

# Performance Story Report

A study of the Mount Lofty Ranges Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Program and how it contributed to biodiversity outcomes in the Adelaide and Mount Lofty Ranges Natural Resources Management region.

September 2008

This "Performance Story Report" is one part of a pilot project being implemented to trial a new way of collecting and reporting NRM results.



Australian Government



Government  
of South Australia



Government of South Australia  
Adelaide & Mount Lofty Ranges  
Natural Resources Management Board

# Executive Summary

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This study is part of an Australian Government pilot of the “participatory performance story report” evaluation process, and was conducted in partnership with the Adelaide and Mount Lofty Ranges Natural Resources Management (AMLR NRM) Board and with the participation of the South Australian Murray-Darling Basin (SAMDB) NRM Board. The aim of the study was to evaluate the extent to which investment in the Mount Lofty Ranges Southern Emu-wren (MLRSEW) and Fleurieu Peninsula Swamps (FPS) Recovery Program contributed to biodiversity outcomes on the Fleurieu Peninsula, South Australia.

The MLRSEW and FPS Recovery Program, aims to improve the conservation status of the Emu-wren and Swamps, which are listed as endangered and critically endangered respectively under the *Environment Protection and Biodiversity Conservation Act 1999*. The activities of the Recovery Program are directed towards reducing, mitigating and managing threats and risks to the species and ecological community. They include research and monitoring, advocacy, contributing to natural resource management and planning processes, awareness raising and education, engaging land managers and other stakeholders, on-ground works and population management of the Emu-wren. Protection and rehabilitation of Swamps and dry-heath habitat through stock exclusion or grazing management, weed and pest control and revegetation are the key on-ground activities of the program.

The evidence collected for this evaluation was sourced from interviews with participating land managers, Recovery Team representatives and scientists, as well as published reports, and unpublished information provided by the Recovery Program. A program logic model was developed to document the hierarchy of activities, outputs and outcomes (regional NRM targets) of the Recovery Program, and was used as a framework against which evidence was collected and evaluated. Many land managers, Recovery Team representatives and natural resource management professionals also contributed to the evaluation by taking part in the identification of the program’s achievements and issues, and formulating recommendations.

The resource condition targets examined in this study relate to the condition, extent and fragmentation of native vegetation, the quality and quantity of water and the status of threatened species and ecological communities. In the absence of comprehensive quantitative data to assess resource condition, expert opinion consistently identified historic declines in these asset characteristics and at least a slowing of the rate of decline during the evaluation period. The following points summarise the Recovery Program’s contribution to resource condition, based on expert opinion informed by the evidence contained in this report.

- The Recovery Program has been effective in improving condition at some sites. Without the program, it is reasonable to assume that areas now under management would have experienced continued threats from grazing, uncontrolled weeds and overall condition decline would have been significantly greater.
- The Recovery Program has deterred clearance and actively contributed to natural regeneration and has therefore substantially contributed to maintaining the extent of Swamps and dry heath habitat.
- The Recovery Program has slightly slowed the rate of isolation of populations/remnants by reducing the degree of isolation at targeted sites.
- The Recovery Program has played a major role in ensuring appropriate water delivery to Fleurieu Peninsula Swamps by identifying their existence, listing them under the EPBC Act 1999, and stating that water has critical influence on their survival and condition. This has enabled water managers to allow for their environmental water requirements.
- Recovery Program actions are helping to reduce the rates of population and habitat quality decline for the Emu-wren. Without the Recovery Program the rates of decline in range and abundance would continue and lead to local extinctions for many species.

Although absolute improvement in the condition of these resources has not been observed, the Recovery Program has made an important contribution to slowing the rates of decline in resource condition which is a significant achievement.

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# Section 1: Background

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## Introduction

The aim of this study was to evaluate the extent to which Australian Government Natural Heritage Trust (NHT) and National Action Plan for Salinity and Water Quality (NAP) investment contributed to biodiversity outcomes on the Fleurieu Peninsula, South Australia. The investment line selected for this study was the Mount Lofty Ranges Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Program (hereafter referred to as the Recovery Program) that has been operating since 1993/4. The program was funded through the Adelaide and Mount Lofty Ranges (AMLR) NRM Board and the South Australian Murray Darling Basin (SAMDB) NRM Board.

## Background to the Recovery Program

The Mount Lofty Ranges Southern Emu-wren (MLRSEW) and Fleurieu Peninsula Swamps (FPS) Recovery Program aims to improve the conservation status of the Emu-wren and Swamps. Both the species and ecological community are listed as threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the Emu-wren being classified as endangered and the Fleurieu Peninsula Swamps as critically endangered.

When the program began in 1993/4 its focus was primarily on the recovery of the Emu-wren and protection of its dry heath and swamp habitats on the Fleurieu Peninsula. The greater understanding of the swamps gained as a result of the program led to their successful nomination as a critically endangered ecological community. In 2003, the beginning of the evaluation period, the program was expanded to include the recovery of Swamps in their own right.

The Recovery Program, while funded by the Natural Heritage Trust (NHT) and the National Action Plan for Salinity and Water Quality (NAP) through the Natural Resource Management Boards, was delivered by the Conservation Council of South Australia (CCSA) and directed by a Recovery Team with representatives from Government agencies, NRM boards, non-government conservation organisations and a research institution.

The Emu-wren and Swamps are threatened by a range of processes including habitat loss and fragmentation, isolation of populations and remnants, water reduction, interception and extraction, weeds, feral animals, predators, pathogens, inappropriate grazing, fire and other disturbance regimes and climate change. Plantation forestry is one example of intensified land use in the region, increasing demand and pressure on natural resources and driving threatening processes such as water reduction, interception and extraction.<sup>a b</sup>

The program activities are directed towards reducing, mitigating and managing threats and risks to the survival of the species and ecological community. They include research and monitoring, advocacy, contributing to natural resource management and planning processes, awareness raising and education, engaging land managers and other stakeholders, on-ground works and population management of the Emu-wren. Protection and rehabilitation of Swamps and dry-heath vegetation through stock exclusion or grazing management, weed and pest control and revegetation are the key on-ground activities of the program.

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<sup>a</sup> Mount Lofty Ranges Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Team (2007) Recovery Statement for the Fleurieu Peninsula Swamps 2007-2011. Conservation Council of South Australia

<sup>b</sup> Pickett, M. (2007) MLR Southern Emu-wren Conservation Strategy. Version 1.5 Mount Lofty Ranges Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Team

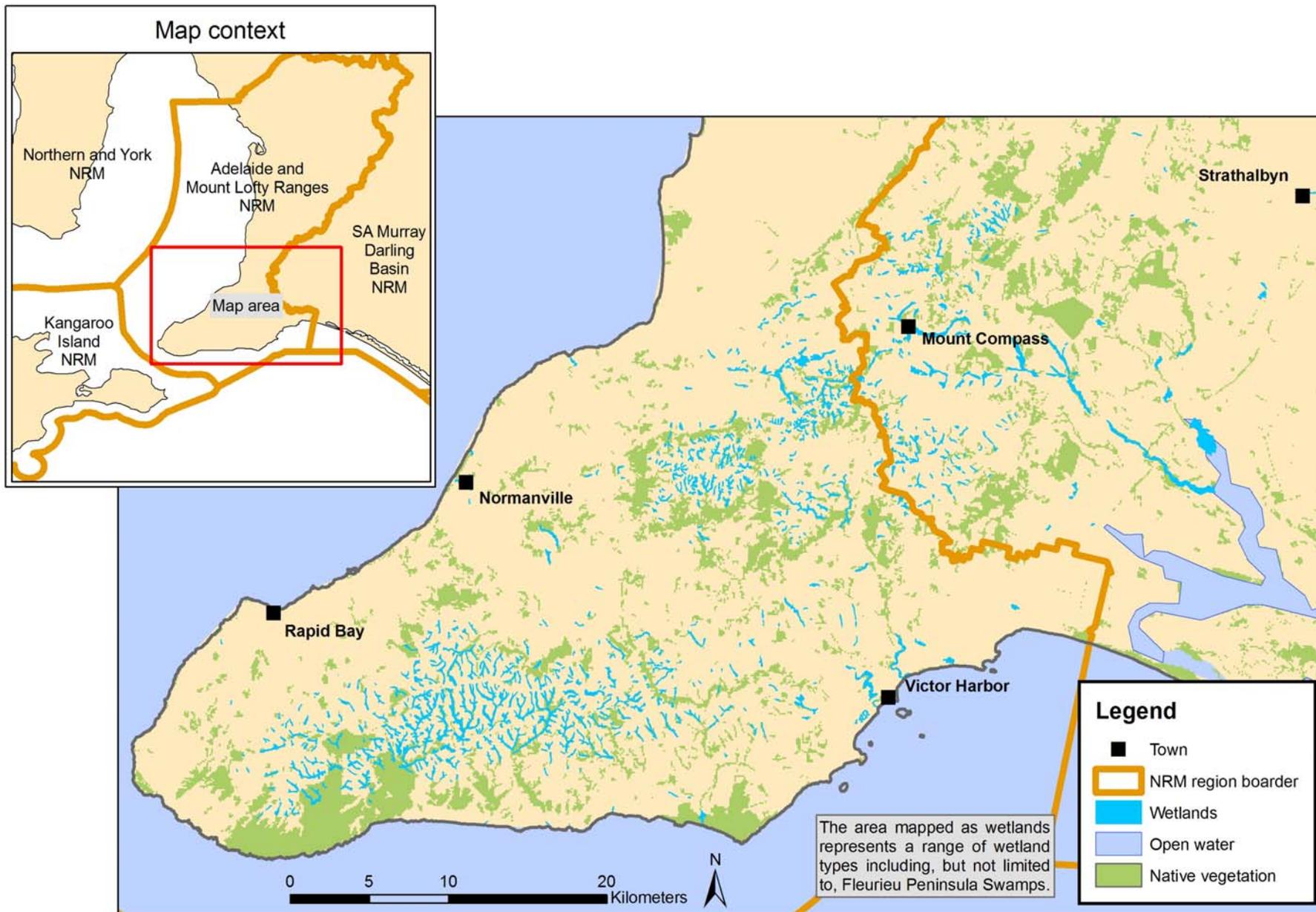


Figure 1. Mount Lofty Ranges Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Program location

EXPOSURE DRAFT

## Relationship to regional NRM targets

The following table summarises relevant biodiversity and water targets for the AMLR NRM region that the Recovery Program intended to contribute to. While the contribution of the Recovery Program to the resource condition targets of the SAMDB NRM Board was not directly addressed in this evaluation, the targets for the SAMDB NRM region are consistent with the AMLR NRM targets and the broad target themes identified in the table below.

Broad Target Themes	AMLR NRM Resource Condition Targets (RCTs)
PRIORITY AREAS IN IMPROVED CONDITION	<ul style="list-style-type: none"> <li>RCT 8.1.2 All disproportionately cleared habitats and threatened ecological communities protected and actively managed to maintain or improve condition by 2017</li> <li>RCT 8.1.3 A progressive improvement in the condition and conservation status of areas of particular biodiversity significance based upon clear baselines and targets to be established: by June 2006</li> <li>RCT 8.2.1 All wetlands and watercourses (including swamps and bogs) of particular biodiversity significance protected and managed to maintain or improve biodiversity values: by Dec 2017</li> </ul>
EXTENT OF WETLAND AND DRY HEATH HABITAT	<ul style="list-style-type: none"> <li>RCT 8.1.4 A progressive increase in the extent of disproportionately cleared vegetation communities towards a vision of all communities occupying at least 30% of their original extent, with:               <ul style="list-style-type: none"> <li>Clear targets established by June 2006; and</li> <li>Indicative minimum target of 15000ha of re-constructed habitat by 2017</li> </ul> </li> </ul>
FRAGMENTATION/CONNECTIVITY	<ul style="list-style-type: none"> <li>RCT 8.1.1 No further fragmentation of biodiversity associated with native vegetation clearance: by June 2006</li> </ul>
WATER QUANTITY AND QUALITY	<ul style="list-style-type: none"> <li>RCT 6.1.1 A progressive reduction in turbidity levels and sediment, and nutrient loads (N and P) in streams throughout the region with clear targets determined by June 2006</li> <li>RCT 6.3.1 Water regimes sufficient to sustain wetland and watercourse ecosystems of particular biodiversity significance: by 2017</li> </ul>
STATUS OF SPECIES AND COMMUNITIES	<ul style="list-style-type: none"> <li>RCT 8.5.1 Decrease in number of listed threatened species due to recovery and long term sustainability: by Dec 2010</li> </ul>

## Background to the Performance Story Report

This study is part of the pilot of the “participatory performance story report” process and was lead by the Australian Government in partnership with the AMLR NRM Board. The SAMDB NRM Board also participated in the evaluation, providing information relevant to the Recovery Program in the SAMDB NRM region. Clear Horizon Consultancy Pty Ltd and O’Connor NRM Pty Ltd conducted this study between February 2008 and July 2008.

