

5.

AESTHETICS

5.1 Introduction

South African estuaries represent one of the few sheltered environments along a rugged coastline dominated by a high wave energy. As a result, estuaries have naturally become the focus of coastal development for either commercial or industrial use such as ports and harbours or as residential and recreational areas (Morant & Quinn, 1999). With the growth of human populations and the rapid increase in urbanisation and industrial activities, the pressure to develop estuaries will also increase. However, the protection of the estuarine environment in the long term is essential if the natural resources provided by estuaries and the quality of life offered by them is to be maintained (Day & Grindley, 1981).

Estuaries offer a number of socio-cultural values other than ecological or economic ones and these socio-cultural values are often those intangible attributes which contribute to the 'quality of life' (Reimold *et al.*, 1980). The open space and pristine scenery associated with natural estuaries, attracts many people and these visitors are not only foreign or inland visitors but also local residents enjoying the aesthetic appeal of natural areas close to home. It often happens, however, that when an area has such aesthetic appeal people flock to it and over-use or abuse it, thereby reducing the aesthetic qualities that attracted visitors in the first place (Reimold *et al.*, 1980). Apart from their aesthetic and recreational appeal, estuaries also serve an important educational function from the non-scientific general public to basic and applied research. Education of citizens is essential in order to develop an awareness of the value of estuaries and ensure their conservation and long-term sustainability. It also requires good management of the resource to maintain quality while providing pleasure for large numbers of people (Reimold *et al.*, 1980).

In a public relations context, aesthetic aspects of estuarine quality are an important factor and the appearance of an estuary contributes to its perceived environmental health, particularly in terms of its utilisation by man (Portman & Wood, 1985). Certain uses (e.g. industrial or commercial development) change the appearance of an estuary and in so doing

impair its suitability for other potential uses (e.g. nature conservation/recreation/tourism). In this section an assessment of the aesthetic state of South Africa's estuaries is provided. It is intended that the information presented will be of use in planning the utilisation of estuarine areas: those which are unspoilt might, for example, be retained for nature conservation; those with little disturbance might be suitable for recreation, as long as water quality is suitable for that purpose; estuaries which are heavily impacted visually by industrial development are unlikely to be of much use in encouraging tourists to the area.

5.2 Methods

The perception of the best possible appearance of an area will vary from one individual to another and from members of one socio-economic or cultural group to another. Thus the measurement of aesthetic health of estuaries and other wetlands is largely subjective (Reimold *et al.*, 1980). This problem centres on what an individual perceives the ideal state of an estuary to be. In order to eliminate this problem and introduce a more objective method of assessment, the aesthetic state of each estuarine area was assessed in terms of the degree of 'naturalness' of the estuary. The basic premise of what we have termed the Aesthetic Health Index is that an estuary which is totally undeveloped by man, reflecting a maximum degree of 'naturalness', is in a perfect or pristine state - and deviation from this state is indicative of 'degradation' or loss of aesthetic appeal.

A number of parameters contribute to the aesthetic health of an estuary and it is in the selection and assignment of a relative value to each parameter that subjectivity is involved. Reimold *et al.* (1980) in a rare assessment of the aesthetic value of estuaries noted that an aesthetic appreciation of wetlands is essentially a sensual one, in that vision, hearing, smell, touch and taste senses are stimulated. An objective attempt to describe subjective visual-cultural values of freshwater wetlands was described where wetlands were evaluated in terms of landform contrast, landform diversity, wetland edge complexity, wetland type diversity, educational and recreational quality and possible outstanding elements. These attributes were weighed and the resultant rating proved useful in comparing visual-cultural values of different freshwater wetlands (Reimold *et al.*, 1980). The aesthetic quality of estuaries in the United Kingdom was assessed by Portman & Wood (1985) using factors

such as smell, colour, debris, oil, recognisable sewage solids, and effects from discharge of domestic or industrial effluent. This assessment also took account of natural turbidity, algal growth and the frequency with which floating debris was encountered (Portman & Wood, 1985).

During the development of the Aesthetic Health Index used here, a survey of 25 coastal zone managers and planners was undertaken to identify and determine the relative importance of the various criteria which contribute to the aesthetics an estuary (Cooper, 1993). The parameters which accommodate most of the aesthetic impacts on an estuary were considered to be floodplain landuse, the state of the shoreline or channel margins, development in the estuary/floodplain surrounds, bridges, dams and weirs, the degree to which the mouth of a system is artificially stabilised, litter and rubble, the extent of human use, invasive/exotic vegetation, algal growth and/or aquatic nuisance plants, turbidity, odours, air pollution, and noise.

