

## Concept Plan SP 2018-136

# Understanding the key ecosystem services provided by the seagrass meadows of Western Australia

Marine Science

### Project Core Team

Supervising Scientist	Simone Strydom
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### Project status as of Jan. 9, 2020, 12:43 p.m.

Approved and active

### Document endorsements and approvals as of Jan. 9, 2020, 12:43 p.m.

Project Team	granted
Program Leader	granted
Directorate	granted

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## Biodiversity and Conservation Science Program

Marine Science

### Departmental Service

Service 7: Research and Conservation Partnerships

### Aims

The overarching aim of this project is to increase our understanding of how anthropogenic pressures and climate change affect seagrass habitats and their associated ecosystem services. To achieve this, three key objectives have been identified: 1) collate baseline information to describe seagrass distribution and condition over time across the sub-tropical/temperate WA marine reserves; 2) establish which methods are most appropriate for assessing key fish and invertebrate communities in seagrass meadows across WA marine reserves; and 3) assess faunal communities across different types of seagrass meadows to inform how they are affected by seagrass condition. This project will advance our knowledge of the vulnerability of different types of seagrass meadows to pressures, the effects disturbance has on seagrass ecosystem services and the implications for conservation management and planning.

### Expected outcome

The information gained from this project will illustrate the extent and patchiness of seagrass meadows in marine reserves and their variability over time. Results will be related to natural, anthropogenic and climate-related pressures to assess their impact on seagrass condition. Habitat maps and measures of seagrass condition (e.g. shoot density and canopy cover) for marine reserves will be collated and used in ecological monitoring reports to support evidence-based management. Methodology will be developed for monitoring the condition of fish and invertebrates in seagrass habitats. Results on how declining seagrass condition effects fauna habitat will provide knowledge that is of global significance and will be shared through presentations and scientific publications (estimate x6 publications across the 3 objectives). This project will markedly increase management-related knowledge of seagrass habitats and their associated communities in WA's temperate and sub-tropical marine reserves.

### Strategic context

This project will assist to meet the following strategic goals of the DBCA Science Strategic Plan 2018-21:

- Adequate knowledge of biodiversity is available to support the department's conservation and management of terrestrial, estuarine and marine ecosystems.
- Understanding of the effects and opportunities for mitigation of pressures and threats to terrestrial, estuarine and marine ecosystems and associated values.
- Impacts of climate change on biodiversity are better understood and adaptation strategies are incorporated into conservation management and planning.

Seagrass communities are key ecological values and Key Performance Indicators of the Shark Bay, Jurien Bay, Marmion, Shoalwater Islands and Ngari Capes marine parks and this proposal aligns with management plan strategies to monitor seagrass extent and condition as a high priority and to undertake research to improve knowledge of seagrass-related biodiversity and the ecological structure and function of seagrass meadows (see management plans CALM 1996, CALM 1992, DEC 2007). The management plan for Shoalwater Islands Marine Park (DEC 2007), for example, contains the strategies:

- Monitor the spatial distribution and biomass of seagrass communities in the marine park (High priority).
- Build the knowledge base on the floral and faunal diversity and natural variability of seagrass communities in the marine park (High priority).

Improving ecological knowledge of seagrasses and the communities they support has been identified as a high research priority for management of most of WA's marine parks, especially with regard to the emerging pressures associated with marine heatwave events and climate change (Kendrick et al. 2016).

### Expected collaborations

This project will be a collaboration between the Marine Science and Remote Sensing and Spatial analysis programs in BCS and regional marine park staff based in Swan Coastal, Blackwood, Moora and Shark Bay districts. This project will build on a long-standing BCS/regional collaboration to monitor seagrass condition in these marine parks as part of the DBCA Marine Monitoring Program.

To deliver this project, we will also collaborate with experts in seagrass ecology (Prof Glenn Hyndes, ECU, and Dr Matthew Fraser, UWA) and spatial modelling (Prof Rod Connolly, Griffith University, and Dr Ben Radford AIMS).

### Proposed period of the project

Nov. 21, 2018 – Nov. 21, 2023

### Staff time allocation

Role	Year 1	Year 2	Year 3
Scientist	1.5	1.4	1.3
Technical	0	0.05	0.05
Volunteer	0.05	0.05	0.05
Collaborator	0.15	0.15	0.15

### Indicative operating budget

Source	Year 1	Year 2	Year 3
Consolidated Funds (DBCA)	8200	9980	6980
External Funding			