Performance story reports provide a statement of progress towards NRM goals and/ or targets, and are supported by evidence at each level of outcome developed in the program logic. Although performance story reports vary in content and format, they are short, mention program context and aims, relate to a plausible results chain, and are backed by empirical evidence (Dart and Mayne 2005<sup>c</sup>). Dart and Mayne (Mayne 2003<sup>d</sup>) state that credible performance story reports should note intended accomplishments, report achievements against expectations, discuss what was learned and what will be changed, and describe steps taken to ensure the quality of the data presented

<sup>c</sup> Dart J. J., Mayne J. (2005) Performance Story. In the ‘Encyclopaedia of Evaluation’ edited by Sandra Mathison (pp.307-308). Sage Publications: Thousand Oaks.

<sup>d</sup> Mayne, J. (2003) Reporting on outcomes: setting performance expectations and telling performance stories. Office of the Auditor General of Canada. [http://www.oag-bvg.gc.ca/domino/other.nsf/html/99pubm\\_e.html](http://www.oag-bvg.gc.ca/domino/other.nsf/html/99pubm_e.html)

The performance story report process provides a structured approach to outcomes evaluation and consists of a five part participatory process, and a six part report structure. The process steps used to develop this report are as follows:

- Process step 1: Planning workshop
- Process step 2: Data Trawl
- Process step 3: Social inquiry process
- Process step 4: Outcomes panel
- Process step 5: Evaluation summit workshop.

During the planning workshop, stakeholders created a program logic model, which diagrammatically represents the hierarchy of the Recovery Program's activities, outputs and outcomes and the links between them. The program logic model created is shown in Figure 2 and it formed the basis from which the evaluation questions were developed and the framework on which evidence is presented in Section 2: Results chart.

The following key evaluation question, which defined the scope of the study, was also determined during the planning workshop.

*To what extent did the MLR Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Program contribute to improved biodiversity outcomes within the geographic extent of the MRLSEW and FPS from 2003 to 2008?*

Please refer to Section 5: Process report, for a detailed description of the process steps.

EXPOSURE DRAFT

Figure 2: Program logic model



## Section 2: Results chart

Program Logic Steps	Expected results	2003-2008 Results statement in summary	Examples to illustrate results statement <i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i>	Additional information about the data
<b>Foundational activities</b>	<ul style="list-style-type: none"> <li>• Planning undertaken (recovery, conservation management, natural resource management)</li> <li>• Research and monitoring undertaken</li> <li>• Extension material produced</li> <li>• Threats identified</li> </ul>	<p>The Recovery Program has had a strong focus on research and information collection to support decision making for recovery actions and to influence planning decisions. This includes,</p> <ul style="list-style-type: none"> <li>• Surveys, research and monitoring conducted and reported.</li> <li>• A range of planning documents for the species and community produced.</li> <li>• A range of water research projects undertaken to support water allocation planning.</li> <li>• Extension material produced.</li> <li>• Threats identified adequately.</li> </ul>	<ul style="list-style-type: none"> <li>• AMLR/Australian Government investment \$1,093,293 (includes NAP funds). \$154,500 Fleurieu Group/Sustainable Landscapes (AMLR NRM Board levy funding).<sup>28</sup></li> <li>• Leveraged funding \$298,100 (\$257,000 Envirofund, \$25,100 Threatened Species Network, \$16,000 Foundation for Australia's Most Endangered Species).<sup>28</sup></li> <li>• SAMDB/Australian Government investment \$200,000. \$50,000 from SAMDB NRM Board levy funding.<sup>58</sup></li> <li>• Review of Recovery Program completed Feb 2003.<sup>56</sup></li> <li>• Strategic informants and scientist interviewed reported that threats have been identified fairly well to very well.<sup>54</sup></li> <li>• 30 monitoring sites (for impact of recovery actions) were established in 2007/2008. Swamp management trials are undertaken at one site and a survey was undertaken at Glenshera.<sup>26</sup></li> <li>• The majority of on-ground works projects are strategically targeted, especially those in 'conservation clusters'. The Local Govt planning tool is an example of a strategically targeted communication/extension project. Responding to development proposals and preparing submissions is often reactionary.<sup>57</sup></li> <li>• Planning documents produced by the program: 1993 - 2006 MLRSEW Population Monitoring, Cox Scrub reintroduction paper, MLRSEW Conservation Strategy, Role of translocation in MLRSEW recovery-2007, Swamp Management Experiments Summer - discussion paper, FPS Conservation Strategy, Wetland Spatial Extent, Swamp monitoring methodology, FPS Recovery Statement 2007 - 2011, MLRSEW Recovery Plan 2007 - 2011, FPS Vegetation Survey 2006 - Floristic definition of the FPS, Draft Communication Strategy.<sup>15</sup></li> <li>• Extension materials produced (eg Swamp Management Guidelines, Local Government Decision Tool).<sup>37</sup></li> <li>• Hydrological impact of bores, dams and plantation forestry recognised, generic environmental water requirements (EWRs) of wetlands determined, water dependant biota surveys undertaken, Water Allocation Planning in progress, hydrological monitoring and modelling undertaken (including surface water/ground water interactions).<sup>36</sup></li> </ul>	

EXPOSURE

Program Logic Steps	Expected results	2003-2008 Results statement in summary	Examples to illustrate results statement <i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i>	Additional information about the data
<b>Influence activities</b>	<ul style="list-style-type: none"> <li>• Advice and information provided to land managers, natural resource managers and other stakeholders.</li> <li>• Submissions made regarding natural resource management planning and policy and development proposals.</li> <li>• Advocacy for protection of swamps and other habitat.</li> </ul>	<p>The Recovery Program has undertaken activities to address causes and consequences of unsustainable use of the conservation assets and the resources necessary to maintain them. This includes,</p> <ul style="list-style-type: none"> <li>• Recovery program contributed to key planning processes.</li> <li>• Submission made on development proposals.</li> <li>• Stakeholders involved in the program included Government Agencies, Local Government, NRM Groups, Community Groups, Research Institutions, Land Managers and one Industry Group.</li> <li>• Information and advice provided covering a range of ecological and land management issues.</li> <li>• Land managers were engaged in fencing/stock exclusion, establishing/relocating water points, weed management and revegetation.</li> <li>• Workshops and presentations given to a range of stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>• The Recovery Program contributed to at least 16 key planning processes (State) including water allocation and prescription, regional recovery planning, habitat restoration, pest management, wetland management and forestry management.<sup>1</sup></li> <li>• 66 submissions were made by the Recovery Program since 2003, at least 7 for development applications; 6 for Environment Protection and Biodiversity Conservation (EPBC) Act referrals and 4 for Native Vegetation Act issues.<sup>2</sup></li> <li>• Department of Water Land and Biodiversity Conservation (DWLBC) have commented on numerous Development Act and EPBC submissions.<sup>59</sup></li> <li>• 260 site visits were made to provide advice and facilitate on-ground works for land managers since 2005.<sup>17</sup></li> <li>• The range of stakeholders involved included at least: 44 community groups, 3 schools, 3 local Governments, 6 natural resource management groups, 8 groups within Government Agencies, 4 tertiary or research institutions, 2 natural resource management consultancies, 1 industry group and 49 land owners or managers.<sup>3</sup></li> <li>• Advice provided to stakeholders includes: identification of swamps and swamp condition, identification of flora and fauna, Emu-wren and Swamp ecology, conservation management and habitat management, stock management, weed control, importance of buffer zones, impact of kangaroos, revegetation species, native vegetation and natural resource management planning and legislation, Heritage Agreements, vegetation survey methods, trade offs for swamp clearance, assessing impacts of developments, mitigation of impacts.<sup>27</sup></li> <li>• Of 27 landholders interviewed, 21 reported biodiversity conservation as a motivation for involvement and 11 reported improved management for production as a motivation. 6 reported that the first contact with the Recovery Program was unsolicited, while 13 reported that they made contact with the Recovery Program through local networks.<sup>53</sup></li> <li>• At least 24 workshops were held during the period, including 7 presentations to community groups, 6 to NRM staff or groups, 3 to landholders, 2 to the general public and 2 to Government Agencies.<sup>6</sup></li> </ul>	<p>The prescription of water resources is a legislative mechanism, and is the initial phase of water allocation planning. Once water has been prescribed all water use, except for stock and domestic purposes, must be made under licence.</p>
<b>Immediate results (non-biophysical)</b>	<ul style="list-style-type: none"> <li>• EW and FPS appropriately and comprehensively considered in decision making.</li> <li>• Site-based management plans produced.</li> <li>• Incentives/subsidies available.</li> <li>• Improved capacity of stakeholders</li> </ul>	<p>The recovery project has contributed significantly to the recognition of FPS and SEWS as endangered ecological assets and supported a substantial number of land managers to take action. These achievements include,</p> <ul style="list-style-type: none"> <li>• FPS listed as critically endangered under <i>EPBC Act 1999</i>.</li> <li>• 51 (site or property based) management plans produced.</li> <li>• 49 landowners participating in on-ground works.</li> <li>• Incentives offered for fencing, weed control and water point works at highest conservation value AMLR NRM rates.</li> </ul>	<ul style="list-style-type: none"> <li>• FPS listed as critically endangered under <i>EPBC Act 1999</i>.<sup>60</sup></li> <li>• Prescription of water resources.<sup>61</sup></li> <li>• 1180 hits on the Recovery Program website were recorded since July 2003.<sup>9</sup> <a href="http://www.ccsa.asn.au/index.php?option=com_content&amp;task=blogcategory&amp;id=215&amp;Itemid=628">http://www.ccsa.asn.au/index.php?option=com_content&amp;task=blogcategory&amp;id=215&amp;Itemid=628</a></li> <li>• 51 management plans were developed.<sup>16</sup></li> <li>• Local Government Planning Officer reported using geographic information system (GIS) layer of Swamps and discussions with project staff to assess development applications. Development applications for plantation forestry are required to allow at least a 50m buffer zone around Swamps.<sup>19</sup></li> <li>• 49 landowners or managers received funding or were offered funding for on-ground works through the project from 2005-2008. Other participants in on-ground works include: GreenCorps, Mount Compass School, and participants in research projects. These additional participants could not be quantified<sup>4</sup></li> <li>• Incentives based on AMLR NRM Board highest conservation rates: up to \$4,500/km for fencing (usually \$4,000/km), \$7-8,000/km for fencing Heritage Agreements (100% of cost), 50% of weed control costs (landholder in-kind accepted), \$500 per water point, management plan developed as part of on-ground works agreement, support for earthworks assessed on application.<sup>29</sup></li> </ul>	<p>The prescription of water resources is a legislative mechanism, and is the initial phase of water allocation planning. Once water has been prescribed all water use, except for stock and domestic purposes, must be made under licence.</p>

