

A CENTURY OF SCIENCE IN SOUTH AFRICAN ESTUARIES: BIBLIOGRAPHY AND REVIEW OF RESEARCH TRENDS

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INTRODUCTION

In March 1993 a co-ordinated research programme on Decision Support for the Conservation and Management of Estuaries was launched under the auspices of the Consortium for Estuarine Research & Management (CERM) and funded by the Water Research Commission (WRC). A procedure was developed whereby decision support systems were to be structured around certain key issues, with currently available information and wisdom providing the basis for individual decision support modules. A collation of scientific information on individual southern African estuaries was identified as a high priority in order to facilitate subsequent components of the CERM contract with the WRC. To cater for this need, a separate WRC Report (No. 577/1/95) entitled *Available Scientific Information on Individual South African Estuarine Systems* was published in 1995.

In June 2000 it was recommended that an updated hard copy of the report be produced and this was implemented in July 2000 with the production of WRC Report No. 577/3/00. In addition to providing valuable data sources for individual systems, the more recent version also highlighted those estuaries for which limited information was available. The additional work and new interpretations concerning South African estuaries during the past decade has necessitated the production of this latest version which we hope will be of use to local and international estuarine scientists, students, environmental practitioners and managers. We have also used the bibliography to examine research outputs and trends in the South African estuarine science field.

APPROACH & ANALYSES

For the purposes of this report, estuarine systems have been divided into three major biogeographic regions, viz. subtropical from the Kosi Estuary in KwaZulu-Natal to the Mbashe Estuary in the Eastern Cape, warm temperate from the Mendwana Estuary in the Eastern Cape to the Ratels Estuary near Cape Agulhas, and cool temperate from the Orange River Estuary to the Mbashe Estuary in the Eastern Cape. Each estuary has been placed in one of the three biogeographic categories described above, a map of which is shown below.

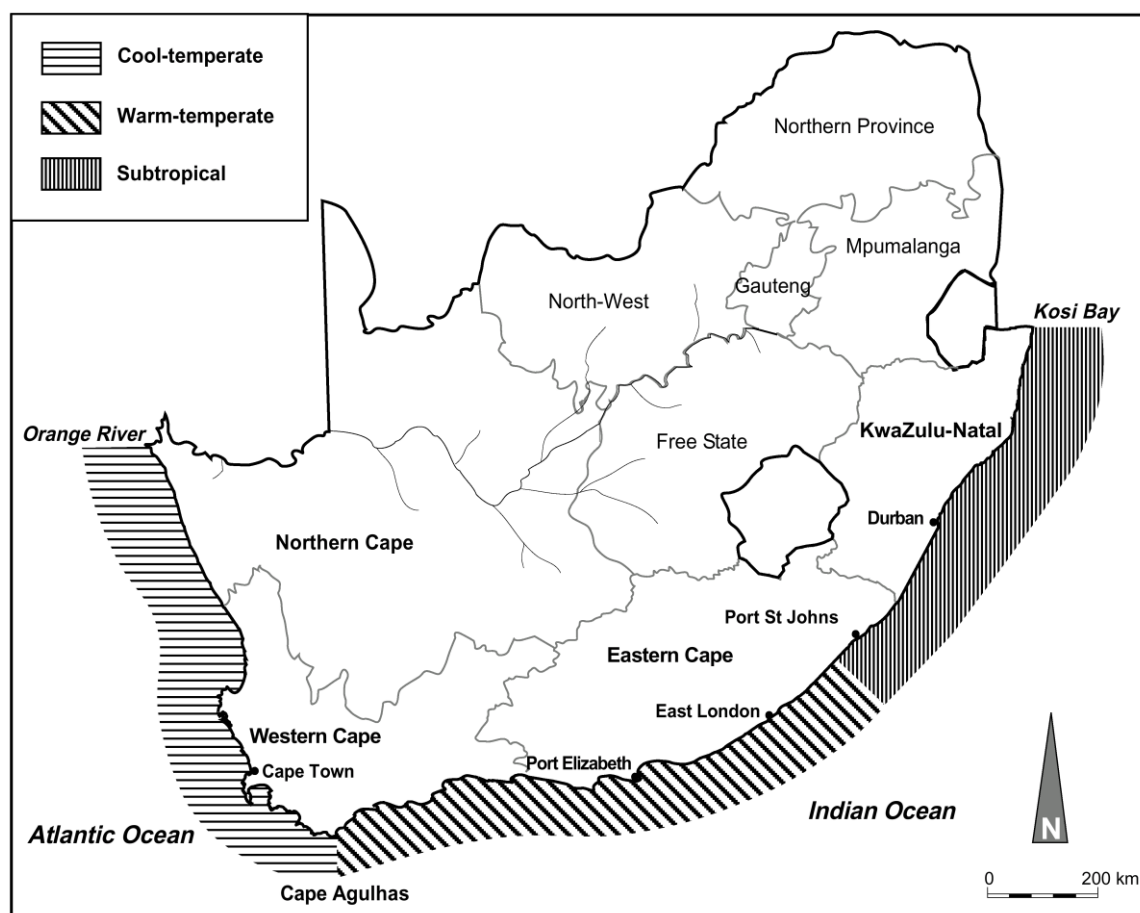


Figure 1. Map of southern Africa showing the three major biogeographic regions used in this document.

Systems that do not function as estuaries using the widely accepted definition of Day (1980) were not included in this report and are listed in Table 1. Previously functional estuaries such as the Sout, Baakens, Ngqurha and Sipingo, which have been drastically altered as a result of canalization, industrialization and urbanization, are included in this report because of the potential for rehabilitation. The Papkuils, which may not have been a functional estuary in its natural state (and is now an industrial waste-water canal), is excluded from this analysis.

Table 1. Inlets to the sea (some of which are intermittent) that probably do not function as estuaries.

COASTAL INLET NAME	GPS COORDINATES	BIOGEOGRAPHIC REGION
Holgat	28°58'43"S; 16°43' 15" E	Cool temperate
Buffels	29°40'38"S; 17°3'2"E	Cool temperate
Swartlintjies	30°15'47"S; 17°15'33"E	Cool temperate
Spoeg	30°28' 21"S; 17°21'31"E	Cool temperate
Bitter	30°35'53"S; 17°26'34"E	Cool temperate
Groen	30°50'48"S; 17°34'35"E	Cool temperate
Dwars (North)	33°24'15"S; 18°13'39"E	Cool temperate
Dwars (South)	33°26'12"S; 18°15'46"E	Cool temperate
Modder	33°29'5"S; 18°18'24"E	Cool temperate
Jakkals	32°5'4"S; 18°18'48"E	Cool temperate
Lêerbaai	33°32'14"S; 18°19'4"E	Cool temperate
Jacobsbaai	33°31'12"S; 18°19'27"E	Cool temperate
Wadrif	32°12'16"S; 18°19'30"E	Cool temperate
Bok	33°34'8"S; 18°20'2"E	Cool temperate
Silwerstroom	33°34'39"S; 18°21'8"E	Cool temperate
Olifantsbos	34°15'26"S; 18°22'58"E	Cool temperate
Elsies	34°9'37"S; 18°25'53"E	Cool temperate
Buffels (West)	34°19'5"S; 18°27'42"E	Cool temperate
Mossel	34°24'29"S; 19°16'21"E	Cool temperate
Rooi	34°3'3"S; 22°17'3"E	Warm temperate
Skaapkop	34°2'23"S; 22°29'55"E	Warm temperate
Meul	34°0'49"S; 22°32'35"E	Warm temperate
Grooteiland	34°5'9"S; 23°12'34"E	Warm temperate
Kranshoek	34°5'11"S; 23°13'30"E	Warm temperate
Crooks	34°5'28"S; 23°14'44"E	Warm temperate
Brak	33°59'49"S; 23°31'49"E	Warm temperate
Witels	33°59'18"S; 23°42'8"E	Warm temperate
Geelhoutbos	34° 0'22"S; 23°47'8"E	Warm temperate
Kleinbos	34° 0'42"S; 23°48'46"E	Warm temperate
Bruglaagte	34°1'34"S; 23°56'12"E	Warm temperate
Langbos	34°1'58"S; 23°58'25"E	Warm temperate
Sanddrif	34°2'13"S; 24°0'17"E	Warm temperate
Boskloof	34° 5'31"S; 24°17'41"E	Warm temperate
Klipdrif	34°10'20"S; 24°38'13"E	Warm temperate
Salt vlei	33°36'54"S; 26°52'55"E	Warm temperate
Blue Krans	33°21'15"S; 27°22'36"E	Warm temperate
Freshwater Poort	33°20'6"S; 27°24'50"E	Warm temperate
Mfihlelo	31°26'9"S; 29°47'53"E	Subtropical region
Mlambomkhulu	31°26'0"S; 29°49'18"E	Subtropical region
Mkhambathi	31°16'27"S; 30°1'26"E	Subtropical region
Mlazi	29°58'10"S; 30°58'42"E	Subtropical region

The following extremely small systems (Table 2) have catchments arising within the immediate coastal environment, are seldom linked to the sea, and make a minimal contribution (in some instances a zero contribution) to the overall estuarine biota of southern Africa. All these systems are excluded from this report because of their limited proven estuarine functions. However, this does not imply that they are unimportant ecosystems. There are also numerous small coastal stream inlets (micro-estuaries?) linked to the sea, especially along the Eastern Cape coast, which may or may not have estuarine attributes. These inlets, mostly unnamed, are included in Table 2 and require further study in order to determine whether they function as estuaries or not.

Table 2. Extremely small estuaries with very limited estuarine biota, as well as small coastal stream inlets whose functioning is currently unknown.

NAME OF ESTUARY	GPS COORDINATES	GEOGRAPHIC REGION
Sewejaarskop	31°05'53"S; 17°43'53"E	Cool temperate
Paternosterbaai	32°48'8"S; 17°54'1"E	Cool temperate
Booiskraal	34°17'14"S; 18°23'46"E	Cool temperate
Kaapsedrif	34°6'20"S; 24°23'13"E	Warm temperate
Helpmekaaars	33°58'48"S; 23°35'57"E	Warm temperate
Klip	33°58'42"S; 23°37'1"E	Warm temperate
Shwele-Shwele	33°15'36"S; 27°31'19"E	Warm temperate
Mvubukazi	33°4'11"S; 27°50'33"E	Warm temperate
Ngqenga	33°3'22"S; 27°51'53"E	Warm temperate
Mthwendwe	32°44'26"S; 28°17'9"E	Warm temperate
Mbokotwana	32°37'20"S; 28°27'17"E	Warm temperate
Masiminana	32°33'09"S; 28°33' 15"E	Warm temperate
Gume	32°19'15"S; 28° 48' 58"E	Warm temperate
Ngomane	32°18'48"S; 28°49'32"E	Warm temperate
Dwesana	32°16'56"S; 28°52'27"E	Warm temperate
Unnamed 1	32°15'45"S; 28°53'24"E	Warm temperate
Dakana	32°13'13"S; 28°56'17"E	Subtropical region
Kwa-Suka	32°12'19"S; 28°56'48"E	Subtropical region
Unnamed 2	32°6'23"S; 29°02'46"E	Subtropical region
Lubanzi	32°4'28"S; 29°5'10"E	Subtropical region
Mhlahlane	32°3'50"S; 29°5'14"E	Subtropical region
Mthonjane	32°1'59"S; 29°6'43"E	Subtropical region
Unnamed 3	32°1'14"S; 29°7'30"E	Subtropical region
Unnamed 4	32°1'1"S; 29°7'46"E	Subtropical region
Unnamed 5	31°59'44"S; 29°8'13"E	Subtropical region
Ku-Bomvu	31°59'19"S; 29°8'56"E	Subtropical region
Unnamed 6	31°55'30"S; 29°13'29"E	Subtropical region
Unnamed 7	31°55'25"S; 29°13'37"E	Subtropical region
Unnamed 8	31°55'8"S; 29°13'40"E	Subtropical region
Unnamed 9	31°54'44"S; 29°14'03"E	Subtropical region
Unnamed 10	31°54'30"S; 29°14'12"E	Subtropical region
Unnamed 11	31°52'46"S; 29°15'41"E	Subtropical region
Unnamed 12	31°52'27"S; 29°15'45"E	Subtropical region
Unnamed 13	31°52'13"S; 29°15'44"E	Subtropical region
Unnamed 14	31°50'26"S; 29°17'27"E	Subtropical region
Mtonga	31°47'35"S; 29°20'53"E	Subtropical region
Unnamed 15	31°46'50"S; 29°21'13"E	Subtropical region
Unnamed 16	31°46'8"S; 29°21'14"E	Subtropical region
Ndluzula	31°44'28"S; 29°23'13"	Subtropical region
Tyityane	31°40'5"S; 29°29'29"E	Subtropical region
Ntloloba	31°39'33"S; 29°30'3"E	Subtropical region
Gxwaleni	31°39'19"S; 29°30'24"E	Subtropical region
Mnenga	31°37'S; 29°34'5"E	Subtropical region
Unnamed 17	31°36'57"S; 29°34'7"E	Subtropical region
Unnamed 18	31°36'47"S; 29°34'27"E	Subtropical region
Manzana	31°36'1"S; 29°36'4"E	Subtropical region
Gugu	31°35'6"S; 29°36'58"E	Subtropical region
Unnamed 19	31°34'39"S; 29°37'39"E	Subtropical region
Unnamed 20	31°34'35"S; 29°37'39"E	Subtropical region
Unnamed 21	31°33'22"S; 29°38'47"E	Subtropical region
Unnamed 22	31°33'17"S; 29°39'05"E	Subtropical region
Ingo	31°32'56"S; 29°39'38"E	Subtropical region

NAME OF ESTUARY	GPS COORDINATES	GEOGRAPHIC REGION
Ntyivini	31°32'41"S; 29°40'3"E	Subtropical region
Dakana	31°32'6"S; 29°40'43"E	Subtropical region
Mguga	31°30'45"S; 29°41'51"E	Subtropical region
KwaNyambalala	31°28'6"S; 29°44'4"E	Subtropical region
Unnamed 23	31°27'4"S; 29°45'17"E	Subtropical region
Unnamed 24	31°26'47"S; 29°45'55"E	Subtropical region
Unnamed 25	31°26'42"S; 29°46'6"E	Subtropical region
Sikatsha	31°26'37"S; 29°46'17"E	Subtropical region
Cutweni	31°26'18"S; 29°47'12"E	Subtropical region
Unnamed 26	31°26'8"S; 29°48'9"E	Subtropical region
Unnamed 27	31°26'4"S; 29°48'32"E	Subtropical region
Unnamed 28	31°23'51"S; 29°52'44"E	Subtropical region
Unnamed 29	31°23'49"S; 29°52'49"E	Subtropical region
Maviti	31°23'26"S; 29°53'41"E	Subtropical region
Thezana	31°22'31"S; 29°54'21"E	Subtropical region
Magogo	31°22'1"S; 29°55'10"E	Subtropical region
Unnamed 30	31°21'38"S; 29°55'37"E	Subtropical region
Kilroe Beach	31°21'34"S; 29°55'45"E	Subtropical region
Mbaxeni	31°21'3"S; 29°56'19"E	Subtropical region
Unnamed 31	31°18'55"S; 29°58'53"E	Subtropical region
Butsha	31°18'45"S; 29°59'6"E	Subtropical region
Kwa-Nondindwa	31°18'37"S; 29°59'22"E	Subtropical region
Daza	31°18'20"S; 29°59'50"E	Subtropical region
Mgwetyana	31°15'41"S; 30°02'24"E	Subtropical region
Unnamed 32	31°15'4"S; 30°02'42"E	Subtropical region
Unnamed 33	31°14'31"S; 30°03'08"E	Subtropical region
Unnamed 34	31°14'26"S; 30°03'24"E	Subtropical region
Mtholane	31°9'34"S; 30°7'37"E	Subtropical region
Unnamed 35	31°3'52"S; 30°13'10"E	Subtropical region
Unnamed 36	31°1'17"S; 30°14'48"E	Subtropical region
Unnamed 37	30°55'26"S; 30°19'9"E	Subtropical region
Unnamed 38	30°54'19"S; 30°20'13"E	Subtropical region
Unnamed 39	30°53'47"S; 30°20'44"E	Subtropical region
Unnamed 40	30°48'16"S; 30°24'47"E	Subtropical region
Unnamed 41	30°48'4"S; 30°24'57"E	Subtropical region
Unnamed 42	30°47'54"S; 30°25'3"E	Subtropical region
Unnamed 43	30°47'38"S; 30°25'16"E	Subtropical region
Unnamed 44	30°34'25"S; 30°34'37"E	Subtropical region
Unnamed 45	30°32'43"S; 30°35'46"E	Subtropical region
Unnamed 46	30°31'2"S; 30°37'2"E	Subtropical region
Unnamed 47	30°26'33"S; 30°39'39"E	Subtropical region
Unnamed 48	30°26'7"S; 30°40'2"E	Subtropical region
Mdezingane/Mdesingane	30°25'31"S; 30°40'18"E	Subtropical region
Unnamed 49	30°22'39"S; 30°42'4"E	Subtropical region
Nkomba	30° 21' 10"S; 30° 43' 13"E	Subtropical region
Unnamed 50	30°20'1"S; 30°44'3"E	Subtropical region
Unnamed 51	30°14'36"S; 30°46'54"E	Subtropical region
Unnamed 52	30°12'50"S; 30°47'53"E	Subtropical region
Unnamed 53	30°5'41"S; 30°51'43"E	Subtropical region
Unnamed 54	29°59'12"S; 30°57'48"E	Subtropical region
Unnamed 55	29°36'33"S; 30°09'37"E	Subtropical region
Zimbali	29°33'02"S; 31°12'25"E	Subtropical region
Bob's Stream	29° 26' 16"S 31° 17' 41"E	Subtropical region
Unnamed 56	29°24'38"S; 31°19'2"E	Subtropical region
Unnamed 57	29°24'34"S; 31°19'4"E	Subtropical region
Unnamed 58	29°24'14"S; 31°19'27"E	Subtropical region

The estuarine classification system used in this review mainly follows that of Whitfield (1992), viz. permanently open estuaries, temporarily open/closed estuaries, estuarine lake systems, estuarine bays and river mouths. Langebaan has been added to the above estuary categories, a review of which is contained in Whitfield (2005a). That discussion came to the conclusion that the Langebaan system should be classified as an estuarine embayment and is therefore included in this analysis.

Individual systems may change from one estuarine type to another under the influence of natural events or anthropogenic influences. Human induced changes have resulted in rapid and dramatic alterations to a number of systems, e.g. Richards Bay has been transformed from an estuarine lake into two estuarine bays through harbour development. It should be noted that a water body must have a surface area exceeding 1000 ha to be considered as an estuarine lake or estuarine bay system. It should also be noted that permanently open estuaries and river mouths do sometimes close during prolonged drought periods, but that under normal seasonal river flow conditions they remain open. Increasing freshwater abstraction from perennial river systems for agricultural, domestic and industrial use will inevitably lead to changes in sediment scouring patterns and mouth dynamics, with concomitant changes in the future classification of these estuaries.

The condition of each estuary, which is based on the degree to which human activities have changed the functioning or viability of a particular system, is broadly classified as poor, fair, good or excellent. These assessments are based on the opinions of scientists from the different regions, use of Google Earth to view each estuary and its surrounding catchment, as well as information from the literature data base presented in this report. The following criteria acted as guidelines in the designation of the condition of a particular estuary:

Excellent - estuary appears to be in a near pristine condition (negligible human impact).

Good - no major negative anthropogenic influences on either the estuary or catchment (low impact).

Fair - noticeable degree of ecological degradation in the catchment and/or estuary (moderate impact).

Poor - major ecological degradation arising from a combination of anthropogenic influences (high impact).

A biogeographical analysis of the current situation is given below (Table 3).

Table 3. A subjective assessment of the condition of South African estuaries in each biogeographical region.

ESTUARINE CONDITION	REGION							
	Cool Temperate		Warm Temperate		Subtropical		South Africa	
	No.	%	No.	%	No.	%	No.	%
Poor	9	35	6	5	24	19	39	14
Fair	9	35	37	29	48	38	94	34
Good	7	27	71	56	40	31	118	42
Excellent	1	4	13	10	15	12	29	10
TOTAL	26	100	127	100	127	100	280	100

A subjective assessment of estuarine condition, based on expert opinion from the Whitfield (2000) bibliography, together with a more recent Google Earth view of catchment and estuary development/degradation was used to independently compare the state of each estuary to that obtained by van Niekerk & Turpie (2012) as part of the 2011 National Biodiversity Assessment (NBA) Report. Based on the 271 estuaries for which information was available, 179 had identical scores, 91 showed a single category difference, and one estuary differed by two categories. Table 3 represents the results from the 280 estuaries that were analysed and showed that a majority of systems (52%) were in a good or excellent condition, with 48% in a poor or fair condition. This table also revealed that the estuaries in the warm temperate biogeographic region were in the best condition when compared to those in the cool temperate and subtropical regions. Although 15 estuaries from the subtropical region were assessed as being in excellent condition, all these systems were located along the Pondoland coast and not in the highly developed KwaZulu-Natal region. This latter area had 24 estuaries (19%) in poor condition, which was more than the 9 estuaries in poor condition in the cool temperate zone but that latter figure equated to 35% of the 26 systems within that zone.

The estuary information categories are, of necessity, very broad and the contents of a number of papers cover more than one category. Although published works in scientific journals and books have received the most attention, numerous reports synthesizing both published and unpublished information on South African estuaries are also given. In addition, much of the ‘grey’ literature which is readily accessible has been included in this report but a number of documents were excluded on the basis that this type of information is not available to either scientists or managers (e.g. unpublished honours projects). Abstracts from conferences are also excluded from the data base since these often cover preliminary findings which are published in detail at a later date.

Where an unpublished report or progress report duplicates information provided by the same author in a published article, the former document is excluded from this analysis. Likewise, if preliminary reports are followed by final reports which include the information given previously, then only the final document is indexed. Taxonomic papers dealing with the descriptions of species have not been included in this database. Selected references from both the marine and freshwater environment have been included where they contain considerable information directly relevant to estuaries or typical estuarine organisms. It is important to note that references listed in the section “General Estuarine References” are not repeated under the individual estuary headings. In a number of instances we have provided alternative isiXhosa and isiZulu spelling for the earlier accepted spelling and pronunciation of many estuaries in the Eastern Cape and KwaZulu-Natal.

Information availability on each estuary is categorized as nil, poor, moderate, good or excellent. Systems with 1-9 references were classified as poor, 10-19 as moderate, 20-39 as good, and 40+ as excellent. A preliminary analysis of the estuarine information database in the different biogeographic regions is shown in Table 4. Indications are that the status of information on 79% of South African estuaries was classified as nil or poor, with 10% having moderate information and 11% having good or excellent information. One third of the poor returns are from the former Transkei region of the Eastern Cape, where 82 out of 87 estuaries have little or no published information. A similar situation pertains to the former Ciskei, where 10 of the 14 estuaries have limited available information.

Table 4. Synthesis of available information categories from individual estuaries in each biogeographical region.

