water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

MVOTI TO UMZIMKULU NWRCS

ESTUARY EWR AND CONSEQUENCES OF SCENARIOS

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26 November 2014

Mvoti Estuary

Mvoti Estuary

Presence of several other Red Data waterbird species, e.g. Woolly-necked Stork – IBA directory

Source: David Allen

Sub-regionally important tern roost (mainly Common/Arctic and Little terns, also Swift and Sandwich terns), i.e. over 10 000 individual terns regularly present – IBA directory

Source: David Allen

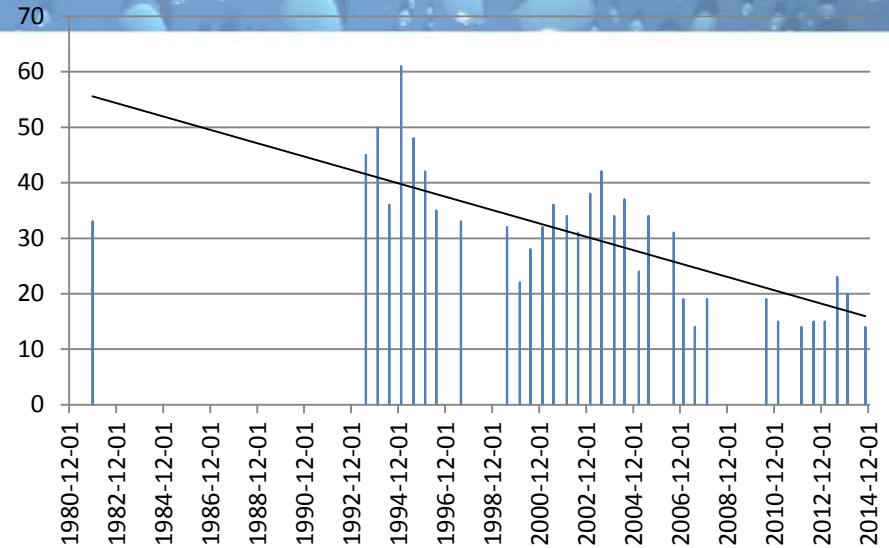
Southernmost extant (at the time) breeding of Collared (Red-winged) Pratincole – IBA directory

Source: David Allen

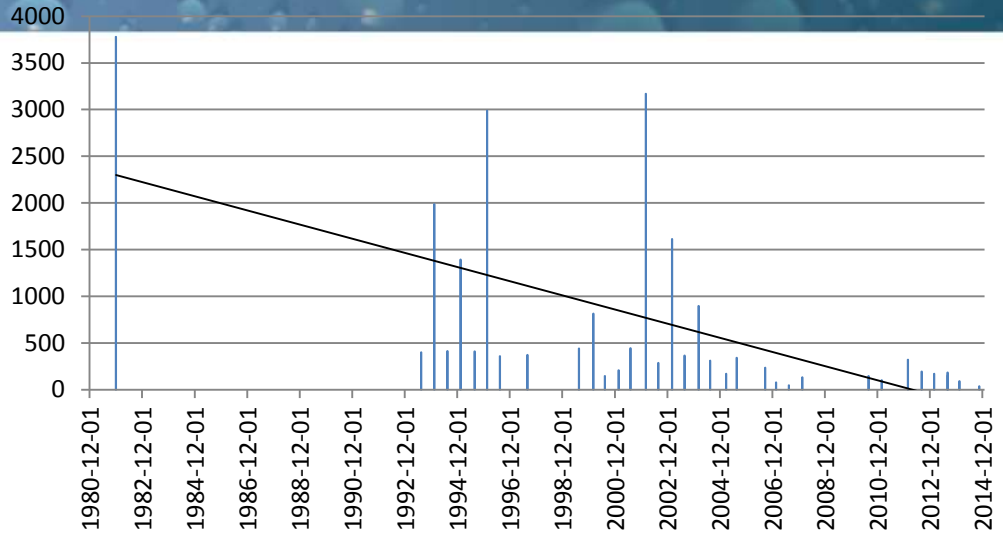
"hundreds present in the 1960s"

