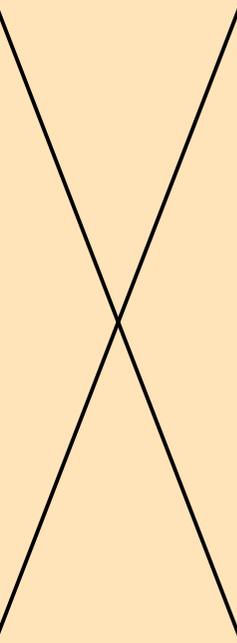


## A2.4 PPM for Land resources

LAND RESOURCES	Objectively Verifiable Indicators	Means of Verification	Assumptions
<p><b>Overall Outcome</b> To contribute substantially to the conservation and management of targeted land resources in the South West NRM region so they remain healthy and productive, and are effectively co-managed.</p>	<p><b>Indicators for the Overall Outcome</b></p> <p><b>LI-1a</b> By 2020, maintain and/or improve the productivity of the land on the majority of targeted agricultural holdings in the region.</p> <p><b>LI-1b</b> By 2020, the majority of targeted agricultural holdings are implementing strategies to improve soil health (structure, biology and chemistry).</p> <p><b>LI-1c</b> The proportion of agricultural land within the region on which production is constrained by dryland salinity and by acidity shows a downward trend between 2010 and 2020.</p> <p><b>LI-2</b> By 2020, no new invasive species capable of causing significant environmental harm as identified by the State government establish within the region.</p> <p><b>LI-3</b> By 2020, the majority of targeted agricultural landholders have implemented measures to improve and/or provide habitat on their remnant bushland blocks and along rivers and streams.</p> <p><b>LI-4</b> By 2020, the majority of targeted landholders have a clear understanding of the threat posed by climate variability and how to mitigate and/or adapt to its effects.</p>	<ul style="list-style-type: none"> <li>• State of Environment Report WA</li> <li>• Annual reports (SWCC)</li> <li>• Report cards or State of Environment reports (SWCC)</li> </ul>	
<p><b>Management Outcome</b> <b>LM-1</b> All land and water resources on targeted agricultural holdings in the SW are managed according to the best management practises available, specifically with regard to maintaining and/or improving soil health and productivity, reducing the impact of salinity and soil acidity, managing and/or controlling invasive species and maintaining, restoring or enhancing ecosystem services on-farm.</p>	<p><b>Management Outcome Indicators</b></p> <p><b>LMI-1</b> Farm management is improved on all targeted agricultural holdings in the SW region by 2020.</p> <p><b>LMI-2</b> Invasive species are controlled on all targeted agricultural holdings in the SW region and appropriate management systems for invasive species are implemented for the entire region by 2020.</p> <p><b>LMI-3</b> Biodiversity as measured by numbers of bird species is increased by at least 20% on all targeted agricultural holdings in the SW region by 2020.</p> <p><b>LMI-4</b> The risks associated with a fluctuating climate on land resources are identified and incorporated into land management for at least one sub-region in the period up to 2020.</p>	<ul style="list-style-type: none"> <li>• DAFWA (data and reports)</li> <li>• Annual reports (SWCC)</li> <li>• Report cards or State of Environment reports (SWCC)</li> </ul>	<ul style="list-style-type: none"> <li>• The effects of climate variability remain manageable.</li> <li>• Landholders remain personally committed and financially able to implement the proposed actions.</li> </ul>