ESTUARINE INFORMATION	REGION							
	Cool Temperate		Warm Temperate		Subtropical		South Africa	
	No.	%	No.	%	No.	%	No.	%
Nil	-	-	13	10	8	6	21	8
Poor	16	61	87	69	97	77	200	71
Moderate	3	12	14	11	12	9	29	10
Good	5	19	4	3	7	6	16	6
Excellent	2	8	9	7	3	2	14	5
TOTAL	26	100	127	100	127	100	280	100

A long-term analysis of the number of references per decade over the past century revealed several interesting trends. From a low base in the 1950s and 1960s virtually all outputs went from strength to strength until the beginning of the 1990s, after which they went into decline (Figure 2). The reason for the decline in virtually all the analysed categories after 1991 appears to be directly related to the decline in highly productive researchers in the subsequent decades (Figure 3). Although the ‘brain drain’ and retirement factors may be partially responsible for the above decline, the exact reasons for this trend are unknown.

Overall, there appear to be similar outputs in terms of references from each of the major regions along the South African coast. This is particularly the case for physical and chemical studies (Figure 4). However, as far as biological and ecological studies are concerned, outputs are considerably higher in the Eastern Cape Province when compared to the Western and Northern Cape.

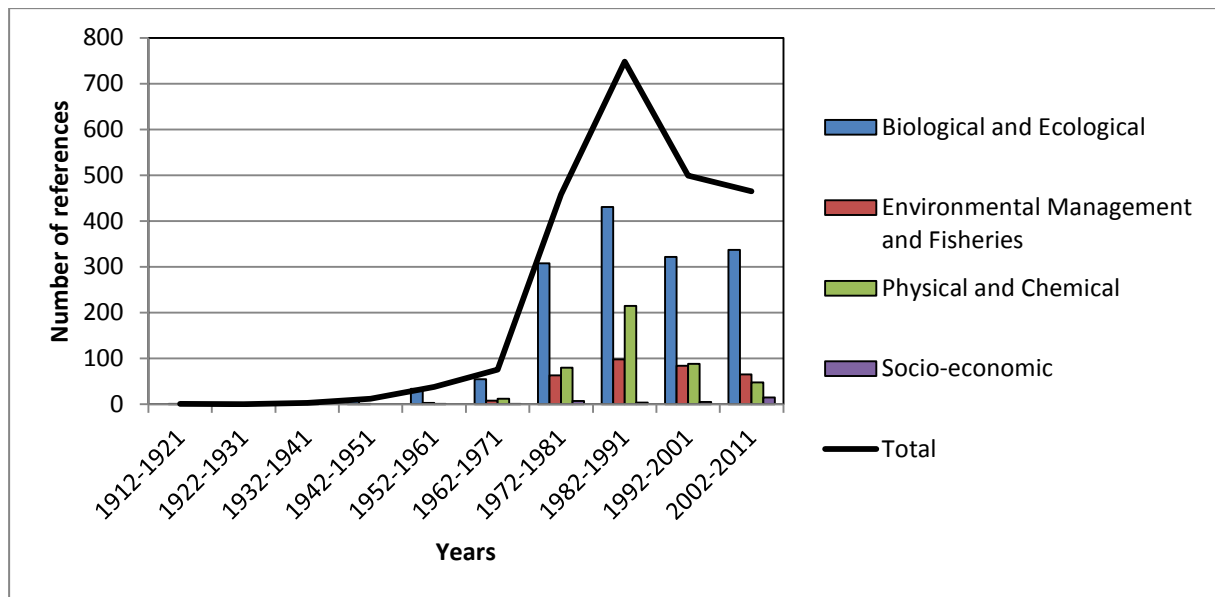


Figure 2. A decadal analysis of the number of references in different categories over the past century. The total number of publications in each decade is also shown.

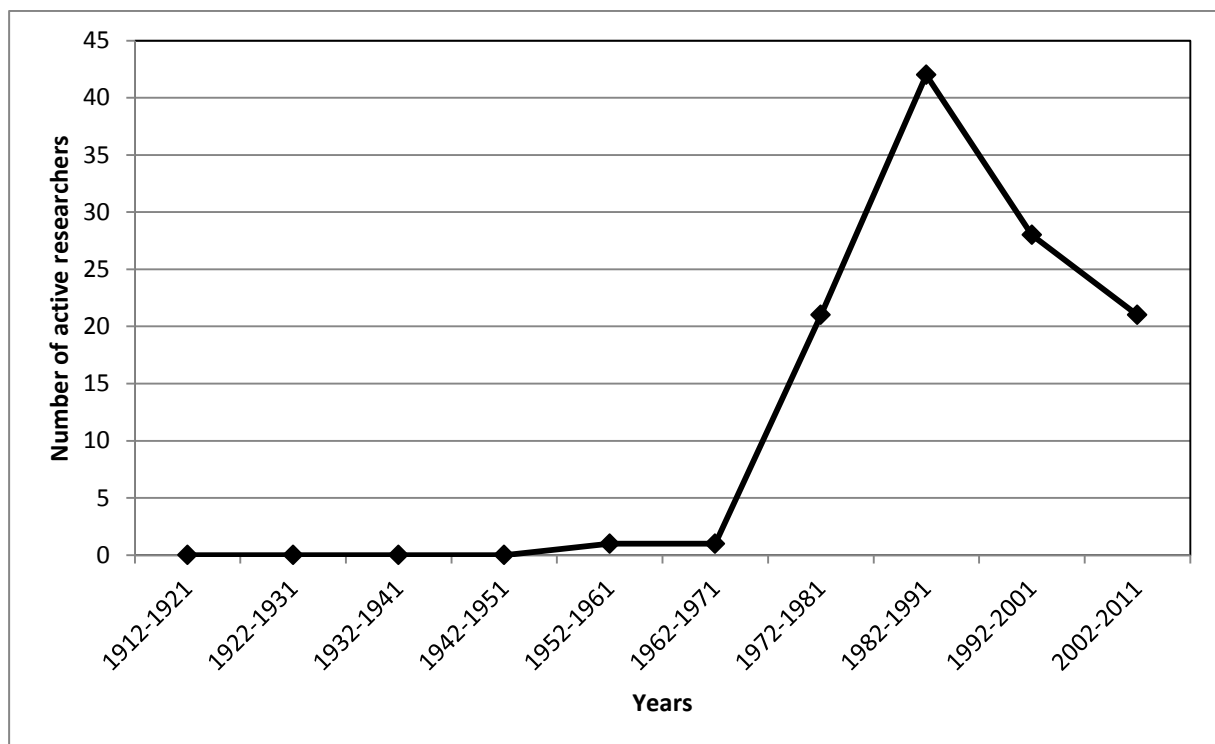


Figure 3. Number of highly active researchers per decade as obtained from the first author of referenced publications, reports and thesis. To qualify as an active researcher in a particular decade, a minimum of five senior authored outputs had to be produced by that individual in the decade.

A total of 249 Masters and PhD theses on South African estuaries have been produced, with the overwhelming majority (173) covering biological and ecological topics (Figure 5). This was followed by the physico-chemical category with 51 theses, and environmental management and fisheries with 19 theses. Only six theses over the past century had a primary focus on socio-economic issues.

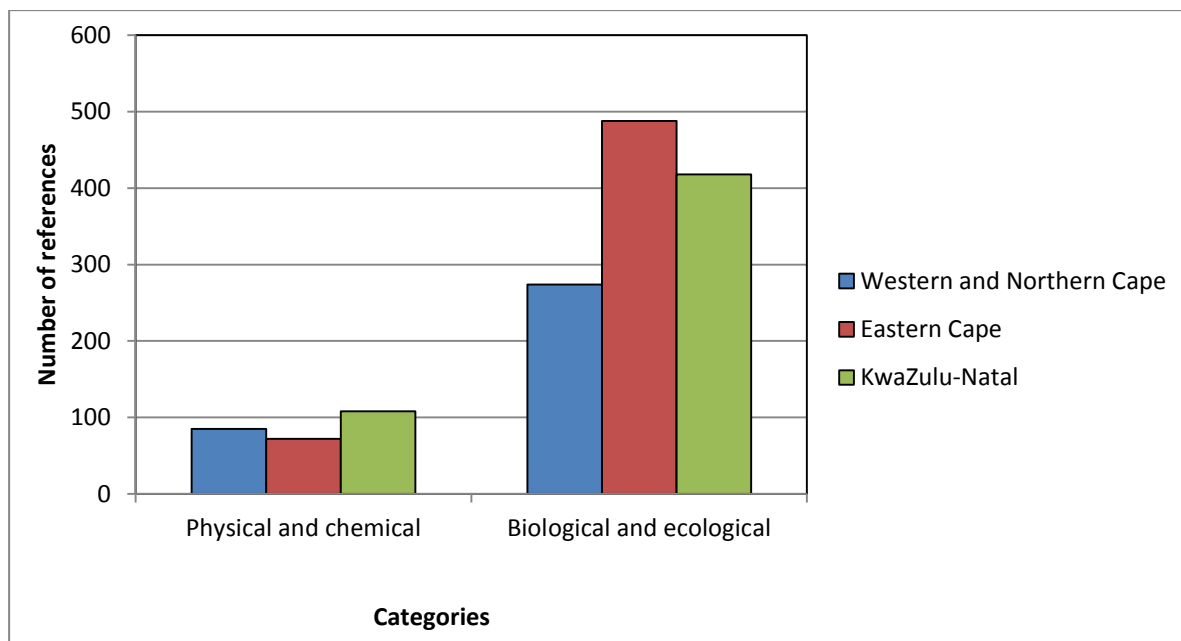


Figure 4. Diagram illustrating the number of estuarine references in two different categories from three major regions along the South African coast.

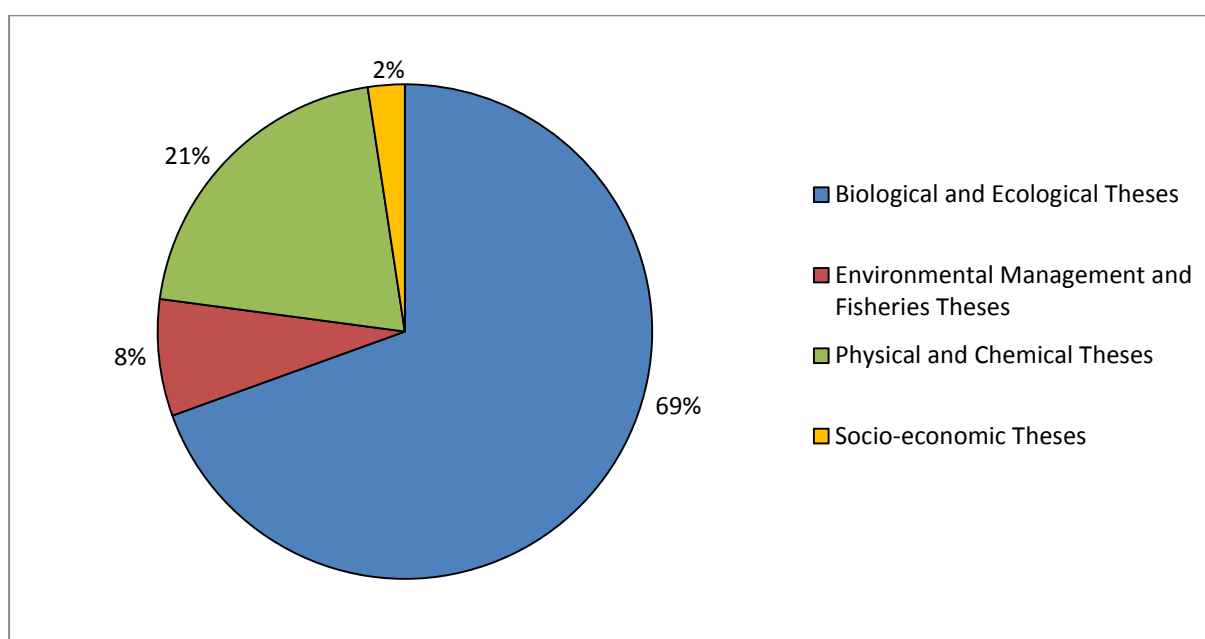


Figure 5. Diagram illustrating the composition of theses involving studies on South African estuaries based on four major themes.

The graduation of Masters and Doctoral students in South African estuarine studies was dominated by four coastal universities (Figure 6), namely Nelson Mandela Metropolitan University (36%), University of KwaZulu-Natal (28%), Rhodes University (13%) and the University of Cape Town (12%). Together these universities accounted for 89% of all degrees awarded in the estuarine research field, with the remaining 12 universities responsible for 11% of graduates within this field. The reasons why the four coastal universities have dominated the supervision of postgraduate students is linked to the location of the universities, their infrastructure and funding resources, but perhaps most of all, the research interests of lecturing staff at these institutions. Certain staff at these universities have been responsible for training a large number of students during their careers and in many cases were succeeded by lecturers with similar interests to their own, thus continuing the tradition of

estuarine research at that particular university. In other cases, collaboration within and between universities and research institutes created teams of researchers who worked together on estuarine programmes to the benefit of both the science and students at these institutions.

The presence of research institutes such as the Institute for Coastal Research at the University of Port Elizabeth, the South African Institute for Aquatic Biodiversity associated with Rhodes University, and the Oceanographic Research Institute associated with the University of KwaZulu-Natal, also contributed to the relative strengths of estuarine research at these universities, when compared to others where such collaborative links were absent. The importance of a university's location in determining whether estuarine studies are a feature of these institutions or not can be gauged from the minimal student contribution to estuarine research by the large University of the Witwatersrand and Pretoria University. Conversely, the Walter Sisulu University is located relatively close to a large number of important estuaries in the Eastern Cape but has not fully utilized the training opportunities provided by these systems. The reasons for this mismatch can be traced back to the historically disadvantaged nature of this university and the pressures on graduating students to seek employment once a Bachelor's degree has been obtained.

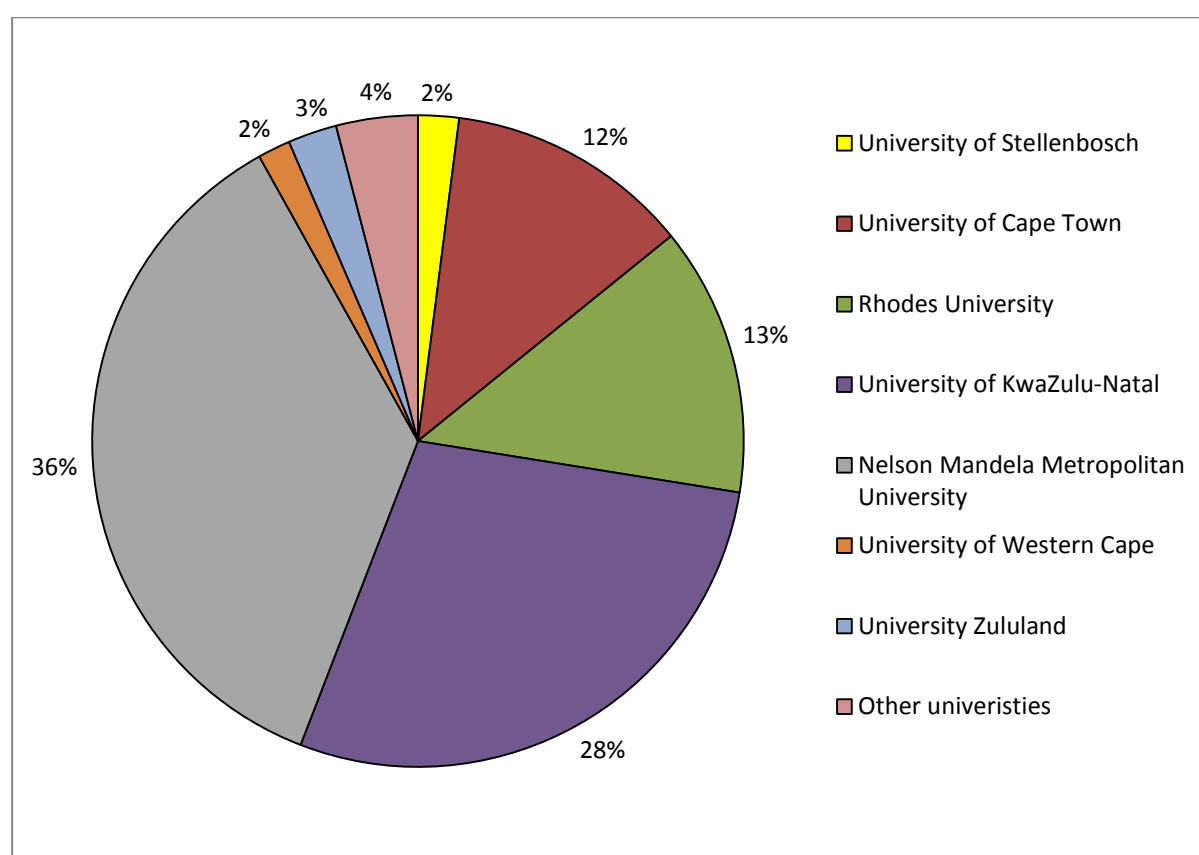


Figure 6. Diagram illustrating the graduation of Masters and Doctoral students in South African estuarine studies at various universities.

A temporal breakdown of the relative contributions by the different universities towards the production of Masters and Doctoral theses over time is shown in Figure 7. The important role of Nelson Mandela Metropolitan University in the training of postgraduate students in estuarine work from the 1970s to the present is most apparent. Similarly, Rhodes University and the University of KwaZulu-Natal have made important contributions over the same period, although the latter university seems to have faltered during the 1990s before increasing its outputs following the turn of the century. Again, these trends can be traced back to the changing staff composition in various departments at this university.

There appears to be a strong disjuncture between the peak in thesis production during the period 2002-2011 (Figure 7) and the continued overall decline in published papers and reports in various disciplines during the same period (Figure 2). The reasons for this mismatch are obscure but may be related to a change in

emphasis by lecturers and scientists towards the training new Masters and Doctoral students, together with a reduced focus on the publication of results from these theses. This does, however, run counter to the pressures on supervisors to generate publications for their universities and institutes for subsidy and NRF rating purposes, although it is also true that government subsidies for postgraduate students graduating with these higher degrees has also increased markedly within the last decade. Another reason for the decline in published documents during the past two decades could be the curtailment of report outputs during this period. For example, a number of substantial Department of Environmental Affairs estuarine contracts with the CSIR came to an end during the 1980s and led to a major drop in outputs from this source during the 1990s and onwards (Figure 8).

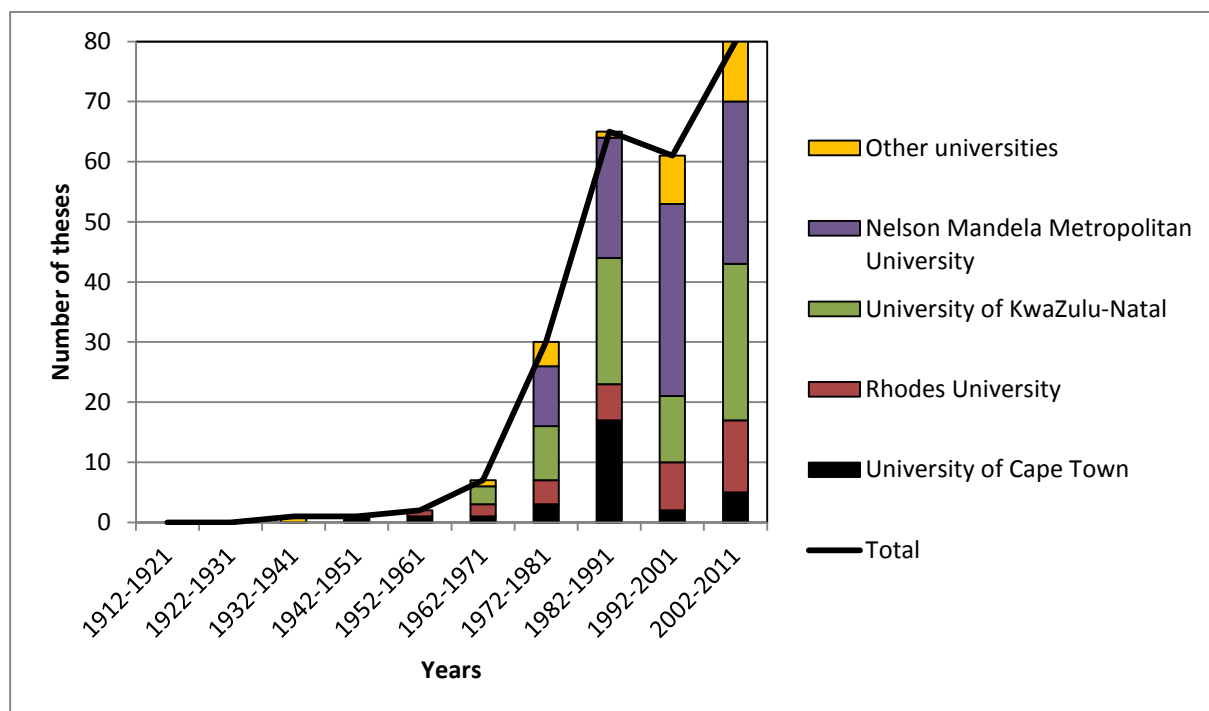


Figure 7. Decadal diagram illustrating the production of Masters and Doctoral theses by students conducting South African estuarine studies at various universities.

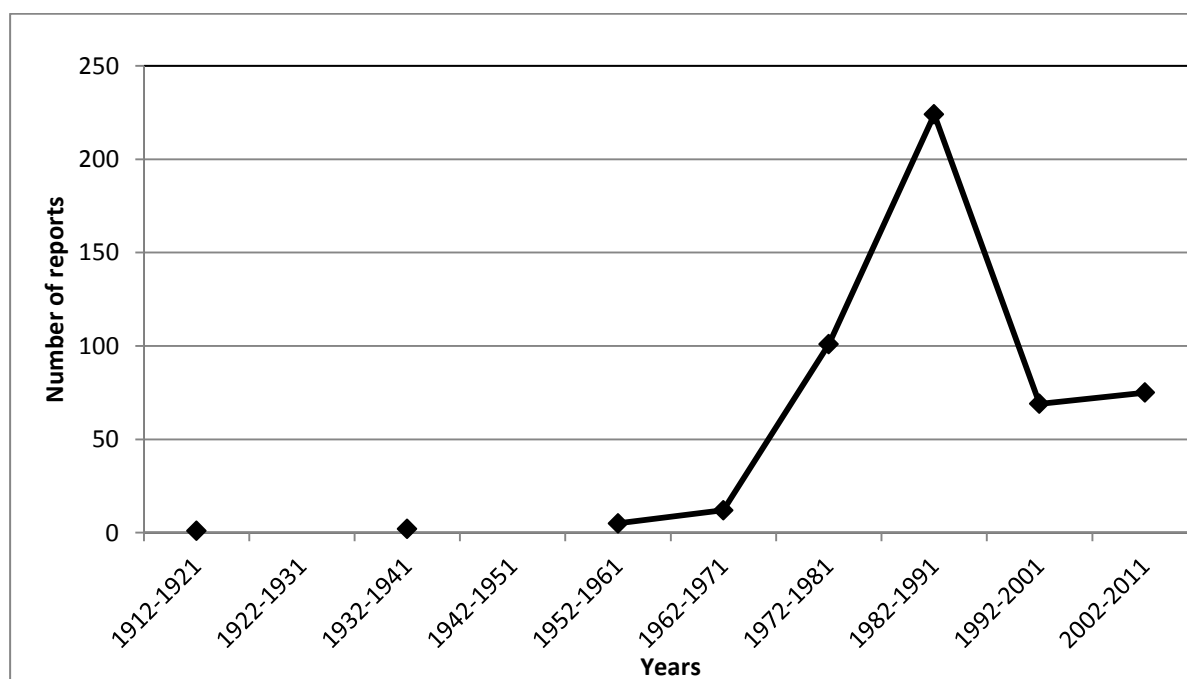


Figure 8. Number of estuarine reports produced per decade between 1912 and 2011.

