

SANDVELD EPHEMERAL WATER BODY VEGETATION

(EXCLUDING ESTUARIES)

CHARLIE BOUCHER 28 SEPTEMBER 2022

Factors affecting riparian and wetland vegetation and survival of plant species

Flora

Vegetation

Climatic Region

- West Coast Sandveld
- G30 A-H = Rivers and Estuaries: Jakkalsvlei, Langvlei & Verlorenvlei; plus Tributaries, Upper Kruis, Bergvallei, KromAntonies, Alexandershoek & Lambertshoek; Pans, Wadrift, Sout (?), Papkuil, Sandlaagte, Rocher Pan and a number of smaller wetlands.
- F60 A-E = Groot Goerap River, Soutrivier, Brakrivier and numerous wetlands.

Geology

- Influences soils & water quality and quantity

Geomorphology

- Location in the topography dictates and influences substrate and sediment characteristics, water movement and moisture regimes.
- These then influence the vegetation

Effects of Shaping Natural Events

Examples

- Floods, droughts, wind, climate changes
- Habitat creation & destruction

Consequences

- Changes in Flora distribution, density, individual size & even destruction (local loss)
- Vegetation shaping composition & structure

Water quantity & quality

- Water depth
- Flows
- Seepages
- Duration Permanently, regular to sporadically inundated, to soil wetting (both surface & or subsurface)
- Timing (season)
- Nutrients, salinities, aeration, temperatures, etc
- **ALL ARE FACTORS INFLUENCING THE VEGETATION**

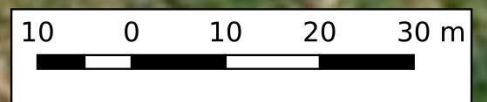
Considerations

- Some individual plants have SURVIVED for CENTURIES at a single site with LITTLE CHANGE, while others have survived by ADAPTATION
 - The vegetation thus reflects history
- Our ability to interpret these biotic elements is still in its infancy

Sampling Strategy at Each Site

- Co-operative decision on Transect location made in Summer “dry” season.
- Identified & pegged each vegetation change
- Examine & record species & their estimated canopy cover in each of the vegetation units along a swathe 1m broad on each side of central line across the sample site
- Photograph features along the transect
- Dry season sampling of permanently recognisable species
- Examine transect again in Spring “wet” season