Each parameter was given a weighting from which points were deducted according to the type and degree of impairment. The relative weighting of the various parameters are given in the table below.

Table 5.1. Parameters and their relative weighting used in the Aesthetic Health Index.

Category	Weight
Floodplain landuse	25
Shoreline status	15
Floodplain/estuary surrounds	15
Bridges	6
Dams & weirs	6
Mouth stabilisation	6
Litter & rubble	6
Human use	4
Algal growth/ aquatic nuisance plants	3
Turbidity	3
Odour	3
Air pollution	3
Noise	3
Invasive & exotic vegetation	2

An information-gathering sheet was designed which could be completed in the field while sampling. It should be noted here that the assessments were essentially conducted on the ground from some vantage point such as a bridge and were limited to only the area visible from that point. Assessments, particularly for the larger estuaries, were therefore generally limited to the lower reaches of these systems. Once each estuary was scored, the overall index value was calculated which ranged between 0 and 100. The final index values were then rescaled between 0 and 10. An aesthetically poor or heavily developed estuary would have a value tending toward 0 and a near-natural estuary would tend toward 10. The index scores were then rated where systems which had values below 6 were regarded as being aesthetically poor, systems with scores between 6 and 9 were rated as moderately impaired aesthetically and systems with scores above 9 were rated as good.

5.3 Results & discussion

A total of 251 systems were assessed during this study. Although many systems were not considered estuaries either because they were dry or were too small, these have been included here since they still form part of the natural beauty that characterises our coastal environment.

A total of 50 systems were assessed on the west and south-west coasts (Figure 5.1). Eight systems had poor ratings. On the west coast, the Sout (Noord) comprises a salt-works while the Berg has been developed as a fishing harbour. On the south-west coast, the Diep and Soutrivier pass through the Cape Town metropolitan area. Both systems have been canalised and the latter essentially serves as a drain for domestic and industrial effluent. The remaining systems all flow into False Bay and, although only four had poor ratings, most of the systems in this area had relatively low scores. Only four systems, Buffels (Wes), Steenbras, Rooiels and Buffels (Oos), had relatively high scores in relation to the others in the False Bay area. Of the poorly rated systems, the Elsie has been modified from a marshy vlei to a canal which drains an artificial wetland; the Sand is heavily urbanised and the system is extensively used for recreation; the Seekoe has been transformed into a canal

which serves largely as an outfall for treated sewage effluent. The Lourens flows near the urban area of Strand and a factory is situated near the mouth.

In the south coast region, 53 systems were assessed (Figure 5.2). Five estuaries had poor ratings. The Hartenbos is situated near Mossel Bay and receives treated effluent and the Groot Brak passes through the coastal development of the same name. Development has also resulted in a relatively low aesthetic score for the Knysna system. The Bakens and Papkuils both fall within the Port Elizabeth metropolitan area and both systems have been canalised. A relatively low score was obtained for the Swartkops which is also situated in Port Elizabeth. The Ngcura (Koega) system, just north-east of Port Elizabeth has been given over almost entirely to salt-works.

A total of 58 systems were assessed in the south-east coast and only two systems, the Kowie and Buffalo had relatively low ratings (Figure 5.3). The Kowie passes through the coastal town of Port Alfred. Part of the system has been canalised and a marina development is situated in the lower reaches. The Buffalo has been developed into an industrial port for the city of East London.

The 43 estuaries assessed on the Transkei coast are largely undeveloped and most had moderate to good ratings (Figure 5.4). The estuaries with relatively low ratings were mostly situated in or near the coastal development of Port St Johns. Despite their high aesthetic appeal, increased human pressure was apparent in many systems in the Transkei where riparian and floodplain vegetation was being removed to make way for subsistence agriculture.

In KwaZulu-Natal, 47 estuaries were assessed (Figure 5.5). Three estuaries, the Manzimtoti, Mbokodweni and Sipingo had low ratings. All these systems flow through the industrial area of Prospecton to the south of the city centre of Durban. The Mgeni, which also had a relatively low index score, is also situated in the Durban metropolitan area. It is interesting to note that few estuaries in KwaZulu-Natal had good ratings. This is largely due to the steady ribbon development in the coastal zone of this region.