COOL TEMPERATE ESTUARIES

ORANGE ESTUARY

LOCALITY: 28°38'01"S; 16°27'28"E

REGION: Cool temperate

CLASSIFICATION: River mouth

INFORMATION: Good

CONDITION: Fair (Remarks: Reduced riverine input will lead to increased mouth closure in the future)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Morant & O'Callaghan (1990), Swart et al. (1988), Swart et al. (1990), van Heerden (1986)

(b) BIOLOGICAL/ECOLOGICAL: Bornman (2002), Bornman et al. (2004), Brown (1958), Grindley (1959), Harrison (1997a), Shaw (2007), Shaw et al. (2008), Seaman & van As (1998), Williams (1986)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Anderson (2006), Council for Scientific and Industrial Research (1985a), Cowan (1995), Department of Water Affairs and Forestry (2003a), Harrison et al. (1994a), Harrison et al. (1994b), Prins (1990), Prins (2002), van der Merwe (1988a), van der Merwe (1988b)

OLIFANTS ESTUARY

LOCALITY: 31°42'03"S; 18°11'19"E

REGION: Cool temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Estuary in good condition but major agricultural developments in catchment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Bornman (2002), Bornman & Adams (2010), Bornman et al. (2002), Bornman et al. (2003), Harrison (1998a), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Day (1981h), Morant (1984)

(d) REPORTS/DOCUMENTS: Council for Scientific and Industrial Research (1990a), Harrison et al. (1994a), Harrison et al. (1994b), Slinger (1990), van der Merwe (1988b)

VERLORENVLEI ESTUARY

LOCALITY: 32°18' 57"S; 18°19' 59"E

REGION: Cool temperate

CLASSIFICATION: Estuarine lake

INFORMATION: Poor

CONDITION: Poor (Remarks: Human impacts on freshwater supply high and reduced marine connectivity)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Fromme (1985a)

(b) BIOLOGICAL/ECOLOGICAL: Baxter & Davies (1994)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Cooper (1976), Council for Scientific and Industrial Research (2009), Fromme (1985a), Lane (1980), Parkington (1980), Robertson (1980), Sinclair et al. (1986)

GROOT BERG ESTUARY

LOCALITY: 32°46'10"S; 18°08'44"E

REGION: Cool temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Good

CONDITION: Fair (Remarks: Human impacts on freshwater supply likely to increase dramatically)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Schumann (2009), Schumann & Brink (2009), Slinger & Taljaard (1994)

(b) BIOLOGICAL/ECOLOGICAL: Bennett (1994), Clarke et al. (2009), Harrison (1997a), Kalejta (1991), Kalejta (1992a), Kalejta (1992b), Kaletja (1993a), Kaletja (1993b), Kalejta & Hockey (1991), Kalejta & Hockey (1994), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b), Snow & Bate (2009), Velásquez & Hockey (1992), Velásquez et al. (1990), Velásquez et al. (1991), Wooldridge & Deyzel (2009a), Wooldridge & Deyzel (2009b)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Clark (2007), Davies & Day (1995), Harrison et al. (1994a), Harrison et al. (1994b), Heydorn & Morant (undated 3), Slinger et al. (1998), van der Merwe (1988b), van Wyk (1983)

LANGEBAAAN EMBAYMENT

LOCALITY: 33°5' 106"S; 18°1' 42"E

REGION: Cool temperate

CLASSIFICATION: Estuarine embayment

INFORMATION: Excellent

CONDITION: Good (Remarks: Much of the embayment and associated shoreline is in a protected national park)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Atkinson et al. (2006), Birch (1976), Day (1959), Flemming (1977b), Fourie (1976), Tibbles & Rawlings (1994), Tibbles et al. (1994), Watling & Watling (1974), Willis et al. (1977)

(b) BIOLOGICAL/ECOLOGICAL: Acuna et al. (2004), Allanson & Fearon (2012), Atkinson et al. (2006), Attwood et al. (2007), Boucher & Jarman (1977), Brown (1958), Christie & Moldan (1977), Clark (1997), Compton (2001), Cooper et al. (1976), Day (1959), Fairhurst et al. (2007), Fielding et al. (1988), Flemming (1977b), Fourie (1976), Franceschini et al. (2005), Giffen (2009), Grindley (1977), Hanekom & Nel (2002), Harebottle & Underhill (2006), Harris et al. (1988), Henry (1977), Hey (1977a), Hey (1977b), Hutchings & Lamberth (2002), Kalejta (1994), Kerwath et al. (2009), Liversidge et al. (1958), Mazure & Branch (1979), Pillay et al. (2010), Pringle & Cooper (1975), Puttick (1977), Puttick (1978), Puttick (1980), Robinson & Griffiths (2002), Robertson (1981), Robinson et al. (2007), Rothman et al. (2009), Rotmann (1990), Schils et al. (2001), Schils et al. (2005), Shannon & Stander (1977), Siebert & Branch (2005b), Summers & Kalejta-Summers (1996), Tunley et al. (2009), Underhill (1987a), Underhill (1987b), Wynberg & Branch (1991)

(c) SYNTHESSES/REVIEWS: Fuggle (1977), Whitfield (2005c)

(d) REPORTS/DOCUMENTS:

RIETVLEI/DIEP ESTUARY

LOCALITY: 33°53'25"S; 18°29'00"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Poor (Remarks: Encroaching urbanization and canalization has altered this system)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Hughes et al. (1993)

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1997b), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b), Scott (1954)

(c) SYNTHESSES/REVIEWS: Day (1981h), Millard & Scott (1954),

(d) REPORTS/DOCUMENTS: Barwell (1989), Beaumont & Heydenrych (1980), Harrison et al. (1994a), Harrison et al. (1994b), Peak Practice (2008a), Peak Practice (2008b), van der Merwe (1988b), Yeld (1994)

SOUT ESTUARY (WEST)

LOCALITY: 33°54'28"S; 18°28'22"E

REGION: Cool temperate

CLASSIFICATION: Canalized estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Urbanization and canalization of the estuary has largely destroyed this system)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Orren et al. (1981)

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1997b)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

HOUTBAAI ESTUARY

LOCALITY: 34°02'44"S; 18°21'20"E

REGION: Cool temperate

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Poor (Remarks: Intensive urban development in the catchment)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996), Grindley (1988)

(d) REPORTS/DOCUMENTS: Fromme (1985b), Harrison et al. (1994a), Harrison et al. (1994b)

WILDEVOËLVLEI ESTUARY

LOCALITY: 34°07'40"S; 18°20'43"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Discharge of treated effluent and urban developments affecting connectivity)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1997b)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996)

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b), Heineken (1985)

BOKRAMSPRUIT ESTUARY

LOCALITY: 34°08'00"S; 18°20'02"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Stormwater input from township development)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1997b)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

SCHUSTER ESTUARY

LOCALITY: 34°12'07"S; 18°22'20"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1997b)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

KROM ESTUARY

LOCALITY: 34°13'52"S; 18°22'47"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Part of the Cape of Good Hope Nature Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1997b)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

SILVERMINE/SILWERMYN ESTUARY

LOCALITY: 34°07'58"S; 18°26'20"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Could be considered for rehabilitation)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1998)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996), Heineken (1982b)

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

ZANDVLEI/SAND ESTUARY

LOCALITY: 34°06'21"S; 18°28'36"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Good

CONDITION: Fair (Remarks: High intensity residential development and industrial activity in catchment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Harding (1993), Harding (1994)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1976), Byren & Davies (1986), Clark et al. (1994), Davies & Stewart (1984), Davies et al. (1989), Gaigher & Thorne (1979), Harrison (1998), Stewart & Davies (1986)

(c) SYNTHESSES/REVIEWS: Day (1981h), Morant & Grindley (1982), Quick & Harding (1994)

(d) REPORTS/DOCUMENTS: Begg (1981a), Benkenstein (1981), Benkenstein (1982), Davies (1982a), Harrison et al. (1994a), Harrison et al. (1994b)

ZEEKOEI ESTUARY

LOCALITY: 34°5' 54"S; 18°30'17"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Good

CONDITION: Poor (Remarks: Sewage works have major influence on the functioning of this system)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Brown et al. (1991), Das et al. (2007), Das et al. (2008a), Das et al. (2008b), Das et al. (2008c), Das et al. (2009b), Harding (1993), Quick & Johansson (1992)

(b) BIOLOGICAL/ECOLOGICAL: Combrink (1994), Das et al. (2009a), Harding (1992a), Harding (1997), Harding & Quick (1992), Harding & Wright (1999), Matthews et al. (2010), Matthews et al. (2012), Schoonbee (1962)

(c) SYNTHESSES/REVIEWS: Beynon (1971)

(d) REPORTS/DOCUMENTS: Bickerton (1982b), Cape Town City Council (1990), Civil Engineering Contractor (1982), Curtin et al. (1975), Davies (1983), Dick (1990), Hamman et al. (1977), Harding (1990a), Harding (1990b), Harding (1990c), Harding (1990d), King (1973), Purves (2010), Rudnick (1986), Sheel (1976), Skibbe (1991), van Wyk (1970)

EERSTE ESTUARY

LOCALITY: 34°04'51"S; 18°45'51"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Pollution control by sewage works needs to be improved)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Petersen (2002)

(b) BIOLOGICAL/ECOLOGICAL: Clark et al. (1994), Harrison (1998)

(c) SYNTHESSES/REVIEWS: Grindley (1982), Wiseman & Sowman (1992)

(d) REPORTS/DOCUMENTS: Bartlett & Henning (1982), Harrison et al. (1994a), Harrison et al. (1994b)

LOURENS ESTUARY

LOCALITY: 34°05'58"S; 18°48'40"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: System could be considered for rehabilitation)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1998)

(c) SYNTHESSES/REVIEWS: Cliff & Grindley (1982), Coetzee et al. (1996) , Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b)

(d) REPORTS/DOCUMENTS: Cliff (1983), Harrison et al. (1994a), Harrison et al. (1994b)

SIR LOWRY'S PASS ESTUARY

LOCALITY: 34°09'20"S; 18°51'57"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Water quality needs to be improved to facilitate recreational use)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1998)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996), Heineken et al. (1982)

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

STEENBRAS ESTUARY

LOCALITY: 34°11'41"S; 18°49'11"E

REGION: Cool temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Has the characteristics of a small fjord rather than a typical estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1998)

(c) SYNTHESSES/REVIEWS: Heinecken et al. (1982)

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

ROOIELS ESTUARY

LOCALITY: 34°17'50"S; 18°49'12"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Within the proposed Rooiels/Betty's Bay nature area)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1998)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996), Heinecken (1982a)

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b)

BUFFELS ESTUARY (EAST)

LOCALITY: 34°20'21"S; 18°49'52"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Within the proposed Rooiels/Betty's Bay nature area)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1998)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996), Heinecken et al. (1982)

(d) REPORTS/DOCUMENTS: Harrison et al. (1994a), Harrison et al. (1994b), Heinecken (1981b)

PALMIET ESTUARY

LOCALITY: 34°20'37"S; 18°59'45"E

REGION: Cool temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Good

CONDITION: Good (Remarks: Estuary mouth closure more likely due to increase in catchment dams)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Byren & Davies (1989), Largier (1986), Largier & Taljaard (1991), Largier et al. (1991), Slinger & Largier (1990), Taljaard (1987), Taljaard et al. (1986), Taljaard & Largier (1989)

(b) BIOLOGICAL/ECOLOGICAL: Bennett (1989a), Bennett (1989b), Branch & Day (1984), Coetzee (1991), Harrison (1999a)

(c) SYNTHESSES/REVIEWS: Clarke (1989)

(d) REPORTS/DOCUMENTS: Barwell (1988a), Byren (1984), Council for Scientific and Industrial Research (1980), Harrison et al. (1995a), Harrison et al. (1995b), Nel (1980), Rothmann (1992), Taljaard (1987), van der Merwe (1988b)

BOT/KLEINMOND ESTUARINE SYSTEM

LOCALITY: 34°22'06"S; 19°05'56"E

REGION: Cool temperate

CLASSIFICATION: Estuarine lake system

INFORMATION: Excellent

CONDITION: Fair (Remarks: Mouth manipulation a major issue in the management of this system)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Bally & McQuaid (1985), Fromme (1985c), Rogers (1985), van Foreest (1985), van Heerden (1985), Willis (1985)

(b) BIOLOGICAL/ECOLOGICAL: Bally et al. (1985), Bennett (1985), Bennett (1989a), Bennett (1989b), Bennett & Branch (1990), Bennett et al. (1985), De Decker (1987), De Decker & Bally (1985), De Decker & Bennett (1985), Harrison (1999a), Hejl & Currie (1985), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b), O'Callaghan (1994b), Roberts (1985), Roberts et al. (1985a), Roberts et al. (1985b), Stewart & Bally (1985)

(c) SYNTHESSES/REVIEWS: Bally (1985), Bally (1987), Branch et al. (1985), Claassen (1985), Coetzee (1985), Koop (1982), Koop et al. (1983)

(d) REPORTS/DOCUMENTS: Bally & Branch (1986), Barwell (1988b), De Decker (1986), Fromme (1986c), Harrison et al. (1995a), Harrison et al. (1995b), iRAP Consulting (2009a), iRAP Consulting (2009b)

ONRUS ESTUARY

LOCALITY: 34°25'07"S; 19°10'47"E

REGION: Cool temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Siltation and reed encroachment but suitable for rehabilitation)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999a)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996), Heineken & Damstra (1983)

(d) REPORTS/DOCUMENTS: Damstra (1980), Harrison et al. (1995a), Harrison et al. (1995b)

KLEIN ESTUARY

LOCALITY: 34°25'24"S; 19°18'13"E

REGION: Cool temperate

CLASSIFICATION: Estuarine lake system

INFORMATION: Moderate

CONDITION: Fair (Remarks: Farming in catchment and on the floodplain)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Barwell (1987), Coetzee & Pool (1986), du Preez & Hosking (2010), Waldron (1986)

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999a), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b), Scott et al. (1952), Talbot (1955)

(c) SYNTHESSES/REVIEWS: De Decker (1989), Day (1981h)

(d) REPORTS/DOCUMENTS: Council for Scientific and Industrial Research (1988a), Harrison et al. (1995a), Harrison et al. (1995b), iRAP Consulting (2008), King et al. (1989), van der Merwe (1988b)

UILKRAALS ESTUARY

LOCALITY: 34°36'23"S; 19°24'33"E

REGION: Cool temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment natural but bridge and embankment constrict river and tidal flow)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Gaigher (1984), Morant (1987), Harrison (1999a)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1996), Heydorn & Bickerton (1982)

(d) REPORTS/DOCUMENTS: Crowther (1988a), Harrison et al. (1995a), Harrison et al. (1995b)

WARM TEMPERATE ESTUARIES

RATEL ESTUARY

LOCALITY: 34°46'13"S; 19°44'47"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Within a private coastal nature reserve but mouth has been diverted)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1995a), Harrison et al. (1995b)

HEUNINGNES ESTUARY

LOCALITY: 34°42'50"S; 20°07'13"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Under natural conditions the mouth of this estuary used to close)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Barham (1979), Harrison (1999b)

(c) SYNTHESSES/REVIEWS: Bickerton (1984), Coetzee et al. (1996), Day (1981h), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b)

(d) REPORTS/DOCUMENTS: Cowan (1995), Harrison et al. (1995a), Harrison et al. (1995b), Hill and Associates Environmental Management Consultants (2008)

KLIPDRIFSFONTEIN ESTUARY

LOCALITY: 34°27'05"S; 20°43'53"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: State owned property)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999b)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1995a), Harrison et al. (1995b)

BREË/BREEDE ESTUARY

LOCALITY: 34°24'26"S; 20°50'53"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Riverine input declining due to irrigation demands in the catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Coetzee & Pool (1991), Harrison (1999b), McCord & Lamberth (2009), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b), Ratte (1982),

(c) SYNTHESSES/REVIEWS: Carter (1983), Coetzee et al. (1997), Day (1981h)

(d) REPORTS/DOCUMENTS: Bohlweki SSI Environmental (2008a), Bohlweki SSI Environmental (2008b), de Villiers (1988), Department of Water Affairs and Forestry (2003b), Department of Water Affairs and Forestry (2003c), Harrison et al. (1995a), Harrison et al. (1995b)

DUIWENHOKS ESTUARY

LOCALITY: 34°21'53"S; 21°00'05"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Freshwater supply to the estuary is being progressively curtailed)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999b)

(c) SYNTHESSES/REVIEWS: Carter & Brownlie (1990), Coetzee et al. (1997)

(d) REPORTS/DOCUMENTS: Fromme (1989), Harrison et al. (1995a), Harrison et al. (1995b)

GOUKOU/KAFFERKUILS ESTUARY

LOCALITY: 34°22'38"S; 21°25'22"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Freshwater supply to the estuary is being progressively curtailed)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999b), Montoya-Maya & Strydom (2009a), Montoya-Maya & Strydom (2009b)

(c) SYNTHESSES/REVIEWS: Carter & Brownlie (1990), Coetzee et al. (1997)

(d) REPORTS/DOCUMENTS: Fromme (1989), Harrison et al. (1995a), Harrison et al. (1995b), Sowman (1988)

GOURITS ESTUARY

LOCALITY: 34°20'37"S; 21°53'16"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Freshwater supply to the estuary is being progressively curtailed)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999b)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Day (1981h), Heydorn (1989)

(d) REPORTS/DOCUMENTS: Enviro-Fish Africa (Pty) Ltd (2008a), Harrison et al. (1995a), Harrison et al. (1995b)

BLINDE ESTUARY

LOCALITY: 34°12'34"S; 22°00'47"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Dense stands of exotic vegetation surround the estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Harrison (1999b)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1995a), Harrison et al. (1995b)

TWEEKUILEN ESTUARY

LOCALITY: 34°9'5"S; 22°6'42"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Poor (Remarks: Surrounded by industrial and residential developments)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

GERICKE ESTUARY

LOCALITY: 34°8'38"S; 22°6'37"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Poor (Remarks: River catchment suffers from major urban developments)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

HARTENBOS ESTUARY

LOCALITY: 34°07'07"S; 22°07'27"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Water quality important for recreation)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Watling & Watling (1982c)

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2008)

(c) SYNTHESSES/REVIEWS: Bickerton (1982), Coetzee et al. (1997), Day (1981h)

(d) REPORTS/DOCUMENTS: Bruwer (1989a), Bruwer (1989b), Harrison et al. (1995a), Harrison et al. (1995b)

KLEIN BRAK ESTUARY

LOCALITY: 34°05'31"S; 22°08'59"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Water quality important for recreation)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Watling & Watling (1982c)

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2008)

(c) SYNTHESSES/REVIEWS: Day (1981h),

(d) REPORTS/DOCUMENTS: Harrison et al. (1995a), Harrison et al. (1995b)

GROOT BRAK ESTUARY

LOCALITY: 34°03'23"S; 22°14'25"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Management of the mouth necessary following major dam construction)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Slinger et al. (1994), Watling & Watling (1982c)

(b) BIOLOGICAL/ECOLOGICAL: Adams et al. (2012), James & Harrison (2008)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Day (1981h), Morant (1983a), Slinger & Breen (1995)

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2009b), Dimopoulos (2005), EMATEK (1990), EMATEK (1992), Harrison et al. (1995a), Harrison et al. (1995b)

MAALGATE ESTUARY

LOCALITY: 34°03'14"S; 22°21'18"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Dense stands of exotic vegetation in the catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2008)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2008a), Harrison et al. (1995a), Harrison et al. (1995b)

GWAING ESTUARY

LOCALITY: 34°03'21"S; 22°26'07"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Dense stands of exotic vegetation in the catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2008)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2008a), Harrison et al. (1995a), Harrison et al. (1995b)

KAAIMANS ESTUARY

LOCALITY: 34°59'50"S; 22°33'26"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary has been subjected to narrowing through road construction)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2008)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Council for Scientific and Industrial Research (1984a), Department of Water Affairs and Forestry (2008a), Harrison et al. (1995a), Harrison et al. (1995b)

WILDERNESS ESTUARINE SYSTEM

LOCALITY: 34°59'51"S; 22°34'51"E

REGION: Warm temperate

CLASSIFICATION: Estuarine lake system

INFORMATION: Excellent

CONDITION: Good (Remarks: Located within the Wilderness Lakes National Park)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Birch et al. (1978), Coetzee & Palmer (1982), Görgens & Hughes (1982), Hughes (1982a), Martin (1962)

(b) BIOLOGICAL/ECOLOGICAL: Boshoff & Palmer (1983), Boshoff & Palmer (1988), Boshoff & Palmer (1991), Boshoff et al. (1991a), Boshoff et al. (1991b), Boshoff et al. (1991c), Boshoff & Piper (1992), Boshoff & Piper (1993), Coetzee (1981a), Coetzee (1983), Davies (1984), Hall et al. (1987), Howard-Williams (1980), Jacot Guillarmod (1982), James & Harrison (2008), Olds et al. (2011), Russell (1994), Russell (1996a), Russell (2003), Weisser & Howard-Williams (1982), Weisser et al. (1992)

(c) SYNTHESSES/REVIEWS: Allanson & Whitfield (1983)

(d) REPORTS/DOCUMENTS: Chunnet (1972), Council for Scientific and Industrial Research (1981a), Council for Scientific and Industrial Research (1982a), Cowan (1995), Department of Planning (1970), Fijen (1995a), Fijen (1995b), Fijen & Kapp (1995a), Fijen & Kapp (1995b), Fijen & Kapp (1995d), Fijen & van Zyl (1995a), Hall (1985), Hughes (1982b), Harrison et al. (1995a), Harrison et al. (1995b), Hughes (1983a), Hughes (1983b), Hughes (1983c), Hughes & Görgens (1983), Jacot Guillarmod & Allanson (1981a), Jacot Guillarmod & Allanson (1981b), Jacot Guillarmod & Allanson (1981c), Manley (1976)

SWARTVLEI ESTUARINE SYSTEM

LOCALITY: 34°01'51"S; 22°47'49"E

REGION: Warm temperate

CLASSIFICATION: Estuarine lake system

INFORMATION: Excellent

CONDITION: Good (Remarks: Controlled by South African National Parks)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Allanson & Howard-Williams (1984), Howard-Williams (1977), Huizinga (1987), Robarts & Allanson (1977), Silberbauer (1981), Silberbauer (1982)

(b) BIOLOGICAL/ECOLOGICAL: Boshoff & Palmer (1988), Boshoff & Palmer (1991), Boshoff et al. (1991a), Boshoff et al. (1991b), Boshoff et al. (1991c), Boshoff & Piper (1992), Boshoff & Piper (1993), Coetzee (1981b), Coetzee (1982a), Coetzee (1982b), Coetzee & Pool (1985), Davies (1982b), Fairall (1981), Forbes (1978), Howard-Williams (1978), Howard-Williams (1981), Howard-Williams & Allanson (1981a), Howard-Williams & Allanson (1981b), Howard-Williams & Davies (1979), Howard-Williams & Liptrot (1980), James & Harrison (2008), Kok & Whitfield (1986), Lockyear et al. (2006), Ratte (1989), Robarts (1976a), Robarts

