MONITORING OF THE BUFFALO RIVER

FEBRUARY 2009

water & forestry
Department:
Water Affairs and Forestry
REPUBLIC OF SOUTH AFRICA

THE RIVER HEALTH PROGRAMME

Prepared for:

Department of Water Affairs and Forestry
River Health Program
P.O. Box 7019
East London
5201

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. Buffalo River (together with its tributaries) is one of the major rivers that are seasonally monitored.

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 (accumulate, decrease or steady) can be detected.

Team

L. Ntshebe, S. Mzileni, X. Gwadana and K. Zulu conducted the monitoring of the Buffalo River from the 04th -05th Feb. 2009.

Methodology

Materials and Methods

Water Quality parameters (pH, Conductivity, Temperature, TDS etc) were measured on site using a multimeter. Sampling of fish and macro invertebrates was conducted at each Biomonitoring site. Macro invertebrates were sampled using SASS nets and identification books. Biotopes sampled were stones, GSM and Vegetation. Fish were sampled using a seine-net and the habitats sampled were slow deep pools and slow shallow. Fish caught were identified to species level with the number of juveniles and infected recorded.

NB: The Bio-monitoring for the Buffalo system could not be completed due to weather conditions. Only four sites were monitored: Yellowoods @ Lonsdale; Buffalo @ Zwelitsha confluence; Buffalo @ Nxamkwane; Buffalo @ Buffalo pass.

Findings/Results

At Buffalo pass the site is being again being used as a dumping site. **See evidence below**:

Site 1: Nxamkwane during the time of visit
Flows were low.

Site 2: Buffalo pass during the time of visit

Site 3: Lonsdale Bridge
At this site the flows were very low and there was a lot of Algae.

Site 4: Zwelitsha confluence

Table 1: showing Date and Time during Sampling (Summer 2009)

SITE	TIME (during sampling)	DATE (during sampling)
Yellowoods @ Lonsdale	12H50	04/02/09
Zwelitsha@ Confluence	14H00	04/02/09
Buffalo @ Nxamkwane	10H55	05/02/09
Buffalo @ Buffalo pass	13H20	05/02/09

