




Washpool Lagoon BushRat re-assessments February/March 2022



T&M Ecologists Pty Ltd

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Executive Summary

The Washpool Lagoon at Aldinga Beach is one of very few remaining coastal freshwater and estuarine lagoon systems along the Adelaide metropolitan coast, and provides significant habitat, biodiversity, cultural and spiritual values. This report summarises the results of the re-assessment of 12 monitoring sites which were originally established across the various vegetation communities in the Washpool in 2016. These sites were re-assessed using the Bushland Rapid Assessment Technique or 'BushRAT' methodology in February and March 2022.

A comparison of the 2016 data with the 2022 data indicates that the vegetation condition has remained relatively consistent in some sites across the Washpool and improved in others where active control of high threat weeds and corresponding revegetation has occurred. In particular, it is apparent that woody weeds such as Olives (**Olea europaea*), Boneseed (**Chrysanthemoides monilifera*), Boxthorn (**Lycium ferocissimum*), Western Coastal Wattle (**Acacia cyclops*) and Mirror Bush (**Coprosma repens*) have been targeted and in 2022 these species were either not recorded or only detected as a few scattered seedlings. Other weeds which appear to have been actively controlled include Gazania (**Gazania linearis*), Sea-lavender (**Limonium companyonis*) and Sea Wheat Grass (**Thynopyrum junceiforme*).

Due to the time of the year of assessment (late summer/early autumn), weeds such as Bridal Creeper (**Asparagus asparagoides*) and Soursob (**Oxalis pes-caprae*) were not able to be detected.

Of concern is the emergence of a new weed record for the Washpool – Saltmarsh Grass (**Puccinellia ciliata*)¹. This is a species which can spread vigorously on saline soils.

¹ Note that until very recently this species was considered to be Spreading Saltmarsh Grass (**Puccinellia perlaxa*) – a closely related and also introduced grass.

1. Introduction

1.1 Purpose and scope of this report

The Washpool Lagoon is situated south of Adelaide at Aldinga Beach and is one of very few remaining coastal freshwater and estuarine lagoon systems along the Adelaide metropolitan coast. This unique area provides a range of significant habitat, biodiversity, cultural and spiritual values.

This report provides the results of the re-assessment of 12 monitoring sites which were originally established across the various vegetation communities in the Washpool in 2016. These sites were assessed using the Bushland Rapid Assessment Technique or 'BushRAT'.

This report includes:

- Overview of previous baseline data.
- Assessment in the change in condition of key condition indicators for the BushRAT method, including species richness, structural diversity and weed abundance and threat, based on comparison of previous 2016 BushRAT data to data gathered in 2022.
- Evaluation of photopoint data using relevant indicators of change.
- Evaluation of the trajectory of change and the confidence change is real rather than being an artefact.
- Assessment of the likely drivers/reasons for change (eg due to management intervention, disturbance, seasonal or climatic factors).

1.2 Washpool Lagoon study area

The study area is located near Aldinga Beach, approximately 45km south of the Adelaide CBD. Figure 1 shows the current (2022) land ownership and boundaries of the study area. The study area covers approximately 71 hectares.

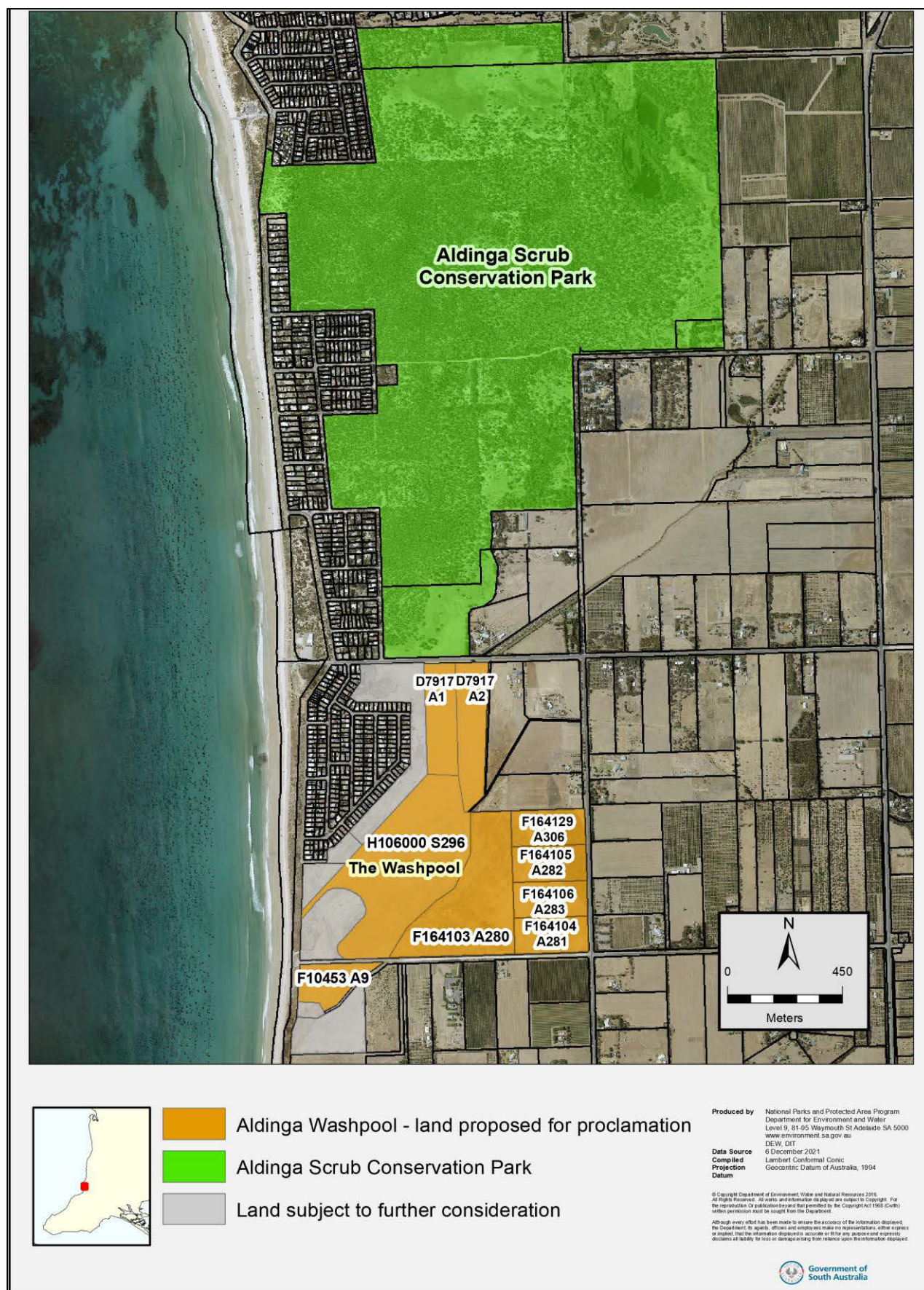


Figure 1: Location of the Washpool Lagoon and land ownership

1.3 Field assessment methodology

Initial field assessment was undertaken in June 2016 as part of a vegetation survey and mapping project². BushRAT assessments³ were undertaken across representative areas of the Washpool and 12 sites were established. See Figure 2 for site locations.

The BushRAT method establishes a photopoint, conducts an inventory of the native and weed species present in a defined area, and assesses a number of vegetation condition parameters to help with evaluation and ongoing monitoring of the condition of a site. An outline of the method, and the sites established, is provided in Appendix 1.

The BushRATs were re-assessed in February and March 2022.

²T&M Ecologists, 2016. *Washpool Lagoon vegetation survey and mapping 2016*. Report prepared for Natural Resources Adelaide and Mount Lofty Ranges, December 2016.

³ DEWNR (2012) NVBMU *BushRAT assessment and scoring Manual*. Unpublished document, Department for Environment, Water and Natural Resources, Waite.