(1976b), Robarts (1979), Robb et al. (1979), Russell (1994), Russell (1996a), Smale & Kok (1983), Taylor (1983), Whitfield (1984), Whitfield (1986a), Whitfield (1986b), Whitfield (1988a), Whitfield (1988b), Whitfield (1989a), Whitfield (1989b), Whitfield (1989d), Whitfield (1993a), Whitfield & Kok (1992), Wooldridge (1991)

(c) SYNTHESSES/REVIEWS: Howard-Williams & Allanson (1979), Whitfield et al. (1983)

(d) REPORTS/DOCUMENTS: Allanson & Whitfield (1982), Barker (1985), Council for Scientific and Industrial Research (1975), Fijen (1995c), Fijen (1995d), Fijn & Kapp (1995c), Fijn & Kapp (1995d), Fijn & van Zyl (1995d), Harrison et al. (1995a), Harrison et al. (1995b), Liptrot (1978), Liptrot & Allanson (1978), Taylor (1981), Whitfield (1982)

GOUKAMMA ESTUARY

LOCALITY: 34°04'35"S; 22°57'01"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Within the Goukamma Provincial Nature Reserve)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2008)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2009a), Harrison et al. (1995a), Harrison et al. (1995b)

KNYSNA ESTUARY

LOCALITY: 34°04'38"S; 23°03'33"E

REGION: Warm temperate

CLASSIFICATION: Estuarine bay

INFORMATION: Excellent

CONDITION: Good (Remarks: The only estuarine bay in the warm temperate region)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Allanson et al. (2000a), Huizinga (1985b), Huizinga & Haw (1986), Largier et al. (2000), Marker (2000), Marker & Miller (1993), Reddering & Esterhuysen (1984c), Reddering & Esterhuysen (1987a), Russell (1996b), Schumann (2000), Watling & Watling (1975), Watling & Watling (1976), Watling & Watling (1977), Watling & Watling (1982b), Watling et al. (1980)

(b) BIOLOGICAL/ECOLOGICAL: Allanson et al. (2000b), Allanson & Herbert (2005), Allanson & Fearon (2012), Allanson & Msizi (2010), Angelino & della Croce (1975), Barnes (2002), Barnes (2004), Barnes (2010), Barnes (2013), Barnes & Barnes (2012), Barnes & Ellwood (2011a), Barnes & Ellwood (2011b), Barnes & Ellwood (2012), Bell et al. (2003), Cretchley (1996), Davies (1987), Day (1967), Day et al. (1952), Genade & Hirst (1986), Hill (1977), Hodgson et al. (2000a), Hodgson et al. (2000b), James & Harrison (2008), Le Quesne (2000), Lockyear et al. (2006), Maree (2000), Martin et al. (2000), Millard (1950), Smale & Kok (1983), Smith (1981), Switzer (2004), Teske et al. (2003), Teske et al. (2007b), Toeffie (2001), Veldhuis (1987)

(c) SYNTHESSES/REVIEWS: Allanson (2000a), Allanson (2000b), Day (1981h), Grindley (1985), Yssel (1986)

(d) REPORTS/DOCUMENTS: Allanson (1991), Allanson & Grange (1996), Benson & Maddocks (1961), Burns & Heydorn (1988), Chunnet (1965), Coastal & Environmental Services (2007), Council for Scientific and Industrial Research (1974), Council for Scientific and Industrial Research (1976), Council for Scientific and Industrial Research (1988b), Council for Scientific and Industrial Research (1989), Crowther & Grange (1994), CSIR Environmental Services (1994), Department of Planning (1970), Dimopoulos (2005), Geldenhuys (1979), Grange & Allanson (1994), Grindley (1976), Grindley (1986), Grindley & Eagle (1978), Grindley & Snow (1983), Hanekom & Russell (1991), Harrison et al. (1995a), Harrison et al. (1995b), Haw (1984), Huizinga & Barwell (1989), Koringa (1956), Manley (1976), National Research Institute for Oceanology & VISKOR (1980), Reddering (1993), Reddering (1994), Watling & Watling (1980)

NOETSIE ESTUARY

LOCALITY: 34°04'43"S; 23°07'46"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Situated within a State forestry area)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2008)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2008a), Harrison et al. (1995a), Harrison et al. (1995b)

PIESANG ESTUARY

LOCALITY: 34°03'37"S; 23°22'46"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Estuary important from an aesthetics and recreational viewpoint)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Duvenage & Morant (1984)

(d) REPORTS/DOCUMENTS: Davies (1987), Department of Water Affairs & Forestry (1994a), Fromme (1985d), Harrison et al. (1995a), Harrison et al. (1995b)

KEURBOOMS ESTUARY

LOCALITY: 34°02'17"S; 23°23'12"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: Threat of increased freshwater offtake from the Keurbooms River)

HEALTH (NBA ASSESSMENT): Dark Blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Reddering (1981), Reddering (1983), Reddering (1988c), Reddering & Esterhuysen (1983a), Rossouw (1932), Rust & Reddering (1983), Watling & Watling (1982d)

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009), Lockyear et al. (2006)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Day (1981h), Duvenage & Morant (1984)

(d) REPORTS/DOCUMENTS: Bitou Municipality (2008), Department of Water Affairs & Forestry (1994a), Fromme (1985e), Harrison et al. (1995a), Harrison et al. (1995b), Huizinga & Gaillard (1987)

MATJIES ESTUARY

LOCALITY: 34°00'06"S; 23°28'14"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Small system which supplies freshwater to Keurboomstrand development)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2007a), Harrison et al. (1995a), Harrison et al. (1995b)

SOUT ESTUARY (EAST)

LOCALITY: 33°59'20"S; 23°32'12"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Within the De Vasselot State Forestry Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Morant & Bickerton (1983)

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2007b), Harrison et al. (1995a), Harrison et al. (1995b)

GROOT ESTUARY (WEST)

LOCALITY: 33°58'52"S; 23°34'17"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Forms western boundary of the Tsitsikamma National Park)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Morant & Bickerton (1983)

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

BLOUKRANS ESTUARY

LOCALITY: 33°58'45"S; 23°38'52"E

REGION: Warm temperate

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Good (Remarks: Located within the Tsitsikamma National Park)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

LOTTERING ESTUARY

LOCALITY: 33°59'41"S; 23°44'10"E

REGION: Warm temperate

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Good (Remarks: Located within the Tsitsikamma National Park)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

ELANDBOS ESTUARY

LOCALITY: 34°00'04"S; 23°46'04"E

REGION: Warm temperate

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Good (Remarks: Located within the Tsitsikamma National Park)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

STORMS ESTUARY

LOCALITY: 34°01'08"S; 23°54'15"E

REGION: Warm temperate

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Good (Remarks: Located within the Tsitsikamma National Park)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

ELANDS ESTUARY

LOCALITY: 34°02'38"S; 24°04'43"E

REGION: Warm temperate

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Good (Remarks: Located within the Tsitsikamma National Park)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Department of Water Affairs & Forestry (1994b), Harrison et al. (1996a), Harrison et al. (1996b)

GROOT ESTUARY (EAST)

LOCALITY: 34°03'34"S; 24°11'42"E

REGION: Warm temperate

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Fair (Remarks: Extensive agriculture in the catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Department of Water Affairs & Forestry (1994b), Harrison et al. (1996a), Harrison et al. (1996b)

TSITSIKAMMA ESTUARY

LOCALITY: 34°08'06"S; 24°26'18"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Extensive agriculture in the catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS: Turpie et al. (2002)

(d) REPORTS/DOCUMENTS: Bate et al. (1994), Department of Water Affairs & Forestry (1994b), Department of Water Affairs and Forestry (2003d), Harrison et al. (1996a), Harrison et al. (1996b), Lee (1993), Nel et al. (2006)

KLIPDRIF ESTUARY

LOCALITY: 34°10'13"S; 24°38'01"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Dense stands of exotic vegetation and agriculture in the catchment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

SLANG ESTUARY

LOCALITY: 34°10'23"S; 24°39'01"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Coastal resort of Oyster Bay situated on the west bank)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2009)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

KROMME ESTUARY

LOCALITY: 34°08'27"S; 24°50'36"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Excellent

CONDITION: Fair (Remarks: This system has a catchment which is severely impounded)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Crosby (1993), Emmerson & Erasmus (1987), Schumann & de Meillon (1993), Watling & Watling (1982e)

(b) BIOLOGICAL/ECOLOGICAL: Adams (1991), Adams et al. (1992), Adams & Talbot (1992), Allesina et al. (2005), Baird (1979), Baird et al. (1981), Cloete (1993), Cloete (1994), Hanekom & Baird (1984), Hanekom (1982), Hanekom & Baird (1988), Hecht (1973), Heymans & Baird (1995), James & Harrison (2010a), Jerling & Wooldridge (1994a), Marais (1983a), Melville-Smith (1981), Newman (1993), Quinn et al. (1998), Scharler & Baird (2000), Scharler & Baird (2003b), Scharler & Baird (2005a), Scharler & Baird (2005b), Scharler & Fath. (2012), Seagrief (1976), Snow et al. (2000b), Snow & Adams (2006), Strydom (2002), Strydom & Whitfield (2000), Strydom et al. (2003), Teske & Wooldridge (2001), Teske & Wooldridge (2003), Wooldridge (2007), Wooldridge & Callahan (2000)

(c) SYNTHESSES/REVIEWS: Baird & Heymans (1996), Bate & Adams (2000), Bickerton & Pierce (1988), Coetzee et al. (1997), Day (1981h), Scharler et al. (1997)

(d) REPORTS/DOCUMENTS: Baird et al. (1992), Bickerton (1986), Council for Scientific and Industrial Research (1984b), Council for Scientific and Industrial Research (1992), Department of Water Affairs and Forestry (2006a), Department of Water Affairs and Forestry (2006b), Department of Water Affairs and Forestry (2006c), Emmerson et al. (1982), Fromme & Badenhorst (1987), Harrison et al. (1996a), Harrison et al. (1996b), Heymans (1992), Huizinga (1991), Lee (1993), Reddering & Esterhuysen (1983b), Sale (2007), Sowman (1990a), Sowman & Fuggle (1985), Sowman & Fuggle (1989)

SEEKOEI ESTUARY

LOCALITY: 34°05'11"S; 24°54'30"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Good

CONDITION: Fair (Remarks: Large number of small farm dams in the catchment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Esterhuysen (1983)

(b) BIOLOGICAL/ECOLOGICAL: Adams (1991), Adams et al. (1992), Dundas (1994), James & Harrison (2010a), Whitfield (1989e)

(c) SYNTHESSES/REVIEWS: Bickerton & Pierce (1988), Coetzee et al. (1997), Whitfield (1989f)

(d) REPORTS/DOCUMENTS: Bickerton & Badenhorst (1987), Bickerton & Zoutendyk (1990), Department of Water Affairs and Forestry (2006a), Department of Water Affairs and Forestry (2006b), Department of Water Affairs and Forestry (2006c), Esterhuysen (1982), Fromme & Badenhorst (1987), Harrison et al. (1996a), Harrison et al. (1996b), Wooldridge & Wallace (1977)

KABELJOUS ESTUARY

LOCALITY: 34°00'17"S; 24°56'13"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: Threatened with increased freshwater demand for catchment irrigation)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Adams (1991), Adams et al. (1992), Dundas (1994), James & Harrison (2010a), Strydom (2002), Strydom (2003a), Strydom et al. (2003), Teske & Wooldridge (2001), Teske & Wooldridge (2003)

(c) SYNTHESSES/REVIEWS: Bickerton & Pierce (1988), Coetzee et al. (1997)

(d) REPORTS/DOCUMENTS: Fromme & Badenhorst (1987), Harrison et al. (1996a), Harrison et al. (1996b), Reddering & Esterhuysen (1984b)

GAMTOOS ESTUARY

LOCALITY: 33°58'10"S; 25°01'55"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Good

CONDITION: Fair (Remarks: Quantity and quality of river water declining)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Pearce (1997), Pearce & Schumann (1997), Schumann & Pearce (1997), Watling & Watling (1982e), Zhang et al. (1995)

(b) BIOLOGICAL/ECOLOGICAL: Adams (1991), Adams et al. (1992), Bate et al. (2002), Callaghan (2001), Gyedu-Ababio (2011), James & Harrison (2010a), Loubser (1992), Marais (1983b), Newman (1993), Newman et al. (2007), Scharler & Baird (2003a), Scharler & Baird (2005b), Schlacher & Wooldridge (1994), Schlacher & Wooldridge (1995), Schlacher & Wooldridge (1996a), Schlacher & Wooldridge (1996b), Schlacher & Wooldridge (1996c), Shewell (1950), Skelton (1993), Snow (1999), Snow et al. (2000a), Strydom (1998), Strydom (2002), Strydom et al. (2003), Teske & Wooldridge (2001), Strydom & Wooldridge (2005), Whitfield & Wood (2003)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Day (1981h), Heineken (1981c)

(d) REPORTS/DOCUMENTS: Enviro-Fish Africa (Pty) Ltd (2007), Enviro-Fish Africa (Pty) Ltd (2008b), Harrison et al. (1996a), Harrison et al. (1996b), Lee (1993), Reddering & Esterhuysen (1984a), Reddering & Scarr (1990a)

VAN STADENS ESTUARY

LOCALITY: 33°58'10"S; 25°13'17"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Water quality important for recreational purposes)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Dundas (1994), Gama (2008), James & Harrison (2010a), Skinner (2005), Skinner et al. (2006), Strydom (2002), Strydom (2003a), Strydom et al. (2003), Teske & Wooldridge (2001), Teske & Wooldridge (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Gama et al. (2005), Harrison et al. (1996a), Harrison et al. (1996b)

MAITLAND ESTUARY

LOCALITY: 33°59'17"S; 25°17'27"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Important recreational area on the outskirts of Port Elizabeth)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Gama (2008), James & Harrison (2010a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Gama et al. (2005), Harrison et al. (1996a), Harrison et al. (1996b)

BAAKENS/BAKENS ESTUARY

LOCALITY: 33°57'50"S; 25°37'46"E

REGION: Warm temperate

CLASSIFICATION: Canalized estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Completely transformed due to harbour and urban developments)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2010a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b), Hops (1990)

SWARTKOPS ESTUARY

LOCALITY: 33°51'54"S; 25°38'00"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Excellent

CONDITION: Fair (Remarks: Ecologically viable despite urban developments and floodplain modification)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Baird & Winter (1990a), Baird & Winter (1990b), Baird & Winter (1992), Baird et al. (1987), Binning & Baird (2001), Branch (1986), Dye (1978a), Emmerson (1985a), Esterhuysen & Rust (1987), Hilmer & Bate (1987), Huizinga (1984), Lord & MacKay (1993), MacKay (1994), Mlangeni (2007), Talbot (1982a), Watling & Watling (1982a), Winter (1990), Winter & Baird (1991), Winter et al. (1996)

(b) BIOLOGICAL/ECOLOGICAL: Addo-Bediako (1998), Allesina et al. (2005), Baird (1978), Beckley (1983), Beckley (1984a), Beckley (1985a), Bok (1979), Bok (1983), Daniel (1992), Daniel (1994a), Daniel (1994b), de Keyser (1987), de Wet (1988), de Wet & Marais (1990), Dye (1977), Dye (1978b), Dye (1978c), Dye et al. (1978), Dye & Furstenberg (1981), Els (1982), Emmerson (1983), Emmerson (1986), Emmerson (1987), Every (1973), Forbes (1977), Gilchrist (1918), Gyedu-Ababio (2002), Gyedu-Ababio (2011), Gyedu-Ababio et al. (1999), Hanekom (1980), Hanekom (1986), Hanekom (1989), Hanekom & Baird (1992), Hanekom et al. (1988), Hanekom & Erasmus (1988), Hanekom & Erasmus (1989), Hilmer (1984), James & Harrison (2010a), Kitson (1994), Macnae (1956a), Macnae (1957a), Macnae (1957b), Malan (1982), Marais (1976), Marais (1977-79), Marais & Baird (1980a), Marais & Baird (1980b), Marais & Erasmus (1977a), Marais & Erasmus (1977b), Martin (1984), Martin (1991a), Martin (1991b), Martin & Baird (1987), Masson & Marais (1975), McLachlan (1972), McLachlan & Grindley (1974), Melville-Smith (1978), Melville-Smith & Baird (1980), Nixon (1975), Painter (1966), Perissinotto & Wooldridge (1989), Pereyra Lago (1986), Pereyra Lago (1993a), Pierce (1979), Pierce (1983), Pocock (1955), Scharler & Baird (2003b), Scharler & Baird (2005a), Scharler & Baird (2005b), Scharler & Fath. (2012), Strydom (2002), Strydom (2003a), Strydom et al. (2003), Talbot & Bate (1987), Talbot (1982b), Talbot et al. (1988), Teske & Wooldridge (2001), Teske & Wooldridge (2003), van der Horst & Erasmus (1978), van der Westhuizen & Marais (1977), van Staden (2001), Whitfield (1978a), Winter (1979), Wooldridge (1979), Wooldridge & Melville-Smith (1979)

(c) SYNTHESSES/REVIEWS: Baird (1992), Baird et al. (1986), Baird et al. (1988), Baird et al. (1991), Baird et al. (1996), Coetzee et al. (1997), Day (1981h), Edwards (1969), McLachlan (1975), Tyson (1988), van der Merwe (1975), Scharler et al. (1997)

(d) REPORTS/DOCUMENTS: Anon (1974a), Badenhorst (1985), Colloty et al. (2000), Connell et al. (1976a), Connell et al. (1976d), Emmerson et al. (1982), Enviro-Fish Africa (Pty) Ltd (2009), Fromme (1988), Glen (1980), Harrison et al. (1996a), Harrison et al. (1996b), Hill et al. (1984), Lee (1993), MacKay (1993), Martin & Baird (1988), Reddering & Esterhuysen (1981a), Slinger et al. (1998), van der Merwe (1974), Wooldridge (1992)

COEGA/NGQURA/NGQURHA ESTUARY

LOCALITY: 33°47'49"S; 25°41'43"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Estuary has been converted into a salt works)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Dicken (2010), Every (1970), James & Harrison (2010a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b)

SUNDAYS ESTUARY

LOCALITY: 33°43'19"S; 25°50'57"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Excellent

CONDITION: Fair (Remarks: Important recreational area, especially for anglers)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Emmerson (1989), Forbes & Allanson (1970), Illenberger (1988), Illenberger (1991), MacKay & Schumann (1990), MacKay (1988), MacKay & Schumann (1991), Watling & Watling (1982f)

(b) BIOLOGICAL/ECOLOGICAL: Allesina et al. (2005), Beckley (1984b), Harrison & Whitfield (1990), Hilmer (1990), Hilmer & Bate (1990), Daniel (1994b), Hilmer & Bate (1991), Illenberger (1992), James & Harrison (2010a), Jerling (1988), Jerling (1994), Jerling & Wooldridge (1991), Jerling & Wooldridge (1992), Jerling & Wooldridge (1994b), Jerling & Wooldridge (1995a), Jerling & Wooldridge (1995b), Jerling & Wooldridge (1995c), Kotsedi et al. (2012), MacKay (1989), Marais (1981), Scharler & Baird (2003b), Scharler & Baird (2005a), Scharler & Baird (2005b), Scharler & Fath (2012), Strydom (2002), Strydom et al. (2003), Sutherland et al. (2012), Teske & Wooldridge (2001), Teske & Wooldridge (2003), Wasserman & Strydom (2011), Wasserman et al. (2011b), Wasserman et al. (2012), Whitfield (1994a), Whitfield & Harrison (1996), Whitfield & Paterson (1995), Wooldridge (1979), Wooldridge (1986a), Wooldridge & Bailey (1982), Wooldridge & Erasmus (1980), Wooldridge & Melville-Smith (1979), Wooldridge & Webb (1988)

(c) SYNTHESSES/REVIEWS: Baird et al. (1996), Beckley & Wooldridge (1988), Day (1981h), Scharler et al. (1997)

(d) REPORTS/DOCUMENTS: Council for Scientific and Industrial Research (1983a), Department of Water Affairs and Forestry (2008b), Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 4), Reddering & Esterhuysen (1981c), National Research Institute for Oceanology (1983a), Swart (1986)

BOKNES ESTUARY

LOCALITY: 33°43'36"S; 26°35'13"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Extensive aquatic plant beds a feature of this system)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2010b)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Fromme (1986b), Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 1)

BUSHMANS/BOESMANS ESTUARY

LOCALITY: 33°41'41"S; 26°39'48"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Good

CONDITION: Fair (Remarks: Reduced riverine input due to high agricultural demands)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Baird et al. (1983), Watling & Watling (1983), Uncles et al. (1990)

(b) BIOLOGICAL/ECOLOGICAL: Becker et al. (2012), Gerber (1992), James & Harrison (2010b), Jubb (1972), Palmer (1980a), Robertson (1984), Robertson (1996)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Baird et al. (1981), Bornman & Klages (2004), Fromme (1986b), Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 1), Reddering & Esterhuysen (1981b), Whitfield & Ter Morshuizen (1992)

KARIEGA ESTUARY

LOCALITY: 33°40'55"S; 26°41'15"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Excellent

CONDITION: Fair (Remarks: Reduced freshwater input due to urban and agricultural demands)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Allanson & Read (1987), Mlangeni (2007), Orr et al. (2008), Taylor (1992), Ter Morshuizen (1995), Watling & Watling (1983)

(b) BIOLOGICAL/ECOLOGICAL: Bate et al. (2002), de Villiers (1990), Froneman (2000), Froneman (2001a), Froneman (2001b), Froneman (2001c), Froneman (2002a), Froneman & McQuaid (1997), Froneman (2002d), (Froneman & Vorwerk (2003), Grange (1992), Grange & Allanson (1995), Hodgson (1987), James & Harrison (2010b), Neethling & Jubb (1973), Paterson (1995a), Paterson (1998), Paterson & Whitfield (1996), Paterson & Whitfield (1997), Paterson & Whitfield (2000a), Richardson et al. (2006), Richoux & Froneman (2007), Richoux & Froneman (2008), Robertson (1996), Strydom (2002), Strydom et al. (2002), Strydom et al. (2003), Taylor & Allanson (1993), Taylor & Allanson (1995), Ter Morshuizen & Whitfield (1994), Teske & Wooldridge (2001), Teske & Wooldridge (2003), Vorwerk et al. (2007), Vorwerk et al. (2008a), Vorwerk et al. (2008b), Vorwerk et al. (2009), Wasserman & Strydom (2011), Whitfield (1994a), Whitfield (1994b), Whitfield & Paterson (2003), Whitfield & Wood (2003)

(c) SYNTHESSES/REVIEWS: Allanson & Read (1995), Grange et al. (2000)

(d) REPORTS/DOCUMENTS: Fromme (1986b), Gaillard & Huizinga (1988), Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 1), Taylor (1987), Whitfield & Ter Morshuizen (1992)

GRANT'S ESTUARY

LOCALITY: 33°40'12"S; 26°42'10"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Threatened by impoundment in the small catchment.