**Verlorenvlei transect @ Wittedrif
(overlaid on Bing satellite image)**



Samples captured on Spreadsheet for each site

Table 1. Alphabetic Floristic data for VERLORENVLEI - WITTEDRIF, Western Sandveld Wetlands.							Vegetal Assessment Ecol Condition Level 3 = D & 4 = F									
Sample no. [VW=Verlorenvlei Wittedrif]	VW5	VW4	VW3	VW2	VW1	VW0	VW51	VW52	VW53	VW54	VW55	VW56	VW57	VW58	No. of sample plots =	
Community Reference Number	2.3	2.2	1.1	1.1	1.1	1.1	1	2.2	2.2	2.2	2.2	2.3	2.5	2.5	14	
Moisture status (I = inundated, free water; W = wet, M = moist, D = Dry, S = seasonal condition)	SD	SM	SW	SM	SW	SI	SW	SW	SM	SD	SM	SM	SD	D		
Habitat	Slope step, Path, Grazed.	Steep out bank, Grazed.	Side channel, Grazed, Trampled, Cobbles.	Channel with Artificially raised area	Bed often flooded, Heavy grazing.	Bed often flooded, Heavy grazing.	Bed often flooded, Heavy grazing.	Channel side, Dry clay.	Flatish regular overflow step	Raised area, Added bed materials.	Slight dip at higher overflow level.	Channel side	Upper flood flats, Cattle	Back floodplain, Cattle		
No. of species in sample plot	6	7	6	5	3	2	4	7	10	5	11	5	8	9	No. of species in area = 28	
Taxon (* = Listed in RDB)	% occurrence in sample (brackets = changed values recorded on 8 September; 0 = absent)														No. of occurrences per species	
<i>Aponogeton distachyos</i> L.f.			(30)			(50)	(50)								3	
<i>Arctotheca calendula</i> (L.) Levyns														(<1)	1	
<i>Atriplex nummularia</i> Lindl.													(<1)	(<1)	2	
<i>Atriplex semibaccata</i> R.Br.	5	1						15(5)	25(1)	20(1)	65(<1)	2(1)	1		8	
<i>Bolboschoenus maritimus</i> (L.) Palla		20(60)	30	30	15(10)		15(75)	15(35)	15(30)		20				8	
<i>Cotula coronopifolia</i> L.			5	1							<1				3	
<i>Cotula turbinata</i> (L.) Pers.														(1)	1	
<i>Cynodon dactylon</i> (L.) Pers.	(1)														1	
<i>Cyperus textilis</i> Thunb.		60(0)	50(0)	30(0)	15(0)		75(0)	15(0)	25(0)	20(0)	65(0)				9	
<i>Drosanthemum floribundum</i> (Haw.) Schwantes														1	1	
<i>Exomis microphylla</i> (Thunb.) Aellen var. <i>axyrioides</i> (Fenzl) Aellen	1														1	
<i>Frankenia repens</i> (P.J.Bergius) Fourc.										1		5	1		3	
Geophyte (different species)									(<1)					(<1)	2	
<i>Galenia africana</i> L.													(1)		1	
<i>Hordeum capense</i> Thunb.								5					<1(1)	1	3	
<i>Isolepis antarctica</i> (L.) Roem. & Schult.			5					(5)			<1(1)				3	
<i>Juncus acutus</i> L. subsp. <i>leopoldtii</i> (Parl.) Snogerup	(1)								(1)						2	
<i>Lolium multiflorum</i> Lam.		(30)							(2)		(1)		(1)		4	
<i>Medicago polymorpha</i> L. *		(2)												(1)	2	
<i>Oxalis pes-caprae</i> L.														(1)	1	
<i>Paspalum distichum</i> L.				10(0)	30(0)	10(0)									3	
<i>Pentstemon densifolia</i> (Nees) Stapf	5										(2)	(<1)			3	
<i>Phragmites australis</i> (Cav.) Steud.			5	15			(5)	(5)	40(20)	(1)	(3)				7	
Poaceae (annual juveniles)		(20)													1	
<i>Potamogeton pusillus</i> L. (Boucher 8085)			(<5)			(40)									2	
<i>Rumex crispus</i> L. *		<1							(1)		(1)				3	
<i>Ruschia</i> sp.									(<1)				(1)		2	
<i>Sarcocornia natalensis</i> (Bunge ex Ung.-Sternb.) A.J.Scott							1(2)				(1)				2	
<i>Sarcocornia pillansii</i> (Moss) A.J.Scott								(2)	(10)	40		5(35)	60	60	6	
<i>Senecio burchellii</i> DC.														2	1	
<i>Sporobolus virginicus</i> (L.) Kunth	20(10)										1(<1)	(<1)	2	<1	5	

Site Data collated into single Table

134 species 90 samples

Table 3. Summary of number of samples in each community containing each species in the Sporobolus virginicus - Phragmites australis Lowland Wetland Communities. All Species

Community No.	U	1	1A	1B	1C	2	2A	2B	2C	2D	2E	2F	2G	2H	2I	2J	2K	2L	2M	2N	2O	2P	2Q	2R	2S	2T	2U	2V	2W	2X	2Y	2Z							
Number of plants	6	3	4	4	4	8	7	5	3	4	4	14	1	5	10	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
1. Wetland Species in the Sporobolus virginicus - Phragmites australis Lowland Wetland Communities																																							
Phragmites australis (Sw.) Klasek																																							
Sporobolus virginicus L. Kunth	5	3	3	3	3	3	3	4	1	4	4	14	1	5	10	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Sarcocornia tetrandra (Bergens. Ving. Olsen) A.J. Scott																																							
Sarcocornia tetrandra	4	2	3	1	2	4	2	1	1	2	1	7	1	4	8	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Other species																																							
Alisma sp. (Baucher 807, BA 1-2)	1	2																																					
1. Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.	2	3	4	1				1	1																														
1.1 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.	1	1		1				1	1																														
1.2 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.3 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.4 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.5 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.6 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.7 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.8 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.9 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.10 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.11 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.12 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.13 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.14 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.15 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.16 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.17 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.18 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.19 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.20 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.21 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.22 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.23 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.24 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.25 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.26 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.27 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.28 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.29 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.30 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.31 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.32 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.33 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.34 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.35 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.36 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.37 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.38 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.39 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.40 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.41 Equisetum terreste - Phragmites australis Reed Wetland																																							
Equisetum terreste Thunb.																																							
1.42 Equisetum terreste - Phragmites australis Reed Wet																																							