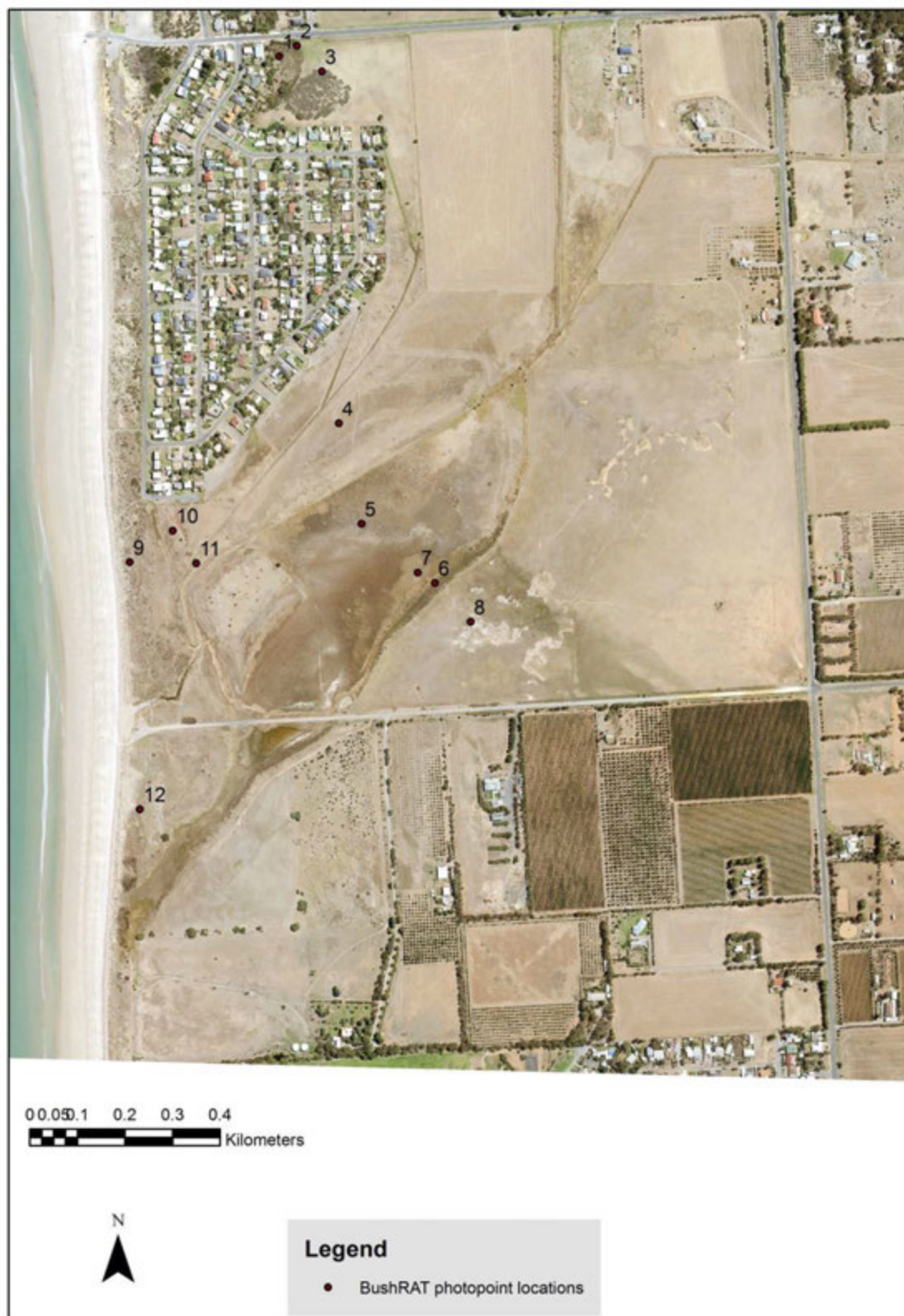


Figure 2: Location of BushRat sites – Washpool Lagoon

2. Survey results

Washpool Site 1

First assessment 7th June 2016

Second assessment 1st March 2022

Vegetation Community: *Leucopogon parviflorus*, *Olearia axillaris*, *Myoporum insulare* Shrubland

BCM Benchmark Community: SMLR Co 7.2 – Coastal Shrublands and Tall Shrublands

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	13	8/15	13	8/15
Weeds	36	4/15	19	4/15
Native Plant Life forms	18+	10/10	18	10/10
Regeneration**	2	1/8	3	4/8
Native: Exotic Understorey Biomass		7/10	-	8/10
Bare Ground		1/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		2/4		3/4
TOTAL VEGETATION CONDITION SCORE		33/65		40/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Asparagus asparagoides</i>	Bridal Creeper	5 (plentiful cover <1%)	-
<i>Cenchrus clandestinus</i>	Kikuyu	-	3 (<1%)
<i>Ehrharta calycina</i>	Perennial Veldt Grass	8 (1-5%)	8 (1-5%)
<i>Euphorbia terracina</i>		3 (<1%)	3 (plentiful cover <1%)
<i>Oxalis pes-caprae</i>	Soursob	16 (26-50%)	-
<i>Scabiosa atropurpurea</i>	Scabious		3 (<1%)
<i>Stenotaphrum secundatum</i>	Buffalo Grass	4 (1-5%)	2 (<1%)
Weed abundance and threat score		36	19

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Acacia longifolia</i> var. <i>sophorae</i>	Coastal Wattle			LC	-	R
<i>Acacia pycnantha</i>	Golden Wattle			LC	✓	R
<i>Baumea juncea</i>	Bare Twig-rush			LC	✓	✓

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Cyperus gymnocaulos</i>	Spiny Flat-sedge			LC	✓	✓
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT	✓	✓
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Ficinia nodosa</i>	Knobby Club-rush			LC	✓	✓
<i>Leucopogon parviflorus</i>	Coast Beard-heath			NT	✓	✓
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			LC	✓	✓
<i>Myoporum insulare</i>	Common Boobialla			NT	✓	✓
<i>Olearia axillaris</i>	Coast Daisy-bush			NT	✓	✓
<i>Pteridium esculentum</i>	Bracken Fern			LC	✓	✓
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			LC	✓	R
<i>Tetragonia implexicoma</i>	Bower Spinach			LC	✓	0

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Cover		
		Declared	2016	2022
<i>Asparagus asparagoides</i> forma	Bridal Creeper	Declared	1a	
<i>Avena barbata</i>	Wild Oat			1a
<i>Bambusa</i> sp.	Bamboo			1
<i>Briza maxima</i>	Large Quaking-grass		1a	1a
<i>Bromus diandrus</i>	Great Brome			1a
<i>Bromus</i> sp.	Brome			1a
<i>Cenchrus clandestinus</i>	Kikuyu			1
<i>Convolvulus arvensis</i>	Field Bindweed			1a
<i>Dittrichia graveolens</i>	Stinkwort			1
<i>Ehrharta calycina</i>	Perennial Veldt Grass		2	2
<i>Ehrharta longiflora</i>	Annual Veldt Grass		1a	
<i>Euphorbia terracina</i>	False Caper	Declared	1	1a
<i>Graminae</i> sp.	Grasses		2	
<i>Helminthotheca echinoides</i>	Bristly Ox-tongue			1
<i>Hordeum marinum</i>	Sea barley-grass		1a	
<i>Lagurus ovatus</i>	Hare's-tail Grass			1a
<i>Oxalis pes-caprae</i>	Soursob		4	
<i>Plantago lanceolata</i>	Ribwort			1
<i>Reichardia tingitana</i>	False Sowthistle		1	
<i>Scabiosa atropurpurea</i>	Pincushion		1	1
<i>Sonchus oleraceus</i>	Common Sow-thistle		1a	
<i>Stenotaphrum secundatum</i>	Buffalo Grass		2	1
<i>Trifolium campestre</i>				1
<i>Vicia</i> spp.	Vetch		1	

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 –50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

Growth of shrubs – Boobialla (*Myoporum insulare*) is now a co-dominant overstorey species and not just a '+/-'. Comparison of the photographs shows more weedy grasses in the foreground which is perhaps a seasonal factor (2016 assessment was undertaken in early winter, whilst the 2022 assessment was undertaken in late summer).

Weed scores have improved since 2016, however this may be at least in part due to not being able to detect Bridal Creeper (**Asparagus asparagoides*) and Soursob (**Oxalis pes-caprae*) in late summer.

Kangaroos were commonly observed in 2022.



Washpool Site 1: Photopoint photograph taken on 7th June 2016. GPS location 268261E 6089724.



Washpool Site 1: Photopoint photograph re-taken on 1st March 2022. GPS location 268261E 6089724.

Washpool Site 2

First assessment 7th June 2016Second assessment 1st March 2022Vegetation Community: *Baumea juncea*, *Ficinia nodosa* Sedgeland

BCM Benchmark Community: SMLR 6.2 – Common Reed, Bulrush and Lignum Swamps

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	14	14/15	12	13/15
Weeds	33	5/15	21	9/15
Native Plant Life forms	9	7/10	10	8/10
Regeneration	0	0/8	0	0/8
Native: Exotic Understorey Biomass		6/10		5/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		2/4
TOTAL VEGETATION CONDITION SCORE		39/65		40/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Cenchrus clandestinus</i>	Kikuyu	6 (1-5%)	3 (plentiful cover <1%)
<i>Ehrharta calycina</i>	Perennial Veldt Grass	8 (1-5%)	8 (1-5%)
<i>Olea europaea</i>	Olive	4 (<1%)	4 (<1%)
<i>Oxalis pes-caprae</i>	Soursob	12 (5-25%)	-
<i>Phalaris sp.</i>	Phalaris	3 (<1%)	3 (plentiful cover <1%)
<i>Scabiosa atropurpurea</i>	Scabious	-	3 (plentiful cover <1%)
Weed abundance and threat score		33	21

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Baumea juncea</i>	Bare Twig-rush			LC	✓	✓
<i>Carex bichenoviana</i>	Notched Sedge			RA	✓	✓
<i>Cyperus gymnocaulos</i>	Spiny Flat-sedge			LC	✓	✓
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT	✓	✓
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Eucalyptus camaldulensis</i> ssp. <i>Camaldulensis</i> (planted?)	River Red Gum			NT	✓	✓

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Ficinia nodosa</i>	Knobby Club-rush			LC	✓	✓
<i>Geranium retrorsum</i>	Grassland Geranium			LC	✓	✓
<i>Isolepis cernua</i>	Nodding Club-rush			LC	✓	0
<i>Juncus subsecundus</i>	Finger Rush			LC	✓	0
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			LC	✓	✓
<i>Myoporum insulare</i>	Boobialla					✓ (emergent)
<i>Olearia axillaris</i>	Coast Daisy-bush			NT	✓	✓
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			LC	✓	✓
<i>Tetragonia implexicoma</i>	Bower Spinach			LC	✓	0

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Declared	Cover	
			2016	2022
<i>Avena</i> spp.	Oat		1a	
<i>Bromus diandrus</i>	Great Brom			1a
<i>Bromus</i> sp.	Brome Grass			2
<i>Cruciferae</i> sp.	Mustard family		1a	1
<i>Ehrharta calycina</i>	Perennial Veldt Grass		2	2
<i>Graminae</i> sp.	Grasses		2	3
<i>Hordeum marinum</i>	Sea Barley-grass			2
<i>Malva parviflora</i>	Small-flower Marshmallow		1	
<i>Oenothera stricta</i>	Evening Primrose			1a
<i>Olea europaea</i> ssp.	Olive	Declared	1	1
<i>Oxalis pes-caprae</i>	Soursob		3	
<i>Pennisetum clandestinum</i>	Kikuyu		2	1a
<i>Phalaris aquatica</i>	Phalaris		1	1a
<i>Picris</i> sp.	Picris		1	1
<i>Plantago lanceolata</i> var.	Ribwort		2	2
<i>Scabiosa atropurpurea</i>	Scabious			1a
<i>Sonchus oleraceus</i>	Common Sow-thistle		2	1
<i>Trifolium</i> spp.	Clover		1	1a
<i>Vicia</i> spp.	Vetch		2	1a

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

The understorey may be moderately weedier in 2022, however this may be due to assessment in different seasons. Only one small Olive (**Olea europaea*) was observed in 2022. This area appears to have remained in similar condition from the 2016 to 2022 assessment.



