



ESTUARINE HEALTH INDEX (EHI) SCORES

Variable	Score	Weighted score
Hydrology	44	11
Hydrodynamics and mouth condition	81	20
Water quality	39	10
Physical habitat alteration	30	8
HABITAT HEALTH SCORE		49
Microphytes	65	11
Macrophytes	20	4
Invertebrates	10	2
Fish	20	4
Birds	35	7
BIOTIC HEALTH SCORE		28
ESTUARINE HEALTH SCORE		38
ECOLOGICAL STATUS		E

ESTUARINE HEALTH INDEX

EHI 38 = PES of Category E "highly degraded"

EHI Score	PES	Description
91 – 100	A	Unmodified, natural
76 – 90	B	Largely natural with few modifications
61 – 75	C	Moderately modified
41 – 60	D	Largely modified
21 – 40	E	Highly degraded
0 – 20	F	Extremely degraded

IMPORTANCE OF THE UMNGENI ESTUARY
 Estuarine Importance Score 82 = "important"

CRITERION	WEIGHT	SCORE	WEIGHTED SCORE
Estuary Size	15	70	11
Zonal Rarity Type	10	10	1
Habitat Diversity	25	90	23
Biodiversity Importance	25	86.5	22
Functional Importance	25	100	25
ESTUARINE IMPORTANCE SCORE			82

IMPORTANCE SCORE	DESCRIPTION
81 – 100	Highly important
61 – 80	Important
0 – 60	Low to average importance

RECOMMENDED ECOLOGICAL RESERVE CATEGORY (ERC)

= the level of protection

1. Determine the 'minimum' ERC, based on PES.

EHI Score	PES	Description	Minimum ERC
91 – 100	A	Unmodified, natural	A
76 – 90	B	Largely natural with few modifications	B
61 – 75	C	Moderately modified	C
41 – 60	D	Largely modified	D
21 – 40	E	Highly degraded	-
0 – 20	F	Extremely degraded	-

NOTE: Should the PES of an estuary be either an E or F recommendations must be made as to how the status can be elevated to at least achieve a Category D

ESTUARINE IMPORTANCE

Degree to which PES needs to be elevated depends on the level of importance and level of protection or desired protection of a particular estuary

Current/desired protection status and estuary importance	Recommended Ecological Reserve Category (ERC)	Policy basis
Protected area	A or BAS*	Protected and desired protected areas should be restored to and maintained in the best possible state of health
Desired Protected Area (based on conservation planning analyses)		
Highly important	PES + 1 min B	Highly important estuaries should be in an A or B category
Important	PES + 1 min C	Important estuaries should be in an A, B or C category
Low to Average importance	PES min D	Remaining estuaries may be allowed to remain in a D category

uMngeni is in the core set of estuaries for national and provincial planning - implication is that it should be in either an A or best attainable category

Water flow scenarios evaluated

Scenario	MAR (million m ³)	Percentage Natural MAR
Natural	671	100
Present	263	39
1	235	35
2	281	42

Scenario 1: Removal of 80% of the waste water discharge stream currently released to the estuary from KwaMashu & Northern treatment works.

Scenario 2: As above but with increased volume to the estuary due to addition of discharge from Phoenix works.

EHI and EC for the different water flow scenarios evaluated

VARIABLE	WEIGHT	PD	RUNOFF SCENARIO	
			1	2
Hydrology	25	11	11	17
Hydrodynamics/mouth condition	25	20	20	22
Water quality	25	10	10	10
Physical habitat alteration	25	8	8	8
Habitat health score	50	49	49	57
Microphytes	20	11	4	5
Macrophytes	20	4	3	4
Invertebrates	20	2	2	2
Fish	20	4	4	5
Bird	20	7	7	7
Biotic health score	50	28	20	23
Estuarine Health Index		38	35	40
Ecological Category		E	E	E

SUMMARY

1. Under present conditions the estuary is highly degraded due to major, largely irreversible habitat loss, catchment modification and poor water quality. Mouth management maintains a tidal regime and the relatively large tidal prism acts as a mitigatory influence.
2. Flow scenarios 1 and 2 are unlikely to significantly influence the biological status quo.
3. The "rules" in the reserve determination method determine that a system in an "E" category must be raised to a category appropriate to its conservation importance. In the present context of its core status the uMngeni is meant to be raised to an A or Best Attainable State.
4. The BAS was determined as a D which would depend on:
 - ✓ Improved water quality
 - ✓ Rehabilitation of historical, estuarine associated areas