

**APPENDIX F:
RIPARIAN VEGETATION**

Compiled by James Mackenzie

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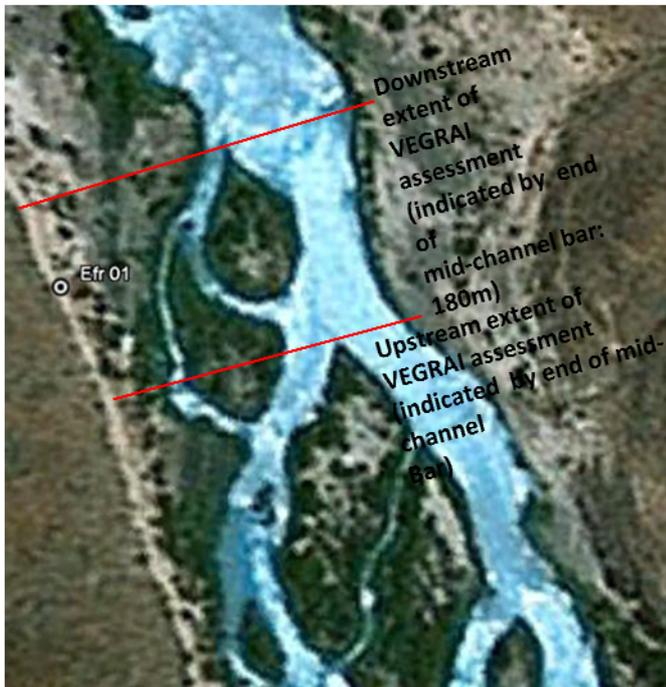
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F1. EXTENT OF VEGRAI SAMPLING EFR 01 – 04

F1.1. EXTENT OF VEGRAI SAMPLING AT EFR 01



EWR 1, Orange at Hopetown

Figure F1 Extent of the VEGRAI sampling site at EFR 01 (180m from mid-channel bar to mid-channel bar as indicated)

F1.2. EXTENT OF VEGRAI SAMPLING AT EFR 02



Figure F2 Extent of the VEGRAI sampling site at EFR 2 (Boegoeberg). section 200m long x 900m wide

F1.3. EXTENT OF VEGRAI SAMPLING AT EFR O3



Figure F3 Extent of VEGRAI sampling site. (700 m downstream from the point of the indicated mid-channel bar)

F1.4. EXTENT OF VEGRAI SAMPLING AT EFR O4

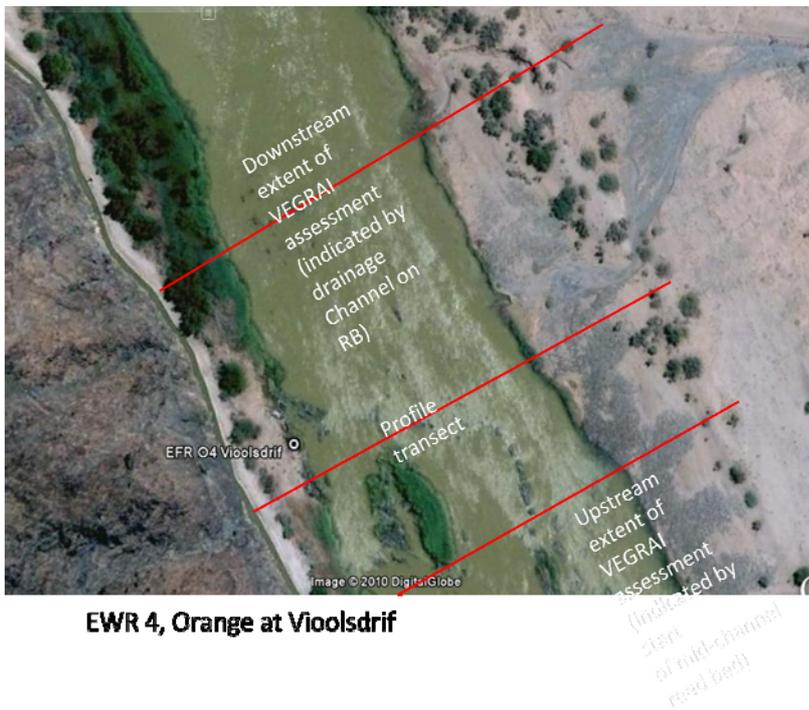
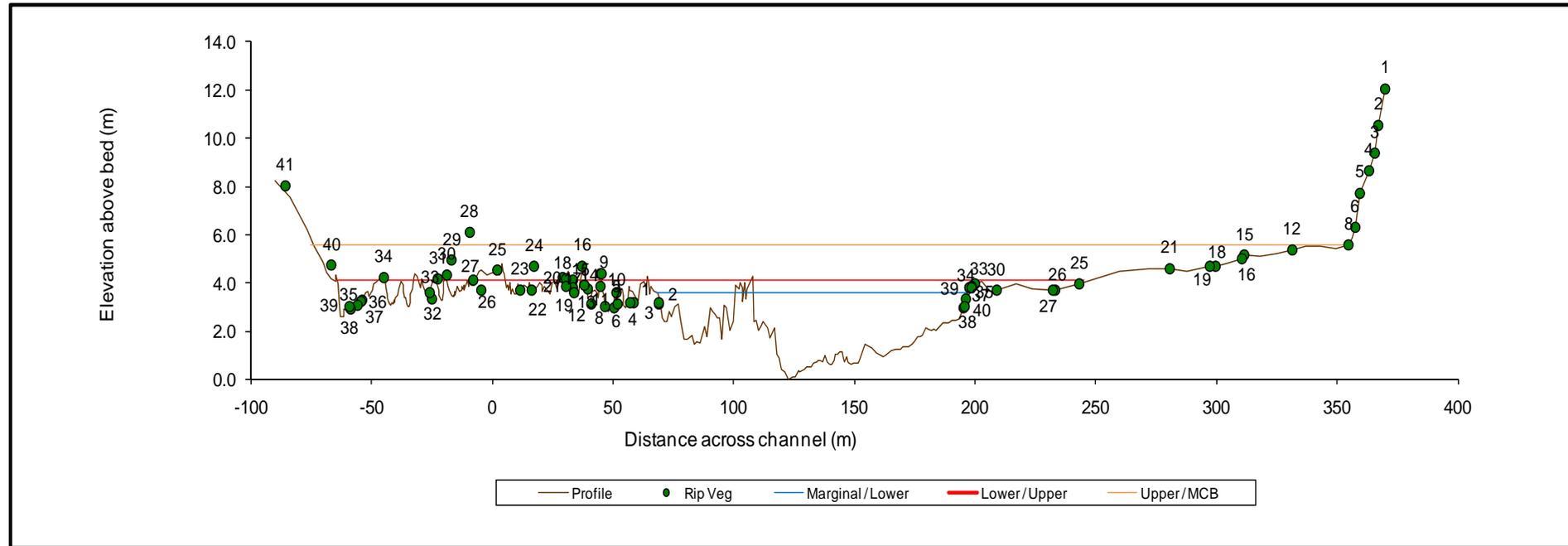


Figure F4 Extent of VEGRAI sampling site. (270 m from reed bed to drainage channel)