Vegetation units identified

Widespread Species in the *Sporobolus virginicus-Phragmites australis* Sandveld Wetland Communities

1. *Cyperus textilis* - *Phragmites australis* Reed Wetland

1.1 *Cyperus textilis* - *Paspalum distichum* Reed Wetland

1.2 *Cyperus textilis* - *Acacia saligna* disturbed form of *Cyperus textilis* - *Phragmites australis* Reed Wetland

1.3 *Cynodon dactylon*-*Juncus acutus* Halophytic Meadow

2. *Sarcocornia pillansii* - *Frankenia repens* Salt marsh

2.1 Typicum

2.2 *Panicum maximum* - *Sarcocornia pillansii* Salt marsh

2.3 *Mesembryanthemum crystallinum* form of *Sarcocornia pillansii* - *Frankenia repens* Salt marsh

2.4 *Senecio burchellii* form of Disturbed *Sarcocornia pillansii* - *Frankenia repens* Salt marsh

2.5 *Zygophyllum morgsana* Sand Strandveld Shrubland

2.6 *Lycium tetrandrum* edge of *Sarcocornia pillansii* - *Frankenia repens* Salt marsh

2.7 *Nidorella foetida* - *Sarcocornia pillansii* Salt marsh Edge

2.8 *Ehrharta villosa* Transition Strandveld to *Sarcocornia pillansii* - *Frankenia repens* Salt marsh

