



AGENDA

FOR ENVIRONMENTAL SUSTAINABILITY AND TREES SUB COMMITTEE MEETING TO BE HELD ON

14 AUGUST 2023 AT 6.30PM

**IN WITTBER & DR RUBY DAVY ROOMS, SALISBURY COMMUNITY HUB,
34 CHURCH STREET, SALISBURY**

MEMBERS

Cr L Brug (Chairman)
Mayor G Aldridge (ex officio)
Cr C Buchanan
Cr J Chewparsad
Cr P Jensen
Cr S McKell (Deputy Chairman)
Cr S Ouk

REQUIRED STAFF Chief Executive Officer, Mr J Harry
General Manager City Infrastructure, Mr J Devine
General Manager Business Excellence, Mr C Mansueto
General Manager Community Development, Mrs A Pokoney Cramey
General Manager City Development, Ms M English
Manager Governance, Mr R Deco

APOLOGIES

LEAVE OF ABSENCE

PRESENTATION OF MINUTES

Presentation of the Minutes of the Environmental Sustainability and Trees Sub Committee Meeting held on 10 July 2023.

REPORTS

ESATS1	Future Reports for the Environmental Sustainability and Trees Sub Committee	7
ESATS2	Tree Removal Requests - Monthly Update for June 2023	9
ESATS3	Review of Tree Removal Request - Various Locations	15
ESATS4	Save St Kilda Mangroves Alliance - St Kilda Mangroves Community Vision and Strategic Plan	19

MOTIONS ON NOTICE

There are no Motions on Notice

QUESTIONS ON NOTICE

There are no Questions on Notice

OTHER BUSINESS

(Motions without Notice, Questions Without Notice, CEO Updates)

CLOSE



**MINUTES OF ENVIRONMENTAL SUSTAINABILITY AND TREES SUB COMMITTEE
MEETING HELD IN WITTBERT & DR RUBY DAVY ROOMS, SALISBURY
COMMUNITY HUB, 34 CHURCH STREET, SALISBURY ON**

10 JULY 2023

MEMBERS PRESENT

Mayor G Aldridge (ex officio)
Deputy Mayor, Cr C Buchanan
Cr J Chewparsad
Cr P Jensen
Cr S McKell (Deputy Chairman)

STAFF

Chief Executive Officer, Mr J Harry
General Manager City Infrastructure, Mr J Devine
General Manager City Development, Ms M English
Manager Governance, Mr R Deco
PA to Executive Office, Ms M Healy
Team Leader Urban Built Assets, Mr J Hosking
Team Leader Natural Assets, Mr C Johannsen
Team Leader Strategic Assets, Mr J Corletto

The meeting commenced at 6.51pm.

The Chairman welcomed the Elected Members, Members of the Public and staff and to the meeting.

APOLOGIES

Apologies were received from Cr L Brug and Cr S Ouk.

LEAVE OF ABSENCE

Nil

PRESENTATION OF MINUTES

Moved Mayor G Aldridge
Seconded Cr J Chewparsad

The Minutes of the Environmental Sustainability and Trees Sub Committee Meeting held on 13 June 2023, be taken as read and confirmed.

CARRIED

REPORTS

ESATS1 Future Reports for the Environmental Sustainability and Trees Sub Committee

Moved Cr P Jensen
Seconded Cr J Chewparsad

That Council:

1. Notes the report.

CARRIED

ESATS2 Review of Tree Removal Request - Various Locations

Moved Cr C Buchanan
Seconded Mayor G Aldridge

That Council:

1. Approves the lodgement of development applications seeking removal of:
 - a. The regulated *Eucalyptus sideroxylon* tree at the rear of 33Seabright Avenue, Parafield Gardens, noting that should the application be approved four replacement trees are required to be planted.
 - b. The regulated *Eucalyptus leucoxylon* tree at front of 18 Ottoma Street Paralowie, noting that should the application be approved two replacement trees are required to be planted.
 - c. The regulated *Eucalyptus intertexta* tree at the front of 3 Venlo Court Salisbury Downs, noting that should the application be approved three replacement trees are required to be planted.
 - d. The three regulated *Angophora costata* to the side of 19 Forest Avenue Paralowie noting that should the application be approved six replacement trees are required to be planted.

- e. The two regulated *Eucalyptus sideroxylon* trees at front of 41 Firmin Street Paralowie, noting that should the application be approved four replacement trees are required to be planted.
- f. The significant *Eucalyptus leucoxylon* tree at front of 17 Ascot Drive Paralowie, noting that should the application be approved three replacement trees are required to be planted.

CARRIED

ESATS3 Tree Removal Requests - Monthly Update for May 2023

Moved Cr C Buchanan

Seconded Cr P Jensen

That Council:

1. Notes the report.

That the Environmental Sustainability and Trees Sub Committee, in accordance with its delegated powers set out in the adopted Terms of Reference:

2. Approves that trees listed at lines 38, 52 and 70 in Attachment 1 – Tree Removal Requests – May 2023 of the report (Item ESATS3 – Tree Removal Requests – Monthly Update for May 2023 - Environmental Sustainability and Trees Sub Committee, 10 July 2023) be approved for removal.

CARRIED

MOTIONS ON NOTICE

There were no Motions on Notice.

QUESTIONS ON NOTICE

There were no Questions on Notice.

OTHER BUSINESS

(Motions without Notice, Questions Without Notice, CEO Updates)

There were no Other Business items.

CLOSE

The meeting closed at 7.04pm.

CHAIRMAN.....

DATE.....

INFORMATION ONLY

ITEM	ESATS1
	ENVIRONMENTAL SUSTAINABILITY AND TREES SUB COMMITTEE
DATE	14 August 2023
HEADING	Future Reports for the Environmental Sustainability and Trees Sub Committee
AUTHOR	Heather Prasad, PA to GM City Infrastructure, City Infrastructure
CITY PLAN LINKS	4.2 We deliver quality outcomes that meet the needs of our community
SUMMARY	This item details reports to be presented to the Environmental Sustainability and Trees Sub Committee as a result of a previous Council resolution.

RECOMMENDATIONThat Council:

1. Notes the report.

ATTACHMENTS

There are no attachments to this report.

1. BACKGROUND

- 1.1 A list of resolutions requiring a future report to Council is presented to each Sub Committee and standing Committee for noting.
- 1.2 If reports have been deferred to a subsequent month, this will be indicated, along with a reason for the deferral.

2. CONSULTATION / COMMUNICATION

- 2.1 Nil.

3. REPORT

- 3.1 The following table outlines reports to be presented to the Environmental Sustainability and Trees Sub Committee as a result of a previous Council resolution:

Meeting - Item	Heading and Resolution	Officer
26/6/23	Tender for selection of an arborist to provide independent assessment of Council tree removal requests	Jamie Hosking
4.0.2 ESAT4	3. Notes a report will be presented to the Environmental Sustainability Sub-Committee for final approval of the selected Panel.	
Due:	October 2023	

Item ESATS1

4. CONCLUSION / PROPOSAL

- 4.1 Future reports for the Environmental Sustainability and Trees Sub Committee have been reviewed and are presented to Council for noting.

INFORMATION ONLY

ITEM	ESATS2 ENVIRONMENTAL SUSTAINABILITY AND TREES SUB COMMITTEE
DATE	14 August 2023
HEADING	Tree Removal Requests - Monthly Update for June 2023
AUTHORS	Nigel John, Team Leader Parks & Landscape, City Infrastructure Jamie Hosking, Team Leader Urban Built Assets, City Infrastructure
CITY PLAN LINKS	1.1 Our City is attractive and well maintained 4.1 Members of our community receive an exceptional experience when interacting with Council
SUMMARY	This monthly report provides Elected Members with updates on tree removal requests received from residents.

RECOMMENDATION

That Council:

1. Notes the report.

ATTACHMENTS

This document should be read in conjunction with the following attachments:

1. Tree Removal Requests June 20223

1. BACKGROUND

- 1.1 At its meeting held on Tuesday, 27 April 2021 Council resolved:

“That a standing report be established for every meeting of the Tree Management Appeals Sub Committee to inform Council of every application received for tree removal and the outcome of that request.”

Resolution Number 0916/2021

- 1.2 Staff currently upload a monthly tree removal request information table to the Elected Members Portal. This document has been adapted to provide further information and will now be reported to each meeting of the Environmental Sustainability and Trees Sub Committee.

2. CONSULTATION / COMMUNICATION

- 2.1 External
 - 2.1.1 Various relevant Residents

3. REPORT

- 3.1 The attached tables are a summary of requests for tree removals received and actioned by staff during the past months and have been provided on the Elected Member Portal for June 2023.
- 3.2 Fifty-one (51) tree removal requests were received in June 2023. Of these requests twenty-eight (28) were approved for removal including six (6) significant or regulated trees approved through development applications. Twenty-three (23) requests were refused. Of these, fifteen (15) are related to significant or regulated trees under the *Planning Development and Infrastructure Act 2016*.
- 3.3 Tree removal requests often result in ongoing dialogue between the owner of the property and Council on the proposed tree removal and subsequent discussions around the species type and location of the new street tree.
- 3.4 It is important to note that through various annual programs Council plants 2,000 trees each year. These programs include Street Tree Renewal Program, In-fill Planting Program, Tree Screen Renewal Program, Reserve Upgrade Program, Feature Landscape Renewal Program, Greening Program, School Tree Planting Program, Major Projects and ad-hoc planting requests. These tree renewal programs are cognizant of regulated, significant trees or those forming habitat corridors.

4. CONCLUSION / PROPOSAL

- 4.1 It is proposed that the information contained in the report be noted.

TREE REMOVAL REQUESTS

MONTH: June 2023

Assessed by Parks and Open Space Assets team on site and removed based on Councils Tree Removal Criteria

	ADDRESS		DATE	REFERENCE	APPROVED OR APPROVAL SUPPORTED	REFUSED NOT Regulated/Significant	REFUSED Regulated/Significant
1	Brahma Lodge	19 Cambridge Street - DA 23015583 - New Dwelling	8/06/2023	CRM 430471	Approved at Cost		
2	Brahma Lodge	23 Brahma Drive - Tree adjacent property	15/06/2023	CRM 430989	Approved x 1		
3	Gulfview Heights	Leonard Street Reserve - Tree hanging over/closest to side of 58 Kiekebusch Road	7/06/2023	CRM 427950	Approved x 1		
4	Gulfview Heights	40 Lipson Reach Road - Tree adjacent property, in front of mailbox	30/06/2023	CRM 430055	Approved x 1		
5	Ingle Farm	26 Luprena Avenue	27/06/2023	CRM 429826		Refused x 1	
6	Mawson Lakes	34 Beechwood Avenue (behind No. 34)	16/06/2023	CRM 430864	Approved x 1		
7	Mawson Lakes	14 Cascades Drive	16/06/2023	CRM 430218		Refused x 1	
8	Para Hills	8A Bolton Road - Tree 2 - DA 23014658 - New Dwelling	1/06/2023	CRM 429859	Approved at Cost x 1		
9	Para Hills	14 Cynthia Street - Regulated tree adjacent property	1/06/2023	CRM 429484			Refused x 1 - Regulated Tree
10	Para Hills	8A Rowe Street - Tree closest driveway on Rowe	27/06/2023	CRM 430917			Refused x 1 - Regulated Tree
11	Para Hills West	24 Ramsay Way - Lot 1 - Tree 2 - Pistacia chinensis	2/06/2023	CRM 416656	Approved		
12	Para Hills West	24 Ramsay Way - Lot 702 - Cupressus sempervirens	2/06/2023	CRM 416656	Approved		
13	Para Vista	30 Stonehenge Boulevard	8/06/2023	CRM 430120		Refused x 1	Refused x 1 - Regulated Tree
14	Parafield Gardens	3 Tyler Court - Dead tree adjacent property	5/06/2023	CRM 427532	Approved x 1		
15	Parafield Gardens	58 Piper Street - Regulated	6/06/2023	CRM 423286 DA 23016359	D/A Approved - Regulated		
16	Parafield Gardens	20 Sharon Avenue - Tree nearest driveway next to street light	16/06/2023	CRM 421962			Refused x 1 Regulated Tree

TREE REMOVAL REQUESTS

MONTH: June 2023

Assessed by Parks and Open Space Assets team on site and removed based on Councils Tree Removal Criteria

	ADDRESS	DATE	REFERENCE	APPROVED OR APPROVAL SUPPORTED	REFUSED NOT Regulated/Significant	REFUSED Regulated/Significant
17	Parafield Gardens	4 Rhus Avenue - 1 tree between 2 & 4 Rhus, 1 tree on the corner of Rhus Avenue and Oleander Drive (on private land) and 1 regulated tree at 2 Rhus Avenue	27/06/2023	CRM 430467	Approved x 1	Refused x 2 - 1 tree on private land, no action from council
18	Parafield Gardens	14 Raner Avenue - 1 Regulated tree nearest property driveway, 1 non Regulated tree nearest 12 Raner Avenue driveway	30/06/2023	CRM 430803		Refused x 1 - Regulated Tree
19	Paralowie	5 Sandown Ave - Regulated Appeal - Council Meeting 27/3/23 - DW 7711991	6/06/2023	DA 23014392 CRM 414206		APPEAL D/A Refused - Regulated
20	Paralowie	35 Dignam Drive - Regulated Tree Adjacent Property	7/06/2023	CRM 429869		Refused x 1 Regulated Tree
21	Paralowie	18 Otoma Street - Adjacent property - minor prune work recommended	7/06/2023	CRM 430100		Refused x 1 - Regulated Tree
22	Paralowie	9B Lyndon Road - tree adjacent property	7/06/2023	CRM 429982		Refused x 1 - Regulated Tree
23	Paralowie	28 Lombard Avenue - 2 trees adjacent property	27/06/2023	CRM 428939	Approved x 2	
24	Paralowie	50 Caloundra Drive - dead tree nearest 48 Caloundra Drive	30/06/2023	CRM 431958	Approved x 1	
25	Paralowie	31 Caloundra Drive - Dead tree nearest driveway	30/06/2023	CRM 431958	Approved x 1	
26	Paralowie	side of 2 Botham Street - dying trees next to each other, nearest 30 Caloundra Drive	30/06/2023	CRM 431958	Approved x 2	
27	Pooraka	Side of 13 Quinlivan	7/06/2023	CRM 429777		Refused x 2
28	Pooraka	23 Naipa Street - Regulated tree adjacent property	16/06/2023	CRM 430792		Refused x 1 - Regulated Tree

TREE REMOVAL REQUESTS

MONTH: June 2023

Assessed by Parks and Open Space Assets team on site and removed based on Councils Tree Removal Criteria

	ADDRESS		DATE	REFERENCE	APPROVED OR APPROVAL SUPPORTED	REFUSED NOT Regulated/Significant	REFUSED Regulated/Significant
29	Pooraka	side 41 Pratt Avenue - Saxon Street - Regulated - 3rd largest tree from corner	9/06/2023	CRM 418205	D/A Approved - Regulated		
30	Salisbury	44 Margaret Avenue - Regulated	8/06/2023	CRM 421352	Approval Supported		
31	Salisbury	44 Margaret Avenue - Regulated	9/06/2023	CRM 421352 DA 23016806	D/A Approved - Regulated		
32	Salisbury Downs	19 Limerick Street - Tree to the left of mailbox, on the corner of Kerry Street and Limerick Road	7/06/2023	CRM 430072			Refused x 1 Regulated Tree
33	Salisbury Downs	3 Venlo Court - Tree adjacent property	16/06/2023	CRM 431103			Refused x 1 Regulated Tree Appealed 20/6/23 by Cr Kylie Grenfell
34	Salisbury Downs	side 1 Whelstone Court - Woolaston Road - Regulated - APPEAL - Council Meeting 24/4/23	15/06/2023	CRM 414663 DA 23017128	APPEAL D/A Approved - Regulated		
35	Salisbury Downs	10 Gumbrae Avenue - 1 tree corner of property verge near fence and 1 tree nearest driveway, next to mailbox	27/06/2023	CRM 431362		Refused x 2	
36	Salisbury East	27 Jarman Avenue - Tree adjacent property at corner of Jarman Avenue and Sobers Street	13/06/2023	CRM 430697	Approved x 1		
37	Salisbury East	4 Duberal Avenue - Tree adjacent property outside fence - near driveway	16/06/2023	CRM 430783	Approved x 1		
38	Salisbury East	Reserve Moyes Green Rear 3 Lincoln Ave	16/06/2023	CRM430028	Approved x 1		
39	Salisbury East	Kelly Green Reserve side 18 Topaz Crescent	8/06/2023	CRM 430283			Refused x 1 - Significant