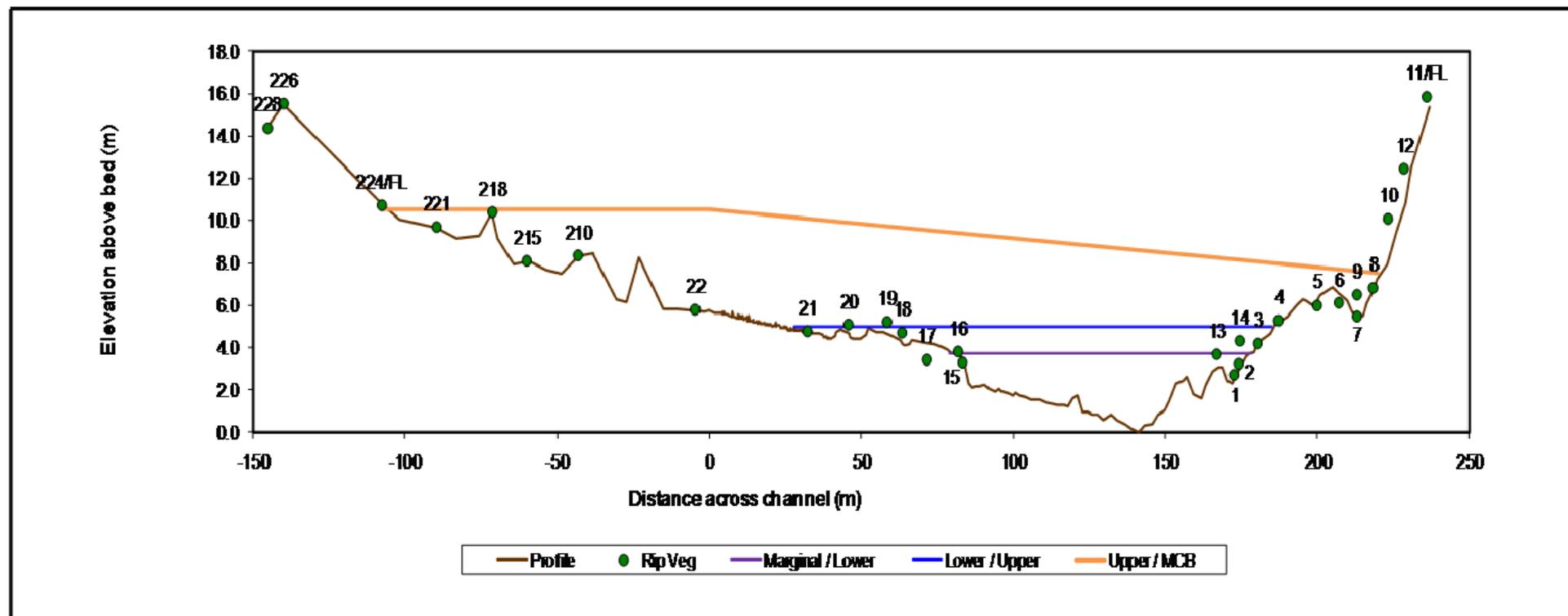
F2. RIPARIAN VEGETATION PROFILES

F2.1. EFR O2



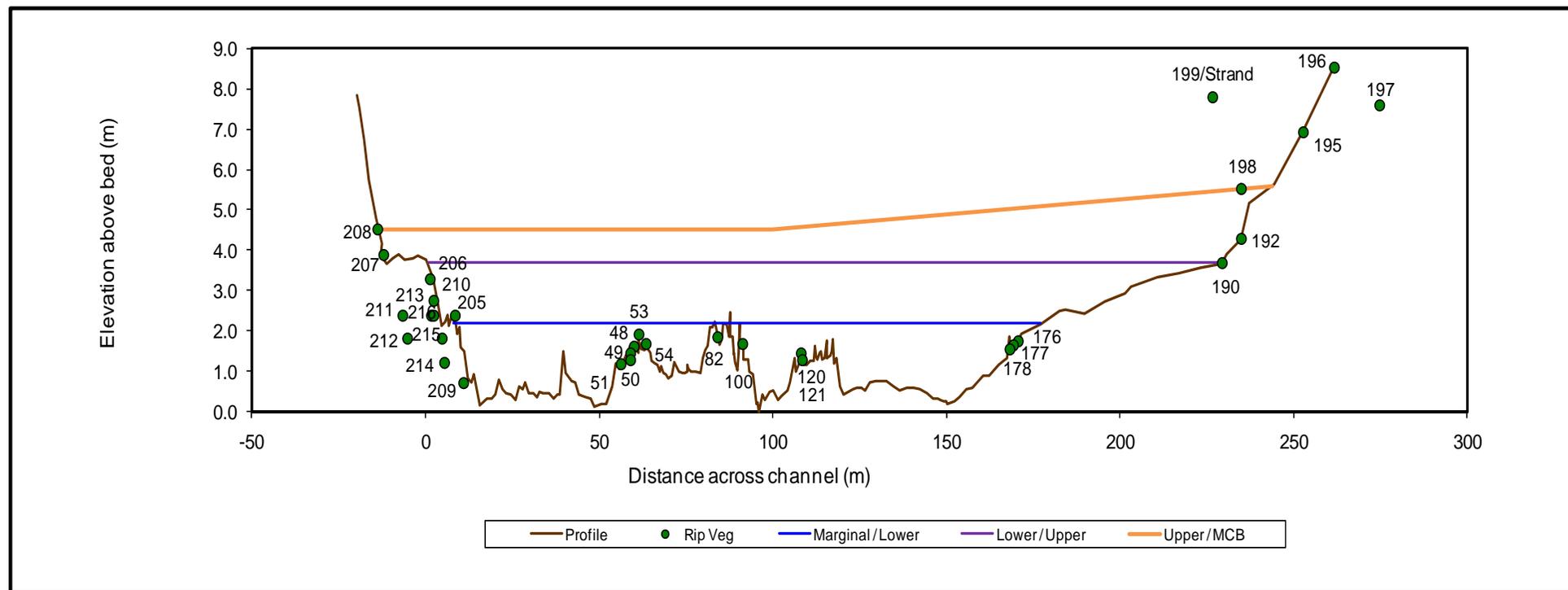
Profile showing riparian vegetation indicators where: 1 = *P. australis* (lower limit); 2 = *G. virgatum* (lower limit); 3 = *P. decipiens* & *C. marginatus* (lower limit); 4 = *Persicaria lapathifolia* (lower limit); 4 = *Ziziphus mucronata* & tree line (lower limit); 5 = *Prosopis glandulosa* (lower limit); 5 = *S. mucronata* (lower limit); 6 = *P. lapathifolia* & *P. decipiens* (lower limit); 6 = *Tamarix usneoides* (Upper limit); 7 = *G. virgatum* (lower limit); 8 = *C. marginatus* (lower limit); 8 = *Digitaria* sp (Upper limit); 9 = *S. mucronata* (Upper limit); 10 = *G. virgatum* (Upper limit); 11 = *P. decipiens* (Upper limit); 12 = *Eucalyptus camuldensis* (lower limit); 12 = *G. virgatum* (lower limit); 13 = *G. virgatum* (Upper limit); 14 = *P. lapathifolia* (Upper limit); 15 = *G. virgatum* (Upper limit); 15 = *Ziziphus mucronata* on MCB & *Prosopis glandulosa* (lower limit); 16 = *P. australis* (Upper limit); 16 = *Tamarix usneoides* (lower limit); 17 = *C. marginatus* (Upper limit); 18 = *C. marginatus* (Upper limit); 18 = *Digitaria* sp/*Crinum bulbispermum* (l/u limit); 19 = *A. karoo* fatalities from flooding (limit); 19 = *C. marginatus* (Upper limit); 20 = *S. mucronata* (Upper limit); 21 = *C. bulbispermum* (lower limit); 21 = *Crinum* recruitment (limit); 22 = *C. bulbispermum* (lower limit); 23 = *P. lapathifolia* (lower limit); 24 = *P. lapathifolia* (Upper limit); 25 = *C. bulbispermum* (Upper limit); 25 = *G. virgatum* (Upper limit); 26 = *A. karoo* fatalities from flooding; 26 = *C. bulbispermum* (lower limit); 27 = *C. marginatus* (lower limit); 27 = *Digitaria/Chloris* (lower limit); 28 = *Diospyros lyceoides/Searsia pendilina/Z. mucronata* (lower limit); 29 = *A. karoo* lowest viable point (lower limit); 30 = *C. bulbispermum* (Upper limit); 30 = dead *A. karoo*; 31 = *P. lapathifolia* (Upper limit); 32 = *C. marginatus* (lower limit); 33 = *C. bulbispermum* (lower limit); 33 = *Salix mucronata* (Upper limit); 34 = *Phragmites australis* & *Persicaria decipiens* (Upper limit); 34 = *S. pendulina / S. mucronata* (l / u limit); 35 = *P. decipiens* & *S. mucronata* (lower limit); 35 = *S. mucronata* (lower limit); 37 = *C. marginatus* (lower limit); 37 = *G. virgatum* (lower limit); 38 = *C. marginatus* & *P. decipiens* (lower limit); 38 = *P. australis* (lower limit); 39 = *S. mucronata* (lower limit); 39 = *S. mucronata* (lower limit); 40 = *P. australis* (lower limit); 40 = *Z. mucronata* & *S. pendulina/P. australis* (l/u limit); 41 = *Acacia erioloba* (Yadlt) (lower limit); 41 = *C. marginatus* (lower limit); 42 = *Persicaria* sp (lower limit); 43 = *G. virgatum* (lower limit).