Washpool Site 2: Photopoint photograph taken on 7th June 2016. GPS location 268291E 6089743.



Washpool Site 2: Photopoint photograph re-taken on 1st March 2022. GPS location 268291E 6089743.

Washpool Site 3

First assessment 7th June 2016Second assessment 1st March 2022Vegetation Community: *Duma florulenta* Shrubland

BCM Benchmark Community: SMLR 6.2 – Common Reed, Bulrush and Lignum Swamps

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	3	5/15	4	6/15
Weeds	15	11/15	23	8/15
Native Plant Life forms	5	4/10	11	8/10
Regeneration	1	NA	1	NA
Native: Exotic Understorey Biomass		10/10		9/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		2/4
TOTAL VEGETATION CONDITION SCORE		37/65		36/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Gramineae sp.</i>		4 (1-5%)	6 (5-25%)
<i>Hordeum marinum</i>	Sea Barley-grass	1 (plentiful cover <1%)	3 (5-25%)
<i>Medicago sp.</i>	Medic	2 (plentiful cover <1%)	-
<i>Olea europaea</i>	Olive	-	4 (<1%)
<i>Phalaris sp.</i>	Phalaris	6 (1-5%)	6 (1-5%)
<i>Trifolium sp.</i>		-	4 (1-5%)
<i>Vicia sp.</i>	Veitch	2 (plentiful cover <1%)	-
Weed abundance and threat score		15	23

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT		✓
<i>Duma florulenta</i>	Lignum			VU	R	✓
<i>Oxalis perennans</i>	Native Sorrel			LC	✓	0
<i>Rytidosperma sp.</i>	Wallaby Grass					✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Cover		
		Declared	2016	2022
<i>Avena sp.</i>	Wild Oat			2
<i>Bromus diandrus</i>	Great Brome			1a
<i>Bromus sp.</i>	Brome Grass			1a
<i>Cirsium vulgare</i>	Spear Thistle			1
<i>Dittrichia graveolens</i>	Stinkwort			1
<i>Graminae sp.</i>	Grasses		2	3
<i>Helminthotheca echinoides</i>	Bristly Ox-tongue			1
<i>Hordeum marinum</i>	Sea barley-grass		1a	3
<i>Medicago spp.</i>	Medic		1a	
<i>Olea europaea</i>	Olive	Declared		1
<i>Phalaris aquatica</i>	Phalaris		2	2
<i>Plantago lanceolata</i>	Ribwort			1a
<i>Trifolium campestre</i>				2
<i>Vicia spp.</i>	Vetch		1a	
<i>Vulpia sp.</i>				2

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 –50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

There is possibly a higher cover of weedy grass and herbaceous species in 2022, which may be a seasonal impact.

Numerous kangaroo scats and camps/trampling were observed in 2022 – hence there has been a decline in the Grazing Pressure score.



Washpool Site 3: Photopoint photograph taken on 7th June 2016. GPS location 268335E 6089700.



Washpool Site 3: Photopoint photograph re-taken on 1st March 2022. GPS location 268335E 6089700.

Washpool Site 4

First assessment 7th June 2016Second assessment 14th February 2022Vegetation Community: +/- *Sarcocornia quinqueflora* +/- *Tecticornia* spp. Low open shrubland

BCM Benchmark Community: SMLR Co 8.2 – Coastal Samphire +/- Saltbush, Bluebush Shrublands with Infrequent Inundation/Lower Salinity

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	4	6/15	7	11/15
Weeds	17	4/15	19	3/15
Native Plant Life forms	4	3/10	6	5/10
Regeneration	1	2/8	0	0/8
Native: Exotic Understorey Biomass		3/10		4/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		4/4
TOTAL VEGETATION CONDITION SCORE		25/65		30/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Avena</i> sp.	Wild Oat	-	4 (1-5%)
<i>Chenopodium album</i>	Fat Hen	-	3 (5-25%)
<i>Hordeum marinum</i>	Sea Barley-grass	5 (51-75%)	5 (51-75%)
<i>Limonium</i> sp.	Sea Lavender	2 (plentiful cover <1%)	-
<i>Lolium</i> sp.	Rye-grass	-	3 (5-25%)
<i>Oenothera stricta</i>	Evening Primrose	-	4 (1-5%)
<i>Oxalis pes-caprae</i>	Soursob	8 (1-5%)	-
<i>Polypogon monspeliensis</i>	Annual Bear Grass	1 (plentiful cover <1%)	-
<i>Sonchus oleraceus</i>	Sow Thistle	1 (plentiful cover <1%)	-
Weed abundance and threat score		17	19

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Distichlis distichophylla</i>	Emu Grass			LC		✓
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush			LC	R	✓

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Gahnia filum</i>	Thatching Grass			VU		Reveg
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT	✓	✓
<i>Suaeda australis</i>	Austral Seablite			NT		Reveg
<i>Tecticornia halocnemoides</i> ssp. <i>halocnemoides</i>	Grey Samphire			VU	✓	✓
<i>Tecticornia pergranulata</i> ssp. <i>pergranulata</i>	Black-seed Samphire			RA	✓	✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Declared	Cover	
			2016	2022
<i>Avena</i> sp.	Wild Oat			2
<i>Chenopodium</i> sp.				3
<i>Dittrichia graveolens</i>	Stinkwort			1
<i>Hedypnois rhagadioloides</i>	Cretan Weed			1a
<i>Hordeum marinum</i>	Sea barley-grass		5	5
<i>Limonium companyonis</i>	Sea-lavenders		1a	
<i>Lolium</i> sp.	Ryegrass		2	3
<i>Oenothera stricta</i>	Evening Primrose			2
<i>Oxalis pes-caprae</i>	Soursob		2	
<i>Parapholis incurva</i>	Curly Ryegrass		1a	
<i>Plantago lanceolata</i>	Ribwort			1a
<i>Polypogon monspeliensis</i>	Annual Beard-grass		1a	1a
<i>Sonchus oleraceus</i>	Common Sow-thistle		1a	1a

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

There appears to have been little change in this vegetation community apart from an increase in native species diversity due to revegetation (note the tree guards in the 2022 photograph).

Species which have been planted include Thatching Grass (*Gahnia filum*) and Austral Seablite (*Suaeda australis*). However, the cover of weedy grass and herbaceous species remains high.



Washpool Site 4: Photopoint photograph taken on 7th June 2016. GPS location 268380E 6089099N.



Washpool Site 4: Photopoint photograph re-taken on 1st March 2022. GPS location 268380E 6089099N.

Washpool Site 5

First assessment 7th June 2016Second assessment 14th February 2022Vegetation Community: +/- *Sarcocornia quinqueflora* +/- *Tecticornia* spp. Low shrubland

BCM Benchmark Community: SMLR Co 8.2 – Coastal Samphire +/- Saltbush, Bluebush Shrublands with Infrequent Inundation / Lower Salinity

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	5	8/15	5	8/15
Weeds	2	14/15	1	15/15
Native Plant Life forms	7-8	6/10	9	7/10
Regeneration	3	4/8	0	0/8
Native: Exotic Understorey Biomass		10/10		10/10
Bare Ground		2/3		2/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		4/4
TOTAL VEGETATION CONDITION SCORE		48/65		46/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Chenopodium album</i>	Fat Hen	1 (<1%)	1 (plentiful cover <1%)
<i>Polypogon monspeliensis</i>	Annual Bear Grass	1 (<1%)	-
Weed abundance and threat score		2	1

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Bolboschoenus caldwellii</i>	Salt Club-rush			RA	✓	✓
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT	R	✓
<i>Suaeda australis</i>	Austral Seablite			NT	✓	✓
<i>Tecticornia halocnemoides</i> ssp. <i>halocnemoides</i>	Grey Samphire			VU	R	✓
<i>Tecticornia pergranulata</i> ssp. <i>pergranulata</i>	Black-seed Samphire			RA	R	✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name		Cover	
		Declared	2016	2022
<i>Chenopodium sp.</i>			1	1a
<i>Polypogon monspeliensis</i>	Annual Beard-grass		1	-
<i>Suaeda baccifera</i>			-	-

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

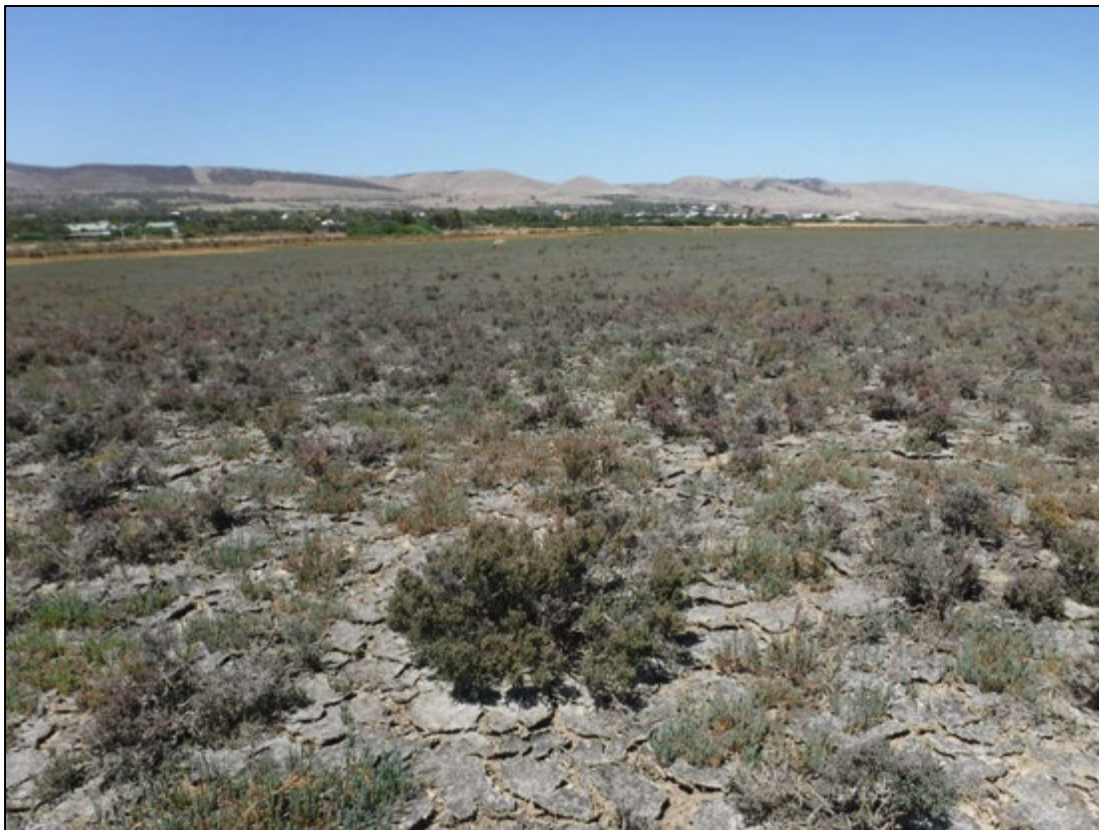
Comparison – 2016/ 2022

Little appears to have changed in this plant community since 2016.

