increases in importance for angling in winter and this is principally due to the presence of shoals of shad. These fish are only caught in large numbers there and at Dog Point.

One of the most important problems during this survey has been that anglers, local and otherwise, know that fish have legally binding size and bag limits. Shad are the only species for which it is regularly possible to exceed the prescribed bag limit. For this reason there is a nervousness about anyone looking at their catches. Throughout the study a proportion of shad anglers have not co-operated with the monitoring programme.

Nevertheless this proportion was probably at no stage more than half the anglers and it was almost only related to those catching numbers of shad. It is also likely that the proportion would have been fairly similar throughout the study and thus for comparative purposes the trends should still be valid.

INDUCED BY HAVING NO LEGISLATIVE CONTROL

In the last two years the importance of the northern areas has increased. Numbers of young anglers now camp for days at a time in the forest above the beach. From these camps they fish heavily and then take fish away, often to be sold. Most of these anglers come from some distance west of the Kosi system.

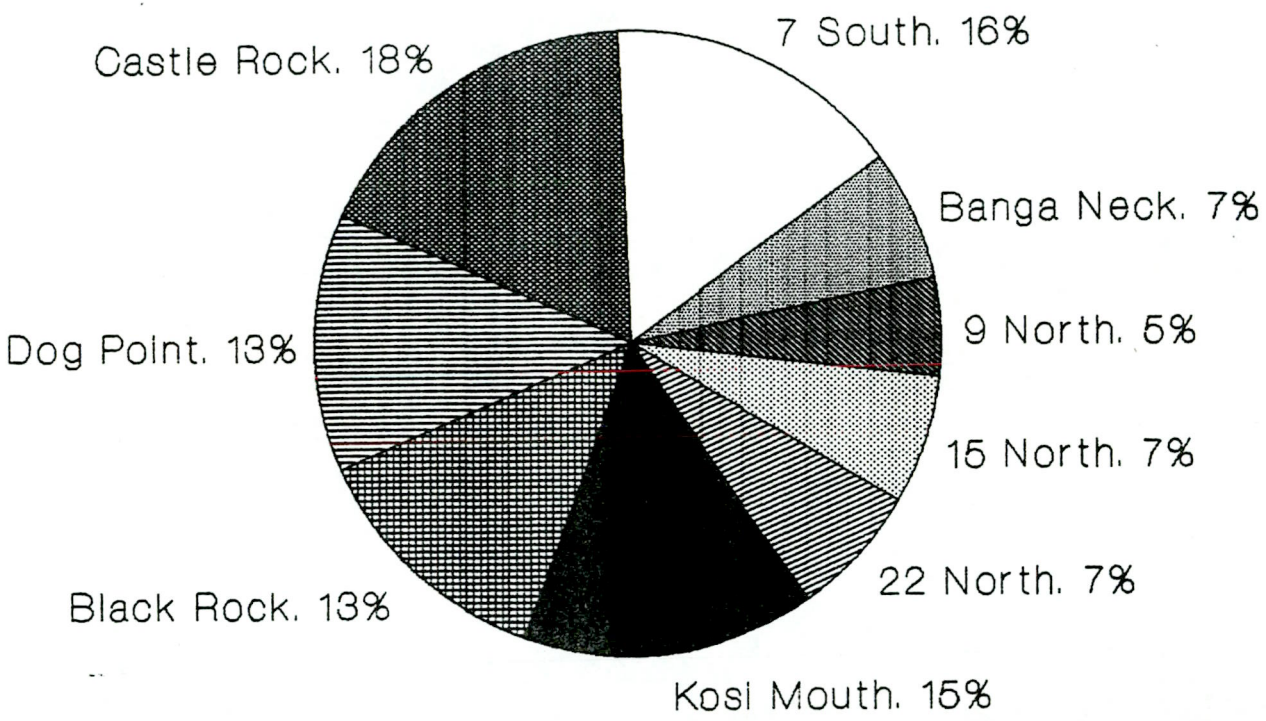
The Maputaland Marine Reserve sanctuary has not impacted on fishing patterns and it can be seen that 47% of the angling sample in Figure 7 was carried out within the sanctuary.

5. General discussion:

In some respects this fishing offtake is not controlled at all. If a fish is caught and it is edible, or of any use, it is kept regardless of size etc. Fishing by local residents cannot be regarded as a truly traditional utilisation, as can the intertidal organism utilisation, as according to reports it simply did not occur before the mid 1950's. This ties in with reports from Magistrates and other past residents of the region.

On the other hand the aim of fishing regulations is to maintain stocks by ensuring catches are of a sustainable size and nature. It is clear that during this study the C.P.U.E. showed no signs of declining while the effort and total numbers of fish caught did.

Maputaland Marine Reserve.
Fishing locality analysis.

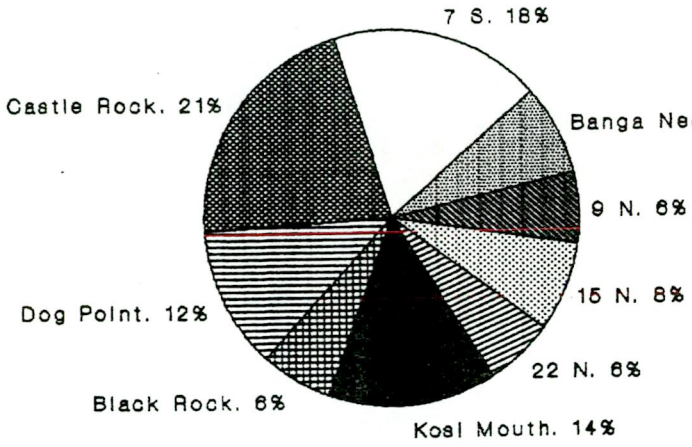


Overall.
(n = 2.482.)

