

Wilson Inlet Foreshore Flora Survey

Annual monitoring sites

May 2020



Acknowledgements

This survey was carried out by Wilson Inlet Catchment Committee Inc (WICC) with funding from the Shire of Denmark. These funds are allocated on the basis of contributing to achieving outcomes of the Wilson Inlet Management Strategy (WIMS).

The ground works were planned, supervised and led by local vegetation specialist Mark Parré. The Southern Aboriginal Corporation Ranger Team assisted with each transect and the quadrat, whilst also receiving flora survey training from Mark. Donna Carman from WICC took photos and documented field procedures. Shaun Ossinger from WICC provided mapping, field and technical support. Shaun recorded some of the methodology in action at the Poison Point transect and Cherryup quadrat sites for future training and promotional purposes.

Elke Reichwaldt from the Department of Water (DWER) (Albany) provided guidance on what will be the most meaningful data to collect for planning and future decision making regarding inlet water level effects on riparian vegetation.

Valuable assistance was provided by each member of the Ranger Team: Samantha Williams, Errol Eades, Shawn Colbung and Jackson Tovey. Having the right people in the field enabled easier confirmation of previous photo monitoring points.

2020 report prepared by Donna Carman of WICC.



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Introduction

Annual Surveys have been initiated in response to observations of detrimental changes to foreshore vegetation health. This is thought to be tied in with extended periods of inundation when the sandbar at Ocean Beach isn't opened in lower rainfall years. These are intended as a supplement to the established surveys at 16 sites done every 5 years. It had been previously noted that when the fringing plants are damaged, less protection is afforded to the next layer of riparian vegetation through exposure, erosion and the potential for weed invasion in these disturbed areas. Some species of foreshore vegetation are particularly vulnerable to prolonged saline and / or highwater effects. To inform management decisions it was deemed ideal to obtain data that might explain some of these changes.

Aims

- To provide the beginning of a portfolio of photos and other data that can be compared between years at four specially selected sites.
- To complement the full surveys done every five years (2011, 2016 and next in 2021)
- To establish a quadrat survey site. It is proposed this will provide finer detail on inundation effects.

