

Culham Inlet - Eastern Foreshore Management Plan

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Abbreviations

AHD	Australian Height Datum
ARI	Annual Recurrence Interval
CIMG	Culham Inlet Management Group
DEC	Department of Environment and Conservation
DIA	Department of Indigenous Affairs
DoW	Department of Water
DRDL	Department of Regional Development and Lands
FESA	Fire and Emergency Services Authority of Western Australia
MRWA	Main Roads Western Australia
EPA	Environmental Protection Authority
RAIN	Ravensthorpe Agricultural Initiative Network
South Coast NRM	South Coast Natural Resource Management Inc.
SCRIPT	South Coast Regional Initiative Planning Team (now South Coast NRM)
SWALSC	South West Aboriginal Land and Sea Council
UCL	Unallocated Crown Land
UNESCO	United Nations Educational, Scientific and Cultural Organisation

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1 Summary

The Culham Inlet Management Group (CIMG) has this vision for the Inlet:

‘Culham Inlet has a natural setting and a diversity of habitats supporting abundant plant and animal populations, with public access that enables enjoyment of, but not damage to, these natural attributes.’

Culham Inlet is a large shallow inlet (11.3km²) which remains closed off from the ocean most of the time. It lies on the eastern boundary of the internationally recognised Fitzgerald River National Park and is 7km west of Hopetoun in the Shire of Ravensthorpe.

Culham Inlet is recognised in the Southern Prospects - South Coast Regional Strategy for Natural Resource Management (SCRIPT, 2005) as an inlet with significant community values and a priority for management. The Inlet is also listed in ‘A Directory of Important Wetlands in Australia’ (Environments Australia, 2001) for its importance as a place of habitat and refuge, particularly for birds and for its historical significance. Mining in the area has resulted in a recent increase in population and associated development. With this development, it is expected that there will be an increase in pressures on the Inlet.

Culham Inlet and it’s surrounds, like most estuaries on the south coast, is managed by several different government agencies. Most of the eastern foreshore Reserves are vested in the Shire of Ravensthorpe although there are also areas of Unallocated Crown land (UCL).

The Culham Inlet Management Group (CIMG) has been formed to enhance the management of the Inlet and is made up of representatives from local and state government agencies, key organisations and the local community. The CIMG has guided the preparation of this Management Plan for the eastern foreshore.

Culham Inlet’s eastern foreshore has significant natural features which are valued by the community. To maintain these values, the area needs to be actively managed. Implementation actions recommended in this Plan are simple and cost effective. The actions can be undertaken as small projects over a five year time frame, through partnerships with existing stakeholders.

Community values for the Inlet were identified through a survey (undertaken in 2007 with an update in 2011), a series of workshops and site visits. Community input is now sought on this Draft Plan.

Threats to foreshore values include:

- Uncertainty of land tenure for UCL;
- Incomplete knowledge of Aboriginal heritage values;
- Risk of damage to foreshore with increased, unmanaged recreational use;
- Inappropriate/poorly defined access;
- Facilities absent or in poor repair;
- Weed invasion;
- Impact of feral animals;
- Risk of dieback introduction and spread;

- Risk of unmanaged fire; and
- Future planning and development on private and reserved land.

A series of management strategies have been formulated to address these threats under the headings of:

- Effective management partnerships and community involvement;
- Resolution of land tenure;
- Habitat protection and revegetation;
- Invasive species control and monitoring;
- Integrated fire management;
- Sustainable access
- Establishment and maintenance of facilities and infrastructure;
- Appropriate recreational use;
- Protection of Aboriginal and European heritage; and
- Management of future development and determination of foreshore width.

The implementation of the Management Plan will be overseen by the Culham Inlet Management Group (CIMG) which is made up of key organisations and individuals with an interest in the Culham Inlet. The progress of implementation will be measured using short and long-term targets and the results will be reported to the community. The Plan will be reviewed after 5 years but it is expected that it will be updated to take advantage of new opportunities and allow for flexibility in its implementation. The review will be adaptive by taking into account what has been learnt from implementation of this Plan and other available information.

Table 1 is a summary of proposed actions and includes lead organisation(s), priority, suggested timeframes and indicative budget. The organisation named first has the main responsibility to lead the action. Others mentioned may be involved in an active or advisory capacity, or have an interest as a 'neighbour'.

Please note that time allocated and costs are indicative and need to be more fully investigated. Costs will be higher where contract labour is used and reduced with community input and support from the other partners.

Table 1: Summary of Proposed Actions

Action	Lead	Priority	Timeframe	Indicative budget
Partnership Action 1: Continue support of the Culham Inlet Management Group through employment of a Project Officer.	RAIN, DoW, Shire of Ravensthorpe, South Coast NRM.	Very high, ongoing.	2011 to 2016.	Allow for \$32,000 (0.4 of a Full Time Equivalent. This is based on an FTE salary and on-costs of \$80,000). There is currently no funding for a Project Officer.
Partnership Action 2: Develop and implement a communication strategy to outline and encourage community and stakeholder involvement in the implementation of this plan.	CIMG, Project Officer.	Medium.	Ongoing.	Project Officer time – Allow 5 days plus funds for implementation.
Partnership Action 3: Develop Memorandum of Understanding for	South Coast NRM,	Medium.	2012.	Allow 5 days of officer time.

Action	Lead	Priority	Timeframe	Indicative budget
management with traditional custodians and Native Title claimants.	traditional custodians and CIMG (Project Officer).			
Tenure Action 1: Investigate reservation of UCL with advice from DRDL, including options for appropriate management bodies, with regard for current Native Title claim. Include consultation with Shire of Ravensthorpe, DEC, DoW, South West Land and Seas Council and traditional custodians.	CIMG, Project Officer, Shire of Ravensthorpe and DRDL.	High.	Initiate in 2011.	Officer time.
Tenure Action 2: Once an appropriate management body and process has been identified in TA1, facilitate the process for reservation of UCL, including the formulation of management agreement(s).	CIMG, Project Officer, Shire of Ravensthorpe, South Coast NRM, DRDL.	Dependent on TA1.	When land tenure is resolved.	Officer time.
Tenure Action 3: Review current purposes of Reserves and determine if they are appropriate to protect key identified values including cultural, environmental and social. Prepare an options paper for consideration by stakeholders.	CIMG, Shire of Ravensthorpe, Project Officer, DRDL.	Dependent on TA1.	2012/13.	Officer time.
Tenure Action 4: Initiate Reserve purpose changes for existing Reserves, where appropriate (from TA3).	Shire of Ravensthorpe and DRDL.	Dependent on TA1.	2012/13.	Officer time.
Habitat Protection Action 1: Seek funding and undertake a flora survey to identify Declared Rare and/or Priority Flora.	CIMG, Project Officer.	Low.	Initiate in 2012.	Subject to funding - Allow \$8,000.
Habitat Protection Action 2: Seek funding and undertake targeted surveys to establish the status and distribution of the water rat, <i>Hydromys chrysogaster</i> .	CIMG, Project Officer and DEC.	Low.	Initiate in 2012.	Allow \$5,000.
Habitat Protection Action 3: Use notional zoning (Conservation, Mixed Use and Visitor Precinct; Figure 7) to guide uses within the foreshore Reserves.	Shire of Ravensthorpe.	Medium.	Ongoing.	Officer time.
Habitat Protection Action 4: Rehabilitate the floodplain area currently used by Main Roads WA as a depot using local native species.	Main Roads WA with CIMG and Shire of Ravensthorpe.	High.	To be determined.	To be determined.
Habitat Protection Action 5: Delineate car park 3 with bollards to prevent vegetation damage and replant bare areas with local native species.	Shire of Ravensthorpe.	High.	2013.	Dependent on further funding - allow \$10,000.
Invasive Species Action 1: Conduct a dieback survey of Phillips River Road and Hamersley Drive precincts.	CIMG (Consultant) with advice from DEC.	High.	2012.	Allow \$5,000.

Action	Lead	Priority	Timeframe	Indicative budget
Invasive Species Action 2: Implement guidelines for dieback hygienic practice and procedures as outlined in the <i>Shire of Ravensthorpe Dieback Management Plan</i> and by the Western Australian Dieback Working Group.	CIMG, Shire of Ravensthorpe South Coast NRM.	High. – dependent on ISA 1.	Ongoing.	To be determined.
Invasive Species Action 3: Use limestone material only for stabilisation and sheeting.	Shire of Ravensthorpe, CIMG.	Dependent on ISA 2.	Ongoing.	To be determined.
Invasive Species Action 4: Incorporate information about risks of dieback on interpretive and safety signage.	CIMG and Shire of Ravensthorpe.	Medium.	2012 for signage, Ongoing.	Dependent on further funding.
Invasive Species Action 5: Survey and map the distribution of Bridal Creeper every two years in the foreshore Reserve by using GPS coordinates and photography. Distribute rust fungus during first survey.	Volunteer community member.	Medium/low.	Initially 2012, then every two years.	Community volunteer time and Project Officer coordination.
Invasive Species Action 6: During the initial survey for Bridal Creeper (ISA5), map and note other weed distribution for comparison with future surveys, using GPS and photo monitoring at Phillips River Reserve and Hamersley Drive Precinct. Repeat every two years.	Volunteer community member.	Low.	2012.	Community volunteer time and Project Officer coordination.
Invasive Species Action 7: Use weed treatments as outlined in <i>Southern Weeds and Their Control</i> (Moore and Wheeler, 2008).	CIMG, Shire of Ravensthorpe RAIN, South Coast NRM.	Low.	2012.	To be determined.
Invasive Species Action 8: Inform landowners of the risk of weed spread through agricultural and garden escapees through a letter drop and use of existing weed pamphlets.	CIMG, RAIN, Shire of Ravensthorpe, DEC, DAFWA and landholders.	Low.	Initiated 2011.	Officer time.
Invasive Species Action 9: Coordinate with DEC and landowners to implement feral animal control complement current feral animal control regimes in the district (including feral animal shooting and baiting). Investigate financial, logistical and/or material support.	Project Officer.	Medium.	Initiated by 2012.	Officer time.
Invasive Species Action 10: Carry out a survey using a GPS to record the extent and distribution of feral bee hives and habitat trees with hollows.	CIMG, Shire of Ravensthorpe, DEC and landowners.	Low.	2013.	Community volunteer time and Project Officer coordination.
Invasive Species Action 11: Incorporate information into interpretive signs to encourage dog owners to have their pets under control at all times.	Shire of Ravensthorpe.	Low.	2012/13.	Officer time.
Fire Management Action 1: Engage a suitably qualified person to prepare a	Shire of Ravensthorpe	High.	Initiate 2011.	Allow: \$8,000 - \$10,000.

Action	Lead	Priority	Timeframe	Indicative budget
fire management plan for the eastern foreshore with advice and review by from Fitzgerald River National Park Fire Advisory Board, Shire of Ravensthorpe and Fire and Emergency Services representatives about fire management and suppression regimes.	with advice from FESA and DEC.			
Fire Management Action 2: Once finalised, implement the fire management plan.	Shire of Ravensthorpe with advice from FESA and DEC.	High.	2012, Ongoing.	To be determined.
Access Action 1: Improve existing access at Phillips River Reserve, including: <ul style="list-style-type: none"> - Improve drainage to prevent erosion (Figure 5); - Delineate parking areas, turn around points, boat launching area and picnic area with bollards to prevent undesirable access (Figure 5). 	Shire of Ravensthorpe.	High.	2012 to 2016.	To be determined.
Access Action 2: Investigate and report on feasibility of converting access within Phillips River Reserve from four wheel drive to two wheel drive.	Shire of Ravensthorpe.	High.	2012 to 2016.	To be determined.
Access Action 3: Control access by vehicles to the lagoon area adjacent to Hamersley Drive by the installation of bollards (Figure 6). Install signage 'Area under rehabilitation'.	CIMG, DEC and Shire of Ravensthorpe.	High.	2012.	Allow: \$3,000 (if contractor).
Facilities Action 1: Sheet boat launching area and adjacent track with compacted limestone to ensure a well drained, stable surface.	Shire of Ravensthorpe.	High.	2012-2015.	To be determined.
Facilities Action 2: Apply for funding from DoT to design and implement a low key boat ramp using materials such as GeoPro.	Shire of Ravensthorpe, DoT.	Medium.	2012-2015	To be determined.
Facilities Action 3: Install a picnic facility in Phillips River Reserve <ul style="list-style-type: none"> - Install two picnic benches; - Create car park for three or four cars; and - Install bollards to delineate day use area and car park (and close access to multiple tracks). 	Shire of Ravensthorpe.	Low.	2013.	Allow: \$15,000 (if Shire resources used).
Facilities Action 4: Main Roads WA to design and implement rehabilitation of the depot site in car park 1. Rehabilitation to include reinstatement of car park to meet DEC design standards and replanting of flood plain area with local native species. Installation of an interpretive signage shelter and picnic benches also desirable.	Main Roads WA.	High.	When Main Roads depot is not required (to be confirmed).	To be determined.

Action	Lead	Priority	Timeframe	Indicative budget
Facilities Action 5: Enlarge car park 2 so that layout meets car park design standards. Reinstate bollards to protect native vegetation.	Shire of Ravensthorpe.	Medium.	2014.	Allow: \$5,000 (if Shire resources used).
Facilities Action 6: Seek funding, design and construct a bird hide at Location A and a lookout at Location B, with interpretive signage, access paths and 3 bay car parks, following consultation with Traditional Custodians.	CIMG and Shire of Ravensthorpe.	Medium.	2013.	Allow: \$20,000 (with volunteer and labour assistance e.g. Green Corp).
Facilities Action 7: Undertake community consultation and determine feasibility of walk trail in Reserve 34988 and adjacent to Lot 1 Hamersley Drive by preparing an options paper for public discussion.	CIMG and Shire of Ravensthorpe.	Medium.	2012.	Officer time.
Facilities Action 8: Formulate a signage plan for the Inlet access points, including drawing together safety and interpretive information.	CIMG, Shire of Ravensthorpe.	High.	2012.	Officer time.
Facilities Action 9: Install the following signs at Phillips River Reserve for traffic, safety and interpretation: <ul style="list-style-type: none"> - Traffic signage as per Figure 5 - 'No camping', 'no firewood collection' and 'no fire' signage at entry point to Reserve - Safety sign consistent with AS Z535 integrated with interpretive sign shelter as per Figure 5 at the boat launching site (also incorporates boat speed limit). Subjects for interpretation include information on commercial and recreational fishing at the inlet (including bag limits), how to launch boats at the site, a map of the river and inlet, information about birds and animals (e.g. native water rat) and/or information about the Phillips River catchment. - Interpretive signage at proposed picnic site. Subjects for interpretation could include history of area and cultural heritage. 	Shire of Ravensthorpe.	Medium.	2012/13.	Allow: \$35,000 for all signage.
Facilities Action 10: Install the following signs at Hamersley Drive precinct for traffic, safety and interpretation: <ul style="list-style-type: none"> - Interpretive signage associated with the bird hide outlining values of Inlet and types of birds that visit. Trail head and directional signage for the bird hide will also be required. Cultural heritage information could also be included. - Interpretive signage shelter associated with car park 1 and lagoon area outlining information on previous 	Shire of Ravensthorpe.	High.	2012.	Allow: \$35,000 for all signage.