Hugh Chittenden

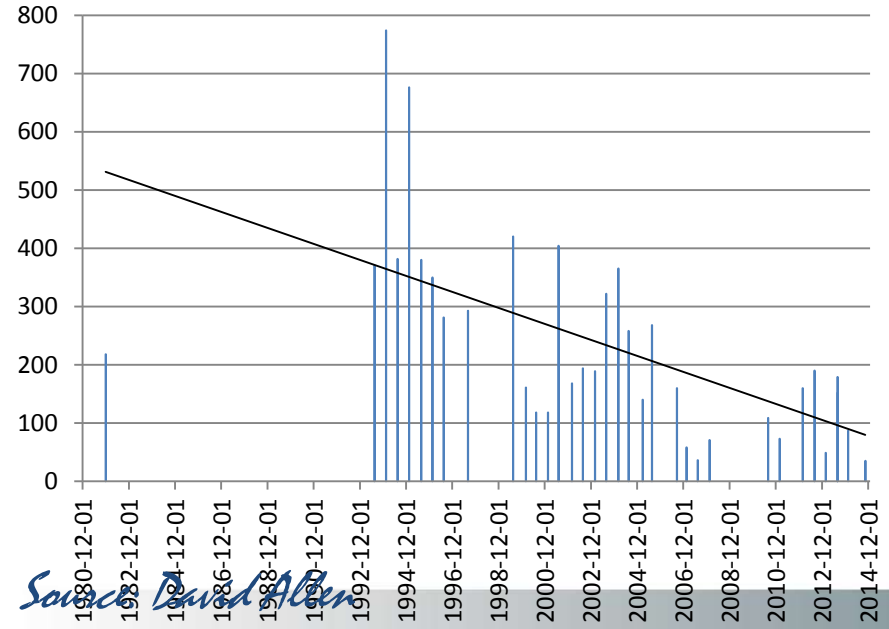
Total no. of waterbird spp.