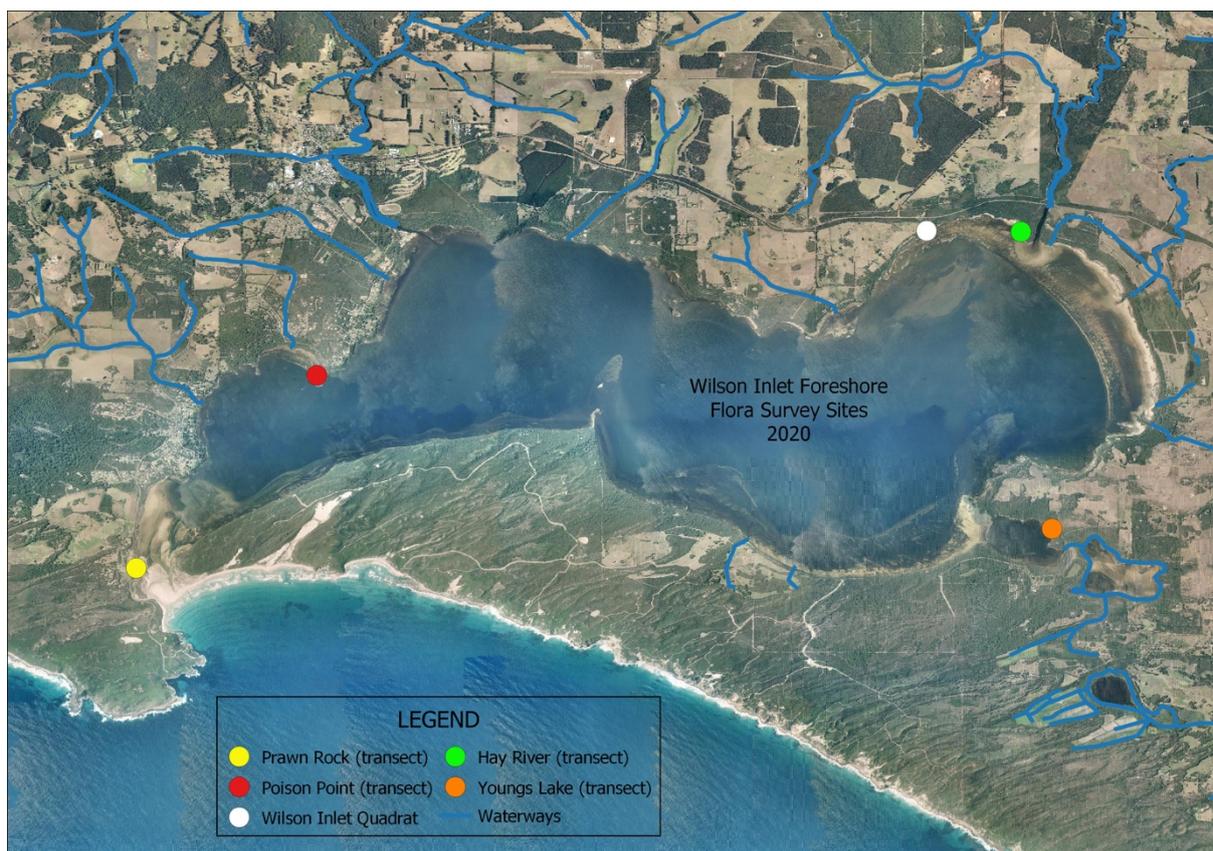


Figure 1: Location of 2020 Wilson Inlet Foreshore Flora Survey Sites

Methods

TRANSECTS

Four sites were chosen from the 2016 Wilson Inlet Foreshore Flora Survey to best represent any changes that might be occurring. They are gently sloping, easily accessible and will likely give a good snapshot of inundation effects.

Prior to field work, comparative photos were summarised into a single A4 page for each of the 4 sites for ease of use in the field. On each page we had 3 photos: Inlet peg looking inland, looking left, looking right; Land peg looking back to inlet, looking left, looking right. The left and right are noted as compass directions for each specific location. Other 2016 site data and comments were also summarised for field use.

All four transects were located onsite by comparing photos from the 2016 survey. GPS can be used for initial approximate location if needed prior to photo ID.

Each transect has 2 pegs: inlet and land. These create a 20m transect line approximately perpendicular to the inlet foreshore at each site. The inlet peg location was located first. A tall jarrah stake was hammered into the ground at this point for the duration of survey activities. The stake has easy-to-spot fluoro pink paint on its top section (see cover photo).

Heading inland, the photo comparison is repeated, this time with the pink of the jarrah stake assisting with location if line of sight was able to be made through the vegetation. Another pink-topped tall jarrah stake was hammered into the ground. A tape was run between the two stakes to ground truth the 20 metres and to provide a directional line for photos. Care is taken to keep the tape line vertically and horizontally as straight as possible, and to prevent stretching if using a plastic tape.

Once these two pegs are in place, the 3 photos for each of the inlet and inland peg can be taken. If space permits due to vegetation and water level constraints, each photo needs to show the peg and the ground vegetation in the foreground, as well as the tape line and if possible the peg in the distance. Checking that distinguishing upper storey features are also captured and lining up with points in the landscape. Cross checking to previous year survey photos continues to be crucial at this point.

Comments from the previous year survey were read on site to provide a focus for any further comparisons to check and field notes to record.

At Poison Point only: Carry out flora survey using data sheets. For each metre along the transect, flora data was recorded for 2 sq m, being 1 sq m either side of the tape. (See Appendix 2). *Only 1 site surveyed in this way due to time constraints and funding. Poison Point was chosen as a good capture of species occurrence over the 20m. Also, no data sheet has been done previously for this site.*

Remove jarrah pegs. Some locations had small white, durable plastic star pickets put in place almost to ground level if it was deemed a location where they might outlast people, vegetation and fluctuating water levels.

Morley Beach was initially chosen as one of the 4 sites for the ongoing annual surveys. As road works were known to be in the area, a quick inspection on the afternoon before the survey was scheduled found access to be too onerous with the number of people to co-

ordinate (access only through private property with permission required to drive through paddocks of unknown condition). The nearby Youngs Lake survey site was substituted.

QUADRAT

A gently sloping site was chosen with representatives of mature plants species, seedlings and rushes. Approximate orientation being N-E-S-W.

A 10m x 10m quadrat was marked out with tall white durable plastic star pickets. These were replaced once the work was finished with a short version that were left onsite. It is in a low use area so disturbance by the public is unlikely.

Two sides were marked out with 3 pegs, before a diagonal was used to cross check correct angles of corners. This was done with a pre-marked string. The 4th peg was then confidently put in place. The GPS location recorded of the first corner (southeast) was taken.

Keighrey field survey forms were used (see Appendix 2).

Three photos were taken at each point, 2 looking along each tape line direction and 1 diagonal across the transect. Once again, having the peg & tape in shot as well as adjacent low growing vegetation, while lining up with distinguishable features in the vegetation and landscape that are highly likely to be present in annual returns. Horizontal and vertical photos were taken to show the health at both ground and canopy level.

Photos were taken above approximately 1m² at three locations along the south and west tape lines. These photos included the tape measurement location This sampling is to show seedlings and species known to be affected by salinity and other inundation effects.