Program Logic Steps	Expected results	2003-2008 Results statement in summary	Examples to illustrate results statement	Additional information about the data
<b>Immediate on-ground change</b>	<ul style="list-style-type: none"> <li>Improved on-ground management and protection.</li> <li>Prescribed burns implemented.</li> <li>Fencing erected.</li> <li>Stock exclusion.</li> <li>Weed management.</li> <li>Regeneration and revegetation.</li> </ul>	<p>Direct action to protect the endangered ecological assets has been substantial and produced a large number of on-ground outputs. The works undertaken and outputs include,</p> <ul style="list-style-type: none"> <li>293.1 ha Fleurieu Peninsula Swamps, 469 ha dry-heath vegetation, 77 ha of other vegetation types protected by fencing. Total 839.1 ha</li> <li>898.9 ha of habitat have been enhanced through facilitating natural regeneration</li> <li>21.3 ha of habitat have been enhanced through revegetation.</li> <li>Weed management has been undertaken over 890.6 ha</li> <li>At least 76 on-ground works projects are being implemented.</li> </ul>	<p><i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i></p> <ul style="list-style-type: none"> <li>97.17 km of fencing to protect 839.1 ha.<sup>10</sup> Fencing protected: 293.1 ha Fleurieu Peninsula Swamps, 469 ha dry-heath vegetation, 77 ha of other vegetation types including woodlands and some coastal systems.<sup>11</sup></li> <li>898.9 ha of habitat have been enhanced through facilitating natural regeneration (stock exclusion and/or weed management).<sup>12</sup></li> <li>21.3 ha of habitat have been enhanced through revegetation (7.3 ha 'in fill' to replace absent strata and 14 ha in cleared land to increase Swamp extent or as buffer zones).<sup>13</sup></li> <li>Weed management has been undertaken over 890.6 ha and has targeted the following: Blackberry, Radiata Pine, Gorse, Montpellier Broom, Dog Rose/ Briar Rose, Arum Lily, Kikuyu, Willow, Olives, Boxthorn, Fennel, False Bamboo (<i>Arundo donax</i>), Bridal Creeper, <i>Aloe</i> sp.<sup>14</sup></li> <li>12 landholders reported that weed management was effective. Landholder opinion regarding effectiveness of weed management included:<sup>51</sup> <ul style="list-style-type: none"> <li>'Having the area professionally sprayed is good as they don't damage other plants.'</li> <li>'When I bought the property it was blackberries from top to bottom, that has been the biggest change.'</li> <li>Weed infestations reduced by 50% based on weed mapping done in 2000.</li> </ul> </li> <li>'I really do believe we have made an impact on some properties. Having follow up means we get a really big impact. If we don't do follow up it means the first season is a waste of money. There is a visible reduction in the area of weeds and [visible] regeneration of native vegetation.'<sup>52</sup> (Strategic informant)</li> <li>13 management plans were developed in 2004 under NAP Save the Swamps project, but there is no information available regarding their implementation. 38 management plans were produced since 2005 covering 89 on-ground works projects (fencing, weed management or revegetation), of which 13 were not funded due to landholder withdrawal. At least 76 on-ground works (OGW) projects are being implemented.<sup>16</sup></li> </ul>	
<b>Practice and attitude change</b>	<ul style="list-style-type: none"> <li>Engagement of key stakeholders</li> <li>Increased awareness in key stakeholders and general community</li> <li>No inappropriate developments</li> <li>Environmental water provisions assigned</li> <li>Mandate for water resource development 'methods'.</li> </ul>	<p>The recovery program has been successful in raising the profile of the endangered ecological assets but developments with negative impact of the SEW and FPS continue to occur despite improved planning arrangements.</p> <ul style="list-style-type: none"> <li>The Emu-wren and FP Swamps have been considered in natural resource management and planning, and in development planning.</li> <li>Inappropriate developments have occurred.</li> </ul>	<ul style="list-style-type: none"> <li>Negative influences on the recovery of the MLRSEW and FPS reported by landholders were (number of responses): plantation forestry (4), drought (10), water extraction (4), chemical drift (2) and sand mining (1).<sup>55</sup></li> <li>5 of 8 strategic informants identified plantation forestry and dams as inappropriate developments that have occurred since 2003. 2 strategic informants also identified the Mount Compass overtaking lane.<sup>49</sup></li> <li>Local Government Planning Officer reported using GIS layer of Swamps and discussions with project staff to assess development applications. Development applications for plantation forestry are required to allow at least a 50m buffer zone around Swamps.<sup>19</sup></li> <li>Assigning environmental water provisions and mandating water resource development methods is in progress.<sup>62</sup></li> </ul>	<p>Inappropriate developments are defined here as those developments that may have a negative impact on the recovery of the MLR Southern Emu-wren or Fleurieu Peninsula Swamps</p>

EXPLOSIVE

Program Logic Steps	Expected results	2003-2008 Results statement in summary	Examples to illustrate results statement <i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i>	Additional information about the data
<b>Change in state of asset (EW and FPS) in areas of investment</b>	<ul style="list-style-type: none"> <li>• Increase in size of site-populations, increase in number of site-populations, increase in area occupied.</li> <li>• Improvement in swamp condition</li> </ul>	<p>The state of the SEW is worse than in 2003, while the condition of FPS is likely to have improved. The impact of development on water quality and quantity may have been masked by dry conditions in the last few years. The decline in SEW is thought to be slower than would have been likely if the Recovery Program had not intervened. Key outcomes are,</p> <ul style="list-style-type: none"> <li>• There has been a decline in number of site-populations, overall population size, area of occupancy and extent of occurrence of the MLR Southern Emu-wren.</li> <li>• Improvement in swamp condition has been observed at most on-ground works sites.</li> </ul>	<ul style="list-style-type: none"> <li>• In the period from 2003-2006 there was a net loss of 5 site-populations. This represents a 22% decline in sites and an 8-38% decline in overall population size. There has been a 10% decline in extent of occurrence (based on 2 minimum convex polygons: north and south) and a 17% decline in area of occupancy (based on 0.5 km<sup>2</sup> grid cells, corresponding to the Aust Map Grid).<sup>24</sup></li> <li>• 17 of the 27 landholders interviewed reported an improvement in native vegetation condition, while 2 reported that condition was stable and 2 reported declines in condition which they attributed to drought.<sup>46</sup></li> <li>• 3 strategic informants indicated that they have observed or can infer an improvement in condition of native vegetation at the site scale. These opinions were based on knowledge of management actions eg fencing and weed control, field observations and before and after images.<sup>45</sup></li> <li>• 9 of the 27 landholders interviewed reported an increase in native fauna (one of these had an increase in Emu-wren numbers) and 2 reported a decline in native fauna (1 of these being a decline in Emu-wren numbers on his property). 8 reported improvements in stock health and or management and 7 reported problems with increased grazing pressure from kangaroos.<sup>46</sup></li> <li>• 7 of the 27 landholders interviewed reported an improvement in water quality (one making reference to her Waterwatch monitoring data), and 1 reported a decline in water quality attributed to drought conditions and plantation forestry.<sup>46</sup></li> <li>• 5 of the 27 landholders interviewed reported an improvement in water quantity, and 3 reported a reduction in water quantity which they attributed to drought, extraction or plantation forestry.<sup>46</sup></li> </ul>	<p>1 site-population is greater than or equal to one pair, size classes are used for site populations as the number of birds at a given location cannot be accurately determined. The area of occupancy and extent of occurrence were calculated according to International Union for the Conservation of Nature (IUCN) guidelines.<sup>e</sup> Please refer to this document for further explanation.</p>
<b>Aggregate change in the way the catchment has been managed</b>	<ul style="list-style-type: none"> <li>• Reduced risk of population loss from wildfire.</li> <li>• No further fragmentation of native vegetation.</li> <li>• Strategic regeneration of swamps, dry heath and woodland.</li> <li>• Increase in the area fenced and weeded.</li> <li>• Increase in the area under secure tenure.</li> <li>• Licenses and conditions to take/use water (in progress)</li> </ul>	<p>Substantial increases in the security of the endangered ecological assets are evident in recent changes in land management. Greater security and management is likely to result from water licensing processes currently being implemented in the region. Changes in management at the catchment scale include,</p> <ul style="list-style-type: none"> <li>• Illegal vegetation clearance has occurred, and in some cases has been reported and enforced.</li> <li>• Illegal water extraction has been reported.</li> <li>• The risk of population loss to fire has been reduced to a very small degree.</li> <li>• 510 ha have been placed under secure tenure (State Reserve System or Heritage Agreements)</li> <li>• 60% of the known area of FP Swamps is managed for conservation.</li> </ul>	<ul style="list-style-type: none"> <li>• The establishment of water licensing as a tool for managing water resources is in progress.<sup>48</sup></li> <li>• Information provided by the Recovery Program has had an influence on water licence conditions.<sup>20</sup></li> <li>• Water licence conditions may include: low flow bypasses, limiting dam size and water extraction volumes.<sup>48</sup></li> <li>• Dams have been prohibited from being constructed on wetlands.<sup>48</sup></li> <li>• 2 incidences of illegal vegetation clearance in swamps have been enforced (both required rehabilitation and stock exclusion, one involved prosecution and a fine and the other an enforcement notice) and one incidence is currently being investigated.<sup>18</sup></li> <li>• 4 of 5 strategic informants reported that compliance with management plans was generally good. Incidences of non-compliance with Native Vegetation legislation or the <i>EPBC Act 1999</i> were reported by 5 of 8 strategic informants, and 2 reported that the level of enforcement was inadequate in some cases.<sup>47</sup></li> <li>• An illegal bore has been reported by a landholder, however no action has been taken to date.<sup>50</sup> (Landholder interview)</li> <li>• Scientists and strategic informants reported that:<sup>42</sup> <ul style="list-style-type: none"> <li>▪ There is an increased awareness of the risk of population loss to fire.</li> <li>▪ Conservation of the Emu-wren has been considered in fire management planning for the Deep Creek area.</li> <li>▪ Few of the actions required have been implemented yet, but are planned over the next 3-4 years. First prescribed burn was implemented in 2008.</li> </ul> </li> <li>• 2 of 23 extant site-populations as at 2003 (9%) were incorporated in the SA State Reserve System, representing 4-19% of individuals.<sup>25</sup></li> <li>• 68 ha have been added to the reserve system, with a 110 ha addition to the reserve system in progress.<sup>7</sup></li> <li>• 7 Heritage Agreements have been made, protecting a total of 332ha.<sup>8</sup></li> <li>• Approximately 60% of the known area of FPS is managed for conservation.<sup>63</sup></li> </ul>	<p>There is a proposal to prevent the construction of on-stream dams or dam extraction points on watercourses either within, or within 200m of existing wetlands – to allow wetland complexes to be linked up, and to allow for the expansion of wetland extent.</p> <p>According to the recovery statement for FPS 2007-2011, the known extent of FPS is 500 ha.<sup>64</sup></p>

<sup>e</sup> IUCN (2001). IUCN Red List Categories and Criteria: Version 3.1. Species Survival Commission. International Union for the Conservation of Nature and Natural Resources: Gland, Switzerland and Cambridge, UK.

Program Logic Steps <b>Changes in the state of the natural resources on the Fleurieu Peninsula</b>	Expected results	2003-2008 Regional Statement <i>Please note: all statements in this column were created by the Outcomes Panel</i>	Examples to support statement <i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i>	Contribution of the MLRSEW & FPS recovery Program to asset condition <i>Please note: all statements in this column were created by the Outcomes Panel</i>
<p><b>PRIORITY AREAS IN IMPROVED CONDITION</b></p> <p><b>RCT 8.1.2 All disproportionately cleared habitats and threatened ecological communities protected and actively managed to maintain or improve condition by 2017</b></p> <p><b>RCT 8.1.3 A progressive improvement in the condition and conservation status of areas of particular biodiversity significance based upon clear baselines and targets to be established: by June 2006</b></p> <p><b>RCT 8.2.1 All wetlands and watercourses (including swamps and bogs) of particular biodiversity significance protected and managed to maintain or improve biodiversity values: by Dec 2017</b></p>	<p><b>Priority areas (including dry heath and swamps) in improved condition</b></p>	<ul style="list-style-type: none"> <li>• There has been a decline in the condition of priority areas, especially since 1945 (soldier settlement period, see Harris 1976)<sup>f</sup>. There was a leveling off of clearance with the 1983 Native Vegetation Act, but condition continued to decline.</li> <li>• Between 2003 and 2008, we have had the driest period on record, with ongoing degradation due to edge effects (from fragmentation), increased grazing pressure due to drought, inappropriate delivery of water for the environment and the spread of weeds. Overall, the net effect is likely to have been a continued decline, at similar rates, (or slightly accelerated due to drought).</li> <li>• Future prospects (with current level of resourcing) are positively influenced by improved water management systems and better stock management through protection and landuse change. However, the decline will be on-going and will be driven by weeds, feral animals, and increased affects of a changing climate.</li> </ul> <p><i>Moderate confidence</i></p>	<p>No published information was found regarding the condition of swamps or dry heath in the region.</p> <p>(29 monitoring sites (for impact of recovery actions) were established in 2007/2008)<sup>26</sup></p> <p>State of the region report acknowledges a continuing decline in biodiversity condition.<sup>43</sup></p> <p>3 strategic informants or scientists gave opinions relating to the condition of native vegetation/habitat in general, 2 believing that it is declining and 1 suggesting that the decline has been reduced.<sup>44</sup></p> <p>3 strategic informants indicated that they have observed or can infer an improvement in condition at the site scale. These opinions were based on knowledge of management actions eg fencing and weed control, field observations and before and after images.<sup>45</sup></p> <p>17 of the 27 landholders interviewed reported an improvement in native vegetation condition, while 2 reported that condition was stable and 2 reported declines in condition which they attributed to drought.<sup>46</sup></p>	<ul style="list-style-type: none"> <li>• The Recovery Program has been effective in improving condition at some sites. Targeted sites cover approximately 60% of known remnant FPS, and involved fencing, grazing control and weed management. It is plausible, therefore, that the Recovery Program has contributed to an improvement in a significant proportion of FPS and dry heath.</li> <li>• Without the program, it is reasonable to assume that areas under management would have experienced continued threats from grazing, uncontrolled weeds and overall condition decline would have been significantly greater.</li> </ul> <p><i>Moderate confidence</i></p>

<sup>f</sup> Harris, C. (1976) Vegetation Clearance in South Australia. Report of the Interdepartmental Committee on Vegetation Clearance.

