

CONSTRUCTED SEASCAPES: UNDERSTANDING FISHTRAP CONSTRUCTION, USE, CONDITION AND FUTURES IN THE WELLESLEY ISLANDS REGION, GULF OF CARPENTARIA

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This project is a collaboration with the Wellesley Islands Rangers, the Gulf Region Aboriginal Corporation RNTBC (GRAC), and the Carpentaria Land Council Aboriginal Corporation (CLCAC). It was developed in response to community request and has continued to be shaped through a co-discovery process.

This project works with and on the Sea Country of the Lardil, Kaiadilt, Yangkaal and Gangalidda peoples of the Wellesley Islands region. It is an honour and a privilege to work on and with their Country.

Introduction

The Wellesley Islands Fishtrap Project is a co-designed, Indigenous-led project where the research is structured with specific aims defined by community. This project is a collaboration between the Lardil, Kaiadilt, Yangkaal and Gangalidda communities, the Carpentaria Land Council Aboriginal Corporation, the Wellesley Islands Rangers, and JCU researchers.

The primary foci of this project are the construction of a geospatial database of fishtraps across the Sea Country of the Wellesley Islands region, and a best practice methodology for recording, monitoring and managing the fishtraps. These outputs will be incorporated into the On-Country workflow of the Wellesley Islands Rangers, to support fishtrap monitoring and management, and to aid in conservation efforts and encourage community engagement with the fishtraps.