Transect Results

Poison Point

Date of inspection: 4/5/2020

Land peg S34.99133 E117.35429

Inlet peg S34.99139 E117.35405

(first Transect Survey Form done 2020)

Observations and field notes

- Both pegs missing. Stub of inlet peg located. Most likely broken off by wave action.
- New pegs using short white star pickets driven within 7cm of surface so as not to accumulate debris while inundated.
- Transect form filled out.
- Of significance is the priority conservation species *Selliera radicans* located near the inland peg.
- Shaun filmed transect set up for future instruction and promotion.



Figure 2: Location of Poison Point Transect

POISON POINT INLET PEG

Poison Point
Inlet peg
S34.99139
E117.35405

From inlet
peg looking
to land peg



Poison Point
Inlet peg
S34.99139
E117.35405

From inlet
peg looking
West



Poison Point
Inlet peg
S34.99139
E117.35405

From inlet
peg looking
East



POISON POINT LAND PEG

Poison Point
Land peg
S34.99133
E117.35429

From land
peg looking
south to
inlet peg



Poison Point
Land peg
S34.99133
E117.35429

From land
peg looking
West



Poison Point
Land peg
S34.99133
E117.35429

From land
peg looking
East



Prawn Rock Island

Date of inspection: 4/5/2020

Land peg S35.02494 E117.32808

Inlet Peg S35.02486 E117.32808

(not in 2011 survey)

Observations and field notes

- Inlet peg missing. Inland peg located: a lightweight green camouflaged tall peg.
- Transect form not redone. About 0.5 m – 0.7m of sand has built up over the first four metres of the transect line from the inlet end. Marram grass has colonised this.
- *Melaleuca cuticularis* planted in 2011 are growing slowly.