Note that the introduced **Suaeda baccifera* has been observed in this community in the vicinity of Button Road. Although it was not detected as part of this BushRAT assessment, it is likely to still be present and should be monitored.



Washpool Site 5: Photopoint photograph taken on 7th June 2016. GPS location 268423E 6088928N.



Washpool Site 5: Photopoint photograph re-taken on 1st March 2022. GPS location 268423E 6088928N.

Washpool Site 6

First assessment 7th June 2016Second assessment 2nd March 2022Vegetation Community: *Gahnia filum* Sedgeland

BCM Benchmark Community: SMLR 6.3 – Cutting Grass Swamps

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	12	12/15	13	12/15
Weeds	17	9/15	10	12/15
Native Plant Life forms	9	6/10	18	10/10
Regeneration	NA	0/8	NA	0/8
Native: Exotic Understorey Biomass		9/10		10/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		4/4
TOTAL VEGETATION CONDITION SCORE		43/65		51/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Chenopodium album</i>	Fat Hen	-	2 (1-5%)
<i>Cynara cardunculus ssp. flavescent</i>	Artichoke Thistle	-	2 (<1%)
<i>Lycium ferocissimum</i>	Boxthorn	3 (<1%)	-
<i>Olea europaea</i>	Olive	4 (<1%)	-
<i>Oxalis pes-caprae</i>	Soursob	4 (<1%)	-
<i>Phalaris sp.</i>	Phalaris	3 (<1%)	3 (plentiful cover <1%)
<i>Plantago lanceolata</i>	Ribwort	-	2 (plentiful cover <1%)
<i>Polypogon monspeliensis</i>	Annual Bear Grass	-	1 (plentiful cover <1%)
<i>Scabiosa atropurpurea</i>	Scabious	3 (plentiful cover <1%)	-
Weed abundance and threat score		17	10

score based on the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Bolboschoenus caldwellii</i>	Salt Club-rush			RA	✓	✓
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Duma florulenta</i>	Lignum			VU	✓	✓

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush			LC	✓	0
<i>Ficinia nodosa</i>	Knobby Club-rush			LC	✓	✓
<i>Gahnia filum</i>	Thatching Grass			VU	✓	✓
<i>Hemichroa pentandra</i>	Trailing Hemichroa			EN	✓	✓
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			LC	✓	✓
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			LC	✓	✓
<i>Samolus repens</i>	Creeping Brookweed			NT	✓	✓
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT	✓	✓
<i>Selliera radicans</i>	Shiny Swamp-mat			RA		✓
<i>Suaeda australis</i>	Austral Seablite			NT	✓	R
<i>Wilsonia rotundifolia</i>	Round-leaf Wilsonia			VU		✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Declared	Cover	
			2016	2022
<i>Chenopodium album</i>	Fat Hen			2
<i>Cynara cardunculus</i> ssp. <i>flavescens</i>	Artichoke Thistle	Declared	1	1
<i>Dittrichia graveolens</i>	Stinkweed		1	1
<i>Helminthotheca echioides</i>	Bristly Oxtongue			1a
<i>Hordeum marinum</i>	Sea Barley-grass			1a
<i>Lycium ferocissimum</i>	African Boxthorn	Declared	1	
<i>Malva arborea</i>	Tree Mallow		1	
<i>Olea europaea</i> ssp.	Olive	Declared	1	
<i>Oxalis pes-caprae</i>	Soursob		1	
<i>Phalaris aquatica</i>	Phalaris		1	1a
<i>Plantago lanceolata</i>	Ribwort			1a
<i>Polypogon monspeliensis</i>	Annual Beard Grass			1a
<i>Scabiosa atropurpurea</i>	Pincushion		1a	
<i>Symphyotrichum subulatum</i>				1

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

An improvement in the weed score can be attributed to the fact that no Olive (*Olea europaea*), Boxthorn (*Lycium ferocissimum*), Scabious (*Scabiosa atropurpurea*) or Soursob (*Oxalis pes-caprae*) were noted in 2022 – although the absence of Soursob is probably due to the time of year of assessment. Artichoke Thistle (*Cynara cardunculus*) are still scattered throughout this area.

There has been an increase in the native plant life form score due to the growth (in cover and height) of Thatching Grass (*Gahnia filum*). The cover of mat plants such as Trailing Hemichroa (*Hemichroa pentandra*), Creeping Brookweed (*Samolus repens*) and Round-leaf Wilsonia (*Wilsonia rotundifolia*) is also good.



Washpool Site 6: Photopoint photograph taken on 7th June 2016. GPS location 268552E 6088830N.



Washpool Site 6: Photopoint photograph re-taken on 1st March 2022. GPS location 268552E 6088830N.

Washpool Site 7

First assessment 7th June 2016Second assessment 2nd March 2022Vegetation Community: *Bolboschoenus caldwellii* +/- *Sarcocornia quinqueflora* +/- *Tecticornia* spp.

Sedgeland/Low Shrubland

BCM Benchmark Community: SMLR 6.2 – Common Reed, Bulrush and Lignum Swamps

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	7	9/15	8	10/15
Weeds	11	13/15	9	14/15
Native Plant Life forms	10-12	8/10	12	8/10
Regeneration	*SNB	0/8	*SNB	0/8
Native: Exotic Understorey Biomass		9/10		8/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		4/4
TOTAL VEGETATION CONDITION SCORE		46/65		47/65

*SNB = Score Not Benchmarked

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Aster subulatus</i>	Aster-weed	2 (plentiful cover <1%)	2 (plentiful cover <1%)
<i>Chenopodium album</i>	Fat Hen	-	2 (1-5%)
<i>Cynara cardunculus ssp. flavescent</i>	Artichoke Thistle	2 (plentiful cover <1%)	2 (<1%)
<i>Helminthotheca echioides</i>	Bristly Oxtongue	-	2 (1-5%)
<i>Oxalis pes-caprae</i>	Soursob	4 (<1%)	-
<i>Polypogon monspeliensis</i>	Annual Bear Grass	-	1 (plentiful cover <1%)
<i>Reichardia tingitana</i>	False Sow-thistle	2 (plentiful cover <1%)	-
<i>Sonchus oleraceus</i>	Sow-thistle	1 (plentiful cover <1%)	-
Weed abundance and threat score		11	9

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Apium annuum</i>	Annual Celery			VU	✓	0
<i>Bolboschoenus caldwellii</i>	Salt Club-rush			RA	✓	✓
<i>Distichlis distichophylla</i>	Emu-grass			LC		✓

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Gahnia filum</i>	Thatching Grass			VU	✓	✓
<i>Hemichroa pentandra</i>	Trailing Hemichroa			EN	✓	✓
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT	✓	✓
<i>Suaeda australis</i>	Austral Seablite			NT	✓	✓
<i>Tecticornia pergranulata</i>	Black-seed Samphire			RA		✓
<i>Threlkeldia diffusa</i>	Coast Bonefruit			NT	✓	✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name		Cover	
		Declared	2016	2022
<i>Aster subulatus</i>	Aster-weed		1a	1a
<i>Chenopodium sp.</i>			1a	2
<i>Cynara cardunculus ssp. flavescent</i>	Artichoke Thistle	Declared	1a	1
<i>Dittrichia graveolens</i>	Stinkweed			1a
<i>Helminthotheca echioides</i>	Bristly Oxtongue			2
<i>Oxalis pes-caprae</i>	Soursob		1	
<i>Polypogon monspeliensis</i>	Annual Beard Grass			1a
<i>Reichardia tingitana</i>	False Sowthistle		1a	
<i>Sonchus oleraceus</i>	Common Sow-thistle		1a	
<i>Spergularia rubra</i>	Sand-spurrey		1a	

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

Little change is apparent in vegetation condition in this community (with changes in photopoint images attributed to season of assessment). Artichoke Thistle (**Cynara cardunculus*) is still scattered throughout. Emu-grass (*Distichlis distichophylla*) and Black-seed Samphire (*Tecticornia pergranulata*) were added to the native plant species list in 2022, however Annual Celery (*Apium annuum*) was not observed in 2022.



Washpool Site 7: Photopoint photograph taken on 7th June 2016. GPS location 268522E 6088847N.



Washpool Site 7: Photopoint photograph re-taken on 1st March 2022. GPS location 268522E 6088847N.