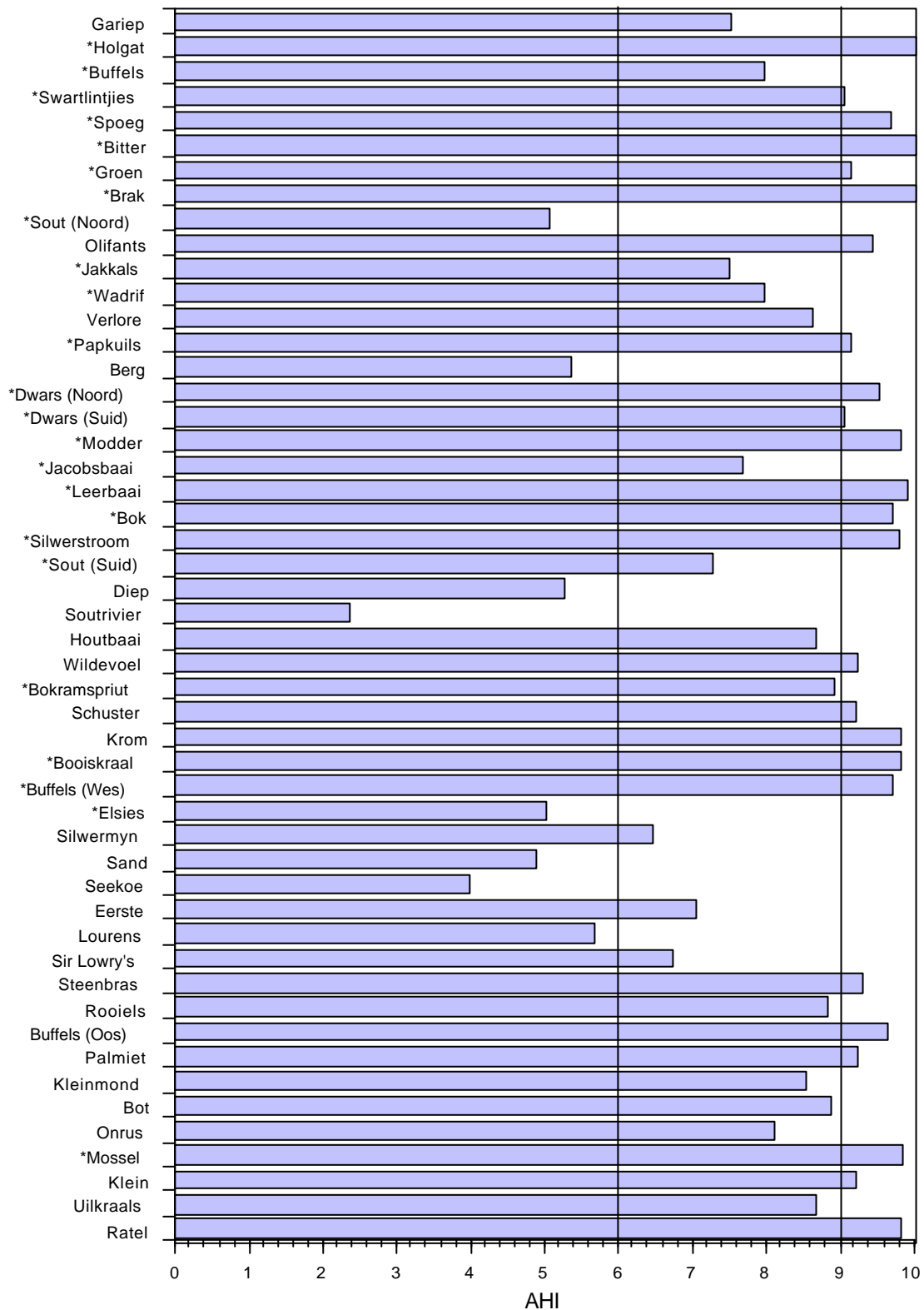


Figure 5.1. Aesthetic scores for estuaries on the west and south-west coast. Systems not considered estuaries are marked with an asterisk. Vertical lines indicate cut-off values for rating the systems.