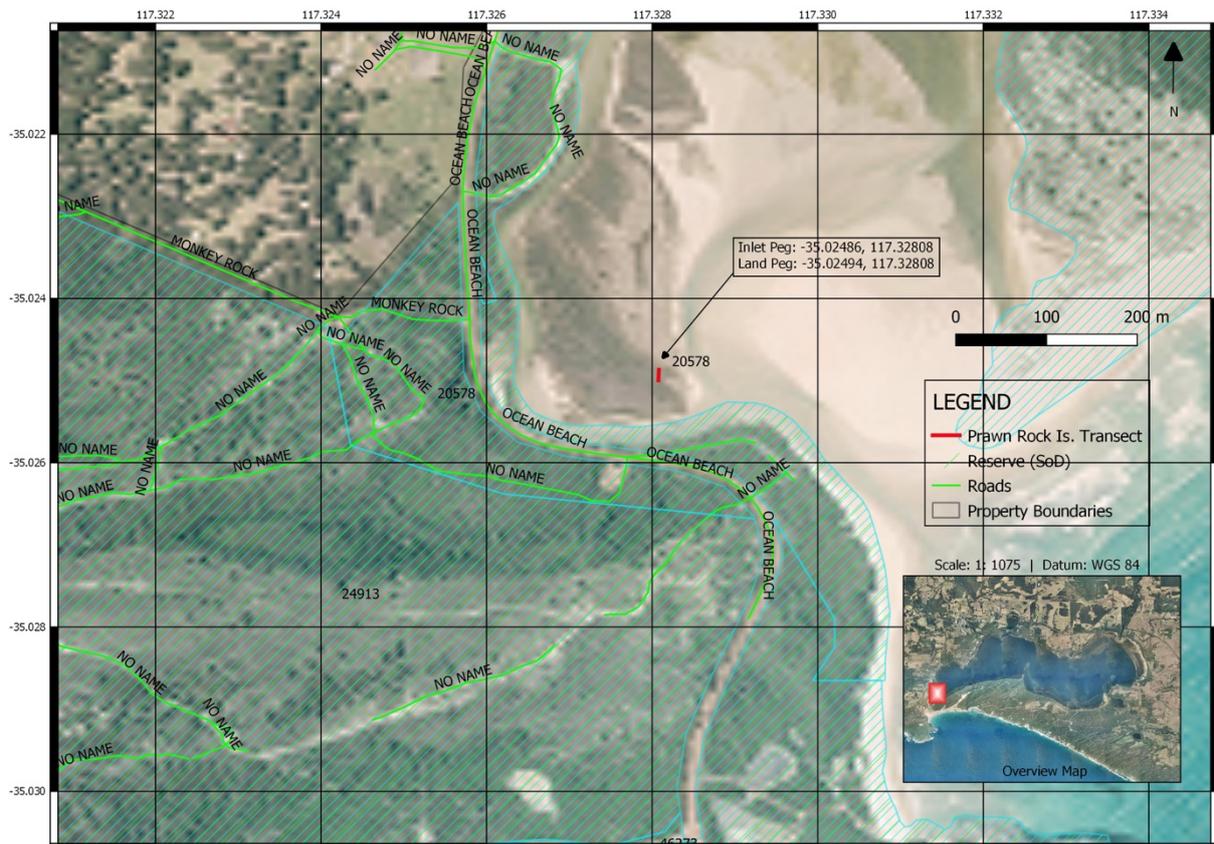


Figure 3: Location of Prawn Rock Island Transect

PRAWN ROCK ISLAND INLET PEG

**Prawn
Rock
Island**
Inlet Peg
S35.02486
E117.32808

Looking
along
transect
from inlet
peg to land
peg



**Prawn
Rock
Island**
Inlet Peg
S35.02486
E117.32808

Looking
North
across inlet
peg



**Prawn
Rock
Island**
Inlet Peg
S35.02486
E117.32808

Looking
South
across inlet
peg



PRAWN ROCK ISLAND LAND PEG

Prawn Rock Island

Land peg
S35.02494
E117.32808

At land peg
looking
towards inlet
peg



Prawn Rock Island

Land peg
S35.02494
E117.32808

Looking
Southwest
from land peg



Prawn Rock Island

Land peg
S35.02494
E117.32808

Looking South
East from land
peg



PRAWN ROCK ISLAND PHOTO TO MATCH 2016 DATA

**Prawn Rock
Island
(2020)**

Land peg
S35.02494
E117.32808

Looking
Northwest
from land peg

*This view is
in a line that
is the
continuation
of the
transect
looking
further inland*



**Prawn Rock
Island (2016)**

Land peg
S35.02494
E117.32808

Looking
Northwest
from land peg



Hay River

Date of inspection: 4/5/2020

Land peg S34.96961 E117.46075

Inlet Peg S34.96964 E117.46061

Observations and field notes

- No inlet peg. New peg established based on land peg. It is not in the same location as the 2016 peg as that was set at 14m instead of 20m due to inundation.
- The new inlet peg is a white durable plastic star picket that has been driven in to 5cm above the surface.
- The *Juncus kraussii* has declined further since 2016 despite plantings.



Figure 4: Location of Hay River Transect

HAY RIVER INLET PEG

Hay River
Inlet peg
S34.96964
E117.46061

Looking
towards land
peg



Hay River
Inlet peg
S34.96964
E117.46061

Looking
North West
from inlet peg



Hay River
Inlet peg
S34.96964
E117.46061

Looking
South East
from inlet peg



HAY RIVER LAND PEG

Hay River
Land peg
S34.96961
E117.46075

Looking
towards
inlet.



