Concept Plan SP 2021-040

Benefits of marine parks for marine fishes in a changing climate

Marine Science

Project Core Team

Supervising Scientist	Jordan Goetze
Data Custodian	Jordan Goetze
Site Custodian	

Project status as of July 5, 2021, 3:06 p.m.

New project, pending concept plan approval

Document endorsements and approvals as of July 5, 2021, 3:06 p.m.

Project Team	required
Program Leader	required
Directorate	required

Benefits of marine parks for marine fishes in a changing climate

Biodiversity and Conservation Science Program

Marine Science

Departmental Service

Service 7: Research and Conservation Partnerships

Aims

- Collate fish data from collaborators to enable biodiversity assessment of fish inside and outside of marine reserves.
- Develop conversion factors that will enable the synthesis of DBCA finfish data with legacy datasets and emerging methods (remotely operated vehicle video).
- Assess how well W.A.s current network of marine parks, represents the states finfish biodiversity.
- Identify which, if any, fish communities are not adequately represented within marine parks.
- Assess if the composition of finfish assemblages within marine parks has changed over time, and if any changes correspond with climatic events or changes in fishing pressure.
- Do these changes persist through time and do patterns of change differ among parks located along the WA coast?

Expected outcome

This state-wide synthesis of finfish data will assess the ability of marine parks to conserve the biodiversity of marine fishes across W.A., providing guidance on long-term marine park planning and management, and important information that could be used to determine where future parks may be best placed (Aims 3 and 4). It will also provide an improved understanding of how marine parks function in a changing environment (Aims 5 and 6). We will develop protocols for increasing the size/scope of datasets facilitating a better understanding of spatial and temporal trends in finfish populations (Aim 2). By addressing aim 3, we will also enable the evaluation of W.A. conservation management within a global context, highlighting the significance of our ecological assets. Finally, we will make sure that this legacy data is "future proofed" by ensuring comparability with emerging methods due to technological advances (e.g. remotely operated vehicle video surveys).

Strategic context

This project aligns with five strategic themes outlined in the Science Plan 2018-21 (listed in italics below). Specifically, the project will acquire and share knowledge on biodiversity (*Biodiversity knowledge*) through the collation and synthesis of a state-wide finfish dataset, through collaboration with researchers from universities and government agencies (*Collaboration with science providers)*. This will enable a state-wide assessment of the conservation status of marine fishes (*Conservation of ecological communities*), and a greater understanding of the pressures and threats acting on them (*Pressures and threats to ecosystem composition*). It will provide information on the vulnerability of marine fishes to climate change and how marine parks may buffer against these impacts (*Impacts of climate change on biodiversity*). Finally, this project addresses applied research priorities; *to explore the effects of climate change and fishing on finfishes*, as identified in Kendrick et al, (2016) and the management plans of nine marine parks.

Expected collaborations

This project will synthesise DBCA finfish data across all marine parks in W.A. As such we will work closely with MPCs in regional offices and the monitoring program in MSP. To incorporate data outside of marine parks (needed for objective 1), we will collaborate with external government agencies (AIMS, CSIRO, DPIRD) and universities (UWA and Curtin). We have spoken to data custodians, Euan Harvey and Ben Saunders from Curtin University, Tim Langlois from UWA and James Gilmour and Matthew Birt from AIMS, and Mike Travers from DPIRD who have agreed to commit data to the project and assist in the statistical analysis and interpretation of results. These researchers have extensive experience with the methods used to collect fish data as well

as combining large scale datasets to synthesize and provide ecological assessments over broad scales. As such a workshop will be organised to facilitate collation, analysis, interpretation, and write-up of results among collaborators.

Proposed period of the project

July 1, 2021 – July 1, 2024

Staff time allocation

Role	Year 1	Year 2	Year 3
Research Staff (Jordan Goetze, Shaun Wilson)	0.3 (JG),0.05 (SW)	0.3 (JG),0.05 (SW)	0.3 (JG),0.05 (SW)
Monitoring Staff (Tom Holmes, Claire Ross, Will Robbins)	0.05 (All combined)	0.05 (All combined)	0.05 (All combined)
Technical Officer (Caprice Hyde)	0.05	0.05	0.05

Indicative operating budget

Source	Year 1	Year 2	Year 3
Consolidated Funds (DBCA)	$5,000 Research Budget$; $30,000$ Kimberley Fieldwork	$5,000 Research Budget$	$6,500 Research Budget$
External Funding		$7,500 Collaborators$	