TREE REMOVAL REQUESTS

MONTH: June 2023

Assessed by Parks and Open Space Assets team on site and removed based on Councils Tree Removal Criteria

	ADDRESS		DATE	REFERENCE	APPROVED OR APPROVAL SUPPORTED	REFUSED NOT Regulated/Significant	REFUSED Regulated/Significant
40	Salisbury Heights	52 Target Hill Road - Significant	15/06/2023	CRM 424807	Approval Supported - Significant tree		
41	Salisbury Heights	52 Target Hill Road - Significant	21/06/2023	CRM 424807 DA 23017450	D/A Approved - Significant tree		
42	Salisbury Heights	93 Stanford Road - Tree furthest property driveway - nearest 58 Stanford Road	30/06/2023	CRM 417636			Refused x 1 - Regulated
43	Salisbury North	9 Bearing Road - Tree nearest driveway	1/06/2023	CRM 427595	Approved x 1		
44	Salisbury North	Miller Green Reserve Harold Road - Side of 1 Chord Road	2/06/2023	CRM 428974	Approved x 4		
45	Salisbury North	14 Haughan Drive - tree adjacent property	7/06/2023	CRM 430020		Refused x 1 Appealed 19/06/23 via Cr David Hood & Refused by Jamie Hosking	
46	Salisbury North	5A Audley Avenue - Tree on verge adjacent property	8/06/2023	CRM 430044		Refused x 1	
47	Salisbury North	2 Ghent Street - Tree adjacent property	30/06/2023	CRM 431453	Approved x 1		
48	Salisbury Park	4 Goldthorn Road - Desert ash tree on verge closest driveway	7/06/2023	CRM 429613		Refused x 1	
49	Salisbury Park	4 Karingal Crescent - 2 trees adjacent property	7/06/2023	CRM 429727		Refused x 2	
50	Salisbury Park	3 Floriston Way - Regulated Tree Adjacent Property	27/06/2023	CRM 430481			Refused x 1 - Regulated
51	Valley View	88 Walkleys Road - Tree adjacent property	7/06/2023	CRM 428506	Approved x 1		

Item ESATS2 - Attachment 1 - Tree Removal Requests June 20223

ITEM	ESATS3 ENVIRONMENTAL SUSTAINABILITY AND TREES SUB COMMITTEE
DATE	14 August 2023
HEADING	Review of Tree Removal Request - Various Locations
AUTHORS	Nigel John, Team Leader Parks & Landscape, City Infrastructure Jamie Hosking, Team Leader Urban Built Assets, City Infrastructure
CITY PLAN LINKS	1.1 Our City is attractive and well maintained 1.2 The health and wellbeing of our community is a priority 2.1 Salisbury has a balance of green spaces and natural environments that support biodiversity
SUMMARY	In line with the approved tree removal procedure several decisions relating to the retention of trees have been appealed

RECOMMENDATIONThat Council:

1. Approves the lodgement of development applications seeking removal of:
 - a. The three regulated *Eucalyptus sideroxylon* trees at the side of 306 Whites Road Paralowie, noting that should the application be approved 6 trees are required to be replaced.

ATTACHMENTS

There are no attachments to this report.

1. BACKGROUND

- 1.1 In line with the approved tree removal procedure, residents are able to appeal decisions relating to the retention of trees. This appeal process involves:
 - On-site meeting with residents and ward members
 - Report to the Environmental Sustainability and Trees Sub Committee (ESATS)
 - Notification of outcome to residents

2. CONSULTATION / COMMUNICATION

- 2.1 External
 - 2.1.1 Residents
 - 2.1.2 Ward Councillors in line with the adopted procedures

3. REPORT

- 3.1 Significant and regulated trees are offered protection through the *Planning Development and Infrastructure Act 2016* (the Act) and require development applications for removal. Objectives for assessment of development applications are contained within the Regulated and Significant Tree Overlay of the Act:

Regulated trees are retained where they:

- *make an important visual contribution to local character and amenity;*
- *are indigenous to the local area and listed under the National Parks and Wildlife Act 1972 as a rare or endangered native species; and/or*
- *provide an important habitat for native fauna.*

Significant trees are retained where they:

- *make an important contribution to the character or amenity of the local area;*
- *are indigenous to the local area and are listed under the National Parks and Wildlife Act 1972 as a rare or endangered native species;*
- *represent an important habitat for native fauna;*
- *are part of a wildlife corridor or a remnant area of native vegetation;*
- *are important to the maintenance of biodiversity in the local environment; and/or*
- *form a notable visual element to the landscape of the local area.*

- 3.2 These objectives are distinct from City of Salisbury criteria for removal, which are not a consideration through the development assessment.

- 3.3 The following appeals have been lodged under the Tree Removal Policy and the residents are seeking removal of the trees.

3.4

CRM	Street	Suburb	Ward	Trees
433136	306 Whites Road	Paralowie	Central	3 x regulated <i>Eucalyptus sideroxylon</i>

- 3.5 The initial assessment for each appeal has identified that the trees are healthy, in good condition without any structural flaws and didn't meet City of Salisbury criteria for removal.

- 3.6 Where appropriate, pruning or canopy reduction has been undertaken to help alleviate concerns raised and actively manage the trees.

- 3.7 Following notification of appeal, and where appropriate, site meetings were arranged given the history with the trees. Further information provided by residents was reviewed and the appeals are presented directly to the Urban Services Committee for recommendation to Council for consideration to progress the requests for removal via development applications.

3.8 306 Whites Road Paralowie

The trees are in good condition with no obvious structural defects, there is a history of resident complaints for minor limb drops and nuisance leaf litter. A Development Application for removal is unlikely to be supported and will likely be refused.

4. CONCLUSION / PROPOSAL

- 4.1 In accordance with the approved tree removal procedure, some decisions relating to the retention of trees have been appealed.
- 4.2 Site meetings have been completed and recommendations are made regarding the tree removal appeals and actions recorded.

ITEM	ESATS4
	ENVIRONMENTAL SUSTAINABILITY AND TREES SUB COMMITTEE
DATE	14 August 2023
HEADING	Save St Kilda Mangroves Alliance - St Kilda Mangroves Community Vision and Strategic Plan
AUTHOR	Craig Johansen, Team Leader Natural Assets, City Infrastructure
CITY PLAN LINKS	<p>2.1 Salisbury has a balance of green spaces and natural environments that support biodiversity</p> <p>2.3 Our community, environment and infrastructure are adaptive to a changing climate</p>
SUMMARY	The Administration has been working with numerous stakeholders as part of the St Kilda Mangroves Restoration working group following the decline of the mangrove forest and samphire areas at St Kilda. Save St Kilda Mangroves Alliance are members of the working group. The St Kilda Mangroves Alliance facilitated by the Conservation Council of SA and Department for Environment and Water (DEW) has prepared the attached Community Vision and Strategic Plan.

RECOMMENDATION

That Council:

1. Notes the report
2. Endorses the vision and principles outlined in this report (Item ESATS4 - Save St Kilda Mangroves Alliance - St Kilda Mangroves Community Vision and Strategic Plan - Environmental Sustainability and Trees Sub Committee – 14 August 2023), as it closely aligns with the City Plan 2035 direction of ‘A sustainable City’ and the Sustainability Strategy.
3. Authorises the Mayor to write to the Minister for Environment and Water in support of the Vision and Principles stated in the St Kilda Mangroves Community Vision and Strategic Plan, emphasising the need for the renewal of the St Kilda mangrove trail boardwalk, and reminding the Minister of Council’s vision for the construction of a multi-purpose facility as outlined in Section 3.10 of this report (Item ESATS4 - Save St Kilda Mangroves Alliance - St Kilda Mangroves Community Vision and Strategic Plan - Environmental Sustainability and Trees Sub Committee – 14 August 2023).

ATTACHMENTS

This document should be read in conjunction with the following attachments:

1. St Kilda Mangroves Community Vision and Strategic Plan
2. Vegetation Dieback Mapping March 2021
3. North Western Sustainable Precincts Plan

BACKGROUND

- 1.1 The St Kilda Mangroves are an area of ecological significance, within 30 minutes of Adelaide's CBD, being located within the Adelaide International Bird Sanctuary National Park – Winaityinaityi Pangkara established in 2016, the Adelaide Dolphin Sanctuary established in 2005 and two aquatic reserves.
- 1.2 The coastal area/ western edge of Council is also part of the Barker Inlet which provides critical habitat for a diverse range of species, including local fish nursery and as a destination on the East Asian-Australasian Flyway for migratory birds.
- 1.3 The Mangrove Trail and Interpretive Centre was established by Council in 1985 to showcase this unique ecosystem and provide education to preserve this highly valued and beneficial landscape within the region. The trail offered one of the longest immersive mangrove experiences within Australia.
- 1.4 In 2020, waters from the mineral lease adjacent the mangrove and samphire area south of St Kilda leaked out and impacted over 24 hectares of this native landscape with 9 hectares of Mangroves directly impacted.
- 1.5 Since early 2021 the Administration has participated in multi-agency meetings to establish monitoring and potential management actions for the wider ecosystem.
- 1.6 The Save St Kilda Mangroves Alliance was formed in 2020/21 in response to the significant impact the super saline seepage had on the St Kilda Mangroves in close proximity to the Mangrove Interpretive Centre. At the launch event of the Alliance, the Mayor provided a speech and Elected Members and Administration were in attendance.
- 1.7 Of the seven areas identified in the plan, the lower three areas are located within the City of Salisbury and are important to the protection and enhancement of local biodiversity and the broader coastal environment.

2. CITY PLAN CRITICAL ACTION

- 2.1 Enhance our biodiversity corridors along Dry Creek and Little Para River and other environmentally sensitive areas such as coastal mangroves.

3. REPORT

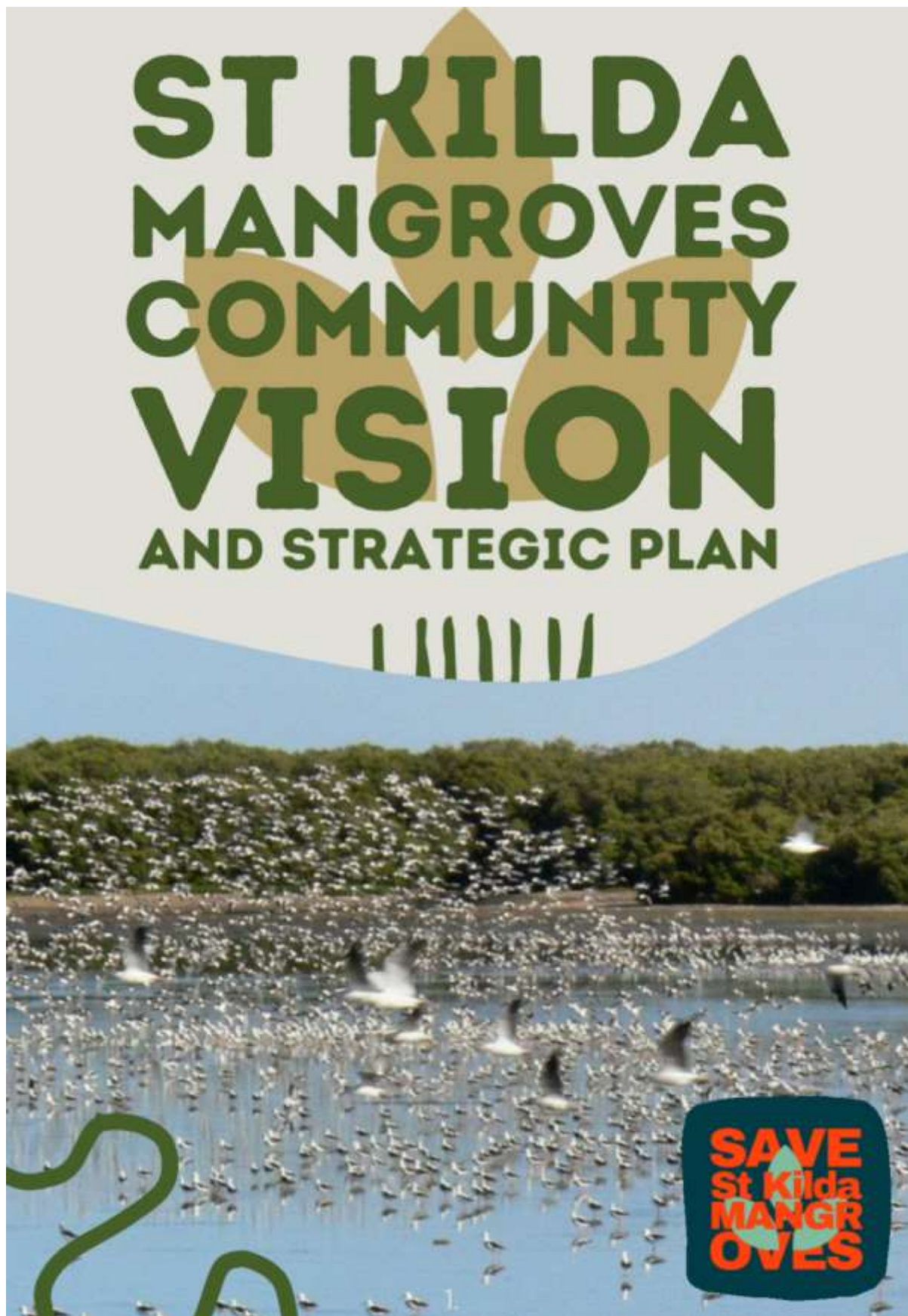
- 3.1 The Community Vision and Strategic Plan, Attachment 1, provides history on the St Kilda area and information about the national and international significance of the environment located on Council's western boundary, as well as the considerations and complexities involved in managing the St Kilda coastline.
- 3.2 The Plan identifies the numerous regulatory and legislative instruments that cover the management of the area by both the South Australian and Australian Governments which have reach far greater than that of Council.
- 3.3 The impact on the St Kilda Mangroves was not just isolated to the area immediately south of Mangrove Street and the Interpretive Centre with the full extents shown in Attachment 2 to this report.
- 3.4 The Plan provides information as to the suspected cause of the decline of the Mangroves and samphire area to the west of the mining leases.


- 3.5 It was anticipated that with better management of the water held within the adjacent evaporation pans south of St Kilda Road, the local ecosystem would be restored or return to a state where natural restoration would commence. To date no signs of natural restoration has occurred, so it is deduced that the salinity levels within the soil profile have not returned to a state which will facilitate natural restoration of the Mangroves and samphire.
- 3.6 The strategy presents the Community Vision and Principles as outlined below:
- 3.6.1 Community Vision
- 3.6.1.1 To allow space for nature to regenerate and thrive, providing a soft defence for urban areas facing sea level rise, in turn creating climate resilient communities.
 - 3.6.1.2 To create an area that is rich in both culture and biodiversity.
 - 3.6.1.3 To support biodiverse ecosystems that enhance opportunities in nature-based tourism and the green economy.
 - 3.6.1.4 To create a healthy sanctuary for the people of St Kilda and greater Adelaide.
- 3.6.2 Principles
- 3.6.2.1 'Do no harm' and ensure the safe closure of the salt field.
 - 3.6.2.2 Establish long term environmental stability of the mangrove and wider ecosystem.
 - 3.6.2.3 Establish and support ongoing research and monitoring alongside restoration.
 - 3.6.2.4 Promote community involvement in the mangroves through restoration and education opportunities.
 - 3.6.2.5 Support the St Kilda township to become a hub for the sanctuary, while preserving local heritage.
 - 3.6.2.6 Support Blue Carbon Opportunities in South Australia.
 - 3.6.2.7 Ensure appropriate management of the adjacent wetlands during development.
 - 3.6.2.8 Support the development of relevant industries including fisheries and eco-tourism.
- 3.7 The Plan identifies that the multiple stakeholder and land ownership is a current constraint to good management of the areas identified.
- 3.8 The Plan also identifies possibilities for each of the zones to manage the situation for benefit/betterment of the Mangrove and surrounding environmentally sensitive coastal area.
- 3.9 Council has previously developed a North Western Sustainable Precincts Plan that sets out a vision for the North Western area of Salisbury, which includes St Kilda. St Kilda provides a significant opportunity to develop an integrated and regionally significant eco-tourism destination that builds on its existing tourism and recreational offerings and protects environmentally and culturally sensitive areas.