Program Logic Steps  Changes in the state of the natural resources on the Fleurieu Peninsula	Expected results	2003-2008 Regional Statement  <i>Please note: all statements in this column were created by the Outcomes Panel</i>	Examples to support statement  <i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i>	Contribution of the MLRSEW & FPS recovery Program to asset condition  <i>Please note: all statements in this column were created by the Outcomes Panel</i>
<b>EXTENT OF WETLAND AND DRY HEATH HABITAT</b>  <b>RCT 8.1.4 A progressive increase in the extent of disproportionately cleared vegetation communities towards a vision of all communities occupying at least 30% of their original extent, with:</b> <ul style="list-style-type: none"> <li>• Clear targets established by June 2006; and</li> <li>• Indicative minimum target of 15000ha of re-constructed habitat by 2017</li> </ul>	<b>Enough wetland and dry heath habitat</b>	<ul style="list-style-type: none"> <li>• There has been a decline in the extent of native vegetation, especially since 1945 (soldier settlement period see Harris et al 1978). There was a leveling off of clearance with the 1983 Native Vegetation Act and a further reduction in the rate of decline in extent after the program inception in 1992. <i>Moderate confidence</i></li> <li>• Between 2003 and 2008 the extent of Fleurieu Peninsula Swamps and dry heath has nearly stabilized. <i>Moderate confidence</i></li> </ul>	<p>No published information was found regarding the change in extent of swamp and dry heath habitat.</p> <p>Strategic informants and scientists reported that:<sup>40</sup></p> <ul style="list-style-type: none"> <li>▪ Quantitative data are not available to accurately evaluate the net change in extent of habitats.</li> <li>▪ Examples exist of reduction in extent of habitat (through legal and illegal vegetation clearance, fire and drought and over extraction of water (eg. Finnis Park Swamp)).</li> <li>▪ Examples of 'real' increases in extent of FP Swamps through regeneration exist.</li> <li>▪ The known extent of FP Swamps has increased through improved knowledge.</li> </ul> <p>In one strategic informant's opinion: 'It's not just about increasing the extent, it's significant because we still have some. We would have lost a lot more without the Recovery Program.'<sup>41</sup></p>	<ul style="list-style-type: none"> <li>• The Recovery Program has deterred clearance and actively contributed to natural regeneration. The Recovery Program has substantially contributed to maintaining the extent of the Fleurieu Peninsula Swamps and dry heath. <i>High confidence</i></li> </ul>
<b>FRAGMENTATION/ CONNECTIVITY</b>  <b>RCT 8.1.1 No further fragmentation of biodiversity associated with native vegetation clearance: by June 2006</b>	<b>Improved habitat linkages</b>	<ul style="list-style-type: none"> <li>• Clearance over the last 20-50 years has resulted in populations becoming isolated. Decline in condition in extant vegetation has also contributed to fragmentation effects. This has resulted in lack of recolonisation after local extinctions and total decline in the MLRSEW population. <i>High confidence</i></li> <li>• The extent of isolation of populations and remnants has increased between 2003 and 2008 due to decline in the condition of linkages, inappropriate management and minor clearance. This has been partially offset by natural and active revegetation and regeneration. <i>High confidence</i></li> </ul>	<p>898.9 ha of habitat have been enhanced through facilitating natural regeneration (stock exclusion and/or weed management).<sup>12</sup></p> <p>21.3 ha of habitat have been enhanced through revegetation (7.3 ha 'in fill' to replace absent strata and 14 ha in cleared land to increase Swamp extent or as buffer zones).<sup>13</sup></p> <p>Up to 2 ha restored habitat and linkages created on one property. Examples of habitat fragmentation or clearance cited by project staff total at least 35 ha.<sup>32</sup></p> <p>Strategic informants and scientists agreed that:<sup>39</sup></p> <ul style="list-style-type: none"> <li>▪ Quantitative data are not available to accurately evaluate the net change in fragmentation.</li> <li>▪ Examples of continuing fragmentation through legal and illegal vegetation clearance exist.</li> <li>▪ Examples of improved habitat linkages created through the Recovery Program and other NRM programs exist.</li> </ul> <p>In one scientist's opinion, there is unlikely to have been an improvement in fragmentation: 'I would say that we have broken even or worse.'<sup>38</sup></p>	<ul style="list-style-type: none"> <li>• The Recovery Program has slightly slowed the rate of isolation of populations/remnants by reducing the degree of isolation at targeted sites. <i>High confidence</i></li> </ul>

Program Logic Steps  Changes in the state of the natural resources on the Fleurieu Peninsula	Expected results	2003-2008 Regional Statement  <i>Please note: all statements in this column were created by the Outcomes Panel</i>	Examples to support statement  <i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i>	Contribution of the MLRSEW & FPS recovery Program to asset condition  <i>Please note: all statements in this column were created by the Outcomes Panel</i>
<p><b>WATER QUALITY AND QUANTITY</b></p> <p><b>RCT 6.1.1 A progressive reduction in turbidity levels and sediment, and nutrient loads (N and P) in streams throughout the region with clear targets determined by June 2006</b></p> <p><b>RCT 6.3.1 Water regimes sufficient to sustain wetland and watercourse ecosystems of particular biodiversity significance: by 2017</b></p>	<p>Enough quality water</p>	<ul style="list-style-type: none"> <li>• There have been ongoing negative impacts on water resource delivery to the environment on the Fleurieu Peninsula since European settlement, due to surface and groundwater development, land clearance and land use change. This has resulted in a decline in the condition of water dependent ecosystems reliant on the natural flow regimes (including Fleurieu Peninsula Swamps). <i>High confidence</i></li> <li>• The identification of Fleurieu Peninsula Swamps and their listing under the EPBC Act 1999, has significantly contributed to the development of a refined methodology to replace the standard sustainable diversion limits stated in the State Water Plan/State NRM Plan, specifically for application to the Fleurieu Peninsula Swamps. This method ensures that appropriate quantities of water (to the best of our knowledge), are delivered to swamps.</li> <li>• The prescription of water resources in the Mount Lofty Ranges identifies Fleurieu Peninsula Swamps as a critical water dependent ecosystem with sensitive water needs. It is likely that the Water Allocation Plan will have water allocation rules that specifically relate to Fleurieu Peninsula Swamps and their water regime requirements and will aim to deliver these flow requirements/needs. <i>Moderate confidence</i></li> <li>• It is likely that under the Water Allocation Plan, water delivery (regime) will not be a limiting factor to swamp condition. <i>Low-Moderate confidence</i></li> </ul>	<p>Surface Water Quality: Excluding the effects of drought, surface water quality has been stable in recent years.<sup>21</sup> The Environment Protection Agency's (EPA) water chemistry monitoring for Deep Creek, Inman River, Hindmarsh River and Myponga River, does not show any significant changes.<sup>22</sup> 7 of the 27 landholders interviewed reported an improvement in water quality (one making reference to her Waterwatch monitoring data), and 1 reported a decline in water quality attributed to drought conditions and plantation forestry.<sup>46</sup></p> <p>Water Quantity (Surface and Ground): The decline in water quantity has been limited as a result of increased capacity to manage water resources, through the prescription of water resources and using tools such as the 'Wetland Water Balance Method'.<sup>34</sup> Decrease in number of days/year of flow in the Upper Deep Creek Catchment since the early 1990's documented in the report 'Deep Creek: 9<sup>th</sup> report of the Parliamentary Natural Resources Committee' with afforestation in the area acknowledged as a significant contributing factor, other possible factors being rainfall patterns and dams.<sup>35</sup> 5 of the 27 landholders interviewed reported an improvement in water quantity, and 4 reported a reduction in water quantity which they attributed to drought, extraction or plantation forestry.<sup>46</sup></p> <p>Groundwater Quantity and Quality: Groundwater in the Hindmarsh Inman groundwater subregion is extracted primarily for dairy pasture irrigation. It is estimated that between 2000 and 2005 groundwater extraction increased by 35% for Hindmarsh Tiers and by 7% for Myponga with 2007 estimated extraction at 7.5G/yr.<sup>33</sup> There has been little change in the highest pre-irrigation groundwater levels in the Myponga area (1-2 m in lowest summer level) but there have been 2-3 m variations in the Hindmarsh Tiers area in response to variations in annual rainfall. Ground water salinity is not regularly monitored in this subregion.<sup>33</sup> In the Southern Fleurieu groundwater subregion, demand for groundwater is generally limited by low yields and higher salinity, however, groundwater extraction is not metered. A monitoring network of shallow wells was recently established but it is too early to detect any trends in groundwater levels. There is limited monitoring of groundwater salinity.<sup>33</sup> Sustainable yield of ground water in the Southern Fleurieu has recently been estimated.<sup>65</sup></p>	<ul style="list-style-type: none"> <li>• The Recovery Program played a major role in ensuring appropriate water delivery to Fleurieu Peninsula Swamps by identifying their existence, listing them under the EPBC Act 1999, and stating that water has critical influence on their survival and condition. This has enabled water managers (NRM boards and Department of Water Land and Biodiversity Conservation) to allow for their environmental water requirements, both prior to and in the development of the Eastern Mount Lofty Ranges and Western Mount Lofty Ranges Water Allocation Plans. <i>High confidence</i></li> <li>• There is a significant risk that appropriate environmental water requirements would not have been determined if the Recovery Program had not identified and extended (communicated) knowledge of these systems, potentially causing swamp degradation due to inappropriate water delivery. <i>Moderate confidence</i></li> </ul>

<b>Program Logic Steps</b>  <b>Changes in the state of the natural resources on the Fleurieu Peninsula</b>	<b>Expected results</b>	<b>2003-2008 Regional Statement</b>  <i>Please note: all statements in this column were created by the Outcomes Panel</i>	<b>Examples to support statement</b>  <i>Note: all superscript numbers in this column refer to a source item listed in Section 6: Evidence base</i>	<b>Contribution of the MLRSEW &amp; FPS recovery Program to asset condition</b>  <i>Please note: all statements in this column were created by the Outcomes Panel</i>
<b>STATUS OF SPECIES AND COMMUNITIES</b>  <b>RCT 8.5.1 Decrease in number of listed threatened species due to recovery and long term sustainability: by Dec 2010</b>	<b>Species and communities less threatened</b>	<ul style="list-style-type: none"> <li>Over the last 20-50 years there has been an ongoing (but un-quantified) decline in status of flora and fauna species and ecological communities in the AMLR region.</li> <li>Between 2003-8 these declining trends have continued in terms of both range and abundance. For example, overall numbers of MLRSEW populations and individuals have continued to decline. However, this decline has primarily occurred in the small and isolated habitat remnants. (This is a good example of extinction debt, that is, of the lag time taken to extinction following fragmentation and isolation). In the larger remnants, the populations have remained relatively stable despite drought conditions.</li> </ul> <p><i>Moderate confidence</i></p>	<p>Status of Fleurieu Peninsula Swamps: FPS are not considered eligible for down listing due to<sup>30</sup>:</p> <ul style="list-style-type: none"> <li>Substantial historic decline in geographic distribution, in 1993 it was estimated that 25% of the former area of FPS remained<sup>37</sup>, currently estimated to be approximately 20%<sup>30</sup>;</li> <li>Very restricted geographic distribution (500ha in 1993)<sup>37</sup>, not thought to have improved<sup>30</sup>;</li> <li>Severe reduction in integrity from: weed invasion; altered hydrology, nutrient imbalance, altered peat accumulation, soil disturbance, inappropriate slashing, burning and grazing, and illegal vegetation clearance.<sup>37</sup> Current threat status: increased threat of reduced water, continuing threat from environmental weeds (ongoing management required), threat of grazing reduced due to fencing but countered by increased pressure from drought, change in nutrient balance unknown, change in peat accumulation and soil disturbance unknown but likely to be linked to grazing, legal and illegal vegetation clearance continuing.<sup>30</sup></li> </ul> <p>Status of MLR Southern Emu-wren: “The MLRSEW currently meets IUCN* (2001) criteria for Endangered (EN B1a,b(ii,iii,iv)+B2a,b(ii,iii,iv)) (Pickett in prep. a) due to its:</p> <ul style="list-style-type: none"> <li>restricted geographic range—extent of occurrence &lt;5,000 km<sup>2</sup> (174 km<sup>2</sup>) and area of occupancy &lt;500 km<sup>2</sup> (20.75 km<sup>2</sup>);</li> <li>severely fragmented population; and</li> <li>continuing decline observed and projected in: <ul style="list-style-type: none"> <li>- area of occupancy;</li> <li>- area, extent and/or quality of habitat, and</li> <li>- number of locations or subpopulations.</li> </ul> </li> </ul> <p>It was previously considered Critically Endangered (CR B1+2abcde sensu IUCN 1994) (MLR Southern Emu-wren Recovery Team 1998; Garnett and Crowley 2000), but the disparity reflects differences in data and methods used to measure area of occupancy rather than actual change in status.”<sup>31</sup></p> <p>In the period from 2003-2006 there was a net loss of 5 site-populations. This represents a 22% decline in sites and an 8-38% decline in overall population size. There has been a 10% decline in extent of occurrence (based on 2 minimum convex polygons: north and south) and a 17% decline in area of occupancy (based on 0.5 km<sup>2</sup> grid cells, corresponding to the Aust Map Grid).<sup>24</sup></p> <p>*International Union for the Conservation of Nature</p>	<ul style="list-style-type: none"> <li>It is plausible that the Recovery Program is contributing in various ways to slowing/halting/reversing the rates of decline of species and communities on the Fleurieu Peninsula through protection and enhancement of habitats and threat management.</li> <li>With regard to the Emu-wren, recovery actions including fencing, stock management and weed management, and translocation are all helping to reduce the rates of population and habitat quality decline. This should eventually make some level of recovery of the Emu-wren possible at some sites at least.</li> <li>Without the Recovery Program the rates of decline in range and abundance would continue and lead to local extinctions for many species.</li> </ul> <p><i>Moderate confidence</i></p>

# Section 3: Implications

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## Overview of results chart<sup>g</sup>

### *Foundational and influence activities*

The Recovery Program successfully implemented foundational activities including planning, research and monitoring, and the development of extension materials. There is evidence to show the Recovery Program has participated in planning processes and that it provided advice to, and engaged with stakeholders.