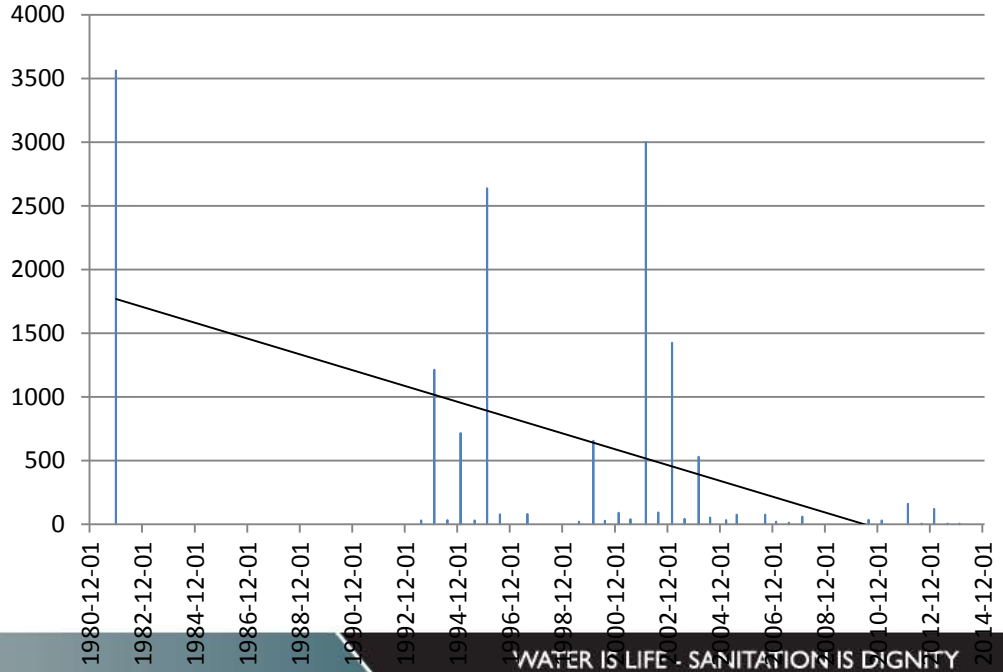
Total no. of waterbirds



Total no. of waterbirds, minus terns



Roosting terns



Source: David Allen

Organic input from Sappi

Source: N Forbes, MER

PES Mvoti Estuary

Variable	Weight	Present
Hydrology	25	53.4
Hydrodynamics	25	95
Water quality	25	58.4
Physical habitat alteration	25	73
Habitat health score		**70**
Microalgae	20	80
Macrophytes	20	32
Invertebrates	20	25
Fish	20	55
Birds	20	10
Biotic health score		**40**
ESTUARY HEALTH SCORE		55
ECOLOGICAL STATUS		D

Importance

Estuarine Importance	Wt	Score
Size	15	60
Zonal Type Rarity	10	70
Habitat diversity	25	30
Biodiv Importance	25	81
Functional importance (sediments to nearshore)	25	100
ESTUARINE IMPORTANCE SCORE		**69**

IMPORTANCE SCORE	DESCRIPTION
Protected status	Protected area
Desired protected status	Desired Protected Area
80-100	Highly important
60-80	**Important**
<60	Of low to average importance

Conservation Importance (NEMP)

National priorities, the extent of protection required (full = full no-take protection, partial includes no-take sanctuary zone where feasible), the recommended proportion of the estuary margin that should remain undeveloped and proposed Recommended Ecological Category.

Estuary (West to East)	Current health category	Priority set for national and/or CAPE	Recommended extent of protection	Recommended extent of undeveloped margin	Provisional estimate of Recommended Ecological Category
Mkomazi	C	SA	Partial	25%	B
Mvoti	D	SA	Full	75%	D

South African National Biodiversity Assessment 2011: Technical Report. Volume 3: Estuary Component

PROTECTION STATUS/ IMPORTANCE	ECOLOGICAL CATEGORY
Protected Area	A or Best Attainable Status
Desired Protected Area	A or Best Attainable Status
Highly important	Improve Present Ecological Status (Min B)
Important	Improve Present Ecological Status (Min C)
Of low to average importance	Present Ecological Status, min D

Recommended Ecological Category is a C

Mvoti Estuary

Variable	Weight	Scenario Group				
		PRESENT	A MV21, 22, 41	B MV3	C MV42 &43	MV21,MV22 & MV 41 – ANT
Hydrology	25	53.4	59	42	55	**59**
Hydrodynamics	25	95	99	95	99	**99**
Water quality	25	58.4	59	54	59	**65**
Physical habitat alteration	25	73	73	69	70	**73**
Habitat health score		**70**	**72**	**65**	**71**	**74**
Microalgae	20	80	80	65	80	**85**
Macrophytes	20	32	33	33	33	**50**
Invertebrates	20	25	25	15	25	**60**
Fish	20	55	55	55	55	**75**
Birds	20	10	10	10	10	**45**
Biotic health score		**40**	**41**	**36**	**14**	**63**
ESTUARY HEALTH SCORE		**55**	**56**	**50**	**56**	**68**
ECOLOGICAL STATUS		**D**	**D**	**D**	**D**	**C**