WATER QUALITY

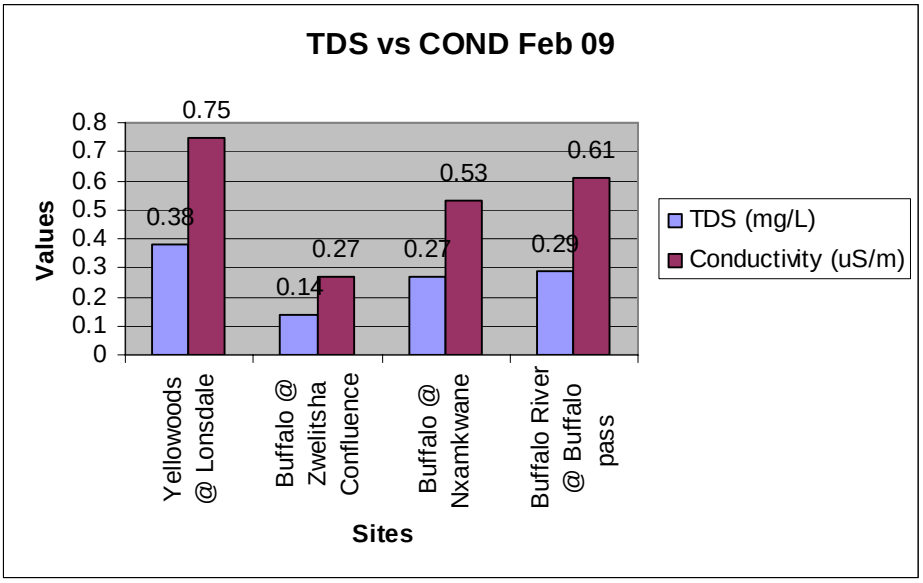

Figure 1: graph showing TDS and Conductivity

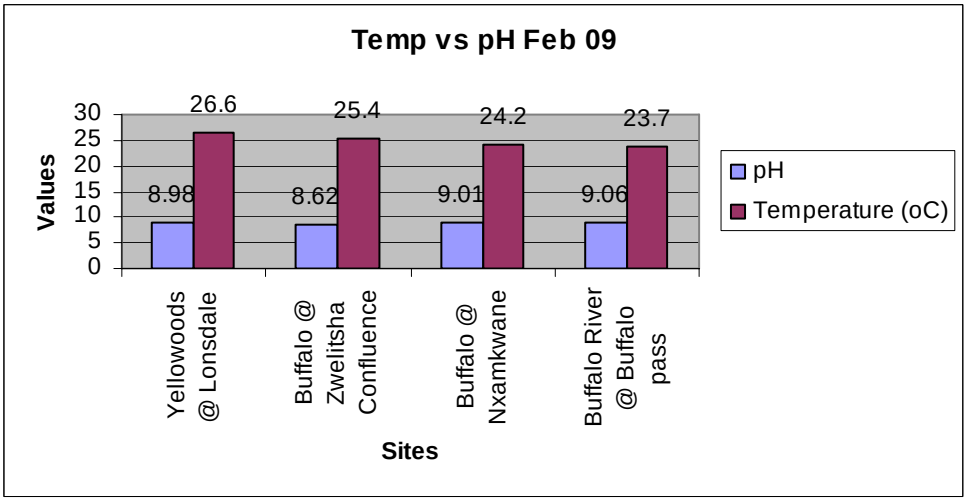

Figure 2: graph showing Temperature and pH

SASS 5

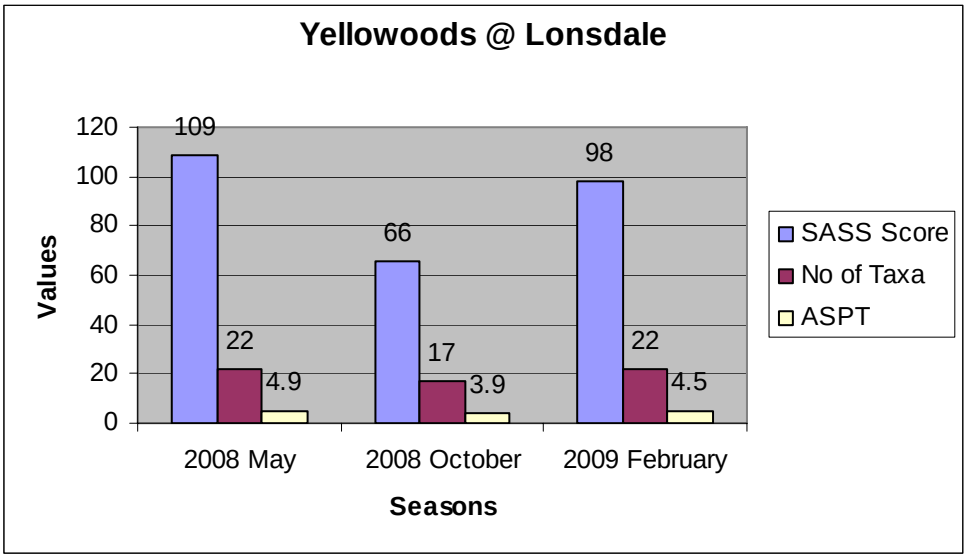

Figure 3: showing SASS 5 surveys in different seasons

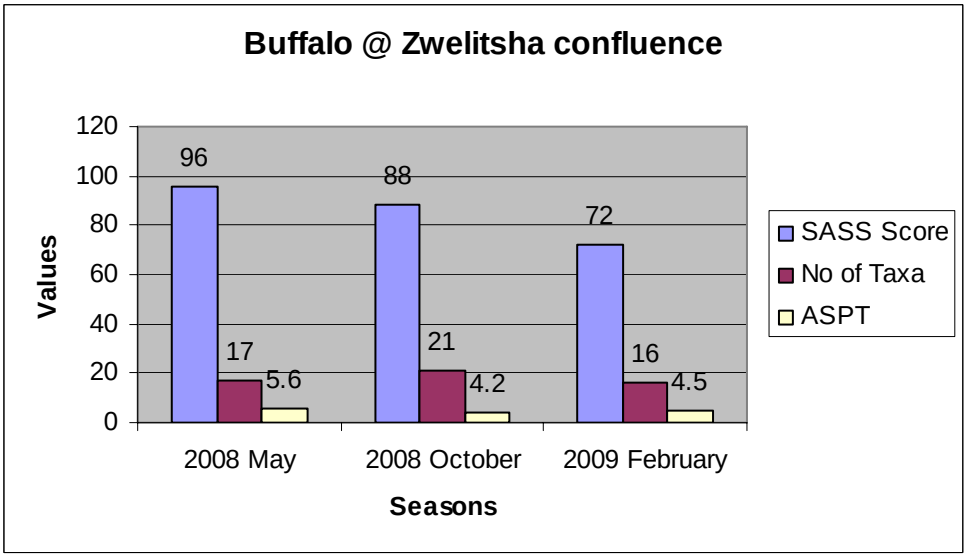

Figure 4: showing SASS 5 surveys in different seasons

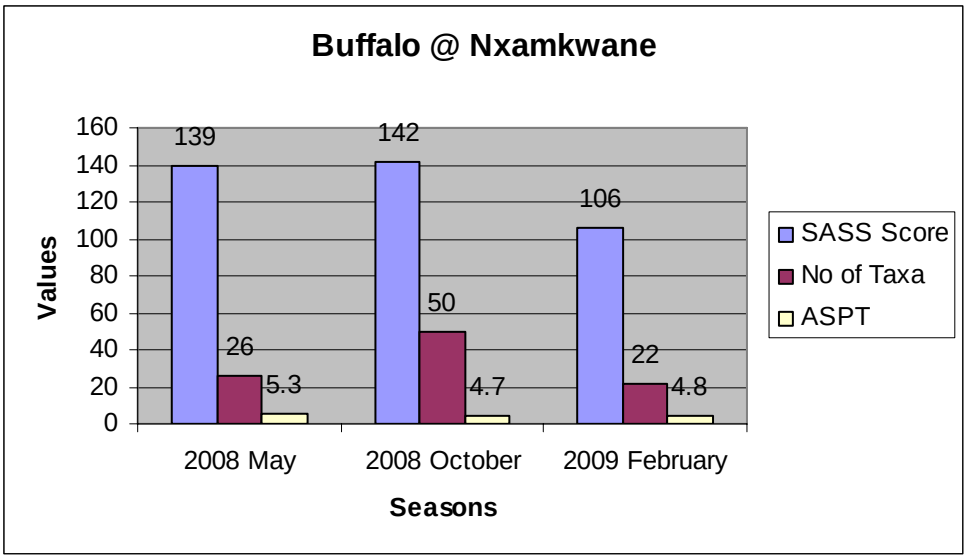

Figure 5: showing SASS 5 surveys in different seasons

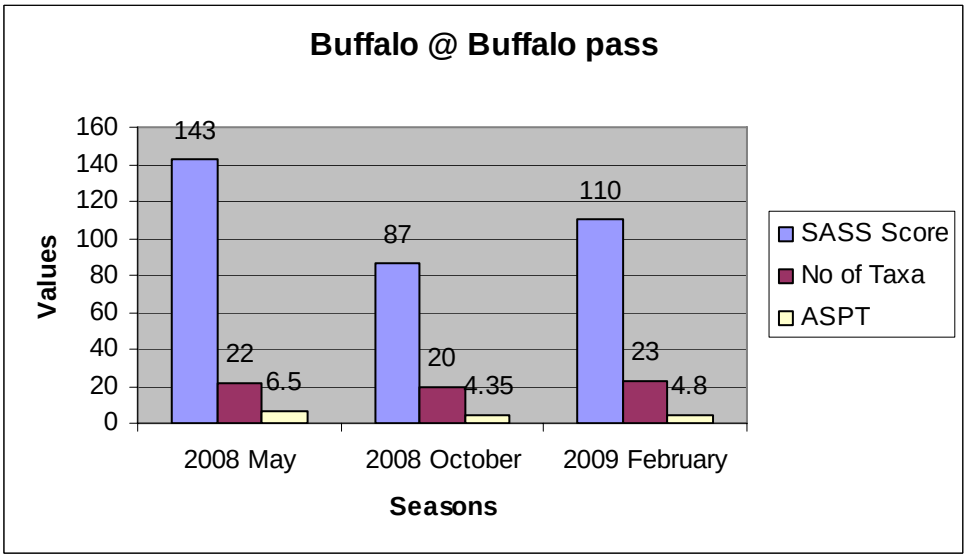

Figure 6: showing SASS 5 surveys in different seasons

FISH

Table 2: The results of fish caught in the Buffalo River and its tributaries. The (A) next to the fish species indicates alien species and (I) indicates indigenous species. (J) under the column numbers of species are the juveniles whereas (A) are the adults.

SITE	SPECIES	NUMBER OF FISH SAMPLED
Yellowoods @ Lonsdale	*barbus anoplus (I)* *tilapia sparmanii (A)*	50 J 120 J
Buffalo @ Zwelitsha Conf.	*clarius gariepinus (A)* *tilapia sparmanii (A)* *labeo umbratus (A)*	5 J 8 J 15 J
Buffalo @ Nxamkwane	*glossogobius callidus (I)* *tilapia sparmanii (A)* *labeo umbratus (I)*	20 J 50 J 5 J
Buffalo @ Buffalo pass	*tilapia sparmanii (A)*	27 J