Washpool Site 8

First assessment 7th June 2016Second assessment 2nd March 2022Vegetation Community: **Hordeum marinum*, *Wilsonia rotundifolia* Low herbland

BCM Benchmark Community: SMLR Co 8.2 – Coastal Samphire +/- Saltbush, Bluebush Shrublands with Infrequent Inundation / Lower Salinity

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	10	13/15	7	11/15
Weeds	7	9/15	15	4/15
Native Plant Life forms	5	4/10	7	6/10
Regeneration	3	2/8	1	2/8
Native: Exotic Understorey Biomass		5/10		3/10
Bare Ground		1/3		1/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		0/4		4/4
TOTAL VEGETATION CONDITION SCORE		34/65		31/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Chenopodium album</i>	Fat Hen	-	1 (<1%)
<i>Dittrichia graveolens</i>	Stinkwort	2 (plentiful cover <1%)	2 (plentiful cover <1%)
<i>Hordeum marinum</i>	Sea Barley-grass	3 (5-25%)	4 (26-50%)
<i>Plantago coronopus</i>	Buck's-horn Plantain	2 (plentiful cover <1%)	4 (1-5%)
<i>Puccinellia ciliata</i>	Saltmarsh Grass		4 (26-50%)
Weed abundance and threat score		7	15

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Angianthus preissianus</i>	Salt Angianthus			VU	✓	✓
<i>Austrostipa flavescens</i>	Coast Spear-grass			LC	✓	0
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Juncus bufonius</i>	Toad Rush			LC	✓	0
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass			LC	✓	0
<i>Samolus repens</i>	Creeping Brookweed			NT		✓
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT	✓	✓
<i>Selliera radicans</i>	Shiny Swamp-mat			RA	✓	0

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Tecticornia pergranulata</i>	Black-seed Samphire			RA		R
<i>Triglochin mucronata</i>	Prickly Arrowgrass			VU	✓	0
<i>Wilsonia humilis</i>	Silky Wilsonia			VU	✓	✓
<i>Wilsonia rotundifolia</i>	Round-leaf Wilsonia			VU	✓	✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Cover		
		Declared	2016	2022
<i>Avena barbata</i>	Wild Oat			1a
<i>Chenopodium album</i>	Fat Hen			1
<i>Dittrichia graveolens</i>	Stinkweed		1a	1a
<i>Helminthotheca echinoides</i>	Bristly Oxtongue			1
<i>Hordeum marinum</i>	Sea barley-grass		3	4
<i>Plantago coronopus ssp.</i>	Bucks-horn Plantain		1a	2
<i>Puccinellia ciliata</i>	Saltmarsh Grass			4

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 - 25%	3
Covering 26 - 50%	4
Covering 51 - 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

There has been a slight decrease in the native plant species diversity, which may be due to seasonal influences but may also be due to an increase in weed cover. Several native plant species which were previously recorded in 2016 were not observed in 2022, including Coast Spear-grass (*Austrostipa flavescens*), Common Wallaby-grass (*Rytidosperma caespitosum*), Shiny Swamp-mat (*Selliera radicans*) and Prickly Arrowgrass (*Triglochin mucronata*).

Of particular note is the presence in 2022 of the weedy Spreading Saltmarsh Grass (**Puccinellia perluxa*) which was not recorded in 2016. This introduced grass appears to be spreading rapidly in this particular location.

No evidence of grazing was detected in 2022, however grazing pressure was high in 2016 due to the presence of sheep which have since been removed from this site.

Also of note is the emergence of young Samphire shrubs (*Tecticornia pergranulata*) which were not recorded in 2016 but are now scattered throughout the site.



Washpool Site 8: Photopoint photograph taken on 7th June 2016. GPS location 268615E 6088765N.



Washpool Site 8: Photopoint photograph re-taken on 2nd March 2022. GPS location 268615E 6088765N.

Washpool Site 9

First assessment 7th June 2016Second assessment 15th February 2022Vegetation Community: *Olearia axillaris* +/- *Leucopogon parviflorus* Shrubland

BCM Benchmark Community: SMLR Co 7.2 – Coastal Shrublands and Tall Shrublands

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	15	9/15	15	9/15
Weeds	23	5/15	19	7/15
Native Plant Life forms	16-17	9/10	17	10/10
Regeneration	2	3/8	3	4/8
Native: Exotic Understorey Biomass		7/10		8/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		3/4		4/4
TOTAL VEGETATION CONDITION SCORE		39/65		45/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Chrysanthemoides monilifera</i>	Boneseed	4 (<1%)	-
<i>Euphorbia terracina</i>	False Caper	3 (plentiful cover <1%)	3 (<1%)
<i>Euphorbia paralias</i>	Sea Spurge	3 (plentiful cover <1%)	3 (<1%)
<i>Gazania linearis</i>	Gazania	-	3 (<1%)
<i>Lycium ferocissimum</i>	Boxthorn	9 (5-25%)	-
<i>Oxalis pes-caprae</i>	Soursob	4 (plentiful cover <1%)	-
<i>Plantago coronopus</i>	Buck's-horn Plantain	-	6 (5-25%)
<i>Reichardia tingitana</i>	False Sow-thistle	-	4 (1-5%)
Weed abundance and threat score		23	19

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Atriplex paludosa</i> ssp. <i>cordata</i>	Marsh Saltbush			LC	✓	0
<i>Carpobrotus rossii</i>	Native Pigface			LC	R	R
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT	✓	✓
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	Round-leaf Pigface			LC		✓

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Enchylaena tomentosa</i>	Ruby Saltbush			LC		✓
<i>Ficinia nodosa</i>	Knobby Club-rush			LC	✓	✓
<i>Juncus kraussii</i>	Sea Rush			LC	✓	0
<i>Leucophyta brownie (planted)</i>						✓
<i>Leucopogon parviflorus</i>	Coast Beard-heath			NT	✓	✓
<i>Lythrum hyssopifolia</i>	Lesser Loosestrife			LC	✓	0
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			LC		✓
<i>Myoporum insulare</i>	Common Boobialla			NT	✓	✓
<i>Olearia axillaris (some recent plantings)</i>	Coast Daisy-bush			NT	✓	R
<i>Poa poiformis var. poiformis</i>	Coast Tussock-grass			LC	✓	✓
<i>Rhagodia candolleana ssp. candolleana</i>	Sea-berry Saltbush			LC	R	R
<i>Senecio pinnatifolius</i>						✓
<i>Spinifex hirsutus</i>	Rolling Spinifex			LC	✓	✓
<i>Suaeda australis</i>	Austral Seablite			NT	✓	0
<i>Threlkeldia diffusa</i>	Coast Bonefruit			NT		✓
<i>Tetragonia implexicoma</i>	Bower Spinach			LC	✓	0

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Declared	Cover	
			2016	2022
<i>Briza maxima</i>	Large Quaking-grass			1a
<i>Bromus hordaceus</i>	Soft Brome			1
<i>Cakile maritima</i>	Two-horned Sea Rocket			1
<i>Bromus madritensis</i>	Compact Brome		1a	
<i>Chrysanthemoides monilifera ssp. monilifera</i>	Boneseed	Declared	1	
<i>Ehrharta longiflora</i>	Annual Veldt Grass		1a	1a
<i>Euphorbia paralias</i>	Sea Spurge		1a	1
<i>Euphorbia terracina</i>	False Caper		1a	1
<i>Gazania linearis</i>	Gazania		1	1
<i>Graminae sp.</i>	Grasses		1a	
<i>Hypochaeris glabra</i>	Smooth Cat's Ear		1a	
<i>Hypochaeris radicata</i>	Rough Cat's Ear		1a	1
<i>Lagurus ovatus</i>	Hare's Tail Grass		1a	1a
<i>Limonium companyonis</i>	Sea-lavender			1
<i>Lycium ferocissimum</i>	African Boxthorn	Declared	1	
<i>Olea europaea</i>	Olive	Declared		1
<i>Oxalis pes-caprae</i>	Soursob		1a	

Name	Common Name		Cover	
		Declared	2016	2022
<i>Plantago coronopus ssp.</i>	Bucks-horn Plantain		1a	3
<i>Plantago lanceolata var.</i>	Ribwort		1a	1
<i>Reichardia tingitana</i>	False Sowthistle		1a	2
<i>Sonchus oleraceus</i>	Common Sow-thistle		1a	1a
<i>Vulpia sp.</i>	Fescue			1a

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 –50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

There has been an improvement in vegetation condition since 2016 due largely to the growth in the size and cover of coastal shrub species.

There has been a corresponding decrease (improvement) in the weed score as no Boneseed (**Chrysanthemoides monilifera*) or Boxthorn (**Lycium ferocissimum*) were detected in 2022. However, Gazania (**Gazania linearis*) has appeared since 2016, although it has been (partially) controlled.



Washpool Site 9: Photopoint photograph taken on 7th June 2016. GPS location 268027E 6088852N.



Washpool Site 9: Photopoint photograph re-taken on 15th February 2022. GPS location 268027E 6088852N.