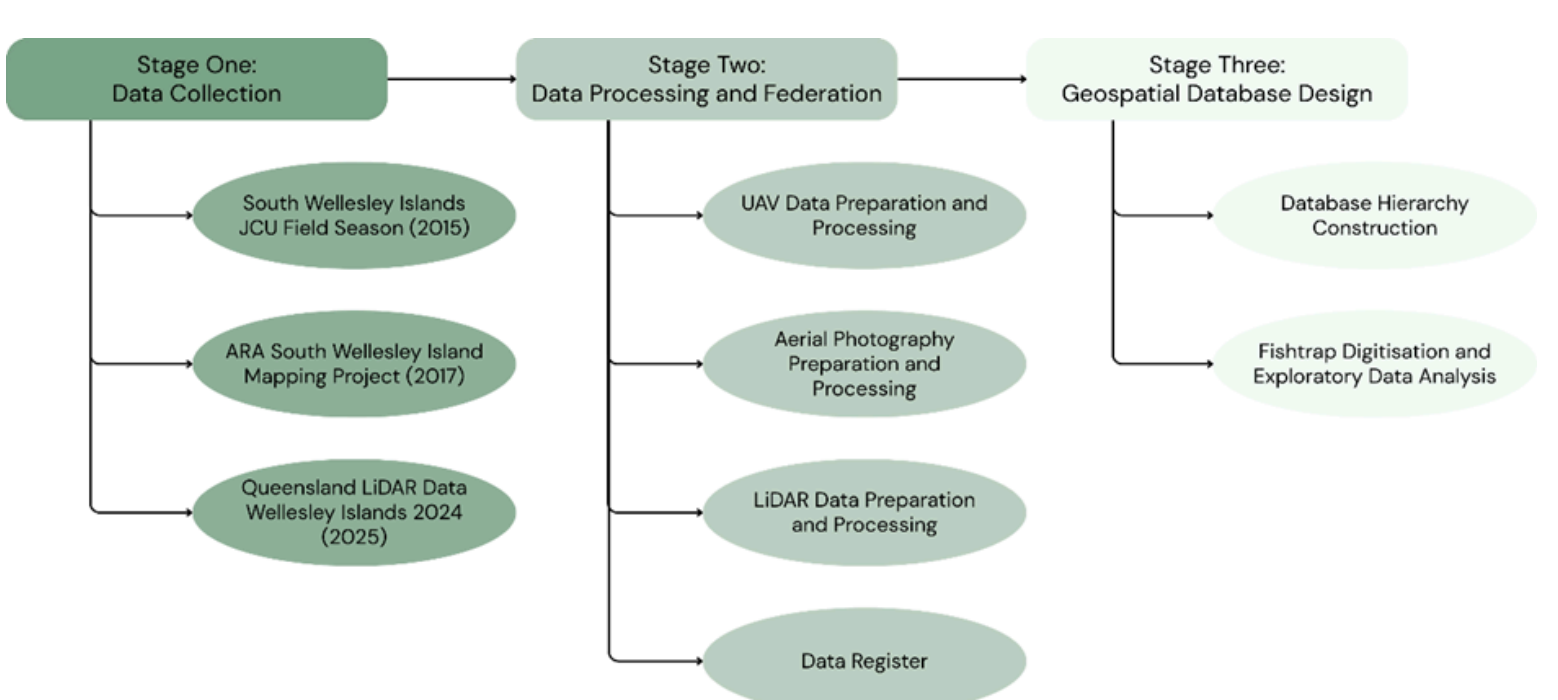
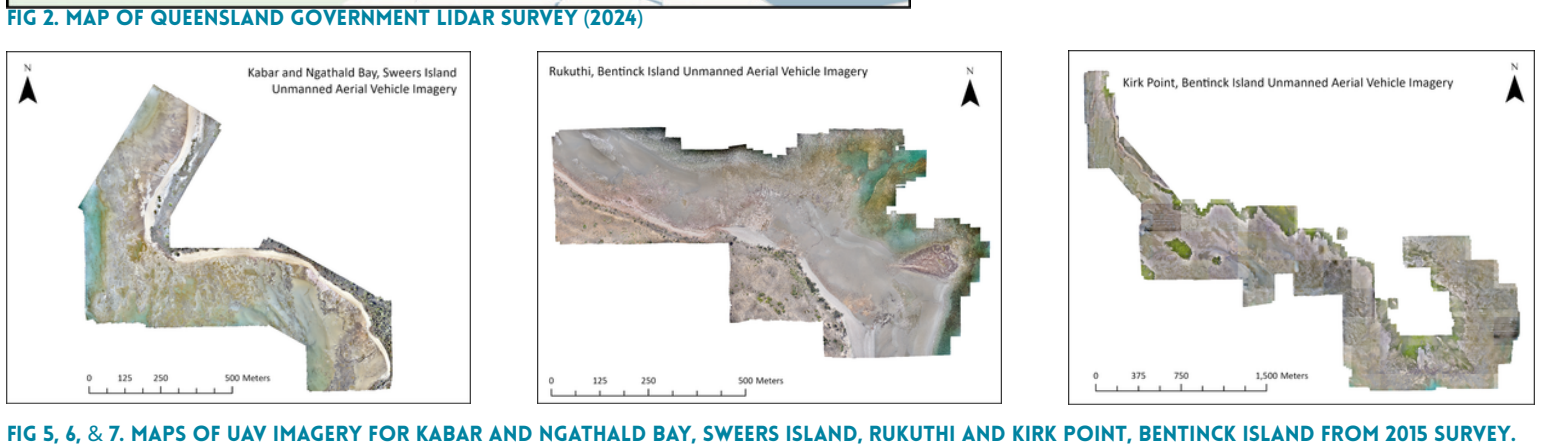