Hay River
Land peg
S34.96961
E117.46075

Looking SE



Hay River
Land peg
S34.96961
E117.46075

Looking NW



HAY RIVER EXTRA 2011-2016-2020 COMPARISON

2011



2016



2020



Youngs Lake

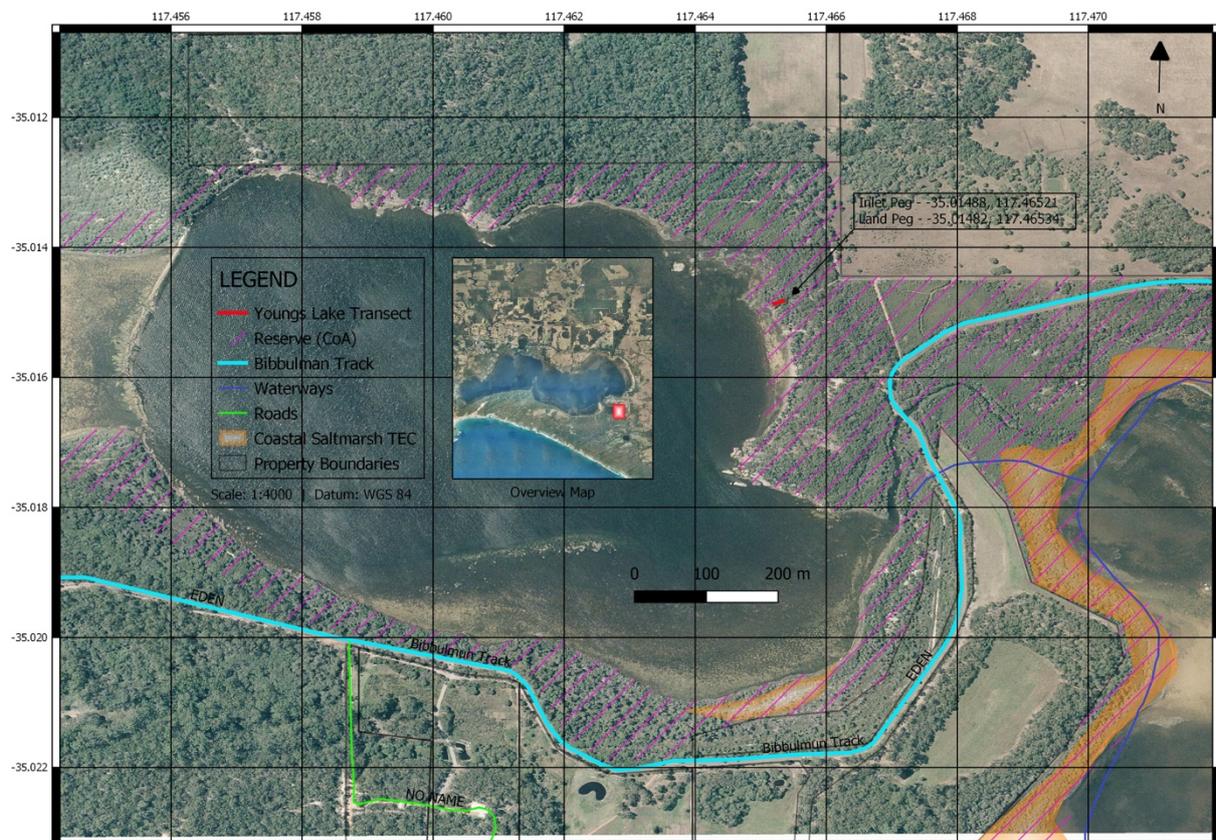
Date of inspection: 5/6/2020

Land peg S35.01482 E117.46534

Inlet Peg S35.01488 E117.46521

Observations and field notes

- Inlet peg missing. Reset from photos and land peg.
- 2016 inlet peg was left in place at 14m.
- *Agonis flexuosa* that was not well in 2016 is now dead.
- Not many weeds in zone of inundation.
- *Watsonia sp* and *Gladiolus undulatum* are at high water mark and at extra photopoint shown at the end of this section.



YOUNGS LAKE INLET PEG

**Youngs
Lake**
Inlet Peg
S35.01488
E117.46521

Looking
towards land
peg.



**Youngs
Lake**
Inlet Peg
S35.01488
E117.46521

Looking north



**Youngs
Lake**
Inlet Peg
S35.01488
E117.46521

Looking
south



YOUNGS LAKE LAND PEG

Youngs Lake
Land peg
S35.01482
E117.46534

Looking
towards inlet.



Youngs Lake
Land peg
S35.01482
E117.46534

Looking north



Youngs Lake
Land peg
S35.01482
E117.46534

Looking south



YOUNGS LAKE EXTRA PHOTO POINT *(following 2016)*

**Youngs
Lake**

Taken South
East of land
peg looking
South from
GPS location
S35.01484
E117.46542

*Seedlings of
Gladioli
undulatum &
Watsonia spp
present.*



YOUNGS LAKE 2011-2016-2020 COMPARISON

March 2011



June 2016



May 2020



Quadrat Results

Date of establishment: 5/6/2020

10m x 10m

GPS coordinate of SE peg: S34.96941 E117.44674

Quadrat site below Cherryup. Access from where the Mundabiddi track crosses the highway east of Sunny Glen Rd. Parking is available on the inlet side of highway. Follow the track until it veers southwest then follow an access track to inlet.

Observations and field notes

- Location of quadrat was chosen to include a wide range of species being present in the zone of inundation including *Callistachys lanceolata*, *Taxandria juniperena*, *Melaleuca raphiophylla*. Some mature specimens of these are in the quadrat.
- The northern half of the quadrat is established *Lepidospermum offusum*, 1-2m tall.
- Beneath the Foreshore paperbarks there is some recruitment of native seedlings including *Callistachys lanceolata* and *Bilardiera fusiformis*. These seedlings are sensitive to inundation and saline intrusion.
- A large *Acacia melanoxylon* is to the north of the quadrat.