### *Immediate results*

The outputs of the Recovery Program (immediate results, on-ground and non-biophysical) are consistent with the expected results and are well quantified. The listing of Fleurieu Peninsula Swamps as a threatened ecological community is a particularly significant result and was cited by Strategic Informants interviewed as an important factor which contributed to raising the profile of Swamps.

### *Practice and attitude change*

At the outcome level of practice and attitude change, the Recovery Program was successful in promoting the consideration of Emu-wren and Fleurieu Peninsula Swamp recovery in natural resource management and planning processes. Despite this, developments which may have a negative impact on the recovery of the Emu-wren and Fleurieu Peninsula Swamps have occurred. It is possible that this reflects a lack of preparedness to interpret regulations in favour of the environment, rather than inadequate participation of the Recovery Program in planning processes. It was difficult to find evidence to assess the response to advice provided by the Recovery Program.

### *Changes in the state of the asset in the areas of investment*

Population monitoring for the Emu-wren shows that the estimated number of birds, number of site-populations and the area occupied have declined during the evaluation period. At most on-ground works sites an improvement in the condition of Swamps (vegetation, water regime and water quality) was observed, however quantitative data to support these observations are not available.

In this study, improvement in Swamp condition was considered to encompass regeneration of native vegetation, reduction in abundance or cover of environmental weeds, expansion of the Swamp area, improvements in stream bank stability, increase in water quantity, increase in length of soil saturation period, reduction in the rate of water flow, increase in native fauna observations (excluding kangaroos), and a reduction in water turbidity. The development of a more precise model for assessing Swamp condition (i.e. a state and transition model) is identified as an action in the Recovery Statement for Fleurieu Peninsula Swamps<sup>h</sup>.

### *Aggregate changes in the way the catchment has been managed*

Positive changes in the way the catchment has been managed include: 510ha being placed under secure tenure (State reserve system or conservation covenant), conservation management over approximately 60% of the known area of Fleurieu Peninsula Swamps, the establishment of tools to improve water management and reduction (albeit small) in the risk of population loss to fire through improved fire management planning.

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<sup>g</sup> All the information described in the “overview of results chart” is referenced in the results chart (Section 2) and the evidence base (Section 6).

<sup>h</sup> Mount Lofty Ranges Southern Emu-wren and Fleurieu Peninsula Swamps Recovery Team (2007) Recovery Statement for the Fleurieu Peninsula Swamps 2007-2011. Conservation Council of South Australia

Incidences of illegal native vegetation clearance and illegal water extraction have occurred, despite improved management of natural resources and better awareness and understanding of the Emu-wren and Swamps.

Due to the uncertainties with defining the extent of Swamps, evaluation of improvement in terms of area or extent is difficult. Work has also been undertaken in non-Swamp habitats so a comparison of the area of on-ground works with the total area of Swamps is inappropriate.

### *Resource condition change<sup>i</sup>*

The Recovery Program's contribution to resource condition targets or outcomes for the region is as follows:

- The Recovery Program has been effective in improving condition at some sites. Without the program, it is reasonable to assume that areas now under management would have experienced continued threats from grazing, uncontrolled weeds and overall condition decline would have been significantly greater.
- The Recovery Program has deterred clearance and actively contributed to natural regeneration and has therefore substantially contributed to maintaining the extent of Swamps and dry heath habitat.
- The Recovery Program has slightly slowed the rate of isolation of populations/remnants by reducing the degree of isolation at targeted sites.
- The Recovery Program has played a major role in ensuring appropriate water delivery to Fleurieu Peninsula Swamps by identifying their existence, listing them under the EPBC Act 1999, and stating that water has critical influence on their survival and condition. This has enabled water managers to allow for their environmental water requirements.
- Recovery Program actions are helping to reduce the rates of population and habitat quality decline for the Emu-wren. Without the Recovery Program the rates of decline in range and abundance would continue and lead to local extinctions for many species.

Although absolute improvement in the condition of these resources has not been observed, the Recovery Program has made an important contribution to slowing the rates of decline in resource condition which is a significant achievement.

## **Key achievements and benefits**

The following points are summaries of the findings generated by participants at the summit workshop. The findings are based on participants' analysis of multiple lines of evidence presented at the summit.

### *1. Landscape scale improvements in natural resource management*

The Recovery Program has improved the management of natural resources in the region by facilitating the conservation management of 890 ha of native vegetation which includes dry heath habitat and approximately 60% of the known area of Fleurieu Peninsula Swamps. By identifying threats, requirements and management for the MLR Southern Emu-wren and Fleurieu Peninsula Swamps, participating in planning processes and contributing to development assessment processes, the Recovery Program has influenced the management of water in the region. The listing of Fleurieu Peninsula Swamps as a critically endangered ecological community under the *EPBC Act 1999* was an important factor in this process. As this was the first threatened ecological community to be nominated for listing from South Australia, it had a significant positive influence on the development of further nominations.

### *2. Local changes in wildlife abundance and vegetation condition and extent*

There have been local improvements in native vegetation condition and extent over the 898.9 ha that are being enhanced through facilitating natural regeneration. This includes swamp vegetation and other vegetation types such as heath and woodland. In at least one case a landholder reported that swamp regeneration

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<sup>i</sup> Information provided here relating to changes in resource condition is taken directly from statements created by the outcomes panel

reduced the extent of weeds. This improvement in vegetation condition and extent should be considered in the context of ongoing decline in Swamps and other native vegetation communities at sites that are not managed for conservation. An increase in Emu-wren numbers was observed at one site.

### *3. Local improvements in water quality, water regime and erosion*

Regeneration of native vegetation has resulted in a reduction in erosion, improved water quality, and improved water retention at some sites. These improvements were reported by project participants.

### *4. Improvement in pasture productivity, stock health and property management*

Interviews with landholders and land managers revealed that the implementation of on-ground works through the Recovery Program resulted in benefits for productivity, stock health and property management in many cases. These benefits included, the ability to plan farm and property management more efficiently and effectively, through creating appropriate management units with fencing; an increase in the length of the 'season' or time that green pasture is available for stock in areas adjacent to swamps; improved ability to manage stock (for example, stock don't get lost in swamp vegetation); and improved stock health such as a lower risk of Liver Fluke.

### *5. Improved management of native vegetation*

As a result of the Recovery Program there has been an increase in the protection of Swamps and other remnant vegetation for wildlife habitat, through grazing exclusion or pulse grazing, weed management, fencing and establishing covenants. Funding incentives for on-ground works played an important role in allowing these changes to occur. In many cases there was a short time period between changing management and observing positive results, providing timely feedback for landholders and contributing to the collective understanding of management of natural areas in general and Swamps in particular.

### *6. Increased landholder or land manager awareness, skills and knowledge*

An improvement in awareness of wildlife and native vegetation was described by the majority of informants, and was often demonstrated by the observations of birds, bats, frogs, fish, insects or plants made by landholders. The perception of and attitude towards Swamps has changed from negative or indifferent to recognition of Swamps as valuable biodiversity assets. Further learning about Swamp management through the Recovery Program was also a common factor in the experience of project participants, and was developed through experience of changing management practices, observations, and technical and expert information provided by the project team.

### *7. Engagement*

Effective engagement with landholders and land managers is a key achievement of the program as it underpins many of the other outcomes. Positive responses to interactions and negotiations with project staff were prevalent in project participant feedback with personal contact, persistence, relationship building, negotiation, excitement and optimism highlighted as characteristics of the successful engagement developed by the extension officers. Financial incentives were also recognised as a key factor in getting landholders involved.

### *8. Better planning and targeting*

Achievements in this area include the expansion of the program at the beginning of the evaluation period to include Fleurieu Peninsula Swamps as well as the MLR Southern Emu-wren; adopting a whole of region approach; improved access to funding; maintaining continuity and skills of staff; and most significantly, strategically targeting program activities, in particular extension and on-ground works. These achievements were built on the foundation of improved practical and applied knowledge of the Emu-wren and Swamps through research.

### *9. Perseverance and being there for the long haul.*

The long-term commitment from the Recovery Program and the benefits achieved by being there for the 'long haul' were recognised in interviews with several informants.

## Key issues impacting on Recovery Program outcomes

During the evaluation summit, participants were presented with the top issues arising from the data collection, and asked to list what they saw as the major issues with the project. Participants were also asked to rank the issues in terms of importance in high, medium and low priority.

The summit participants felt that the most significant issues, those of high or medium importance, existed within eight themes as detailed below.

### *1. Drought conditions are impacting on swamps and on-ground works*

Drought conditions in recent years have had an adverse impact on the condition of swamps. Some landholders reported that there has been an increase in the time period that a particular water body has been dry each year, while one reported that areas that had previously been permanently wet had completely dried out. These conditions have also impacted on the management of swamps, increasing the pressure on landholders to graze swamp vegetation that wouldn't normally be grazed (legally or illegally).

While climate change is inevitable, planning, education and adaptation can be implemented to mitigate or minimise its impacts. There is a need to better understand the water requirements of Swamps and how they vary for particular swamp types (eg. peat swamps), to better manage water resources and to adopt a longer-term perspective.

### *2. Kangaroos are impacting on revegetation, fencing and morale*

Many participants reported that kangaroo numbers have increased, and that high kangaroo numbers are having a negative influence on productivity, biodiversity and morale as a result of damage to fences and revegetation and increased grazing pressure on pastures. However these impacts of kangaroos are not considered to be ubiquitous throughout the region, they are localised or patchy and affect some sites more than others. There is a sense that this issue is a political 'hot potato' and that currently there is limited capacity to address it. Monitoring to gain a better understanding of kangaroo population dynamics and impacts is needed, as well as advocacy for systems that enable land managers to manage kangaroo populations.

### *3. Insufficient coordination between the Recovery Program and some NRM staff/programs*

There have been incidences where coordination, integration and communication between the Recovery Program and some other NRM Staff and programs have been insufficient. As a consequence, landholders have been confused about the role of staff and projects or programs and in one case a landholder was given conflicting advice regarding weed management which was not adequately resolved. A consistent, coordinated approach is thought to be essential to increase landholder understanding and ability to adopt effective integrated planning and whole property management. Compounding factors for this lack of integration between NRM programs include their differences in focus and funding sources and issues with staff continuity linked to the short term funding cycles.

### *4. Funding is insecure*

A lack of secure funding has created circumstances in which it has been difficult to plan effectively, to maintain continuity in staff and programs, and to maintain momentum in landholder engagement and on-ground works. For example, funding on-ground works through small grants has been inefficient as a high proportion of program staff time is spent on assisting landholders with funding application and reporting processes, and

sometimes landholders have pulled out due to delays in receiving funds. The Recovery Program has little influence on resource allocation, and therefore recognise that this issue will be difficult to resolve.

#### *5. Water extraction and plantation forestry are continuing threats to Swamps*

Water extraction, including dams and bores and inappropriate forestry developments continue to impact on Swamps, by altering water regimes. Lack of water presents an extremely severe threat to Swamps. Several project participants expressed concerns about the potential and current impacts of neighbouring forestry plantations and one participant claimed that illegal water extraction by a neighbour has dried a Swamp. Although reported, this incidence had not been adequately addressed. Improvements in efficiency of water use, better integration of planning by Government Departments, strengthened assessments and regulations to mitigate adverse impacts and improved enforcement of legislation are needed.

#### *6. Population increase*

The human population in the region is increasing, resulting in a general trend of decline in property size, growth in the number of properties and ownership turnover as well as a new and more variable demographic of landholders. Most significantly this is placing increased pressure on limited water resources, but also has implications for the resources needed for community education and engagement.

#### *7. Measuring ecological outcomes of the program*

There is limited information available to assess the ecological outcomes of the program. While detailed and reliable information is collected relating to how the investment has been spent, currently there are insufficient data to evaluate outcomes such as the effectiveness of weed management and other actions, the change in condition of vegetation (including Swamps), vegetation community extent, habitat connectivity and water regimes at the site or regional scales. It should be noted however that monitoring of the Emu-wren does provide information with which to assess changes in its status and the impact of some recovery actions, and that monitoring sites were established within the last year to measure the outcome of management actions.

Although the Recovery Program has placed significant emphasis on improving the information available for management, with considerable success as described in the achievements above, knowledge gaps still exist. Therefore, measuring the impact of the Recovery Program's threat management activities will also improve the capacity to influence planning and policy decisions.