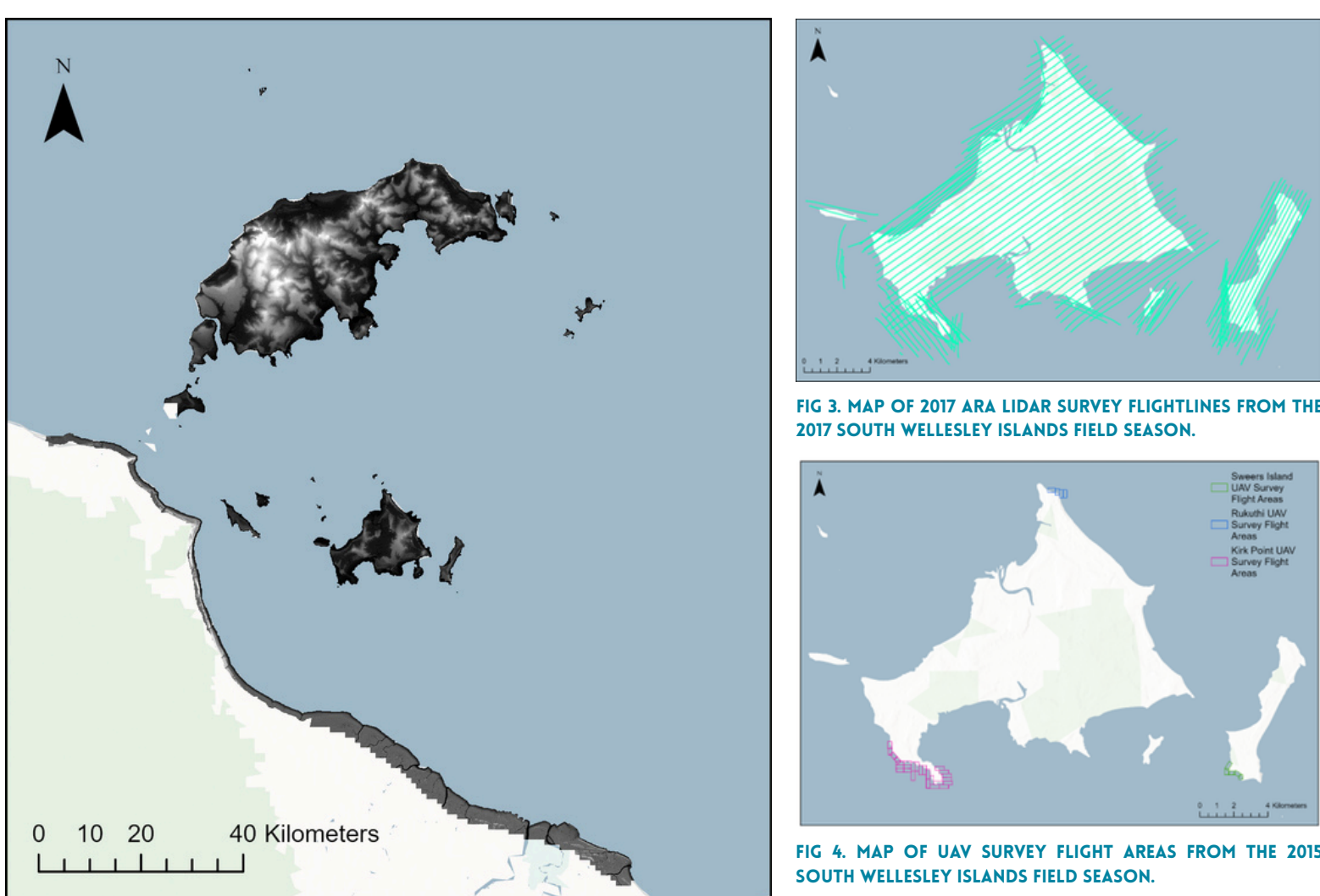