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Froneman (2006a), Lukey (2005), Lukey et al (2006)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

KASUKA/KASOUGA ESTUARY

LOCALITY: 33°39'17"S; 26°44'08"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: A well conserved, recreationally important Eastern Cape estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Froneman (2002a), Froneman (2002b), Froneman (2002c), Froneman (2004a), Froneman (2004b), Froneman (2004c), Henninger et al. (2008), James & Harrison (2010b), Jubb (1979), Tweddle (2005), Wasserman, & Froneman (2013), Wasserman et al. (2013)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Fromme (1986b), Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 1), Whitfield & Ter Morshuizen (1992)

KOWIE ESTUARY

LOCALITY: 33°36'11"S; 26°54'10"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Good

CONDITION: Fair (Remarks: Lower reaches highly impacted by human activities)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Crosby (1993), Gray (2001), Kokkinn & Allanson (1985), Schumann et al. (2001), Watling & Watling (1983)

(b) BIOLOGICAL/ECOLOGICAL: Bok (1979), Bok (1983), Davies (1980), Hill (1975b), Hill (1978), James & Harrison (2010b), Kruger & Strydom (2010), Nsubuga (2004), Robertson (1996), Vromans (2011), Wasserman (2011a), Wasserman & Strydom (2011), Whitfield et al. (1994)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Day (1981h), Heineken & Grindley (1982)

(d) REPORTS/DOCUMENTS: Grange et al. (1992), Harrison et al. (1996a), Harrison et al. (1996b), PLAN Associates (1986), Sale (2007)

RUFANE ESTUARY

LOCALITY: 33°34'51"S; 26°56'15"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Water supply compromised by large farm dams in the tributaries)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: James & Harrison (2010b)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 2)

RIET ESTUARY

LOCALITY: 33°33'40"S; 27°00'53"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Important from an aesthetic and recreational viewpoint)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Orr et al. (2008)

(b) BIOLOGICAL/ECOLOGICAL: Froneman et al. (2011), James & Harrison (2010b), Terörde (2008)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 2)

KLEINEMONDE ESTUARY (WEST)

LOCALITY: 33°32'28"S; 27°02'51"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: Holiday resort development in mouth region)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Brown (1953), Blaber (1973a), Blaber (1973c), Blaber (1974a), Henninger et al. (2008), James & Harrison (2010b), Reddy et al. (2011), Riddin & Adams (2009), Terörde (2008)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Badenhorst (1988a), Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 2)

KLEINEMONDE ESTUARY (EAST)

LOCALITY: 33°32'21"S; 27°02'55"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Excellent

CONDITION: Good (Remarks: Holiday resort development in mouth region)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Kruger (2007), Orr et al. (2008), Smakhtin (2004)

(b) BIOLOGICAL/ECOLOGICAL: Allan & Froneman (2008a), Allan & Froneman (2008b), Becker et al. (2010), Becker et al. (2011a), Becker et al. (2011b), Bell et al. (2001), Bernard et al. (2005), Bennett et al. (2012), Cowley (1998), Cowley & Whitfield (2001a), Cowley & Whitfield (2001b), Cowley & Whitfield (2002), Cowley et al. (2001), Ellender et al. (2008), Froneman (2006a), Froneman (2006b), Henninger et al. (2008), James (2006), James et al. (2007b), James et al. (2008c), James et al. (2008d), James & Harrison (2010b), Kemp & Froneman (2004), Kerwath et al. (2005), Reddy et al. (2011), Richardson et al. (2010), Riddin & Adams (2008), Riddin & Adams (2009), Riddin & Adams (2010), Riddin & Adams (2012), Sheppard et al. (2011), Sheppard et al. (2012), Strydom (2002), Strydom et al. (2003), Terörde (2008), Terörde & Turpie (2012), Teske & Wooldridge (2001), Teske & Wooldridge (2003), Van Niekerk et al. (2008), Vorwerk et al. (2001), Vorwerk et al. (2003), Vromans (2011)

(c) SYNTHESSES/REVIEWS: Richardson et al. (2011), Whitfield et al. (2008)

(d) REPORTS/DOCUMENTS: Badenhorst (1988a), Harrison et al. (1996a), Harrison et al. (1996b), Heydorn & Morant (undated 2), Turpie et al. (2008), Turpie et al. (2009a), Turpie et al. (2009b), Turpie et al. (2009c)

KLEIN PALMIET ESTUARY

LOCALITY: 33°30'29"S; 27°07'32"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Beach access road encroaches onto estuary margins)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Vorwerk et al. (2001), Vorwerk et al. (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

GREAT FISH ESTUARY

LOCALITY: 33°39'37"S; 27°08'10"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Excellent

CONDITION: Good (Remarks: A very important recreational area, especially for anglers)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Allanson & Read (1987), Hiller & Stavrakis (1982), Watling & Watling (1983)

(b) BIOLOGICAL/ECOLOGICAL: Bate et al. (2002), Bok (1979), Bok (1983), Childs (2006), Childs et al. (2008a), Childs et al. (2008b), Childs et al. (2008c), Cowley et al. (2008), Froneman (2000), Froneman (2002a), Grange (1992), Grange & Allanson (1995), James & Harrison (2010b), Mesher (2005), Strydom (2002), Strydom et al. (2002), Strydom et al. (2003), Ter Morshuizen (1996), Ter Morshuizen et al. (1996), Ter Morshuizen et al. (1997), Teske & Wooldridge (2001), Teske & Wooldridge (2003), Vorwerk et al. (2001), Vorwerk et al. (2003), Wasserman (2012), Wasserman & Strydom (2011), Whitfield (1994a), Whitfield et al. (1994), Whitfield & Wood (2003)

(c) SYNTHESSES/REVIEWS: Allanson & Read (1995), Day (1981h), Grange et al. (2000)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1996a), Harrison et al. (1996b), Lucas (1986), Reddering & Esterhuysen (1982)

OLD WOMAN'S ESTUARY

LOCALITY: 33°28'58"S; 27°08'53"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: Estuary surrounded by a golf course)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Richardson et al. (2010), Richardson et al. (2011), Strydom (2002), Strydom et al. (2003), Teske & Wooldridge (2001), Teske & Wooldridge (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

THATSHANA ESTUARY

LOCALITY: 33°27'47"S; 27°11'11"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Fair (Remarks: Large farm impoundment in catchment and escaped alien bass in the estuary)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

MPEKWENI ESTUARY

LOCALITY: 33°26'17"S; 27°13'51"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary mouth is artificially manipulated by the Mpekeni Sun Hotel)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Teske & Wooldridge (2001), Teske & Wooldridge (2003), Vorwerk et al. (2001), Vorwerk et al. (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

MTHATHI/MTATI ESTUARY

LOCALITY: 33°25'20"S; 27°15'36"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: New resort development near mouth)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Teske & Wooldridge (2001), Teske & Wooldridge (2003), Vorwerk et al. (2001), Vorwerk et al. (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Grobblers et al. (1987), Harrison et al. (1997a), Harrison et al. (1997b)

MGWALANA ESTUARY

LOCALITY: 33°24'47"S; 27°16'28"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Small holiday resort at the mouth)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Vorwerk et al. (2001), Vorwerk et al. (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

BHIRHA/BIRA/BEGHA ESTUARY

LOCALITY: 33°22'57"S; 27°19'34"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Northern bank artificially stabilized near the mouth)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Vorwerk et al. (2001), Vorwerk et al. (2003), Terörde (2008)

(c) SYNTHESSES/REVIEWS: Turpie et al. (2002)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

GQUTYWA ESTUARY

LOCALITY: 33°21'45"S; 27°21'31"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: This estuary falls within a declared conservation area)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Strydom (2002), Strydom et al. (2003), Teske & Wooldridge (2001), Teske & Wooldridge (2003), Vorwerk et al. (2001), Vorwerk et al. (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

NGCULURA/NGCULURHA ESTUARY

LOCALITY: 33°21'29"S; 27°22'10"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment degradation has occurred)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Vorwerk et al. (2001), Vorwerk et al. (2003)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

MTANA ESTUARY

LOCALITY: 33°19'06"S; 27°25'58"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Vehicle access route to the beach encroaches onto the estuary bank)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Richardson et al. (2010), Richardson et al. (2011)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

KEISKAMMA ESTUARY

LOCALITY: 33°16'56"S; 27°29'33"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Increasing freshwater abstraction and human impacts in the catchment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Read (1983a)

(b) BIOLOGICAL/ECOLOGICAL: Colloty (1997), Read (1982), Read (1985a), Read (1985b), Robertson (1996), Strydom (2002), Strydom et al. (2003), Vorwerk et al. (2001), Vorwerk et al. (2003)

(c) SYNTHESSES/REVIEWS: Allanson & Read (1995), Cowling & McKenzie (1979), Day (1981h), Teske & Wooldridge (2001), Teske & Wooldridge (2003)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

NGQINISA ESTUARY

LOCALITY: 33°15'12"S; 27°31'47"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment shows rural development and estuary undeveloped)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

KHIWANE/KIWANE ESTUARY

LOCALITY: 33°14'57"S; 27°32'38"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment shows rural development and estuary undeveloped)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b)

TYOLOMNQA ESTUARY

LOCALITY: 33°13'32"S; 27°35'01"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: State forestry reserve on the western side)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Bowd et al. (2012), Maponya (2004), Maponya & Ngulube (2007), Mosia & Ngulube (2005), Robertson (1996)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b), Mosia (2003)

SHELBERTSSTROOM ESTUARY

LOCALITY: 33°12'22"S; 27°36'58"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Floodplain disturbed following construction of car park and ablution facility)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

LILYVALE ESTUARY

LOCALITY: 33°11'36"S; 27°38'15"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Resort development of Christmas Rock situated to the east of the estuary)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

ROSS' CREEK ESTUARY

LOCALITY: 33°10'35"S; 27°39'31"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Farmlands in the catchment and resort development to the east)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

NCERHA/NCERA ESTUARY

LOCALITY: 33°10'12"S; 27°40'11"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Causeway/weir at head of estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

MLELE ESTUARY

LOCALITY: 33°09'35"S; 27°40'51"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Weir at head of estuary and part of shoreline has been stabilized)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

MCANTSI ESTUARY

LOCALITY: 33°08'44"S; 27°42'11"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Kidd's Beach holiday resort on southern bank of estuary)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

GXULU ESTUARY

LOCALITY: 33°07'04"S; 27°43'55"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Fair proportion of estuarine floodplain comprises holiday resort)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

GODA ESTUARY

LOCALITY: 33°06'00"S; 27°46'30"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Small holiday resort on northern bank of estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Vumazonke et al. (2008)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

HLOZI ESTUARY

LOCALITY: 33°05'09"S; 27°48'39"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Farmlands in catchment may impact on estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

HICKMAN'S ESTUARY

LOCALITY: 33°04'11"S; 27°50'22"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment under agriculture but estuary surrounds in good condition)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

BUFFALO ESTUARY

LOCALITY: 33°01'42"S; 27°54'57"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Urban and rural pollution of freshwater supply to estuary)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Watling et al. (1985)

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Connell et al. (1978a), Connell et al. (1981a), Harrison et al. (1997a), Harrison et al. (1997b)

BLIND ESTUARY

LOCALITY: 33°00'25"S; 27°55'38"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: There is an urgent need to improve estuarine water quality)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Talbot et al. (1985)

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

HLANZE/IHLANZE ESTUARY

LOCALITY: 32°59'20"S; 27°57'02"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: There is an urgent need to improve estuarine water quality)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Talbot et al. (1985)

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

NAHOON ESTUARY

LOCALITY: 32°59'10"S; 27°57'08"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Important environmental asset and recreational facility)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Reddering & Esterhuysen (1987b), Talbot et al. (1985)

(b) BIOLOGICAL/ECOLOGICAL: Bursey & Wooldridge (2002), Bursey & Wooldridge (2003), Campbell et al. (1991), Sale (2007), Steinke (1986a)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Wiseman et al. (1993)

(d) REPORTS/DOCUMENTS: Council for Scientific and Industrial Research (1985b), Department of Water Affairs and Forestry (2001), Esterhuysen & Reddering (1985), Harrison et al. (1997a), Harrison et al. (1997b), Wooldridge (1986b)

QUINIRHA/QUINERA ESTUARY

LOCALITY: 32°58'27"S; 27°57'57"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Important environmental asset and recreational facility)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Talbot et al. (1985)

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Wiseman et al. (1993)

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

GQUNUBE ESTUARY

LOCALITY: 32°55'59"S; 28°01'59"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Important environmental asset and recreational facility)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Campbell et al. (1991), Steinke (1972a), Steinke (1986a)

(c) SYNTHESSES/REVIEWS: Coetzee et al. (1997), Wiseman et al. (1993)

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b), Wooldridge (1986b)

KWELERA/KWELERHA ESTUARY

LOCALITY: 32°54'26"S; 28°04'35"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Resort development in estuary mouth region)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: du Preez & Hosking (2010)

(b) BIOLOGICAL/ECOLOGICAL: Campbell et al. (1991), Steinke (1986a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b), Wooldridge (1986b)

BULURHA/BULURA ESTUARY

LOCALITY: 32°53'28"S; 28°05'38"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Resort development in the estuary mouth region)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

CUNGE ESTUARY

LOCALITY: 32°51'41"S; 28°06'44"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Relatively low dissolved oxygen levels in bottom waters reported)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

CINTSA ESTUARY

LOCALITY: 32°49'51"S; 28°06'59"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Extensive resort development in the vicinity of the lower reaches)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

CEFANE ESTUARY

LOCALITY: 32°48'30"S; 28°08'11"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: May be considered for inclusion in a coastal reserve)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

KWENXURA/KWENXURHA ESTUARY

LOCALITY: 32°47'57"S; 28°09'02"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: May be considered for inclusion in a coastal reserve)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

NYARHA/NYARA ESTUARY

LOCALITY: 32°47'02"S; 28°10'56"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: May be considered for inclusion in a coastal reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Perissinotto et al. (2000), Walker et al. (2001)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

HAGA-HAGA ESTUARY

LOCALITY: 32°45'42"S; 28°15'15"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Increased pressure on freshwater supply for resort development)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Whitfield (1992a)

(c) SYNTHESSES/REVIEWS: Hill & Brown (1996),

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b), Whitfield (1993b)

MTENDWE ESTUARY

LOCALITY: 32°44'24"S; 28°17'13"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Both catchment and estuary in excellent condition)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

QUKO ESTUARY

LOCALITY: 32°43'34"S; 28°18'32"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Most of the estuary is within a declared conservation area)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS: Burns et al. (1988), Coetzee et al. (1997)

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

MORGAN ESTUARY

LOCALITY: 32°42'27"S; 28°20'44"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Increasing demand for freshwater supply to holiday resort)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

CWILI ESTUARY

LOCALITY: 32°41'27"S; 28°22'29"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment in excellent condition but remnants of old road bridge in estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Harrison et al. (1997a), Harrison et al. (1997b)

GREAT KEI ESTUARY

LOCALITY: 32°40'43"S; 28°23'15"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment rehabilitation needed to reduce silt load)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Plumstead (1984), Plumstead et al. (1985), Robertson (1996)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1997a), Harrison et al. (1997b), Marais & Prinsloo (1980)

GXARHA/GXARA ESTUARY

LOCALITY: 32°40'00"S; 28°23'00"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Water quality measurements indicate bacterial contamination)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

GQWARHA/GQWARA ESTUARY

LOCALITY: 32°39'30"S; 28° 24'45"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Some soil erosion occurring in the undeveloped catchment)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

NGOGWANE ESTUARY

LOCALITY: 32°38'56"S; 28°25'18"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Subsistence agriculture in the catchment but estuary in good condition)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

QOLORHA/QOLORA ESTUARY

LOCALITY: 32°37'49"S; 28°25'59"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment in fair condition but estuary in excellent condition)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Coastal & Environmental Services (2010), Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

NCIZELE ESTUARY

LOCALITY: 32°37'43"S; 28°26'19"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Catchment in fair condition but estuary in excellent condition)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

TIMBA ESTUARY

LOCALITY: 32°37'31"S; 28° 26'45."E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Nil

CONDITION: Fair (Remarks: Most of catchment is used for subsistence agriculture with evidence of erosion)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

KHOBONQABA/KOBONQABA ESTUARY

LOCALITY: 32°36'25"S; 28°29'25"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Reduced water quality due to high *E.coli* counts)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Steinke (1972a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

NGQUSI/INXAXO ESTUARY

LOCALITY: 32°35'05"S; 28°31'32"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Wavecrest holiday resort on southern shore near mouth)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Robertson (1996), Steinke (1972a), Steinke & Ward (1990), Wasserman et al. (2010)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MASIMINI/BOWKER'S ESTUARY

LOCALITY: 32°33'06"S; 28°33'16"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Extensive rural agriculture in the catchment but no soil erosion)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

CEBE ESTUARY

LOCALITY: 32°31'22"S; 28°35'06"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: The Cebe Nature Reserve camp site is situated near the estuary mouth)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

GQUNQE ESTUARY

LOCALITY: 32°31'08"S; 28°35'23"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: There is in urgent need for ecological information on this estuary)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

ZALU ESTUARY

LOCALITY: 32°30'09"S; 28°36'12"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary in excellent condition but catchment fair)

HEALTH (NBA ASSESSMENT): Blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

NGQWARHA/NGQWARA ESTUARY

LOCALITY: 32°29'32"S; 28°36'51"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Floodplain and surrounding area used for grazing cattle)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

SIHLONTLWENI/GCINI ESTUARY

LOCALITY: 32°28'48"S; 28°38'45"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Subsistence agriculture in catchment but riverine vegetation undisturbed)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

NEBELELE ESTUARY

LOCALITY: 32°27'45"S; 28°39'21"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Estuary in excellent condition but rural agriculture in southern catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

QHORHA/QORA ESTUARY

LOCALITY: 32°26'50"S; 28°40'21"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: System is regularly used for recreational boating and fishing)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Robertson (1996)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

JUJURHA/JUJURA ESTUARY

LOCALITY: 32°25'49"S; 28°41'40"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Poor water quality requires attention)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

NGADLA ESTUARY

LOCALITY: 32°25'03"S; 28°42'33"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary excellent and limited subsistence agriculture in catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

SHIXINI ESTUARY

LOCALITY: 32°24'10"S; 28°43'39"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary excellent but catchment under subsistence agriculture)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

BEECHAM WOOD ESTUARY

LOCALITY: 32° 22'29"S; 28° 45'7"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Excellent (Remarks: Abandoned rural agriculture in most of the catchment area)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

TENZA ESTUARY

LOCALITY: 32° 22'10"S; 28° 45'27"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Erosion caused by vehicles in the vicinity of the estuary of concern)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

KWAGOQO ESTUARY

LOCALITY: 32° 21'55"S; 28° 45'42"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Erosion caused by vehicles in the vicinity of the estuary of concern)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

KU-NOCEKEDWA ESTUARY

LOCALITY: 32° 20'53"S; 28° 46'39"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Erosion caused by sand removal in the vicinity of the estuary is of concern)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

NQABARA ESTUARY

LOCALITY: 32°20'21"S; 28°47'23"E

REGION: Warm temperate

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Mangroves stands present in estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Robertson (1996), Steinke (1972a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Marais & Prinsloo (1980)

DWESA ESTUARY

LOCALITY: 32°18'18"S; 28° 49' 46"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Excellent (Remarks: Situated in the Dwesa Nature Reserve adjacent to tourist camp)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

NGOMA/KOBULE ESTUARY

LOCALITY: 32°18'05"S; 28°50'18"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Situated in the Dwesa Nature Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: van der Elst (1978a)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MENDU ESTUARY

LOCALITY: 32°16'46"S; 28°52'46"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Situated in the Dwesa Nature Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MENDWANA ESTUARY

LOCALITY: 32°16'07"S; 28°53'01"E

REGION: Warm temperate

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Excellent (Remarks: Situated within the Dwesa Nature Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

SUBTROPICAL ESTUARIES

MBHASHE/MBASHE ESTUARY

LOCALITY: 32°14'55"S; 28°54'03"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: Poor catchment management has led to siltation of the estuary)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Dardis & Plumstead (1988)

(b) BIOLOGICAL/ECOLOGICAL: Plumstead (1984), Plumstead (1990), Plumstead et al. (1989a), Steinke (1972), Venter & Mann (2012)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Connell et al. (1976b), Connell et al. (1976d), Connell et al. (1978b), Connell et al. (1980a), Connell et al. (1981b), Harrison et al. (1998a), Harrison et al. (1998b), Marais & Prinsloo (1980)

KUMPENZU/KU-MPENZU ESTUARY

LOCALITY: 32°14'35"S; 28°54'50"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Causeway crosses upper reaches of the system)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MBHANYANA/KUBHULA ESTUARY

LOCALITY: 32°13'41"S; 28°55'43"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary falls within the Cwebe Nature Reserve but not most of catchment)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

NTLONYANE ESTUARY

LOCALITY: 32°11'39"S; 28°57'25"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary excellent but catchment in fair condition)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

NYUMBAZANA ESTUARY

LOCALITY: 32°11'16"S; 28°57'42"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Excellent (Remarks: Much of the catchment under natural forest)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

NKANYA ESTUARY

LOCALITY: 32°10'39"S; 28°58'34"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary excellent but catchment has extensive subsistence agriculture)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

SUNDWANA ESTUARY

LOCALITY: 32°10'23"S; 28°59'00"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Excellent (Remarks: Nearby sand extraction for building might be a threat to estuarine health)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

XHORHA/XORA/XHORA ESTUARY

LOCALITY: 32°09'30"S; 28°59'48"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: An exceptionally important system in need of further study)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

BULUNGULA ESTUARY

LOCALITY: 32°08'19"S; 29°00'39"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

AMANZIMNYAMA ESTUARY

LOCALITY: 32°06'56"S; 29°02'02"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

NQAKANQA ESTUARY

LOCALITY: 32° 5'55"S; 29° 3' 44"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Threatened by development in the catchment and around the estuary)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

NQAKANQANA ESTUARY

LOCALITY: 32° 5'21"S; 29° 4' 8"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Good (Remarks: Sand extraction along the estuary might affect estuary health)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

MNCWASA ESTUARY

LOCALITY: 32°04'55"S; 29°04'34"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MPAKO ESTUARY

LOCALITY: 32°02'25"S; 29°06'27"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

NENGA ESTUARY

LOCALITY: 31°59'04"S; 29°09'04"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary floodplain impacted by road and other infrastructural developments)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MAPHUZI/MAPUZI ESTUARY

LOCALITY: 31°58'08"S; 29°10'07"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: This system is used by commercial fishermen as a ski boat launch site)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MTHATHA/MTATA ESTUARY

LOCALITY: 31°57'08"S; 29°10'57"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Water quality and catchment management issues need to be addressed)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Plumstead (1984), Plumstead et al. (1989b), Robertson (1996)

(c) SYNTHESSES/REVIEWS: Adams et al. (2002)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Department of Water Affairs and Forestry (2000), Marais & Prinsloo (1980), Harrison et al. (1998a), Harrison et al. (1998b)

TSHANI ESTUARY

LOCALITY: 31°56'41"S; 29°12'32"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Fair (Remarks: Extensive disturbance of the estuary floodplain and catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

MDUMBI ESTUARY

LOCALITY: 31°55'50"S; 29°12'58"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Portion of the floodplain is used for subsistence agriculture)

HEALTH (NBA ASSESSMENT): Green (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Robertson (1996)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

LWANDILANA ESTUARY

LOCALITY: 31°53'46"S; 29°14'39"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