- 3.10 It was suggested in the Precincts Plan that the development of a St Kilda Sustainability Centre for Excellence and Eco-Tourism Destination could:
- 3.10.1 Incorporate a Sustainability Centre for Excellence to provide experiential and nature-based learning (integrating both environmental and indigenous interpretive elements) for primary and secondary schools, universities, tourists and the general community
 - 3.10.2 Provide a regional base for State Government staff to manage important ecological assets
 - 3.10.3 Provide opportunities for people to learn about and gain a deeper appreciation of Kaurna culture
 - 3.10.4 Provide opportunities for university research, observation and monitoring
- 3.11 The Precincts Plan is in line with Principle 3.6.2.5 (Item ESATS4 - Save St Kilda Mangroves Alliance - St Kilda Mangroves Community Vision and Strategic Plan - Environmental Sustainability and Trees Sub Committee – 14 August 2023): Support the St Kilda township to become a hub for the sanctuary, while preserving local heritage.
- 3.12 Council's North Western Sustainable Precincts Plan has previously been shared with DEW and the Minister.
- 3.13 Council would be able to play a part in the restoration of the area once management methodologies have been confirmed. Through both direct action by Council and through the supporting of other agency works through community engagement, education and capacity building for stewardship of the Council's coastline.

4. CONCLUSION / PROPOSAL

- 4.1 The St Kilda Mangroves Alliance facilitated by Conservation Council SA and Department for Environment and Water (DEW) has prepared a St Kilda Mangroves Community Vision and Strategic Plan.
- 4.2 It is recommended that the community vision and principles set out in the strategic plan are supported by Council.
- 4.3 Due to the environmental significance of the area and the numerous stakeholders, continued contact with the multiple agencies is recommended. This enables Council to be aware of and able to contribute to the protection and management of the environmentally sensitive coastal areas within Council.





04	Community Vision
05	Acknowledgement of Country
07	Summary and Snapshot
09	Background
16	History
19	Environmental Considerations
24	Land Use
27	Mangrove Decline
33	Community Vision – Principles
53	The Future: Zone Management
61	References
2.	



Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan

COMMUNITY VISION

To allow space for nature to **regenerate** and **thrive**, providing a soft defence for urban areas facing sea level rise, in turn creating **climate resilient communities**.

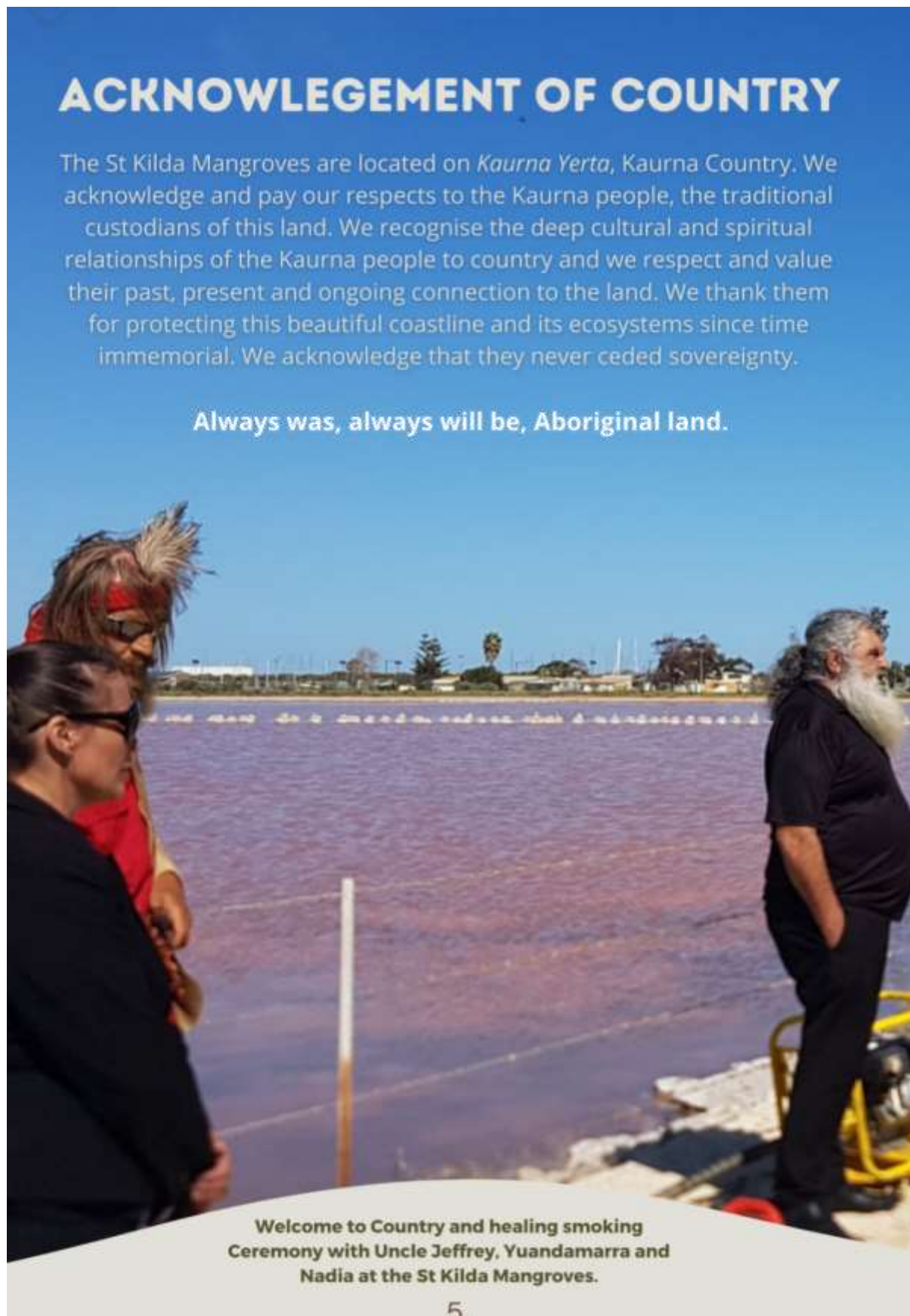
To create an area that is **rich** in both **culture** and **biodiversity**.

To support biodiverse ecosystems that enhance opportunities in **nature-based tourism** and the **green economy**.

To create a **healthy sanctuary** for the people of St Kilda, and greater Adelaide.

Photo by Peter Hall.

4.





SUMMARY

The *Save St Kilda Mangroves Alliance* was formed in 2020/2021 in response to the death, since September 2020, of over 24 hectares of vegetation at the St Kilda Mangroves.

The affected mangroves and saltmarsh adjoin the Dry Creek saltfields and were killed by hypersaline incursions from leaking saltfield ponds. Residents' trees and assets e.g. septic tanks, also suffered harm. Salt was last produced at the Dry Creek saltfields in 2013 and a planned future has not yet been determined for the area.

This internationally renowned conservation area:

- Stretches 35km along the Gulf St Vincent coastline, from Dry Creek in the south to Middle Beach in the north, 12 km northwest of Adelaide.
- Has mineral leases, regulated by Government, covering approximately 10,000 hectares with 4,000 of these being developed as salt ponds.
- Includes substantial areas of government land ownership and limited areas of private ownership.
- Provides essential habitat for a diverse range of species, including endemic and migratory shorebirds and nursery habitat for fish.
- Encompasses the protected Adelaide International Bird Sanctuary, the Adelaide Dolphin Sanctuary and two aquatic reserves.

Since forming, the Save St Kilda Mangroves Alliance has been advocating on behalf of this internationally renowned conservation area, so that restoration efforts can begin. As at May 2023, natural restoration is not proceeding as would be expected if salinity levels were sufficiently reduced.

Drawing on contributions to an Alliance workshop and on members' expertise, this Community Vision and Strategic Plan has been prepared by the Conservation Council, on behalf of the Alliance. Page 62 of this document provides the names and logos of the organisations belonging to the Alliance.

The Community Vision and Strategic Plan outlines the history of the St Kilda Mangroves, their ecological, cultural and economic significance, the damage done and the unparalleled opportunity for investment in the green economy, local cultural heritage and in community climate change resilience, through mangrove and saltmarsh regeneration.

May 2023

SNAPSHOT

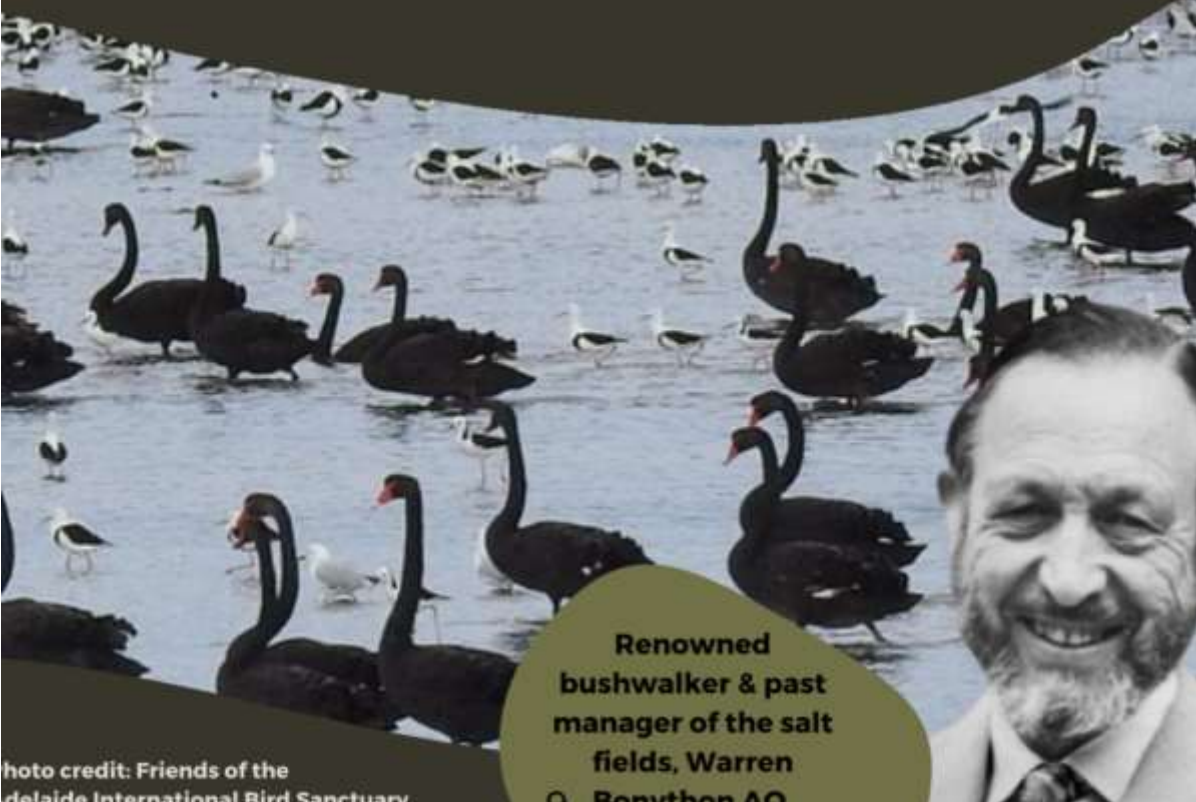
The Community Vision and Strategic Plan proposes large scale restoration on parts of the salt ponds and surrounding areas of mineral leases. The Community Vision and Strategic Plan propose eight (8) key principles, two of which include:

1. 'Do no harm' and ensure the safe closure of the salt field
2. Establish long-term environmental stability of the mangrove and wider ecosystem

Detailed actions are proposed under each of the key principles. The Community Vision and Strategic Plan proposes seven (7) management zones across the overall site and the suggested plans for these sites include:

- **Zone 1 Middle Beach Ponds:** These ponds may be ideal to manage via tidal reconnection. Provide pedestrian and push bike access and allow swimming and fishing to continue in the historic pumping basin.
- **Zone 2 Buckland Park Precinct:** Manage varied habitats, through reconnecting the Gawler River to its delta, saving key samphire species, reconnecting watercourses and dealing with invasive casuarina trees.
- **Zone 3 Birdwatcher Pond Zone and Adjacent Habitats:** Reconnect the estuary of Thompsons Creek through the salt ponds, as demonstrated by the XB8A Pond Trial which was a collaborative effort of government and universities (2019). Maintain as the area most valuable for bird watching.
- **Zone 4 Northern Gypsum Ponds:** Undertake small scale trials to determine how best to restore these ponds, since managing the layers of gypsum and monosulfidic black ooze during closure will require care.
- **Zone 5 Leaking Gypsum Ponds:** Removal of the salt that was deposited in these ponds is a priority, to prevent ongoing impacts. Once the ponds are stable, options include capping, followed by light top-soiling and direct seeding with a coastal herb and shrub mix and/or 'polishing' wastewater from Bolivar to provide for bird watching. Maintaining a pedestrian and cycle path along these southern ponds would enable the linkage of St Kilda to the Tapa Martinthi Yala bikeway at the Little Para.
- **Zone 6 St Kilda Township:** St Kilda can be a recognised Gateway to the Bird Sanctuary, with suitable signage, a rejuvenated boardwalk, replacement trees in the township and repurposing of the St Kilda Mangrove Trail building as a Blue Carbon research, historic and ecological interpretative centre.
- **Zone 7 Crystalliser and Final Areas:** With the area south of the expressway subject to the plans of the owner/developer, it is the responsibility of State and local governments, and the developer, to ensure that the interests of households and the wider South Australian community are protected should development proceed. Restoration of abandoned salt ponds north of the expressway can create wetlands reconnected to the mangroves of Barker Inlet.

8.



BACKGROUND ST KILDA MANGROVES

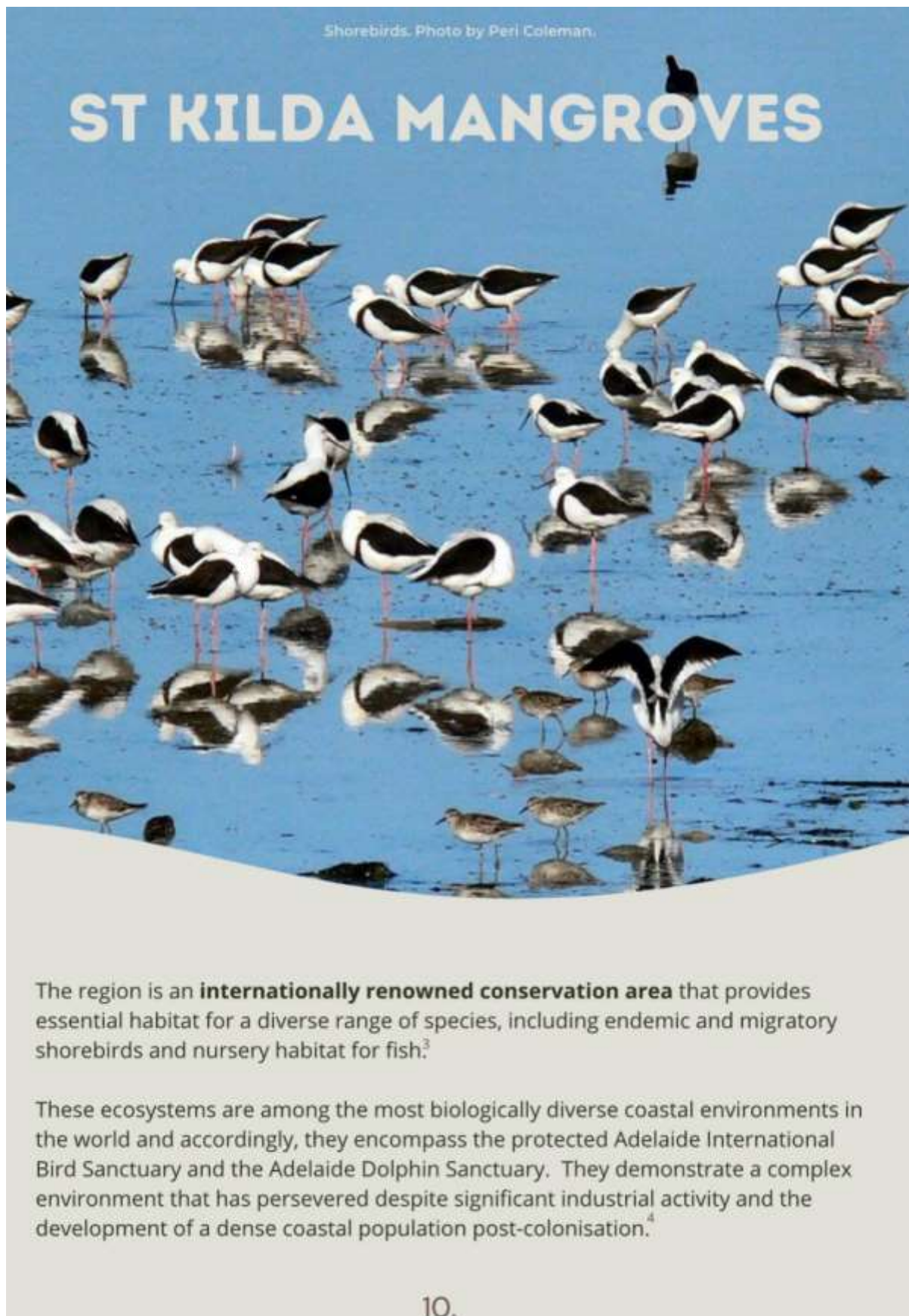
The St Kilda Mangroves, within and around the leases of the Dry Creek salt field, are ecosystems of significant **ecological, economic, and cultural importance** that fringe the outskirts of Adelaide's northern suburbs.