F2.2. EFR O3



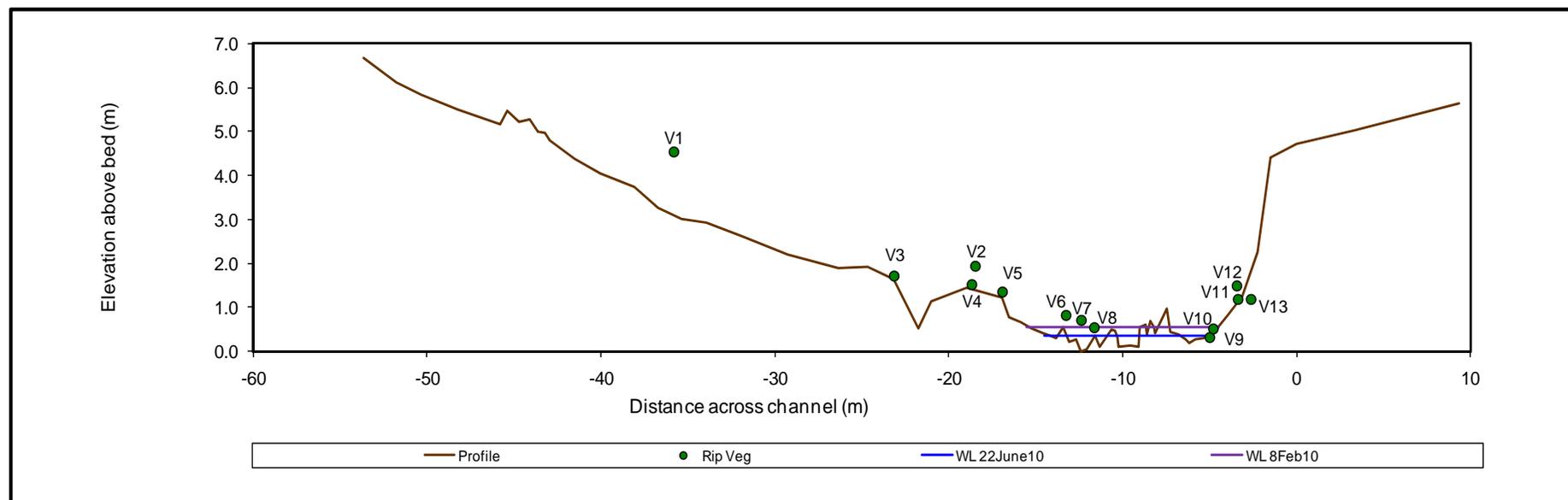
Profile showing riparian vegetation indicators where: 1 = *P. australis* (lower limit); 2 = *C. dactylon* (lower limit); 3 = *S. mucronata* (lower limit); 4 = *S. mucronata* (upper limit); 5 = *P. australis* (upper limit); 6 = *T. usneoides* (upper limit); 7 = *T. usneoides* (lower limit); 8 = *T. usneoides* (upper limit); 9 = *Searsia pendulina* (lower limit); 10 = *Z. mucronata* & *Euclea pseudebenus* (lower limit); 11/FL = flood line; 12 = *Gymnosporia linearis*; 13 = *S. mucronata* (lower limit); 14 = *S. mucronata* (upper limit); 15 = *C. marginatus* & *C. dactylon* (lower limit); 16 = *S. mucronata* (lower limit); 17 = *G. virgatum* (lower limit); 18 = *T. usneoides* (lower limit); 19 = *A. karoo* (fatalities from flooding) (lower limit); 20 = *A. karoo* (fatalities from flooding); 21 = *C. dactylon* (upper limit); 22 = *Z. mucronata* (Y Adlt) (lower limit); 210 = *P. glandulosa* v & *D. lyceoides* (lower limit); 215 = *T. usneoides* (upper limit); 218 = *Z. mucronata*, *E. pseudebenus*, *G. linearis* (lower limit); 221 = upper terrace (limit); 224/FL = flood line; 226 = end rip zone/artificially elevated levee; 228 = start vineyard.

F2.3. EFR O4



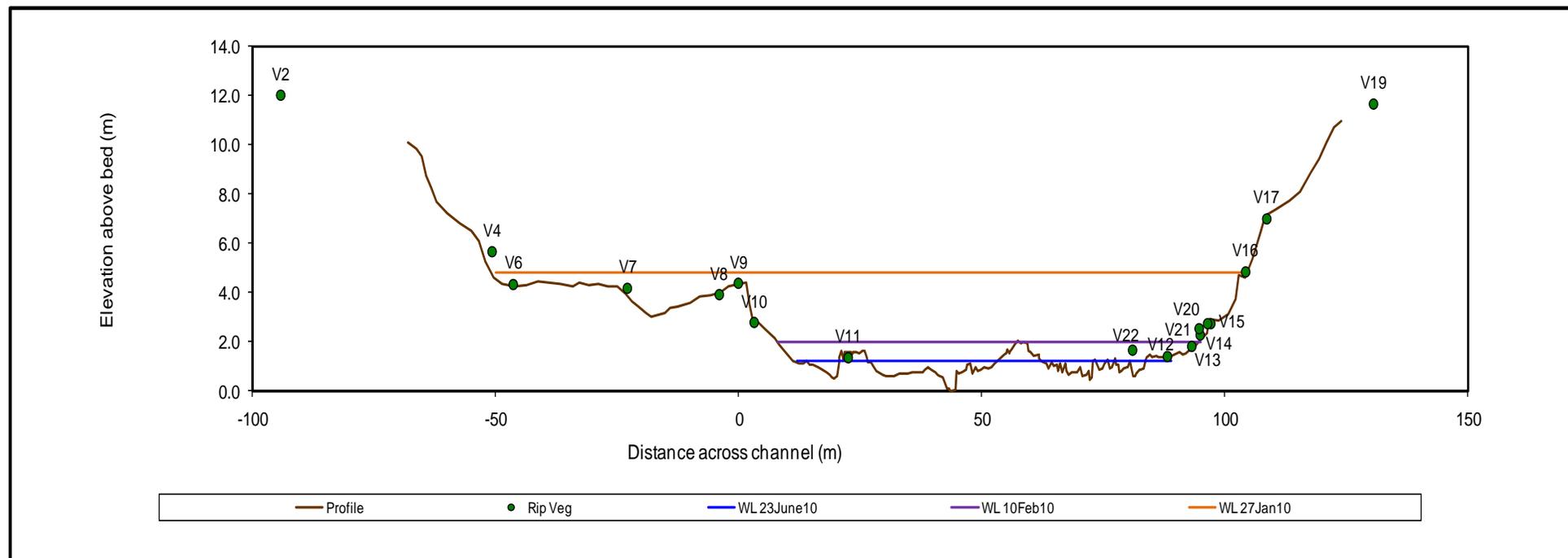
Profile showing riparian vegetation indicators where: 48 = *G. virgatum* (lower limit); 49 = *G. virgatum* (lower limit); 50 = *P. australis* (lower limit); 51 = *G. virgatum* (lower limit); 53 = *G. virgatum* (upper limit); 54 = *P. lapathifolia* (l / u limit); 82 = *G. virgatum* (island limit); 100 = *G. virgatum* (lower limit); 120 = *G. virgatum* (lower limit); 121 = *G. virgatum* (lower limit); 177 = *C. dactylon* (lower limit); 178 = *Prosopis glandulosa* (flood fatality) (lower limit); 190 = *C. marginatus* (l/u limit); 192 = *T. usneoides* (also upper limit of dead *Prosopis glandulosa*) (lower limit); 195 = *T. usneoides* (upper limit); 196 = *Z. mucronata* (lower limit); 197 = *P. glandulosa* & *Prosopis* recruitment (upper limit); 198 = *T. usneoides* (lower limit); 199/Strand = flood line; 205 = *G. virgatum* (upper limit); 206 = *T. usneoides* (lower limit); 207 = *T. usneoides* (upper limit); 208 = *S. pendulina* (tree line) (lower limit); 209 = *P. australis* (lower limit); 210 = *P. australis* (upper limit); 211 = *G. virgatum* (upper limit); 213 = *S. mucronata* (upper limit); 214 = *G. virgatum* (lower limit); 215 = *S. mucronata* (lower limit); 216 = *P. glandulosa* (lower limit).