#### *8. Scale of implementation is insufficient to achieve long-term recovery*

The scale of implementation of recovery actions is limited by the resources available and it is believed that it is currently insufficient to achieve the long-term vision of the program, ie the recovery of the Emu-wren and Swamps.

## Recommendations

### **RECOMMENDATION ONE: Improve funding security**

*This recommendation encompasses the following:*

- *longer term funding, such as a 3-5 year funding cycle (rather than 1 year) should be pursued*
- *funding for on-ground works (particularly weed control) should be maintained*
- *funding terms should allow recovery team to manage/allocate its own resources*
- *explore opportunities to diversify funding sources*

**RECOMMENDATION TWO:**  
**Improve communication of the project achievements and value**

*Improved communication of the value of the project and its achievements is likely to assist with attracting investment, with the integration of this program with other NRM programs in the region and with raising the profile of the Emu-wren and Swamps and biodiversity conservation in general community.*

**RECOMMENDATION THREE:**  
**Maintain the autonomy and identity of the program**

*Maintain the status of the program as one hosted by a non-government organisation, as this allows unrestricted access to stakeholders at all levels and reduces limitations on capacity for objective advocacy. While maintaining the identity of the program (i.e. Emu-wren and Swamps) extend the scope of information communicated by talking about the overall system.*

**RECOMMENDATION FOUR:**  
**Maintain skills and knowledge base of project team**

*Maintain the multi-disciplinary project team, including expertise in administration, monitoring and evaluation, science, ecology, on-ground works, extension, policy and planning.*

**RECOMMENDATION FIVE:**  
**Improve communication, integration and cooperation between NRM stakeholders**

*This recommendation includes the following:*

- *Improved communication between all parties regarding weed control (suggested development of an information kit)*
- *Improved integration of this program with other NRM activities in the region*
- *Improved coordination with Government Agencies through the NRM Boards*
- *Improved coordination across NRM boundaries*

*The possibility of improving integration and funding efficiency through having the Recovery Program hosted by the AMLR NRM*

**RECOMMENDATION SIX:**

***Continue to improve communication, awareness raising and education programs***

*This recommendation includes the following:*

- *Keep cohesive program with ongoing focus on landholders*
- *Improve resources for communicating information to stakeholders, particularly landholders*
- *Target education for property management and improving land management practice*
- *Develop comprehensive manual for interpretation of management requirements under legislation*

**RECOMMENDATION SEVEN:**

***Support the establishment of schemes that create economic value for native vegetation***

*Creating economic value for native vegetation (for example carbon offsets for swamps, rather than Tasmanian Blue Gum plantations) would work towards making environmental stewardship a profitable option for landholders.*

**RECOMMENDATION EIGHT:**

***Improve management of the whole system***

*Improve management of the whole system to deal with externalities better, and therefore maximise benefits of works.*

**RECOMMENDATION NINE:**

***Maintain focus on water extraction and plantation forestry as key threats***

*In addition to maintaining focus on these threats, both assessments of plantation forestry and the size of the buffer zone required between swamps and plantations should be improved to stop adverse impacts. (50 m buffer zone is insufficient.)*

**RECOMMENDATION TEN:**

***Improve measuring and recording of ecological outcomes***

*The ecological monitoring of the impact of the Recovery Program should be improved and include both the impacts on the Emu-wren and Swamps and on other species.*

EXPOSURE DRAFT

## Section 4: Instances of significant change

The following vignettes were chosen by the participants of the summit workshop as representing the most significant changes occurring as a result of investment in the Recovery Program. These vignettes were chosen out of three sets of vignettes (22 in total).

### What is a vignette?

Vignettes are used to elicit responses, interpretations and judgments about a particular set of circumstances or context within a research setting. Typically used in the qualitative social sciences, vignettes offer a method for simulating complex events, outcomes and/or problems and use these to explore people's perceptions, opinions, beliefs and attitudes. In this case, the vignettes were extracted directly from interview transcripts, which were captured with digital audio recording. While edits were kept to a minimum, some text was removed, this is indicated by three dots between sentences.

### Vignette #1: Changing mind set

*When we came here 10 years ago and found out how valuable the swamps are, and someone said you could be milking cows off it. ...Part of the reason that this property was bought was so that we could use the swamp for the cattle to be in, and now it has completely changed around to where you are not allowed to let, where we won't be letting any cattle in at all. ...I remember a long time ago, someone saying that this may be coming, and at the time I was thinking, oh well, we won't be doing that because we need our swamps for our cows, we can't shut them off. But that was our mind set...*

*And I don't think we contemplated shutting off the swamps when we were fully milking cows because that area was just too important. ... I think the fact that we have stopped milking cows makes it a whole lot easier too, because the milking cows needed to have every amount of grass...*

*Now I am ready to fence off swamp, but I have to do it slowly because Dad doesn't see all this land getting fenced off. ... [the project officer] came out and we got a bit of a line where we were going to run the fence. When I told Dad about it, he wanted to shift the line by quite a few metres further into the swamp so that he didn't lose so much land, but I think we have come to an agreement out of that, of how to do it, and what we should be doing. And usually with my father, he grizzles about things at the start, but once you have done it he has friends coming around and he is out showing them how great it is.*

*I think it is changing, I think there's more people that are into swamps... Maybe the more people do it the more acceptable it will be for other people to do it....It is a bit of an issue but it is more acceptable for us, I guess, and for others, I guess the more you hear about it the more you learn, the easier it is.*

*I guess I know now by seeing the map, the Emu-wrens are probably only a few kilometres away, and if we can certainly fence off our swamp and revegetate it, there is a chance that the Emu-wrens would move onto our property. And think the visual effect of seeing the swamps revegetated will certainly make the property look better, probably not quite as bare as it is. Everything that you hear around the place all the time, is how much everything is changing in our environment. Maybe this is just our way of trying to do our bit to help. It could be nicer for the kids, if the farm stayed in the family, they might see the rewards out of what we have done, maybe the Emu-wren will still be around then.*

*This vignette was considered significant by the participants at the summit workshop for the following reasons:*

- *It provides a real farmer perspective.*
- *It demonstrates how increased environmental knowledge and awareness can lead to attitudinal change and then to behavioral change.*
- *Promotion of change of practice needs to be continuous but also opportunistic. In this case the change in land use created an opportunity to encourage habitat protection (fencing).*
- *It highlights that motivations for change are complex, include aesthetic and non-profit motivations, are grounded in community attitudes as well as personal attitudes and may rely on generational mind set change.*
- *It shows that sharing of knowledge of the endangered ecological assets with land managers is important and contributes to their anticipation of good project results.*

## Vignette #2: Letting everything regenerate itself

*I really wasn't doing anything; I was just basically leaving the land and letting everything regenerate itself. That was my little project. I wondered what would happen if you just left it alone. Everybody has all these – you have to do this, you have to do that. And I thought what happens if no stock, no, nothing getting into it that shouldn't. And what happens if it is actually, is allowed to just regenerate itself and became my passion? Let's leave it alone and just see what it does. And sure enough it did. There is no doubt in my mind – it grew quite significantly in the time that it was left alone.*

*...They were more interested in fixing the creek than preserving the wildlife if you know what I mean. The wildlife is sensitive but they were very focused on getting rid of willows, blackberries and my Emu-wrens had established themselves in the blackberries and no way, and that was another thing, okay all the blackberries have to go but I already have got things living in the blackberries that are natural to this habitat, so that is another argument down the track sort of thing. I basically broke off and did my own thing just quietly. I always had the Conservation Council keeping in touch at least every six months I would hear, they would ring me and ask if they could look at the place or check on something...*

*And then about 2 years ago they established that there was definitely a new Emu-wren had come into the area. Most definitely, there were more than what had originally been there and they were adult ones that hadn't been the offspring of the ones that were there. And they recorded that there were definitely new Emu-wrens that had come to live in that area, so that was really good. They established a whole new nesting group. So once again I say it is the swamp that has been left alone. It had 10 years, that I had it, which I allowed it to. I just left it alone, I didn't touch it except for the weeds people wanted to do a demonstration of how they could get rid of broom and blackberries and they asked me if they could use a couple of areas on the block to demonstrate that, but that was on the other side well away from the Emu-wrens – so that was about the only thing that happened on the block.*

*The water has definitely slowed down, the pace of the water was quite fast flowing when I first took over the place, but since all the natives, reeds and all the other native water plants have had an opportunity to regrow themselves, regenerate, the water flow has definitely slowed right down as it goes through, which was something they wanted to encourage because it was just rushing through and eroding the banks.*

*The fact that the swamp, when left without interference, actually started to overtake some areas particularly where the swamp was stronger and more established. It was actually starting to take back the broom and blackberry areas, slowly but surely it was taking. It grew from the time I started looking after it until the time I sold it. It more than doubled in size from its original size from the healthy part that had been there, to the healthy part that I left behind. It had definitely doubled which really impressed me.*

*This vignette was considered significant by the participants at the summit workshop for the following reasons:*

- It records the experience of an independent landholder who had taken their own steps to preserve swamp habitat. The tension between the landholders' perspective on appropriate management and 'conventional' management approaches (evidenced by different opinions about weed control in Emu-wren habitat) highlights the need for good communication and understanding of different approaches to management.*
- It reports a landholders' perspective on cause and effect in habitat recovery; reduced threats leads to habitat recovery and expansion, and increased viability of the threatened Emu-wren population.*
- It demonstrates a passive management strategy achieving results over 10 years (highlighting the necessity for flexible approaches to allow for alternative management strategies).*
- It demonstrates shared understanding between the Recovery Program and the landholder about the goals for habitat recovery, including protection of the hydrogeology of the creek.*
- It highlights the strong presence the Recovery Program has in the minds of key landholders and the importance of two-way information flow (shared knowledge about Emu-wren populations and needs).*
- It demonstrates that visible change in the condition of the habitat provided powerful feedback on management.*

### Vignette #3: Recovering vegetation

*...[The project officer] was rather taken with the potential of protecting the swamp, not so much from the Emu-wren side of things but from habitat – and I guess we have both been environmentally conscious for a long, long time – I was a biology teacher for many years so you get a little bit sensitive to destroying through agriculture.*

*...I think one of the things that kicked off an interest in the swamp areas was [my wife's] interest in photography and she was photographing flora and fauna with an emphasis on native flowers and a particular emphasis on native orchids and finding some of the relative rare species of swamp plants. ...we don't want all this sort of pugged up by cattle going through there every year and degrading to the point that they are no longer even remotely pristine. A lot of the swamps in the area are so degraded they will never come back to what they were once – not that ours are necessarily pristine but there was a lot there that was unusual.*

*...It is not much of a story. Sometimes there is a bit of serendipity in what happens, we wouldn't have considered fencing the swamps off ourselves because of the cost involved, but when there was a participation by the conservation council for fencing it became more attractive didn't it?*

*The swamp, it was – well I know that we have had two terribly dry years when I would have loved to put the cattle in – 3 years it has been fenced off – 2005 it was fenced off – late 2005 early 2006. It is running into its third year and cattle have been excluded.*

*...You have lost a certain amount of productivity – the argument is that swamp country doesn't provide much extra in the way of nutrition but in a bad year, because maybe the swamp is drying out a bit, you have that fringe of green feed which may just make the difference to your cattle losing condition or being able to maintain condition to feed the calves. See this is a place where once upon a time...there certainly has been according to the old timers, a significant trend away from those very wet years. The saying was you wear your "wellies" until Christmas it was that wet. So there is a small loss of productivity. ...We have had to buy more hay.*

*...You don't lose animals that are calving in dense scrub or something like that and end up with an animal in trouble.*

*... it is an interesting property, it is largely stringy bark – we have one little stand on the wall of the dam that actually was enclosed. That had Pink Gums. And I am not sure yet what they are, just down from the dam wall there are loads of trees or saplings which are probably around about a metre high. And if they are Pink Gums I will be delighted, because that means we will end up with something... a lot of this area through here was Pink Gums which were cut for firewood and fencing posts and things like that. So there is one example where regrowth of the right sort is occurring.*

*...And I have noticed since it was fenced off, different ferns have come back, the cattle wouldn't have eaten them but they would have trampled everything. In fact there is not a lot in most fenced off areas that the cattle would want but it has now got an awful lot of kangaroos – they are right into it that is for sure.*

*This vignette was considered significant by the participants at the summit workshop for the following reasons:*

- It highlights the role that incentive payments (cost-sharing which recognizes the public and private benefits of fencing the native vegetation) played in moving the landholder from interested and aware to active in conserving the habitat.*
- It demonstrates that information, education and financial support (for on-ground works) from the Recovery Program have provided robust protection for habitat through changed management expectations and practice.*
- It shows that landholder interests can be encouraged and that observations of change from management have a strong reinforcing effect on appropriate management practice.*
- It raises the issue that management change is ongoing and needs to adapt over time – e.g. there may be a need to manage total grazing pressure as unmanaged native animals may be replacing domestic stock as a potential threat.*

