

Knysna Basin Project

Director's report to general Trustees meeting, 2 February 2016

Introduction.

Summer has properly introduced a heated environment along the Cape south coast and with it the coastal seas starting from Algoa Bay have experienced another Red Tide bloom. This spelt a near disaster to the purveyors of shell fish, particularly oysters. Fortunately just short of Xmas it was established that the tide was not toxic, being made up of the dinoflagellate *Lingulodinium polyedra*. This event obscured somewhat the overall work of the Project but its research responsibilities continued while I tried to fend off the inevitable queries and questions.

Research activities

Since the AGM in November and the return of Professor Barnes and Frances and Peter Smith field work has continued apace. Richard Barnes is continuing his examination of the distribution of macro invertebrates in King Fisher Creek, but during this spell of work his interest is focussed on the influence of sample size upon the structure and assessment of density of the various populations which inhabit the sediments within the eel grass meadows. This study requires a pattern of sampling and number of replicates which will complement the earlier work reported in Barnes and Hendry (2015) on functional uniformity with in common macro faunal assemblages and with a formal title 'Constancy of sea grass macro faunal biodiversity across spatial scales' the spatial scale in question being spatial grain, i.e. size of sampling unit.

Given that all our studies enlarge the detail of biological systems in the estuary, the recent work of Professor Alan Hodgson and his students has provided new understanding of the biology of Mangrove snails, *Cerithida decollata* (Hodgson and Dickens 2012), Life history parameters of the non-native amphipod *Platorchestria platensis* (Hodgson et al.2014) and Pollard and Hodgson (2016) in which reasons for the underlying distribution of the invasive mussel *Mytilus galloprovincialis* are evaluated as are the influence of wave action and the lack of wave action upon the growth and condition of the mussels. This detailed study rejected earlier hypotheses

in which mussels subject to heavy wave action were in better condition than in quiet water areas. The authors argue that in quiet water areas energy can be channelled into growth and reproduction: a response which allows invasive success.

From April 2015 until January 2016 a team of workers from KBP and the Department of Botany, NMMU, Port Elizabeth, completed a two part report on (1) the abundance and distribution of a group of green macro-algae collective called *Ulva* or sea lettuce throughout the lower estuary; (2) a geobiochemical study which is likely to show the role of anoxic sediments in the release of nutrients which the microalgae utilize. Both reports are currently under review for the South African Journal of Botany.

The KySS programme is developing important knowledge of the biology of seahorses in man-made structures – Thesen Islands Marina is now in its third year of investigation in which Louw Claassens is deeply engaged. It is a remarkable study, for without Louw's training and skill as a SCUBA diver and Mike Davies' management of dive procedures the ecological and biological characteristics of the marina population would be very poorly served. More recently Louw and Mike have begun a comparative study of an external population in the eelgrass beds in lower Ashmead.

With the return of Frances and Peter Smith, the important intertidal shore study called ShoreSearch continues. New records are established and this knowledge is used in the shore environmental outing. This important work is linked to an increasing interest in the biology of polychaete worms which because of the smothering impact of the green tide upon. It has provided a rich field of study for Dr Carol Simon of the Department of Zoology, Stellenbosch University and an honours student who is assessing the use of the change shore environment by bait collectors – notably of the case worm *Diopatra* sp. which the collectors call 'moonshine worm'. An important aspect of this investigation is the way it shows the change in bait organism when conditions in the intertidal of Ashmead are altered. A previous report by Hodgson et al.(2000) on the distribution and use of mud prawn, *Upogenia africana*, by bait collectors should provide a useful ecological comparison.

Marius Venter an honours student from Stellenbosch will be continuing my earlier work on the pollution growth and structure of the endangered pulmonate siphonariid, *S. compressa*. I thought that a combination of bait diggers using forks and the

smothering impact of green tide algae had decimated the small but unique population of *S.compressa* in King Fisher Creek. Fortunately this is not the case as Richard Barnes has reported living animals in King Fisher Creek.. Louw and I have spent some time examining a previous site in the vicinity of Braamekraal and found a viable population within the eelgrass beds of Lower Ashmead.

Knysna Environmental Management Protocol KEMP.

My last report to the Trustees (August 6, 2015) described the work of KEMP in some detail. Since then there has been further development in the operation of two multiprobe units and because of the success of the respective installations in the marina, Mr Konrad Taeuber agreed to support the design and construction of a third station involving two probes – one fixed at the maximum depth and the second allowed to move up and down with the tide at a depth just below the surface. In this way it will be possible to capture events not only in the deep water of the estuary but also at shallower levels where real time changes in salinity, dissolved oxygen, turbidity and plant pigments, e.g. chlorophyll are most pronounced.

Social responsibilities and Environmental and Conservation Awareness

Maureen Lake directed our attention to this feature of the Project's mission by setting up a very successful member meeting at Bollard Bay. Maureen will tell us more of this meeting in her review.

Knysna Secondary School has become an important focus of the environmental awareness team and is reciprocating the contribution which the team is making in their environmental program. In so doing has shown the value of concentrating effort on a responsive group.

Throughout the new year there are a number of important environmental dates such as Marine Week and the like, the Project is involved in each one.

The Project is one of three nominations for a SANLAM Knysna award related to social communications and responsibility. The award evening is Thursday, 4 February 2016, at Simola at which we will be represented by Frances and Peter Smith and myself and Sue.

A development of major significance was initiated by Prof Richard Barnes in which the work of the Project becomes adjunct to the Cambridge Conservation Forum. (CCF). Richard provided a summary of the activities of CCF in the documents for this meeting together with the website address of the Forum. He will expand on this link in his report.

Funding

The development of three channels of expenditure within the Project, John Edwards and Letitia with the assistance of Konrad Taeuber; each is accounted separately so that we can assess income and expenditure in any of the channels quickly. This has proved valuable in many contexts and was reported on more fully in my report to the AGM and the financial statements presented by John Edwards of AQB.

While referring to funding in the form of grants, awards and the like, there is another form of funding which drives the Project in the minds of the scientific community and our parent University.

Since 2014 the scientists, both professional and citizen, have prepared and had accepted through peer review 10 papers, one symposium contribution and three MS presently in review, I am confident that even in these depressing economic times, Rhodes University will continue to support our research and provide the rental for the Field Laboratory.

Very little of our success would have been possible without the support and generosity of members, our Chairman, Ian Corbett, who advises on a number of important issues and the accounting services of AQB under the direction of John Edwards, The Lakes area Manager, Johan de Klerk, and Chief Ranger, Owen Govender, and his staff.

It follows equally that the success of KySS is due to the ongoing support afforded by the Trustees of the TIHOA. Similarly the funding provided by TC Trust through Konrad Taeuber and the wisdom of Richard Wilkinson, Chair of KEMP is greatly appreciated.

Brian Allanson
Director
2nd February 2016.