Washpool Site 10

First assessment 7th June 2016Second assessment 15th February 2022

Vegetation Community: *Gahnia filum* Sedgeland over +/- *Sarcocornia quinqueflora* +/- *Tecticornia* spp. Low open shrubland

BCM Benchmark Community: SMLR 6.3 – Cutting Grass Swamps

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	16	13/15	12	12/15
Weeds	28	5/15	20	7/15
Native Plant Life forms	11-13	8/10	9	6/10
Regeneration	SNB	0/8	SNB	0/8
Native: Exotic Understorey Biomass		6/10		6/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		4/4
TOTAL VEGETATION CONDITION SCORE		39/65		38/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Avena</i> sp.	Wild Oat	-	8 (26-50%)
<i>Chrysanthemoides monilifera</i>	Boneseed	4 (<1%)	-
<i>Ehrharta longiflora</i>	Annual Veldt Grass	4 (1-5%)	2 (plentiful cover <1%)
<i>Hordeum marinum</i>	Sea Barley-grass	-	2 (1-5%)
<i>Olea europaea</i>	Olive	4 (<1%)	4 (<1%)
<i>Oxalis pes-caprae</i>	Soursob	12 (5-25%)	-
<i>Plantago lanceolata</i>	Ribwort	4 (1-5%)	4 (1-5%)
Weed abundance and threat score		28	20

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Atriplex paludosa</i> ssp. <i>cordata</i>	Marsh Saltbush			LC	✓	0
<i>Austrostipa flavescens</i>	Coast Spear-grass			LC	✓	0
<i>Bolboschoenus caldwellii</i>	Salt Club-rush			RA	✓	
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT	✓	R

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	Round-leaf Pigface			LC		✓
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush			LC	✓	R
<i>Frankenia pauciflora</i> var. <i>gunnii</i>	Southern Sea-heath			NE	✓	0
<i>Gahnia filum</i>	Thatching Grass			VU	R	R
<i>Hemichroa pentandra</i>	Trailing Hemichroa			EN	✓	✓
<i>Oxalis perennans</i>	Native Sorrel			LC		✓
<i>Poa poiformis</i> var. <i>poiformis</i>	Coast Tussock-grass			LC	✓	✓
<i>Rytidosperma caespitosum</i>	Common Wallaby-grass			LC	✓	0
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT	✓	✓
<i>Suaeda australis</i>	Austral Seablite			NT	✓	✓
<i>Tecticornia pergranulata</i> ssp. <i>pergranulata</i>	Black-seed Samphire			RA	✓	✓
<i>Wilsonia humilis</i>	Silky Wilsonia			VU	✓	✓
<i>Wilsonia rotundifolia</i>	Round-leaf Wilsonia			VU	✓	✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Cover		
		Declared	2016	2022
<i>Avena</i> spp.	Oat		1a	4
<i>Bromus diandrus</i>	Great Brome			1
<i>Bromus madritensis</i>	Compact Brome			1
<i>Chenopodium album</i>	Fat Hen			1
<i>Chrysanthemoides monilifera</i> ssp. <i>monilifera</i>	Boneseed	Declared	1	
<i>Ehrharta longiflora</i>	Annual Veldt Grass		1a	1a
<i>Hordeum marinum</i>	Sea Barley-grass			2
<i>Olea europaea</i> ssp.	Olive	Declared	1	1
<i>Oxalis pes-caprae</i>	Soursob		3	
<i>Plantago lanceolata</i> var.	Ribwort		2	2
<i>Thinopyrum junceiforme</i>	Sea Wheat-grass		1a	

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

The vegetation condition score has remained relatively constant since 2016. Whilst native plant life forms and species richness were scored lower, the weed score has improved. No Boneseed (**Chrysanthemoides monilifera*) was recorded in 2022 – this has probably been actively controlled. As with all 12 sites, no Soursob (**Oxalis pes-caprae*) was detected in the summer/autumn 2022 assessment. Only 1 small Olive (**Olea europaea*) was recorded – growing at the base of a (previously treated) dead mature Olive.



Washpool Site 10: Photopoint photograph taken on 7th June 2016. GPS location 268099E 6088908N.



Washpool Site 10: Photopoint photograph re-taken on 15th February 2022. GPS location 268099E 6088908N.

Washpool Site 11

First assessment 7th June 2016Second assessment 15th February 2022Vegetation Community: +/- *Sarcocornia quinqueflora* +/- *Tecticornia* spp. Low shrubland

BCM Benchmark Community: SMLR Co 8.2 – Coastal Samphire +/- Saltbush, Bluebush Shrublands with Infrequent Inundation/Lower Salinity

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	8	12/15	10	13/15
Weeds	13	5/15	10	7/15
Native Plant Life forms	10-12	8/10	12	8/10
Regeneration	0	0/8	1	2/8
Native: Exotic Understorey Biomass		6/10		7/10
Bare Ground		3/3		3/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		4/4
TOTAL VEGETATION CONDITION SCORE		38/65		44/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Acacia cyclops</i>	Western Coastal Wattle	-	3 (<1%)
<i>Hordeum marinum</i>	Sea Barley-grass	3 (5-25%)	3 (5-25%)
<i>Lolium</i> sp.	Ryegrass	-	1 (plentiful cover <1%)
<i>Oxalis pes-caprae</i>	Soursob	8 (1-5%)	-
<i>Plantago lanceolata</i>	Ribwort	2 (plentiful cover <1%)	2 (plentiful cover <1%)
<i>Sonchus oleraceus</i>	Sow-thistle	-	1 (<1%)
Weed abundance and threat score		13	10

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Enchylaena tomentosa</i>	Ruby Saltbush			LC		✓
<i>Frankenia pauciflora</i> var. <i>gunnii</i>	Southern Sea-heath			NE	✓	✓
<i>Gahnia filum</i>	Thatching Grass			VU	✓	✓
<i>Hemichroa pentandra</i>	Trailing Hemichroa			EN	✓	✓
<i>Samolus repens</i>	Creeping Brookweed			NT	✓	✓

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Sarcocornia quinqueflora</i>	Beaded Samphire			NT	✓	✓
<i>Tecticornia pergranulata</i> ssp. <i>pergranulata</i>	Black-seed Samphire			RA	✓	✓
<i>Wilsonia humilis</i>	Silky Wilsonia			VU	✓	✓
<i>Wilsonia rotundifolia</i>	Round-leaf Wilsonia			VU		✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Declared	Cover	
			2016	2022
<i>Acacia cyclops</i> (?)	Western Coastal Wattle			1
<i>Avena</i> sp.	Wild Oat			1a
<i>Chenopodium album</i>	Fat Hen			1
<i>Hordeum marinum</i>	Sea barley-grass		3	3
<i>Lolium</i> sp.	Ryegrass			1a
<i>Oxalis pes-caprae</i>	Soursob		2	
<i>Plantago lanceolata</i> var.	Ribwort		1a	1a
<i>Sonchus oleraceus</i>	Sow-thistle			1

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 - 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

There has been an increase in vegetation condition since 2016. There was a slight increase in native plant species diversity due to the presence of Coastal Wattle (*Acacia longifolia* var. *sophorae*) seedlings on the channel bank. Ruby Saltbush (*Enchylaena tomentosa*) was also added to the list in 2022.

The improvement in weed score is likely to be attributed to the absence of the annual Soursob (**Oxalis pes-caprae*) from 2022 assessments.

Of concern is the presence of several seedling Western Coastal Wattle (**Acacia cyclops*), although identification is unsure as no mature fruits or flowers are present.



Washpool Site 11: Photopoint photograph taken on 7th June 2016. GPS location 268141E 6088853N.



Washpool Site 11: Photopoint photograph re-taken on 15th February 2022. GPS location 268141E 6088853N.

Washpool Site 12

First assessment 7th June 2016Second assessment 14th February 2022Vegetation Community: *Ficinia nodosa* Sedgeland with emergent *Olearia axillaris*

BCM Benchmark Community: SMLR Co 7.2 – Coastal Shrublands and Tall Shrublands

BushRAT vegetation condition attributes

Attribute	2016		2022	
	Raw score	Scaled Score	Raw score	Scaled Score
Native Plant Species Diversity	14	9/15	19	11/15
Weeds	23	5/15	17	7/15
Native Plant Life forms	10-11	6/10	13	8/10
Regeneration	1	2/8	3	4/8
Native: Exotic Understorey Biomass		5/10		6/10
Bare Ground		3/3		1/3
Tree Health		NA		NA
Tree Hollows		NA		NA
Fallen Timber		NA		NA
Grazing Evidence		4/4		4/4
TOTAL VEGETATION CONDITION SCORE		34/65		41/65

Weed abundance and threat score comparison (based on five highest scoring weeds#)

Scientific name	Common name	Weed threat score (estimated cover)	
		2016	2022
<i>Bromus diandrus</i>	Great Brom	-	2 (1-5%)
<i>Euphorbia paralias</i>	Sea Spurge	3 (plentiful cover <1%)	3 (<1%)
<i>Limonium sp.</i>	Sea-lavender	-	2 (plentiful cover <1%)
<i>Olea europaea</i>	Olive	4 (<1%)	-
<i>Oxalis pes-caprae</i>	Soursob	8 (1-5%)	-
<i>Plantago coronopus</i>	Buck-horn Plantain	4 (1-5%)	6 (5-25%)
<i>Reichardia tingitana</i>	False Sow-thistle	4 (1-5%)	4 (1-5%)
Weed abundance and threat score		23	17

score based upon the BushRAT method, where cover category is multiplied by a weed threat score for each weed.

Native Plant List

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Acacia ligulata</i> (prostrate – planted?)						✓
<i>Atriplex semibaccata</i>	Berry Saltbush			LC		✓
<i>Baumea juncea</i>	Bare Twig-rush			LC	✓	✓
<i>Carpobrotus rossii</i>	Native Pigface			LC	✓	✓
<i>Cotula vulgaris</i> var. <i>australasica</i>	Slender Cotula			RA	✓	0

Name	Common Name	Conservation Status			Present	
		EPBC	NPWSA	Regional	2016	2022
<i>Dianella brevicaulis</i>	Short-stem Flax-lily			NT	✓	R
<i>Disphyma crassifolium</i> ssp. <i>clavellatum</i>	Round-leaf Pigface			LC	✓	✓
<i>Distichlis distichophylla</i>	Emu-grass			LC	✓	✓
<i>Enchylaena tomentosa</i>	Ruby Saltbush			LC		✓
<i>Ficinia nodosa</i>	Knobby Club-rush			LC	✓	✓
<i>Frankenia pauciflora</i> var. <i>gunnii</i>	Southern Sea-heath			NE	✓	✓
<i>Olearia axillaris</i>	Coast Daisy-bush			NT		✓
<i>Isolepis cernua</i>	Nodding Club-rush			LC	✓	0
<i>Muehlenbeckia gunnii</i>	Coastal Climbing Lignum			LC		✓
<i>Myoporum insulare</i>	Boobialla			NT		R
<i>Poa poiformis</i> var. <i>poiformis</i>	Coast Tussock-grass			LC	✓	0
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	Sea-berry Saltbush			LC	R	R
<i>Schoenus nitens</i>	Shiny Bog-rush			RA	✓	
<i>Spinifex hirsutus</i>	Rolling Spinifex			LC	✓	✓
<i>Suaeda australis</i>	Austral Seablite			NT	✓	✓
<i>Tecticornia</i> sp.	Samphire					✓
<i>Tetragonia implexicoma</i>	Bower Spinach			LC		✓