Action	Lead	Priority	Timeframe	Indicative budget
<p>flooding, replacement of Hamersley Drive, history of Culham Inlet water levels and salinity (e.g. Ralph Cooper's excellent inlet monitoring information) and/or cultural heritage information.</p> <ul style="list-style-type: none"> - Safety signage at car parks 1, 2 and 3. - Erect sign 'rehabilitation area – please keep off' at area proposed to be bollarded at lagoon. 				
<p>Facilities Action 11: Ensure that appropriate approvals are in place, including:</p> <ul style="list-style-type: none"> - Clearing of native vegetation approvals (DEC); - Any building licences (Shire of Ravensthorpe); and - Approvals under the <i>Aboriginal Heritage Act 1972</i> (DIA). 	Shire of Ravensthorpe, DEC.	Medium.	During life of management plan.	Officer time.
<p>Facilities Action 12: Develop an assets management plan for maintenance and monitoring of infrastructure in the Culham Inlet foreshore area, including:</p> <ul style="list-style-type: none"> - Annual condition checks of infrastructure; - Active monitoring of Reserve use by Shire of Ravensthorpe ranger; and - Maintenance and upgrade schedule for infrastructure. 	Shire of Ravensthorpe.	High.	Initiate in 2012 for life of infrastructure. Depends on infrastructure completion date.	Officer time.
<p>Facilities Action 13: Funding will be sought from external sources wherever possible for the maintenance of infrastructure created through the implementation of the Management Plan.</p>	Project Officer, Shire of Ravensthorpe.	Medium.	Initiate in 2012 for life of Management Plan.	Officer time.
<p>Recreational Use Action 1:</p> <ul style="list-style-type: none"> - Support low impact recreational uses (e.g. walking, bird watching, canoeing/ kayaking, swimming and motor boats in areas notionally zoned 'Mixed Use' and 'Visitor Precinct'. - Investigate the potential for the incorporation and management of medium impact activities (e.g. mountain biking) in areas notionally zoned 'Mixed Use' and 'Visitor Precinct'. - Exclude and raise awareness of high impact uses (e.g. motor bikes, quad bikes and horse riding). 	Shire of Ravensthorpe, CIMG.	Medium.	During life of management plan.	Officer time.
<p>Recreational Use Action 2: Adopt a 'no camping' and 'no fires' policy in the foreshore Reserve area.</p>	Shire of Ravensthorpe.	High.	Initiate 2011.	Officer time.
<p>Recreational Use Action 3: Shire rangers to patrol visitor nodes to</p>	Shire of Ravensthorpe.	High.	2011 - 2016.	Shire Ranger time.

Action	Lead	Priority	Timeframe	Indicative budget
monitor use of these areas and determine if maintenance is required (e.g. weekends and holidays).				
Heritage Action 1: Seek funding and carry out a cultural heritage assessment of the inlet area and associated waterways.	Traditional custodians, South Coast NRM and DIA.	High.	Seek funding 2011/2012, undertake in 2012/2013.	- Archaeologist: Allow \$10,000. - Traditional custodians – two day workshop and site visit: Allow \$15,000 for 15 people.
Heritage Action 2: Seek appropriate approvals for on-ground works through consultation with DIA.	CIMG, Shire of Ravensthorpe, traditional custodians, South Coast NRM and DIA.	High.	Initiate 2011.	Officer time.
Heritage Action 3: Consult with traditional custodians over the life of the management plan and seek funding to enable this.	CIMG, traditional custodians via South Coast NRM and DIA.	High.	Initiate 2011.	- Organise two half day meetings in Albany and Esperance (allow \$2000) in 2012. - Provide progress reports in person, annually to existing groups: Esperance Nyungar Aboriginal Corporation and Albany Heritage Reference Group.
Heritage Action 4: Traditional custodians to seek clarification from DIA regarding the creation of a Heritage Complex, to identify possible impacts on management of the Inlet.	Traditional custodians via South Coast NRM and DIA.	Medium.	Initiate 2012.	South Coast NRM Cultural Heritage Officer time.
Heritage Action 5: Collect and collate suitable information for use in interpretive signage that relates to Aboriginal and European heritage.	Project officer, South Coast NRM, traditional custodians, Ravensthorpe Historical Society.	Medium.	Initiate 2011/12.	Officer time.
Future Development Action 1: Consider the following attributes (as shown in Figure 7) in determining the foreshore width of areas subject to subdivision. - Flood zone, sea level rise, storm surge; - Development and drainage requirements; - Ecological corridor, flora, vegetation and fauna needs;	Shire of Ravensthorpe, Department of Planning.	Medium.	During planning and development approvals process.	Officer time.

Action	Lead	Priority	Timeframe	Indicative budget
and - Cultural heritage, recreation requirements.				
Future Development Action 2: Preparation of a guidance note under the Shire of Ravensthorpe's Town Planning Scheme No. 5 to proactively guide the design, location and management of proposed areas of development.	CIMG, DoW and the Shire of Ravensthorpe.	Medium.	2013.	Shire of Ravensthorpe planner time.
Reporting Action 1: Project Officer and action leaders to prepare the following applications and reports: - Grant funding applications; - Biannual reports to each CIMG meeting; - Annual progress reports to Shire of Ravensthorpe, Aboriginal groups and community; and - Funding progress and completion reports.	CIMG and Action Leaders.	High.	2011 to 2016.	Officer time.

2 Culham Inlet Partnerships and Strategic Framework

This management plan for the eastern foreshore of Culham Inlet proposes simple, cost effective measures to allow the study area to better cope with increased use and to allow for an appreciation of the values (environmental, cultural and recreational) of the area.

The eastern foreshore of Culham Inlet is made up of Crown Reserves which are managed by the Shire of Ravensthorpe and some areas of UCL. The broader community and several government agencies have a policy or legislative interest in the area. Below is a list of these agencies, their management responsibilities and the main plans and legislation that relate to the foreshore of Culham Inlet:

- The Department of Water has general responsibilities for the management of water resources and on the South Coast undertakes considerable research and monitoring of estuarine condition, as well as resource planning and protection.
- The Department of Environment and Conservation (DEC) manages the Fitzgerald River National Park which includes the western foreshore of Culham Inlet. The *Fitzgerald River National Park Management Plan 1991–2001*, a statutory management plan under the *Conservation and Land Management Act 1984*, outlines the activities that can be undertaken in the park. The environmental values of the eastern foreshore mean that management measures should be compatible with those of the National Park to the west.
- The Department of Fisheries manages the fish resource in the Inlet. The *South Coast Estuarine Fisheries Management Plan* outlines the restrictions on commercial fishing at the Inlet. Recreational fishing restrictions are outlined in the *Fish Resources Management Act 1994* and associated regulations. When conditions are suitable, commercial fishermen operate from the foreshore of Culham Inlet.
- The Department of Transport manages boat usage on the Inlet through the *Navigable Waters Regulations 1958* and the *Marine Act 1982*. There is one informal boat ramp at Phillips River Reserve.
- The Shire of Ravensthorpe manages development and land use planning, which is particularly relevant to the area east of the Inlet with the growth of Hopetoun. The Shire also, through its management of roads and Reserves, has a major responsibility for management of the eastern inlet foreshore.

Additionally, Ravensthorpe Agricultural Initiative Network (RAIN) is a local community group that works actively in the catchments that surround Culham Inlet and across the Ravensthorpe area. RAIN has facilitated the formation of CIMG, which is made up of interested Agencies, organisations and individuals to coordinate implementation of the Culham Inlet Management Plan.

The Culham Inlet Management Plan (Department of Water, 2008) identified a series of actions to improve the management of the area, including the preparation of a foreshore management plan for the eastern side of Culham Inlet. (Action ARD, Culham Inlet Management Plan, DoW 2008).

The South Coast Management Group's *Southern Shores* (Coffey Environments and South Coast Management Group, 2009) guides coastal and marine planning and management for the period 2009 - 2030. This document discusses estuarine management, with the strategic objective:

'Coastal wetlands and estuaries in the South Coast will be managed to maintain natural values, ecological processes and linkages'.

The South Coast Management Group supports the community and local government in its goals to manage estuarine systems through education, forming and implementing management plans and sharing information.

Background Paper Four for the *South Coast Regional Strategy for Natural Resource Management* (Gunby, 2004) considers water resources in the South Coast Region. This document outlines South Coast estuarine values and threats and provides a framework for determining which systems, such as Culham Inlet, are priorities for management.

The Ravensthorpe Council is currently completing a Coastal Management Plan for areas across the Shire.

The CIMG and the community want to build on the achievements and recommendations of the Culham Inlet Management Plan (Department of Water, 2008) to provide an action plan that will lead to better management of the eastern foreshore of the Culham Inlet. The benefits of having a plan for the Inlet are that it can be used to promote a more integrated approach to the work presently being undertaken, gain wider community input, better describe the Inlet's values, and attract funding to implement important measures to enhance and protect the values of the foreshore and inlet.

3 Culham Inlet – An Overview

3.1 Location and background

Culham Inlet is a large (approximately 11.3 km²) shallow inlet located approximately 7km west of Hopetoun and 50km south of the town of Ravensthorpe on the south coast of Western Australia (see Figure 1 and inset map below). It falls within the Shire of Ravensthorpe which is 590km south east of Perth.

Culham Inlet is a shallow basin about 1m below mean sea level. The Inlet is separated from the sea by a 1km long sand dune which acts as a bar and reaches heights of up to 15m high. Hamersley Drive, which provides access to Fitzgerald River National Park from Hopetoun, runs along the inlet side of the sand dune and south of the inlet itself.

The Inlet is within the internationally recognised Fitzgerald Biosphere which was established through the United Nations Educational, Scientific and Cultural Organisation (UNESCO) Man and the Biosphere Programme. The Inlet borders the Fitzgerald River National Park, which is noted for its diversity of native vegetation. Culham Inlet is recognised in *Southern Prospects - South Coast Regional Strategy for Natural Resource Management* (South Coast NRM, 2005) as an inlet with significant community and environmental values.



Culham Inlet is fed by two rivers, the Steere and Phillips Rivers. These rivers are typical of those in the area as they normally have low flow, are naturally saline and experience unpredictable and sporadic flooding. The lower foreshores of these Rivers are estuarine and are considered part of the Culham Inlet foreshore for the purposes of this plan.

The inlet comprises coastal sand and dunes along the southern half, deposits of clay and silt in swamps and clay pans along the northern third and a narrow band of sand and gravel between these. In addition, the mid-eastern edge of the foreshore has limestone deposits which form a cliff line 15-20m tall (Chapman, 2009). The eastern foreshore geology is significantly different to that of the western foreshore (which comprises quartzite hills). The different rock types and formations around the Inlet provide

diverse habitats for plants and animals.

The study area includes the eastern foreshore of Culham Inlet which extends approximately 12km south from Phillips River Road to where Hamersley Drive enters the Fitzgerald River National Park (Figures 1 and 2). The foreshore Reserve width ranges from 20m to 500m. Many parcels of land make up the foreshore, including three Crown Reserves. Land tenure in the area is complicated and comprises Crown Reserves (including road Reserves) managed by the Shire of Ravensthorpe, parts of the Fitzgerald River National Park that extend to the eastern side of the Phillips River and vacant (unallocated) Crown land (UCL). UCL is held by the State government, but with limited management. DEC has some responsibilities in UCL, including fire and feral animal management, where resources allow. Reserve tenure, purpose and management authority is listed in Table 2.

Private land is situated very close to the Inlet in some areas (Figure 1).

Table 2: Areas included in the Culham Inlet - Eastern Foreshore Management Plan

Reserve	Purpose	Management Authority
Reserve 34998 Oldfield Location 194/1450 Extends from Hamersley Drive area, along eastern foreshore to north of the inlet.	Recreation with power to lease	Shire of Ravensthorpe
Reserve 17589 Oldfield Location 195 An isolated Reserve adjacent to Phillips River (only access is unmade road Reserves)	Recreation and protection of native vegetation	Shire of Ravensthorpe
Reserve 26302 Oldfield Location 75 Phillips River Reserve	Recreation and conservation of flora	Shire of Ravensthorpe
Unallocated Crown land Inlet and foreshore areas, including Steere River	No purpose described	State Government (by default, little or no active management)

The Fitzgerald River National Park (managed by DEC) flanks the west of Culham Inlet and in some areas, extends to the eastern edge of Phillips River (Figure 1). While areas managed by DEC are not included in this Plan the values of surrounding areas, including the Fitzgerald National Park are considered.

Land uses adjacent to the eastern foreshore include farming, privately owned bushland with residences, and 'Rural Living' subdivisions.

Prior to 1993, Culham Inlet was considered permanently closed or a 'fossil estuary' as it had not breached its sandbar and opened to the ocean in over 70 years. The Inlet varies in depth from around 4m AHD (Australian Height Datum) to minus 1m AHD (that is, empty) depending on river flow and periods of evaporation. However, the Inlet broke through to the ocean in 1993 and 2000, causing considerable damage by washing away the Hamersley Drive causeway. Since 2000, the causeway has been rebuilt so that the floodway and the barrier sandbar are lower than they were originally. To protect the road structure it is now required that the water level in the inlet does not exceed 3m AHD. To ensure this, the sandbar on the western edge of the dune line needs to be kept at a maximum of 3m AHD.

Access to the Inlet by the general public is limited to the eastern shore at the end of Phillips River Road (Figures 4 and 5) and Hamersley Drive (Figures 4 and 6) where it crosses near the southern edge of Inlet. These nodes have been identified as being key recreational areas. Activities appear to focus on low key activities such as bird watching. However, at times when the inlet is full, fishing, canoeing and boating are likely to be key activities. The foreshore area is currently largely unmanaged with poorly defined access points. The Inlet foreshore requires more active management to ensure that visitor use does not degrade the environmental, cultural and recreational values of the Inlet.

Surveys have been undertaken to determine community attitudes to Culham Inlet in 2007 and 2011 to help provide information for this Plan. Values identified by the community for the foreshore and inlet included birdlife, beauty/scenery, unspoilt natural environment, flora and fauna (plants and animals), peace and solitude.



Hamersley Drive crossing Culham Inlet, (photo by Mieke Bourne, 2007)

Present road alignment

Old road alignment

Sandbar

The population of the Shire of Ravensthorpe is approximately 1,150 people (Hopetoun 586 and Ravensthorpe 438; ABS, 2006) and is likely to grow with the development of mining in the district. It is expected that the increase in the population is likely to result in an increase in visitor use of the National Park and the Inlet.

In addition, the Shire of Ravensthorpe Local Planning Strategy and Town Planning Scheme shows that a portion of Lot 1 Hamersley Drive, near the south eastern section of the foreshore is zoned for a 'Special Use' related to a caravan park, chalets, motel or other complementary uses (Figure 1). The balance of Lot 1 Hamersley Drive is shown as 'Rural Living' (subject to environmental and planning approvals). This indicates that more active management of the foreshore, and additional facilities will be needed in the future to cater for increased recreational activity.