FIG 8. OVERVIEW OF METHODOLOGY STAGES ONE TO THREE: DATA COLLECTION, DATA PROCESSING AND FEDERATION, AND GEOSPATIAL DATABASE DESIGN.

Data Ranking

- Is the coverage of the fishtrap site complete?
 - 0.5 points if complete
 - 0.25 points if partial coverage
 - 0 points if no coverage
- Is the fishtrap site inundated at the time of capture?
 - 0.5 points if not underwater
 - 0.25 points if partially inundated
 - 0 points if underwater
- Is the fishtrap site fully visible?
 - 0.5 points if site is fully visible
 - 0.25 points if site is partially covered by vegetation
 - 0 site points if site is completely covered by vegetation
- Are the fishtrap walls easy to distinguish from the background colour?
 - 0.5 points if walls are very different to the background colour
 - 0.25 points if walls are similar to the background colour
 - 0 points if walls are indistinguishable from the background colour

Data Register

A data register was created using Excel to register every fishtrap site as identified and digitised in the point feature class in the Wellesley Islands Region Fishtrap Geodatabase; Fishtrap Site Locations. This data register was designed to highlight data availability at each identified Fishtrap Site Location, as well as data quality. The rating system seen in was implemented to assess data quality and suitability for the purposes of fishtrap identification and digitisation. This rating system includes four questions targeting the aerial data type's quality, each with a rating range of 0-0.5.