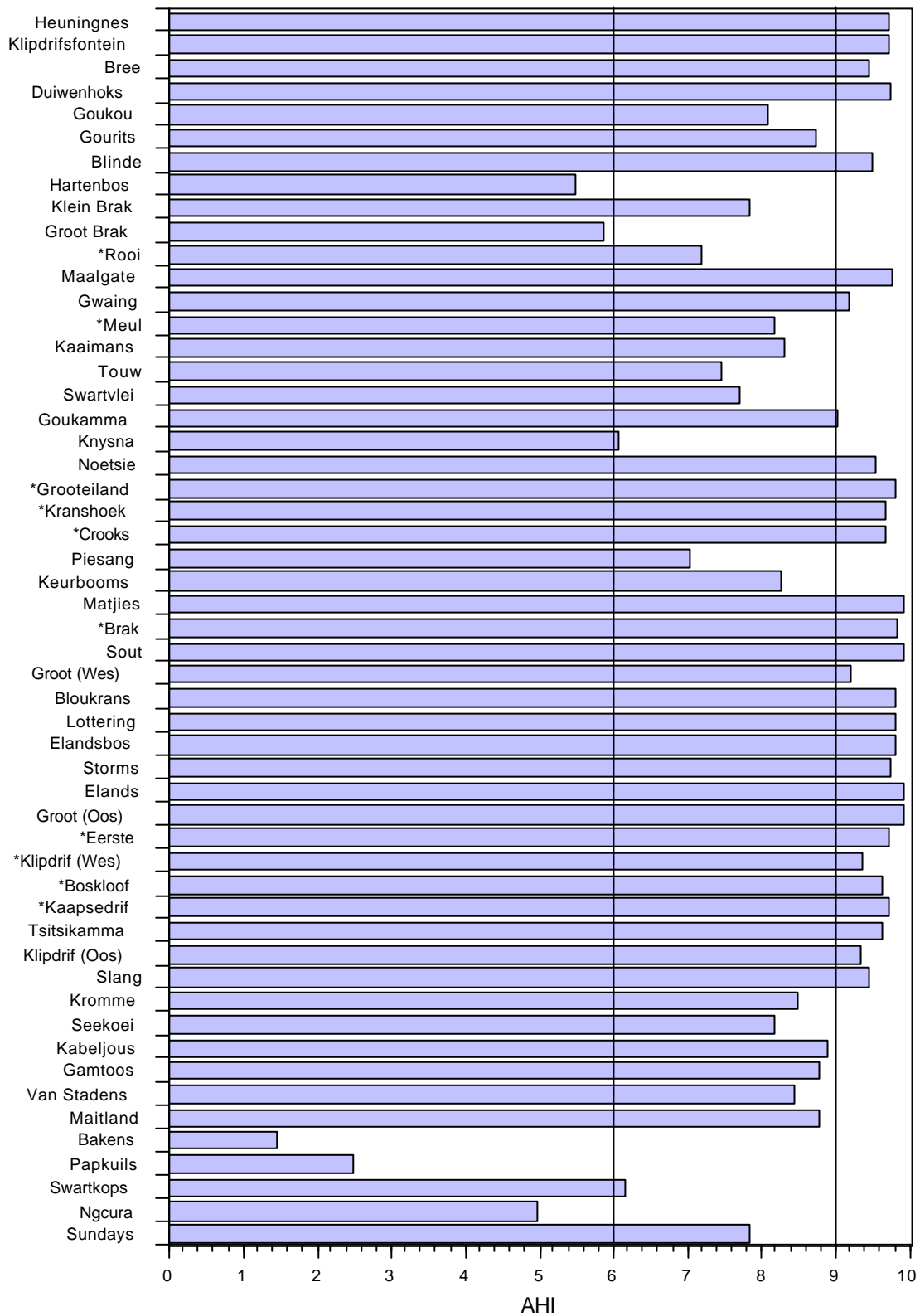


Figure 5.2. Aesthetic scores for estuaries on the south coast. Systems not considered estuaries are marked with an asterisk. Vertical lines indicate cut-off values for rating the systems.