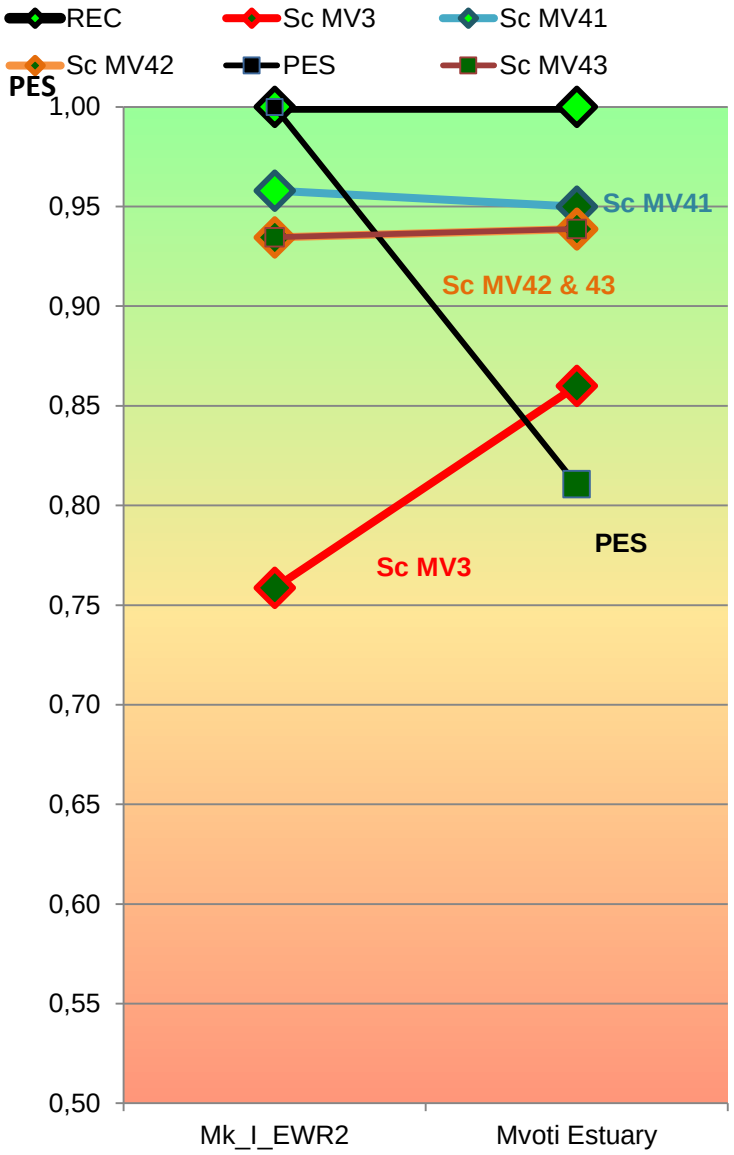
Mvoti Estuary Scenarios

- None of the scenarios achieved the REC of a C Category.

- But Scenario Group A (MV 21, MV22 and MV41) & Group C (MV42 and MV43) in conjunction with a number of management interventions will achieve the REC.

- The following management interventions are required to achieve the Mvoti REC:
  - Remove organics from Sappi effluent to improve oxygen;
  - Reduce nutrients from the catchment by 20% to control growth of reeds and aquatic invasive; and
  - Remove sugar cane from the Estuary Functional Zone (below 5 m contour) to allow for a buffer against human disturbance and the development of a transitional vegetation ecotone between estuarine and terrestrial ecosystems.

Mvoti Consequences



Mkomazi Estuary

Key Impacts

Sappi Weir in upper Mkomazi Estuary

Source: N Forbes, MER

Key Impacts

Sandmining in the Mkomazi Estuary

Source: N Forbes, MER

Grazing in the middle reaches

Railway line has removed habitat on the south bank

Pipelines for the SAPPI SAICCOR factory

Brazilian pepper trees displacing lagoon hibiscus

Ipomoea creepers strangling swamp forest habitat

Sand mining in the upper reaches

Source: NMMU

PES Mkomazi Estuary

Variable	Wght	Pres
Hydrology	25	66.8
Hydrodynamics and mouth condition	25	95
Water quality	25	66.6
Physical habitat alteration	25	78
Habitat health		76
Microalgae	20	80
Macrophytes	20	21
Invertebrates	20	75
Fish	20	60
Birds	20	60
Biotic health		59
ESTUARY HEALTH SCORE		68
ECOLOGICAL STATUS		C

Importance

Estuarine Importance	Wt	Score
Sediments to the marine environment		
NB from an fish egg production persective		
NB for eels		
NB for exploited stock		
ESTUARINE IMPORTANCE SCORE		85

IMPORTANCE SCORE	DESCRIPTION
Protected status	Protected area
Desired protected status	Desired Protected Area
80-100	**Highly important**
60-80	Important
<60	Of low to average importance

Conservation Importance (NEMP)

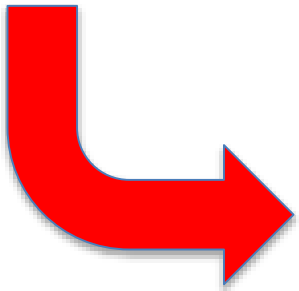
National priorities, the extent of protection required (full = full no-take protection, partial includes no-take sanctuary zone where feasible), the recommended proportion of the estuary margin that should remain undeveloped and proposed Recommended Ecological Category.