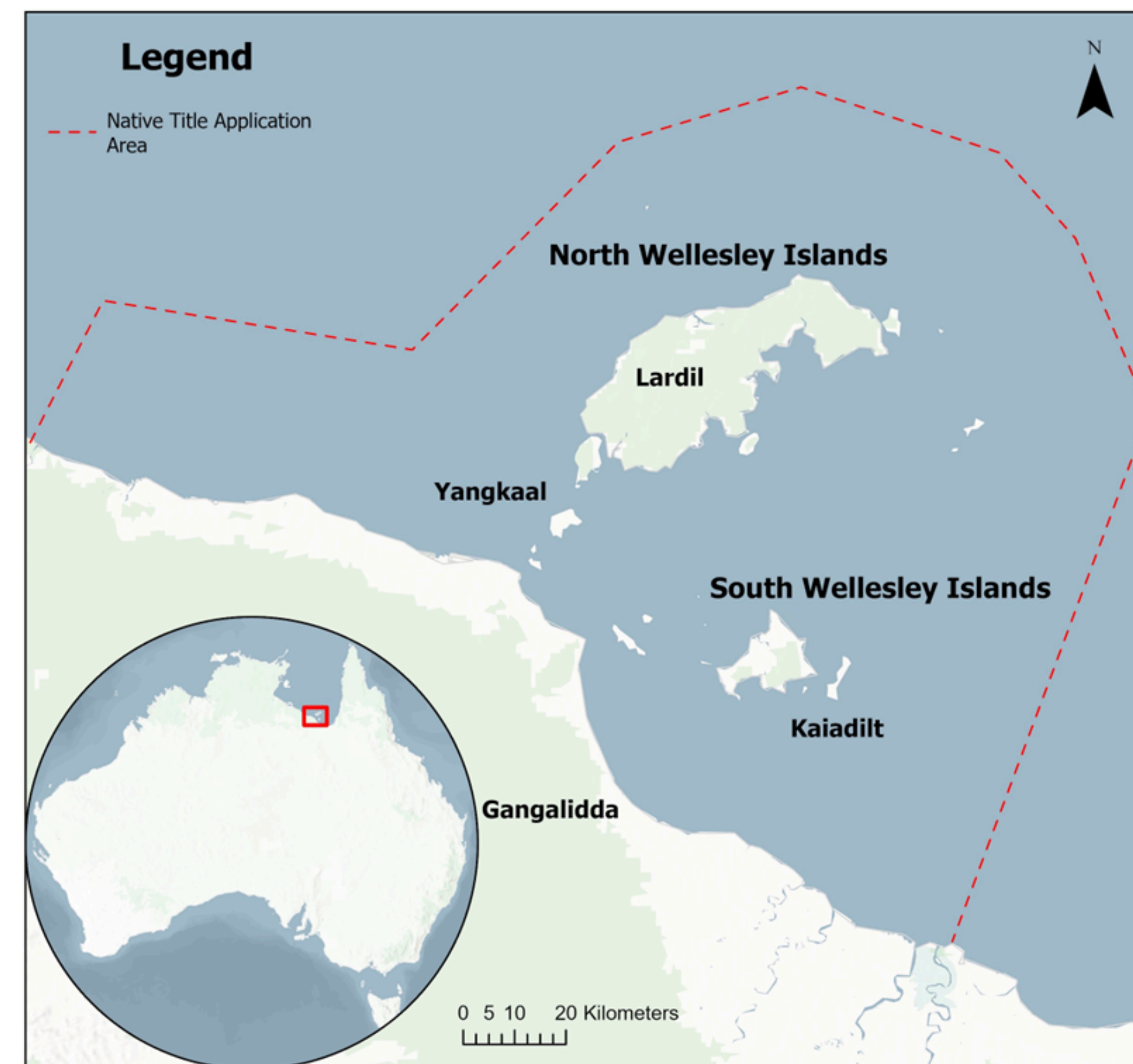
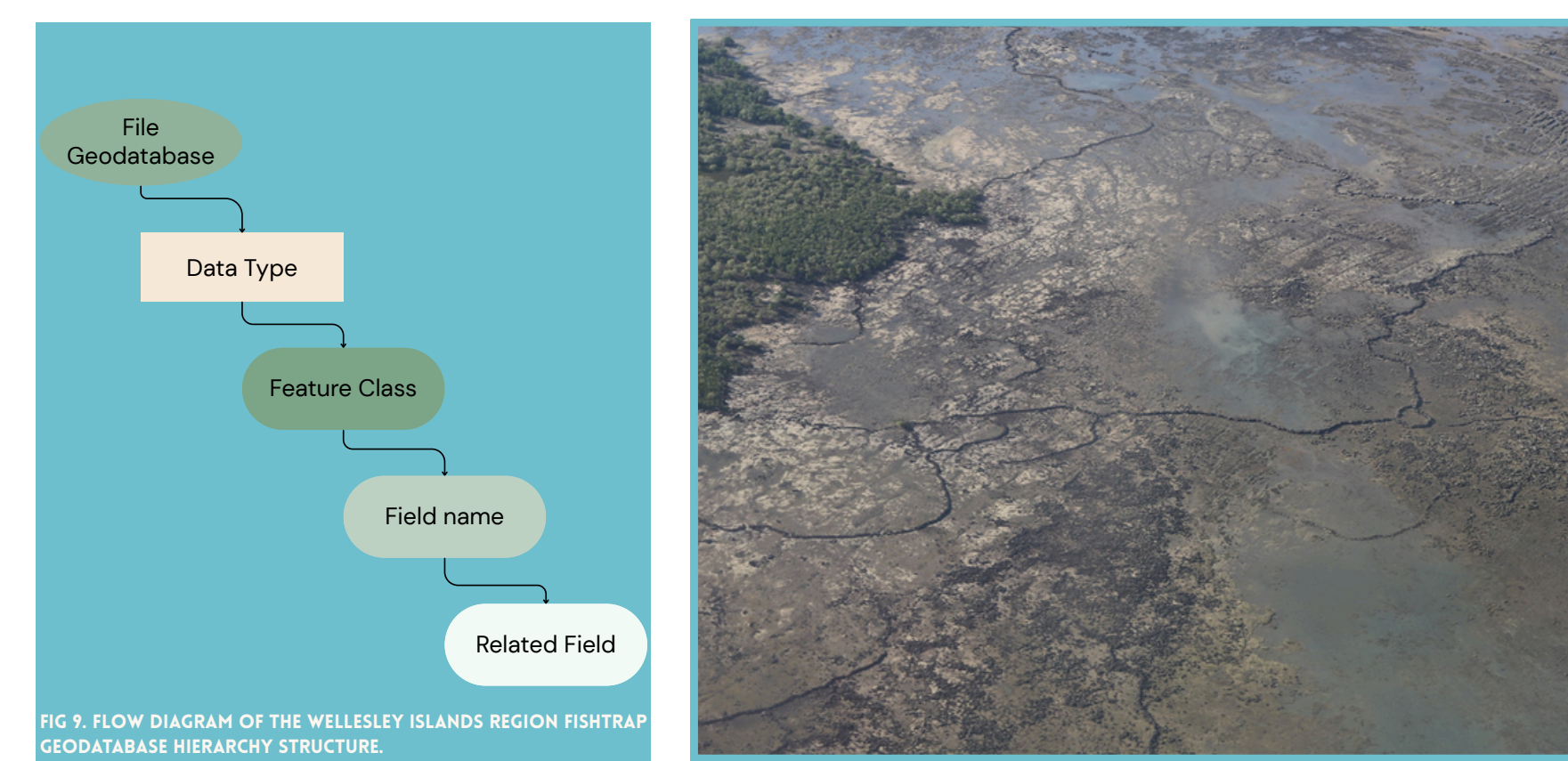