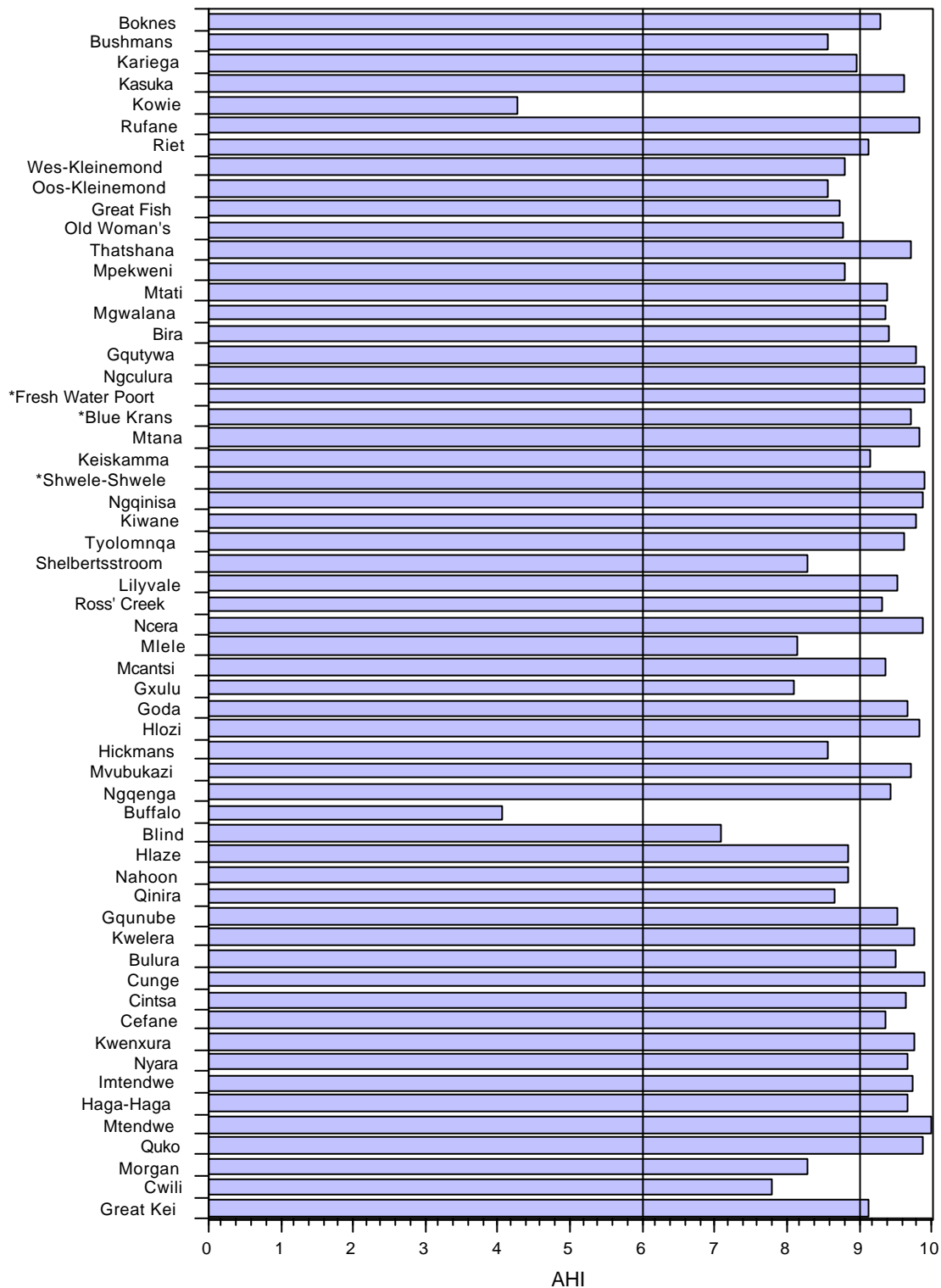


Figure 5.3. Aesthetic scores for estuaries on the west and south-east coast. Systems not considered estuaries are marked with an asterisk. Vertical lines indicate cut-off values for rating the systems.