LWANDILE ESTUARY

LOCALITY: 31°53'25"S; 29°14'48"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MTAKATYE/MTHAKATYE ESTUARY

LOCALITY: 31°51'30"S; 29°16'19"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

HLULEKA/MAJUSINI ESTUARY

LOCALITY: 31°49'36"S; 29°18'09"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MNENU ESTUARY

LOCALITY: 31°48'27"S; 29°19'41"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Green (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MTONGA ESTUARY

LOCALITY: 31°47'31"S; 29°20'54"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MPANDE ESTUARY

LOCALITY: 31°45'42"S; 29°21'27"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Some of the floodplain has been used for subsistence agriculture)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

SINANGWANA ESTUARY

LOCALITY: 31°45'02"S; 29°22'11"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Some of the floodplain has been used for subsistence agriculture)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MNGAZANA ESTUARY

LOCALITY: 31°41'29"S; 29°25'24"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Good

CONDITION: Good (Remarks: Diverse flora and fauna contribute to great conservation potential)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Dye (1983a), Emmerson (2005), Mlangeni (2007)

(b) BIOLOGICAL/ECOLOGICAL: Branch & Grindley (1979), Dayimani (2002), Deyzel (2004), Dye (1979), Dye (1983b), Dye (1983c), Emmerson (1990), Emmerson & McGwynne (1992), Emmerson & Ndenze (2007), Grant (2007), Mbande (2003), Mbande et al. (2004), Mbande et al. (2005), Rajkaran (2004), Rajkaran & Adams (2007), Rajkaran & Adams (2010), Rajkaran & Adams (2012), Rajkaran et al. (2004), Skillicorn (2007), Thwala (2004), Wooldridge (1977)

(c) SYNTHESSES/REVIEWS: Branch (1976), Day (1981h)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Connell et al. (1978e), Connell et al. (1980a), Harrison et al. (1998a), Harrison et al. (1998b)

MNGAZI ESTUARY

LOCALITY: 31°40'32"S; 29°27'40"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: Coastal resort of Umngazi River Bungalows situated at the mouth)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Taljaard et al. (1997)

(b) BIOLOGICAL/ECOLOGICAL: Bowd et al. (2012), Grant (2007), Mbande (2003), Mbande et al. (2004), Mbande et al. (2005), Mlangeni (2007), Snow & Adams (2006), Wooldridge & Deyzel (2012)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

BULOLO ESTUARY

LOCALITY: 31°39'00"S; 29°31'04"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Two traffic causeways traverse the system)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Robertson (1996), Whitfield (1979)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MTHAMBANE/MTAMBANE ESTUARY

LOCALITY: 31°38'52"S; 29°31'14"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Camp site and caravan park situated on the estuary floodplain)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Whitfield (1979)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MZIMVUBU ESTUARY

LOCALITY: 31°37'18"S; 29°33'04"E

REGION: Subtropical

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Fair (Remarks: System suffers from excessive siltation due to poor catchment management)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Taljaard et al. (1997)

(b) BIOLOGICAL/ECOLOGICAL: Robertson (1996)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Connell et al. (1978d), Connell et al. (1980a), Harrison et al. (1998a), Harrison et al. (1998b)

NTLUPHENI/NTLUPENI ESTUARY

LOCALITY: 31°36'30"S; 29°34'51"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: This estuary is a popular recreational venue for the local community)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

NKODUSWENI ESTUARY

LOCALITY: 31°35'36"S; 29°36'28"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MNTAFUFU ESTUARY

LOCALITY: 31°33'49"S; 29°38'10"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Wide variety of natural habitats makes this a very valuable estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Taljaard et al. (1997)

(b) BIOLOGICAL/ECOLOGICAL: Plumstead (1984), Plumstead et al. (1991)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

INGO ESTUARY

LOCALITY: 31°32'56.92"S; 29°39'38.90"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Excellent (Remarks: Baselines studies urgently required)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

MZINTLAVA ESTUARY

LOCALITY: 31°31'19"S; 29°41'23"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baselines studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MZIMPUNZI/UMZIMPUNZI ESTUARY

LOCALITY: 31°28'44"S; 29°43'18"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MBOTYI ESTUARY

LOCALITY: 31°27'57"S; 29°44'06"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Wooldridge (1974)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MKHOZI/MKOZI ESTUARY

LOCALITY: 31°26'49"S; 29°45'46"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

SIKATSHA ESTUARY

LOCALITY: 31°26'41"S; 29°46'06"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

LUPHATHANA/LUPATANA ESTUARY

LOCALITY: 31°25'26"S; 29°51'03"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MKWENI ESTUARY

LOCALITY: 31°24'12"S; 29°52'28"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Robertson (1996)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MSIKABA ESTUARY

LOCALITY: 31°19'13"S; 29°57'56"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Forms the southern boundary of the Mkambati Nature Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Blaber et al. (1974), Robertson (1996), Wooldridge (1974), Wooldridge (1976)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MGWEGWE ESTUARY

LOCALITY: 31°17'13"S; 30°00'42"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Situated within the Mkambati Nature Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MTHENTU/MTENTU ESTUARY

LOCALITY: 31°14'53"S; 30°02'49"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Forms the northern boundary of the Mkambati Nature Reserve)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Connell (1974)

(c) SYNTHESSES/REVIEWS: Day (1981h)

(d) REPORTS/DOCUMENTS: Coastal & Environmental Services (2009), Colloty et al. (2001), Connell et al. (1980a), Harrison et al. (1998a), Harrison et al. (1998b)

SIKOMBE ESTUARY

LOCALITY: 31°13'12"S; 30°04'09"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Extensive erosional area on north bank may threaten estuary)

HEALTH (NBA ASSESSMENT): Dark blue (Excellent)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

KWANYANA ESTUARY

LOCALITY: 31°11'10"S; 30°06'17"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MNYAMENI ESTUARY

LOCALITY: 31°09'03"S; 30°08'05"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MNYAMENANA ESTUARY

LOCALITY: 31° 8'49"S; 30° 8'33"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Excellent (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

MPAHLANYANA ESTUARY

LOCALITY: 31°07'27"S; 30°09'38"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MPAHLANE ESTUARY

LOCALITY: 31°07'11"S; 30°09'53"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Excellent (Remarks: Baseline studies urgently required)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001)

MZAMBA ESTUARY

LOCALITY: 31°06'30"S; 30°10'31"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Water quality issues need to be addressed)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Klinger & Kennedy (1980)

(b) BIOLOGICAL/ECOLOGICAL: Plumstead (1984), Plumstead et al. (1991), Robertson (1996)

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Begg (1986a), Harrison et al. (1998a), Harrison et al. (1998b)

MTENTWANA ESTUARY

LOCALITY: 31°05'21"S; 30°11'08"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Infrastructural developments by Wild Coast Sun Hotel)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Klinger & Kennedy (1980)

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS: Colloty et al. (2001), Harrison et al. (1998a), Harrison et al. (1998b)

MTHAMVUNA/MTAMVUNA ESTUARY

LOCALITY: 31°04'56"S; 30°11'39"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Good (Remarks: Northern bank forms part of the Mtamvuna Nature Reserve)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Cooper (1993a), Hemens et al. (1986), National Research Institute for Oceanology (1981a)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Robertson (1996)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Hemens et al. (1975h)

ZOLWANE ESTUARY

LOCALITY: 31°04'31"S; 30°12'18"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Good (Remarks: Private ownership with definite conservation potential)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

SANDLUNDLU ESTUARY

LOCALITY: 31°02'32"S; 30°13'43"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Private ownership with dune conservation potential)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

KU-BOBOYI ESTUARY

LOCALITY: 31°02'02"S; 30°14'12"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Impact of sugar cane cultivation on this estuary needs attention)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a), Turpie et al. (2002)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

THONGAZI/TONGAZI ESTUARY

LOCALITY: 31°00'38"S; 30°15'31"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Catchment dominated by both urban and rural settlements)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

KHANDANDLOVU/KANDANDHLOVU ESTUARY

LOCALITY: 30°59'48"S; 30°16'07"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Siltation from banana plantations requires attention)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MPENJATI ESTUARY

LOCALITY: 30°58'21"S; 30°17'02"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Has conservation potential)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Anandraj (2008), Anandraj et al. (2007), Anandraj et al. (2008), Begg (1984a), Kibirige (2002), Kibirige & Perissinotto (2003a), Kibirige & Perissinotto (2003b), Kibirige et al. (2002), Kibirige et al. (2003), Perissinotto et al. (2002)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1986c)

MHLANGANKULU/UMHLANGANKULU ESTUARY

LOCALITY: 30°56'40"S; 30°18'10"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Estuary forms part of the San Lameer holiday resort)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Council for Scientific and Industrial Research (1990b)

KHABA/KABA ESTUARY

LOCALITY: 30°56'07"S; 30°18'30"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: The system is adversely affected by weir construction and siltation)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MBIZANA ESTUARY

LOCALITY: 30°54'34"S; 30°20'02"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Siltation of the estuary is a major problem)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1984a)

MVUTSHINI ESTUARY

LOCALITY: 30°53'37"S; 30°20'50"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Important recreational area)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

BILANHLOLO ESTUARY

LOCALITY: 30°53'21"S; 30°20'58"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Important recreational area)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

UVUZANA ESTUARY

LOCALITY: 30°52'40"S; 30°21'32"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Siltation of estuary a major problem)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

KONGWENI ESTUARY

LOCALITY: 30°51'39"S; 30°22'19"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Surrounded by urban area and highly disturbed)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Cooper et al. (1994a)

(c) SYNTHESSES/REVIEWS: Begg (1978)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

UVONGO/VUNGU ESTUARY

LOCALITY: 30°50'07"S; 30°23'45"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: High aesthetic and recreational value)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

- (a) PHYSICAL/CHEMICAL: Smakhtin (2004)
- (b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)
- (c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)
- (d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MHLANGENI ESTUARY

LOCALITY: 30°49'06"S; 30°24'22"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Highly disturbed but important recreational value)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

- (a) PHYSICAL/CHEMICAL:
- (b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)
- (c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)
- (d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

ZOTSHA ESTUARY

LOCALITY: 30°47'17"S; 30°25'25"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: An important estuarine system on the KwaZulu-Natal south coast)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Harrison (1993), Harrison & Cooper (1991), Harrison & Whitfield (1995)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

BOBOYI ESTUARY

LOCALITY: 30°46'13"S; 30°26'22"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Catchment in poor condition)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

IMBANGO/MBANGO ESTUARY

LOCALITY: 30°45'24"S; 30°26'54"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Catchment in poor condition)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MZIMKHULU/MZIMKULU ESTUARY

LOCALITY: 30°44'23"S; 30°27'32"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Water pollution and siltation are major problems)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a), Day (1981h)

(d) REPORTS/DOCUMENTS: Connell et al. (1975b), Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1977)

MTENTWENI ESTUARY

LOCALITY: 30°42'33"S; 30°28'54"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Degradation linked to sand accumulation and urban encroachment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MHLANGAMKULU ESTUARY

LOCALITY: 30°41'17"S; 30°29'55"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Undisturbed plant communities in upper reaches)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

DOMBA/DAMBA ESTUARY

LOCALITY: 30°40'19"S; 30°30'39"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Important swamp forest on south bank)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Harrison (1993), Harrison & Whitfield (1995)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1986d)

IKOTSHWANA/KOSHWANA ESTUARY

LOCALITY: 30°39'33"S; 30°31'04"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Siltation and sewage problems)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

NTSHAMBILI/INTSHAMBILI ESTUARY

LOCALITY: 30°38'12"S; 30°32'13"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Valuable swamp forest community and well conserved catchment)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MZUMBE ESTUARY

LOCALITY: 30°36'48"S; 30°32'52"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Siltation problems arising from severe erosion in the catchment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1981b)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Council for Scientific and Industrial Research (1981c)

MHLABATSHANE ESTUARY

LOCALITY: 30°35'02"S; 30°34'19"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Important for recreation)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MHLUNGWA ESTUARY

LOCALITY: 30°33'35"S; 30°35'02"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Siltation problems)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Environmental Advisory Services (1990c)

MFAZAZANA ESTUARY

LOCALITY: 30°31'51"S; 30°36'28"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Road and rail communications across estuary)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MAKOSI/KWA-MAKOSI ESTUARY

LOCALITY: 30°31'31"S; 30°36'37"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Road and rail communications across estuary)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MNAMFU ESTUARY

LOCALITY: 30°30'28"S; 30°37'31"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Impacts of road and rail construction are apparent)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MTWALUMI/MTWALUME ESTUARY

LOCALITY: 30°29'07"S; 30°38'02"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Heavily silted but rehabilitation of this important system is possible)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1983b)

MVUZI ESTUARY

LOCALITY: 30°28'08"S; 30°38'49"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Mouth area has been modified by railway construction)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

FAFA ESTUARY

LOCALITY: 30°27'17"S; 30°39'13"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Botanical and recreational value)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a), Day (1981h)

(d) REPORTS/DOCUMENTS: Archibald & Warwick (1975a), Archibald & Warwick (1975b), Archibald & Warwick (1975c), Cooper et al. (1993a), Cooper et al. (1993b), Hemens et al. (1975g), National Research Institute for Oceanology (1987d)

SEZELA ESTUARY

LOCALITY: 30°24'50"S; 30°40'39"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: A marked improvement has occurred following rehabilitation actions)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Ramm et al. (1977)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

UMKOMBANE/MKUMBANE ESTUARY

LOCALITY: 30°24'17"S; 30°40'59"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Siltation problems)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MZINTO ESTUARY

LOCALITY: 30°22'00"S; 30°42'32"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Has considerable ecological value if human impacts can be reduced)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MZIMAYI ESTUARY

LOCALITY: 30°20'47"S; 30°43'34"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: This small system has recreational potential)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

ROCKY BAY ESTUARY

LOCALITY: 30°20'01"S; 30°44'02"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Nil

CONDITION: Fair (Remarks: Affected by urban development and intensive agriculture in the catchment)

HEALTH (NBA ASSESSMENT): None

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL:

(c) SYNTHESSES/REVIEWS:

(d) REPORTS/DOCUMENTS:

MPAMBANYONI ESTUARY

LOCALITY: 30°16'44"S; 30°45'39"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: One of the most degraded estuaries on the KwaZulu-Natal coast)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1983a)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1983c)

MAHLONGWA ESTUARY

LOCALITY: 30°16'06"S; 30°45'54"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Wetland reclamation associated with sugar cane cultivation a problem)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1981b)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MAHLONGWANA ESTUARY

LOCALITY: 30°13'29"S; 30°47'38"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Sugar cane encroachment onto the floodplain)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MKHOMAZI/MKOMAZI ESTUARY

LOCALITY: 30°12'03"S; 30°48'11"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Moderate

CONDITION: Poor (Remarks: Siltation and localized industrial pollution need attention)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1982a)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a), Day (1981h)

(d) REPORTS/DOCUMENTS: Burton (1960), Cooper et al. (1993a), Cooper et al. (1993b), Linstrom (1998), National Research Institute for Oceanology (1982f)

NGANE ESTUARY

LOCALITY: 30°10'44"S; 30°49'01"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Faecal contamination and bilharzia infestation require investigation)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MGABABA/UMGABABA ESTUARY

LOCALITY: 30°09'20"S; 30°49'48"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Has considerable conservation potential)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Grobblers (1987), Smakhtin (2004)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a), Day (1981h)

(d) REPORTS/DOCUMENTS: Connell et al. (1976e), Connell et al. (1978c), Connell et al. (1981c), Cooper et al. (1993a), Cooper et al. (1993b), Council for Scientific and Industrial Research (1982b), Grobblers et al. (1988), National Research Institute for Oceanology (1984b)

MSIMBAZI ESTUARY

LOCALITY: 30°07'48"S; 30°50'50"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Road and railway developments affect hydrodynamics within the system)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

LOVU ESTUARY

LOCALITY: 30°06'47"S; 30°51'12"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Serious siltation and pollution problems need to be solved)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Grobler (1987), National Research Institute for Oceanology (1982b)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

LITTLE MANZIMTOTI ESTUARY

LOCALITY: 30°04'38"S; 30°52'21"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Catchment in reasonable condition but estuary floodplain highly developed)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Smakhtin (2004)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Environmental Advisory Services (1992b), Ramm et al. (1992)

MANZIMTOTI ESTUARY

LOCALITY: 30°03'34"S; 30°53'00"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Should be considered for rehabilitation as a recreational asset)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

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(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

UMBOHODWENI/MBOKODWENI ESTUARY

LOCALITY: 30°00'29"S; 30°56'12"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Degraded due to siltation, pollution and mouth manipulation)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1984c)

SIPINGO ESTUARY

LOCALITY: 30°59'38"S; 30°57'05"E

REGION: Subtropical

CLASSIFICATION: Modified permanently open estuary

INFORMATION: Moderate

CONDITION: Poor (Remarks: Mlazi canal diverts water previously entering the Sipingo estuary)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

- (a) PHYSICAL/CHEMICAL: Naidoo & Raiman (1982)
- (b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Ward (1971)
- (c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)
- (d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Kallicharran (1990), Natal Town and Regional Planning Commission (1987), National Research Institute for Oceanology (1984c)

DURBAN BAY ESTUARINE SYSTEM

LOCALITY: 29°52'16"S; 31°03'29"E

REGION: Subtropical

CLASSIFICATION: Estuarine bay

INFORMATION: Good

CONDITION: Poor (Remarks: Remaining bayhead mangroves declared a Natural Heritage Site)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

- (a) PHYSICAL/CHEMICAL: Cockcroft & Forbes (1981a)
- (b) BIOLOGICAL/ECOLOGICAL: Beckley et al. (1995), Beckley & Naidoo (2003), Begg (1984a), Blackler (2002), Cockcroft & Forbes (1981b), Cyrus & Forbes (1996), Day & Morgans (1956), Graham (1994), Guastella (1994), Forbes et al. (1996), Harris & Cyrus (1999), Harris & Cyrus (2000), Joubert (1964), Pillay et al. (2008), Pradevand et al. (2003), Rajkaran & Adams (2011), Simpson (2003), Steinke (1975), Weerts et al. (1997)
- (c) SYNTHESSES/REVIEWS: Begg (1978)
- (d) REPORTS/DOCUMENTS: Anon. (1974b), Connell et al. (1979a), Environmental Advisory Services (1990b), Hay (1993a), Institute of Natural Resources (1993a), Institute of Natural Resources (1993c)

MNGENI/MGENI ESTUARY

LOCALITY: 29°48'35"S; 31°02'27"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Excellent

CONDITION: Poor (Remarks: Catchment dams have transformed this previously permanently open estuary)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Cooper (1987a), Cooper (1988), Cooper (1993a), Cooper & Mason (1985), Cooper & McMillan (1987), Cooper et al. (1990), Garland & Moleko (2000), Mann & Steinke (1989), Mann & Steinke (1992), Mann & Steinke (1993), Naidoo (1980), Naidoo & Raiman (1982), Njoya (2003), Oliff et al. (1975), Schoonbee (1963), Swart (1987), National Research Institute for Oceanology (1982c)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Brijlal (2005), Brown (1971), Harrison (1991), Mann (1988), Moll (1972), Phillips et al. (1994), Phillips et al. (1996), Pradevand et al. (2003), Raiman (1988), Schoonbee (1962), Singh & Steinke (1992), Singh et al. (1991), Steinke (1988), Steinke et al. (1983), Steinke et al. (1990), Steinke & Charles (1984), Steinke & Charles (1986a), Steinke & Charles (1986b), Steinke & Rajh (1995), Steinke et al. (1993), Steinke et al. (1995)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper (1986), Cooper & Mason (1986), Cooper & Mason (1987), Cooper et al. (1993), Council for Scientific and Industrial Research (1984c), Edwards & Moll (1972), Glennie (2001), Hemens et al. (1975f), National Research Institute for Oceanology (1975a), National Research Institute for Oceanology (1975b)

MHLANGA/OHLANGA ESTUARY

LOCALITY: 29°42'14"S; 31°06'03"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Good

CONDITION: Fair (Remarks: Estuary forms part of a nature reserve)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Cooper (1989), Lawrie (2007), Lawrie et al. (2010)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Cooper & Harrison (1992), Harrison (1993), Harrison & Whitfield (1995), Iyer (2004), Kibirige et al. (2006), Perissinotto et al. (2004), Perissinotto et al. (2006), Raiman (1988), Scharler (2012), Thomas (2003), Thomas et al. (2005), Thwala (2005), Whitfield (1980a), Whitfield (1980b), Whitfield (1980c), Whitfield (1982), Zietsman (2004)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a), Day (1981h)

(d) REPORTS/DOCUMENTS: Cooper (1987b), Cooper et al. (1993a), Cooper et al. (1993b), Department of Water Affairs and Forestry (2002), Department of Water Affairs and Forestry (2003e), Environmental Advisory Services (1992a)

MHLOTI/MDLOTI ESTUARY

LOCALITY: 29°39'07"S; 31°07'43"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Good

CONDITION: Fair (Remarks: Siltation, pollution and sugar cane encroachment are problems)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Garden & Garland (2005), Grobblers (1987), National Research Institute for Oceanology (1982d)

(b) BIOLOGICAL/ECOLOGICAL: Anandraj (2008), Anandraj et al. (2007), Begg (1984a), Blaber et al. (1984), Deale (2010), Deale et al. (2013), Iyer (2004), Kibirige et al. (2006), Mundree (2001), Mundree et al. (2003), Nozais et al. (2001a), Nozais et al. (2001b), Perissinotto et al. (2004), Perissinotto et al. (2006), Raiman (1988), Scharler (2012), Thomas (2003), Thomas et al. (2005), Thwala (2005), Zietsman (2004)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Council for Scientific and Industrial Research (1985c), Department of Water Affairs and Forestry (2002), National Research Institute for Oceanology (1986a)

THONGATHI/TONGATI ESTUARY

LOCALITY: 29°34'21"S; 31°11'07"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Degraded due to pollution and siltation but suitable for rehabilitation)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1982e)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), Blaber et al. (1984)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MHLALI ESTUARY

LOCALITY: 29°27'40"S; 31°16'39"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Poor (Remarks: Problems include siltation and sugar cane encroachment)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

- (a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1983b), Schmidt (1985)
- (b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)
- (c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)
- (d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1983d)

SETENI ESTUARY

LOCALITY: 29°25'45"S; 31°18'12"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: The only apparent problem is siltation)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

- (a) PHYSICAL/CHEMICAL:
- (b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)
- (c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)
- (d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

MVOTI ESTUARY

LOCALITY: 29°24'03"S; 31°20'18"E

REGION: Subtropical

CLASSIFICATION: River mouth

INFORMATION: Poor

CONDITION: Poor (Remarks: Supports a wide variety of birdlife despite severe organic pollution)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1983c), Cooper (1993b), Cooper (1994a)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a), O'Brien et al. (2009)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: National Research Institute for Oceanology (1983e)

MDLOTANE ESTUARY

LOCALITY: 29°21'07"S; 31°22'26"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Estuary good but catchment poor due to intensive sugar cane cultivation)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Environmental Advisory Services (1991a), National Research Institute for Oceanology (1983f)

NONOTI ESTUARY

LOCALITY: 29°19'01"S; 31°24'29"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Encouraging signs of recovery from a severely polluted condition)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), National Research Institute for Oceanology (1983g)

ZINKWASI ESTUARY

LOCALITY: 29°16'45"S; 31°26'35"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Organic pollution gives rise to periods of anoxia in the water column)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: National Research Institute for Oceanology (1981d)