Figure 6: Location of Cherryup Quadrat

CHERRYUP QUADRAT SOUTHEAST PEG

SE peg
Looking
West



SE peg
Looking
North



SE peg
Diagonal
view



CHERRYUP QUADRAT NORTHEAST PEG

NE peg
Looking
South



NE peg
Looking
West

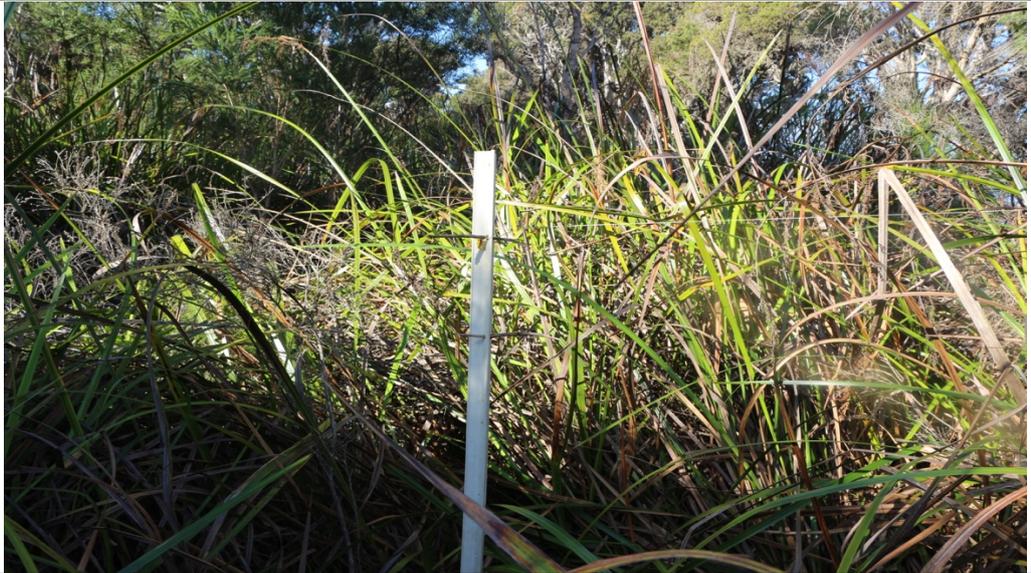


NE peg
Diagonal
view



CHERRYUP QUADRAT NORTHWEST PEG

NW peg
Looking
East



NW peg
Looking
South



NW peg
Diagonal
view



NB: this data point was crowded with sword grass.
CHERRYUP QUADRAT SOUTHWEST PEG

SW peg
Looking
North



SW peg
Looking
East



SW peg
Diagonal
view



CHERRYUP QUADRAT SQUARE METRE SAMPLE PHOTOPOINT 1 of 3

4m west of
SE peg
(south side of
quadrant)

*Ficinia
nodosa*
adjacent to
4m mark

*Billardiera
fusiformis*
&
*Callistachys
lanceolata*
seedlings
present



SQUARE METRE SAMPLE PHOTOPOINT 2 of 3

2m north
of SW peg.
(west side
of quadrat)

1x
*Callistachys
lanceolata*
seedling

Weed:
*Gladiolus
undulatus*
(small)



CHERRYUP QUADRAT SQUARE METRE SAMPLE PHOTOPOINT 3 of 3

3m north of
SW peg
(west side of
quadrat)

2x
Callistachys
lanceolata
seedlings



Recommendations

Transects

Using the three photos for locating the pegs worked very well. Tall plastic pegs were often missing and replaced with short plastic pegs where able. The type of peg to use in the future needs consideration when reviewing detail for the 2021 survey.

Youngs Lake

- Move inlet peg further inland as little to no benefit being amongst rocks. This will require a corresponding movement inland of land peg. Current land peg site could remain as an extra monitoring point along the new transect. This can be considered when doing desktop planning for the 2021 survey, with a final decision being made in the field.
- A potential sleeper weed *Gladiolus undulatus* (wavy gladioli) exists around the inlet. It is persisting at Youngs Lake along with some *Watsonia spp.* Control at this stage while they are in relatively low numbers is ideal.

Quadrat

Its recommended the quadrat have 3 standardised visits per year for the 3 overhead 1m² photos and other data to be meaningful. These need to be at predicted water level changes and can be linked to DWER water height data:

1. pre winter rains, ie prior to inundation
2. pre bar opening ie during inundation
3. after bar opening. As soon as practical after the water level has dropped.

Vertical view quadrat photos were taken to complement the horizontal. The point of this is to capture inundation effects on mature trees. A clear view of treetops with either green leaves or dead twigs is ideal. These need to be replicated to show mature tree health over time. Vertical photos from quadrat are stored electronically.

Watch for *Acacia melanoxylon* seedlings from the mature tree to north of quadrat.

General Comments & Future Surveys

It is recommended the data sheet templates be reviewed in time for the 2021 five-year survey. The 2021 survey would ideally be done in March with survey sheets reviewed and a new version finalised well beforehand. This review would include improved standardised points and recording across and within all sites, to set things in place for the coming years.

There is value in the same team who did the field work writing the report too. Ongoing discussions as things come to light on the most suitable way to present data and findings. With the overall aim to not only present a snapshot of 2020, but to add to a long term picture of foreshore vegetation changes that can be cross referenced with water level data. To this end, its about being able to compare one year to the next primarily through photos, and to identify trends over several years. With a standardized template it might not be so important to have the continuity of field data collection and report writing personnel.

With 16 sites coming up to be visited in 2021, it is recommended to get into a rhythm with the transect photos:

At each peg end take

1. inlet transect photo looking along tape line first
2. then left, then right
3. repeat for land peg

Similarly for quadrat: left string line, right string line, diagonal, then repeat for vertical pics. The repeated order provides an extra element of certainty when cross checking notes with photos. When photographing, keep in mind the purpose of the data captured as well as duplicating previous years' view.