<p><b>Appropriate Management Actions</b></p> <p><b>LA-1 Title (what):</b> Sustainable farm management.</p> <p><b>Target (why):</b> Ensure that the productivity of agricultural land and the quality and quantity of water available for human use and for the functions of healthy ecosystems in the SW region is maintained or improved for future generations.</p> <p><b>Appropriate actions (how):</b></p> <ul style="list-style-type: none"> <li>• Expansion of perennial and salt-land pastures (including native species) through extension, technical assistance, R&amp;D, incentives and demonstration sites.</li> <li>• Enabling the revegetation of least productive land in marginal farming areas</li> <li>• Education programs targeting improvement of fertilizer management through soil testing and other BMP techniques, alternative fertilizer sources (bio-solid re-use, compost) and effluent re-use (dairies and feed-lots).</li> <li>• Provision of extension services and access to expert advice (on-farm one-on-one advice) targeting improvement of grazing management.</li> <li>• Implementing field trials and demonstration sites (dealing with soil compaction, soil biological activity) and providing technical assistance on aspects such as soil biological activity and improving productivity and phosphorus retention through soil amendments targeting the improvement of soil health and condition.</li> <li>• Provision of support for demonstration sites to increase awareness about water repellence.</li> <li>• Improvement of surface water management through demonstration sites and technical assistance.</li> <li>• Improvement of water use efficiency through education, demonstration sites and incentives.</li> </ul> <p><b>Contributes significantly to LM-1.</b> In addition, contributes significantly to objectives of PM-1.</p>	<p><b>Potential Management Action Indicators</b></p> <p><b>LAI-1a</b> Increasing adoption of perennial and salt-land pastures in multiple landscapes; decreasing recharge of groundwater; increased acreage.</p> <p><b>LAI-1b</b> Fertilizer management – decreasing use of fertilizers, increasing productivity.</p> <p><b>LAI-1c</b> Grazing management – pasture growth rates, total dry matter, percentage ground cover.</p> <p><b>LAI-1d</b> Soil health – increase in soil organic matter levels.</p> <p><b>LAI-1e</b> Surface water – reduction in erosion.</p> <p><b>LAI-1f</b> Water use – reduction in water use.</p> <p><b>LAI-1g</b> Number of demo sites; site visits; advice provided; incentives.</p> <p><b>LAI-1h</b> Increased levels of awareness.</p>	<ul style="list-style-type: none"> <li>• SWCC (annual and quarterly reports, other reports)</li> <li>• Government agencies (DAFWA, DEC, DoW, BOM).</li> <li>• Landcare and other community groups.</li> <li>• Landholders.</li> </ul>	<ul style="list-style-type: none"> <li>• Landholders remain personally committed and financially able to implement the proposed actions.</li> <li>• Funding is available to implement all management actions.</li> <li>• Political support continues.</li> <li>• Government agencies continue to collaborate.</li> </ul>
<p><b>LA2 Title (what):</b> IPM (Integrated Pest Management).</p> <p><b>Target (why):</b> Ensure that all significant invasive species are managed /controlled on agricultural holdings throughout the region.</p> <p><b>Appropriate actions (how):</b></p> <ul style="list-style-type: none"> <li>• Support for extension (provision of technical advice).</li> <li>• Improve management and control of invasive species through creation of biosecurity group in partnership with DAFWA, and by providing support to programs such as the Blackberry Containment Line and also through education &amp; raising awareness.</li> </ul> <p><b>Contributes significantly to LM-1.</b> In addition, contributes significantly to objectives BM-2 and PM-1.</p>	<p><b>LA2a</b> Number of extension and awareness raising programs.</p> <p><b>LA2b</b> Biosecurity group set up and functioning.</p> <p><b>LA2c</b> Blackberry Containment Line fulfils its functions and objectives.</p>		

**Appropriate Management Actions contd.)**

**LA3 Title (what):** Agricultural land and biodiversity.

**Target (why):** Ensure that services provided by healthy ecosystems to agricultural holdings are maintained or improved throughout the region.

**Appropriate actions (how):**

- Support for planting of windbreaks, block plantings, agroforestry and mallees to provide habitat and reduce wind erosion and evaporation.
- Provision of planting incentives and technical assistance for riparian revegetation work to provide habitat and reduce groundwater recharge.
- Implementation of relevant community awareness programs.