Estuary (West to East)	Current health category	Priority set for national and/or CAPE	Recommended extent of protection	Recommended extent of undeveloped margin	Provisional estimate of Recommended Ecological Category
Mkomazi	C	SA	Partial	25%	B
Mhlali	C	SA	Partial	50%	B
Mvoti	D	SA	Full	75%	D

South African National Biodiversity Assessment 2011: Technical Report. Volume 3: Estuary Component

Recommended Ecological Category

PROTECTION STATUS/ IMPORTANCE	ECOLOGICAL CATEGORY
Protected Area	A or Best Attainable Status
Desired Protected Area	A or Best Attainable Status
Highly important	Improve Present Ecological Status (Min B)
Important	Improve Present Ecological Status (Min C)
Of low to average importance	Present Ecological Status, min D



Recommended Ecological Category is a B

Mkomazi Estuary

Variable	Wght	Scenario Group								
		Pres	A 2,4	B 21,42	C 22,23, 43	D 31	E 32,33	F 21,42, + WWTW	G 21, 42 –Ant & +Wei	H 21, 42 – Anth & – Weir
Hydrology	25	66.8	45	63	62	59	57	63	63	63
Hydrodynamics	25	95	75	95	95	38	38	95	95	97
Water quality	25	66.6	61	66	67	66	67	34	66	66
Physical habitat alteration	25	78	70	75	75	75	75	75	84	90
Habitat health		76	63	75	75	60	59	67	77	79
Microalgae	20	80	65	80	80	80	80	50	80	90
Macrophytes	20	21	20	26	31	33	34	15	46	46
Invertebrates	20	75	60	75	75	70	70	50	85	90
Fish	20	60	35	60	60	60	55	50	70	75
Birds	20	60	50	55	55	55	55	50	57	65
Biotic health		59	46	59	60	60	59	43	68	73
ESTUARY HEALTH SCORE		68	54	67	67	60	59	55	72	76
ECOLOGICAL STATUS		C	D	C	C	D	D	D	B/C	B