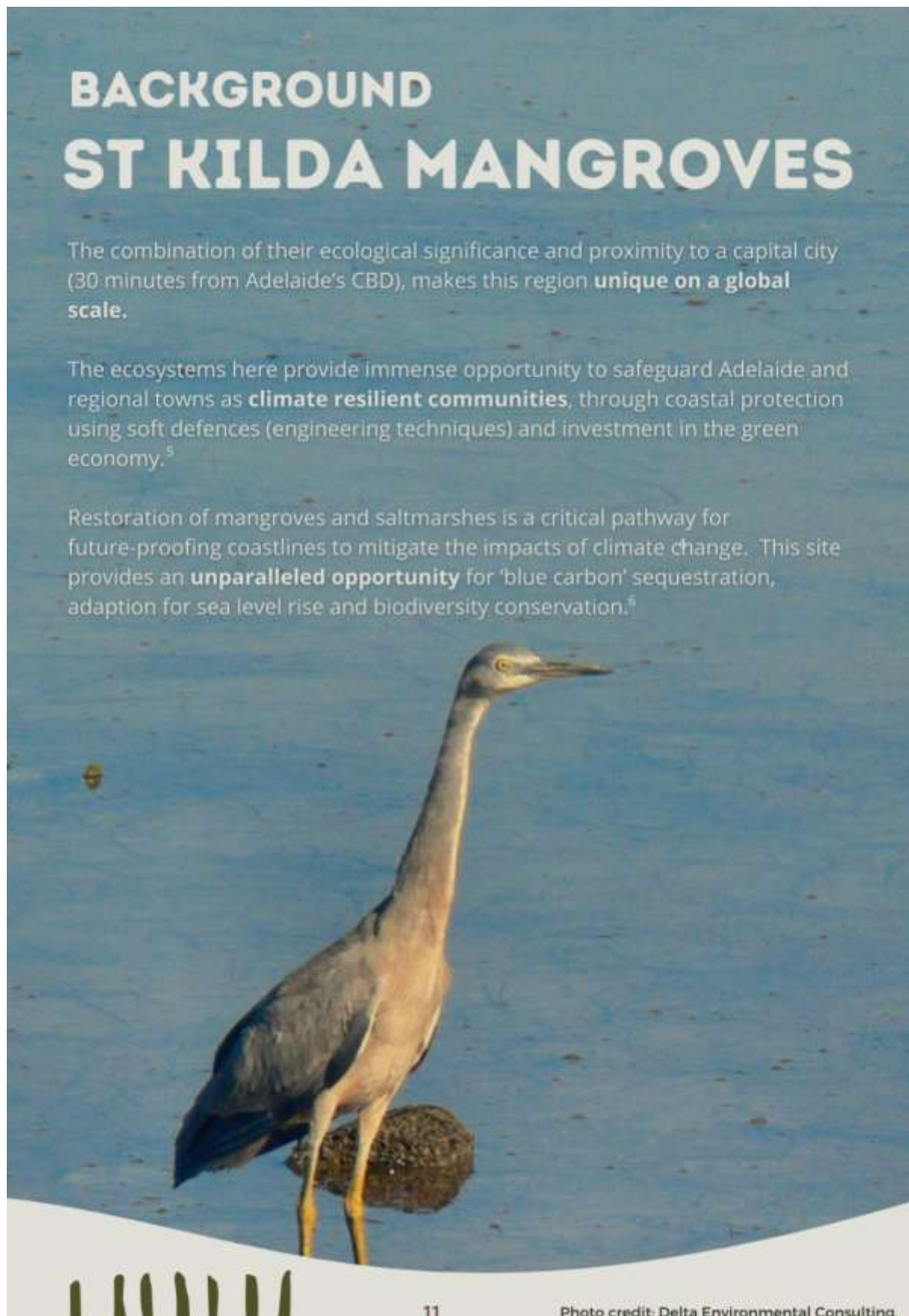
Having evolved over several thousand years, the mangroves are deeply valued by their traditional owners, the *Kurna Miyurna*, with a rich cultural and evolutionary history.

Post-colonially, the region has noteworthy heritage too. The wider salt fields were managed for two decades by **Warren Bonython AO**, renowned bushwalker and founder of the Heysen Trail.¹ The Mangrove Trail and Interpretive Centre were built in 1985 to celebrate and preserve this spectacular landscape.² The trail meanders through mangroves, tidal saltmarshes and seagrass channels to a scenic outlook at Barker Inlet, providing a rare opportunity to explore South Australia's temperate blue-carbon ecosystems.

Renowned bushwalker & past manager of the salt fields, Warren Bonython AO

Photo credit: Friends of the Adelaide International Bird Sanctuary









Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan





HISTORY

Aboriginal Heritage

The '*Kaurna Miyurna*' or the Kaurna people are the traditional owners of the land on which the St Kilda mangroves, within the *Yerta Bulti*, the Port River region and estuary, are located.

They have valued the abundant natural resources of this region for thousands of years and this area remains an important area of cultural, economic and spiritual significance.

There are several vital cultural sites and significant species in this region, including the *Kudlyo* (black swan) and *Yaltu* (pelican).¹¹

Some coastal areas are now known to be amongst the most densely populated regions of pre-colonial Australia.⁴

Key areas within St Kilda are under the *Native Title Act*, including the whole of the St Kilda Mangrove Trail.



HISTORY

Post-colonial/European Heritage

Prompt development of Port Adelaide as a major shipping centre involved the removal of significant coverage of mangroves in the estuary.

Over several decades, major efforts to protect and rehabilitate this area have been made.¹²

The Adelaide Dolphin Sanctuary, covering 118km² was established in 2005 and the Adelaide International Bird Sanctuary, covering 60km in 2016.

The 1.7km mangrove walking trail, established and maintained by the City of Salisbury, offers one of longest immersive mangrove experiences in Australia.¹³





Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan

ENVIRONMENTAL CONSIDERATIONS

The region is made up of a mosaic of coastal protected areas, including *Winaityinaityi Pangkara* - The Adelaide International Bird Sanctuary, The Adelaide Dolphin Sanctuary and two aquatic reserves. These diverse marine, coastal and estuarine environments provide a myriad of crucial ecosystem services, including blue carbon sequestration, food, stabilisation of shorelines and improved water quality.¹⁴

***Winaityinaityi Pangkara* - The Adelaide International Bird Sanctuary**

The East Asian-Australasian Flyway is the migratory route for millions of waders and shorebirds that breed in Alaska and northern Asia and migrate to South-East Asia and Australasia for the non-breeding season. About five million birds – 55 species - take this path annually, spanning across 22 countries.¹⁴

The Dry Creek salt fields are part of this flyway and are recognised nationally and internationally for their importance for migratory shorebirds.¹⁴

Many of the migratory and resident birds that depend on these ecosystems are endangered, including the Samphire Thornbills, a sub-species of Slender-billed Thornbill, found only in Southern Australia.¹¹

South Australia contains a third of the known population of Shrubby Samphire (*Tecticornia arbuscula*) and with temperate saltmarsh ecology under threat, species like the Samphire Thornbill are at considerable risk of extinction.¹⁵



ENVIRONMENTAL CONSIDERATIONS

The Adelaide Dolphin Sanctuary

The Adelaide Dolphin Sanctuary, established in 2005, includes Barker Inlet and the St Kilda and St Kilda–Chapman Creek Aquatic Reserves. The sanctuary was established to protect the mangroves, seagrass, saltmarsh, tidal flats, tidal creeks and estuarine rivers from the impacts of industrial discharges, stormwater and treated effluent.¹⁶

Aquatic Reserves

The area includes two aquatic reserves – the Barker Inlet St Kilda and St Kilda–Chapman Creek Aquatic Reserves, which are managed under the *Fisheries Management Act 2007*.¹⁵

The Barker Inlet has the largest area of mangroves in the Gulf St Vincent, providing crucial nursery areas for a range of commercial and recreational marine fish and crustacean species.¹⁶ Additionally, the variety of coastal habitats provide roosting, sheltering and feeding grounds for a large number of waterbirds and migratory waders.¹⁶

Water Quality Issues

Declining water quality in Gulf St Vincent is due to nutrient rich inputs from stormwater, wastewater and industrial discharges. The Adelaide Coastal Waters Study (2008) found that nutrient loads to Adelaide's coastal waters have increased by a factor of 30 to 50 times post European settlement.¹⁷

ENVIRONMENTAL CONSIDERATIONS

Ecosystem Services and Blue Carbon Opportunities

Ecosystem services are the many, varied benefits provided to humans by healthy ecosystems. Globally, the ecosystem services provided by mangroves are worth an estimated US\$1.6 billion, annually.⁴

Blue carbon is one such example, and the Dry Creek Saltfields could provide a critical pilot site for the advancement of blue carbon sequestration in Australia.⁶ Some of the other benefits, including biodiversity, water quality and support for coastal economies, are demonstrated in Figure 1. Plankton produce roughly half of oxygen production on earth and highest concentrations are found in coastal zones of the ocean, including mangroves.¹⁸

Production value from South Australia's marine industries are estimated to be worth \$1.3 billion with 2/3rds of all fish consumed worldwide dependent on healthy coastal wetlands and blue carbon ecosystems.^{4,9}



Figure 1. Infographic by Rene Campbell. Blue carbon ecosystems sequester carbon and provide other co-benefits such as biodiversity, water quality, shoreline protection and support coastal economies and livelihoods. From the Blue Carbon Strategy for South Australia.



LAND USE

The Dry Creek Salt Fields are an area of evaporation ponds stretching 35km along the Gulf St Vincent coastline, from Dry Creek in the south to Middle Beach in the north, 12 km North West of Adelaide.¹⁰

They were primarily used to provide brine for the commercial production of soda ash, until salt extraction ceased in 2013, and the salt fields were subsequently acquired by Buckland Dry Creek Pty Ltd (BDC), taking on the mining lease for the site.¹⁰

BDC hold a licence for chemical storage and warehousing facilities, chemical works (salt production) and discharges to marine or inland waters under the *Environment Protection Act 1993*.¹⁹

The mineral leases cover approximately 10,000 hectares with 4,000 of these being developed as salt ponds.³ The ponds are being decommissioned through the requirements identified under the *State Mining Act*.¹⁶ The remaining land is a patchwork of remarkably intact artificial and natural wetlands, due to limited access to the site over the past 80 years.



LAND USE

Substantial areas of land at the salt field are also owned by the South Australian Government. The Minister for Environment, Water and Natural Resources owns the St Kilda Mangrove Trail, the marina and the areas of salt evaporation pans. The entire trail is under *Native Title Act* 1993. SA Water Corp own land involving the Bolivar waste water treatment plant and surrounds.

Figure 2. (page 51) shows a map of St Kilda Mangroves and relevant surrounding areas.

This region is primarily regulated under the *Mining Act 1971*, as well as other key state and Commonwealth environment law (Department for Energy and Mining);²¹ Other agencies integral to site management include:

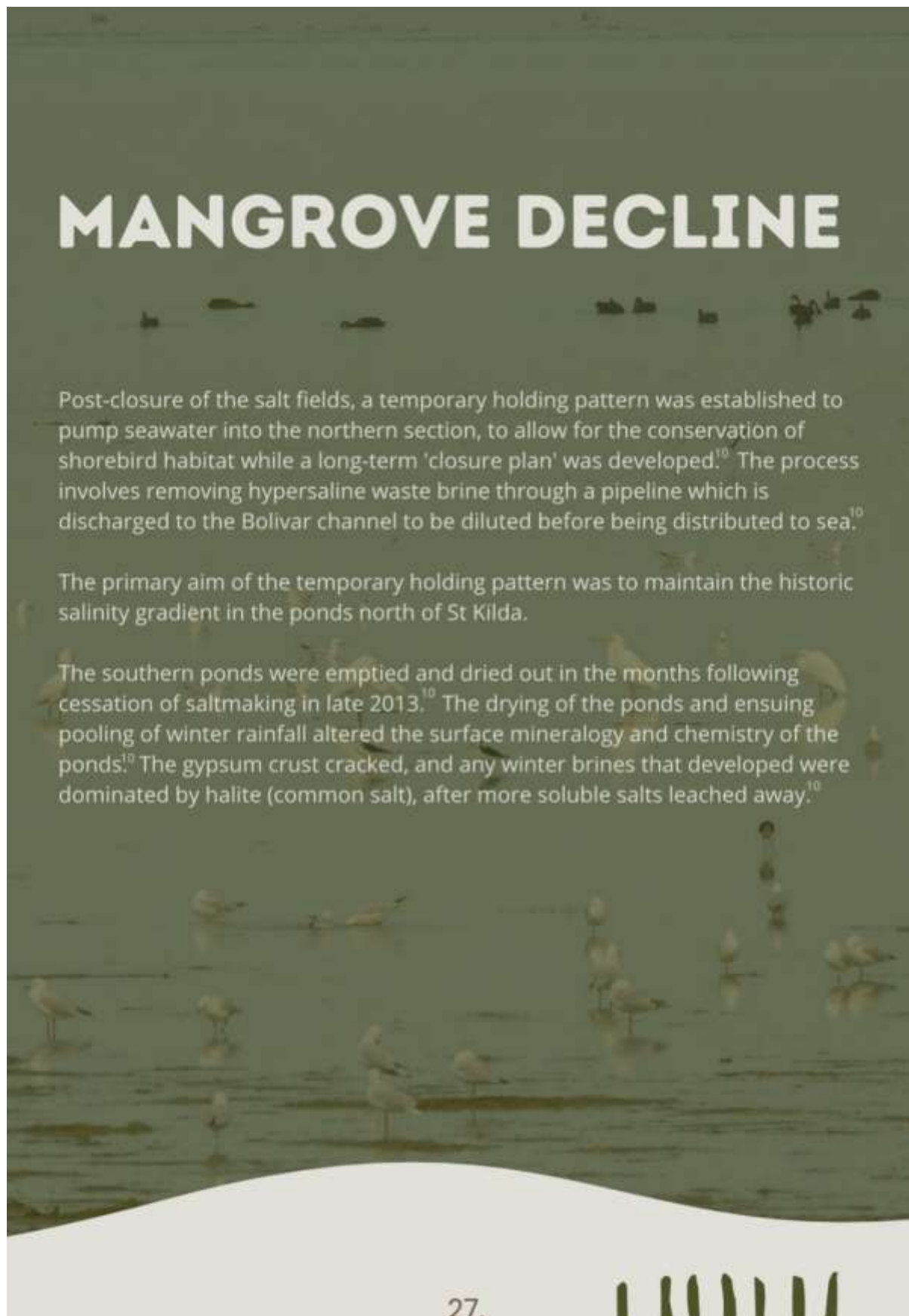
- The Environment Protection Authority, responsible for regulating salt fields under the *Environment Protection Act 1993*.
- The Department for Environment and Water, responsible for the *Native Vegetation Act 1991* and management of the Adelaide Dolphin Sanctuary and the Adelaide International Bird Sanctuary National Park – *Winaityinaityi Pangkara*.
- The Commonwealth Department of Agriculture, Water and the Environment, responsible for regulating the site as one of National Environmental Significance under the *Environment Protection and Biodiversity Conservation Act 1999*.





Shorebirds at sunset. Photo by Perl Coleman.

26





Shorebirds. Photo by Peri Coleman.

MANGROVE DECLINE



Due to seasonal fluctuations and declining availability of water from SA Water due to the Northern Irrigation Scheme, decreased levels of wastewater have been available to dilute the brine in the Bolivar Channel and subsequently, lower volumes of brine have been discharged.¹⁰

According to data from the EPA and the miner's compliance report (DEM), the holding pattern has not maintained a "steady state" salinity gradient and individual ponds have been highly variable, in comparison to their salt production operation levels.¹⁰

In late 2019 and during 2020, brine was discharged into the dried ponds adjacent to the St Kilda mangroves, to prevent build up of water in other areas.¹⁰ Lack of control of the salinity gradients in the northern ponds, and the discharge of brine to the mangroves and saltmarshes from the cracked ponds potentially breached the *EPBC Act*.²²


29.