3.2 Project scope

This project has included a document review, site assessment, meetings with project managers, consultation with stakeholders, collation of information and reporting.

Information Review - A review of existing information relating to the Inlet has been undertaken. There is a large amount of good quality information about Culham Inlet and its foreshore.

Site Inspection and Analysis - A site inspection over three days in March 2011 was carried out with project managers and key stakeholders attending to explain issues and areas of interest. Most of the eastern foreshore of the inlet was traversed, by walking and vehicle. Where access was not possible, aerial photos were examined. The site visit was supported by the most recent information available, including maps with aerial photography, up to date property boundaries, tenure information and topography.

Community Workshop and Consultation - An evening workshop was held at the Hopetoun Telecentre with invitations circulated by RAIN, CIMG and South Coast NRM to reach as many contacts as possible. Landowners and other local stakeholders were consulted in person and by telephone. A community survey was also distributed.

Traditional Custodian Workshop - A workshop and site visit facilitated by RAIN, South Coast NRM and Applied Archaeology Australia was held between 2 and 3 April 2011 to allow traditional custodians to discuss ideas for the management of Culham Inlet eastern foreshore. A full account of the meeting is contained in Cummings (2011). Several recommendations came out of the workshop and site visits that directly relate to this management plan.

Reporting - This Management Plan provides a clear action plan to guide on-ground works, and will be a useful tool to support funding applications and to guide monitoring and evaluation.

Public Review – The Draft Management Plan was made available for public comment for a three week period. Submissions received were summarised and collated with resulting changes incorporated into the final document.

Life of Management Plan - It is recommended that this plan have a working life of five years and be reviewed in 2016. However, the strategic outlook of this plan is for outcomes over the next 10 to 20 years.

3.3 Objectives

The objective of this Management Plan is to engage with the community to discuss ideas about the future management of the foreshore in light of increasing use of the Inlet. The traditional custodians of the district have become involved in the planning for Culham Inlet and wish to protect and share their culture, where appropriate.

The objectives of this project are to:

1. Articulate community, land manager and agency desires for recreational use and protection of values of Culham Inlet.
2. Identify preferred access points, for pedestrian and vehicle use.
3. Identify appropriate facilities and suggested locations for these (such as bird hides, interpretive signage and other facilities).
4. Identify locations and nodes for recreational activities (walking, cycling, boat launching, camping).
5. Identify high conservation areas and nodes to be protected based on environmental and cultural values.
6. Provide recommendations to manage nodes and access points (covering issues such as weeds, dieback, fire management, animal and plant protection, cultural heritage).
7. Identify preferred locations, demarcation and vesting of future foreshore Reserves and nodes.

Actions recommended in this management plan aim to take a short to long term view and need to be practical to ensure implementation. The community and other stakeholders provided feedback on the suggestions in this plan through the public consultation process. Of particular importance is the need for the Shire of Ravensthorpe to determine its capability in relation to the implementation of this Plan and ongoing maintenance, as most of the foreshore contains Crown Reserves for which the Shire holds the management orders.

3.4 Information available

A wealth of information exists for Culham Inlet. Targeted studies have been carried out to identify flora habitat and fauna values. Analysis has been undertaken for Inlet use and potential land development in the vicinity. This information has been included in a compendium which is available to the public from RAIN.

Information on Culham Inlet and environs includes:

- A preliminary archaeological heritage assessment and community recommendations (Applied Archaeology Australia, 2011);
- A vertebrate biological survey of the eastern foreshore of Culham Inlet, Hopetoun, Western Australia, (Chapman, 2009);

- Habitats and vegetation condition, (Craig, 2009);
- Culham Inlet Management Plan, (Department of Water, 2008);
- Traditional custodian workshop report, (Bourne et al. 2008).
- Background paper, inlet use and access, (Winslow, 2007a);
- Background paper, land use development, (Winslow, 2007b);
- Background paper, birdlife on Culham Inlet, (Bennett, 2007);
- Culham Inlet observations 1989–2007 (Cooper, unpublished report 2007); and
- Bird survey data (included in a study of bird populations, Tucker and Sanders, *in prep.*).

4 Site Evaluation and Management Strategies

This Management Plan provides an opportunity for community input into what is appropriate for future implementation and considers the needs of the Inlet foreshore, protection of environmental values and ways to share knowledge. To prevent damage from uncontrolled use and access, some modest measures can be put in place over the next five years to accommodate increasing use and encourage the community to value Culham Inlet and its surrounds.

Initial consultation with the community and Government Agencies has indicated that low key, sensitive management actions are favoured. People do not want to see the Inlet highly developed, just managed for sustainable community enjoyment and for the benefit of the natural environment. In light of this, action recommendations have been developed to improve management without costing a great deal or creating onerous maintenance requirements.

The following chapter includes an analysis of the site and puts forward options for management.

4.1 Strategy - Effective management partnerships and community involvement

Goal:	To have positive relationships so that Culham Inlet can be protected and enjoyed by the community.
Outcome:	The community is engaged and involved in the management of the Culham Inlet foreshore.

One of the most important considerations for management is the need for leadership, partnerships and coordination in the implementation of the Plan. The CIMG brings together key stakeholders to guide the management of Culham Inlet and it's foreshore and will be pivotal to the success of this Plan.

Community involvement can be enhanced through raising awareness, providing and receiving information and knowledge, facilitating a flow of skills and providing training and support.

The Shire of Ravensthorpe is a key stakeholder and partner who is ultimately responsible for the management of the Reserves under it's control. The Shire needs to be comfortable that management actions are sustainable, as there are implications for ongoing maintenance.

Proposed actions

Partnership Action 1:	Continue support of the Culham Inlet Management Group through employment of a Project Officer. Allow for \$32,000 (0.4 of a Full Time Equivalent. This is based on an FTE salary and on-costs of \$80,000). No currently no funding for a Project Officer.
Explanation:	Having a Project Officer will ensure effective support for CIMG and will strengthen it's advocacy and engagement potential. The community, including traditional custodians are likely to be more actively involved in management decisions and implementation by representation on CIMG with technical support and assistance. A Project Officer is a key resource for seeking funding and coordinating activities.
Lead:	RAIN, DoW, Shire of Ravensthorpe, South Coast NRM.
Priority:	Very high, ongoing.
Time period:	2011 to 2016.
Partnership Action 2:	Develop and implement a communication strategy to outline and encourage community and stakeholder involvement in the implementation of this plan. The strategy should be reviewed annually. Allow 5 days.
Explanation:	The preparation of a simple tabular communication plan to outline an operational plan and methods and timing for communication with stakeholders. This will enhance community involvement and success of the Culham Inlet – Eastern Foreshore Management Plan.

<p>Communications include meetings, workshops, busy bees, media releases, field days, newsletters and reports. The plan will indicate costs and labour required. Funds for implementation will need to be determined.</p> <p>Lead: CIMG, Project Officer.</p> <p>Priority: Medium</p> <p>Time period: Ongoing</p>
<p>Partnership Action 3: Develop Memorandum of Understanding for management with traditional custodians and Native Title claimants. Allow 5 days of officer time.</p> <p>Explanation: A memorandum of understanding to outline communication protocols, how people will work together and roles and responsibilities will clarify and enhance the working relationships between partners.</p> <p>Lead: South Coast NRM, traditional custodians and CIMG.</p> <p>Priority: Medium</p> <p>Time period: 2012.</p>

4.2 Strategy - Resolution of land tenure

<p>Goal: To ensure that the public land making up the Foreshore Reserve and UCL is appropriately vested with appropriate management authority(s) and purpose descriptions to ensure that best management practices are facilitated.</p> <p>Outcome: The Inlet foreshore is properly managed for its many values.</p>
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When looking at the Reserve boundaries of the study area, it is obvious that many parts of the foreshore Reserves are very narrow and that boundaries do not necessarily match where the foreshore is 'on the ground'. This is partly due to different standards that were used to determine foreshore boundaries when the area was surveyed. In addition, since the original survey, the Inlet and rivers have been subject to considerable changes to shorelines due to flood events, the dynamic nature of the foreshore and changes in the catchment due to development for agriculture. Some of the foreshore Reserves are in fact road Reserves (e.g. adjacent to Phillips River) although they lie over muddy flood plains that are not suitable for road construction.

The Shire of Ravensthorpe has the management orders for the balance of the foreshore Reserves. The purposes of the Reserves (Table 2) are broadly compatible with recreation and conservation. Department of Regional Development and Lands (DRDL) have advised that purposes of the Reserves need to be adhered to. This means that while camping might be construed to be compatible with a 'recreation' purpose, it cannot be undertaken at the expense of conservation values (e.g. provision of adequate facilities). In addition, commercial uses (e.g. camping for commercial fishing) within a Reserve is not compatible with a 'recreation and conservation' purpose and would not be supported unless there was a change to the purpose (and possibly the addition of the power to lease).

The Inlet itself and part of the Steere River is Unallocated Crown Land (UCL). No active management is undertaken by the State Government in this area, except by Government Agencies with a particular interest in the Inlet (e.g. DoW has an interest in estuarine health and management). Initial advice from the DRDL suggests that reservation of the UCL with an appropriate managing body could be initiated, with a view to establishing an Indigenous Land Use Agreement. To do this, a suitable management body would need to be willing to hold the management orders in the long term and work with interested parties such as Native Title claimants. DRDL would refer the proposal for comments to interested parties and progress the reservation of the UCL.

Proposed actions

<p>Tenure Action 1: Investigate reservation of UCL with advice from DRDL, including options for appropriate management bodies, with regard for current Native Title claim. Include</p>

<p>Explanation: consultation with Shire of Ravensthorpe, DEC, DoW, South West Land and Seas Council and traditional custodians. Resolution of land tenure will make management of the area more cohesive and will clarify roles and responsibilities. Investigation of management partnership opportunities that are consistent with Native Title claims and environmental values would be useful.</p> <p>Lead: CIMG, Project Officer, Shire of Ravensthorpe and DRDL.</p> <p>Priority: High.</p> <p>Time period: Initiate in 2011.</p>
<p>Tenure Action 2: Once an appropriate management body and process has been identified in TA1, facilitate the process for reservation of UCL, including the formulation of management agreement(s).</p> <p>Explanation: Management agreements will outline how people will communicate and work together (including between management authority, CIMG, Native Title claimants, South West Land and Sea Council and claimant representatives). It will also outline responsibilities in the new tenure framework.</p> <p>Lead: CIMG, Project Officer, Shire of Ravensthorpe, South Coast NRM, DRDL.</p> <p>Priority: Dependent on TA1.</p> <p>Time period: When land tenure is resolved.</p>
<p>Tenure Action 3: Review current purposes of Reserves and determine if they are appropriate to protect key identified values including cultural, environmental and social. Prepare an options paper for consideration by stakeholders.</p> <p>Explanation: Consultation on future public land tenure needs to be undertaken so that the community understands the implications and benefits of various tenure options.</p> <p>Lead: CIMG, Shire of Ravensthorpe, Project Officer, DRDL.</p> <p>Priority: Dependent on TA1</p> <p>Time period: 2012/2013.</p>
<p>Tenure Action 4: Initiate Reserve purpose changes for existing Reserves, where appropriate (from TA3).</p> <p>Explanation: Having Reserve purpose designations that are appropriate will assist in justifying activities or actions that protect cultural, environmental and social values.</p> <p>Lead: Shire of Ravensthorpe and DRDL.</p> <p>Priority: Dependent on TA3</p> <p>Time period: 2012/2013.</p>

4.3 Strategy - Habitat protection

The vegetation corridors along the rivers form an important link from the coast to the inland areas. In the case of the Phillips River, the foreshore vegetation is in very good condition with most fenced off from adjacent farmland. A recent assessment of the Steere River (Chapman, 2007) and its tributaries found that in the upper catchment, weed infestation was degrading the main river channel and that the tributaries showed additional manifestations of degradation including erosion, excess sediment transport, secondary salinisation and water impoundment. Habitat and condition mapping of vegetation has been undertaken by Craig (2009). The survey area covered between Pitchi Richi (approximately 4km to the north of the study area) and the eastern and western foreshores of Culham Inlet (Figure 3). The vegetation was mapped according to habitat types, with seventeen units recorded in the riparian zone and grouped into three major categories: estuary basin and river channels, flood plain and verge. Six habitats were mapped in the non-riparian zone on upper slopes. Habitat types are shown in Figure 3.



Coastal Moort Woodland (Melanie Price, 2011)

Most of the riparian zone vegetation is in excellent (35%) or very good (40%) condition. The alluvial plain adjacent to the Steere River and east side of the inlet is in good condition with evidence of past grazing activities. Only 2.4% of the survey area was considered to be in poor to very poor condition including points at which access is currently available, such as Phillips River Reserve and around Hamersley Drive (Figure 3).

No flora surveys have been undertaken for the area, so the distribution of declared rare or priority flora is not known.

The Inlet is very important for birdlife and is listed in *A Directory of Important Wetlands in Australia* (Environments Australia, 2001), based partly on the large number of water birds found there when conditions are favourable. Birdlife on Culham Inlet is one of the major attractions for visitors to the Inlet (Bennett, 2007). Surveys indicate that the majority of bird breeding takes place in September to November with some migrant birds breeding between January and February (Tucker and Sanders, *in prep.*). The study area contains some of the most important breeding areas which are in the lower reaches of the Phillips and Steere Rivers and associated floodplain and swamp areas. Culham Inlet provides seasonal and water level dependent feeding resources.

Culham Inlet has a low diversity of fish types with only ten different types caught during a study between 2002 and 2004 (DoW, 2008). Black Bream are recreationally and commercially the most important fish in the Inlet. When water levels have remained high for an extended period the Black Bream commercial fishery has been very productive with up to 77 tonnes caught in one year. These conditions have not occurred since 1993, so no commercial and very little recreational fishing has taken place since that time.

A vertebrate survey of the eastern foreshore was carried out between March and October 2009 (Chapman, 2009). Ninety eight species of vertebrates were recorded including 17 birds, 7 native mammals, 1 frog and 15 reptiles. Numbers of species of frogs and reptiles and numbers of individual mammals were considered to be low compared to what was expected for the area (Chapman, 2009). It was considered that limited habitat along some sections of the foreshore and predation by foxes could be the cause of this. The survey confirmed the importance of the inlet to water birds and recorded the presence of the native water rat (*Hydromys chrysogaster*).

The variable water levels have a direct influence on the foreshore in terms of native vegetation and fauna habitat. For example, when water levels are high the fringing vegetation can be flooded and die, but when the inlet dries the rising salinity can result in mass fish deaths.

Notional ‘zoning’ of foreshore areas

The plants and animals of Culham Inlet are valued by the community, with the bushland and birdlife being one of the main attractions. While the entire foreshore has conservation values, the assessment indicated that some areas have higher values due to habitat quality and low levels of accessibility. A notional zoning of the foreshore, shown in Figure 7 indicates areas which are suited for the following management:

1. Conservation/cultural protection;
2. Mixed uses – conservation, recreation and cultural protection; and
3. Visitor precincts.