The photo quality in this report may be adequate to locate photo monitoring points and do most comparisons, but some detail may be required from the higher res original photos. These are to be stored with WICC, with access to be made available to DWER and Shire of Denmark as required. It is recommended long term that an arrangement is made for the photos to be stored in at least one other community based location. Photo ID on the WICC server needs to be cross referenced to the reports with similar naming conventions used.

It is recommended to have a collection of printed normal photo size for future comparisons. These would need to be laminated or similar quality for long term use in the field. This will be discussed in the planning sessions for the 2021 survey as the reset and standardized version of reports into the future.

With 2021 being the next full 5 year survey visiting all 16 sites, planning consideration will need to be given to the nature of pegs to be used. The current system will need modifying as its not practical to go looking for pegs each year, and to a degree misses the point of 'permanent' locations. The resultant report and field locations need to be in a format that is useful and accessible to anyone wanting to check sites and store data at any time in the interim due to environmental or other conditions.

Ideally the City of Albany would contribute funds towards both the annual and five-yearly surveys, via a financial commitment to the WIMS of which they are stakeholder. It is unlikely this will happen in the short term due to reported covid-related reduction in revenue. The conversation has been initiated with the city's environmental officer Yvette Caruso during the 2020 WIMS review meeting.

Conclusions

The process and results are valuable. They are providing baseline data for future decision making through comparing photos and field note summaries. The surveys are only useful if we are gaining data that can show something and collected often enough to see why changes occur. Minor changes to data recording and presentation are to be standardized for future surveys beginning March 2021.

Appendix 1: Poison Point Transect Data Sheets

Monitoring Collection Data Sheets

Wilson Inlet Foreshore Fringing Vegetation Survey Template

Date: 4.5.20 Transect ID: _____ Size: 20m x 2m
 Location: POISON POINT

Shore end Lat/Long: S 34.99139 Inland end Lat/Long: S 34.99133
E 117.35405 E 117.35429

Soil Type:
 Colour: Dark Brown
 Texture: _____
 (s/v/c): clay, silt, organic matter
 (sand/loam/clay)

Survey Project Officers:
Mark Favre, Donna Marie Carmel

Cover Abundance Scale (A)	
Cover Abundance Value	Description
1	one-a few individuals
2	uncommon and < 5 % cover
3	common and < 5 % cover
4	very abundant and 5 % or 5-20 % cover
5	20 - 50 %
6	50 - 75 %
7	75 - 100 %

Bushland Condition Scale (B)	
Bushland Condition Value	Description
Very Good - Excellent (VG) (4)	80-100% Native Flora Composition. Vegetation structure intact or nearly so. Cover/abundance of weeds less than 5%. No or minimal signs of disturbance.
Fair - Good (G) (3)	50-80% Native Flora Composition. Vegetation structure modified or nearly so. Cover/abundance of weeds 5-20% any number of individuals. Minor signs of disturbance.
Poor (P) (2)	20-50% Native Flora Composition. Vegetation structure completely modified. Cover/abundance of weeds 20-60% any number of individuals. Disturbance incidence high.
Degraded (D) (1)	0-20% Native Flora Composition. Vegetation structure disappeared. Cover/abundance of weeds 60-100% any number of individuals. Disturbance incidence very high.

Common vegetation species and their acronyms

Md	<i>Melaleuca densa</i>	Cl	<i>Callistachys lanceolatum</i>	La	<i>Lobelia alata</i>
Mc	<i>Melaleuca cuticularis</i>	Af	<i>Anigothanthos flavidus</i>	Cc	<i>Centella cordifolium</i>
Mr	<i>Melaleuca raphiophylla</i>	Fn	<i>Ficinia nodosa</i>	Le	<i>Lepidosperma effusum</i>
Ec	<i>Eucalyptus cornuta</i>	JK	<i>Juncus kraussii</i>	Bh	<i>Billardiera fusiformis</i>
Hc	<i>Hakea oleifolia</i>	Jp	<i>Juncus patidus</i>	Df	<i>Desmodium flexuosa</i>

General Comments/observations:

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Wilson Inlet Foreshore Fringing Vegetation Survey Transect Template