F2.4. EFR C5



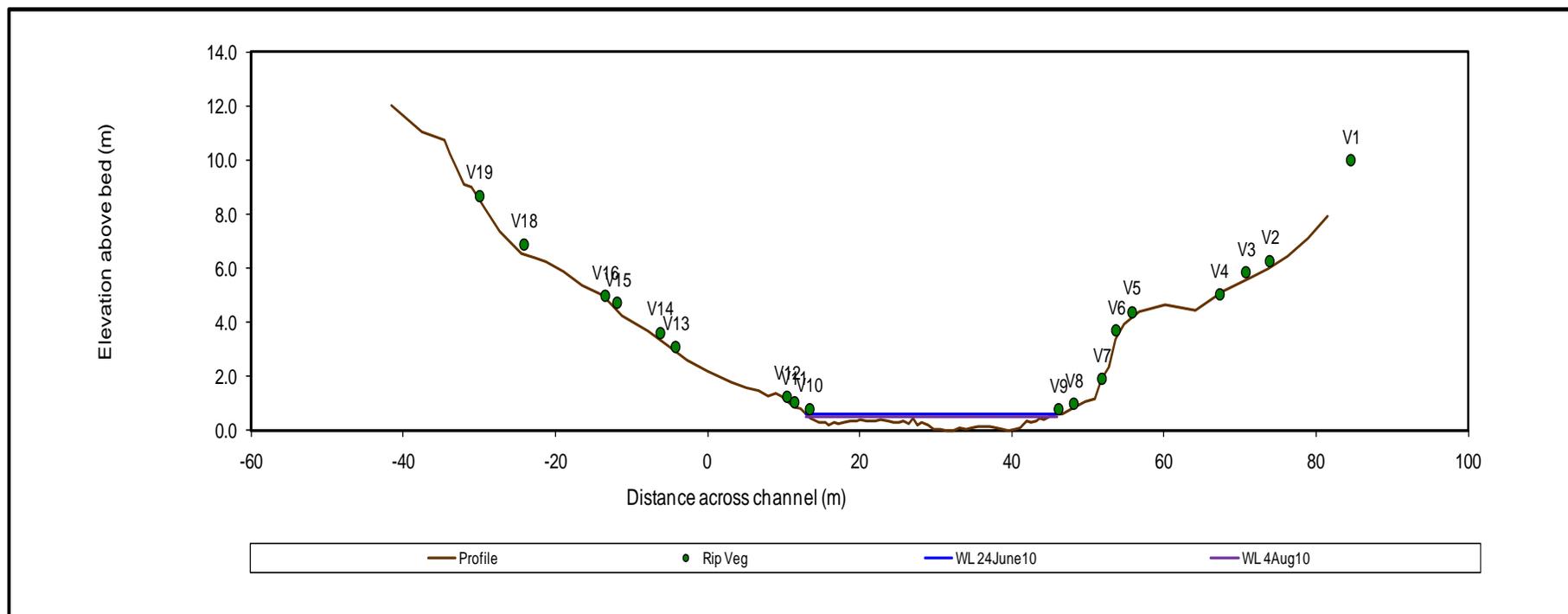
Profile showing riparian vegetation indicators where: V1 = *Eucalyptus camuldensis* (Upper Zone; lower limit); V2 = *Leucosidea sericea*/*Salix babylonica* (Lower Zone; Upper limit); V3 = *Salix fragilis* (Lower Zone; Upper limit); V4 = *Cyperus marginatus* (low density) (Lower Zone; Upper limit); V5 = *Leucosidea sericea* (Lower Zone; lower limit); V6 = *Gomphostigma virgatum* (Marginal Zone; Upper limit); V7 = *Gomphostigma virgatum* (Marginal Zone; lower limit); V8 = *Cyperus marginatus* (Marginal Zone; lower limit); V9 = *Cyperus marginatus* (Marginal Zone; lower limit); V10 = *Gomphostigma virgatum* (Marginal Zone; lower limit); V11 = *Cyperus marginatus* / *Gomphostigma virgatum* (Lower Zone; Upper limit); V12 = *Leucosidea sericea* (Lower Zone; lower limit); V13 = *Salix mucronata*/*Salix fragilis* (Lower Zone; lower limit).