This indicative zoning will assist in indicating activities which may be suitable (or unsuitable) for an area and will assist in prioritising actions or infrastructure installation. The inaccessible sections of the eastern inlet foreshore, which are in excellent condition, provide undisturbed havens for native animals and plants. These areas have been notionally zoned for ‘Conservation’ and primarily occur around the north and northern east edge of the Inlet. Other areas notionally zoned for ‘Mixed Use’ and as ‘Visitor Precinct’ (Figure 7) still have high conservation values and active management will be required to protect habitat values.

Within the different zones, it is recommended that delineation of accessible areas using bollards or similar devices will help to control access and prevent disturbance. Degraded areas will often regenerate naturally if disturbing influences are removed and this is often preferable to active rehabilitation (e.g. planting). In sandy eroded areas, brushing with trimmings of native vegetation can stabilise an area enough for natural regeneration. This is discussed more specifically in following sections.

The main site that would benefit from rehabilitation is in the Hamersley Drive Precinct (Figure 6), including the car park where the Main Roads depot is currently located. Areas at this site not required for the reinstatement of the car park will require active rehabilitation and planting. The rehabilitation will preferentially be undertaken using local provenance native species.

Car park 3 the north of Hamersley Drive is proposed to become a 3 or 4 bay car park for access to the Lookout (Figure 6). Whether or not this site is used as a lookout, bollards should be installed to delineate the car park and associated walk trail. Remaining areas should be brushed and/or planted with local native species.



Foreshore adjacent to Lot 1 Hamersley Drive (Melanie Price, 2011)

Proposed actions

<p>Habitat Protection Action 1: Seek funding and undertake a flora survey to identify Declared Rare and/or Priority Flora.</p> <p>Explanation: Identification of the presence and location of significant flora will assist in prioritising future management actions.</p> <p>Lead: CIMG, Project Officer.</p> <p>Priority: Low.</p> <p>Time period: Initiate in 2012.</p>
<p>Habitat Protection Action 2: Seek funding and undertake targeted surveys to establish the status and distribution of the water rat, <i>Hydromys chrysogaster</i>.</p> <p>Explanation: Identification of the presence and location of significant flora will assist in prioritising future management actions to ensure the protection of this species.</p> <p>Lead: CIMG, Project Officer and DEC.</p> <p>Priority: Low.</p> <p>Time period: Initiate in 2012.</p>
<p>Habitat Protection Action 3: Use notional zoning (Conservation, Mixed Use and Visitor Precinct; Figure 7) to guide uses within the foreshore Reserves.</p> <p>Explanation: Notional zoning will help to delineate future management actions in the foreshore areas with respect to access, installation of facilities and maintenance.</p> <p>Lead: Shire of Ravensthorpe.</p> <p>Priority: Medium</p> <p>Time period: Ongoing.</p>
<p>Habitat Protection Action 4: Rehabilitate the floodplain area currently used by Main Roads WA as a depot using local native species.</p> <p>Explanation: Main Roads WA has indicated that they will undertake the planning and on-ground works to rehabilitate the current depot site when it is no longer required.</p> <p>Lead: Main Roads WA with CIMG and Shire of Ravensthorpe.</p> <p>Priority: High.</p> <p>Time period: To be determined.</p>
<p>Habitat Protection Action 5: Delineate car park 3 with bollards to prevent vegetation damage and replant bare areas with local native species.</p> <p>Explanation: Delineation and replanting of this area will enhance its visual amenity and reduce weed invasion.</p> <p>Lead: Shire of Ravensthorpe.</p> <p>Priority: High.</p> <p>Time period: 2012.</p>

4.4 Strategy - Invasive species control and monitoring

Goal:	Reduce the impacts of invasive species on local flora and fauna.
Outcome:	A healthy ecosystem supporting native flora and fauna.

Invasive plants, animals and disease are affecting, or have the potential to affect the Culham Inlet foreshore. Invasive species can reduce biodiversity and habitat values through competition or predation.

Dieback

The introduced dieback fungus (*Phytophthora cinnamomi*) is known to exist in the Fitzgerald River National Park and in other areas throughout the Shire of Ravensthorpe. The status of dieback in the eastern foreshore Reserve has not been determined. Dieback kills many types of plants, greatly reduces biodiversity and is not curable. The primary vectors of introduction and movement of dieback through the landscape are

from soil, gravel or mud containing the pathogen being transported to a new location and then moved around by water and root-to-root contact.

Both Hamersley Drive and John Forrest Drive have been surveyed by DEC for dieback (Rodger Walker *pers. comm.*) in early 2011 and are considered to be free of dieback or uninterpretable. The status of the rest of the foreshore area is not known.

To minimise the threat of introducing and/or spreading *Phytophthora* dieback it is recommended that standard operating procedures are adopted for any work or maintenance that is being undertaken in the eastern inlet foreshore (including earthworks). Standard operating procedures may need to be adapted for specific stakeholder groups, but need to be applied consistently. These practices and procedures are provided in *Managing External Dieback Threats to the Fitzgerald River National Park* (Steady State Consulting, 2009) and are consistent with priorities of the *Phytophthora Dieback Management Plan* for the South Coast Region 2010 - 2017.

Interpretive and safety signage should contain information about the risks of dieback.

Proposed actions

<p>Invasive Species Action 1: Conduct a dieback survey of Phillips River Road and Hamersley Drive precincts.</p> <p>Explanation: By determining the presence and/or interpretability of these priority sites, hygiene management can be better planned.</p> <p>Lead: CIMG (Consultant) with advice from DEC.</p> <p>Priority: High.</p> <p>Time period: 2012.</p>
<p>Invasive Species Action 2: Implement guidelines for dieback hygienic practice and procedures as outlined in the <i>Shire of Ravensthorpe Dieback Management Plan</i> and by the Western Australian Dieback Working Group.</p> <p>Explanation: Depending on the outcomes for ISA1, dieback hygiene practices need to be used for all projects and activities where there is a risk of introducing or spreading dieback.</p> <p>Lead: CIMG, Shire of Ravensthorpe, South Coast NRM.</p> <p>Priority: High, dependent on ISA 1.</p> <p>Time period: Ongoing.</p>
<p>Invasive Species Action 3: Use only limestone material only for stabilisation and sheeting.</p> <p>Explanation: Limestone has a high pH which is not conducive for the survival of <i>Phytophthora cinnamomi</i>, which prefers a more acid environment.</p> <p>Lead: Shire of Ravensthorpe, CIMG.</p> <p>Priority: Dependent on ISA 2</p> <p>Time period: Ongoing.</p>
<p>Invasive Species Action 4: Incorporate information about risks of dieback on interpretive and safety signage.</p> <p>Explanation: By raising awareness, the risk of introducing or spreading dieback will be reduced.</p> <p>Lead: CIMG and Shire of Ravensthorpe.</p> <p>Priority: Medium</p> <p>Time period: 2012 for signage, Ongoing.</p>

Weeds

Weeds are the principal indicator of vegetation condition in the study area (Craig, 2009). The habitat and vegetation mapping project identified that disturbed areas and associated weeds occur at Phillips River Reserve and the Hamersley Drive Precinct. However, much of the foreshore is in excellent condition with low weed invasion (Figure 3).

There are currently several weed species that are found in isolated sections of the foreshore, including annual veldt grass (*Ehrharta brevifolia*), wild oat (*Avena fatua*), pimpernel (*Anagallis arvensis*), clover (*Trifolium* species) and medics (*Medicago* species). The sandy edges of the four wheel drive tracks along the eastern foreshore contained angled ice plant (*Mesembryanthemum aitonis*).

The weed of greatest concern is Bridal Creeper which is evident at many points in low densities. This weed is spread through bird droppings and is therefore not necessarily associated with disturbed areas. Leaf rust fungus appears to be reducing the virulence of this weed (Craig, 2009).

Craig (2009) reported the presence of African Boxthorn (*Lycium ferrocissimum*) on the east of the Phillips River (but outside the study area). The Boxthorn infestation located in the middle reaches of the Phillips River, starting at Cocanarup to the end of the Moir Track, is also a concern, although it is understood that measures are being taken to map and possibly treat the infestation. The weed has also been detected at Pitchi Ritchi but is not yet badly infested.

Measuring and recording the extent of weed infestations (e.g. Bridal Creeper, Boxthorn) using GPS and photographs would allow for comparison over time and an indication of success after any treatment.

The comprehensive document, *Southern Weeds and Their Control* (Moore and Wheeler, 2008) outlines Weed treatments suitable for use in the South Coast region and should form the basis for any weed management programs.

Awareness of the risk of spreading weeds through agricultural and garden escapees could be raised amongst farmers and residents around the Inlet through distribution of existing weed brochures.

Proposed actions

<p>Invasive Species Action 5: Survey and map the distribution of Bridal Creeper every two years in the foreshore Reserve by using GPS coordinates and photography. Distribute rust fungus during first survey.</p> <p>Explanation: This survey will assist in identifying the distribution of Bridal Creeper and allow for initial control activities with follow up monitoring. Rust fungus is the most effective way to reduce the virulence of Bridal Creeper when compared with chemical or mechanical controls.</p> <p>Lead: CIMG, volunteer community members.</p> <p>Priority: Medium/Low.</p> <p>Time period: Initially 2012, then every two years.</p>
<p>Invasive Species Action 6: During the initial survey for Bridal Creeper (ISA5), map and note other weed distribution for comparison with future surveys, using GPS and photo monitoring at Phillips River Reserve and Hamersley Drive Precinct. Repeat every two years.</p> <p>Explanation: While some weeds do not need to be targeted for direct control at this stage, monitoring will ensure that managers know if some weeds have increased in number and/or distribution. This includes lower priority weeds such as flax leafed flea bane, grasses and the angled ice plant.</p> <p>Lead: CIMG, volunteer community members.</p> <p>Priority: Low.</p> <p>Time period: 2012.</p>
<p>Invasive Species Action 7: Use weed treatments as outlined in <i>Southern Weeds and Their Control</i> (Moore and Wheeler, 2008).</p> <p>Explanation: This document contains best practice weed management for the South Coast in bushland and agricultural settings.</p> <p>Lead: CIMG, Shire of Ravensthorpe, RAIN, South Coast NRM.</p> <p>Priority: Low.</p> <p>Time period: 2012.</p>

Invasive Species Action 8:	Inform landowners of the risk of weed spread through agricultural and garden escapees through a letter drop and use of existing weed pamphlets.
Explanation:	Through better understanding, weed invasion can be minimised.
Lead:	CIMG, RAIN, Shire of Ravensthorpe, DEC, DAFWA and landholders.
Priority:	Low.
Time period:	Initiated by 2011.

Feral Animals

The main feral animals of concern are rabbits and foxes (Chapman, 2009) due to their destruction of native vegetation and predation of native animals (respectively). It is likely that wild cats, dogs and feral bees are also likely to impact on the values of the inlet foreshore, although the extent of this is not clear.

Integrating with feral animal control already being carried out in the district will maximise the impacts of any treatments (e.g. by coordinating with feral shooting events or baiting programs). With respect to feral bees, it would be useful to undertake a survey of the foreshore to determine the extent of feral bee invasion (and also to determine the distribution of possible habitat trees with hollows).

Domestic pets such as dogs need to be kept under the control of their owners so that they do not disturb native animals. Advice regarding this can be integrated into safety signage.

Proposed actions

Invasive Species Action 9:	Coordinate with DEC and landowners to implement feral animal control to complement current feral animal control regimes in the district (including feral animal shooting and baiting). Investigate financial, logistical and/or material support.
Explanation:	By working with stakeholders who currently undertake feral animal control in the district, better outcomes can be achieved for feral animal control.
Lead:	Project Officer.
Priority:	Medium.
Time period:	Initiated by 2012.
Invasive Species Action 10:	Carry out a survey using a GPS to record the extent and distribution of feral bee hives and habitat trees with hollows.
Explanation:	Better knowledge of feral bee and hollow distribution will assist in determining if action against feral bees is necessary.
Lead:	CIMG, Shire of Ravensthorpe, DEC and landowners.
Priority:	Low.
Time period:	2013.
Invasive Species Action 11:	Incorporate information into interpretive signs to encourage dog owners to have their pets under control at all times.
Explanation:	When kept under control, dogs are likely to have minimal impacts on foreshore values.
Lead:	Shire of Ravensthorpe.
Priority:	Low.
Time period:	2012/13

4.5 Strategy - Integrated fire management

Goal:	To effectively manage fire to retain biodiversity and reduce risk to life and property.
Outcomes:	Fire is used as a tool to retain biodiversity without degrading values of the inlet foreshore. The community is involved and consulted about fire management and suppressions.

The DEC, FESA and Shire of Ravensthorpe are the main controlling agencies for wildfire control and controlled burns on private and public lands. Fires have burnt parts of the western foreshore in 2006 and 1989 (Craig, 2009). No fires have been recorded in the eastern foreshore study area since 1984 (Fould's farm house to John Forrest Road) and 1957 (all eastern Reserve; R. Daw *pers. comm.* as reported in DoW and RAIN, 2010).

It is recommended that a fire management plan be prepared with advice from the Fitzgerald River National Park Fire Advisory Board, Shire of Ravensthorpe, Fire and Emergency Services representatives and local bush fire brigades about fire management/suppression regimes.

It is recommended that cooking fires should not be permitted in the Reserves.

Proposed actions

<p>Fire Management Action 1:</p> <p>Explanation:</p> <p>Lead:</p> <p>Priority:</p> <p>Time period:</p>	<p>Engage a suitably qualified person to prepare a fire management plan for the eastern foreshore with advice and review from Fitzgerald River National Park Fire Advisory Board, Shire of Ravensthorpe and Fire and Emergency Services representatives about fire management and suppression regimes.</p> <p>Management of fire risk requires consideration of biodiversity values and risks to life and property. Expert advice is required to balance these needs and determine if a fuel reduction regime is required, or if fire suppression should be implemented. Should a wild fire occur, monitoring is recommended to detect and treat any weed invasion.</p> <p>Shire of Ravensthorpe with advice from FESA and DEC.</p> <p>High.</p> <p>Initiate 2011.</p>
<p>Fire Management Action 2:</p> <p>Explanation:</p> <p>Lead:</p> <p>Priority:</p> <p>Time period:</p>	<p>Once finalised, implement the fire management plan.</p> <p>Implementation of a fire plan will protect life and property and enhance biodiversity values.</p> <p>Shire of Ravensthorpe with advice from FESA and DEC.</p> <p>High.</p> <p>2012, Ongoing.</p>

4.6 Strategy - Sustainable access

<p>Goal:</p> <p>Outcome:</p>	<p>To have adequate and appropriate access to the eastern Culham Inlet foreshore.</p> <p>The inlet foreshore is protected from inappropriate access and the community values the inlet through interaction with the foreshore area.</p>
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General

Presently, public access to the Culham Inlet eastern foreshore is limited to Phillips River Reserve and the Hamersley Drive precinct. This limited access ensures that areas of high conservation, including waterbird breeding and feeding areas are relatively undisturbed by human activities (Figure 7). The only (minor) downside is that many people do not get to see or experience many areas of the Inlet and therefore may not appreciate the values of the Inlet as a whole. It is important that people can experience the Inlet at appropriate locations which will ensure that the Inlet is enjoyed in a sustainable way.