3. *Restio subverticillatus* Lowland Fynbos Wetland

4. Secondary *Searsia undulata* Strandveld Bushclump

5. *Typha capensis* Secondary Sandveld Wetland

6. *Restio* sp. - *Psoralea aphylla* Fynbos Wetland

GENERAL VEGETATION PATTERN - 1

Stream Bed

Free water for longer period in Wet Season

Example: Verlorenvlei River @ Wittebrug

Potamogeton pusillus

Aponogeton distachvos



GENERAL VEGETATION PATTERN - 2

Stream Margins

Saturated soil with Regular High flow inundation

Cyperus textilis

Bolboschoenus maritimus

Wet soil with Intermittent High flow inundation

Juncus acutus ssp leipoldtii



GENERAL VEGETATION PATTERN - 3

Flood Plain

Sarcocornia pillansii

Frankenia repens

Seeps

Panicum maximum



GENERAL VEGETATION PATTERN - 4

Flood Plain Edge

Ehrharta villosa

Lycium tetrandrum

Zygophyllum morgsana



GENERAL VEGETATION REACTIONS TO WATER REGIME CHANGES

Phragmites australis spread



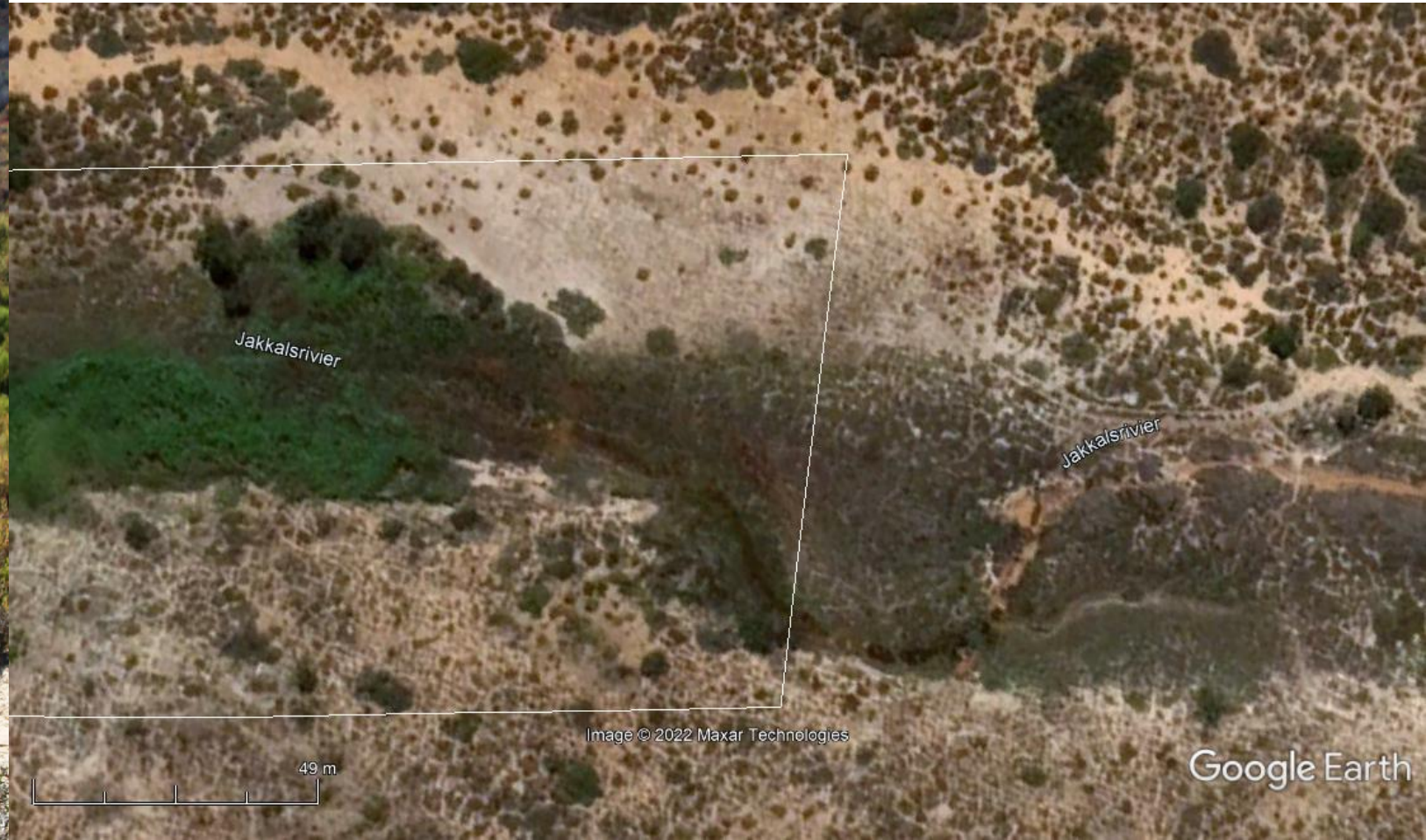
Flow disruption followed by *Typha capensis* & *Acacia saligna* invasion of *Restio subverticillatus* Lowland Fynbos Wetland



Historic effects influence Vegrai scores

Google imagery is a very useful tool necessary to evaluate each site

DECEMBER 2020



HISTORIC IMAGERY - KRUISMANSRIVIER

MAY 2004



JANUARY 2010



OCTOBER
2020



KRUISMANSRIVIER - Seasonal

“Dry” period 6 April 2022



“Wet” period 7 September 2022



Vegrai Ecological Condition (PES) for each site assessed

- ROCHER PAN - Level 3 = D/E; 4 = D
- LOWER PAPKUILS - Levels 3 & 4 = D
- UPPER PAPKUILS RIVER - Levels 3 & 4 = E
- KROM-ANTONIES RIVER - Levels 3 & 4 = D
- KRUISMANS RIVER - Level 3 = D/E & Level 4 = E
- JAKKALS RIVER - Level 3 = C/D & 4 = D
- LANGVLEI - Levels 3 & 4 = D/E
- VERLORENVLEI – WITTEDRIF - Level 3 = D & 4 = F