F2.5. EFR C6



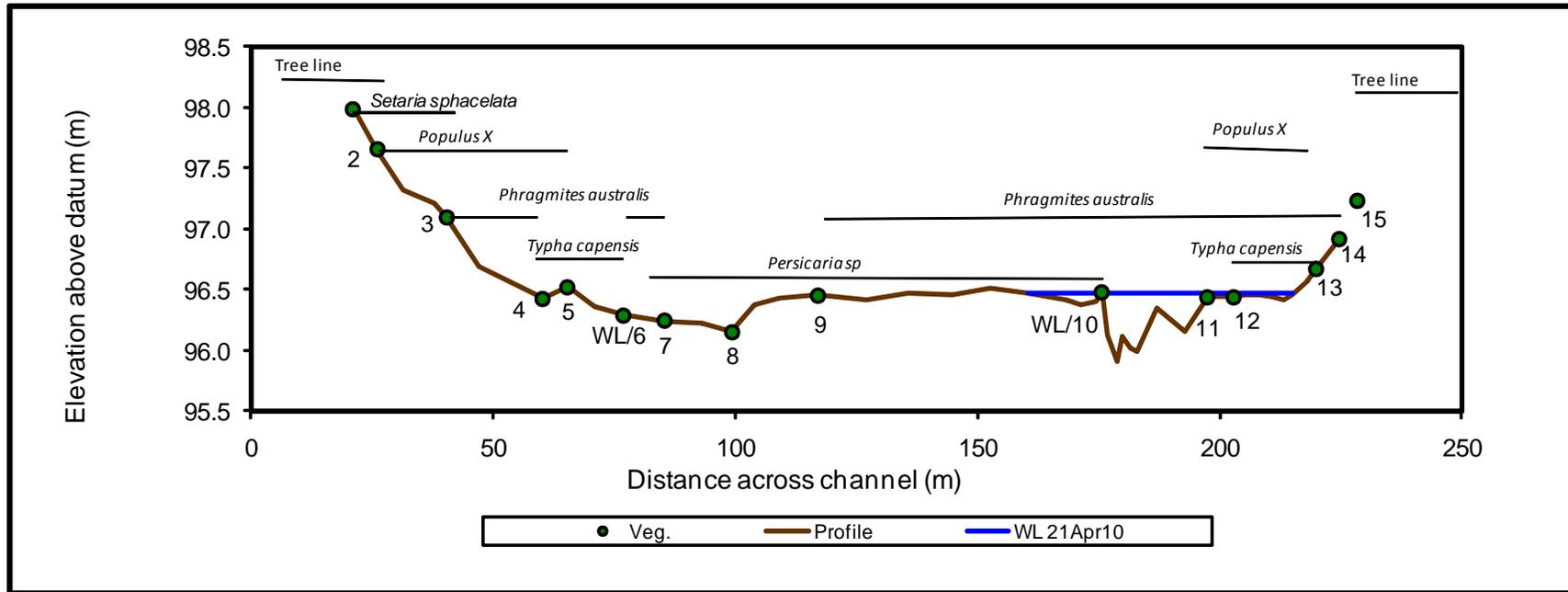
Profile showing riparian vegetation indicators where: V1 = terrestrial tree line (*Diospyros lycioides*, *Rhus pyroides*) (upper Zone; upper limit); V2 = *Rhus pyroides* (upper Zone; upper limit); V4 = terrestrial tree line (*Rhus pyroides*) (upper Zone; lower limit); V6 = lower limit tall, non-grazed grasses, upper limit *Phragmites australis* (upper Zone); V7 = *Phragmites australis* (upper Zone; lower limit); V8 = *Cyperus marginatus* (lower Zone; upper limit); V9 = *Rhus lancea* (lower Zone; lower limit); V10 = *Cyperus marginatus* (lower Zone; upper limit); V11 = *Cyperus marginatus* (marginal Zone; lower limit); V12 = *Cyperus marginatus* (marginal Zone; lower limit); V13 = *Gomphostigma virgatum* (marginal Zone; lower limit); V14 = *Gomphostigma virgatum* & *Cyperus marginatus* (lower Zone; upper limit); V15 = terrestrial tree line (especially *D. lycioides*); *Salix mucronata* (lower Zone; lower limit); V16 = High density terrestrial grasses (upper Zone; lower limit); V17 = terrestrial tree line (upper Zone; lower limit); V19 = *Olea europaea subsp. africana* (upper Zone; upper limit); V20 = *Salix mucronata* (lower Zone; upper limit); V21 = *Gomphostigma virgatum* (lower Zone; upper limit); V22 = *Gomphostigma virgatum* (marginal Zone; lower limit).

F2.6. EFR K7

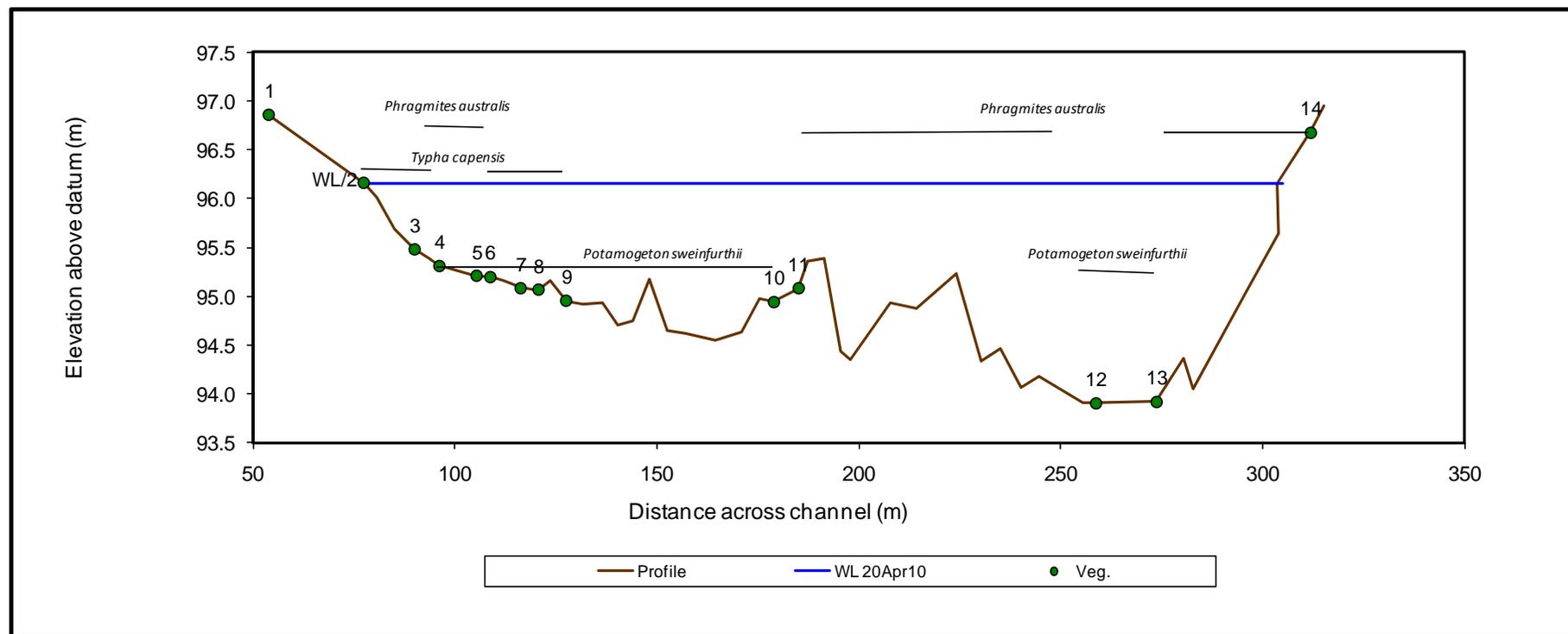


Profile showing riparian vegetation indicators where: V1 = *Rhus pyroides* (terrestrial tree line) (upper Zone; lower limit); V2 = *Lycium hirsutum* (lower limit)/*Salix babylonica* & *Populus X* (upper limit) (upper Zone); V3 = *Phragmites australis* (upper Zone; upper limit); V4 = *Salix mucronata* (upper Zone; upper limit); V5 = *Salix mucronata* (upper Zone; lower limit); V6 = *Gomphostigma virgatum* (lower Zone; upper limit); V7 = *Cyperus marginatus* (lower Zone; upper limit); V8 = *Gomphostigma virgatum* (marginal Zone; lower limit); V9 = *Cyperus marginatus* (marginal Zone; lower limit); V10 = *Cyperus marginatus* / *Salix mucronata* (marginal Zone; lower limit); V11 = *Gomphostigma virgatum* (marginal Zone; lower limit); V12 = *Populus X* (lower limit)/*Cyperus marginatus* (upper limit)(lower Zone); V13 = end of grasses (where sediment meets cobble) (upper Zone; lower limit); V14 = *Salix mucronata* (only larger specimens, excl marginal zone smaller specimens) (upper Zone; lower limit); V15 = *Lycium hirsutum* (upper Zone; lower limit); V16 = *Phragmites australis* (upper Zone; lower limit); V18 = *Salix babylonica* (lower limit)/ *Salix mucronata* & *Phragmites australis* (upper limit)(upper Zone); V19 = *Rhus pyroides* (terrestrial tree line) (upper Zone; lower limit).