**Contributes significantly to LM-1.** In addition, contributes significantly to objectives of BM-1, BM-2 and PM-1.

**LA3a**

Increase in length of riparian corridors (km).

**LA3b**

Increase in associated biodiversity at the local scale.

**LA3c**

Increase in shade levels and decrease in average water temperature.

**LA-4 Title** (what): Managing the effects of climate variability on land resources.

**Target** (why): Contribute to improving the resilience of the region's land resources to climate variability.

**Appropriate actions** (how):

- Providing support for inclusion of adaptive responses to the effects of climate variability based on best available knowledge in the development and implementation of programs to ensure the long-term sustainability of priority agricultural assets.
- Developing a planned response to the effects of climate variability whilst encouraging a balance between land use and the management of biodiversity and water by:
  - providing a guide to planning by identifying and spatially linking local land use with the Regional NRM Strategy, e.g. by addressing land use capability and interpreting agricultural land quality data and other factors such as hydrology;
  - developing an "Issues & Priorities" paper to assess and determine SWCC's role in responding to the effects of climate variability and the future Carbon economy, e.g. access to information and technical advice; community consultation; provision of incentives to farmers; assess business models (auditors, brokers); assess other models and the approaches of community catchment groups to climate variability; and developing projects that top up or provide incentives for biodiversity and salinity.
- Identifying and incorporating risk management strategies for the effects of climate variability into all projects and programs, utilising "best management practice".
- Promoting, providing support for and facilitating funding initiatives that address the effects of climate variability through adaptation and/or mitigation with positive NRM outcomes, e.g. the Carbon Farming Initiative (CFI) and Clean Energy Futures (CEF). Specific activities include:
- Promoting an understanding and awareness of offset methodologies and the use of generic models;
  - Providing information to farmers and land managers;
  - Seeking funding for projects through the Biodiversity Fund;
  - Investigating a co-benefit index; and
  - Assessing existing baseline data available for future measurements.
- Providing support cooperative activities with landholders that address the effects of climate variability based on mechanisms such as the Climate Change Fund and the Biodiversity Fund

**Contributes significantly to WM-1.** In addition, contributes significantly to objectives of BM-2 and AM-2.

**LAI-4a** Climate variability incorporated into land use planning.

**LAI-4b** Strategies to deal with the effects of climate variability on land resources.

**LAI-4c** Risk management strategies for incorporating climate variability into farm management.

**LAI-4d** Number of funding opportunities made available to landholders.

**LAI-4e** Number of capacity-building events.

### **Priority Assets for Management Action**

- All productive agricultural land in the following soil-landscape zones:
  - Bassendean Zone (wind erosion, soil acidification, nutrient loss, loss of soil carbon);
  - Eastern Darling Range Zone (water erosion, land salinization, soil structure decline and/or compaction, loss of soil carbon);
  - Perth Coastal Zone (wind erosion);
  - Pinjarra Zone (land salinization, acidification, loss of soil carbon);
  - Scott Coastal Zone (wind erosion, soil acidification);
  - South Western Zone of Ancient Drainage;
  - Southern Zone of Rejuvenated Drainage (water erosion, soil structure decline and/or compaction);
  - Warren-Denmark Southland Zone (water erosion, land salinization, soil structure decline and/or compaction); and
  - Western Darling Range Zone (water erosion, land salinisation).
- Blackberry Containment Line.

### **Priority threats:**

- Acid sulphate soils;
- Dryland salinity;
- Flooding;
- Irrigation salinity;
- Mass movement;
- Nutrient loss and eutrophication;
- Remnant vegetation decline;
- Soil fertility decline;
- Soil structure decline and compaction;
- Soil acidity;
- Subsurface compaction;
- Surface water supply shortages;
- Water erosion;
- Water repellence (non-wetting soils);
- Waterlogging; and
- Wind erosion.

**Secondary threats** include Phosphorus lock-up; Loss of soil microbiology; and Water repellent soils.