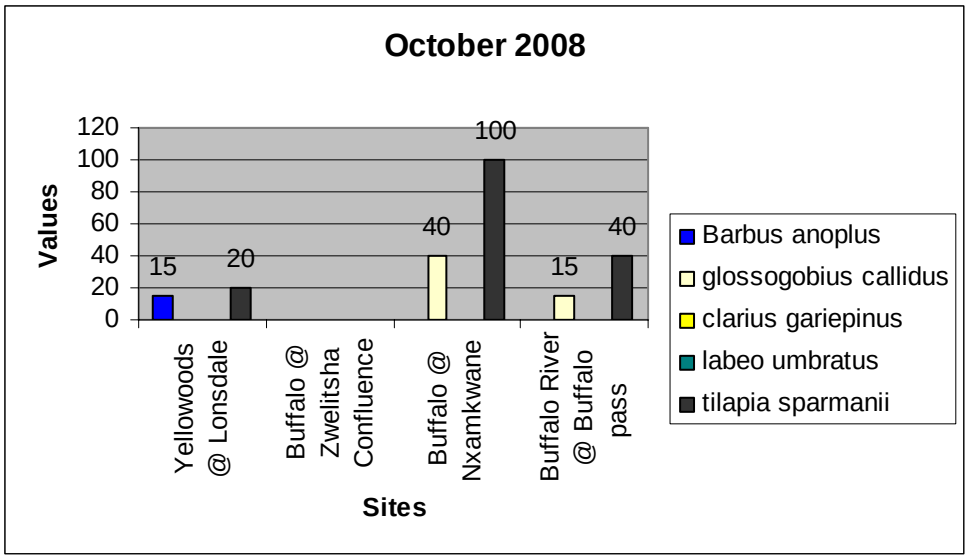

Figure 7: showing fish caught in October 2008.

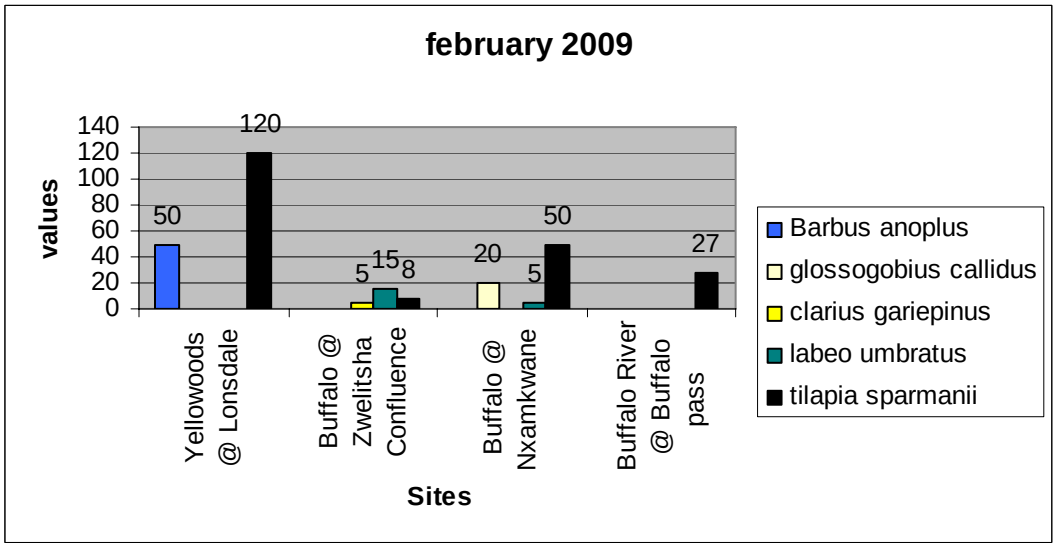

Figure 8: showing fish caught in February 2009.

Discussions/ conclusions

Water Quality

Water quality results at these four sites indicate signs of pollution. Both Conductivity and TDS are high. At Lonsdale, Nxamkwane and Buffalo pass the flows were very low and it is also used as a drinking point for animals hence there were a lot of algae resulting in high nutrient enrichment; this has affected aquatic organisms in such a way that more macro inverts that are tolerant to pollution were sampled. This will also decrease DO that is being used by Fish and increase turbidity; decreasing food availability for these species. Most fish that were caught at Lonsdale and Buffalo pass were infected with parasites.

SASS

During October monitoring; at Lonsdale bridge algae was a huge problem and flows were also extremely low; this made it difficult to identify macro inverts and more tolerant species were sampled as compared to February monitoring, at the confluence the water quality was very poor possible due to urban run-off from Zwelitsha town. This has affected the SASS score (Leeches-very low scorers were sampled in great numbers). At Nxamkwane flows were very low and a lot of algae; this has affected diversity of intolerant species.

FISH

The Buffalo River is dominated by *T sparmanii.* These species are affecting the abundance of indigenous species. At Lonsdale bridge b. anoplus was infected due to poor water quality. At the confluence the catfish that was caught there indicates signs of pollution. This may be possible from the sewage treatment works that is above this site.

Recommendations

A letter requesting operational clean up at Buffalo pass should be submitted to Municipality to avoid solid waste being flushed down to the river and it is also blocking access to the river.