F2.7. EFR M8 (Transect B)



F2.8. EFR M8 (Transect D)

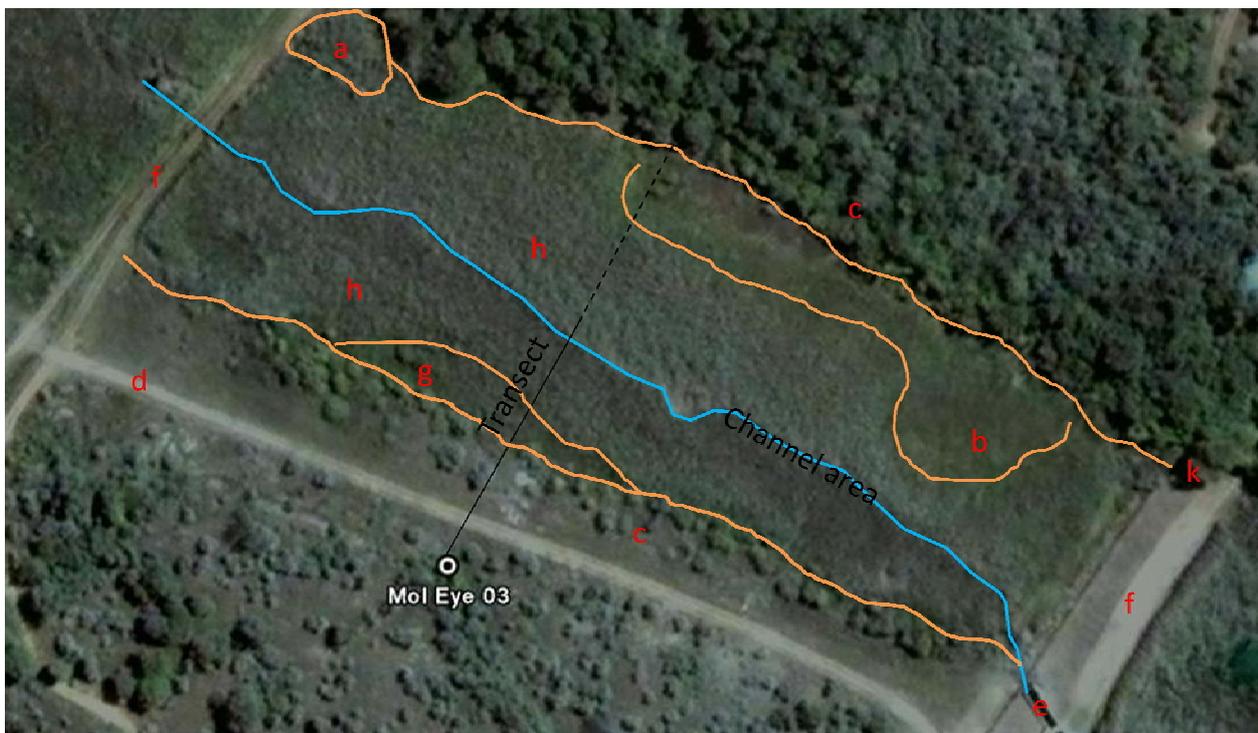


F3. UPPER MOLOPO RIVER FROM MOLOPO EYE

The wetland was divided into 2 sections for vegetation assessment. The upper wetland extended from the weir to the first road crossing, about 240m of wetland (Figure F5) and the lower wetland from the same road crossing (with culvert) to the next road crossing (with steel pipes), about 1350 m of wetland (Figure F7). The distinction was made because each section of wetland falls between distinct hydraulic controls and because the structure and composition of wetland vegetation differs.

F3.1. UPPER SECTION WETLAND

A partial transect was surveyed due to the difficulty of surveying in such tall (4 to 6m) and dense reeds, but the full transect was walked and notes taken. It is apparent that there is a canalised area where most of the flow occurs and this affects the vegetation structure: wetter areas facilitate taller and more dense reed stands while dryer areas reduce reed stature, density and fecundity (Figure F5 and F6). The Vegetation Response Assessment Index (VEGRAI) was used to assess the wetland vegetation. Indications are that the PES (present ecological state) will be high (possibly A or A/B) because the general vegetation structure and composition of the wetland are close to what would be expected for reference conditions. Impacts include an altered distribution of flow in the wetland due to canalisation as well as the presence of exotic species. The reduction of flow as a result of the off take to Mafikeng does not appear to have affected wetland structure and function, but the canalisation of remaining flow has.



Place profile of transect here (profile shows fairly flat wetland clays with distinct channel)

Figure F5 Satellite image from Google Earth showing extent of the upper wetland area assessed with VEGRAI

Where:

a – patch of *Populus X*.

b – patch of lower density and shorter *Phragmites australis* with distinctly lower incidence of flowering (this is also a dryer section due to channelling of flow which is more marked in the upper portion of the wetland).

c – terrestrial shrub and tree zone (reduced by pipeline servitude [d], see species list).

e – main flow from weir (canalised to one side with artificial rock piles to prevent incision).

f – hydraulic controls (dual road crossing with culvert downstream and extensive weir wall upstream) – photo in Figure F6 taken from this point.

g – dryer patch with minimal terrestrialization (*Rhus pyroides* and bracken ferns).

h – high density *P. australis* reed beds, tall (mostly 4 - 6m [in April 2010]) and with >80% of culms with inflorescences.

k – leakage facilitates localized area of taller and more dense reeds, channel area is zone of most flow with increased incidence of *Kniphofia spp*, but also has high density reed beds. No open water areas are apparent.

Figure F6 depicts the profile of partial transect indicating positions of vegetation and well vegetated channel area where most of the flow occurs.



Figure F6 Photo (Taken 22 April 2010) showing patch of lower density and shorter *Phragmites australis* (zone b in Figure F5)

F3.2. LOWER SECTION WETLAND

Three transects were located in the lower wetland (Figure F7). All transects indicated a “dead zone” where no plants were growing, but dead plant matter indicate that they were at some time before the assessment. Anecdotal data suggest that herbicide application in 2004 caused large-scale plant death. Some areas have been subsequently colonised, others remain uncolonised with high amounts of rotting plant matter. Other than the general zones indicated in Figure F7, plant

species form a patchy mosaic within the wetland (Figure F7 and F8). This is not the structure one would expect for a peat land in reference condition. Expectations for reference would not include deep pool areas, and would be dominated by extensive stands of *P. australis*. The occurrence of large stands of *Typha capensis*, *Presicaria sp* and *Potamogeton* species are all deviations from the reference condition.

VEGRAI was used to assess the wetland vegetation. Indications are that the PES will be moderate to low (possibly D or C/D) due to altered vegetation composition and structure, and likely altered passage of water through the wetland due to canalisation and backup from hydraulic controls. Impacts also include the presence of exotic species.