FIG 1. MAP OF THE WELLESLEY ISLANDS REGION FISHTRAP PROJECT STUDY.

Wellesley Islands Region

The Wellesley Islands Region is Gulf Country, up in the southern Gulf of Carpentaria in northwest Queensland. This region consists of the land and sea Country of the Lardil, Kaiadilt, Yangkaal and Gangalidda peoples. The Wellesley Islands region, its 22 islands and adjacent mainland coast, is home to one of Australia's largest concentrations of stone-walled intertidal fishtraps.



Highlights and Key Findings

- 572 fishtraps identified across the Wellesley Islands region
- Almost 80% of fishtraps across the region part of larger interconnected complexes
- 102 fishtrap complexes generated
- 55.5 kilometres of fishtrap walls digitised

Essential Fishtrap Elements

- Fishtrap Site Locations (Points)**
 - Manual identification involving thorough scans of the intertidal zones.
 - Records logistical information for Rangers and available data quality using data ranking system.
- Fishtrap Centrelines (Lines)**
 - Digitisation of the wall shape and length for each fishtrap.
- Fishtrap Complexes (Polygons)**
 - Buffer polygons generated at varying spatial distances to group multiple individual fishtraps occurring in proximity or in physical association with each other as part of a larger interconnected network across the intertidal zone

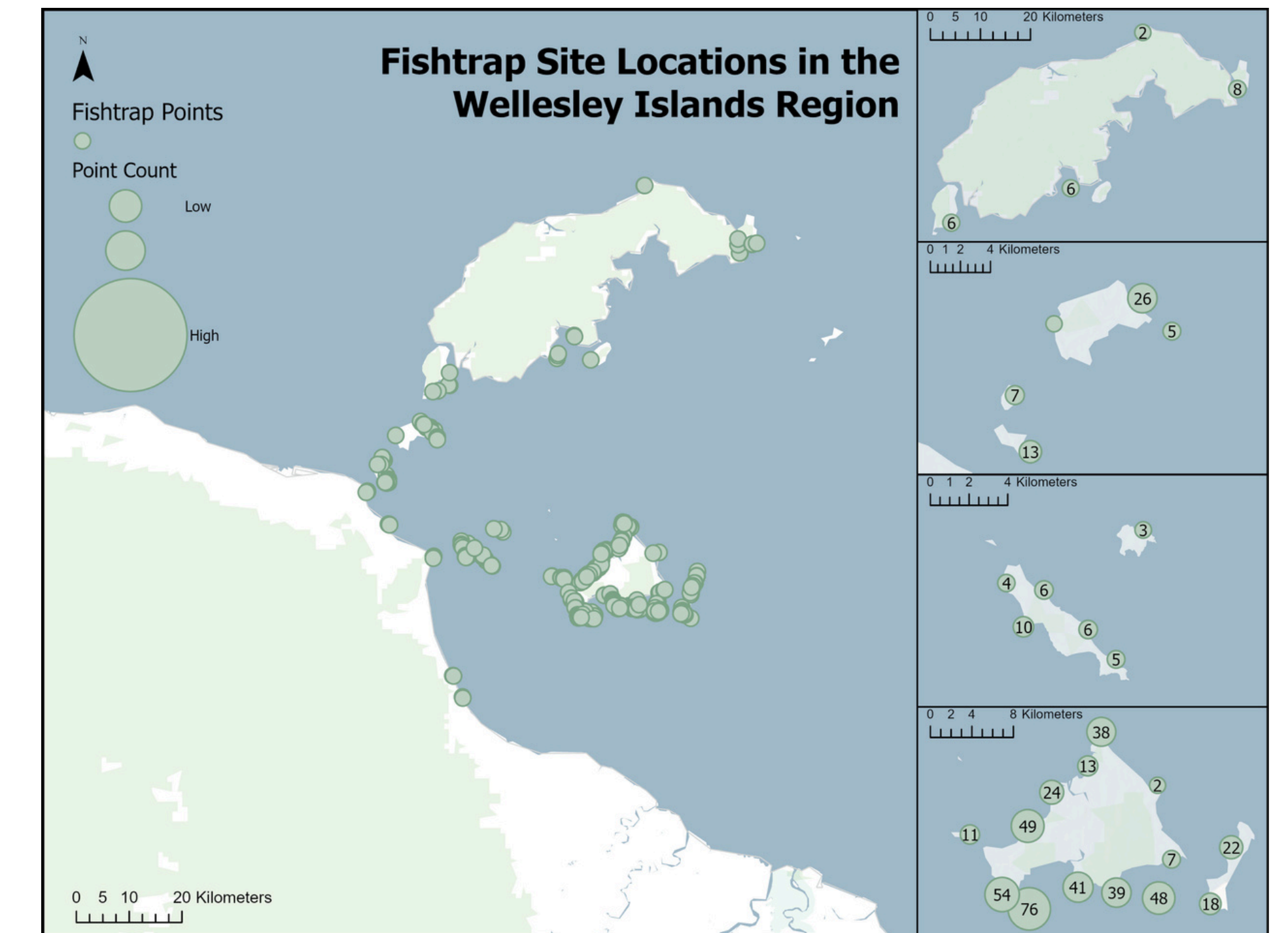


FIG 10. MAP OF FISHTRAP POINTS IDENTIFIED AND DIGITISED IN WELLESLEY ISLANDS REGION FISHTRAP PROJECT STUDY.