MANGROVE DECLINE

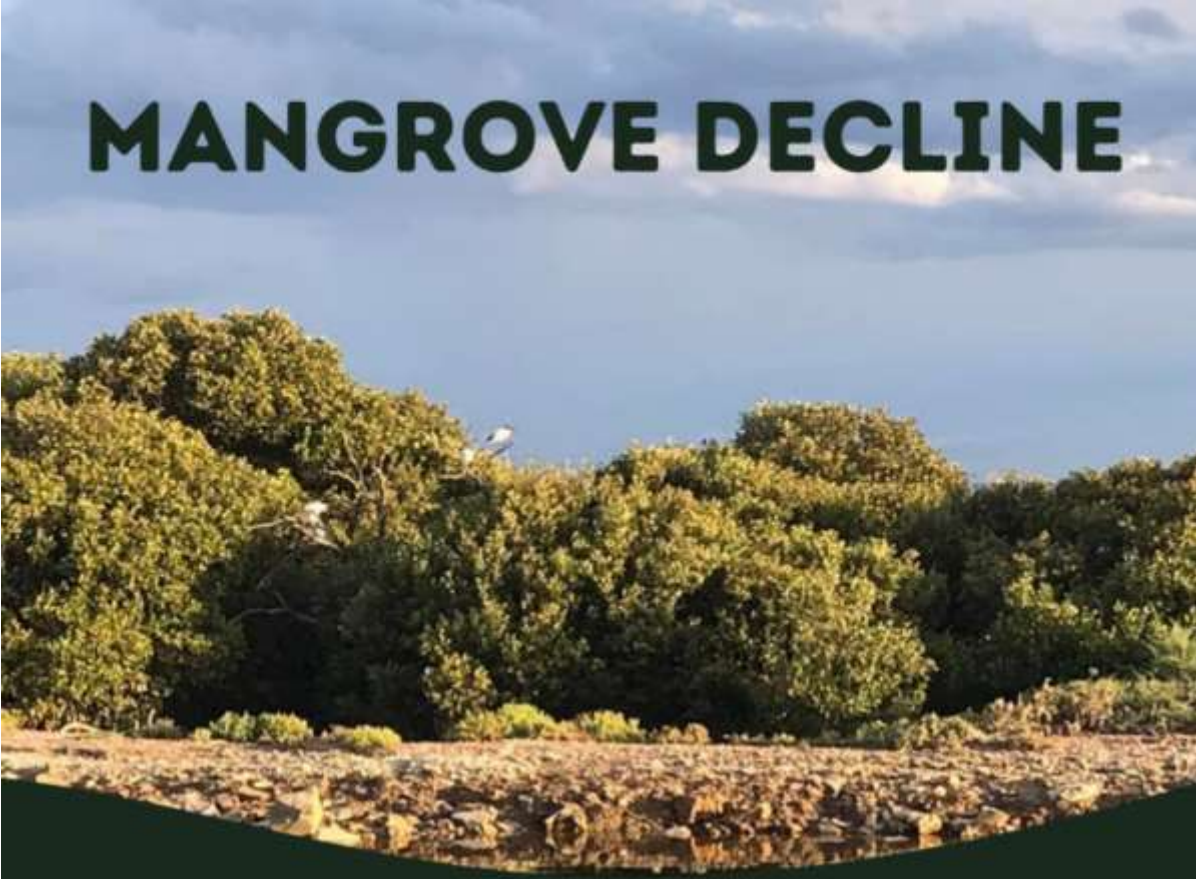
In September 2020, over 24 hectares of vegetation death were reported, including 9 hectares of mangrove, 10 hectares of saltmarsh and nearly 5 hectares of bare, sparsely vegetated or aquatic ecosystems.²³ Death of individual plants that are up to 200 years old occurred.²⁴

A much greater area of vegetation stress was identified.²⁵ Extremely hypersaline conditions were observed in surface water and transects affected by vegetation death.¹⁰

It is likely that other ecosystem impacts occurred, such as stress or acute toxicity to benthic invertebrates and fish assemblages and changes in sediment or soil characteristics, however there is no ecosystem data available to quantitatively assess these impacts.¹⁰



30.



MANGROVE DECLINE

Conceptual modelling from researchers at the University of Adelaide indicates that death and damage of the mangroves was due to leakage of extremely hypersaline water from the Section 2 ponds when they were refilled in December 2019 to October 2020.¹⁰

The modelling indicates that persistence of brine in the ponds is leading to repeated crystallisation in summer months and leakage during the wet, winter months, with potential for continued impacts on the mangrove and saltmarsh ecosystems.²² Intermittent wetting and drying phases also increases the likelihood of other chemicals leaching into the environment.²²

For more info, see the [conceptual model of the 2020 contamination](#) by the University of Adelaide.

31.



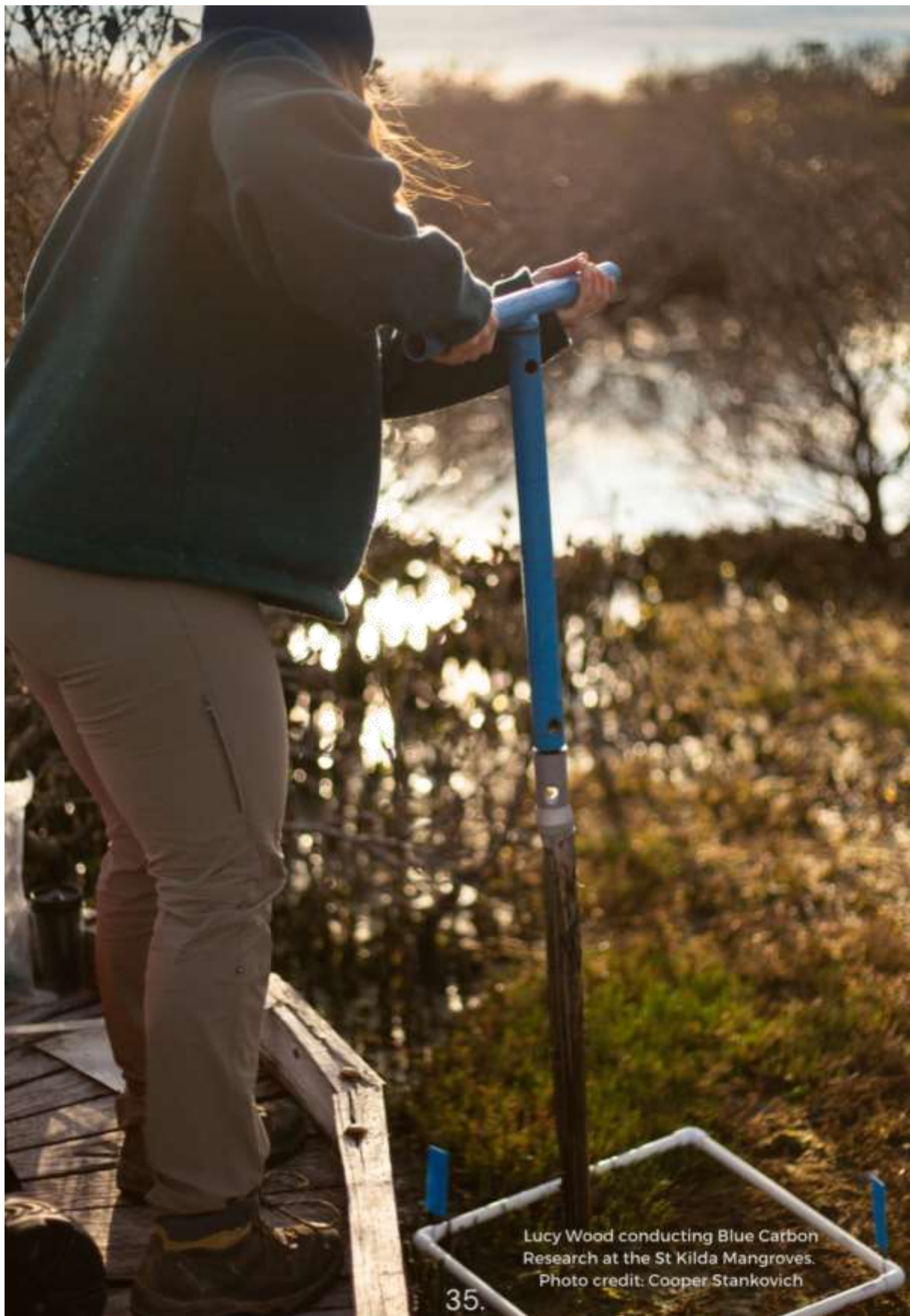
Photo by Peter Hall

32.





Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan



Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan

PRINCIPLES.



Principle 1: 'Do no harm' and ensure the safe closure of the salt fields.

1. Engage with the South Australian government to enact a safe closure plan.





Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan

Natural tidal flows re-established at Dry Creek Salt Field by construction of a new culvert.

PRINCIPLES.

Principle 2: Establish long-term environmental stability of the mangrove and wider ecosystem.

2.1. Develop a restoration plan for the impacted tidal wetlands (mangroves, saltmarshes, estuaries).

2.2. Support the restoration of degraded ecosystems through tidal restoration strategies to transition the land back to a natural saltmarsh mangrove ecosystem and a sanctuary for wildlife.

Dittmann et al. provide a proof of concept and pathway for projects introducing tidal flow in their report 'From salt to C; carbon sequestration through ecological restoration at the Dry Creek Salt Field' (2019).

Their tidal reconnection trial successfully demonstrated that opening a salt pond to tidal flow through removal of barriers such as bunds or seawalls, can result in the restoration of coastal wetlands[i]. After just 1.5 years, the reconnected pond demonstrated revegetated saltmarsh and an increase in soil organic carbon content[ii].

A predicted net project benefit of 286 007 tonnes of CO₂e could be sequestered in three decades, with the restoration of 1963ha of wetland area[iii]. For comparison, an economy class flight direct from Adelaide to Melbourne is the equivalent of 0.18 t CO₂e (Carbon Footprint 2023).

Such restoration will also benefit ecosystem services, such as social and cultural values[iv].

The conservation outcomes of implementing these strategies are outlined in Table 1.



PRINCIPLES.

Principle 2: Establish long-term environmental stability of the mangrove and wider ecosystem cont...

2.3. Reconstruct the environment and provide ongoing support to the highly diverse and crucial ecosystems that persist here.

2.4. Conserve shore and migratory birds and their habitat through ongoing monitoring, restoration and protected areas.

2.5. Enact other appropriate measures such as management of vegetation and perseverance of some managed ponds to support bird life.







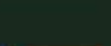


2.6. Conserve crucial ecosystems such as coastal mallee and fish breeding grounds.

Photo credit: Delta Environmental Consulting



CONSERVATION OUTCOMES

TABLE 1. Conservation outcomes and green carbon opportunities for the St Kilda mangroves and wilder saltfields.

Conservation Issue	Business as usual	Implementing the community vision
Blue carbon sequestration across the restored saltfield and adjacent habitats		
Diverse habitats to support coastal birds		
Habitat for shorebirds		
Connectivity for diadromous fish		
Support diverse estuarine vegetation communities		
Possible growth of <i>Tecticornia arbuscula</i> , Shrubby Samphire		
Retreat capacity for saltmarsh and mangrove habitats		
Improved sedimentation providing sea level rise (SLR) mitigation for mangroves and saltmarshes in reconnected downstream deltas		
Local flood mitigation for neighbouring farmlands		
Green economy opportunities		

PRINCIPLES.

Principle 3: Establish and support ongoing research and monitoring alongside restoration.

- 3.1. Explore the potential for shellfish aiding the restoration of the wetland ecosystems.
- 3.2. Develop an ecological monitoring program for indicator species, such as shorebirds, invertebrates and fish.
- 3.3. Implement an integrated monitoring program to assess the response of the saltmarsh and mangrove ecosystem, both affected and unaffected areas of the intertidal zone.
- 3.4. On ground monitoring of vegetation transects and soil pore waters to determine quantitative assessment of recovery trends.
- 3.5. Establish Sediment Elevation Tables (SETs) in the deltas of reconnected rivers and creeks as well as in restored salt ponds, to determine sedimentation rates. This is to measure how quickly sediments from reconnected catchments are accumulating. This will assist in predicting habitat change, and also provides an estimation of carbon sequestration (Flyaway nomination support).







PRINCIPLES.

Principle 4: Promote community involvement in the mangroves through restoration and education opportunities.

4.1 Engage with Kurna community on the development of community outreach and education opportunities, including groups such as the Aboriginal Access Centre (TAFE SA), allowing opportunities for learning on site. Provide opportunities for Aboriginal-owned businesses to utilise the Saltfields area.

4.2. Engage local community in monitoring and citizen science programs.

4.3. Continue to engage community groups and non-government organisations in the conservation, education and tourism of the Adelaide International Bird Sanctuary (AIBS).

4.4. Involve the local community in opportunities such as development of the mangrove boardwalk interpretive centre, future blue carbon opportunities and a groundwater monitoring program.

4.5. Provide opportunities for collaboration with local schools, universities etc. such as through the mangrove boardwalk interpretive centre and blue carbon initiatives.

4.6. Establish and maintain a transparent relationship between Buckland Dry Creek, the Department of Energy and Mining and the public.

Consult with local community, relevant non-government organisations, the St Kilda Mangroves Alliance, the Department of Energy and Mining and Buckland Dry Creek (BDC) about the status and progress of mangrove restoration projects.

44.



Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan

PRINCIPLES.

Principle 5: Support the St Kilda township to become a hub for the sanctuary, while preserving local heritage.

5.1. Create inclusive signage and landscaping that integrates the St Kilda township with the wider mangrove sanctuary, acting as a gateway to this unique landscape.

5.2. Restore the Mangrove Trail, in consultation with the Kaurna community, enhancing its functionality by making a southern entrance to the Adelaide International Bird Sanctuary (AIBS) and considering feasibility of connectivity with other paths.

5.3. Attract new visitors to the region through tourism, highlighting the uniqueness of the region.

Photo credit: Experiencing Marine Sanctuaries





Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan



Dr Alice Jones conducting Blue Carbon Research.
Photo Credit: Sophie Russell

PRINCIPLES.

Principle 6: Support Blue Carbon Opportunities in South Australia.

6.1. Support the Blue Carbon Strategy for South Australia (2020-2025) through mangrove restoration (outlined above) and blue carbon education opportunities.

6.2. Support the creation of a 'Blue Carbon Education Centre' at the St Kilda Mangrove Trail with financing from blue carbon investors. The education centre will support ongoing Blue Carbon research.

6.3. Implement a financially viable blue carbon pilot project at Dry Creek, partnering with private sector to demonstrate the feasibility, cost and benefits.

6.4. Create the 'Blue Carbon Education Centre' through financing strategies discussed above. Incorporate other relevant education opportunities into the centre, such as focus on migratory birds.



Principle 6: Support Blue Carbon Opportunities in South Australia.

The research outlined in Principle 3 provides strong support for the Blue Carbon Strategy for South Australia (2020-2025), progressing the state's reputation as an emerging leader in the blue carbon sphere. This strategy outlines how projects will be financed through blue carbon credits, developed under the Australian Government's Emissions Reduction Fund (2014). This fund provides financial incentives for Australian businesses and natural resource managers to embrace new technologies to decrease greenhouse gas emissions.

Partnerships between Australian, State and Territory Governments and stakeholders in the scientific and business communities are encouraged to realise such opportunities. Other financing models, such as green bonds (and more recently, blue bonds), payment for ecosystem services and innovative private-public partnerships should be assessed and trialled for blue carbon projects in South Australia.

The State Policy for coastal environments includes a policy to "recognise and protect the high carbon storage values of areas such as mangroves and saltmarshes" (Policy 13.9). The protection of blue carbon ecosystems and carbon stocks at the landscape level, and blue carbon sequestration potential of particular locations, can be incorporated into land-use planning processes and instruments, such as the State Planning and Design Codes (Blue Carbon Strategy for South Australia).

For example, a voluntary blue carbon offset, alongside the biodiversity offset requirement, for projects involving the loss of blue carbon under coastal and marine vegetation clearance approvals (Blue Carbon Strategy for South Australia 2019).

Additional information on financing blue carbon projects can be found in 'Blue Infrastructure Finance: A new approach, integrating Nature-based Solutions for coastal resilience' (Thiele et al. 2020).



Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan

PRINCIPLES.



Principle 7: Support the development of relevant industries including:

7.1. Develop eco-tourism opportunities and access to parts of the remediated site, so that domestic and international ecotourists can observe the birds of *Winaityinaityi Pangkara* and the restoration of coastal habitat, or kayak and snorkel the mangrove creeks.

7.2. Restoration of saltmarshes and mangroves will support the local fishery industry and lead to increased employment opportunities.

7.3. Provide a sea level rise buffer for adjacent housing developments.

Photo credit: Friends of Adelaide International Bird Sanctuary





Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan



ZONE 1: MIDDLE BEACH PONDS

Key Values: These ponds may be ideal to manage via tidal reconnection. Little is known about the surviving biota of the ponds.

Possibilities: After appropriate investigations to determine the conservation values of any remaining aquatic species in the coastal ponds and their elevation, these ponds could be reconnected to Salt and Second Creeks to allow the tides back in. Providing pedestrian and bicycle access through the zone with a footbridge across Salt Creek would allow swimming and fishing to continue in the historic pumping basin.

Middle Beach Ponds -
Middle Beach to Port
Gawler.

● **ZONE 1**



ZONE 2: BUCKLAND PARK PRECINCT

Key values: Freshwater lake and marshes, Shrubby Samphire (*Tecticornia arbuscula*) habitat, chenier dune vegetation, whale skeleton, camp sites, university research, history regarding duck hunting and intentional release of foxes, rabbits and deer for hunting.

Possibilities: Reconnecting the Gawler River to its delta, by removing the embankments of the salt ponds and those of the artificial Buckland Park Lake would provide mangroves and saltmarshes of the delta with the sediment supply they need to keep pace with sea level rise and facilitate the survival of the Shrubby Samphire and the Samphire Thornbill. Management of the invasive *Casuarina glauca* trees in the lake area and provision of some low intensity camping or picnic sites would allow people to explore the varied habitats of this zone, with appropriate interpretive material provided. There are opportunities to connect watercourses that have been stranded historically by the Port Gawler Road, by careful placement of culverts. The ponds south of Chapmans Creek could be breached to allow tidal inundation and there are opportunities to use the artesian T3 bore water as an additional water source in these areas, to supply extra wader habitat.

A man-made lake in estuary of the Gawler River (Metta Watte), separating the river from its delta (Chapman, Lindsay and Port Gawler creeks)

● **ZONE 2**



ZONE 3: BIRDWATCHER POND ZONE AND ADJACENT HABITATS

Key values: Saltmarsh restoration trial, Garland Lily paddock, Yellowish Sedge-skipper habitat and Fan Samphire, *Tecticornia flabelliformis*.

Possibilities: : Reconnecting the estuary of Thompsons Creek through the salt ponds, especially if some of the freehold land could be purchased to allow the connection to proceed even further upstream, would be a significant environmental gain. Some preliminary work has been undertaken on this possibility by Green Adelaide in the past. This area includes the University of Adelaide's Trial Pond, where Pumping Creek was reconnected to Pond XB8A. Based on the results of that trial all the ponds on Crown Land could be reconnected to the tides, with confidence in developing low risk, low cost solutions. Maintaining an operational track through this network of ponds would allow ongoing restoration works as well as providing pedestrian and bicycle access, along with limited vehicle access to points such as the restored Pond XB8A, where people could see the progress of the restoration. Purchasing some freehold land could be a win for biodiversity, and could allow the coastal grassland "garland lily paddock" and the *Gahnia filum* sedgeland that could support Yellowish Sedge-skipper butterflies to be managed along with the restored ponds.

Traditionally the most valuable ponds for birdwatching while the fields were operational. Location: Sewage discharge to just north of St Kilda.

● ● ZONE 3



ZONE 4: NORTHERN GYPSUM PONDS

Within the saltfield, the most southerly stand of Vulnerable Fan Samphire occurs in the floodway north of St Kilda. The floodway contains remnant cheniers with seabox groves, and is accessible from the northern section of this zone.

These ponds have been mostly maintained under brine and so they leak less than the ponds south of St Kilda, but managing the layers of gypsum and monosulfidic black ooze during closure will require care.

Possibilities: : Initially, keeping these ponds flooded with low salinity water, either pumped seawater or treated sewage or stormwater, could provide value to waterbirds, while small scale trials are undertaken to determine how best to restore these ponds. Maintaining the main access would allow people to view the waterbirds, visit the trial pond to the north, and join in revegetation activities.

Northern Gypsum Ponds.

● **ZONE 4**



ZONE 5: LEAKING GYPSUM PONDS

More information on the leaking of the gypsum ponds can be found under 'Mangrove Decline' on page 24 and 25. The stressed and dead vegetation boundary is the light transparent white zone (196 ha). The sewage plant is a highly valuable waterfowl site and the little estuaries are beautiful when recovered from the pulse impacts they received from waste brine discharges.

Possibilities: Removal of the salt that was deposited in these ponds is a priority, to prevent ongoing impacts. Use of winter rains or treated sewage to dissolve the salt for removal via pumping could reduce the load of salt considerably. Once the ponds are stable they could be capped, starting from the seaward side, possibly using some of the alkali wastes stockpiled in the past in locations including Osborne, Gillman, Dry Creek and Brooks Road. After light topsoiling the areas could be direct seeded with a coastal herb and shrub mix. Some ponds have been used for 'polishing' wastewater from Bolivar in the past and provided good waterbird habitat. This may be possible again. Maintaining a pedestrian and cycle path along these southern ponds would enable the linkage of St Kilda to the Tapa Martinthi Yala bikeway at the Little Para.

Leaking Gypsum Ponds.

● **ZONE 5**



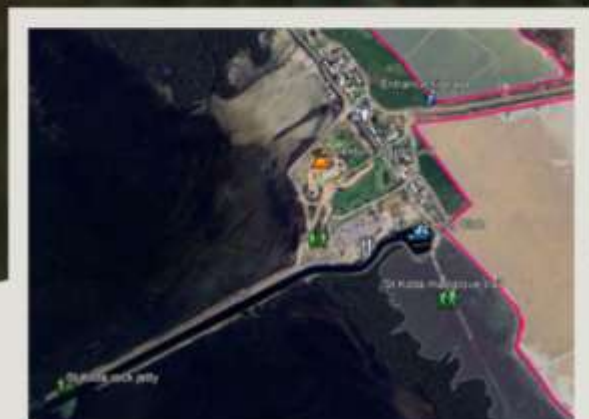
ZONE 6: ST KILDA TOWNSHIP

Possibilities: : The St Kilda Mangrove Trail building is an architecturally designed building, with extensive scientific and conservation heritage, as well as facilities like flow-through tanks. It could be redeveloped to make an ideal Blue Carbon research, historic and ecological interpretative centre.

In the short-medium term, the seaward boardwalk portion of the Mangrove Trail is reaching the end of its life with more maintenance required as sea level rise impacts are increasing. Decommissioning the seaward extent and reinstating the embankment trail could be an economical and sustainable solution. There is also potential for kayaking trips along the creeklines.

In the longer term the boardwalk could be rerouted to cross a short distance of saltmarsh from the boardwalk embankment to the salt ponds embankment, where it could join with the pedestrian and cycle path mentioned in Zone 5, to return to St Kilda. There are opportunities to use the southern St Kilda breakwater for birdwatching. The replacement of dead trees through the township should be undertaken - the community feels the loss of aesthetic values keenly.

The use of interpretive signage to explain the restoration efforts, industrial heritage and biodiversity value of the township should create a "Gateway to the Bird Sanctuary" feel.



● ZONE 6

ZONE 7: CRYSTALLISER AND FINAL AREAS

Key Values: These lands, south of the expressway, are freehold, owned by both private and government development corporations. The lands north of the expressway were designated as 'offset' wetlands for the development of the Expressway.

Possibilities: While the area south of the expressway is subject to the plans of the owner/developer, it is the responsibility of State and local governments, and the developer, to ensure that the interests of households and the wider South Australian community are protected should development proceed.

The 'offset' wetlands to the north are old salt ponds that have not, in the main, been developed as 'wetlands' to any standard at all. Where there have

been penstock gates placed in the old seawall these allow excess stormwater from the road to discharge into truncated tidal creeks where the rapid flow disturbs anaerobic sediments. There is significant opportunity to undertake restoration of these abandoned salt ponds that will reconnect them to the mangroves of Barker Inlet.

Crystalliser and final areas.



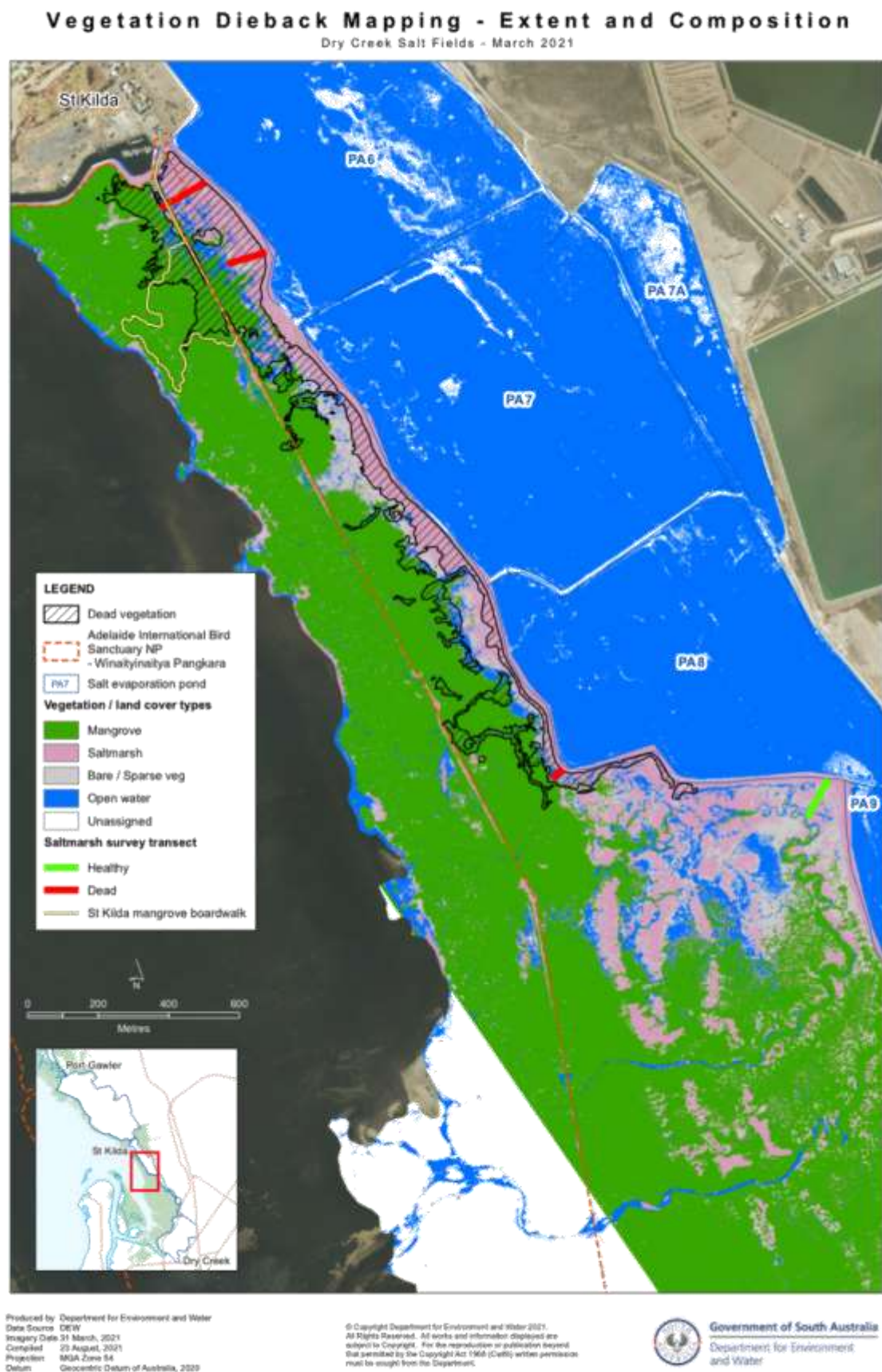
● **ZONE 7**

REFERENCES

- 1 Chesher, J 2007, A Patron's Walking Life, The Friends of the Heyson Trail, viewed 18 May 2023, <<https://heysentrail.asn.au/trailwalker/article/warren-bonnython-a-patrons-walking-life/>>.
- 2 St Kilda History n.d., Discover Salisbury, City of Salisbury, viewed 1 March 2023, <<https://discoverosalisbury.com.au/attractions/st-kilda/>>.
- 3 Coleman, P 2013, 'Risk and opportunities: A briefing paper on coastal habitat and shorebird conservation in the light of potential closure of the Ridley Dry Creek salt fields', AMLR NRM Board.
- 4 Blue Carbon Strategy for South Australia 2019, Government of South Australia.
- 5 National Centre for Coasts and Climate & Earth Systems and Climate Change Hub n.d., Eco-engineering and restoration of coastal habitats in Australia.
- 6 Dittman, S, Mosley, L, Beaumont, K, Clarke, B, Bestland, E, Guan, H, Sandhu, H, Clanahan, M, Baring, R, Quinn, J, Seaman, R, Sutton, P, Min Thomson, S, Costanza, R, Shepherd, G, Whalen, M, Stangoulis, J, Marschner, P & Townsend, M 2019, 'From salt to C: carbon sequestration through ecological restoration at the Dry Creek Salt Field', Goyder Institute for Water Research Technical Report Series, no. 19/28.
- 7 Nyanga, C 2020, 'The Role of Mangroves Forests in Decarbonizing the Atmosphere', Carbon-Based Material for Environmental Protection and Remediation.
- 8 Clarke, B, Thet, AK, Sandhu, H & Dittmann, S 2021, 'Integrating Cultural Ecosystem Services valuation into coastal wetlands restoration: A case study from South Australia', Environmental Science & Policy, vol. 116, pp. 220-229.
- 9 Coastal wetlands - Mangroves and saltmarshes - DCCEW 2016, Department of Climate Change, Energy, the Environment and Water.
- 10 Leyden E, Thomas B & Mosley LM 2022, St Kilda mangrove and saltmarsh hypersaline brine contamination 2020. Report Prepared for the Department for Environment and Water, by The University of Adelaide, November 2022.
- 11 Adelaide International Bird Sanctuary National Park - Winaltynalty, Pangkara - Management Plan 2020, Government of South Australia.
- 12 The Estuary - Estuary Care Foundation SA 2018, Estuary Care Foundation, viewed 26 April 2023, <<https://www.estuary.org.au/the-estuary/#history>>.
- 13 Edyvane, KS & Francis, J 1995, *Where forests meet the sea - mangroves in South Australia*, South Australian Research And Development Institute, Australia.
- 14 Saltfields: Creating the Adelaide International Bird Sanctuary 2013, Government of South Australia.
- 15 Coleman, P, Coleman, F & Fotheringham, D 2017, 'Thornbills, Samphires and Saltmarsh tipping points', Natural Resources Adelaide & Mt Lofty Ranges.
- 16 St Kilda Precinct Plan Stage 2 - Marine Recreation Precinct and Mangroves 2013, <https://www.salisbury.sa.gov.au/development/council-projects/major-projects/st-kilda-masterplan-stage-2-marine-recreation-precinct-and-mangroves>, City of Salisbury.
- 17 Environment Protection Authority 2008, Adelaide Coastal Waters Study Overview A summary of the study, outcomes and recommendations, February, Environment Protection Authority.
- 18 Worrell, N 2022, Every (Other) Breath You Take, School of Marine and Environmental Affairs, viewed 26 April 2023, <<https://smea.uw.edu/currents/every-other-breath-you-take/>>.
- 19 Dry Creek saltfields | EPA 2022, www.epa.sa.gov.au.
- 20 Mosley, L, Thomas, B, Fitzpatrick, R & Quinn, J 2019, Pathways to tidal restoration of the Dry Creek salt field, The University of Adelaide.
- 21 Government of South Australia Department for Environment and Water n.d., Department for Environment and Water - St Kilda mangroves, Department for Environment and Water.
- 22 Save St Kilda Mangroves 2021, www.savestildamangroves.com, viewed 1 February 2023, <<https://www.savestildamangroves.com/>>.
- 23 DEW 2021, Dry Creek salt fields vegetation impact mapping Summary report, Government of South Australian Department for Environment & Water.
- 24 — n.d., St Kilda Wetlands Restoration Workshop Report, Government of South Australia Department for Environment and Water.
- 25 Dittmann, S, Mosley, L, Stangoulis, J, Nguyen, VL, Beaumont, K, Dang, T, Guan, H, Gutierrez-Jurado, K, Lam-Gordillo, O & McGrath, A 2022, 'Effects of Extreme Salinity Stress on a Temperate Mangrove Ecosystem', *Frontiers in Forests and Global Change*, vol. 5.