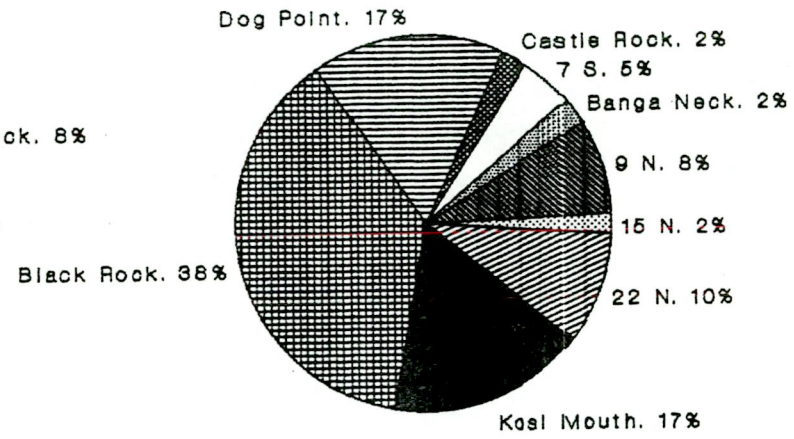
Data are from the two busiest months each year.

Figure 7.

Maputaland Marine Reserve.
Fishing locality analysis.



Summer.
(n = 1 958.)



Winter.
(n = 524.)

Figure 8.

Whether this state of affairs will continue if things are left as they are is the crux of the situation. If present trends continued then there would be no question that the fishing by local people could be accommodated within the aims of the Maputaland Marine Reserve. Even the shad caught contrary to size and bag limits, in terms of total catch, cannot have a significant impact on stocks of these migrating fish.

Even if the monitored offtake is only one half of the real figure it still amounts to less than can be caught in one "good" day at one of several localities on the Natal coast.

The impact of the capture of fairly large numbers of immature fish, such as spotted pompano, on the stocks needs to be assessed. The Oceanographic Research Institute could probably give the best insight into this.

Human population pressure is building up inexorably inland of the reserve and sooner or later this must result in increasing fishing pressure if controls are not put in place. All the land immediately west of the reserve is a KwaZulu reserve and it is likely that this will be fenced within two years.

Currently recreational anglers are expected to abide by all the rules of angling while "local subsistence anglers" have been excused.

It would be "nice" to treat local angling in the same manner as local subsistence use of the intertidal organisms but the following are problematic.....

1. It cannot be regarded as a traditional harvesting method.

2. It is likely that effort will increase in the near future.

3. Recreational angling, within the regulations, often takes place alongside this offtake.

4. Most of the catch of shad is caught for sale.

Aspects promoting it for special consideration are....

1. Most of the catch is for subsistence use by local people.

2. The subsistence use itself does not appear to be a threat to fish stocks.

The two clear options, that of simply accommodating the utilisation within the Management plan or enforcing all the relevant fishing regulations, both have serious drawbacks.

If this is accepted then some form of compromise would seem to be indicated. This compromise would need to address the concerns above of increasing angler effort and ensuring the subsistence nature of the offtake.

Whatever is decided the reasoning must be watertight as it must be defendable in terms of the policy of the N.P.B. as the public at large will see it in operation.

The threat of increasing numbers is common to many aspects of the utilisation of the adjacent Kosi system and much attention is presently being given to this. The avenue being used to explore the possible solutions at Kosi is to convince the local Community Authority of the necessity of such controls. They are then in a position to assist in finding a solution and if this happens then they will support the measures. The support and co-operation of the local community is fundamental to the success, in the long term, of the management of the reserve.

The commercial aspect is possibly easier to control. It is concentrated in the north, with the camping by locals, and in the south with the shad fishermen.

The camping has already caused concern in some quarters in KwaZulu due to the damage to trees and uncontrolled fire. Management problems have also arisen with problems with the Turtle survey associated with some campers.

The camping could be controlled or stopped by KwaZulu.

The Black Rock shad situation, as has been mentioned before, is complex. Many fishermen are subsistence fishermen who exploit the shad on an opportunistic and artisinal basis. Others are more commercial while some such as those employed at Black Rock by the holders of the P.T.O's exploit for commercial gain on top of what, in some cases, is a good wage.

On holiday weekends in July the scene at Black Rock often does not give the impression of a well managed reserve. Conflict sometimes arises between the recreational anglers and locals as there can be about twenty of each group attempting to catch the same fish.

If some form of concession is to be given to subsistence anglers then the pseudo subsistence fishermen, including those being paid a wage by the government to be on duty at the time, must not be included.

A major problem with the Black Rock situation is that it is in the public eye, particularly during the shad run.

Whatever is decided it must be seen to be fair and necessary. It must also be able to be enforced consistently in the field. It makes a mockery of management if there is observance of the rules when management officers are evident but none at all when they are absent. All that happens then is that an effective lookout system is developed by the anglers. Effective management at Black Rock would entail a permanent management presence during the winter season.

6. Concluding remarks:

As well as a summary of data collected this document should serve as a discussion document for stimulating thought on what should be done about this utilisation.

To date there has been no crisis due to overexploitation but the situation needs regularised. It needs to be either consolidated where it is, contained within the regulations or partially accommodated within the reserve Management Plan.

Shore fishing has been shown to be an important food source to the local population but at some stage in the future it could rise to levels which would impact on the Maputaland Marine Reserve goals and aims.

The challenge is to describe and accommodate these local needs, as far as possible within these goals and aims, but to exclude the problems of incrementalism and commercialism.

Robert Kyle,
Fisheries Research Officer.