The access background paper (Winslow, 2007) investigated a number of options including the possible construction of unmade road reserves. The construction of roads is prohibitively expensive and the likely destinations are sensitive and not necessarily appropriate for access (e.g. floodplains). Initial consultation during this project has suggested that the cost of additional road construction in unmade road Reserves is not required or desirable at this time.



Phillips River Reserve - The track to Phillips River becomes boggy in wet conditions (Melanie Price, 2011).

The highest general priority at this stage is likely to be upgrading of existing accessible sites (Phillip River Reserve and Hamersley Drive precinct), so they are appropriately surfaced, signed and maintained.

Phillips River Reserve

Phillips River Road is constructed of formed gravel to the northern end of Phillips River Reserve, where the road becomes a narrow (one lane) gravel four wheel drive track via a short steep slope. The slope is becoming degraded and requires attention to improve drainage (Figure 6). Orchids are common in the adjacent bushland, so care needs to be taken in this area to ensure that accidental clearing does not occur. Dieback hygiene also needs to be observed. There is a car turn-around bay at the top of the slope, should a vehicle decide not to proceed.

The gravel track, which is too narrow for vehicles to pass easily, travels along the top of the ridge line and provides access to a lookout point, loop track and informal boat launching area (Figure 5). Access to the boat launching area is via a steep eroded slope which is only accessible by four wheel drives. There is a car turn-around bay at the top of the slope, should a vehicle decide not to proceed. Some of the track is in poor condition due to erosion on steep slopes and vehicle use on the floodplain during wet and muddy conditions.

To upgrade the road to two wheel drive access to cater for cars and small buses, would require widening (clearing of native vegetation), resurfacing in parts, and provision of adequate turn around areas and parking. No public submissions were received regarding this upgrade, so it is considered that the Shire of Ravensthorpe will need to determine the priority of this action in line with other projects.



Steep, rocky and eroded access point to boat launching area, Phillips River Reserve (Melanie Price, 2011).

Car parking, turn around bays and traffic signs

There are several points on the main entry track where people can either park or turn vehicles around. It is at these points that signage can be placed to inform visitors that four wheel drives are necessary (refer Figure 5).

Proposed actions

<p>Access Action 1: Improve existing access at Phillips River Reserve, including:</p> <ul style="list-style-type: none"> - Improve drainage to prevent erosion (Figure 5); - Delineate parking areas, turn around points, boat launching area and picnic area with bollards to prevent undesirable access (Figure 5). <p>Explanation: Proper delineation of areas will protect native vegetation and prevent degradation of the foreshore.</p> <p>Lead: CIMG and Shire of Ravensthorpe.</p> <p>Priority: High.</p> <p>Time period: 2012 to 2016.</p>
<p>Access Action 2: Investigate and report on feasibility of converting access within Phillips River Reserve from four wheel drive to two wheel drive.</p> <p>Explanation: Investigation of the process and cost associated with the upgrade will determine if this activity should be pursued, with consideration to issues such as dieback hygiene, protection of native vegetation and cultural heritage.</p> <p>Lead: Shire of Ravensthorpe.</p> <p>Priority: High.</p> <p>Time period: 2012 to 2016.</p>

Steere River

Access via land to the Steere River is limited as there is only one point (on John Forrest Road) where there is public access to its foreshore. All other informal access points require crossing over private land, which is not appropriate due to liability and trespass issues. Much of the Steere River is fairly closed in by vegetation and narrow sections. No actions for access to Steere River are proposed in this management plan.



UCL adjacent to the Steere River - The Steere River is not easily accessible from publicly owned land except from John Forrest Road. This photo, taken from private land shows the relatively closed-in nature of this River (Melanie Price, 2011).

Hamersley Drive Precinct

Hamersley Drive (bitumen road) provides access to the southern part of the Inlet and is the main thoroughfare to the eastern section of the Fitzgerald River National Park. The road crosses just north of where Culham Inlet breaks through to the ocean during flood events. Large culverts and a 'break through' point have been constructed to minimise the risk of damage to Hamersley Drive during these events.

At the present time, people are making their way from Hamersley Drive around the edge of the lagoon to fishing spots (Figure 6). This has created a rutted track, damaged vegetation and a bird nesting area. Access to this area needs to be controlled to prevent further damage.



Hamersley Drive Precinct - Lagoon area. Vehicle access to this site is damaging the foreshore and nesting habitat (Melanie Price, 2011).



*Suggested location for bollards adjacent to Lagoon near Hamersley Drive. Main Roads WA depot in the background
(Melanie Price 2011)*

Proposed actions

Access Action 3:	Control access by vehicles to the lagoon area adjacent to Hamersley Drive by the installation of bollards (Figure 6). Install signage ‘Area under rehabilitation’.
Explanation:	Installation of bollards will allow controlled access, but will prevent damage to ecological values. Needs to be done in coordination with signage strategy.
Lead:	CIMG, DEC and Shire of Ravensthorpe.
Priority:	High.
Time period:	2012.

4.7 Strategy - Establishment and maintenance of facilities and infrastructure

Goal:	To provide appropriate low key facilities to enhance visitor enjoyment and understanding.
Outcome:	Facilities and infrastructure that are low maintenance, well located and enhance the values of the inlet.

The community generally visits either Phillips River Reserve or the Hamersley Drive end of the inlet, adjacent to the start of the Fitzgerald National Park (Figure 4). No other locations on the foreshore have any infrastructure or facilities.

The current facilities and infrastructure associated with the Inlet foreshore are not sufficient to meet current and medium term community demand without damage to the foreshore. However, there are some simple and relatively inexpensive facilities and infrastructure that could be installed to allow sustainable use and enjoyment of the Inlet.

A community survey and initial community consultation during site assessments suggests that people want very modest, low impact infrastructure including items shown in Table 3. It should be noted that views on different infrastructure and its possible location was mixed.

Rubbish bin installation has not been recommended in this plan due to the relatively high maintenance requirements. It is suggested that a similar approach is taken to DEC in National Parks, where signage requests that visitors take their rubbish with them.

Table 3: Possible Future Facilities

Improved access
Walk trails, dual-use path/cycle way out to inlet and up eastern side
Walkways into the water
Picnic tables, shelters
Information and interpretation signage (flora, fauna, historical)
Facilities for bird watching, wildflower observation and picnicking
Toilets, picnic benches and shade, information board
Prevention of access to motor bikes or cars
None
Recognised and well defined access tracks
Identification and preservation of Aboriginal and European cultural sites.

Phillips River Reserve

Phillips River Reserve (Figure 5) contains a lookout point over the river and a low key/informal boat ramp. The access track forms a loop from a ridgeline down a steep, rocky scarp to the boat launching area. From the boat launching area, one track ascends the scarp in a loop back to the entry track. Another track continues south on the flood plain and terminates at the river after 300m.

The boat launching area is only suitable for small vessels such as dinghies and kayaks as it is on the muddy floodplain with benching that prevents launching when the inlet level is low.

There is no infrastructure evident at the site, except for a sign that states that the boating speed limit is 8 knots.



Phillips River Reserve - View to north along Phillips River from boat launching site (Melanie Price, 2011).

Boat launching site

The boat launching site is set on the terrace of the flood plain and becomes boggy and muddy in wet weather. It is not practical to use the site for launching anything but small vessels such as canoes and kayaks when the water levels are low.

The boat launching site would be greatly improved by sheeting the turnaround area with compacted limestone to ensure a stable surface and allow for water to drain away. Parking is limited to two vehicles, but is likely to be sufficient for all but peak use times such as public and school holidays. The establishment of additional parking would require clearing of vegetation on the floodplain, which is not considered desirable.

The riverbank is relatively steep and developing gully erosion. The installation of a simple ramp such as a GeoPro cell product (or similar, as illustrated in Appendix B) could be considered for installation as they are relatively low cost and should it be washed away in a flood, would be relatively easy to replace. Department of Transport has a funding program for boat ramp installation that should be considered for this purpose.

Proposed actions

<p>Facilities Action 1: Sheet boat launching area and adjacent track with compacted limestone to ensure a well drained, stable surface.</p> <p>Explanation: Resurfacing the boat launching area and nearby track will increase the ability to use the facility during all seasons.</p> <p>Lead: Shire of Ravensthorpe.</p> <p>Priority: High.</p> <p>Time period: 2012-15</p>
<p>Facilities Action 2: Apply for funding from DoT to design and implement a low key boat ramp using materials such as GeoPro.</p> <p>Explanation: Installation of a boat ramp will reduce erosion and facilitate safe boat launching. Use of a material such as GeoPro mean that the structure is relatively inexpensive and will not cause excessive erosion if lost in a flood event.</p> <p>Lead: Shire of Ravensthorpe, DoT.</p> <p>Priority: Medium.</p> <p>Time period: 2012-15</p>



Phillips River Reserve - Boat launching area. Note: boggy surface and poor delineation to the river's edge (Melanie Price, 2011).



Phillips River Reserve - River bank erosion associated with boat launching site (Melanie Price, 2011).

Picnic area and parking

The access track forms a loop from the ridge to the floodplain and then back up to the ridge. There is a fairly level site on the ridge that could be used for a picnic area if benches and a small car park for three or four vehicles were provided. A suitable location is shown on Figure 5. The provision of two picnic tables could cater for up to a dozen people. The understory is sparse, so there would be no need to remove native vegetation to install infrastructure. The parking area should be delineated with bollards.

Proposed actions

Facilities Action 3: Install a picnic facility in Phillips River Reserve

- Install two picnic benches;
- Create car park for three or four cars; and
- Install bollards to delineate day use area and car park (and close access to multiple tracks).

Explanation: A picnic site will create a focal point in the Reserve and increase community use and enjoyment.

Lead: Shire of Ravensthorpe.

Priority: Low.

Time period: 2013.

Hamersley Drive Precinct

The Hamersley Drive Precinct (Figure 6) is flanked by the Fitzgerald River National Park to the west and the coastline to the south. Private land used for agricultural purposes occurs immediately to the east. The Hamersley Drive precinct is part of the main thoroughfare for access to the Fitzgerald River National Park. Views of the Inlet are expansive from this point.

A lagoon area to the south of Hamersley Drive is mostly within the National Park, although access to the lagoon is from Reserve 34998 which contains two formal car parks and two informal car parks. Some damage has occurred through unauthorised vehicle access around the lagoon, including crushing of a hooded plover nesting site and damage to vegetation.

A small car park (car park 1) exists on the western side of the precinct and currently contains a Main Roads WA depot comprising a fenced off compound area, which is used for servicing road works in the Fitzgerald River National Park. MRWA have agreed to convert the site back into a car park at the end of its use, including the revegetation of the fringing area, installation of bollards to control access and the installation of interpretive signage (RAIN *pers. comm.*). Traditional custodians would like to be involved in the rehabilitation plan and would support the idea of a community project to provide some training and work experience for Noongar youth (AAA, 2011; Cummings, 2011). They also recommend that monitors need to be on site during earth works in case any cultural materials are exposed. A regulation 10 permit from DIA may be required for these activities.

Car park 2 is 400m to the east of car park 1 and on the south side of Hamersley Drive. The car park is delineated with bollards and a boardwalk leads to the beach and ocean. It is an awkward shape and too small to manoeuvre a vehicle easily. It is suggested that this car park be enlarged so that it meets design standards. Sight lines from this car park are limited so it is suggested that ‘pedestrians ahead’ or ‘vehicles entering’ signs are erected on Hamersley Drive.

Car park 3 is not formalised and could form a three bay car park for the Location B bird hide. The car park should be delineated with bollards to prevent vehicle access further down the track. Areas around the existing track that are not required for access should be brushed and/or rehabilitated with local native plant species. Sight lines from this car park are poor due to a bend and slope in Hamersley Drive.

It has been reported that small boats and kayaks are launched from the southern end of the Inlet, off Hamersley Drive. However, no evidence on site was found of a boat launching area, possibly due to the fact that inlet water levels have been low for an extended period of time. Steep banks, vegetation and the alignment of the current road would make boat launching in this area difficult and potentially unsafe.

Proposed action

<p>Facilities Action 4: Main Roads WA to design and implement rehabilitation of the depot site in car park 1. Rehabilitation to include reinstatement of car park to meet DEC design standards and replanting of flood plain area with local native species. Installation of an interpretive signage shelter and picnic benches also desirable.</p> <p>Explanation: This action needs to be undertaken in consultation with CIMG and other stakeholders.</p> <p>Lead: Main Roads WA.</p> <p>Priority: High.</p> <p>Time period: When Main Roads depot is not required (to be confirmed).</p>
<p>Facilities Action 5: Enlarge car park 2 so that layout meets car park design standards. Reinststate bollards to protect native vegetation.</p> <p>Explanation: The current car park layout does not meet standards for layout dimensions.</p> <p>Lead: Shire of Ravensthorpe.</p> <p>Priority: Medium.</p> <p>Time period: 2014.</p>

Bird hide

One of the main attractions to the Inlet is the diversity of water birds. Initial consultation indicates that the installation of a bird hide structure with interpretive signage would be well supported. Two possible sites (Location A and B) were identified in the Hamersley Drive precinct (Figure 6) and considered during the public consultation phase. Submissions indicate that Location A is best suited to be the bird hide site, pending detailed site planning. Further consultation will be held with Traditional Custodians (who were concerned about construction impacts) to explain the need for the hide to be in proximity to bird viewing areas when the Inlet levels are low. A site visit with Traditional Custodians and John Tucker is recommended. The location of a car park to service bird hide needs detailed input from the Shire of Ravensthorpe prior to a site being finalised. Consideration could also be given to a bird hide at the western end of Steeredale Road, should access be constructed.

Location A is on a small sandy dune and it could be sensitively constructed to protect the sand dune environment. A 130m long access path and three bay car park will need to be constructed (with removal of a small amount of native vegetation) and stabilised with compacted limestone. Signage at the trail head will need to be installed. The bird hide should blend in with its environment and be constructed of durable materials. The hide could contain signs with information about visiting water birds. If possible, the access track and bird hide should be accessible to people with disabilities.

Location B is close by and while the vantage point is not as good for bird watching as Location A, it already has a 200m long sandy track leading to it and will make an excellent lookout point (with interpretive signage). The track will need to be stabilised with compacted limestone. A clearing for a small car park (car park 3) already exists and needs to be delineated with bollards with signage to direct people to the lookout. This

location is within UCL and the installation of a lookout may constitute a 'future act' and should consider the requirements of the *Native Title Act 1993*.

Any access tracks or construction involved are likely to require a permit from DIA. The traditional custodians have requested that they be informed of progress with this project and that they be involved in planning and construction. It would be beneficial if the project could provide training and work experience outcomes for the Noongar community.

Proposed action

Facilities Action 6: Seek funding, design and construct a bird hide at Location A and a lookout at Location B (Figure 6), with interpretive signage, access paths and 3 bay car parks, following consultation with Traditional Custodians.

Explanation: Two of the major values of the Inlet are based on waterbird usage and appreciation of the views. Providing facilities to allow for viewing will increase appreciation of the Inlet.