Item ESATS4 - Attachment 1 - St Kilda Mangroves Community Vision and Strategic Plan



North Western Sustainable Precincts Plan



Executive Summary

The land west of Port Wakefield Road provides the last opportunity in the Adelaide metropolitan area to deliver a world-class, integrated ecologically important precincts, urban development and eco-industrial precinct underpinned by sustainability principles. Measuring some 50 square kilometres, this area has the potential to accommodate more than 20,000 new dwellings, see an eco-industrial development establish adjacent to key transport corridors, significant stormwater cleansing and harvesting opportunities, reimagining the role of the Bolivar Wastewater Treatment Plant and the chance to further develop the cultural/ indigenous links throughout the area, and enhance environmental health and biodiversity along the coast, including the Adelaide Dolphin Sanctuary in Barker Inlet, Adelaide International Bird Sanctuary, mangroves/saltmarsh areas and in relation to the natural stream outfalls of Dry Creek and Little Para.

Prior to the re-filling of the salt ponds at St Kilda in the latter half of 2020, the City of Salisbury had commenced the process of structure planning this precinct to ensure that development of the area does not compromise its environmental performance.

Specifically, the North Western Sustainable Precincts Plan will seek to:

- Ensure the coastal environment, including the international importance of the Adelaide International Bird Sanctuary, and the Barker Inlet Adelaide Dolphin Sanctuary is preserved and through this focus, develop infrastructure such as a Sustainability Centre for Excellence including an educational precinct to enable an experiential based curriculum for universities, schools, tourists and the general community, integrating environmental and indigenous elements, recreation and eco-tourism opportunities;
- Capitalise on the government's recent investment into the Northern Connector by rezoning land around the Waterloo Corner Interchange to support freight and eco-industrial activity;
- Increase land availability for job generating investment, capitalising on the momentum in demand for industrial land in North, The Vicinity, Direk and Edinburgh Parks;
- Facilitate the orderly development of the Dry Creek Saltfields to ensure residential development on both government and privately-held land considers and complements the environmental sensitivity of the surrounding area;
- Further develop the lower reaches of the Little Para River and Dry Creek to create additional habitat and address upstream stormwater management issues; and
- Develop economic opportunities around the Bolivar Wastewater Treatment Plant.
- Develop recreational access to the Coastal Corridor for the purposes of connection to nature and the unique habitat and environments found within this corridor.
- Grow and develop connections to deliver ongoing engagement and education for and by Kaurna Nation within the bounds of the City, as well as increase awareness of the value and significance of the natural systems and habitats of the Coastal corridor.
- Foster a healthy coastal environment through provision of retreat zones, retention and regeneration of habitats, and consideration of biodiversity corridors, links and buffers;
- Develop additional wetlands as well as redirect and enhance the drainage pathway from Greater Edinburgh Parks to provide fresh water for rehabilitation of salt ponds around St Kilda.
- Preserving the existing character of St Kilda township and its current status under the PDI Act as a "Rural Shack Settlement Zone".
- That St Kilda is positioned and developed as a place for environmental, cultural and recreational/tourist activities, incorporating the opportunity for boating and fishing activities, supported by infrastructure development which enables access for all.

Overarching the City of Salisbury's North Western Sustainable Precincts Plan are four themes – environmental sustainability, social sustainability, economic sustainability and sustainable governance – to maintain and enhance this section of our City and the state's coast for a sustainable future.

Draft Delivery Program

The following is Council's perspective for a realistic draft delivery program for the activation and rehabilitation of the Precinct.

Timeframe	Works Program
Within 12 months	Delivery of the reinstatement and upgrade of the existing mangrove boardwalk as a complete loop.
	Maintenance management for the stabilisation of the break water, channel (including seaweed management) and current upgrade of existing boating ramp and mooring facilities.
	Seek a code amendment under the PDI Act for the zoning of appropriate land uses west of Port Wakefield Road to include the establishment of the eco-industrial precinct.
	Establish a governance/partnership framework for the ongoing conservation and management of the environmentally sensitive areas
	Development of rehabilitation plan for the mangroves and adjacent bio-scape.
	Development of rehabilitation plan for Dry Creek, Little Para and Helps Road waterways.
	Planning and concept design for the delivery of:
	<ul style="list-style-type: none"> • New purpose built Sustainability Centre of Excellence to be delivered in year 2 • Linkage between Greenfields Wetland Watershed Development and St Kilda Precinct • Shared use paths • Walking trails • Mangrove tails • Employment / skill development programs for indigenous community • Development of educational and research programs through universities and schools
12 – 24 months	Continued maintenance protection and stabilisation of the break water, channel (including seaweed management), boating ramp and mooring facilities.
	Implementation of rehabilitation plan for the mangroves and adjacent bio-scape.
	Implementation of rehabilitation plan for Dry Creek, Little Para and Helps Road waterways.
	Implementation of works relating to:
	<ul style="list-style-type: none"> • New purpose built Sustainability Centre of Excellence • Linkage between Greenfields Wetland Watershed Development and St Kilda Precinct • Shared use paths • Walking trails • Mangrove tails • Delivery of educational, research and employment programs
2 – 10 years	Tourism development of St Kilda Precinct as a fishing precinct and an accessible location for environmental, cultural and recreational/tourist activities
	Continued rehabilitation for the mangroves and adjacent bio-scape.
	Continued rehabilitation for Dry Creek, Little Para and Helps Road waterways.
	Continued tourism development of St Kilda Precinct as a fishing precinct and an accessible location for environmental, cultural and recreational/tourist activities.

Background

The City of Salisbury has long been aware of the huge potential of the coastal corridor along its western boundary and has been working to develop plans for the activation of this area. In 2016 the City of Salisbury and the Department for Environment and Water held a workshop to investigate opportunities in the coastal corridor western edge of the City. That workshop considered economic, tourism and biodiversity/sustainability themes. The City of Salisbury North Western Sustainable Precincts Plan is the next step in the conversation, working on and expanding the ideas discussed previously.

The possibilities for this unique area of Adelaide to deliver sustainable outcomes for the following streams of environment, social, the economy and in governance, for the City of Salisbury and the broader population of Adelaide and beyond, have yet to be realised.

Current circumstances are conducive to change in this area of South Australia in order to position it well for a sustainable future.

The City of Salisbury has a proven track record of leading the way in environmental sustainability. Stormwater and runoff from urban development has been considered a resource and a valued element of the environment and as such, the construction of wetlands has become a developmental philosophy for the City. The wetlands provide amenity, recreational opportunities, retention and creation of habitats and biodiversity and improved water quality for water discharged into the Barker Inlet. In addition to the integration of wetlands into the City, stormwater from the wetlands is injected into the aquifer as part of an Aquifer Storage and Recovery (ASR) system which is then used to irrigate open space areas within the council area, offsetting the use of potable water for this purpose. Furthermore, the ASR program has expanded over time and more than 500 external customers now purchase water from the system, including many of the schools throughout Salisbury.

As part of current practice, the City of Salisbury has identified environmental risks associated with the western edge of the City and proposes to address them in a proactive way as part of this North Western Sustainable Precincts Plan. Risks identified along this portion of the South Australian coast include the loss of habitats and species, impacts due to highly saline and possibly acidic groundwater, climate change impacts such as rising sea levels, impacts from poor water quality discharges, access difficulties along the coastal corridor and land ownership, management and zoning.

Further evidence of the need for a plan for this coastal corridor are the residential developments to the north and south of the area. At the southern end of the coastal corridor, a residential development of approximately 10,000 homes is proposed over portions of the salt pans at Dry Creek. This population growth in the south of the coastal corridor will place pressure on the current environment and facilities.

The Riverlea development at Buckland Park will soon be established to the north of the coastal corridor. This development will contain around 12,000 new homes, bringing a significant population to this area. Approximately 10km north from St Kilda, the additional population will place pressure on the current facilities, services and environment of St Kilda and surrounds.

St Kilda is the only coastal township within the City of Salisbury. There are a number of attractions in the area, including the St Kilda adventure park, the boat ramp and marina and the tramway museum. St Kilda is well known in Adelaide for its adventure park, which was upgraded by the City of Salisbury during the 2015/16 financial year. The upgrade included provision of a new toilet block, BBQs and picnic facilities with a total project cost of \$6M, with \$3M of that funded by the State Government.

The City of Salisbury also recognises the importance of the St Kilda boat ramp. As the only metropolitan boat ramp in the northern suburbs of Adelaide, the St Kilda boat ramp is therefore a well-used and busy facility. As such the City of Salisbury, with funding assistance (\$1M) from the State Government, is currently upgrading the boat ramp, including the addition of another lane to increase the capacity of the facility. Significant parking is available adjacent the ramp, as well as toilet facilities and a kiosk.

The AIBS is located along this coastline – its importance & largely unknown to the general public of Adelaide

Synonymous with St Kilda is the Mangrove Trail. A boardwalk loop through the Mangrove Forest on the southern boundary of St Kilda constructed over 30 years ago. Due to the coastal conditions and the impact of storms, sections of the boardwalk have been damaged over time and access has been restricted to a small section of the boardwalk. The City of Salisbury maintains the remaining trail infrastructure with increasing costs and with the cost of rebuilding the trail further increasing over time. At the start of the mangrove trail, an interpretive centre was constructed through the 1980's. For many years the centre was operated by the City of Salisbury, including interactive displays and information stations for visitors to experience and learn about the unique ecosystem of the mangrove forest. The centre currently stands vacant and has not been actively used for a number of years.

Council sees the opportunity in creating a so called Sustainability Centre for Excellence in the St Kilda Precinct and would work with the Federal and State Government and community partners, which could bring the diverse range of interests and authorities together in a way which would create a future state for the ongoing enhancement and broad sustainability of the area. For example, such a centre could provide:

- The Department of Environment and Water, Adelaide Dolphin Sanctuary and Adelaide International Bird Sanctuary, a cultural service point for its rangers and researches (and possibly other State Government employees with an interest in the area, such as EPA); This would oversee the recovery of the Mangrove area and continue to support the education of the community and schools on the importance of the Mangroves, Adelaide Dolphin Sanctuary and Adelaide International Bird Sanctuary;
- Provide facilities for universities and schools to undertake education and research functions;
- Provide interpretive, cultural (Kaurua) and community displays and resources for both educational purposes and engagement with the general public;
- Provide a basic maintenance store and facilities for the immediate area (including the boardwalk);
- Café facilities, in conjunction with local businesses.

Sustainability Themes

Consideration of the work undertaken in 2016 and subsequent conversations, the current circumstances and a vision for a sustainable way forward has resulted in the development of the North Western Sustainable Precincts Plan by the City of Salisbury which aims to deliver on four major themes:

- Environmental Sustainability
- Social Sustainability
- Economic Sustainability
- Sustainable Governance

The elements considered within each of these themes are shown in Figure 1 and discussed in the pages following.

Environmental Sustainability



- Sustainability Centre for local brand to manage
- Adelaide International Bird Sanctuary
- Dolphin Sanctuary
- Barrier Inlet - 32.5 Ha Aquatic Reserve
- Mangrove Forest
- Saltmarsh Wetland zone
- Coastal Escarpment Principles
- Stormwater Catchment Management - providing clean water
- Wetlands
- Healthy dikes/ribs
- Biodiversity protection, linking and enhancement
- Managing Climate Change, including sea level rise
- Ensuring integration for fauna and flora from the Coast to Urban Forests and Biodiversity Corridors

Social Sustainability



- Recreation
- Trails
- Bird watching
- Boating/Fishing
- Kayaking
- Adventure Playground
- Interpretive Environment
- Countryside group
- Indigenous Enterprise
- Greenfield Wetlands
- Interpretive Development
- Adelaide International Bird Sanctuary Reference Group
- The Collective
- Friends of Adelaide International Bird Sanctuary
- Education and Research
- Self guided for primary schools
- Curriculum Development
- Sustainability Centre for Excellence
- Climate adaptation research
- Environmental rehabilitation research

Economic Sustainability



- Jobs
- Civil works and shared use path development
- Ongoing maintenance
- Green/ Eco-Industry Hub
- Eco-tourism
- Indigenous Enterprise
- Investment to access to the Coast for associated industries
- Investment in infrastructure on the back of the construction of the Northern Connector
- Resilient Development
- Circular Economy Industrial Development (NABVMA as Catalyst)
- SA Water & Cos - Recycling

Sustainable Governance



- State and Local Government working together
- Funding
- Sustainability Centre for Excellence—opportunity for Council owned and built, State managed
- Clarity and determination Maroon Trail Oversight
- Interactions with stakeholders
- Community engagement
- Alliance

Environmental Sustainability

The coastline considered in the North Western Sustainable Precincts Plan is an environmentally significant and sensitive area, with connection to the Barker Inlet and Gulf St Vincent. The role of the Barker Inlet and the unique habitats along this interface between the Adelaide Plains and Gulf St Vincent have been recognised by multiple agencies, setting aside portions of the coastline as a Dolphin Sanctuary, a Bird Sanctuary and an Aquatic Reserve.

The ongoing management of these areas will benefit from a united/ coordinated approach that can be achieved through working together and managing them from a common base of the Sustainability Centre for Excellence, located at St Kilda.

Adelaide International Bird Sanctuary

Along this section of Adelaide's coastline, adjacent Gulf St Vincent, is the Adelaide International Bird Sanctuary which spans approximately 60km of coastline (from Port Adelaide Enfield to the south through to Port Parham in the north) and has been called Winaityinaityi Pangkara, which means 'a country for all birds and the country that surrounds these birds' in Kaurna language.

Areas within the Adelaide International Bird Sanctuary are critical feeding and roosting sites for birds that have migrated along the East Asian-Australasian Flyway (EAAF) from as far away as Siberia and Alaska. Threatened species such as Eastern Curlew, Red Knot, Curlew Sandpiper and Ruddy Turnstone are also found within the Sanctuary.

Dolphin Sanctuary

The Adelaide Dolphin Sanctuary is a marine park that is home to approximately 30 bottlenose dolphins, with up to 400 other dolphins visiting the park to nurse calves, feed and play. The Dolphin Sanctuary includes areas of mangrove forest, salt marsh and tidal flats and a portion of the park is also part of the Adelaide International Bird Sanctuary.

Barker Inlet – St Kilda Aquatic Reserve/ Fish Nursery?

The southern portion of this coastal corridor is an aquatic reserve to protect the nursery habitat and breeding grounds of fish within Gulf St Vincent. Low impact activities such as boating, fishing by rod and line or hand reel are allowed however use of nets and other collection methods are not allowed in this area.

Wetlands and Stormwater Management

In line with the ongoing commitment of the City of Salisbury to clean water, particularly through the construction and management of wetlands throughout the City, new wetlands along the corridor contribute to the environmental sustainability of this plan. Restoration work in and around the estuaries of both the Little Para and Dry Creek, which discharge through mangrove forest towards the southern extent of this corridor, will be part of the works undertaken to improve these environments. The monitoring of water quality throughout the catchments that feed into the coastal corridor will also result in increased waterway health and water discharge to the Barker Inlet.

Social Sustainability

Social sustainability approaches to the area have generally sought to develop a range of outcomes that have been closely associated with increasing tourism, community and cultural education, and economic/employment outcomes. Whilst this is still a valid approach, there are current opportunities to enhance the community and cultural engagement approach so that it aligns more closely with the short and long term environmental restoration plans.

Planning approaches that seek to actively engage Aboriginal and broader community involvement and participation – as well as providing educational experiences and linkages to the education sectors (ie. school programs, University research groups/programs) is a key focus. This has potential for increasing environmental management and conservation knowledge within the community, incorporating traditional indigenous land use practices and knowledge.

Increasing opportunities for family participation at the various sites within the project area needs to be part of the planned approach. This involves creating greater connectivity between individual sites and/or interest areas (ie. playground, mangrove rehabilitation site(s), interpretive centre, salt pans, beach, sanctuaries etc), and opportunities for active transport between sites. Programming for regular activation at and between sites needs to be considered to promote the area as a destination for regular visitation and community/family participation. This will create more sustainable opportunities for families and community to participate in a combination of recreational, environmental and educational activities that supports wellbeing while having potential to increase the visitor economy and generate ongoing employment opportunities.