## Vignette #4: From cringe to valued ecosystem

*Well I think putting the swamps on the map the most important, that is why I said it first. I think no matter what happens to the Emu-wrens in a sense, and I sincerely hope that they are saved, what they have done for its habitat and for a unique ...ecosystem in its own right and for the suite of species that are in it, and for our understanding in South Australia about the values of threatened ecological communities, in their own right, I think that has been invaluable.*

*...when we use the word swamp, most people cringe, and now when you use the word swamp in that region, they think about a valuable listed ecosystem. I think that is pretty significant, and that is almost a very quick snapshot of what has happened.*

*You are able to engage landholders in the bird conservation, so you can engage them because they were charismatic birds, but they weren't particularly interested in the vegetation assets that they had on their property and most of them saw them as good opportunities to crash graze them during difficult periods in summer. And there was a lot of resistance to fencing them and stuff because they were...used extensively for grazing purposes... It was very hard to get them interested in things like orchids and other things ... especially things that are small plants that aren't orchids, even less okay than orchids.*

*The issue [swamp conservation] was a non issue and there was nothing about policy and there was nothing about them for local Government, you just couldn't stop people doing anything to them whatsoever. They weren't interested. Almost hesitant to use the word swamp to discuss their habitat because you thought people might think negatively of their habitat type. So if the birds were not in those swamps then you had no chance of doing anything really unless you had an extremely switched on landholder to begin with...*

*Now it is completely different, it is completely different, they have an extension program of on-ground works on swamps, without any of the birds being present at all, they are obviously potential habitats but some of them will never be habitats without a translocation. But it doesn't matter, they are seen as valuable in their own right, they are receiving funding in their own right, they are receiving management plans in their own right. Swamps are mentioned in every single policy document in the region, and at a State wide level. The Commonwealth has made decisions under EPBC around them, and I think because of the success of that I also think people were spurred on, to continue to push for the nomination of other threatened ecological communities. That is how different I think it is, and I think this Recovery Team, with the support of DEH have made that happen.*

*What made it happen? The listing was really significant, I don't think you can underestimate how important that listing was. Gained greater knowledge about it; about all of the assets associated with it; so all those other species and what it does within the landscape that was really important; trying to give landholders some practical advice about what to do about them...again that effort they have made to share the learning and make sure the learning is very practical. This is a very practical research, practical recovery team; almost all the research that they have participated in has been how do you manage things better. Persistence, persistence, persistence – and this is where having a recovery team that has been in the region for a long time makes such a big difference, it takes at least 10 years I think. ...It takes at least 5 years before you have relationships with people sufficiently enough to start making a difference..... I am trying to think of a single way of describing that they just have a lot of allies to support what they are doing to ensure that the swamps don't get forgotten on all these stages, like policy. So I don't know how you would pull out the key things there, longevity and networking, credibility and knowledge and being practical, they are the things.*

*Strategic Informant*

*This vignette was considered significant by the participants at the summit workshop for the following reasons:*

- It provides an excellent summary of the program.*
- It highlights how raising the profile of the endangered ecological assets has been fundamental to marketing the services of the Recovery Program. The use of charismatic fauna as a focus for conservation efforts is endorsed.*
- It highlights the importance of language in promoting change and the success of the Recovery Program in turning the concept of a 'swamp' from a pejorative descriptor of a low-value asset into a positive descriptor of a complex and living entity.*

- It endorses the Recovery Program as a key driver of the change in attitude and protection of the endangered ecological assets.
- It links the EPBC listing of the FPS as a key foundational activity leading to change in focus and success of the program.
- It endorses the practical approach of the Recovery Program and the importance of program staff credibility and knowledge of habitat recovery and management.
- It emphasizes the necessity for long-term relationships between the Recovery Program and the community to build knowledge and trust for changed practice.

## Vignette #5: Benefits for native vegetation and stock and property management

The company I work for purchased the property in July 2004...that had been allowed to I guess degrade, or was over grazed over the preceding 10 – 15 years, however long it was. And it was the intention of the owner or the shareholder of the company to return and protect the vast area of native vegetation on the property, to lock it up away from grazing, to develop a sustainable farming enterprise, but a sustainable break-even farm enterprise...

Over the last 4 years we have worked closely with [project officer] ...We have done a lot of work with him in respect to how and where our fences should go and be placed to protect the areas that are most sensitive to, not only to the Emu-wrens, but the Southern Brown Bandicoot. So we have used his advice extensively, combined with a Federal Government grant under the Envirofund...we are now in the review stage of our infrastructure establishment, now that all the fences are up and running. So we have been through the identification process, the evaluation or planning process, the implementation of the fences and now we get to see over the next 2-3 years I guess, how well those fences are protecting the area.

...I think the biggest result, I think that we are planning on is the more efficient use of the land for farm, for income producing activities because we are, we have separated quite strictly the areas that are grazing and income producing and the areas that are native vegetation protection areas. And so from there we are able to plan much better, like fertiliser, seed, stocking rate, because we have far more reliable measurements of the areas. As opposed to an area that is say 65% grazing 35% native veg – it is 100%, in terms of fertiliser and stocking rates, so it makes it far easier for us, as a business, to plan our commercial activities

...I guess it has been a very difficult year so, last year was with the drought, and the fencing has only been finished this year so it is very early days to be saying we can see dramatic improvements. I mean there are lots of kangaroos, but there are lots of kangaroos all the time, we haven't had any more sightings of Bandicoots or Wrens recently that I can tell you about, all we can say is that we have lost less cows because of the fencing. Because before we put the fences up we had cows going deep into the vegetation, so we have lost less cows and calves. When a calf is born into the 4ft reeds you can't see it – you don't know it is unwell, you can't go and fix it so it just dies, so we have been able to fix that. I guess the next stage will be once all these areas are fenced off ... we are putting in a reticulation system so there will be troughs, so we should see an improvement in protection of the various swamps, so I guess you came to ask me that question 2 years too early.

This vignette was considered significant by the participants at the summit workshop for the following reasons:

- It demonstrates multiple outcomes from conservation efforts, including a positive effect on production.
- It reports the high level of reliance of the land manager on the expertise and advice of a Recovery Program officer.
- It highlights the private benefits (motivation for cost-sharing) which have flowed from involvement in the program –e.g. financial support for fencing to protect habitat but also make primary production more efficient.
- It indicates that the land manager has developed a strong interest in the outcomes of changed management for conservation and is likely to continue to observe change and 'invest' in the outcomes.

## Vignette #6: Big inroads

*Well I guess the Fleurieu never had a Water Catchment Board and so funding for this region was always a bit more limited, they relied on people chasing external funding. So when the Emu-wren program came on board, they actually had an allocation just for the Fleurieu Swamps, that actually had allocated funding to do that ...basically gave the area more status. And the landholders were never used to having money around very much, so it just helped do that. Then there were people, the Southern Hills Soil Conservation Board, down here were getting funding through NHT and once again it just sort of expanded, the amount of work that could happen in the area and how many people could be engaged for the program and concentrating on those more important areas.*

*They put a whole team on, Project Officers, the Monitoring Officers, the Technical Officers, yeh the program really kicked into gear and made some really big inroads into the region and they still are. They are very – they have got a very good reputation.*

*...I guess the more people that know, the increased awareness in the region, and having access to incentive funding to help people assist them to do these things, I just think ... you can just see the benefits that has, the gains that people will get involved for whatever reasons. Some people will do it because they really want to do it, other people do it because they can get some money and other people do it because they want to manage, it might be just because they want to manage their stock better. But it doesn't really matter why they do it, just having the money and the Project Officers going out and knocking on their doors instead of, I mean some people will ring up and chase information, but when you go out and knock on people's doors and someone who has got good skills, and who can explain why it is important and they have some money to help them do it. The gains are twofold you know, rather than just advertising or sending a letter and saying here just give us a call if you want some money. It is that extension work I think that is really, really important and then the flow on effect from that when, then people will ring the Board and say I heard that this is happening and that is happening. can you help me. And once again the flow on effect from that is really important.*

*Strategic Informant*

*This vignette was considered significant by the participants at the summit workshop for the following reasons:*

- It indicates the growing status of the Recovery Program and staff and the important contribution they make to what people in the region believe they are achieving for the environment.*
- It reports the contribution the Recovery Program has made to increasing the critical mass of effort for conservation/NRM and extending the network of services offered to landholders prepared to manage for conservation.*
- It reports the spectrum of reasons why landholders engage in programs such as the Recovery Program and the importance of flexibility and breadth in the services offered.*

## **Vignette #7: Reaching beyond the converted**

*... when the program was much smaller there was a lot of science occurring ...and it was much more about the recovery of the Emu-wren, and finding out its distribution, and how rare it was, and doing a lot of colour banding and trying to gather information about that species. And it wasn't until the listing of the... swamps as a critically endangered ecological community that, in about 2003 I think, 2004, that the focus became more on managing the habitat and protecting the Fleurieu Swamps.... So the way it was before, there wasn't a targeted on-ground works program. So there was a wide ranging extension program where there were public forums and a lot of information being put out to the public like the Stipiturus newsletter and so forth. And that was basically building the community's understanding and knowledge of the Fleurieu Swamps and Emu-wrens – but there wasn't, landholders weren't being targeted strategically to undertake on-ground works. And in a way, I guess we found that ... we were sort of preaching to the converted. So we were often putting a lot of information out there and spending a lot of time in engaging with the community, but we were always reaching the same people who had either already undertaken conservation exercises, or didn't even have the assets we were aiming to protect.*

*And so we weren't reaching out for the particular people that we really needed to reach. So we changed our tack and started working out, through viewing our aerial photography, using ArcMap and layering over the top of that, any mapping that had been done of the Fleurieu Swamps and vegetation of the Fleurieu, and also cadastral layers. ...And then working out where the critical links were, where the Emu-wrens were in the landscape, and what links do we need to make for them to start moving through the landscape. And actually linking up sub-populations of*

*Emu-wrens. ...And start strategically looking at who do we need to contact; ...where can we get the biggest gain for our buck, and who had the biggest assets that need protecting. Then basically just engaging with them, approaching them, cold calling, and that kind of thing and we have had a few really exciting outcomes there. So often it takes months of engagement to actually even get onto a property or to get them to agree to take on some of our advice. But in the end, where we are having action, is really where we need it, and we are slowly but surely picking up, I guess, the big ticket items on the Fleurieu that we really need protected if we are going to get anywhere.*

*...Even though the stuff that we do is having wider reaching and positive impact in the region for biodiversity, it is really important to have a focus like the – using either the Fleurieu Peninsula Swamps and/or the Mount Lofty Ranges Southern Emu-wren as the target...because it allows you to stay focused on that strategically, and allows you to plan. And also having the science and support of people like [project officers] is extremely important because they really help you identify what makes up a key site for you to be targeting.*

*..We had a decent on-ground works budget and that really built momentum because it allowed us to get out there and bring people on board and spend some money and I don't think, if we hadn't had that budget in the first year to really build momentum, I don't think we would have been able to kind of, keep the ball rolling as we have with grants and so forth over the last couple of years.*

*So that is where it comes from and that is where we are at the moment, ...still making a lot of those actions happen on-ground.*

*...We have got some awesome sites that I didn't even think still grew in the Fleurieu – [project officer] and I were undertaking some monitoring of [a] site late last year and we were supposed to be there for half a day at that point, and we just found this patch of beautiful Pink Gum woodland with a beautiful herbaceous understorey – I had never seen that type of community before. In the entire understorey there was hardly a blade of grass it was all herbs, there was every orchid I could think of from the region en- mass, buttercups and lilies that I had never seen before and I had to look up. We were there for so long writing the species list because a lot of the species, we hadn't seen before. After we identified them, they were all natives, and this patch was so different and so intact and I didn't even think sites like that existed anymore – it was amazing.*

*Strategic Informant*

*This vignette was considered significant by the participants at the summit workshop for the following reasons:*

- It reports the evolution of the Recovery Program from research, through planning and community engagement to education and financial support for changing land management practice.*
- It reports a strategic and spatially explicit planning approach to optimizing the deployment of on-ground incentive payments and direct action.*
- It highlights the broad range of skills required to introduce and run a recovery project.*
- It indicates the importance of economy of scale in funding and the necessity to time investments to make the best use of different tools for motivating landholder management practice change – i.e. the on-ground works funding could be most effectively allocated only when planning and engagement processes were well underway.*
- It shows the enthusiasm of program personnel for biodiversity conservation.*