✓ = observed during BushRAT assessments, R = observed to be recruiting this survey, 0 = observed in previous assessments but not this assessment

Introduced Plant List

Name	Common Name	Cover		
		Declared	2016	2022
<i>Avena</i> sp.	Wild Oat			1a
<i>Bromus diandrus</i>	Great Brome			2
<i>Cenchrus clandestinus</i>	Kikuyu			2
<i>Euphorbia paralias</i>	Sea Spurge	Declared	1a	1
<i>Gazania linearis</i>	Gazania	Declared	1a	1a
<i>Hordeum marinum</i>	Sea barley-grass			1a
<i>Lagurus ovatus</i>	Hare's Tail Grass			2
<i>Gomphocarpus cancellatus</i>	Broad-leaf Cotton-bush		1	
<i>Hypochaeris radicata</i>	Rough Cat's Ear		1a	
<i>Limonium companyonis</i>	Sea-lavenders		1a	1a
<i>Lolium</i> sp.	Ryegrass			2
<i>Olea europaea</i> ssp.	Olive		1	
<i>Oxalis pes-caprae</i>	Soursob		2	
<i>Plantago coronopus</i> ssp.	Bucks-horn Plantain		2	3
<i>Plantago lanceolata</i> var.	Ribwort			1
<i>Reichardia tingitana</i>	False Sowthistle		2	2
<i>Rumex</i> sp.	Dock			1

Name	Common Name	Cover		
		Declared	2016	2022
<i>Thinopyrum junceiforme</i>	Sea Wheat-grass		1a	1
<i>Trifolium angustifolium</i>				1
<i>Trifolium arvense</i>				1
<i>Vulpia</i> sp.	Fescue			2

Cover Rating	
not many, cover <1%	1
Plentiful, cover <1%	1a
Covering 1 – 5%	2
Covering 5 – 25%	3
Covering 26 – 50%	4
Covering 51 – 75%	5
Covering > 75%	6

Comparison – 2016/ 2022

There has been considerable growth in both cover and diversity of native coastal shrub species in this vegetation community. This may be due to both natural recruitment along with some revegetation.

The improvement in weed score can be attributed to the absence of Olive (**Olea europaea*) and the seasonal absence of Soursob (**Oxalis pes-caprae*).

Active fox holes were observed in 2022.



Washpool Site 12: Photopoint photograph taken on 7th June 2016. GPS location 268055E 6088431N.



Washpool Site 12: Photopoint photograph re-taken on 14th February 2022. GPS location 268055E 6088431N.

3. Discussion

In summary, the condition of the various vegetation communities has either remained relatively consistent or degraded slightly (Sites 2, 3, 5, 8 and 10) or improved (Sites 1, 4, 6, 7, 9, 11 and 12) due to active control of high priority weeds and corresponding revegetation.

Table 1 provides an overview of the vegetation condition scores (which is the attribute expected to change over time) for the 12 BushRat sites. Sites which have had a decrease in condition of less than 10% are designated with a “-” symbol, sites which have decreased by more than 10% are shown with a “—” symbol. Conversely, sites with an increase of less than 10% are given a “+” symbol, and sites with an increase of more than 10% are given a “++” symbol. Sites remaining the same have no symbol.

Table 1: Broad overview of vegetation condition score changes across the Washpool – initially assessed in 2016 and “re-BushRatted” in 2022.

Site	Vegetation condition score 2016	Vegetation condition score 2022	Change
1 - <i>Leucopogon parviflorus</i> , <i>Olearia axillaris</i> , <i>Myoporum insulare</i> Shrubland	33	40	++
2- <i>Baumea juncea</i> , <i>Ficinia nodosa</i> Sedgeland	39	40	+
3 - <i>Duma florulenta</i> Shrubland	37	36	-
4 - +/- <i>Sarcocornia quinqueflora</i> +/- <i>Tecticornia</i> spp. Low open shrubland	25	30	++
5 - +/- <i>Sarcocornia quinqueflora</i> +/- <i>Tecticornia</i> spp. Low shrubland	48	46	-
6 - <i>Gahnia filum</i> Sedgeland	43	51	++
7 - <i>Bolboschoenus caldwellii</i> +/- <i>Sarcocornia quinqueflora</i> +/- <i>Tecticornia</i> spp. Sedgeland/Low Shrubland	46	47	+
8 - * <i>Hordeum marinum</i> , <i>Wilsonia rotundifolia</i> Low herbland	34	31	-
9 - <i>Olearia axillaris</i> +/- <i>Leucopogon parviflorus</i> Shrubland	39	45	++
10 - <i>Gahnia filum</i> Sedgeland over +/- <i>Sarcocornia quinqueflora</i> +/- <i>Tecticornia</i> spp. Low open shrubland	39	38	-
11 - +/- <i>Sarcocornia quinqueflora</i> +/- <i>Tecticornia</i> spp. Low shrubland	38	44	++
12 - <i>Ficinia nodosa</i> Sedgeland with emergent <i>Olearia axillaris</i>	34	41	++

A comparison of the 2016 data with the 2022 data indicates that the vegetation condition has remained relatively consistent in some sites and improved in others where active control of high

threat weeds and corresponding revegetation has occurred. In particular, it is clear that woody weeds such as Olives (**Olea europaea*), Boneseed (**Chrysanthemoides monilifera*), Boxthorn (**Lycium ferocissimum*), Western Coastal Wattle (**Acacia cyclops*) and Mirror Bush (**Coprosma repens*). Other weeds which appear to have been actively controlled include Gazania (**Gazania linearis*), Sea-lavender (**Limonium companyonis*) and Sea Wheat Grass (**Thynopyrum junceiforme*).

Due to the time of the year of assessment (late summer/early autumn), weeds such as Bridal Creeper (**Asparagus asparagoides*) and Soursob (**Oxalis pes-caprae*) were not able to be detected.

Of concern is the emergence of a new weed record for the Washpool – Saltmarsh Grass (**Puccinellia ciliata*). This is a species which can spread vigorously on saline soils.

Table 2 provides notes and observations of target/high priority weeds which occur at the Washpool, comparing the data collected in 2016 with the data collected in 2022.

Table 2: Observations of target/high priority weeds, comparing 2016 data with 2022 data

Scientific name	Common name	2016 observations	Notes on current distribution (2022)
<i>Acacia cyclops</i>	Western Coastal Wattle	Isolated individuals in dune remnants	Several seedlings in Site 11 – nearby mature individual has been treated.
<i>Acacia saligna</i>	Golden Wreath Wattle	One individual in dunes south of Button Road. Earmarked for removal in 2016 workplan ⁴	Not detected.
<i>Aloe arborescens</i>	Aloe	Isolated individuals observed in dunes near Button Road.	Not detected.
<i>Asparagus asparagoides forma</i>	Bridal Creeper	Appears to have decreased in cover in dune shrublands and sedgelands in the NW corner.	Not detected, however this may be due to time of year of assessment.
<i>Chrysanthemoides monilifera ssp. monilifera</i>	Boneseed	Very scattered only subadult individuals located.	Not detected.
<i>Cynara cardunculus</i>	Artichoke Thistle	Widespread as scattered individuals <1% cover across study area.	Present as scattered individuals in Site 6 and Site 7.
<i>Ehrharta calycina</i>	Perennial Veldt Grass	Now scattered individuals only.	Cover was estimated to be 1-5% in Site 1 and Site 2 (NW corner of the Washpool).
<i>Euphorbia paralias</i>	Sea Spurge	Common but low cover in degraded dune area south of Button Road and dunes north of Button Road.	Scattered individuals only in Site 9 and Site 12 (dune communities) – has probably been treated.
<i>Euphorbia terracina</i>	False Caper	Sparsely present in dune shrublands in NW corner, but more prevalent as scattered individuals, <1%	Scattered individuals only in Site 1 and Site 9 (dune communities) – has probably been treated.

⁴ Jock Conlon, pers. comm.

Scientific name	Common name	2016 observations	Notes on current distribution (2022)
		cover in dunes north of Button Road.	
<i>Gazania linearis</i>	Gazania	Very scattered individuals in dunes north of Button Road. Abundant and 1-5% cover in dunes south of Button Road.	Very scattered individuals in dunes north of Button Road. Not detected in dunes south of Button Road. Has probably been actively controlled.
<i>Gladiolus communis</i> ssp. <i>byzantinus</i>	Byzantine Gladiolus	Scattered in open grassland areas to the north and west of the main waterbody north of Button Road.	Not detected.
<i>Gladiolus undulatus</i>	Wild Gladiolus	A distinct patch present where water exits the Washpool at western end of Button Road.	Not detected.
<i>Helminthotheca echinoides</i>	Ox-tongue	Significant patches impinging on samphire and Gahnia habitats north of Button Road.	Significant patches still occur in Gahnia patches north of Button Road.
<i>Limonium complanatum</i>	Sea-lavenders	Low abundance at verges and in degraded areas of dunes north and south of Button Road.	Widely scattered individuals still occur in dunes north and south of Button Road, however this species has been targeted.
<i>Lupinus cosentinii</i>	Blue Lupin	Scattered individuals, generally in degraded areas (non-wetland).	Not detected.
<i>Lycium ferocissimum</i>	African Boxthorn	Scattered individuals in some habitats, but all appear to have been treated with herbicide.	Not detected.
<i>Mesembryanthemum crystallinum</i>	Common Iceplant	Isolated individuals near Button Road carpark.	-
<i>Olea europaea</i> ssp.	Olive	Widespread but sparse. Control is being undertaken in a staged approach.	Only 1-2 seedlings detected in Sites 2, 3, 9 and 10. This is due to a concerted control effort over recent years.
<i>Pennisetum clandestinum</i>	Kikuyu	Dense infestations in degraded habitats remain, but appears to have been controlled or reduced in cover in Gahnia sedgeland on the eastern side.	Recorded in degraded patches of Site 1 and Site 2, adjacent to Norman Road. Also present in Site 12 (dune community), south of Button Road.
<i>Phalaris aquatica</i>	Phalaris	May have spread [since 2008].	Cover estimated to be <1% in Site 2 and Site 6 and 1-5% in Site 3.
<i>Piptatherum miliaceum</i>	Rice Millet	Appears to have spread in areas near the path that runs along the north of Washpool Lagoon.	Not detected.
<i>Plantago coronopus</i>	Bucks-horn Plantain	Widespread around verges of samphire habitats in summer 2016, especially south of Button Road.	Dense infestations (5-25%) still occur south of Button Road (Site 12). Also in Site 9 – north of Button Road and in Site 8.