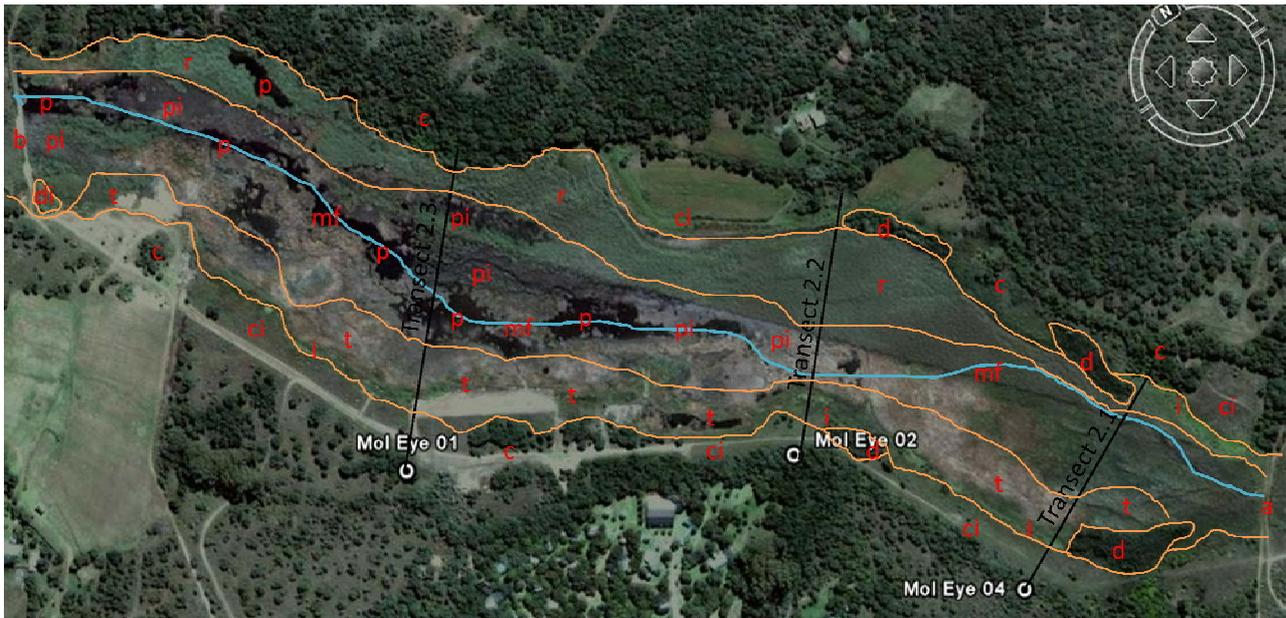


Figure F7 Satellite image from Google Earth showing extent of the lower wetland area assessed with VEGRAI

Where:

- a – upstream hydraulic control (double road crossing).
- b – downstream hydraulic control (road crossing with steel pipes for drainage).
- c - terrestrial shrub and tree zone, uncleared and ci – cleared terrestrial shrub and tree zone.
- d - patches of *Populus X*.
- di – patch of *Arundo donax*.
- p – open water pools, mostly deep (1.8m or more), colonised by aquatic vegetation (*Potamogeton* sp).
- pi – also deep water areas with no live vegetation. These “dead zones” likely due to spraying of herbicides are characterised by dead, rotting vegetation, mostly reed culms.
- i – *Imperata cylindrica* (grass characteristic of wetland edges in damp soils) as shown by light green colouring, markedly reduced due to clearing.
- mf – indicated the zone of most likely flow, along transect 2.1 a distinct channel was observed while along transect 2.2 and 2.3 more open areas and deeper pools obscured flow direction.
- t – indicates areas where *Typha capensis* dominates, but also contains patches of *Persecaria* and *Phragmites australis*.
- r – high density *P. australis* reed beds, tall (mostly 4-6m [in April 2010]) and with >80% of culms with inflorescences.

Figure F8 indicates profiles of three transects indicating positions of vegetation and deep pool areas where most of the flow occurs.



Figure F8 Photo (taken 22 April 2010) of lower wetland in the vicinity of transect 2.3 indicating different types of vegetation

Where:

p – *Populus X*.

t – terrestrial trees and shrubs.

r – high density healthy reeds (*P. australis*).

ri- low density reeds or “dead zone”, o – open water with aquatic vegetation.

t – *Typha capensis*

i – *Imperata cylindrical*

Table F1 List of Species

Orange EFR								Listed Species : 138	Status								
O1	O2	O3	O4	C5	C6	K7	M8		Invasive Exotic	Endemic	Aquatic	IUCN Listing	Riparian Indicator	Wetland Obligate	Forest Species	Terrestrial Species	SANBI Protected
40	43	52	36	40	34	43	51	Species:	31	15	4		74	30	0	48	2
	y	y	y					<i>Acacia erioloba</i>				Declining	3				y
y	y	y	y				y	<i>Acacia karoo</i>				LC	3			y	
y		y						<i>Acacia mellifera subsp. detinens</i>				LC				y	
y				y	y	y	y	<i>Agrostis lachnantha var. lachnantha</i>				LC	3				
	y	y	y					<i>Amaranthus praetermissus</i>				LC	3			y	
		y						<i>Arctotis arctotoides</i>				LC				y	
		y						<i>Argemone mexicana*</i>	cat 1			x				y	
		y						<i>Argemone ochroleuca*</i>	cat 1			x				y	
y								<i>Aristida adscensionis</i>				LC				y	
				y				<i>Aristida congesta</i>				LC				y	
				y				<i>Aristida diffusa subsp. burkei</i>				LC				y	
				y		y	y	<i>Artimisia affra</i>				LC				y	
							y	<i>Azolla filiculoides</i>	Cat 1		y	x	1	y			
y							y	<i>Berula erecta</i>				LC	1	y			
y					y	y	y	<i>Bidens pilosa*</i>	y			x					
		y						<i>Bothriochloa insculpta</i>				LC				y	
				y	y	y	y	<i>Buddleja salviifolia</i>				LC	3				
	y	y	y					<i>Cadaba aphylla</i>				LC				y	
							y	<i>Celtis africana</i>					3				
			y					<i>Cenchrus ciliaris</i>				LC				y	
							y	<i>Centella asiatica</i>				LC	1	y			
y	y				y	y		<i>Chloris virgata</i>				LC	3			y	
y	y						y	<i>Cirsium vulgare*</i>	Cat 1			x					
		y						<i>Cleome kalachariensis</i>				LC				y	
				y				<i>Cliffortia nitidula subsp. nitidula</i>				LC	1				
	y							<i>Combretum erythrophyllum</i>		y		LC	1				
y						y		<i>Conyza bonariensis</i>	y								

WP 5: Assessment of Environmental Flow requirements

Orange EFR								Listed Species : 138	Status								
O1	O2	O3	O4	C5	C6	K7	M8		Invasive Exotic	Endemic	Aquatic	IUCN Listing	Riparian Indicator	Wetland Obligate	Forest Species	Terrestrial Species	SANBI Protected
40	43	52	36	40	34	43	51	Species:	31	15	4		74	30	0	48	2
	y							<i>Crinum bulbispermum</i>				Declining	1	y			
	y	y						<i>Cullen tomentosum</i>				LC	3				
							y	<i>Cymbopogon plurinodis</i>				LC				y	
y	y	y	y		y	y		<i>Cynodon dactylon</i>				LC				y	
	y	y		y	y	y	y	<i>Cyperus congestus</i>				LC	2	y			
y		y						<i>Cyperus eragrostis*</i>				x	1	y			
y	y	y	y	y	y	y	y	<i>Cyperus marginatus</i>				LC	1	y			
							y	<i>Cyperus sexangularis</i>				LC	1	y			
							y	<i>Datura ferox*</i>	Cat 1			x					
	y		y					<i>Datura inoxia*</i>	Cat 1			x					
	y	y	y			y		<i>Datura stromonium*</i>	Cat 1			x					
y	y	y	y				y	<i>Dichanthium annulatum var. papillosum</i>				LC	2				
							y	<i>Diheteropogon amplexens</i>				LC				y	
				y	y	y		<i>Diospyros austro-africana</i>		SA		LC					
y	y	y	y	y	y	y	y	<i>Diospyros lycioides subsp. lycioides</i>				LC				y	
		y						<i>Eleusine coracana subsp. africana</i>				LC				y	
			y					<i>Enneapogon cenchroides</i>				LC				y	
y	y							<i>Enneapogon scoparius</i>				LC				y	
y					y		y	<i>Equisetum ramosissimum subsp. ramosissimum</i>				LC	1				
y								<i>Eragrostis chloromelas</i>				LC				y	
		y						<i>Eragrostis trichophora</i>				LC				y	
	y			y			y	<i>Eucalyptus camaldulensis</i>	Cat 2			x					
	y				y			<i>Euclea crispa subsp. ovata</i>		SA		LC				y	
		y	y					<i>Euclea pseudebenus</i>		y		LC	3				y
			y					<i>Forsskaolea candida</i>				LC				y	
y				y	y	y	y	<i>Gomphocarpus fruticosus subsp. fruticosus</i>				LC	2	y			
y	y	y	y	y	y	y		<i>Gomphostigma virgatum</i>				LC	1				
		y	y					<i>Gymnosporia linearis subsp. lanceolata</i>		SnA		LC	2			y	
		y	y					<i>Heliotropium ciliatum</i>				LC				y	

