

# MONITORING OF THE GREAT KEI RIVER

02 - 07 FEBRUARY 2009



**water & forestry**

Department:  
Water Affairs and Forestry  
REPUBLIC OF SOUTH AFRICA



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## **Introductory background**

### **Introduction**

River Health Programme, a section within the Department of Water Affairs and Forestry, is hands-on the seasonal monitoring of the Eastern Cape major rivers together with their tributaries. Great Kei River (together with its tributaries) is one of the major rivers that are seasonally monitored and this river runs through quaternary catchments. This was the pioneer biomonitoring of this catchment.

### **Objectives**

The main aim of this exercise is to have a thorough understanding of the state of the river as well as the activities taking place within the catchment, and the database will be captured. The seasonal monitoring helps us to compare the current findings with the previous ones, after which the trend (either accumulate, decrease or steady) can be detected.

### **Team**

M. Mbikwana (responsible for SASS and Water quality as well), L. Gaulana (team leader, responsible for Geomorphology) and E. Weni (undertaking fish monitoring) conducted the monitoring of the Great Kei River from the 2<sup>nd</sup> – 06<sup>th</sup> of February 2009.

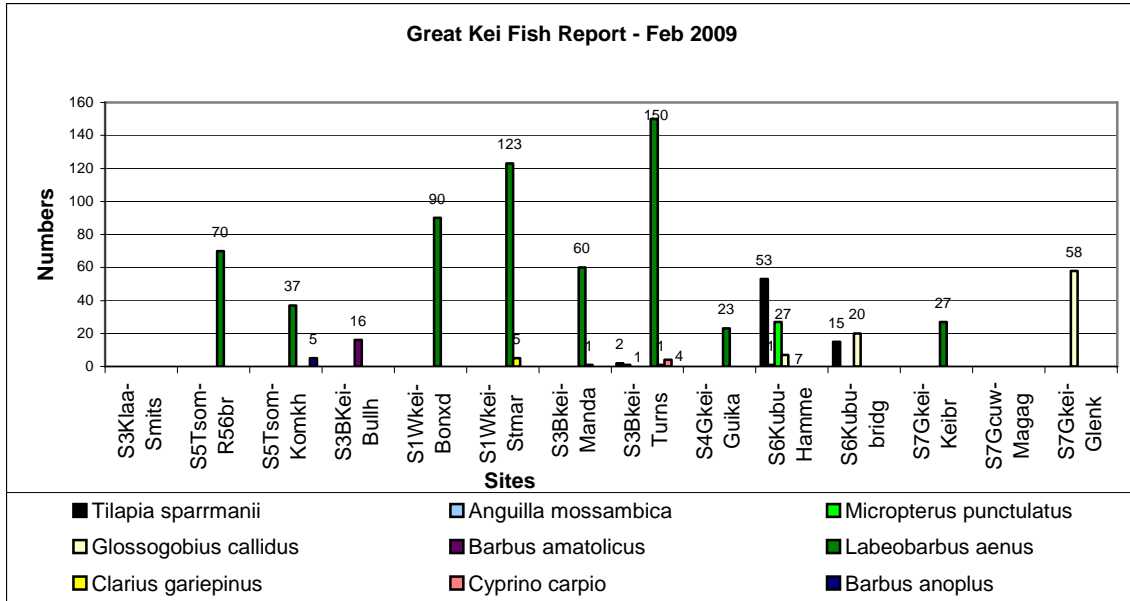
### **Methodology**

Both the seine net and electro-shocker were used to catch the fish. The former was used when the area has pools and few or no stones to entangle the net, while the latter was used when the area is dominated by rocks. Invertebrates were caught using the hand sampling net with a 1mm mesh size. Water quality parameters (DO, temperature, electric conductivity and pH) were determined on-site using the multimeter. A measuring tape was used to measure the size distribution of the stones (also sediments) across the river (river transect). L.G., please edit this comment because you know it better than me.