Scientific name	Common name	2016 observations	Notes on current distribution (2022)
<i>Puccinellia ciliata</i>	Saltmarsh Grass	Not observed.	This species has only been recorded at the Washpool in the last few years. It appears to be spreading significantly in Site 8 – a low-lying degraded Samphire area.
<i>Scabiosa atropurpurea</i>	Pincushion / Scabious	Very widespread especially in disturbed areas north of Button Road. Should be monitored for spread into native vegetation.	Cover of <1% in Site 1 and Site 2, south of Norman Road. Not detected elsewhere.
<i>Stenotaphrum secundatum</i>	Buffalo Grass	Has been a focus of control activities in the dune shrubland in the NW corner, and so may have decreased in abundance in this area.	Cover has reduced due to active control in Site 1, south of Norman Road.
<i>Thinopyrum junceiforme</i>	Sea Wheat-grass	Scattered individuals (<1% cover) in dunes north and south of Button Road.	Only very low levels detected in dune community south of Button Road (Site 12).
<i>Tragopogon porrifolius</i>	Salsify	Present as scattered individuals to the south of Button Road.	-
<i>Watsonia meriana</i> var. <i>bulbillifera</i>	Bulbil Watsonia	Less than ten plants located in dunes north of Button Road.	Not detected.

Appendix 1: Summary of the BushRAT methodology

It is not the intent of this report to provide an extensive overview of the use and application of the BushRAT methodology. A full description of the method and its application can be found within DEWNR (2012)⁵. The following is a simple overview of the contribution of different scoring components to the BushRAT overall score.

Note: A low score indicates poor condition for that attribute, a high score indicates good condition. Thus a very high weed score means there are very few weeds, and a very low weed score means there is a profusion of threatening weeds.

Vegetation Condition Scores

Vegetation condition component	Overview description																
Native Plant Species Diversity (15)	A count of the number of species present is compared to a “benchmark” value for that vegetation type. This is then allocated a score from 0-15.																
Weed Score (15)	<p>The cover and abundance of all weed species present is recorded as per the cover rating table below. The 5 weeds with the highest product of threat rating and cover are summed to provide a score. This is then compared to a “benchmark” value for that vegetation type, and allocated a score from 0-15.</p> <table border="1"> <thead> <tr> <th colspan="2">Cover Rating</th></tr> </thead> <tbody> <tr> <td>not many, cover <1%</td><td>1</td></tr> <tr> <td>Plentiful, cover <1%</td><td>1a</td></tr> <tr> <td>Covering 1 - 5%</td><td>2</td></tr> <tr> <td>Covering 5 – 25%</td><td>3</td></tr> <tr> <td>Covering 26 –50%</td><td>4</td></tr> <tr> <td>Covering 51 – 75%</td><td>5</td></tr> <tr> <td>Covering > 75%</td><td>6</td></tr> </tbody> </table>	Cover Rating		not many, cover <1%	1	Plentiful, cover <1%	1a	Covering 1 - 5%	2	Covering 5 – 25%	3	Covering 26 –50%	4	Covering 51 – 75%	5	Covering > 75%	6
Cover Rating																	
not many, cover <1%	1																
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Covering 1 - 5%	2																
Covering 5 – 25%	3																
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Covering 51 – 75%	5																
Covering > 75%	6																
Native Plant Life Forms (10)	The cover of different native plant life forms is compared to a “benchmark” value for that vegetation type. This is then allocated a score from 0-10.																
Regeneration (8)	The total number of woody native species in juvenile or seedling form is recorded and compared to a “benchmark” value for that vegetation type. This is then allocated a score from 0-8.																
Native:exotic Understorey Biomass (10)	The percentage of the total <i>vegetative biomass</i> of shrubs and groundcover plants < 2m high that is native is noted. This is then allocated a score from 0-10.																
Bare Ground (3)	The percentage of the grounds surface that is truly bare is noted and allocated a score from 0-3.																
Tree Health (5)	Average overall overstorey canopy health is allocated to a category, and then a score from 0-5. NOTE: NOT SCORED FOR COASTAL SHRUBLAND VEGETATION.																
Tree Hollows (5)	This score relates to the number of small and large tree hollows present, with a rating of 0-5. NOTE: NOT SCORED FOR COASTAL SHRUBLAND VEGETATION.																
Fallen timber (5)	This score relates to the amount of branch and trunk sized logs present, with a rating of 0-5. NOTE: NOT SCORED FOR COASTAL SHRUBLAND VEGETATION.																
Grazing Evidence (4)	This score relates to evidence of grazing pressure, including pugging, compacting and chewing. The score is from 0-4.																

BushRAT Scoresheet

⁵ DEWNR (2012) NVBMU BushRAT assessment and scoring Manual. Unpublished document, Department for Environment, Water and Natural Resources, Waite.

Native Plant Life Forms		Cover Rating	
include height of flowering head & dead branches			
Trees > 15 m			
Trees 5 - 15 m			
Trees < 5m			
Mallee > 5m			
Mallee ≤ 5m			
Shrubs > 2 m			
Shrubs 0.5-2m			
Shrubs < 0.5 m			
Herbs			
Mat Plants			
Grasses > 0.2m			
Grasses ≤ 0.2m			
'Sedges' > 1m			
'Sedges' ≤ 1m			
Hummock grass			
Vines, scramblers			
Mistletoe			
Ferns			
Grass-trees			
Total			

Cover Rating	
not many, cover < 1%	1
Plentiful, cover < 1%	1a
Covering 1 - 5%	2
Covering 5 - 25%	3
Covering 26 - 50%	4
Covering 51 - 75%	5
Covering > 75%	6

Bare Ground	
exclude soil crust, litter, exposed rock	
> 51% of site bare ground	2
26-50% bare ground	3
5-25 % bare ground	3
< 5% bare ground	1

Fallen Timber	
log size refers to that of canopy species (+ emergent species if present)	
Log diameter	None < 1 per 10 adult trees ≥ 1 per 10 adult trees Score
Branch-sized	0 1 2
Trunk sized	0 2 3

Tree Hollows	
Hollow diameter	None < 20 per ha ≥ 20 per ha Score
2-10cm	0 1 2
> 10cm	0 2 3

Grazing Evidence (score 4 minus 1 for each sign below)	
heavy/severe chewing	
widespread pugging/compaction	
grazing animals observed /widespread dung &/or fur;	
active warren/stock camp	

Tree Health (excl. long-dead trees)	
< 10% dieback	5
10-25% dieback, few branches dead	4
26-50% dieback, many branches dead	3
51-75% dieback, most branches dead +/- epicormic growth	2
76-99% dieback, most epicormic growth dead	1
100% dieback	0

Native/exotic Understorey Biomass	
include dead material if attached & recognisable as native	
% native	
91%+	10
81-90	9
71-80	8
61-70	7
51-60	6
41-50	5
31-40	4
21-30	3
11-20	2
0-10	1

Date:.....

Location Name:.....

Photo dirn:.....Num:.....Easting:.....Northing:.....

Recorder:..... O/S Cover (%).....O/S Ave. Ht.....

Vegetation Association Description:.....

NVBMU BushRAT Assessment

Weeds	C	Other Weed species:	C
Aira sp.		Plantago lanceolata var.	
Aloe sp.		Polygala myrtifolia	
Ammophila arenaria		Polygonum aviculare	
Anagallis arvensis		Polypogon monspeliensis	
Arctotheca calendula		Rapistrum rugosum ssp.	
Arctotis stoechadifolia		Reichardia tingitana	
Asparagus asparagoides		Reseda lutea	
Asphodelus fistulosus		Retama raetam	
Aster subulatus		Rhamnus alaternus	
Atriplex prostrata		Romulea rosea var. australis	
Avena sp.		Rosa canina	
Brachypodium distachyon		Rostraria cristata	
Brassica tournefortii		Rumex sp.	
Briza maxima		Salvia verbenaca var.	
Briza minor		Scabiosa atropurpurea	
Bromus sp.		Silene sp.	
Cakile maritima ssp. maritima		Silybum marianum	
Carpobrotus edulis ssp. edulis		Sisymbrium sp.	
Carthamus lanatus		Solanum sp.	
Casuarina glauca		Sonchus sp.	
Catapodium rigidum		Stenotaphrum secundatum	
Chondrilla juncea		Suaeda baccifera	
Chrysanthemoides monilifera ssp.		Tamarix sp.	
Cirsium vulgare		Tetragonia decumbens	
Conyza sp.		Thinopyrum sp.	
Coprosma repens		Trachyandra divaricata	
Cotula coronopifolia		Tribulus terrestris	
Cotyledon orbiculata var.		Trifolium sp.	
Crassula tetragona ssp. robusta		Vicia sp.	
Cynara cardunculus ssp. flavescent		Vulpia myuros f. myuros	
Cynodon dactylon var. dactylon		Watsonia meriana var.	
Cyperus sp.*			
Dactylis glomerata			
Diplotaxis tenuifolia			
Dittrichia graveolens			
Echium plantagineum			
Ehrharta calycina			
Ehrharta villosa var. maxima			
Emex australis			
Eragrostis curvula			
Euphorbia paralias			