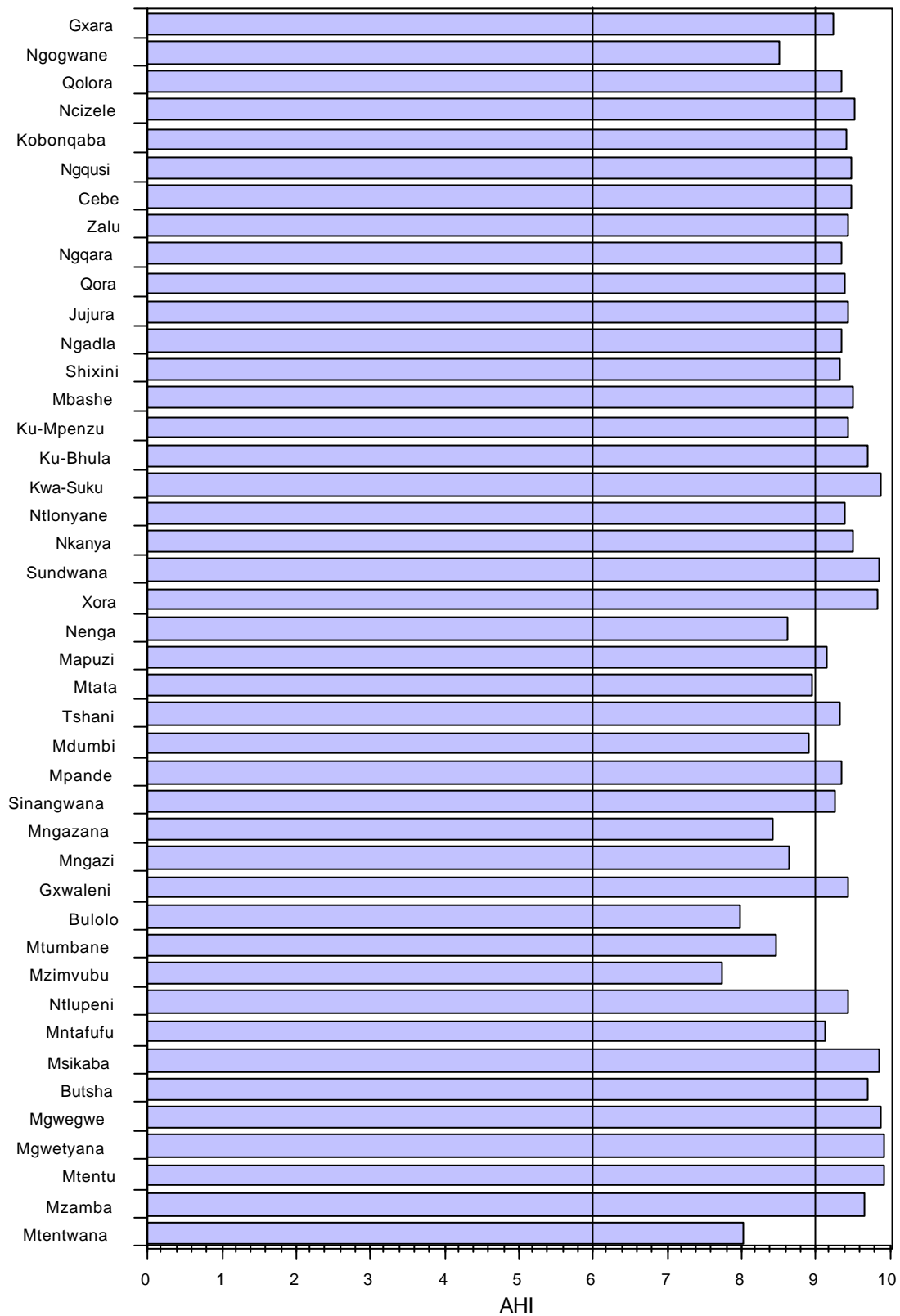


Figure 5.4. Aesthetic scores for estuaries on the Transkei coast. Systems not considered estuaries are marked with an asterisk. Vertical lines indicate cut-off values for rating the systems.