Lead: CIMG and Shire of Ravensthorpe.

Priority: Medium.

Time period: 2013.



This bird hide blends into its surroundings and is made of natural, durable materials.

Potential walk trail

A preliminary investigation was undertaken to assess the eastern foreshore for the alignment of a walk trail. The inlet foreshore is narrow in places, with some areas prone to inundation which makes them relatively unsuitable for a walk trail. Initial assessment suggests that installation of a walk trail would be possible between Hamersley Drive to the unmade road Reserve of Steeredale Road (Figure 4), when considering landform and topography. This area is notionally zoned for 'Mixed Use' in this management plan.

Initial feedback about the construction of a walk trail during the preparation of this plan was mixed. While some people supported the idea of a walk trail, others were opposed on the following grounds:

- The trail may terminate at an inaccessible site (unmade section of Steeredale Road);
- Could be costly to construct with only limited demand at this time, with ongoing maintenance requirements;
- Would pre-empt possible development of Lot 1 Hamersley Drive;
- May be difficult to exclude motorbikes;
- Ideal alignment would cross Lot 1 Hamersley Drive in places (but could be designed to follow boundary);
- Could potentially pass through Aboriginal heritage sites that are yet to be surveyed and documented; and

- Is opposed at this time by the traditional custodians.

Feedback from public submissions indicate that the concept of a walk trail is endorsed, pending more detailed planning and consultation with Traditional Custodians and other stakeholders.

Proposed actions

Facilities Action 7:	Undertake community consultation and determine feasibility of walk trail in Reserve 34988 and adjacent to Lot 1 Hamersley Drive by preparing an options paper for public discussion.
Explanation:	Initial opinions about the possibility of a walk trail (shown in Figures 4 and 6) have been mixed. Further clarification and more detailed investigation of feasibility, costs and timing are required.
Lead:	CIMG and Shire of Ravensthorpe.
Priority:	Medium.
Time period:	2012.

Interpretive and safety signage

Signage is the one of the best ways to educate and inform the public. Installation of traffic, safety, and interpretive signage will ensure that Culham Inlet foreshore is better understood and valued. Development of a signage plan will allow for a coordinated approach to collection of interpretive material for signs, design, choosing the most appropriate location and standard of installation. Signage needs to be placed sensitively so that it does not block views or dominate its location. Signs should be in a standard format that is compatible with Shire of Ravensthorpe signage.

It is also advised that a sign containing standard information that meets the Australian Standard Z535 be installed at each visitor node, including Phillips River boat launching site, car park 1, car park 2 and car park 3 (see photo below). This sign should contain the name of the site, emergency phone numbers, general warnings, activities allowed and any prohibitions (e.g. keeping dogs under control and taking rubbish home as bins are not provided).



Example of an interpretive shelter (left). Example of a safety sign that meets Australian Standard Z535 (right).

Proposed actions

<p>Facilities Action 8: Formulate a signage plan for the Inlet access points, including drawing together safety and interpretive information.</p> <p>Explanation: Signage is the one of the best ways to educate and inform the public. This will ensure that Culham Inlet foreshore is better understood and valued. Development of a plan will allow for a coordinated approach to design and installation of signs.</p> <p>Lead: CIMG, Shire of Ravensthorpe.</p> <p>Priority: High.</p> <p>Time period: 2012.</p>
<p>Facilities Action 9: Install the following signs at Phillips River Reserve for traffic, safety and interpretation:</p> <ul style="list-style-type: none"> - Traffic signage as per Figure 5 - 'No camping', 'no firewood collection' and 'no fires' signage at entry point to Reserve - Safety sign consistent with AS Z535 integrated with interpretive sign shelter as per Figure 5 at the boat launching site (also incorporates boat speed limit). Subjects for interpretation include information on commercial and recreational fishing at the inlet (including bag limits), how to launch boats at the site, a map of the river and inlet, information about birds and animals (e.g. native water rat) and/or information about the Phillips River catchment. - Interpretive signage at proposed picnic site. Subjects for interpretation could include history of area and cultural heritage. <p>Explanation: Appropriate signage will increase knowledge and awareness and inform visitors about safety issues.</p> <p>Lead: Shire of Ravensthorpe.</p> <p>Priority: Medium.</p> <p>Time period: 2012/13.</p>
<p>Facilities Action 10: Install the following signs at Hamersley Drive precinct for traffic, safety and interpretation:</p> <ul style="list-style-type: none"> - Interpretive signage associated with the bird hide outlining values of Inlet and types of birds that visit. Trail head and directional signage for the bird hide will also be required. Cultural heritage information could also be included. - Interpretive signage shelter associated with car park 1 and lagoon area outlining information on previous flooding, replacement of Hamersley Drive, history of Culham Inlet water levels and salinity (e.g. Ralph Cooper's excellent inlet monitoring information) and/or cultural heritage information. - Safety signage at car parks 1, 2 and 3. - Erect sign 'rehabilitation area – please keep off' at area proposed to be bollarded at lagoon. <p>Explanation: Appropriate signage will increase knowledge and awareness and inform visitors about safety issues.</p> <p>Lead: Shire of Ravensthorpe.</p> <p>Priority: High.</p> <p>Time period: 2012.</p>

Approvals and processes

Most recommended projects or actions use currently disturbed sites and will not detract from the low key and scenic nature of the inlet. However, if during more detailed site planning it is determined that removal of any native vegetation is required, the project manager will need to meet with DEC to determine if a vegetation clearing permit is required under the *Environmental Protection Act 1986*.

Built structures will require a building permit from the Shire of Ravensthorpe.

Traditional custodians have requested that some approval processes under the *Aboriginal Heritage Act 1972* be sought, in consultation with DIA. In addition, the custodians would like to be informed of progress so that they can continue to be involved in the implementation of the projects.

Proposed actions

<p>Facilities Action 11: Ensure that appropriate approvals are in place, including:</p> <ul style="list-style-type: none"> - Clearing of native vegetation approvals (DEC); - Any building licences (Shire of Ravensthorpe); and - Approvals under the <i>Aboriginal Heritage Act 1972</i> (DIA).

Explanation:	Approvals for activities may need to be sought.
Lead:	Shire of Ravensthorpe, DEC.
Priority:	Medium.
Time period:	During life of management plan.

Maintenance of facilities and infrastructure

Maintenance of infrastructure is an essential element of sustainable management. When contemplating the installation of new facilities, the lifecycle of the elements need to be considered. Actions in this management plan are likely to introduce signage, furniture, a bird hide, trail and car park infrastructure which will periodically need to be checked, maintained and upgraded. While the CIMG are likely to take an active role in seeking grant funding and facilitating implementation, on-going costs are more likely to be borne by the Shire of Ravensthorpe. The Shire needs to comfortable that they can resource maintenance and monitoring over the lifetime of the management plan, and beyond.

Proposed actions

Facilities Action 12:	Develop an assets management plan for maintenance and monitoring of infrastructure in the Culham Inlet foreshore area, including: <ul style="list-style-type: none"> - Annual condition checks of infrastructure; - Active monitoring of Reserve use by Shire of Ravensthorpe ranger; and - Maintenance and upgrade schedule for infrastructure.
Explanation:	There are ongoing implications for monitoring, maintenance and upgrades in the Foreshore Reserves.
Lead:	Shire of Ravensthorpe.
Priority:	High.
Time period:	Initiate in 2012 for life of infrastructure.
Facilities Action 13:	Funding will be sought from external sources wherever possible for the maintenance of infrastructure created through the implementation of the Management Plan.
Explanation:	There are ongoing implications for monitoring, maintenance and upgrades in the Foreshore Reserves.
Lead:	Project Officer, Shire of Ravensthorpe.
Priority:	Medium.
Time period:	Initiate in 2012 for life of Management Plan.

4.8 Strategy - Appropriate recreational use

Goal:	To encourage low impact activities which enhance enjoyment and protection of the Inlet.
Outcomes:	A protected Inlet foreshore that is valued by the community.

Discussions with various stakeholders indicates that recreational activities that are either occurring or could possibly occur on and around the Inlet are listed in Table 4. These range from fairly low key, passive uses such as walking or bird watching to higher impacts activities such as motorbike use and water skiing. The relative suitability of these activities is also considered in Table 4 with preliminary recommendations for where these activities might best be carried out (or if they should be excluded).

Historically, commercial fishermen have camped at Phillips River Reserve and transported their catches to market via Phillips River Road. DRDL (State Land Section) have indicated that use of the Reserve for camping by commercial fishermen is not compatible with the purpose of the Reserve, which is 'Recreation and Conservation of Flora'. In addition, the Reserve does not have 'Power to Lease'. If the Shire were to consider allowing camping for commercial fishermen the purpose of the Reserve would need to be altered to indicate the commercial use, and incorporation of the 'Power to Lease'. A lease agreement would also need to be developed with the commercial fishermen to ensure that sharing of the site with the general public, access, rubbish and management of the site were adequately addressed.

Initial community feedback has indicated that it may be more appropriate for the site to be for day use only due to degradation of native vegetation, increased fire risk and rubbish. Also, some people felt that camping at this site should be prohibited as Hopetoun is close by and there are no facilities such as toilets to support campers. For any camping, appropriate facilities such as composting toilets would need to be installed.

It is not considered that camping is an appropriate use in the Hamersley Drive precinct due to the exposed nature of the Reserve. However, if planning progresses for the area on Lot 1 Hamersley Drive zoned 'Special Use', camping or tourist accommodation in the area could be undertaken under controlled conditions and with the proper facilities.

As use of the foreshore area increases, Shire officers (e.g. rangers) may be needed to monitor the use and condition of the area.

Table 4: Recreational activities and compatibility with foreshore management

Activity Type	Relative impact	Suitable areas	Comment
Swimming	Low impact if access adequate.	Most suitable areas are Phillips River Reserve and Hamersley Drive precincts.	Currently limited by low water levels.
Walking/ Bird watching	Low impact if access, delineation and signage adequate.	Most suitable areas are Phillips River Reserve and Hamersley Drive precincts. Potential for a walk trail along the south east portion of the foreshore (e.g. adjacent to Lot 1 Hamersley Drive).	South of Phillips River Reserve and around to the western side of the Steere River are not ideal for installation of a walking trail as these areas consist of muddy floodplains with poor access options.
Mountain biking	Medium impact. Would need specific planning to cater for bike access (to prevent introduction and spread of dieback, erosion control and reduce user conflict).	Phillips River Road and existing access tracks to boat launching site area are suitable for mountain bikes.	South of Phillips River Reserve and around to the western side of the Steere River are not ideal for mountain bike trails as these areas consist of muddy floodplains with poor access options. Options associated with the development of Lot 1 Hamersley Drive may present opportunities for multiple use trails in firebreaks.
Horse riding	Medium to high impact. Would need specific planning to cater for bridle trail access (to prevent introduction and spread of dieback, erosion control and reduce user conflict).	None of the foreshore areas assessed are considered suitable for horse riding.	Options associated with the development of Lot 1 Hamersley Drive may present opportunities for multiple use trails in firebreaks.
Motorbikes/ quad bikes	Medium to high impact. Would need specific planning to cater for motorbike access (to prevent introduction and spread of dieback, erosion control and reduce user conflict).	None of the foreshore areas assessed are considered suitable for motorbike or quad bike use.	Options associated with the development of Lot 1 Hamersley Drive may present opportunities for multiple use trails in firebreaks.

Canoeing/ kayaking	Low impact if access adequate.	The Phillips and lower Steere Rivers are most suitable for canoeing. The Inlet is suitable, but can be exposed and windy.	Access for canoeing is most suitable at the boat launching site at Phillips River Reserve. Access to the Steere River is problematic due to the need to access via private property.
Motor boats (e.g. recreational fishing)	Low impact if speed limits observed and there is adequate infrastructure for vehicle parking and boat launching.	Access from the boat launching site at the Phillips River Reserve is suitable, as long as there are no more than 2-3 vehicles at once.	Launching access is not available at any other point around the Inlet. Low water levels make access difficult.
Water skiing	High impact. Risks associated with submerged objects. Wake from speedboat may cause erosion. May disturb water birds. Current speed limit precludes this activity. Would require adequate infrastructure for vehicle parking and boat launching.	Not likely to be compatible due to speed limits, erosion risk and disturbance to water birds.	
Jet skis	Low impact if current speed limit adhered to. High impacts if used at higher speeds.	Access from the boat launching site at the Phillips River Reserve is suitable, as long as there are no more than 2-3 vehicles at once.	Launching access is not available at any other point around the Inlet. Low water levels make access difficult.
Camping	Relatively low impact if there is proper delineation and facilities such as rubbish collection, composting toilets and ongoing maintenance.	Phillips River Reserve is sometimes used as a campground. However the site does not have facilities (e.g. composting toilets) or services (rubbish collection) to cater for this use. Not considered suitable for Hamersley Drive precinct due to exposed nature of area.	Initial consultation has indicated that camping in the Foreshore Reserves are not well supported. Phillips River Reserve could be suitable for camping if services such as composting toilet and a rubbish collection service were implemented. Hamersley Drive precinct is not considered suitable for camping due to its exposed nature. However, there is an area zoned on Lot 1 Hamersley Drive (privately owned) that may be able to support tourist accommodation.

Proposed actions

Recreational Use Action 1:	
	<ul style="list-style-type: none"> - Support low impact recreational uses (e.g. walking, bird watching, canoeing/ kayaking, swimming and motor boats in areas notionally zoned 'Mixed Use' and 'Visitor Precinct'. - Investigate the potential for the incorporation and management of medium impact activities (e.g. mountain biking) in areas notionally zoned 'Mixed Use' and 'Visitor Precinct'. - Exclude and raise awareness of high impact uses (e.g. motor bikes, quad bikes and horse riding).
Explanation:	Low impact and manageable activities will enable enjoyment of the Inlet foreshore without damage to it (if adequately managed). However, medium impact activities require additional consideration and planning. High impact activities are unlikely to be compatible with foreshore management values.
Lead:	Shire of Ravensthorpe, CIMG.
Priority:	Medium.
Time period:	During life of management plan.
Recreational Use Action 2: Adopt a 'no camping' and 'no fires' policy in the Foreshore Reserve area.	
Explanation:	Camping in the Foreshore Reserve is not appropriate unless there is community support for the activity and adequate facilities (e.g. composting toilet) and services (rubbish collection) are provided.
Lead:	Shire of Ravensthorpe.
Priority:	High.
Time period:	Initiate in 2011.
Recreational Use Action 3: Shire rangers to patrol visitor nodes to monitor use of these areas and determine if maintenance is required (e.g. weekends and holidays).	
Explanation:	Regular patrols will allow for identification of inappropriate activities and to pick up any maintenance that might be required.
Lead:	Shire of Ravensthorpe.
Priority:	High.
Time period:	2011 - 2016.

4.9 Strategy - Protection of Aboriginal and European Heritage

Goal:	To understand, respect and protect heritage and cultural sites.
Outcome:	Holistic management of cultural, social and environmental values of Culham Inlet.