Transect ID: _____

Date: 4.5.20

Survey Project Officers: Mark Parve

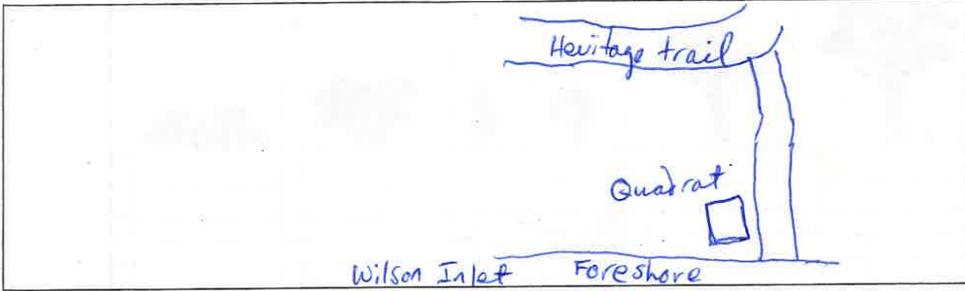
SPECIES	Shoreline end	ABUNDANCE and BUSHLAND CONDITION		SPECIES	WATER LEVEL
		A	B		
<i>Juncus kraussii</i> Samphire		1 A= 7 B= VG	1 D	Samphire	○
<i>Samolus repens</i> <i>Juncus kraussii</i> Samphire		2 A= 7 B= VG	7 VG	Samphire	↓
JK SR S		3 A= 7 B= VG	7 VG	S	
JK SR S	Mc	4 A= 7 B= VG	7 VG	S	
?SP S Mc SR S		5 A= 7 B= G	7 G	Mc S SR	
Mc SR S		6 A= 7 B= G	7 G	Mc SR S	
Mc S		7 A= 7 B= VG	7 VG	S	
Mc SR		8 A= 7 B= G	7 G	S SR	
S		9 A= 7 B= VG	7 VG	S	
Mc S		10 A= 7 B= G	7 G	Mc	
(MD DEAD) SR ?		11 A= 7 B= G	7 G	Mc MD	
(Dead MD) JK SR		12 A= 7 B= G	7 G	MD SR	
SR JK		13 A= 7 B= G	7 G	S SR JK	
SR JK		14 A= 7 B= VG	7 VG	Mc JK SR	
Mc (small) JK		15 A= 7 B= VG	7 VG	JK ?SP	
JK		16 A= 7 B= VG	7 VG	JK	
JK SR		17 A= 7 B= VG	7 VG	JK SR	
MD Couch grass Sedge sp		18 A= 7 B= VG	7 VG		
		19 A= 7 B= VG	7 VG	MD JK	
MD Scleria radicans	FW	20 A= 7 B= VG	7 G	MD JK FW	

Note: *Samolus repens* (white star flower) confused with weedy shiny leaved plant, possibly *Rhagodia baccata*.

Appendix 2: Cherryup Quadrat Data Sheets

AREA Wilson Inlet Foreshore (Below Cherryup)
 P 5-5-20 R M. Parro R Mark Shaw Shaw Sam Errol Donna COMMUNITY NO. _____
 ERS _____
 RS _____

1. LOCATION of the QUADRAT/SAMPLE POINT



S 34 96941 E 117 44674

Peg Mark P.

Topographic position	(alter necessary eg. (circle)
<u>Inlet</u>	<u>permanent</u>
<u>steep</u>	SE <u>5</u>
<input checked="" type="checkbox"/> type <u>sand laterite</u>	<u>1%</u> <u>grey</u>
Soil <u>sand</u> y	<u>off lito</u>
<u>well</u>	<u>1/5</u>
<u>1cm</u>	

Vegetation Survey Sheet 2 (From Keighery 1994.)

3. VEGETATION STRUCTURE AND COVER

From 'Bushland Plant Survey' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

For each layer record - appropriate growth form, cover class (see below) and dominant species in their order of dominance, up to a maximum of 3 species. If more than 3 species are obviously dominant record as many as appropriate to describe each layer. For NVIS record max. height of layer & % crown cover to nearest 5%.

		Cover Class		2 - 10%		10 - 30%		30 - 70%		over 70%	
		TREES						MALLEES			
		over 30m		10 - 30m		under 10m		over 8m		under 8m	
GROWTH FORM											
COVER CLASS (%)											
HEIGHT & CROWN COVER (%)											
DOMINANT SPECIES						Mel euc Mel den Mel rap					
		SHRUBS				SHRUBS					
		over 2m		2m - 1m		under 1m					
GROWTH FORM											
COVER CLASS (%)											
HEIGHT & CROWN COVER (%)											
DOMINANT SPECIES		Broom									
		GRASSES		HERBS		SEDGES		OTHER (eg. ferns)			
GROWTH FORM											
COVER CLASS (%)											
HEIGHT & CROWN COVER (%)											
DOMINANT SPECIES		Annual grass		Lob ala Sam rep Goosefoot weed		Bau jup Fic ncd Lep ell		Centella (gc)			

4. VEGETATION CONDITION (see Keighery 1994 in Appendix 4 of PBP NAJA Templates)

1 'PRISTINE'		COMMENTS (give reasoning for choice) Native seedling recruitment
2 EXCELLENT		
3 VERY GOOD	✓	
4 GOOD		
5 DEGRADED		

From 'Bushland Plant Survey' written by B. Keighery (1994) and published by the Wildflower Society of WA (Inc.), PO Box 64 Nedlands WA 6008.