# Section 5: Evidence base

Chart ref #	Subject	Evidence type	Authenticity	Author or custodian	Reference	Temporal coverage	Spatial coverage	Key words
1	Contribution to planning processes	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008 (most since 2005)	South Australia	Planning processes
2	Submissions made	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Submissions, EPBC referrals, development applications, Native Vegetation Act
3	Range of stakeholders	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Stakeholders
5	Number of landholders engaged in OGW	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2005-2008	South Australia	On-ground works, engagement
6	Types of engagement	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2005-2008	South Australia	On-ground works, engagement
7	Increase in area under secure tenure	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Secure tenure, reserve system
8	Number and area of Heritage Agreements	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2005-2008	South Australia	Heritage Agreement
9	Number of hits on website	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	July 2003- April2008	South Australia	website
10	Km of fencing and area protected	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Fencing, stock exclusion
11	Vegetation types fenced	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Fencing, stock exclusion
12	Area enhanced (regeneration)	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Habitat enhanced, regeneration
13	Area enhanced (revegetation)	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Habitat enhanced, revegetation.
14	Area of weed management and target weed species).	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Weed management, weeds
15	Planning documents produced by program	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Planning documents
16	Management plans produced and actions implemented	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2003-2008	South Australia	Management plans, management actions, implement
17	Number of site visits	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2005-2008	South Australia	Site visits
18	Native Veg. Act compliance and enforcement	Unpublished data	Information supplied by DWLBC	Jess Mitchell, DWLBC		2003-2008	Fleurieu Peninsula	Compliance, enforcement, native vegetation
19	Extent that project information influences planning decisions	Expert Narrative	Information supplied by City of Victor Harbor	Ben Coventry, City of Victor Harbor		2003-2008	Victor Harbor Council Area	Development applications, submissions
20	Extend that project information influences water license conditions	Expert Narrative	Information supplied by DWLBC	Martin Stokes, DWLBC		2003-2008	Fleurieu Peninsula	Water license conditions
21	Change in water quality	Expert Narrative	Information supplied EPA	Clive Jenkins, EPA		2003-2008	Fleurieu Peninsula	Water quality

Chart ref #	Subject	Evidence type	Authenticity	Author or custodian	Reference	Temporal coverage	Spatial coverage	Key words
22	Water chemistry	Published data	EPA website	EPA	Environment Protection Agency (2008) Water Chemistry Monitoring for Deep Creek and Inman, Hindmarsh and Myponga Rivers. Online <a href="http://www.epa.sa.gov.au/">http://www.epa.sa.gov.au/</a> [accessed 26 May 2008]	1995-2006	Myponga River, Hindmarsh River, Inman River and Deep Creek	Water chemistry, water quality
23	Leveraged funds	Unpublished data	Information supplied by project staff	Melanie Rees, CCSA	Rees M (2008) MLRSEW and FPS quantitative data compiled for the Performance Story Report, CCSA unpub.	2005-2008	Fleurieu Peninsula	Leveraged funding, grants
24	Emu-wren population trend	Published data	Report produced by Recovery Program	Marcus Pickett, CCSA	Pickett M (2007) Mount Lofty Ranges Southern Emu-wren <i>Stipiturus malachurus intermedius</i> (Aves: Maluridae) Population Studies 1993–2006, CCSA	2003-2006	Fleurieu Peninsula	Emu-wren population trend, population dynamics
25	Proportion of population under secure tenure	Unpublished data	Information supplied by project staff	Marcus Pickett, CCSA		2003-2006	Fleurieu Peninsula	Emu-wren populations under secure tenure.
26	Number of sites monitored for recovery action impact	Unpublished data	Information supplied by project staff	Alys Stevens, CCSA		2003-2008	Fleurieu Peninsula	Monitoring, recovery actions impact
27	Advice provided by project staff	Expert Narrative	Information supplied by project staff	Tim Vale, Alys Stevens, Marcus Pickett, CCSA		2003-2008	Fleurieu Peninsula	Advice, stakeholders
28	AMLR/Aust Govt investment	Unpublished data	AMLR investment documents	AMLR NRM Board	AMLR NRM Investment Strategy Project Schedules: 2004, 05-06, 06-08, 07-08	2005-2008	Fleurieu Peninsula	Investment, AMLR, Australian Government
29	Incentives	Unpublished data	Information supplied by project staff	Tim Vale, CCSA		2005-2008	Fleurieu Peninsula	Incentives, rates
30	Status of Fleurieu Peninsula Swamps	Expert Narrative	Information supplied by project staff	Alys Stevens, CCSA		2008	Fleurieu Peninsula	Conservation status
31	Status of MLR Southern Emu-wren	Published data	MLRSEW Recovery Plan 2006-2011 (p 6)	MLRSEW Recovery Team	MLR Southern Emu-wren & Fleurieu Peninsula Swamps Recovery Team. (2007) Recovery Plan for the Mount Lofty Ranges Southern Emu-wren <i>Stipiturus malachurus intermedius</i> : 2006–2011. CCSA, Adelaide. (NB: currently under review for EPBC adoption)	2007	Fleurieu Peninsula	IUCN criteria, conservation status
32	Net fragmentation	Unpublished data	Information supplied by project staff	Alys Stevens, Marcus Pickett, Tim Vale, CCSA	Stevens A, Pickett M and Vale T (2008) Known incidences of increases and decreases in habitat fragmentation compiled for the Performance Story Report. CCSA unpub.	2003-2008	Fleurieu Peninsula	Fragmentation, habitat linkages, connectivity
33	Groundwater trends	Published data	AMLR State of the Region Report	AMLR NRM Board	AMLR NRM Board (2007) Creating a sustainable future: a natural resources management plan for the Adelaide and Mount Lofty Ranges region. Volume A: State of the region report. Draft for consultation.	2006	AMLR region	Groundwater, extraction, elevation, salinity
34	Surface water quantity	Expert Narrative	Information supplied by DWLBC	Jason VanLaarhoven, DWLBC		2004-2008	Fleurieu Peninsula	Water quantity
35	Surface water quantity	Published report	Parliamentary Inquiry	South Australian Parliament	Parliament of South Australia, Natural Resources Committee (2007) Deep Creek. Parliament of South Australia	1990-2007	Deep Creek Catchment	Water quantity, deep creek
36	Foundational activities regarding water management	Expert Narrative	Information supplied by DWLBC	Jason VanLaarhoven, DWLBC		2004-2008	Fleurieu Peninsula	Foundational activities, water

Chart ref #	Subject	Evidence type	Authenticity	Author or custodian	Reference	Temporal coverage	Spatial coverage	Key words
37	Status of FPS	Published report	Nomination for Listing FPS under EPBC	CCSA and Nature Conservation Society of South Australia	CCSA and NCSSA (2000) Nomination for listing Fleurieu Peninsula Swamps as an Endangered Ecological Community, CCSA, Adelaide	2000	Fleurieu Peninsula	Nomination, status, Fleurieu Peninsula Swamps
38	Net fragmentation	Expert Narrative	Scientist interview	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. unpub.	2003-2008	Fleurieu Peninsula	Fragmentation, habitat linkages, connectivity
39	Net fragmentation	Expert Narrative	Analysis of social inquiry interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. unpub.	2003-2008	Fleurieu Peninsula	Fragmentation, habitat linkages, connectivity
40	Extent of native vegetation / habitat	Expert Narrative	Analysis of social inquiry interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. unpub.	2003-2008	Fleurieu Peninsula	Native vegetation extent, area, habitat
41	Extent of native vegetation / habitat	Expert Narrative	Social inquiry interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. unpub.	2003-2008	Fleurieu Peninsula	Native vegetation extent, area, habitat
42	Risk of SEW population loss to fire	Expert Narrative	Analysis of expert and strategic informant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. unpub.	2003-2008	Fleurieu Peninsula	Wildfire, population loss, risk, fire, fire management
43	General trend in biodiversity condition is decline	Published report	AMLR State of the Region Report	AMLR NRM Board	AMLR NRM Board (2007) Creating a sustainable future: a natural resources management plan for the Adelaide and Mount Lofty Ranges region. Volume A: State of the region report. Draft for consultation.	2007	AMLR region	Biodiversity condition, trend, decline
44	Trend in biodiversity/ native vegetation condition	Expert Narrative	Analysis of expert and strategic informant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Native vegetation condition, trend, decline
45	Trend in biodiversity/ native vegetation condition at the site scale	Expert Narrative	Analysis of expert and strategic informant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Native vegetation condition, trend, site scale, improvement
46	Trend in Swamp or native vegetation condition, native fauna abundance, stock and farm management, water quality or quantity at the local/site scale	Participant Narrative	Participant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Native vegetation, Swamp, native animals, fauna, water quality, water quantity, stock management, property management, condition, trend, site scale, local

Chart ref #	Subject	Evidence type	Authenticity	Author or custodian	Reference	Temporal coverage	Spatial coverage	Key words
47	Enforcement of and compliance with management plans and legislation.	Expert Narrative	Analysis of expert and strategic informant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Compliance, enforcement, management plans, legislation, EPBC
48	Water licenses, conditions, compliance and enforcement	Expert Narrative	Information provided by DWLBC	Jason VanLaarhoven, DWLBC		2004-2008	Fleurieu Peninsula	Water licenses, conditions, compliance, enforcement
49	Developments with real or potential adverse impacts	Expert Narrative	Analysis of expert and strategic informant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Inappropriate developments, negative impact, adverse impact
50	Illegal water extraction assumed to cause negative impact on neighbouring Swamp	Participant Narrative	Participant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Illegal water extraction, drying swamp, no enforcement
51	Effectiveness of weed management	Participant Narrative	Analysis of participant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Weed management, effectiveness, results, success
52	Effectiveness of weed management	Expert Narrative	Expert strategic informant interview	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. unpub.	2005-2008	Fleurieu Peninsula	Weed management, effectiveness, results, success
53	Motivation for landholder involvement in the program	Participant Narrative	Analysis of participant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Motivation, incentives, engagement, involve, landholders, land managers
54	How well were threats identified?	Expert Narrative	Analysis of expert and strategic informant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Threats, identification
55	Negative influences on recovery of Emu-wren and Swamps	Participant Narrative	Analysis of participant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Threats, negative influences, water extraction, forestry
56	Recovery program review	Published report	Independent review of Recovery Program	Recovery Team	Prescott A and Saunders DA (2003) Review of the Mount Lofty Ranges Southern Emu-wren Recovery Program 1999-2003, MLRSEW Recovery Team	1999-2003	Fleurieu Peninsula	Recovery program review
57	Strategically targeted versus reactionary activities	Expert Narrative	Analysis of expert and strategic informant interviews	O'Connor NRM/Clear Horizon	O'Connor NRM and Clear Horizon (2008) Analysis of social inquiry interviews for the MLRSEW and FPS Performance Story Report. Unpub.	2003-2008	Fleurieu Peninsula	Strategic, target, reactionary

Chart ref #	Subject	Evidence type	Authenticity	Author or custodian	Reference	Temporal coverage	Spatial coverage	Key words
58	SAMDB/Aust Govt investment	Unpublished data	Information provided by SAMDB NRM Board Staff	SAMDB NRM Board		2003-2008	Fleurieu Peninsula	Investment, SAMDB, Australian Government
59	DWLBC comment for EPBC and Development Application decisions	Expert Narrative	Information provided by DWLBC	Jason VanLaarhoven, DWLBC		2005-2008	Fleurieu Peninsula	DWLBC, comment, submission, EPBC, Development Application
60	Listing of Fleurieu Peninsula Swamps as a threatened ecological community	Legislation	Environment Protection and Biodiversity Conservation Act 1999	Department of Environment Water, Heritage and the Arts	<a href="http://www.environment.gov.au/biodiversity/threatened/">http://www.environment.gov.au/biodiversity/threatened/</a>		Fleurieu Peninsula	EPBC Act, listing, Fleurieu Peninsula Swamps
61	Prescription of water resources	Legislation	Natural Resources Management Act 2004	DWLBC	<a href="http://www.dwlbc.sa.gov.au/assets/files/wmlr_fs26_prescription_water_resources.pdf">http://www.dwlbc.sa.gov.au/assets/files/wmlr_fs26_prescription_water_resources.pdf</a> <a href="http://www.samdbnrm.sa.gov.au/Portals/7/EMLR%20Prescription%20Newsletter%201.pdf">http://www.samdbnrm.sa.gov.au/Portals/7/EMLR%20Prescription%20Newsletter%201.pdf</a>		Mount Lofty Ranges	Prescription, water
62	Environmental water provisions and water resource development methods	Expert Narrative	Information provided by DWLBC	Jason VanLaarhoven, DWLBC		2005-2008	Fleurieu Peninsula	Environmental water provisions, resource development methods
63	Proportion of Fleurieu Peninsula Swamps protected	Unpublished data	Analysis of information provided by Recovery Program	O'Connor NRM/Clear Horizon		2007-2008	Fleurieu Peninsula	Percent, proportion protected Fleurieu Peninsula Swamps
64	Extent of Fleurieu Peninsula Swamps	Published report	Recovery Program document	Recovery Team	MLRSEW & FPS Recovery Team (2007) Recovery Statement for Fleurieu Peninsula Swamps, CCSA, Adelaide	2007	Fleurieu Peninsula	Distribution, extent, Fleurieu Peninsula Swamps
65	Estimation of sustainable yield of groundwater in the Southern Fleurieu Peninsula	Expert Narrative	Information provided by DWLBC	Jason VanLaarhoven, DWLBC		2008	Southern Fleurieu Peninsula groundwater sub-region	Sustainable yield, groundwater, Southern Fleurieu Peninsula