(b) BIOLOGICAL/ECOLOGICAL: Begg (1984a)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b)

THUKELA/TUGELA ESTUARY

LOCALITY: 29°13'26"S; 31°29'57"E

REGION: Subtropical

CLASSIFICATION: River mouth

INFORMATION: Moderate

CONDITION: Fair (Remarks: Excessive siltation and organic pollution are major problems)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Cyrus & MacKay (2007), Whitfield & Harrison (2003)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cooper et al. (1994a), Day (1981h)

(d) REPORTS/DOCUMENTS: Cooper et al. (1993a), Cooper et al. (1993b), Council for Scientific and Industrial Research (1983b), Department of Water Affairs and Forestry (2004a), Department of Water Affairs and Forestry (2004b)

MATIKULU/MATIGULU/NYONI ESTUARY

LOCALITY: 29°06'36"S; 31°37'09"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Fair (Remarks: Siltation from the catchment is of concern)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: O'Brien et al. (2009)

(c) SYNTHESSES/REVIEWS: Begg (1978), Day (1981h)

(d) REPORTS/DOCUMENTS: Hemens et al. (1975e)

SIYAYA ESTUARY

LOCALITY: 28°58'01"S; 31°45'44"E

REGION: Subtropical

CLASSIFICATION: Temporarily open/closed estuary

INFORMATION: Moderate

CONDITION: Fair (Remarks: Restoration of this estuary and its catchment is far advanced)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Mackay (1996), Schleyer & Roberts (1987)

(c) SYNTHESSES/REVIEWS: Begg (1978), Begg (1980b), Begg (1981b), van der Elst et al. (1999)

(d) REPORTS/DOCUMENTS: Department of Water Affairs and Forestry (2006d), Schleyer (1986a), Connell et al. (1980b)

MLALAZI ESTUARY

LOCALITY: 28°56'42"S; 31°48'58"E

REGION: Subtropical

CLASSIFICATION: Permanently open estuary

INFORMATION: Poor

CONDITION: Good (Remarks: An important conservation and recreational area)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Hill (1966), Mabaso (2003), Papadopoulos (2003), Weerts et al. (1997)

(c) SYNTHESSES/REVIEWS: Begg (1978), Day (1981h)

(d) REPORTS/DOCUMENTS: Hemens et al. (1975d), Ward (1960)

MHLATHUZE ESTUARY

LOCALITY: 28°50'46"S; 32°02'56"E

REGION: Subtropical

CLASSIFICATION: Estuarine bay

INFORMATION: Good

CONDITION: Fair (Remarks: Previously part of the Richards Bay system)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: MacKay & Cyrus (2001a),

(b) BIOLOGICAL/ECOLOGICAL: Buthelezi (2003), Cyrus et al. (2008b), Grindley & Wooldridge (1974), MacKay & Cyrus (2001b), Millard & Harrison (1954), Mzimela (2001), Owen et al. (2000), Rajkaran & Adams (2011), Steinke & Ward (1988), van der Elst (1977), Viljoen & Cyrus (2002a), Viljoen & Cyrus (2002b), Weerts (2002), Weerts & Cyrus (2001), Weerts & Cyrus (2002a), Weerts & Cyrus (2002b)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cyrus (1998/99a), Cyrus (1998/99b), Cyrus (2001), Day (1981h), Jerling (1998/99), Leverton (1975), MacKay & Cyrus (1998/99), Owen & Forbes (2002), Owen et al. (2000), Weerts & Cyrus (1998/99), Wepener & Vermeulen (1998/99)

(d) REPORTS/DOCUMENTS: Connell et al. (1975a), Connell et al. (1976c), Cyrus et al. (2000), Hemens et al. (1975b), Hemens et al. (1975c), Institute of Natural Resources (1993e), McClurg et al. (1982), Venter (1972)

RICHARDS BAY ESTUARINE SYSTEM

LOCALITY: 28°48'40"S; 32°05'17"E

REGION: Subtropical

CLASSIFICATION: Estuarine bay

INFORMATION: Good

CONDITION: Poor (Remarks: Expansion of the harbour berths will lead to further loss of habitat)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: MacKay & Cyrus (2001a), van Tonder et al. (1986)

(b) BIOLOGICAL/ECOLOGICAL: Cyrus (2001), Cyrus & Forbes (1996), Demetriades (1990), Forbes et al. (1996), Forbes et al. (1999), Grindley & Wooldridge (1974), Harris & Cyrus (1997), Harris & Cyrus (2000), James (2001), MacKay & Cyrus (2001b), Millard & Harrison (1954), Steinke & Ward (1988), McClurg (1979), Weerts (2002), Weerts et al. (1997), Weerts et al. (2003), Weerts & Cyrus (2001), Weerts & Cyrus (2002a), Weerts & Cyrus (2002b)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cyrus (2001), Day (1981h)

(d) REPORTS/DOCUMENTS: Anon. (1972a), Anon. (1974c), Anon. (1978), Connell et al. (1976g), Council for Scientific and Industrial Research (1972), Environmental Advisory Services (1993), Environmental Advisory Services (1996), Hay (1993b), Hemens et al. (1975b), Hemens et al. (1975c), Institute of Natural Resources (1993b), Institute of Natural Resources (1993d), Institute of Natural Resources (1993e), McClurg et al. (1982)

HLOBANE/NHLABANE ESTUARINE SYSTEM

LOCALITY: 28°39'39"S; 32°15'25"E

REGION: Subtropical

CLASSIFICATION: Estuarine lake system

INFORMATION: Moderate

CONDITION: Poor (Remarks: Restoration of the system possible by removal of the RBM barrage)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Chater & van der Elst (1995), Cyrus & Wepener (1997), Jerling (2005), Jerling & Cyrus (1999), Mastenbroek (2002), Riddin (1999), Viljoen & Cyrus (2002b), Vivier & Cyrus (1999a), Vivier & Cyrus (1999b), Vivier & Cyrus (2001), Vivier & Cyrus (2002)

(c) SYNTHESSES/REVIEWS: Begg (1978), Cyrus (2001)

(d) REPORTS/DOCUMENTS: Environmental Advisory Services (1990a), Walmsley Environmental Consultants (1993)

MFOLOZI/MSUNDUZI ESTUARY

LOCALITY: 28°23'33"S; 32°25'28"E

REGION: Subtropical

CLASSIFICATION: River mouth

INFORMATION: Good

CONDITION: Poor (Remarks: Swamp destruction and siltation have been major problems)

HEALTH (NBA ASSESSMENT): Green (Fair)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Garden (2008), Lindsay et al. (1996a), Lindsay et al. (1996b), Maro (2013), Pillay (1997), van Heerden (1993), Wright (1995)

(b) BIOLOGICAL/ECOLOGICAL: Jerling et al. (2010b), Mercer (1976), Ngqulana et al. (2010), Owen et al. (2010), Pike (1979), Roberts & Pyke (1984), Vivier & Cyrus (2009), Cyrus et al. (2010b), Vivier et al. (2010)

(c) SYNTHESSES/REVIEWS: Begg (1978), Lawrie & Stretch (2011a), Lawrie et al. (2011)

(d) REPORTS/DOCUMENTS: Lawrie & Stretch (2008), Mason & Wright (1992), van Lienden (1959)

ST LUCIA ESTUARINE SYSTEM

LOCALITY: 28°22'55"S; 32°25'32"E

REGION: Subtropical

CLASSIFICATION: Estuarine lake system

INFORMATION: Excellent

CONDITION: Fair (Remarks: But poor during drought conditions in absence of Mfolozi River connection)

HEALTH (NBA ASSESSMENT): Brown (Poor)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Alexander (1976), Anderson (1990), Anon. (1965), Anon. (1970a), Anon. (1975), Badenhorst (1988b), Bate & Taylor (2008), Brown (1969), Cyrus & Blaber (1988), Cyrus (1992), Fielding et al. (1991), Hay (1985a), Hobday (1965), Hobday (1975), Humphries (2006), Humphries (2008), Hutchison (1974), Hutchison (1976a), Hutchison & Midgley (1978), Hutchison & Pitman (1977), James & Horne (1969), Kokot (1959), Maine (2012), McGill (1980), McGill (1982), Mercer (1976), Meyer et al. (1993), Lawrie & Stretch 2011b, Nanni (1982), Numme (2007), Pillay (1997), Pitman (1980), Pringle (2011), Sauermann (1966), Sauermann (1967), Swart (1988), Taylor (1980c), Taylor (1982c), Taylor et al. (2006b), van Heerden (1976), van Heerden (1993), van Heerden & Swart (1986a), van Heerden & Swart (1986b), Vogel (1972a), Wright (1990), Wright (1993), Wright (1995), Wright & Mason (1990), Wright & Mason (1993), Wright et al. (1990)

(b) BIOLOGICAL/ECOLOGICAL: Anon. (1970b), Anon. (1979), Anon. (1981), Bass (1976), Bate & Smailes (2008), Benfield et al. (1990), Berruti (1980a), Berruti (1980b), Berruti (1983), Beven (1944a), Beven (1944b), Bickerton (1989), Blaber (1976a), Blaber (1976b), Blaber (1979), Blaber (1981a), Blaber (1982c), Blaber et al. (1983), Blaber & Raynor (1979), Blaber & Whitfield (1976), Bolt (1975), Bonde (1940), Bownes & Perissinotto (2012), Breen et al. (1976a), Burlando (2005), Buthelezi (2003), Carrasco (2011), Carrasco & Perissinotto (2010a), Carrasco & Perissinotto (2010b), Carrasco & Perissinotto (2011a), Carrasco & Perissinotto (2011b), Carrasco & Perissinotto (2012), Miranda et al. (2012b), Carrasco et al. (2007), Carrasco et al. (2010), Champion (1976), Chiazari (1952), Cholnoky (1968), Chubb (1943), Collings (2007), Connell (1996), Cyrus (1984), Cyrus (1988a), Cyrus (1991a), Cyrus (1991b), Cyrus & Blaber (1987b), Cyrus & McLean (1994), Cyrus & McLean (1996), Cyrus & Vivier (2006a), Cyrus & Vivier (2006b), Cyrus et al. (2008a), Daly et al. (2012), Day et al. (1954), Demetriades (1990), Feely (1958a), Feely (1958b), Feely (1962), Fielding (1989), Fielding et al. (1990), Forbes (1982a), Forbes (1982b), Forbes (1982c), Forbes (1982d), Forbes (1989), Forbes & Benfield (1986a), Forbes & Benfield (1986b), Forbes & Cyrus (1991), Forbes & Cyrus (1992), Forbes & Hay (1988), Forrest (1969a), Garland (1944), Gordon (2006), Gordon et al. (2008), Govender et al. (2011), Grindley (1976), Grindley & Heydorn (1970), Grobler et al. (2003), Harris & Cyrus (1994), Harris & Cyrus (1995), Harris & Cyrus (1996), Harris & Cyrus (2000), Harto (1987), Hay (1985b), Hill (1976), Hill (1979b), James (2001), Jerling et al. (2010a), Johnson (1976), Johnson (1977), Johnson & Breen (1982), Joubert (1967), Joubert & Davies (1966), Kennedy (1983), Leslie (1997), MacKay et al. (2010), Mann (1993a), Mann (1993b), Mann (1995), Martin et al. (1992), Mather et al. (2013), Midgley (1982), Millard & Broekhuysen (1970), Miranda (2012), Miranda & Perissinotto (2012), Miranda et al. (2010), Miranda et al. (2011a), Miranda et al. (2011b), Moll (1970), Muir & Perissinotto (2011), Nel et al. (2012), Lawrie & Stretch (2011c), Naicker (2007), Nel et al. (2011), Dyer et al. (2013), Olivier & van Niekerk (1995), Owen (1988), Owen (1992), Owen & Forbes (1997a), Owen et al. (2000), Owen & Forbes (2002), Perissinotto et al. (2010), Perissinotto et al. (2013), Phleger (1976), Pillay & Perissinotto (2008), Pillay & Perissinotto (2009), Pooley (1973), Pooley (1976), Pooley (1982a), Pooley (1982b), Porter & Forrest (1974), Rajkaran & Adams (2011), Rogers (1974), Sandiford (1984), Singh (2009), Skelton et al. (1989), Steinke & Naidoo (1990), Steinke & Ward (1987), Steinke & Ward (1988), Steinke & Ward (1989), Stretch & Maro (2013), Stretch et al. (2013), Taylor (1980a), Taylor (1980b), Taylor (1981), Taylor (1982d), Taylor (2006), Taylor (2008a), Taylor & Blake (1986), Taylor et al. (2006a), Tirok & Scharler (2013), Todaro et al. (2011), Tooth (1946), van der Elst (1972), van der Molen & Perissinotto (2011), Vivier et al. (2010), Wallace (1976), Ward (1976), Ward (1982a), Weiss & Midgley (1976), Whitfield (1976), Whitfield (1977a), Whitfield (1978b), Whitfield (1988c), Whitfield & Blaber (1978a), Whitfield & Blaber (1978b), Whitfield & Blaber (1978c), Whitfield & Blaber (1978d), Whitfield & Blaber (1978e), Whitfield & Blaber (1979a), Whitfield & Blaber (1979b), Whitfield & Blaber (1979c), Whitfield & Blaber (1980), Whitfield & Cyrus (1978), Whitfield & Heeg (1977)

(c) SYNTHESSES/REVIEWS: Anon. (1970c), Anon. (1973), Begg (1978), Bond (1973), Bowker & Downs (2008), Cooper (1970), Crass (1970), Crass (1978), Cyrus (1989), Cyrus et al. (2010a), Cyrus et al. (2011), Day (1981h), Draper (1965), Dutton (2004), Forbes et al. (1987), Forbes & Cyrus (1993), Forrest (1969b), Grindley

(1982), Harty (1952), Kokot (1952), Lawrie & Stretch (2011a), Mann (1996), Orme (1975a), Owen & Forbes (1997b), Robertson (1971), Robertson (1977), Starfield et al. (1989), Taljaard & Slinger (1997), Taylor (1982a), Taylor (1983), Taylor (1982b), Taylor (1987), Taylor (1991), Taylor (1993), Taylor (2007), Taylor (2008b), Taylor et al. (1987), Tinley (1971), van der Merwe (1967), Vincent (1980), Whitfield (1977c), Whitfield (1980d), Whitfield (1999), Whitfield & Taylor (2009), Whitfield et al. (2006), Whitfield et al. (2013)

(d) REPORTS/DOCUMENTS: Anon. (1951), Anon. (1960), Anon. (1962), Anon. (1969), Anon. (1970d), Anon. (1972b), Bacon (1973a), Bacon (1973b), Bacon (1974), Bain (1972), Bate et al. (2011), Berruti (1982), Blok (1976), Cameron-Dow (1974), Connell et al. (1979b), Copley (2009), Cowan (1995), Crass (1960), Crass (1976), CSIR Environmental Services (1993a), CSIR Environmental Services (1993b), CSIR Environmental Services (1993c), Davies (1964), Department of Water Affairs (1978), Department of Water Affairs (1984), Department of Water Affairs (1985), Department of Water Affairs and Forestry (2004c), Dinkele (1977), Dutton (1964), Hutchison (1976b), Hutchison (1977), Jaaback (1993), Jacobi (1971), Joubert (1953), Kriel (1966), Lawrie & Stretch (2008), Lillevang (1971), Lindley & Scott (1987), Mann-Lang (1997), Mason & Wright (1989), Natal Working Group (1981), Taylor (1983), Loudon (1984), Natal Parks Board (1976a), Natal Parks Board (1976b), Pooley & Forrest (1972), Porter & Forrest (1987), Robson (1949), Taylor (1980c), Teal (1962), van Bonde (1940), van der Elst (1978b), van Heerden (1994), van Heerden (undated), van Zijl (1971), van Zyl (1973), Vogel (1972b), Vogel & van Urk (1971), Vogel & van Urk (1975), Wager (1960), Wallace (1969), Ward (1982b), Wearne (1965), Whitfield (1977b), Winter (1975)

MGOBEZELENI ESTUARINE SYSTEM

LOCALITY: 27°32'10"S; 32°40'17"E

REGION: Subtropical

CLASSIFICATION: Estuarine lake system

INFORMATION: Poor

CONDITION: Good (Remarks: Estuary mouth area highly disturbed by human activities)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL:

(b) BIOLOGICAL/ECOLOGICAL: Bruton (1980), Bruton & Appleton (1975), Miranda (2012), Miranda et al. (2011b)

(c) SYNTHESSES/REVIEWS: Begg (1978)

(d) REPORTS/DOCUMENTS: Bruton (1975), Bruton (1976)

KOSI ESTUARINE SYSTEM

LOCALITY: 26°53'37"S; 32°52'52"E

REGION: Subtropical

CLASSIFICATION: Estuarine lake system

INFORMATION: Excellent

CONDITION: Good (Remarks: Maintains a diverse flora and fauna)

HEALTH (NBA ASSESSMENT): Blue (Good)

AVAILABLE LITERATURE

(a) PHYSICAL/CHEMICAL: Anon. (1977), Butler et al. (1983), Ramm (1992), Wright et al. (1997)

(b) BIOLOGICAL/ECOLOGICAL: Blaber (1978), Blaber (1982a), Blaber & Cyrus (1981), Bolt & Allanson (1975), Breen & Hill (1969), Broekhuysen & Taylor (1959), Cyrus (1980), Cyrus & Blaber (1983a), Cyrus & Blaber (1984b), Cyrus & Blaber (1984c), Fielding (2007), Forbes (1979), Forbes & Cyrus (1991), Garratt (1993), Harman et al. (1982), Harris et al. (1995), Jackson (1984), James (2001), James et al. (2008b), Kyle (1980), Kyle (1989a), Kyle (1989b), Kyle (1996), Kyle & Robertson (1997), Miranda (2012), Miranda & Perissinotto (2012), Miranda et al. (2011a), Miranda et al. (2011b), Pederson et al. (2003), Pike (1968), Rajkaran & Adams (2011), Steinke & Ward (1973), Ward et al. (1986), Whitfield (1978c), Wallace et al. (1971)

(c) SYNTHESSES/REVIEWS: Begg (1978), Begg (1980a), Day (1981h), James et al. (2001), Kyle (1990), Kyle (1993a), Kyle (1995), Moll (1978), Taylor (2008c)

(d) REPORTS/DOCUMENTS: Anon. (1971a), Anon. (1971b), Anon. (1984), Begg (1982), Campbell & Allanson (1952), Connell et al. (1976f), Cowan (1995), Hemens et al. (1975a), Kyle (1993b), Kyle & Ward (1995), Mann-Lang (1997), Munnik (1993), Tinley (1976), Wager (1972)

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- (a) PHYSICAL/CHEMICAL: Adams et al. (2010), Anderson (1991), Beck (2005), Boroto (1995), Branch (1987), Butzer & Helgren (1972), Callow (1995), Chew & Bowen (1971), Cooper (1990), Cooper (1991), Comrie-Grieg (1984), Cyrus (1988b), Cyrus (1988c), David (2006), Day (1981b), Day (1981c), Day (1981d), Day (1981e), de Kock & Lord (1988), Eagle & Bartlett (1984), Gardner et al. (1983), Gardner et al. (1985), Harrison (2004), Hay et al. (2005), Hemens et al. (1975), Hill (1975a), Hill et al. (1975), Hobday (1979), Huizinga (1985a), Huizinga & Gaillard (1985), Huizinga & Luger (1988), Huizinga & van Niekerk (2001), Jackson (2002), Kovács (1988), Kovács et al. (1985), Largier (1992), Largier & Slinger (1991), Lusher (1984), Martin (1987), Mather et al. (2009), Mather et al. (2011), McCormick et al. (1992), Meineke (1960), Miller (1990), National Research Institute for Oceanology (1986), National Research Institute for Oceanology (1987a), National Research Institute for Oceanology (1987b), National Research Institute for Oceanology (1987c), Orme (1973), Orme (1974), Orme (1975b), Parkinson & Stretch (2007), Reddering (1987), Reddering (1988a), Reddering (1988b), Reddering & Rust (1990), Rogers (1986), SANCOR Secretariat (1989), Scharler (2000), Schulze et al. (1988), Shannon & Stander (1977), Slinger (1996), Smakhtin (2004), Stevens (2005), Stretch & Parkinson (2006a), Stretch & Parkinson (2006b), Taljaard et al. (2009), Venayagamoorthy (2001), Venayagamoorthy & Stretch (2006), Watling et al. (1983), Watling & Watling (1982), Willis et al. (1977)
- (b) BIOLOGICAL/ECOLOGICAL: Achituv & Cook (1984), Adams & Bate (1994a), Adams & Bate (1994b), Adams & Bate (1994c), Adams & Bate (1995), Adams & Bate (1996a), Adams & Bate (1996b), Adams & Bate (1999), Adams et al. (1992), Adams et al. (2004a), Adams et al. (2004b), Adams & Talbot (1992), Alexander & Ewer (1969), Allan et al. (2006), Allanson et al. (1966), Allanson et al. (1992), Appleton et al. (2009), Avis (1988), Barnabas & Guillard (1979), Barnabas & Naidoo (1981), Barnabas & Naiker (1980), Barnabas et al. (1977), Barnabas et al. (1980), Barnabas et al. (1982), Barnabas et al. (1986), Bate et al. (2013), Beckley (1986), Beckley (1988), Beckley (1989), Beckley (1990), Beckley & Connell (1996), Begg (1981c), Begg (1984b), Benfield (1984), Bennett (1989c), Bennett (1989d), Bennett (1993), Bernard (1988), Bernatzeder & Britz (2007), Bezuidenhout (2004), Bills (2000), Blaber (1973b), Blaber (1974b), Blaber (1974c), Blaber (1975a), Blaber (1975b), Blaber (1977), Blaber (1984), Blaber (1985), Blaber & Cyrus (1983), Blaber et al. (1981), Blaber & Whitfield (1977a), Blaber & Whitfield (1977b), Bok (1984a), Bok (1984b), Bok (1989), Bok & Jongbloed (1987), Bolt & Heeg (1975), Bourgeois (1948), Branch & Pringle (1987), Breen et al. (1976b), Broekhuysen (1955), Bruton (1993), Butler & Steinke (1976), Buxton & Kok (1983), Cambray & Bok (1989), Cerff (1986), Champion (1988), Christain et al. (2005), Christie (1981), Christie & Moldan (1977), Churchill (2004), Clark (1997), Cockcroft & du Preez (1989), Cockcroft & Tomalin (1987), Cockcroft (1978), Cockcroft & Forbes (1981b), Cockcroft & Forbes (1981c), Coetzee (1986), Coetzee (1988), Coetzee (1989), Coetzee (1995), Connell (1981), Connell & Airey (1979), Connell & Grindley (1974), Connell & Robertson (1986), Cooper (1991), Cooper et al. (1992), Cowley (2000), Cyrus (1980), Cyrus (1984), Cyrus & Blaber (1982a), Cyrus & Blaber (1982b), Cyrus & Blaber (1983b), Cyrus & Blaber (1984a), Cyrus & Blaber (1987a), Cyrus & Blaber (1987c), Cyrus & Martin (1988), Cyrus et al. (1993), Davey (1975), Davis et al. (2003), Day (1959), Day (1974a), Deacon & Hecht (1995), Deacon & Hecht (1996), de Freitas (1986), de Villiers & Allanson (1988), de Villiers & Allanson (1989), de Villiers & Hodgson (1993), de Villiers et al. (1989), Drennan (1986), du Preez (1987), du Preez & Cockcroft (1988a), du Preez & Cockcroft (1988b), du Preez et al. (1986a), du Preez et al. (1986b), Dye & Lasiak (1986), Edgcumbe (1980), Ellender et al. (2012), Emmerson (1985b), Emmerson (1985c), Emmerson & Alexander (1986), Emmerson (1994), Emmerson et al. (2003), Farrant (1986), Farrant et al. (1987), Fearnhead & Fabian (1971), Fielding et al. (1988), Forbes (1973), Forbes (1974), Forbes (1977), Forbes (1978), Forbes (1998), Forbes & Benfield (1985), Forbes & Hill (1966), Forbes et al. (1994), Fowles & Archibald (1987), Garcia Rodriguez (1994), Goeck (2005), Gordon et al. (2012), Grange & Cretchley (1995), Griffiths (1996), Griffiths & Hecht (1995), Grindley (1964), Grindley (1965), Grindley (1972), Grindley (1977), Grobler & Cyrus (2003), Grobler et al. (2003), Guillet & Furness (1985), Gundry (1985), Gye-Ababio (2002), Gyedu-Ababio & Baird (2006), Haigh & Whitfield (1993), Hanekom & Baird (1987), Harris (1991), Harris (1996), Harris et al. (1988), Harris et al. (1991), Harrison (2002), Harrison (2003), Harrison (2005), Harrison & Whitfield (2006a), Harrison & Whitfield (2006b), Harrison & Whitfield (2012), Harrison et al. (1986), Hart (1981), Hay & Breen (1993), Hay & Breen (1995), Hay et al. (1995), Hecht & van der Lingen (1992), Henninger et al. (2009), Henninger et al. (2010), Henriques et al. (2012), Henry et al. (1977), Hill (1967), Hill (1971), Hill (1974), Hill (1975b), Hill (1976), Hill (1977), Hill (1978), Hill (1979a), Hill (1980), Hill (1981a), Hill & Allanson (1971), Hill & Forbes (1979), Hill & Koopowitz (1975), Hilmer & Bate (1983), Hodgson & de Villiers (1986), Hodgson et al. (1987), Hoppe-Speer et al. (2011), Hughes (1970), Isla & Perissinotto (2004), Jackson et al. (2005), James et al. (2003), James et al. (2004), James et al. (2008a), Jerling & Wooldridge (1989), Jooste (2004), Kaambo (2006), Katua (1996), Kloppe (2005), Knox (2003), Lambert et al. (1987), Lambert et al. (1989), Lasiak (1981), Lasiak (1983a), Lasiak (1983b), Lasiak (1984), Lucas & Newell (1984), Lucas et al. (1987), Lukey et al. (2006), Malan (1986), Malan (1990), Malan et al. (1988), Mann & Pradervand (2007), Mann & Steinke (1988), Marais (1978), Marais (1980), Marais (1982), Marais (1984), Marais (1988), Marais (1990),

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ESTUARINE INDEX

NBA = 2011 National Biodiversity Assessment of the condition/health of South African estuaries.