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Orange EFR								Listed Species : 138	Status								
O1	O2	O3	O4	C5	C6	K7	M8		Invasive Exotic	Endemic	Aquatic	IUCN Listing	Riparian Indicator	Wetland Obligate	Forest Species	Terrestrial Species	SANBI Protected
40	43	52	36	40	34	43	51	Species:	31	15	4		74	30	0	48	2
				y				<i>Heteropogon contortis</i>				LC					
							y	<i>Hydrocotyle verticillata</i>				LC	1	y			
				y				<i>Hypararrhenia tamba</i>				LC	3				
				y	y	y	y	<i>Imperata cylindrica</i>				LC	2				
				y				<i>Juncus exsertus</i>				LC	1	y			
				y		y		<i>Juncus inflexus</i>				LC	1	y			
					y			<i>Juncus punctorius</i>				LC	1	y			
y	y				y	y		<i>Juncus rigidus</i>				LC	1	y			
							y	<i>Kniphofia typhoides</i>		SA		NT		y			
	y	y						<i>Kohautia cynanchica</i>				LC	3			y	
y								<i>Leonotis ocymifolia</i>				LC				y	
				y	y	y		<i>Leucosidea sericea</i>		y		LC	2				
							y	<i>Ludwigia octovalvis</i>				LC	1	y			
		y	y					<i>Lycium bosciifolium</i>				LC					
y	y				y	y		<i>Lycium cinereum</i>				LC					
y	y				y	y		<i>Lycium hirsutum</i>		y		LC	3				
							y	<i>Melia azedarach*</i>	cat 3			x	y				
					y	y		<i>Melianthus comosus</i>				LC	2				
						y		<i>Mentha aquatica</i>				LC	2	y			
						y		<i>Miscanthus capensis</i>		SnA		LC	2				
							y	<i>Morris alba*</i>	cat 3			x					
		y	y					<i>Nicotiana glauca*</i>	Cat 1			x					
y					y	y	y	<i>Olea europaea subsp. africana</i>				LC	3				
	y							<i>Panicum schinzii</i>				LC	3			y	
							y	<i>Paspalum distichum</i>				LC	2	y			
					y			<i>Pennisetum clandestinum*</i>	y			x					
				y	y	y		<i>Pennisetum sphacelatum</i>				LC	3				
y	y	y	y	y	y	y	y	<i>Persicaria decipiens</i>				LC	1	y			
y	y	y	y	y	y	y	y	<i>Persicaria lapathifolia*</i>	y			x	1	y			
y	y	y	y	y	y	y	y	<i>Phragmites australis</i>				LC	1	y			

WP 5: Assessment of Environmental Flow requirements

Orange EFR								Listed Species : 138	Status								
O1	O2	O3	O4	C5	C6	K7	M8		Invasive Exotic	Endemic	Aquatic	IUCN Listing	Riparian Indicator	Wetland Obligate	Forest Species	Terrestrial Species	SANBI Protected
40	43	52	36	40	34	43	51	Species:	31	15	4		74	30	0	48	2
		y						<i>Platycarpha carlinoides</i>				LC	3				
						y	y	<i>Populus alba</i>	cat 2			x	2				
						y	y	<i>Populus X canescens</i>	cat 2			x	2				
y								<i>Potamogeton pectinatus</i>			y	LC	1	y			
							y	<i>Potamogeton schweinfurthii</i>			y	LC	1	y			
	y	y	y					<i>Prosopis glandulosa var. glandulosa*</i>	Cat 2			x	2			y	
		y	y					<i>Prosopis velutina</i>	Cat 2			x	2			y	
		y						<i>Psilocaulon junceum</i>		SA		LC				y	
				y			y	<i>Pyracantha angustifolia*</i>	Cat 3			x				y	
							y	<i>Ranunculus multifidus*</i>	y			x	2	y			
y	y	y						<i>Rhigozum trichotomum</i>				LC					
	y	y	y					<i>Ricinus communis*</i>	cat 2			x					
				y		y		<i>Rosa rubiginosa</i>	y			x					
				y				<i>Rubus fruticosus</i>	Cat 2			x					
				y		y	y	<i>Salix babylonica*</i>	Cat 2			x	1				
				y		y		<i>Salix fragilis var fragilis*</i>	Cat 2			x	1				
					y	y		<i>Salix mucronata subsp. capensis</i>					1				
y	y	y	y	y				<i>Salix mucronata subsp. mucronata</i>				LC	1				
				y				<i>Salix mucronata subsp. woodii</i>				LC	1				
		y						<i>Salsola kali*</i>	y			x	3			y	
							y	<i>Schoenoplectus brachyceras</i>		SA		LC	1	y			
							y	<i>Schoenoplectus corymbosus</i>				LC	1				
				y	y	y		<i>Schoenoplectus decipiens</i>				LC		y			
				y		y		<i>Schoenoplectus muricinux</i>				LC	1	y			
				y	y	y		<i>Schoenoplectus paludicola</i>		SA		LC		y			
		y						<i>Schotia afra</i>		SA		LC	3			y	
y					y		y	<i>Searsia lancea</i>				LC	3			y	
y	y	y	y					<i>Searsia pendulina</i>		y			2				
y	y			y	y	y	y	<i>Searsia pyroides</i>				LC					
y							y	<i>Sesbania punicea*</i>	cat 1			x					

WP 5: Assessment of Environmental Flow requirements

Orange EFR								Listed Species : 138	Status								
O1	O2	O3	O4	C5	C6	K7	M8		Invasive Exotic	Endemic	Aquatic	IUCN Listing	Riparian Indicator	Wetland Obligate	Forest Species	Terrestrial Species	SANBI Protected
40	43	52	36	40	34	43	51	Species:	31	15	4		74	30	0	48	2
	y							<i>Setaria incrassata</i>				LC	2				
		y						<i>Setaria verticillata</i>				LC				y	
y								<i>Sida dregei</i>				LC					
		y						<i>Sisyndite spartea</i>				LC	2				
y	y	y		y	y	y	y	<i>Sporobolus fimbriatus</i>				LC	2				
y	y	y	y					<i>Stipagrostis ciliata var. capensis</i>				LC	3				
	y	y	y					<i>Stipagrostis obtusa</i>				LC				y	
		y						<i>Stipagrostis uniplumis</i>				LC				y	
y			y	y	y	y	y	<i>Tagetes minuta*</i>	y			x					
	y	y	y					<i>Tamarix usneoides</i>		y		LC	2				
							y	<i>Tarchonanthus camphoratus</i>				LC				y	
				y		y	y	<i>Themeda triandra</i>				LC				y	
	y	y	y					<i>Tribulus terrestris</i>				LC				y	
				y				<i>Triraphis androponoides</i>				LC				y	
							y	<i>Typha capensis</i>				LC	1	y			
							y	<i>Utricularia stellaris</i>			y	LC	1	y			
y				y	y	y	y	<i>Verbena bonariensis</i>	y			x					
	y	y	y	y		y		<i>Xanthium strumarium</i>	Dec weed			x					
y	y	y	y				y	<i>Ziziphus mucronata subsp. mucronata</i>				LC	3			y	
			y					<i>Zygophyllum microcarpum</i>				LC				y	
		y						<i>Zygophyllum prismatocarpum</i>				LC				y	
	y	y	y					<i>Zygophyllum simplex</i>				LC					