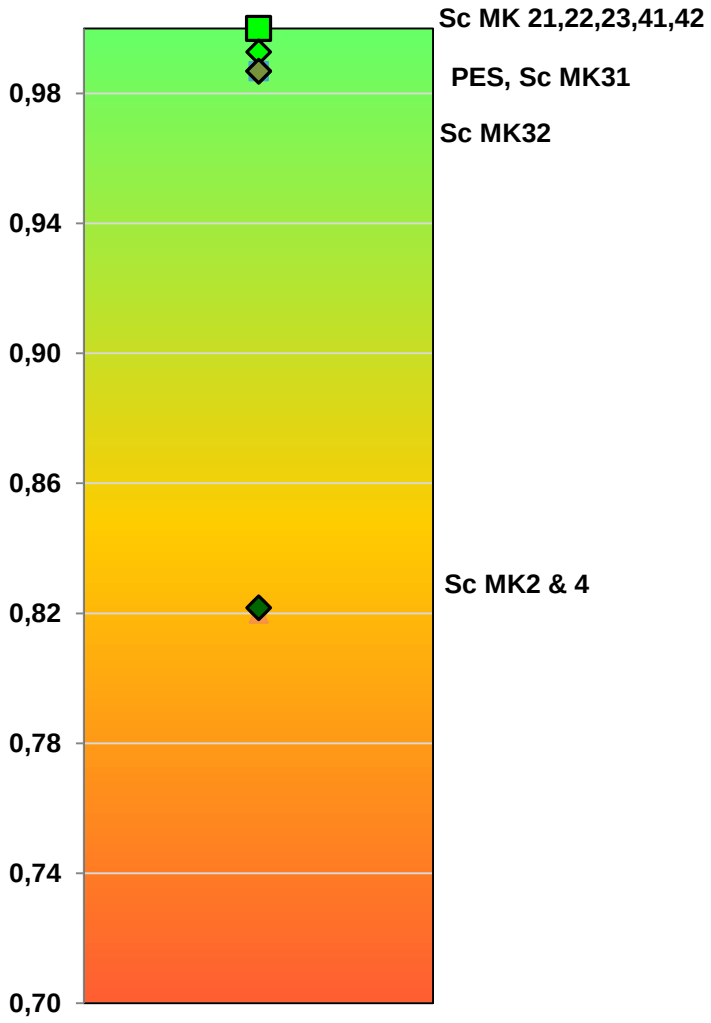
Mkomazi Estuary Scenarios

- None of the scenarios achieved the REC of a B Category.

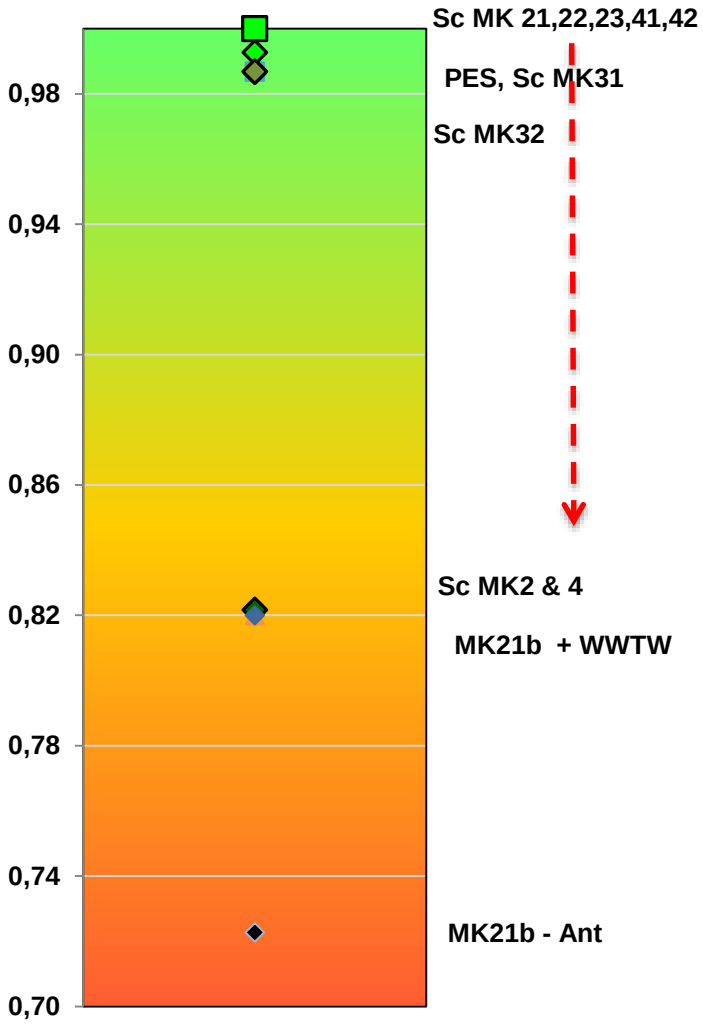
- But Scenario Group B (& C) with management interventions will achieve the REC.

- The following management interventions are required to achieve the Mkomasi REC:
  - Remove sandmining from the upper reaches below the Sappi Weir to increase natural function, i.e. restore intertidal area;
  - Restoration of vegetation upper reaches & along the north bank, e.g. remove aliens and allow disturbed land to revert to natural land cover (is already on upwards trajectory);
  - Curb recreational activities in the lower reaches through zonation & improve compliance;
  - Reduce/remove castnetting in the mouth area through estuary zonation or increase compliance; and
  - Relocate / remove Sappi Weir to restore upper 15% of estuary.

Mkomazi Estuary Scenarios



Mkomazi Estuary Scenarios



Questions…

water & sanitation

Department:
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Thank you

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