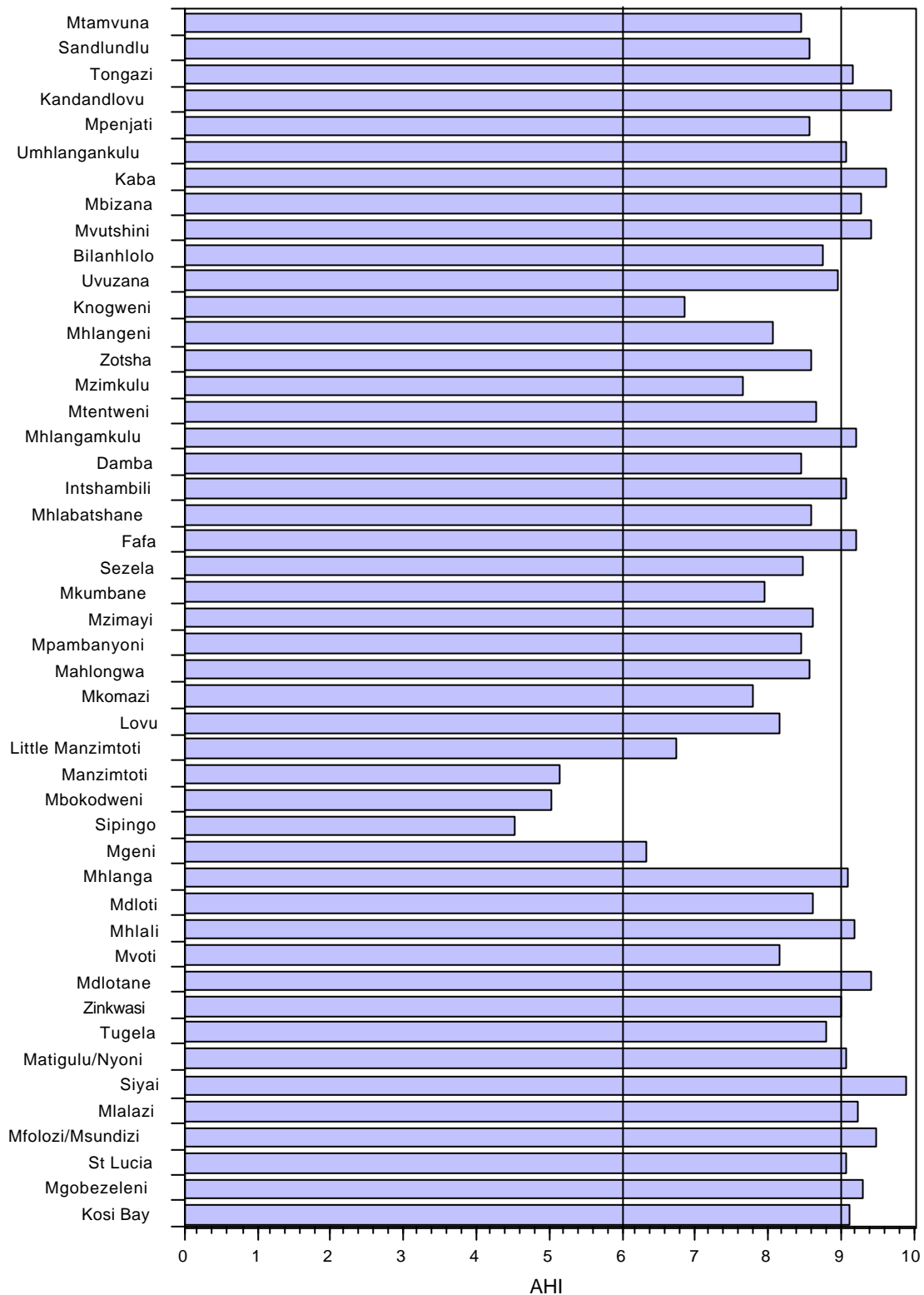


Figure 5.5. Aesthetic scores for estuaries on the KwaZulu-Natal coast. Systems not considered estuaries are marked with an asterisk. Vertical lines indicate cut-off values for rating the systems.

5.4 Summary & conclusions

Overall, of the 251 systems assessed during this study, 18 (7%) had relatively poor aesthetic ratings, 88 (35%) had a moderate rating and 145 (58%) were rated relatively good aesthetically.

While it is acknowledged that measuring the aesthetic value of an estuary is a somewhat subjective assessment, the Aesthetic Health Index represents one of the first attempts by a multidisciplinary team of scientists, to holistically and rationally measure the aesthetics of an estuarine environment. It must be stressed, however, that although somewhat related, an aesthetic appraisal is not the same as measuring the physical degradation in an estuary due to human activities. The aim of aesthetic index is to provide some measure of their socio-cultural value. Aesthetic parameters are commonly recognised as an important aspect of the environment. For example, Heydorn & Tinley (1980) observed "...coast resorts...are dependent on pristine scenery and undamaged resources".