Indigenous Engagement

Building on the success of numerous reconciliation plans and the City of Salisbury Reconciliation Action Plan group, Council has key actions to deliver ongoing engagement and education for and by Kaurna Nation within the bounds of the City, as well as increase awareness of the value and significance of the natural systems and habitats of the Coastal corridor.

The North Western Sustainable Precincts Plan includes opportunities for engagement with Indigenous people and culture, particularly those of Kaurna country. Elements to be embraced within this theme include indigenous enterprise, increased connections with Council's existing Reconciliation Action Plan Group. From a practical point of view, Council has engaged with Tauondi College to deliver various education/ready-for-work programs based in the Greenfields and biodiversity corridors areas.

The trails linking Greenfields, which has the Aboriginal Artwork "Woven Together", and Indigenous Food plantings, is an excellent starting point to link our Community with indigenous culture. The trail to St Kilda and to the associated Little Para (Burial Places & Canoe Trees) & Dry Creek Corridors (Middens), which are deliberately not shown on the map below, providing an incredible opportunity for either indigenous guided or self-guided tours and interpretive signage.

Recreation

This area already includes many opportunities for recreation including walking trails, the St Kilda Boat Ramp, bird watching, fishing, the state significant St Kilda playground and picnic/bbq areas, as well as kayaking within the Barker Inlet and mangrove forests. These valuable recreational activities will be maintained and enhanced as part of the Sustainable Coastal Corridor Plan.

One of the key drivers of the Plan is to create clear links between the Northern Connector cycleway, Gawler Greenway and the City of Salisbury's Green Trails to provide access to the variety of recreational opportunities along the coast, increasing the communities use and appreciation of this area of our state.

The rehabilitation of the existing Mangrove Trail presents as an initial point of infrastructure upgrade.

Economic Sustainability

The development of an eco-industrial area in this corridor, adjacent the existing industry near the Waterloo Corner Road Interchange will provide a space for sustainable industry to the north of Adelaide. The potential for investing in the development of a circular economy, particularly given the City of Salisbury's history and relationship with the Northern Adelaide Waste Management Authority (NAWMA) will provide jobs and opportunities for further development in this area.

A component of the North Western Sustainable Precincts Plan is the generation of jobs and skills training. There will be opportunity for skills training and jobs in the development of destinations and links as well as on-going jobs for the maintenance of established areas (eg shared paths).

In addition, the Northern Connector has provided transport links to this area of the state and opened further possibilities for people to travel to the area for work.

Sustainable Governance

A critical element of a plan to provide a strong, healthy coastal corridor into the future is to ensure there are governance structures and models that support the area. Environmental considerations, stakeholder relationships and processes between the multiple stakeholders within this coastal corridor will need to be clearly outlined particularly with respect to responsibilities to deliver oversight and program implementation.

The Federal, State and Local Government, private sector and community will work together to deliver the plan at multiple levels, including funding. A **Sustainable Centre for Excellence** at St Kilda is proposed to be Council owned and built, and possibly managed by the Council or State Government. The City of Salisbury has previously considered this site and has prepared concept plans in the past. Figure 2 shows a representation of what may be considered for this centre.



Figure 2 Concept of Sustainable Centre for Excellence

A clear governance structure for the mangrove trail and surrounds will be determined as part of this plan. The governance of this must be clarified in order to maintain this most valuable of assets into the future in a sustainable manner.

Governance models will also need to be determined regarding the bird and dolphin sanctuaries and the aquatic reserve and how they interact together within the one coastal environment.

Community engagement, particularly with the St Kilda stakeholders and the Mangrove Alliance, will also require consideration of a governance approach in order to bring parties together with a common goal and clear relationships defined with other interested parties.

North Western Sustainable Precincts Plan - Destinations

The four sustainability themes for the plan could be addressed primarily at nine destinations across this portion of the City of Salisbury. The destinations are marked on Figure 3 which also shows the indicative boundaries of the dolphin and bird sanctuaries.



Figure 3

Destinations within the North Western Sustainable Precincts Plan

1 Greenfields

The area around the Greenfields wetlands is the southern start of the corridor and will be the southern access point to the shared paths network proposed in the plan. The Greenfields Wetlands (over 114 Ha across 3 stages, from Dry Creek to North Arm Creek in the south) is one of Council's major stormwater treatment and harvesting points for the Dry Creek Catchment, providing habitat and refuge for many native fauna and flora for the region.

The area of the Greenfields Wetlands, located near the southern end of the coastal corridor is a significant space for the Kurna people of the Adelaide Plains. A number of middens are known to be located within this area and are valued as part of the City of Salisbury. The significance of the area is demonstrated by the heritage marker 'Together Woven' – a sculptural art piece resembling a flock of birds and making the shape of a boomerang. Incorporated with the site are a performance space, resting areas, accessible paths, a ceremonial platform and a drinking water fountain. In the development of this site Council used the expertise of the local indigenous community to plant native foods, which has the potential to create another aspect to the existing food offerings and indigenous experience.

Greenfields is an excellent first access point as it has all the amenities available to the public, including a well-established café.

2 Dry Creek

The area west of Port Wakefield Road at the southern end of the corridor within the City is the last area in which to intercept and monitor stormwater flows within the Dry Creek system. There is the opportunity with the development of the salt pans to treat stormwater within Wetlands for the benefit of clean water discharge to Barker Inlet and the marine environment of the Barker Inlet – St Kilda Aquatic Reserve.

This location within the coastal zone is critical to retreat zones for Mangroves and Samphire species located on the current coastline with the event of sea level rise, with small populations currently being found seaward of the Northern Connector.

The development of this space for urban form gives opportunity at this point in time to incorporate principles found within the Sustainable Coastal Corridor Plan. These principles if included correctly can benefit both the new urban area as well as the coastal ecosystem, through the development of wetlands and other habitats to cater for and support local flora and fauna. As the area develops, having an increased impermeable area than the current salt pans, the opportunity to incorporate open space areas with water treatment swales and wetlands is seen as the key to ensuring that the development has a limited impact on the local environment and surrounding highly sensitive coastal area, with the estuaries of Dry Creek and Little Para converging just north of this location.

This location is also where public access is available from the eastern side of the Northern Connector, due to the outfalls of Dry Creek and Little Para River. Noting this key intersection of the shared use path of the Northern Connector (Tapa Martinthi Yala) and the City of Salisbury Green Trails there is a great opportunity to further develop the shared use path network on the western side of the Northern Connector to connect Dry Creek to St Kilda along the existing maintenance corridors.

With the development of the Northern Connector, Dry Creek is one of the four connection points north of the Torrens for fauna who migrate from the coast to the hills.

3 *Little Para Estuary and Wetlands*

One of the significant waterways traversing the City of Salisbury is the Little Para. This river flows from the eastern extent of the council area, the escarpment, all the way through to the coast, discharging to the south of St Kilda, slightly north of the Dry Creek estuary. Work here will include provision for saltmarsh retreat, clearing obstructions to flow and restoration of habitat.

The lower reaches of the Little Para River and associated wetlands are a destination for numerous native fauna for roosting and feeding within a freshwater catchment. There is opportunity to further develop this wetland/ stormwater treatment system to provide benefits to the local environment and the Barker Inlet and St Kilda Aquatic Reserve.

4 *Shared Use Path Network/ Connectivity*

It has long been proposed by a variety of entities that a walking/shared path connecting the Dry Creek/Greenfields area with St Kilda, and beyond, along the coast would be a great asset for this area and the State of South Australia. Incorporating shared paths along the existing embankments through the coastal corridor would provide additional recreational opportunities for residents and visitors, provide a link between existing destinations and enable people to experience this unique coastal environment.

Signage would be included along the route of the shared path to inform the community of the Adelaide Dolphin Sanctuary, the International Bird Sanctuary, the estuary environment, biodiversity, indigenous knowledge and other environmental and cultural aspects related to the trail.

Development of a shared path network would also provide links to neighbouring local government areas – City of Playford at the northern boundary and City of Port Adelaide Enfield at the southern end.

5 *St Kilda*

St Kilda stands to be a significant precinct for this section of the City of Salisbury. The existing interpretive centre, which stands vacant and is no longer used, will be replaced with a multipurpose hub for the area which will be a Sustainability Centre for Excellence. Monitoring and care of the Adelaide Dolphin Sanctuary, Adelaide International Bird Sanctuary and Aquatic Reserve will be ongoing by government officers and national parks rangers.

These staff can be accommodated within the hub, working together to preserve the environmentally sensitive areas. In addition to this, the long term regeneration of the mangroves adjacent St Kilda and along the coast, following the recent impacts of changes to the operation of the salt ponds, will require monitoring and be of interest to a range of government agencies and academic institutions. A hub will provide a base for monitoring, observation and research.

Students commonly visit St Kilda and the mangrove trail. In the past, they participated in activities in the interpretive centre however this educational resource as not been available for some time. With increased population in the surrounding area, a hub that includes an educational facility will once again draw school groups to the area. Provision of educational resources in this way will allow students to engage with the coastal environment and learn about the uniqueness of this portion of our coast. There is also the potential to incorporate public amenities in and around the new Centre, with public toilets, picnic areas and a kiosk/café considered as part of the plan.

The mangrove trail is currently in a state of disrepair, with significant portions damaged and inaccessible. Multiple stakeholders and groups have an interest in the mangrove trail and would like to see it restored however the level of coordinated support required to undertake a re-construction project has not been realised to this point. A combination of repair, restoration and replacement may be required in order to achieve a trail through the mangroves which provides an educational, environmental and recreational experience for users.

This element is a critical component of the Coastal Corridor Plan, providing a link between the Sustainability Centre for Excellence and the shared paths network.

The St Kilda boat ramp is the most northerly boat ramp in metropolitan Adelaide and is the focus for recreational sailors/fishermen in northern Adelaide and surrounding regional areas (due to absence of boat launching facilities in the communities north of St Kilda). Despite launching being challenging due to the long and steep manoeuvring lane, the facility is well utilised with over 15,000 boats launched from the three lanes on the boat ramp in 2020. The City of Salisbury is currently upgrading the St Kilda Boat Ramp, with the provision of an additional lane to allow increased movements within the area.

The precinct is also home to the St Kilda Boat Club. The club has indicated it has plans to increase the berthing facilities and undertake further works. This will further reinforce St Kilda as a significant boating asset for the State. Positioning St Kilda as the southern node of the Adelaide International Bird Sanctuary with its potential as a key metropolitan ecotourism destination is likely to increase demand for sea-based activities. Should the urban developments at Buckland Park and the Dry Creek Saltfields progress, there is potential for approximately 32,000 dwellings to be constructed putting further pressure on St Kilda's launch facilities.

6 SA Water

SA Water's Bolivar Wastewater Treatment Plant is located in this region, between the coast and Port Wakefield Road. The majority of the wastewater produced by the metropolitan area of Adelaide is treated at the Bolivar Wastewater Treatment Plant. SA Water already utilises waste products as resources. Wastewater treated to a suitable standard is currently used to irrigate farmland to the north of Adelaide. Biogas is captured to provide power and biosolids are also processed and used by farmers to improve soils and crops. Water that remains at the end of the process and is not recycled is discharged to the Barker Inlet through a channel, north of St Kilda.

SA Water is continuing to research additional reuse opportunities for portions of their treatment process that have not yet been resolved as resources with a pathway. The City of Salisbury will work with SA Water to facilitate the integration of their resources within the broader corridor, particularly in the creation of new sustainable industries.

7 Sustainable Industry

A highlight of the plan for the coastal corridor is the potential for an eco-industrial precinct within this area. In its "9 Points to Skyrocket SA", Business SA recommended the *"development of a holistic low emissions industrial park (eco-industrial park) to showcase South Australia as the most environmentally and technologically advanced state in Australia. This should incorporate all features for companies seeking to differentiate themselves from a sustainability perspective, including but not limited to renewable energy, recycled water, hydrogen, maximum energy rated buildings and industrial symbiosis/circular economy."* Council's view is that the land between the Northern Connector and Port Wakefield Road north of the Bolivar Interchange and extending westerly towards St Kilda is ideally placed for a development of this nature due to:

- being adjacent to existing freight infrastructure, industrial activity and workforce;
- the significant investment in solar panels on Bolivar Wastewater Treatment Plant land and opportunities for further installations;
- potential for the development and establishment of industrial activity which supports the advancement of technology and environmentally advanced industries;
- excess recycled water that will soon be unable to be discharged into the Barker Inlet; and
- proximity to the University of SA's energy test bed at Mawson Lakes that incorporates solar power, flow batteries, a hydrogen fuel cell stack and thermal energy storage.

The area considered, around the Waterloo Corner Interchange and St Kilda Road, is large enough to allow for efficiencies of scale, fostering of innovation and facilitating the sharing of expertise and services. Aligning organisations that can utilise the waste and pollution output of other organisations in close proximity will also reduce transport and dumping costs for resident businesses, improving the economic viability of the precinct. There are significant synergies between this proposal and the directions articulated in the State Government's Waste Management Strategy, Hydrogen Action Plan and the government's aim for South Australian greenhouse gas emissions to reduce by more than 50% below 2005 levels by 2030, as well as the aim to achieve net zero emissions by 2050.

The City of Salisbury aims to be a sustainable city, an endeavour that is aligned with the directions of government. Council currently works with the Northern Adelaide Waste Management Authority (NAWMA) to reduce waste to landfill, improve recycling rates, increase the diversion of food waste from household waste to organics bins, and develop ways to reuse waste products as part of a circular economy. With the potential of an increased population to the north and south of the coastal corridor, sustainable methods of dealing with waste will continue to be a high priority. Expansion of NAWMA services to this area, with the possibility of working with industry to create markets for resources obtained from waste will be critical in the future.

8 Greater Edinburgh Parks Drain

Currently, stormwater runoff from significant portions of Elizabeth is collected in the Greater Edinburgh Parks (GEP) drain. This drain contains stormwater which has principally been collected from land within the City of Playford. For the Greater Edinburgh Parks industrial precinct to be developed, creating up to 20,000 jobs in the region, the stormwater management work needs to be completed. This includes the construction of a large scale drainage channel from the Northern Connector through to St Kilda.

As a component of the Sustainable Coastal Corridor Plan, it is proposed to expand and redirect the small, existing GEP drain from its current discharge pathway to the salt pond adjacent to St Kilda Road on the southern side, identified as Pond 6 in the salt mining operations. This will provide a freshwater source to enable the rehabilitation of both the salt pond and the adjacent recently impacted mangrove area.

9 Retreat Zones

For the preservation of existing habitats and ecosystems along the coast, retreat zones must be provided in the Sustainable Coastal Corridor Plan. As sea level rises, due to climate change, the existing mangrove and salt marsh will retreat further inland in order to adapt to the changing environmental conditions. Areas for this are proposed around the Little Para estuary as well as other suitable areas in the salt ponds along the coast.

These habitats are critical for the survival of many endangered species within this coastal corridor and also provide pathways for fauna to move from the coastal zone through to the escarpment zone.

Barriers to Success

The key opportunities for a North Western Sustainable Precincts Plan have been outlined in this plan however City of Salisbury acknowledges there are barriers to achieving the outcomes proposed. The four principle barriers identified are:

1. **Saltfields**
The pond system of the salt mining business runs through this whole corridor, extending north to south parallel to the coast. The ongoing operation and management of the salt ponds must be determined in order to make informed decisions on the North Western Sustainable Precinct Plan.
2. **No formal governance structure**
Such a significant project of environmental significance, the State Government and the City of Salisbury will require a clear model of governance to be determined. This is not yet in place.
3. **No funding at present**
The Sustainable Coastal Corridor Plan has not been fully costed at this concept stage however significant work is required, which in turn calls for significant funds. Funding could be obtained from multiple agencies as there are many stakeholders willing to support improvements in this area of Australia however at this time, funds have not been identified or secured.
4. **Land tenure**
The land ownership along this coastal corridor is complicated, with parcels owned by the City of Salisbury, the Crown and private entities. There are also mining leases over land parcels within the coastal corridor. The current situation regarding land tenure will restrict what can be achieved through this plan.

Conclusion

The City of Salisbury seeks to be a progressive, sustainable and connected community. The development of plans for this portion of the City of Salisbury has been taking place for many years. Collaboration between the City of Salisbury and the State Government, particularly the Department of Environment and Water, will enable the environmental, social, economic and governance aspects of this coastal corridor to not only be maintained but enhanced for a sustainable future.

Crucial to the success of the project are solutions to overcome the barriers currently in place. The barriers identified threaten not only the success of this North Western Sustainable Precincts Plan, they jeopardise the maintenance, improvement and health of this portion of the coast over the longer term.