**Results/Findings**

**(a) Fish**

**Fig 1 : Histogram indicating the fish species distribution within the Great Kei River.**



## Fuzzy Fish Index (FFI)

**Table 1: Illustrating the FFI of each site and the comments on that site.**

Date	Site	Fuzzy Fish Index (FFI)	Comments on the site
02-02-09	1Klaas Smits River	-	Site dry. This site was not in ground-truthing survey, and it was done during the day of biomonitoring.
02-02-09	2. Black Kei at Bullhoek	C	Flows low and shallow. Sedimentation, due to erodability of the soil type, dominates and it's not a good fish habitat. Few significant pools where we caught the indigenous <i>B. amatolicus</i> .
02-02-09	3. Black Kei at Cathcart	E	Good pools, fast flows, bedrock and vegetation characterized the site. Smallmouth yellowfish and catfish led to this E. No indigenous fish caught.
03-02-09	4. Black Kei at Turnstream	D	Boulders, bedrock, vegetation and pools characterized the site. Indigenous knowledge expected carp, doubted on tilapia, yellowfish, barbs and eel and we confirmed this by sampling and caught them, except barbs. Predation on indigenous is likely to happen, hence we could not find them, and D.
03-02-09	5. White Kei below Xhonxa Da.	E	Although secondary channel and backwater formed, no barbs caught. Only yellowfish.
04-02-09	6. White Kei at St Marks	E	Bedrock and sediments, not suitable for barbs. Only yellowfish and catfish caught.
04-02-09	7. Tsomo at Komkhulu	E	Fast flows, sedimentation and bedrock dominating. Only yellowfish caught.
04-02-09	8. Tsomo at R56 bridge	D	'Pockets', bedrock, boulders, vegetation, fast and slow flows all are features of this site and it is suitable for yellowfish and barbs, which were caught.
04-02-09	9. Gcuwa River at Magagasi	-	We did not work because the river was poor condition. Sedimentation dominated and the water very turbid. This site was not in ground-truthing survey, and it was done during the day of biomonitoring.
04-02-09	10. Great Kei at Glen	D	Bedrock and sedimentation (massive sand on riparian zone). Only indigenous goby caught. This site was not in ground-truthing survey, and it was done during the day of biomonitoring.
05-02-09	11. Great Kei at Gaika Fort	E	Most cobbles out of current, bedrock and sediments dominant. Yellow and catfish caught.
05-02-09	12. Great Kei at N2	E	Secondary channel formed. Sediments and cobbles. Only yellowfish. Seine net used.
07-02-09	Kubusi at the Bridge	D	Bedrock, boulders, cobbles, pools and vegetation characterized the site. Water colour clear. Only gobies and tilapia were caught. SASS tempted to label this as reference site due to NATURAL conditions (high ASPT score). High D (57.1 % FFI).
07-02-09	Kubusi at Hammerhead	D	Bedrock, boulders, pools and vegetation characterized the site. Water colour clear. Only gobies, bass, eel and tilapia were caught. Site ecologically polluted due to dominant bass.

Introduced Smallmouth Yellowfish, *Labeo aenus*, is both the most dominant and widely distributed fish species in this catchment. Some fish were infected and this was evidenced by the presence of spots on the body.

### Discussion and recommendation

This smallmouth yellowfish prefers a fast deep flow and we caught it wherever the habitat was conducive. Its prey, among others, is the indigenous chubby headed fish (*Barbus anoplus*). Whenever and wherever we caught yellowfish and chubby head at the same site, the chubby headed fish always hides in the "pockets", backwaters or a shallow slow secondary channel. They become safe from predation in this habitat, as the yellowfish occur in the middle of the primary (main) river channel. In most sites where we caught the alien (bass, carp and catfish) and introduced fish (yellowfish) species, there were no indigenous fish present (although expected). Great Kei at Bulhoek is the only site where we caught only the indigenous *B. amatolicus*. In this site, the flows were slow

shallow, with few pools for their habitat. The algae in the water resulted to poor water quality, hence some fish showed signs of infection in other sites. In maintaining the goal of Resource Protection, alien species should be eradicated every time biomonitoring is conducted.

For the safety of the officers: First aid training must be done as soon as possible as this site is dominated by poisonous snakes such as cobras; The team must have more members as it is risky to be limited; and the strong life-jackets should be organized.