Estuary	Page	Classification	Information	Condition	NBA
Amanzimnyama	96	Temporarily open/closed	Poor	Excellent	Good
Baakens	47	Canalized estuary	Poor	Poor	Poor
Beechamwood	86	Temporarily open/closed	Nil	Excellent	Excellent
Bilanhlole	124	Temporarily open/closed	Poor	Fair	Fair
Bira	58	Temporarily open/closed	Poor	Good	Good
Blind	68	Temporarily open/closed	Poor	Poor	Fair
Blinde	29	Temporarily open/closed	Poor	Good	Good
Bloukrans	39	River mouth	Poor	Good	Excellent
Boboyi	127	Temporarily open/closed	Poor	Fair	Fair
Boknes	50	Temporarily open/closed	Poor	Fair	Fair
Bokramspruit	16	Temporarily open/closed	Poor	Fair	Fair
Bot/Kleinmond	23	Estuarine lake	Moderate	Fair	Fair
Breede	27	Permanently open estuary	Moderate	Fair	Good
Buffalo	67	Permanently open estuary	Poor	Fair	Fair
Buffels (East)	22	Temporarily open/closed	Poor	Good	Good
Bulolo	106	Temporarily open/closed	Poor	Good	Good
Bulungula	96	Temporarily open/closed	Poor	Good	Good
Bulura	71	Temporarily open/closed	Poor	Good	Good
Bushmans	50	Permanently open estuary	Moderate	Fair	Fair
Cebe	81	Temporarily open/closed	Poor	Good	Good
Cefane	72	Temporarily open/closed	Poor	Good	Good
Cintsa	72	Temporarily open/closed	Poor	Good	Fair
Cunge	71	Temporarily open/closed	Poor	Good	Good
Cwili	76	Temporarily open/closed	Poor	Good	Good
Damba	130	Temporarily open/closed	Poor	Fair	Fair
Diep	14	Temporarily open/closed	Moderate	Poor	Poor
Duiwenhoks	28	Permanently open estuary	Poor	Good	Good
Durban Bay	144	Estuarine bay	Moderate	Poor	Poor
Dwesa	89	Temporarily open/closed	Nil	Excellent	None
Eerste	19	Temporarily open/closed	Poor	Poor	Poor
Elands	41	River mouth	Poor	Good	Excellent
Elandsbos	40	River mouth	Poor	Good	Excellent
Fafa	135	Temporarily open/closed	Poor	Fair	Fair
Gamtoos	46	Permanently open estuary	Moderate	Fair	Fair
Gericke	30	Temporarily open/closed	Nil	Poor	None
Goda	66	Temporarily open/closed	Poor	Good	Good
Goukamma	35	Temporarily open/closed	Poor	Good	Good
Goukou	28	Permanently open estuary	Poor	Fair	Fair
Gourits	29	Permanently open estuary	Poor	Fair	Fair
Gqunube	70	Permanently open estuary	Poor	Good	Good
Gqunqe	82	Temporarily open/closed	Poor	Excellent	Excellent
Gqutywa	59	Temporarily open/closed	Poor	Good	Good
Gqwarha	77	Temporarily open/closed	Nil	Good	None
Grant's	51	Temporarily open/closed	Poor	Fair	None
Great Fish	55	Permanently open estuary	Moderate	Good	Fair
Great Kei	76	Permanently open estuary	Poor	Good	Fair
Groot (East)	42	River mouth	Poor	Fair	Good
Groot (West)	39	Temporarily open/closed	Poor	Good	Good
Groot Berg	13	Permanently open estuary	Moderate	Fair	Fair
Groot Brak	32	Temporarily open/closed	Poor	Fair	Fair
Gwaing	33	Temporarily open/closed	Poor	Good	Good
Gxara	77	Temporarily open/closed	Poor	Good	Good

Estuary	Page	Classification	Information	Condition	NBA
Gxulu	65	Temporarily open/closed	Poor	Good	Good
Haga-Haga	74	Temporarily open/closed	Poor	Good	Good
Hartenbos	31	Temporarily open/closed	Poor	Fair	Fair
Heuningnes	26	Permanently open estuary	Poor	Fair	Fair
Hickman's	67	Temporarily open/closed	Poor	Good	Good
Hlanze	68	Temporarily open/closed	Poor	Fair	Fair
Hlozi	66	Temporarily open/closed	Poor	Good	Good
Hluleka	103	Temporarily open/closed	Poor	Good	Good
Houtbaai	15	River Mouth	Poor	Poor	Poor
Ingo	109	Temporarily open/closed	Nil	Excellent	None
Jujura	85	Temporarily open/closed	Poor	Good	Good
Kaaimans	33	Permanently open estuary	Poor	Good	Good
Kaba/Khaba	123	Temporarily open/closed	Poor	Fair	Good
Kabeljous	45	Temporarily open/closed	Moderate	Good	Fair
Khandandlovu	121	Temporarily open/closed	Poor	Fair	Good
Kariega	51	Permanently open estuary	Good	Fair	Fair
Kasuka	52	Temporarily open/closed	Moderate	Good	Good
Keiskamma	60	Permanently open estuary	Moderate	Fair	Fair
Keurbooms	37	Permanently open estuary	Moderate	Good	Excellent
Kiwane	61	Temporarily open/closed	Poor	Good	Good
Klein	24	Estuarine lake	Moderate	Fair	Fair
Klein Brak	31	Temporarily open/closed	Poor	Fair	Fair
Kleinemonde (East)	54	Temporarily open/closed	Good	Good	Good
Kleinemonde (West)	54	Temporarily open/closed	Moderate	Good	Good
Klein Palmiet	55	Temporarily open/closed	Poor	Fair	Fair
Klipdrif	43	Temporarily open/closed	Poor	Fair	Fair
Klipdrifsfontein	27	Temporarily open/closed	Poor	Excellent	Excellent
Knysna	36	Estuarine bay	Good	Good	Good
Kobonqaba	80	Permanently open estuary	Poor	Good	Good
Kongweni	125	Temporarily open/closed	Poor	Poor	Fair
Koshwana	130	Temporarily open/closed	Poor	Fair	Fair
Kosi	156	Estuarine lake	Good	Good	Good
Kowie	52	Permanently open estuary	Moderate	Fair	Fair
Krom	17	Temporarily open/closed	Poor	Excellent	Excellent
Kromme	44	Permanently open estuary	Good	Fair	Fair
Ku-Boboyi	120	Temporarily open/closed	Poor	Fair	Good
Kumpenzu	92	Temporarily open/closed	Poor	Excellent	Good
Ku-Nocekedwa	88	Temporarily open/closed	Nil	Good	Excellent
Kwagoqo	87	Temporarily open/closed	Nil	Good	Excellent
Kwanyana	115	Temporarily open/closed	Poor	Good	Good
Kwelera	70	Permanently open estuary	Poor	Good	Good
Kwenxura	73	Temporarily open/closed	Poor	Good	Good
Langebaan	14	Estuarine embayment	Good	Good	Fair
Lilyvale	63	Temporarily open/closed	Poor	Fair	Fair
Little Manzimtoti	142	Temporarily open/closed	Poor	Fair	Fair
Lottering	40	River mouth	Poor	Good	Excellent
Lourens	20	Temporarily open/closed	Poor	Poor	Fair
Lovu	142	Temporarily open/closed	Poor	Poor	Fair
Luphathana	112	Temporarily open/closed	Poor	Excellent	Excellent
Lwandilana	101	Temporarily open/closed	Poor	Good	Excellent
Lwandile	102	Temporarily open/closed	Poor	Good	Good
Maalgate	32	Temporarily open/closed	Poor	Fair	Good
Mahlongwa	139	Temporarily open/closed	Poor	Fair	Fair
Mahlongwana	139	Temporarily open/closed	Poor	Fair	Good
Maitland	47	Temporarily open/closed	Poor	Fair	Fair
Makosi	133	Temporarily open/closed	Poor	Fair	Good
Manzimtoti	143	Temporarily open/closed	Poor	Poor	Fair
Maphuzi	99	Temporarily open/closed	Poor	Good	Good

Estuary	Page	Classification	Information	Condition	NBA
Masimini	81	Temporarily open/closed	Nil	Good	None
Matikulu/Nyoni	150	Permanently open estuary	Poor	Fair	Good
Matjies	38	Temporarily open/closed	Poor	Good	Good
Mbango	128	Temporarily open/closed	Poor	Poor	Poor
Mbhanyana	93	Temporarily open/closed	Poor	Good	Excellent
Mbhashe	92	Permanently open estuary	Moderate	Good	Fair
Mbizana	123	Temporarily open/closed	Poor	Fair	Good
Mbokodweni	143	Temporarily open/closed	Poor	Poor	Poor
Mbotyi	111	Temporarily open/closed	Poor	Good	Good
Mcantsi	65	Temporarily open/closed	Poor	Good	Fair
Mdlotane	148	Temporarily open/closed	Poor	Fair	Good
Mdloti	146	Temporarily open/closed	Moderate	Fair	Fair
Mdumbi	101	Permanently open estuary	Poor	Good	Good
Mendu	90	Temporarily open/closed	Poor	Excellent	Excellent
Mendwana	90	Temporarily open/closed	Nil	Excellent	Excellent
Mfazazana	133	Temporarily open/closed	Poor	Poor	Fair
Mfolozi	153	River mouth	Moderate	Poor	Fair
Mgeni	145	Temporarily open/closed	Good	Poor	Fair
Mgobezeleni	155	Estuarine lake	Poor	Good	Good
Mgwalana	58	Temporarily open/closed	Poor	Good	Good
Mgwegwe	114	Temporarily open/closed	Poor	Excellent	Excellent
Mhlabatshane	132	Temporarily open/closed	Poor	Fair	Good
Mhlali	147	Temporarily open/closed	Poor	Poor	Fair
Mhlanga	145	Temporarily open/closed	Moderate	Fair	Fair
Mhlangamkulu	129	Temporarily open/closed	Poor	Fair	Fair
Mhlangankulu	122	Temporarily open/closed	Poor	Fair	Fair
Mhlangeni	126	Temporarily open/closed	Poor	Fair	Fair
Mhlathuze	152	Estuarine bay	Moderate	Fair	Fair
Mhlungwa	132	Temporarily open/closed	Poor	Poor	Fair
Mkhomazi	140	Permanently open estuary	Poor	Poor	Fair
Mkhozi	111	Temporarily open/closed	Poor	Excellent	Excellent
Mkumbane	136	Temporarily open/closed	Poor	Poor	Fair
Mkweni	113	Temporarily open/closed	Poor	Good	Excellent
Mlalazi	151	Permanently open estuary	Poor	Good	Good
Mlele	64	Temporarily open/closed	Poor	Good	Good
Mnamfu	134	Temporarily open/closed	Poor	Fair	Fair
Mncwasa	98	Temporarily open/closed	Poor	Good	Good
Mnenu	103	Temporarily open/closed	Poor	Good	Good
Mngazana	105	Permanently open estuary	Moderate	Good	Good
Mngazi	106	Permanently open estuary	Poor	Good	Fair
Mntafufu	109	Permanently open estuary	Poor	Good	Good
Mnyamenana	116	Temporarily open/closed	Nil	Excellent	None
Mnyameni	116	Temporarily open/closed	Poor	Good	Good
Morgan	75	Temporarily open/closed	Poor	Good	Fair
Mpahlane	117	Temporarily open/closed	Poor	Excellent	Good
Mpahlanyana	117	Temporarily open/closed	Poor	Good	Good
Mpako	98	Temporarily open/closed	Poor	Good	Good
Mpande	104	Temporarily open/closed	Poor	Good	Good
Mpambanyoni	138	Temporarily open/closed	Poor	Poor	Fair
Mpekweni	57	Temporarily open/closed	Poor	Good	Good
Mpenjati	122	Temporarily open/closed	Poor	Fair	Good
Msikaba	113	Permanently open estuary	Moderate	Excellent	Excellent
Msimbazi	141	Temporarily open/closed	Poor	Fair	Good
Mthakaty	102	Permanently open estuary	Poor	Excellent	Good
Mthambane	107	Temporarily open/closed	Poor	Good	Good
Mthamvuna	119	Temporarily open/closed	Poor	Good	Good
Mtana	60	Temporarily open/closed	Poor	Good	Good
Mthatha	100	Permanently open estuary	Poor	Fair	Fair

Estuary	Page	Classification	Information	Condition	NBA
Mtati	57	Temporarily open/closed	Poor	Good	Good
Mtendwe	73	Temporarily open/closed	Poor	Good	Good
Mthentu	114	Permanently open estuary	Poor	Excellent	Excellent
Mtentwana	118	Temporarily open/closed	Poor	Good	Fair
Mtentweni	129	Temporarily open/closed	Poor	Fair	Fair
Mtonga	104	Temporarily open/closed	Poor	Good	Good
Mtwalume	134	Temporarily open/closed	Poor	Poor	Fair
Mvoti	148	River mouth	Poor	Poor	Fair
Mvuzi	135	Temporarily open/closed	Poor	Poor	Fair
Mvutshini	124	Temporarily open/closed	Poor	Fair	Fair
Mzamba	118	Permanently open estuary	Poor	Good	Good
Mzimayi	137	Temporarily open/closed	Poor	Fair	Fair
Mzimkhulu	128	Permanently open estuary	Poor	Poor	Fair
Mzimpunzi	110	Temporarily open/closed	Poor	Good	Good
Mzimvubu	107	River mouth	Poor	Fair	Fair
Mzintlava	110	Permanently open estuary	Poor	Good	Good
Mzinto	137	Temporarily open/closed	Poor	Fair	Fair
Mzumbe	131	Temporarily open/closed	Poor	Poor	Fair
Nahoon	69	Permanently open estuary	Moderate	Fair	Fair
Ncera	64	Temporarily open/closed	Poor	Fair	Good
Ncizele	79	Temporarily open/closed	Poor	Good	Good
Nebelele	84	Temporarily open/closed	Nil	Good	Good
Nenga	99	Temporarily open/closed	Poor	Good	Fair
Ngadla	85	Temporarily open/closed	Poor	Good	Good
Ngane	140	Temporarily open/closed	Poor	Fair	Good
Ngculura	59	Temporarily open/closed	Poor	Good	Good
Ngogwane	78	Temporarily open/closed	Poor	Good	Good
Ngoma	89	Temporarily open/closed	Poor	Excellent	Excellent
Ngqinisa	61	Temporarily open/closed	Poor	Good	Good
Ngqusi	80	Permanently open estuary	Poor	Good	Good
Ngqurha	49	Temporarily open/closed	Poor	Poor	Poor
Ngqwara	83	Temporarily open/closed	Poor	Excellent	Excellent
Nhlabane	153	Estuarine lake system	Moderate	Poor	Poor
Nkanya	94	Temporarily open/closed	Poor	Good	Good
Nkodusweni	108	Temporarily open/closed	Poor	Fair	Good
Noetsie	36	Temporarily open/closed	Poor	Good	Good
Nonoti	149	Temporarily open/closed	Poor	Fair	Good
Nqabara	88	Permanently open estuary	Poor	Good	Good
Nqakanqa	97	Temporarily open/closed	Nil	Good	Excellent
Nqakanqana	97	Temporarily open/closed	Nil	Good	Excellent
Ntlonyane	93	Temporarily open/closed	Poor	Good	Good
Ntlupeni	108	Temporarily open/closed	Poor	Excellent	Good
Ntshambili	131	Temporarily open/closed	Poor	Fair	Good
Nyara	73	Temporarily open/closed	Poor	Excellent	Excellent
Nyumbazana	94	Temporarily open/closed	Nil	Excellent	None
Old Woman's	56	Temporarily open/closed	Poor	Good	Fair
Olifants	12	Permanently open estuary	Moderate	Fair	Fair
Onrus	23	Temporarily open/closed	Poor	Fair	Poor
Orange	12	River mouth	Moderate	Fair	Fair
Palmiet	22	Permanently open estuary	Moderate	Good	Fair
Piesang	37	Temporarily open/closed	Poor	Fair	Fair
Quinerha	69	Temporarily open/closed	Poor	Fair	Good
Qolora	78	Temporarily open/closed	Poor	Good	Good
Qora	84	Permanently open estuary	Poor	Excellent	Good
Quko	75	Temporarily open/closed	Poor	Excellent	Good
Ratel	26	Temporarily open/closed	Poor	Good	Fair
Richards Bay	152	Estuarine bay	Moderate	Poor	Fair

Estuary	Page	Classification	Information	Condition	NBA
Riet	53	Temporarily open/closed	Poor	Good	Good
Rocky Bay	138	Temporarily open closed	Nil	Fair	None
Rooiels	21	Temporarily open/closed	Poor	Good	Good
Ross' Creek	63	Temporarily open/closed	Poor	Fair	Good
Rufane	53	Temporarily open/closed	Poor	Poor	Fair
Sandlundlu	120	Temporarily open/closed	Poor	Fair	Fair
Schuster	17	Temporarily open/closed	Poor	Good	Excellent
Seekoei	45	Temporarily open/closed	Moderate	Fair	Fair
Seteni	147	Temporarily open/closed	Poor	Fair	Fair
Sezela	136	Temporarily open/closed	Poor	Fair	Fair
Shelbertsstroom	62	Temporarily open/closed	Poor	Fair	Fair
Shixini	86	Permanently open estuary	Poor	Good	Good
Sihlontlweni	83	Temporarily open/closed	Poor	Excellent	Good
Sikatsha	112	Temporarily open/closed	Poor	Excellent	Excellent
Sikombe	115	Temporarily open/closed	Poor	Good	Excellent
Silwermyn	18	Temporarily open/closed	Poor	Fair	Fair
Sinangwana	105	Temporarily open/closed	Poor	Good	Good
Sipingo	144	Modified estuary	Poor	Poor	Poor
Sir Lowry's Pass	20	Temporarily open/closed	Poor	Poor	Poor
Siyaya	151	Temporarily open/closed	Poor	Fair	Poor
Slang	43	Temporarily open/closed	Poor	Fair	Fair
Sout (East)	38	Permanently open estuary	Poor	Excellent	Excellent
Sout (West)	15	Canalized estuary	Poor	Poor	Poor
St Lucia	154	Estuarine lake system	Excellent	Fair	Poor
Steenbras	21	Permanently open estuary	Poor	Good	Good
Storms	41	River mouth	Poor	Good	Good
Sundwana	95	Temporarily open/closed	Nil	Excellent	Excellent
Sundays	49	Permanently open estuary	Good	Fair	Fair
Swartkops	48	Permanently open estuary	Excellent	Fair	Fair
Swartvlei	34	Estuarine lake system	Good	Good	Good
Tenza	87	Temporarily open/closed	Nil	Good	Excellent
Thongathi	146	Temporarily open/closed	Poor	Poor	Poor
Thongazi	121	Temporarily open/closed	Poor	Fair	Good
Thatshana	56	Temporarily open/closed	Nil	Fair	None
Thukela	150	River mouth	Poor	Fair	Fair
Timba	79	Permanently open estuary	Nil	Fair	Good
Tshani	100	Temporarily open/closed	Poor	Fair	Good
Tsitsikamma	42	Temporarily open/closed	Poor	Fair	Good
Tweekuilen	30	Temporarily open/closed	Nil	Poor	None
Tyolomnqa	62	Temporarily open/closed	Poor	Good	Good
Uilkraals	24	Permanently open estuary	Poor	Good	Fair
Umgababa	141	Temporarily open/closed	Poor	Fair	Good
Uvuzana	125	Temporarily open/closed	Poor	Fair	Fair
van Stadens	46	Temporarily open/closed	Poor	Fair	Good
Verlorenvlei	13	Estuarine lake	Poor	Poor	Fair
Vungu	126	Temporarily open/closed	Poor	Poor	Good
Wilderness	34	Estuarine lake system	Good	Good	Good
Wildevoëlvlei	16	Temporarily open/closed	Poor	Poor	Fair
Xhorha	95	Permanently open estuary	Poor	Good	Good
Zalu	82	Temporarily open/closed	Poor	Good	Excellent
Zandvlei	18	Temporarily open/closed	Moderate	Fair	Fair
Zeekoei	19	Temporarily open/closed	Moderate	Poor	Poor
Zinkwasi	149	Temporarily open/closed	Poor	Fair	Fair
Zolwane	119	Temporarily open/closed	Poor	Good	Good
Zotsha	127	Temporarily open/closed	Poor	Fair	Fair