Applied Archaeology Australia (AAA, 2011) suggests that the project area was originally inhabited by Aboriginal people as part of a seasonal settlement-subsistence pattern focused on winter occupation. Given the range of associated cultural values, AAA considers that the Phillips River and the Culham Inlet are significant, sensitive areas. The traditional owners maintain traditional and historical connections and have requested ongoing consultation and engagement with any management proposal or action associated with this area.

Places associated with or significant to Aboriginal people are classified as sites and are protected under the *Aboriginal Heritage Act 1972*. This applies to all sites whether or not they have been formally registered with the Department. There are no Indigenous heritage sites recorded in the Department of Indigenous Affairs (DIA) Sites Register for the study area, although there is one recorded site and several potential sites on the western foreshore of Culham Inlet. The few previously recorded sites in this wider area reflect more the lack of formal, regional archaeological survey than the actual distribution of heritage places. Traditional custodians have advised that organisations involved with CIMG and Culham Inlet generally need to be mindful of obligations to the *Aboriginal Heritage Act 1972* in regards to any proposed on-ground works.

The UCL on the eastern foreshore falls within the Region 4 Wagyl Kaip Native Title Claim area under the *Native Title Act 1993*. Claimants and their representatives from the South West Aboriginal Land and Sea Council need be kept informed of proposed activities and events.

The traditional custodians have requested that Applied Archaeology Australia (AAA, 2011) progress a submission to the Department of Indigenous Affairs to list the Inlet and associated waterways as part of a heritage complex. This process is underway but may take some time for the regulatory body to review the nomination and place the area on the Register. Once registered, any proposed actions or works within the boundary of the heritage complex (yet to be determined) will require legal commitments to consult with the traditional custodians and obtain permits under the Aboriginal Heritage Act 1972. AAA suggest that this process can be integrated with the Foreshore Management Plan and ongoing communication and planning can facilitate outcomes for the conservation and management of both the natural and cultural values of the Inlet and associated waterways. Processes and implications need to be more fully explained to stakeholders such as CIMG.

There are no listed sites of European heritage within the study area. However, the Ravensthorpe Historical Society (Letter, 2007) has provided information that would be useful to include in interpretation signage for the Inlet.

Proposed actions

<p>Heritage Action 1: Seek funding and carry out a cultural heritage assessment of the inlet area and associated waterways.</p> <ul style="list-style-type: none"> - Archaeologist: Allow \$10,000. - Traditional custodians – two day workshop and site visit: Allow \$15,000 for 15 people. <p>Explanation: To ensure that cultural values are understood and protected, a cultural heritage assessment is needed to identify archaeological and cultural elements.</p> <p>Lead: Traditional custodians, South Coast NRM and DIA.</p> <p>Priority: High.</p> <p>Time period: Seek funding 2011/2012, undertake in 2012/2013.</p>
<p>Heritage Action 2: Seek appropriate approvals for on-ground works through consultation with DIA.</p> <p>Explanation: There are legal requirements under the Aboriginal Heritage Act to protect known and unknown sites from damage and/or disturbance.</p> <p>Lead: CIMG, Shire of Ravensthorpe, traditional custodians via South Coast NRM and DIA.</p> <p>Priority: High.</p> <p>Time period: Initiate 2011.</p>
<p>Heritage Action 3: Consult with traditional custodians over the life of the management plan and seek funding to enable this.</p> <ul style="list-style-type: none"> - Organise two half day meetings in Albany and Esperance (allow \$2000) in 2012. - Provide progress reports in person, annually to existing groups: Esperance Nyungar Aboriginal Corporation and Albany Heritage Reference Group. <p>Explanation: Active involvement of traditional custodians will enhance the management and understanding of the Culham Inlet foreshore.</p> <p>Lead: CIMG, traditional custodians via South Coast NRM and DIA</p> <p>Priority: High.</p> <p>Time period: Initiate 2011.</p>
<p>Heritage Action 4: Traditional custodians/South Coast NRM to seek clarification from DIA regarding the creation of a Heritage Complex, to identify possible impacts on management of the Inlet.</p> <p>Explanation: CIMG are currently unsure of the implications of the establishment of a Heritage Complex on the management of Culham Inlet foreshore. Clarification from DIA needs to be sought on this matter. CIMG recognises that the organisations best able to explain and facilitate this process are the traditional custodians, South Coast NRM and DIA.</p> <p>Lead: CIMG, Traditional custodians, South Coast NRM and DIA.</p> <p>Priority: Medium.</p> <p>Time period: Initiate 2012.</p>
<p>Heritage Action 5: Collect and collate suitable information for use in interpretive signage that relates to Aboriginal and European heritage.</p>

Explanation:	The use of appropriate material in interpretive signs will enrich visitor understanding of the broader values of the Culham Inlet and its foreshore.
Lead:	Project Officer, South Coast NRM, traditional custodians, Ravensthorpe Historical Society.
Priority:	Medium.
Time period:	Initiate 2012

4.10 Strategy - Management of future development and determination of foreshore width

It is most likely that there were different standards which determined where boundaries were placed for Foreshore Reserves when the original Reserve surveys were done. Also, since surveying, the Inlet and Rivers may have seen considerable changes to shorelines, particularly after flood events and development of the catchment for agricultural purposes. This means that the existing Reserves are narrow in places and/or contain flood plains which are prone to inundation or are not easy to access.

The Culham Inlet is occasionally affected by large storm events which cause river flow and flooding which influences the foreshore, inlet levels and break-through to the ocean. In the longer term, Climate change is causing an increase in mean sea level due to melting of land based ice and thermal expansion, which increases the volume of the ocean (IPCC, 2007). It is anticipated that estuary water levels will rise in line with sea levels (Coffey Environments *et al.*, 2009). Sea levels have already increased by 0.17m during the 20th century and are predicted to rise between 0.2 to 0.8m or even 1.0m over this century (IPCC, 2007; Coffey Environments *et al.*, 2009). It is unclear what the exact implications of sea level rise are for estuaries such as Culham Inlet.

DoW (Simon Rogers, *pers. comm.*) has advised that flood levels in Culham Inlet are likely to be largely driven by coastal processes (i.e. tide and storm surge). Based on some preliminary information for Esperance, the 10 year ARI and 100 year ARI ocean levels are currently estimated at 1.15 m AHD and 1.25 m AHD, respectively. However, these levels will be affected by possible sea level rise and an *Interim Position Paper on State Coastal Planning Policy SPP2.6* (WAPC, 2010) recommends the adoption of a 0.9 metre allowance for possible sea level rise over the next century within planning. Consequently, the 10 year ARI and 100 ARI inundation levels for planning are expected to be ~ 2.05 m AHD and 2.15 m AHD by the year 2110.

Extreme variation in water flow makes Culham Inlet a naturally complex biological ecosystem. The Inlet has been known to hold water for many years, from river flows that almost fill the inlet without breaking the bar. The Inlet can also dry out completely following a break of the bar or after a long period without significant river floods and with high evaporation. With these drastic and unpredictable changes in the water volume, the salinity at different times varies from less than one third sea water when full to eight times that of sea water when shallow, producing sheets of salt crystals round the margins. In addition, floods can have a significant impact on the foreshore through erosion and sedimentation. In light of the variable nature of the system, placement of infrastructure needs to be carefully considered. This consideration also needs to extend to appropriate foreshore Reserve boundaries which will serve the Inlet and community in the long term.

The most common means of increasing foreshore Reserve widths is by ceding of land to the Crown at the subdivision stage of development. The planning and environmental assessment stages of development provide an opportunity to determine whether the development meets planning and environmental requirements. It also allows for identification of a suitable foreshore setback that may be required to accommodate natural processes, Climate Change and recreation/cultural needs. Other than through the subdivision planning process, changing Reserve boundaries has significant implications for the managers of the land including a legal process, resumption and acquisition. It is a path that is seldom taken except in extreme cases. Changing Reserve boundaries may not necessarily improve management of an area,

especially if management agreements can be achieved with surrounding land owners. Management agreements with private landowners may include assistance with fencing to exclude stock and rehabilitation with local native species.

The only area associated with the Culham Inlet foreshore identified by the Shire of Ravensthorpe Local Planning Strategy (2003) as being a possibility for subdivision for 'Rural Living' and a tourist node (e.g. caravan park or similar) is Lot 1 Hamersley Drive. If rezoning and subsequent subdivision of Lot 1 occurs, there is scope to increase the foreshore width to cater for physical and biological processes, recreation and cultural protection.

Determining an adequate foreshore Reserve width involves:

- Making allowances for biophysical processes;
- Catering for recreational needs and consider visual amenity;
- Providing access;
- Managing storm water and drainage,
- Mitigating onsite effluent disposal; and
- Protecting cultural heritage sites.

These parameters are usually assessed in detail through the planning process with preparation and implementation of a management plan to the satisfaction of organisations such as Local Government, DEC and DoW. Each site is dealt with on a case by case basis, with consideration of the following:

- *Aboriginal Heritage Act 1972.*
- Western Australian Planning Commission (2003) State Planning Policy 2.6 State Coastal Planning Policy.
- Western Australian Planning Commission (1989)1989) Development Control Policy 6.1 – Country Coastal Planning Policy.
- EPA (2008) Guidance Statement No. 33 (B5-1 Determining foreshore Reserves).
- Water and Rivers Commission (2001a) Determining Foreshore Reserves. Report RR16.
- Water and Rivers Commission (2001b) Determining Foreshore Reserves. Water Note 23.
- Water and Rivers Commission (2002) Statewide Foreshore Policy 1.

Physical, biological and cultural information that has been collated for the Inlet and foreshore will greatly assist the successful determination of an appropriate foreshore Reserve width. Preliminary¹ consideration of a foreshore width could include the following elements (as shown in Figure 7):

1. Based on flooding history of 1993 and 2000, foreshore areas below 4mAHD may be prone to flooding and/or inundation and could either be incorporated into a foreshore Reserves and/or be the subject of a development exclusion zone.
2. Incorporation of Excellent to Very Good condition vegetation as an ecological corridor to a notional width of approximately 100m from permanent vegetation line; and
3. Allowance for sustainable recreation and access along the foreshore (may be incorporated within elements 1 and 2).

¹ The preliminary foreshore width elements are for discussion only and do not reflect endorsement by the landowners or decision making authorities.

Information which is not currently known, but that could help to determine future foreshore widths include:

- The results of any cultural and/or archaeological surveys; and
- Information regarding Declared Rare and Priority Flora.

To facilitate good planning, the Shire of Ravensthorpe could prepare a guidance note under the Shire of Ravensthorpe’s Town Planning Scheme No. 5, to proactively guide the design, location and management of proposed areas of development.

Proposed actions

<p>Future Development Action 1: Consider the following attributes (as shown in Figure 7) in determining the foreshore width of areas subject to subdivision.</p> <ul style="list-style-type: none"> - Flood zone, sea level rise, storm surge; - Development and drainage requirements; - Ecological corridor, flora, vegetation and fauna needs; and - Cultural heritage, recreation requirements. <p>Explanation: The long term health of the inlet foreshore is dependent on the creation and protection of an adequate foreshore Reserve.</p> <p>Lead: Shire of Ravensthorpe, Department of Planning.</p> <p>Priority: Medium.</p> <p>Time period: During planning and development approvals process.</p>
<p>Future Development Action 2: Preparation of a guidance note under the Shire of Ravensthorpe’s Town Planning Scheme No. 5 to proactively guide the design, location and management of proposed areas of development.</p> <p>Explanation: A guidance note will provide information for the community and prospective developers regarding the planning process.</p> <p>Lead: CIMG, DoW and the Shire of Ravensthorpe.</p> <p>Priority: Medium.</p> <p>Time period: 2013.</p>

5 Implementation and Reporting

Implementation of this Plan will be coordinated by the CIMG in partnership with key stakeholders. Currently the CIMG is supported by a part-time Project Officer who is employed by RAIN. Retention of the RAIN Project Officer is vital to the implementation of the Foreshore Management Plan.

The action plan is summarised in Table 1 and outlines the timeframes of proposed actions. This will assist planning of future works and includes an approximate budget required. Funding can then be sought well in advance of project commencement. On-ground works are the priority for this Plan and should be implemented over five years with a review to be conducted after 2016.

Although approximate budgets have been included for actions, they are considered to be estimates only. More detailed costing for the completion of actions should be determined prior to submitting applications for funding.

The Shire of Ravensthorpe have advised that that any commitment of Shire resources will need to be assessed as part of the Shire's overall financial planning and that the Management Plan will not necessarily be given priority over any other requirements of Council.

Funding opportunities for the implementation of this plan can be sought through the State and Federal natural resource management funding via South Coast NRM. Partner organisations and groups may be able to offer financial and in-kind support for the completion of some projects. Other grant options can be explored such as Coastwest, Lotterywest and DEC grants.

Reporting progress on the implementation of this Plan and changes to the condition of the eastern inlet foreshore area will be an important role for the Project Officer. Annual reports will need to be made available to the community.

The Project Officer and key stakeholders will need to provide updates to the CIMG at each meeting and report to the Shire of Ravensthorpe annually. Any funding received will require progress and completion reporting to the appropriate funding body.

Proposed actions

Reporting Action 1: Project Officer and action leaders to prepare the following applications and reports:

- Grant funding applications;
- Biannual reports to CIMG meeting;
- Annual progress reports to Shire of Ravensthorpe, Aboriginal groups and community; and
- Funding progress and completion reports.

Explanation: The community and key stakeholders need to be informed of progress and outcomes.

Lead: CIMG and action leaders

Priority: High.

Time period: 2011 to 2016.

6 Monitoring, Evaluation and Measuring Progress

To measure the progress of the implementation phase of this Plan, a number of targets have been selected to broadly cover the main action areas. Completion of these targets will indicate the plan is being implemented successfully.

Table 5: Action targets

Action Target	How it will be measured
Action Target 1: Support of CIMG and community by a Project Officer to coordinate implementation of the plan commencing 2011.	Ongoing funding and employment of Project Officer to 2016.
Action Target 2: Involvement of community, including traditional custodians.	Endorsement of communication strategy. Number of community members involved, number of meeting, workshops and events between 2011 and 2016.
Action Target 3: Completion of tenure resolution of UCL.	On resolution of management orders or other agreement.
Action Target 4: Management of invasive species, including weeds, feral animals and dieback. Completion of dieback assessment.	Measured through comparison of weed distribution from Craig, 2009 and 2016. Number of feral shooting events. No dieback introduced or spread during life of Plan.
Action Target 5: Installation of infrastructure and signage.	On completion of precinct implementation plans as determined by the Culham Inlet Management Group.
Action Target 6: Development of fire management Plan.	CIMG to endorse Fire Management Plan with input and advice from Fitzgerald River National Park Fire Advisory Board, Shire of Ravensthorpe and Fire and Emergency Services representatives.
Action Target 7: Proactive planning for future development around Culham Inlet.	Endorsement by the Shire of Ravensthorpe of a development guidance note under the Shire of Ravensthorpe's Town Planning Scheme No. 5 to proactively guide the design, location and management of proposed areas of development.

7 Glossary

Regulation 10 of *Aboriginal Heritage Act 1972*

This form only applies where a proposed activity might occur on an Aboriginal site, is likely to adversely affect that site, and the nature of the activity is such that it is unlikely to be deleterious to the preservation of that site and/or will enhance the preservation of that site. Where the proposed activity has a deleterious purpose, such as construction or development, another more appropriate form of consent may be appropriate, such as consent under section 18 of *the Aboriginal Heritage Act 1972 (WA)*. The Department of Indigenous Affairs provides advice on this matter.

Section 18 of *Aboriginal Heritage Act 1972*

It is DIA's preference that any development plans are modified to avoid damaging or altering any site. Should this not be possible, and in order to avoid committing an offence under the Act, the landowner may seek the Minister for Indigenous Affairs' prior written consent to use the land. This is done by submitting a notice in writing under Section 18 of the Act ("a Section 18 Notice") to the Aboriginal Cultural Material Committee.

8 References and Further Reading

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Unpublished documents prepared for this plan and available from Ravensthorpe Agricultural Initiative Network include:

- Literature Review of Culham Inlet and its catchment – prepared in 2007
- Community Attitudes Towards Culham Inlet – compilation of community and organisation questionnaire response 2007
- Issues Paper – prepared in 2007
- Culham Inlet workshop with Traditional Custodians – report prepared in 2008
- An assessment of condition and values of the Steere River and its tributaries – prepared by Andrew Chapman 2007
- Culham Inlet Observations 1989–2007 - unpublished report prepared by Ralph Cooper in 2007.
- Background papers:
 - Catchment – Ravensthorpe Agricultural Initiative Network
 - Flora and Fauna – compiled by the Department of Water
 - Fish and Fisheries – Department of Fisheries, the Centre for Fish and Fisheries Management, Murdoch University and the South Coast Licensed Fishermen’s Association
 - Birdlife – Merle Bennett (community member)
 - Water Level and Sandbar Management – Main Roads WA
 - Land Use Development – Shire of Ravensthorpe
 - Inlet Use and Access – Shire of Ravensthorpe
 - Elverdton Mine Tailings – compiled by the Department of Water
 - Inlet and Foreshore Management – Department of Water
 - Information on European Heritage – Ravensthorpe Historical Society.

9 Contacts

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FIGURES

Appendix A – Summary of survey results

March and April 2011 (10 respondents)

Age: 1-15: 0 16-30: 1 31-50: 2 51-70: 4 Over 70: 3
Gender: Male: 6 Female:4
What locality do you live in?
Hopetoun 6 Not Hopetoun 1 Ravensthorpe 1 North east Ravensthorpe 1
How long have you lived in the area?
Less than 5 years: 1 More than 5 years: 8
Are you a visitor to the area? Yes: 1 No: 9

Your view of the Inlet:

Q1. Is the Culham Inlet Foreshore important to you?				
Very		Not at all		
1	2	3	4	5
9	0	1	0	0

Why?
Nice to look at
Fun to explore
Good bird watching site
Natural unspoilt area
Still largely unaffected by human predation
Its biodiversity, birds, beauty, serenity
Scenic
Maintains water quality
Provides access to inlet
Part of the local ecosystem
Enjoy the fishing and bird life, swimming, walking and natural bush
It is a good feeding and breeding area for many of our native water birds
Beautiful natural feature currently only a little degraded.
Important wetland

Q2. What are the things you value the most about the Eastern Inlet Foreshore?
The views
Nature
As above. Flora and fauna
As above

Scenery, wildlife, naturalness
Uniqueness
The natural coastline
It is still in a fairly natural state and should remain this way
Preservation of environment, flora and fauna, scenery, and comparative pristine state
So far it is not trashed by bikes and four wheel drives

Q3. Are you concerned about the future of the Inlet Foreshore?

Very Not at all

1	2	3	4	5
7	1	1	0	0

Why?

Potential impacts of road development. Changes in landscape use on eastern side of inlet
Pollution and degradation
Human degradation
Risk of incremental pollution with the increasing population, tourists and farming
Weeds, water quality decline, landholder input nearby, feral animals
It is starting to look sad
With the population explosion in Hopetoun and all the four wheel motorbikes and trail bikes – lots of erosion
Uncontrolled fishing and fishing camp sites. Four wheel drive vehicles
Why do ‘we’ need a caravan park beside it. Why develop everywhere?

Q4. What are the things you value the most about the Eastern Inlet Foreshore?

It is a good buffer between the inlet and farmland. Provides different habitat than west side
Nature
See question 2 (3 responses)
Its beauty and relatively untouched, unspoilt state
Changes over seasons, scenic, ecosystems
It is peaceful
Almost unspoilt. Except for weeds and rabbits

Q5. Do we need to know more about the eastern foreshore e.g. environmental monitoring (If so, what information is needed?).

Effects and amount of nutrient and chemical run off from farmlands
Environmental

Quality of water – contamination e.g. chemicals and mineral deposits. Bird life
Pretty well researched recently but monitoring needs to continue
Fauna levels and distribution, weed locations, water quality indicators
Yes. There are things farmers could be doing to mitigate agricultural impacts on the inlet’s ecology. How can action be encouraged?
Any information
Do we know who lives there? Do these places have to be disturbed?

Q6. What do you think should be done to achieve the future you want for the Eastern Inlet Foreshore?
Procure land to increase natural vegetation.
Revegetation
Control of recreational activities
More money and manpower for monitoring, widen the foreshore Reserve, more control of ferals and weeds
Vested as Reserve, increase the buffer between farmland and foreshore
Get more information out there. People are all in the dark
Stop the use of trail bikes and four wheel drive motorbikes in our bushland
Controlled use
Restrict access – no vehicles, no camping

Q7. What activities do you enjoy on the Inlet and Foreshore?
Bird watching (4 responses)
Exploring (1)
The views (1)
Photography (5 responses)
Nature appreciation (2 responses)
Walking, bird watching, wildflowers
Sightseeing, walking, exploring, canoeing
Picnicking (3 responses)
Meditating
Fishing, walking, bird life, flora and fauna, swimming
Sailing up to Pitchi Ritchi. Marvelling at the scenery, birds

Q8. What facilities do you think are needed in the Eastern Foreshore Reserve?
Dual-use path/cycle way out to inlet and up eastern side. Walkways out into the water. Picnic tables, shelters (2 responses)
Walk trails (5 responses)

Interpretation Signage (flora, fauna, historical) 1
Facilities for bird watching, wildflower observation and picnicking.
Signage, better access to rivers and inlet
Toilets, picnic benches and shade, information board
No bikes or cars. We are not all young
None
Recognised and well defined access tracks
Preservation and identification of Aboriginal sites. Also European settler sites

Q9. Do you have any other comments on the management of the Eastern Foreshore?
I would like to know what sorts of weeds are present around the inlet.
Needs to be policed by rangers

Q10. What role would you like to play in management of the Eastern Foreshore?
Occasional input.
None
Observer
Interested local resident
Observer
Help if I can

Would you like to be informed on the progress of this project? If so, please provide your email or postal address below
Yes 2
No 1

Appendix B – Boat Ramp – GeoPro Cells

Appendix C – Summary of Submissions and Responses

The public submission period for the Culham Inlet – Eastern Foreshore Management Plan ran for three weeks from Monday 5 September to 27 September 2011.

In total, four submissions were received from:

- Department of Environment and Conservation (Peter Masters);
- Andrew Chapman;
- John Tucker; and
- Shire of Ravensthorpe.

In addition, an informal discussion was held with Delma Baesjou of Ayton Baesjou Planning regarding possible interest by nearby landowners.

Representatives from CIMG (Karl Hansom, Rodger Walker and Murray Gangell) also provided input on Action priorities in a track changed version of the Management Plan.

Submissions are summarised in Table 1. A column has been inserted into Table 1 to incorporate CIMG feedback on the submission/comment/recommendation. This information will assist in finalising the management plan.

TABLE 1: SUMMARY OF SUBMISSIONS

SUBMITTOR	SUBMISSION	COMMENT/RECOMMENDED RESPONSE	CIMG DECISION
DEC (Peter Masters)	Page V / Abbreviations FESA = Fire & Emergency Services Authority of Western Australia.	Noted and endorse change.	Agree with recommended response.
	Page 1 Summary/Paragraph 2 (11.3) = 11.3km ³	Changed to 11.3km ² .	Agree with recommended response.
	Page 3 Habitat Protection Action 1, Lead should be CIMG Project Officer; it is not a DEC responsibility.	Endorse change.	Agree with recommended response.
	Page3 Invasive Species Action 1, Lead CIMG, DEC has extensively surveys DEC estate, CIMG should budget for consultants not a DEC responsibility.	Change lead to: CIMG with advice from DEC. Indicative budget: \$5,000.	Agree with recommended response.
	Page 4 Invasive Species 9, DEC has no authority to bait for feral animals on non DEC estate. The only baiting DEC completes is within DEC estate and falls within the Western Shield program.	Noted and endorse removal of DEC.	Agree with recommended response.
	Page 4 Fire Management Action 1 Lead should be Ravensthorpe Shire as it is their responsibility to prepare Fire Management Plans on their estate.	Recommend changing lead to: Shire of Ravensthorpe (with advice from FESA and DEC).	Agree with recommended response.
	Page 5 Fire Management Action 2, Shire of Ravensthorpe responsibility.	Recommend changing lead to: Shire of Ravensthorpe (with	Agree with recommended

		advice from FESA and DEC).	response
	<p>Page 28 Access Actions 3 the photo showing the locations of the proposed bollards is in-fact shown on DEC estate (See attached tenure maps) and its shown on the cadastre boundary map on the Culham Inlet maps that you show on the Management Plan.</p> <p>If bollards are to be erected than they should be placed along Hamersley Drive linking the day use site (Current MRD office) to the Culham Inlet Causeway Bridge and continue on the other bank to link up with park vegetation.</p>	<p>Change Figure 6 to reflect DEC recommended bollard alignment (see submission for detail). Change lead to CIMG, Shire of Ravensthorpe and DEC. Changes required on page 6, page 28.</p>	<p>Agree with recommended response.</p>
Andrew Chapman	<p>Invasive species action 9 should include a means of encouraging adjacent landholders to undertake feral animal control, of fox and rabbit in particular, in adjoining farming lands. This could either be financial, logistic or materials support.</p>	<p>Change ISA 9 to include wording: Investigate financial, logistical and/or material support.</p>	<p>Agree with recommended response.</p>
	<p>A tenure action is required to either extend the width of reserve no. 34998 or mandate a buffer zone along the inlet edge of CG 95 as part of the approval process for the development of that location. The reason for this is that the present reserve is patently too narrow (in places 20 m) to support plants and animals and the processes that sustain them. Note that either way, management inputs of fencing, weed control and revegetation will be required as well as just a 'line on a map'.</p>	<p>Future Development Action 1 recommends consideration of biophysical and social attributes to determine foreshore width for areas going through planning for subdivision/development.</p> <p>I don't think we can undertake a tenure action outside of the planning process. Recommend leaving actions 'as is'. On-ground actions such as fencing and weeding will be made part of development approval.</p>	<p>Agree with recommended response.</p>
	<p>Facilities Action 7 could include a walk trail around the eastern side of the inlet from the south west corner of CG 73 to the bird hide site at the southern end of the inlet. The walk features the limestone cliffs which offer great views of the inlet and mountains, the littoral fringe and some coastal moort</p>	<p>The current plan does suggest consideration of the walk trail from the south west corner of CG 73 (see Figure 4). However, there are some issues that need to be resolved including opposition from the Traditional Custodians.</p> <p>Suggest endorsing concept of</p>	<p>Agree with recommended response.</p>

	woodland. It could be named in honour of Edward John Eyre as it was part of his exploration route as he approached East Mt Barren in 1841. There is excellent material in Eyre's narrative for interpretation.	walk trail pending more detailed planning for walk trail and consultation with Traditional Custodians and other stakeholders.	
	With respect to bird hides, and subject to access, consideration could be given to the proposed northern trail head as a bird hide site; it features shore bird habitat, seasonal brackish water swamps and mature coastal moort and Rottnest ti tree woodland.	Noted. This could be included in more detailed planning. Note that nearby landowners who are currently planning for rural residential development may be interested in being involved in creating a node at the western end of the unmade Steerdale Road reserve.	Agree with recommended response.
	It does occur to me that relevant to all these suggestions is securing the goodwill and co-operation of the owners of CG 95 as well as an understanding of what is proposed and where approvals are at for this development.	CG 95 is now Lot 1 Hamersley Drive which is adjacent to Reserve 34998 on the south eastern edge of the Culham Inlet. Communication with the landowner is recommended. No change required to MP. Recommend ongoing communication and consultation as per Partnership Action 2.	Agree with recommended response.
John Tucker	Bird Hide site – Location B not considered suitable – No birds. Feels that Location A could be constructed without causing damage. Also suggests small car park near the depth marker (plan attached). Wider range of birds viewed from near this point (16 species listed)	Further consultation with Traditional Custodians recommended. However, Location A could be constructed in a way that prevents degradation/erosion to the site. Suggest that Location B have a viewing platform with interpretation but not be a bird hide per se. Melanie to include the following in text: That the Management Plan endorse Location A as the bird hide site, pending detailed site planning. Further consultation will be held with Traditional Custodians to explain the need for the hide to be in proximity to bird viewing areas when the Inlet levels are low. A site visit with Traditional Custodians and John Tucker is recommended. Car park to service bird hide needs detailed input from the Shire of Ravensthorpe prior to a site	Agree with recommended response.

		being finalised.	
	Concerned about access of vehicles around lagoon, which is in Fitzgerald River National Park. Birds are trying to nest in samphire flats, which puts them at risk.	DEC has endorsed an alignment of bollards in its submission. Subject to partnership with CIMG and Shire of Ravensthorpe. Subject to detailed planning, funding/budget.	Agree with recommended response.
Shire of Ravensthorpe	That Council, 1. Generally support and the draft Culham Inlet – Eastern Foreshore Management Plan;	Noted.	Agree with recommended response.
	2. Recommend that it be made clear in the Management Plan that any commitment of Shire resources will need to be assessed as part of the Shire’s overall financial planning and that the Management Plan will not necessarily be given priority over any other requirements of Council;	Insert text to clarify that ‘any commitment of Shire resources will need to be assessed as part of the Shire’s overall financial planning and considered in relation to all of Council’s commitments’.	Agree with recommended response.
	3. An additional action be added to the Management Plan, with the ‘Project Officer’ as the lead, that funding will be sought from external sources wherever possible for the maintenance of infrastructure created through the implementation of the Management Plan.	Funding for maintenance is generally not available (NRM funding). However, this text can be inserted as it emphasizes the ongoing responsibility of maintenance for all infrastructure.	Agree with recommended response.
Delma Baesjou (Ayton Baesjou Planning- phone call)	Nearby landowners who are currently going through the planning process would be interested in being involved in further planning for the foreshore, especially a node at the western end of the unmade portion of Steerdale Road.	Recommend ongoing communication and consultation as per Partnership Action 2.	Agree with recommended response.
CIMG (Karl, Rodger, Murray)	Input on priorities submitted.	Incorporated into Version 5 (Final)	Agree with recommended response.