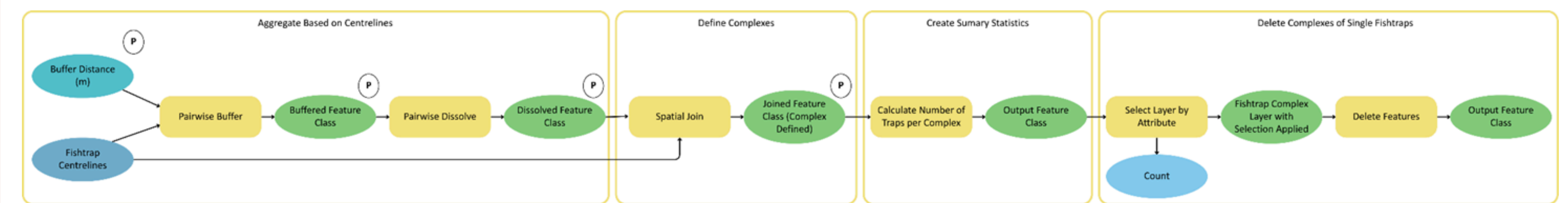


FIG 11. ARCGIS PRO MODEL FOR FISHTRAP COMPLEX GENERATION USING BUFFER DISTANCES AT METRIC INTERVALS (5M, 10M, 15M, AND 20M).

4. Fishtrap Centreline Elevation (Points)

- Extraction from the DEM datasets at points distributed equally along Fishtrap Centrelines (1m)

5. Fishtrap Centreline Gaps (Lines)

- Digitisation of the gaps that occur along fishtrap walls, their length and their position within a trap.

3D Modelling and Tangible Engagement for Communities

We used 3D modelling and printing create tangible, hands-on models of the fishtraps derived from the high-quality, high-resolution UAV LiDAR data captured from selected areas around the South Wellesley Islands. These tiles represent different sections of a complex to highlight the diversity in morphology, the interaction of individual fishtraps within a larger complex, and the broader environmental context of the site. The 3D models were able to support collaborative interpretation and reconnect digital archaeology outputs with lived community engagement. People were able to hold them, point out elements of the fishtraps and areas that they knew and remembered, discuss why they may have been built that way and how long it might have taken to build.

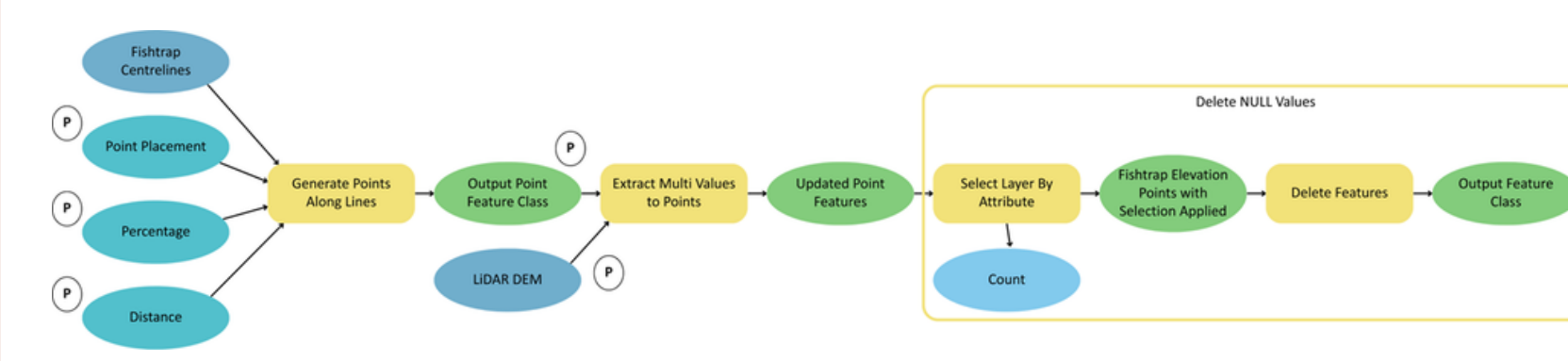
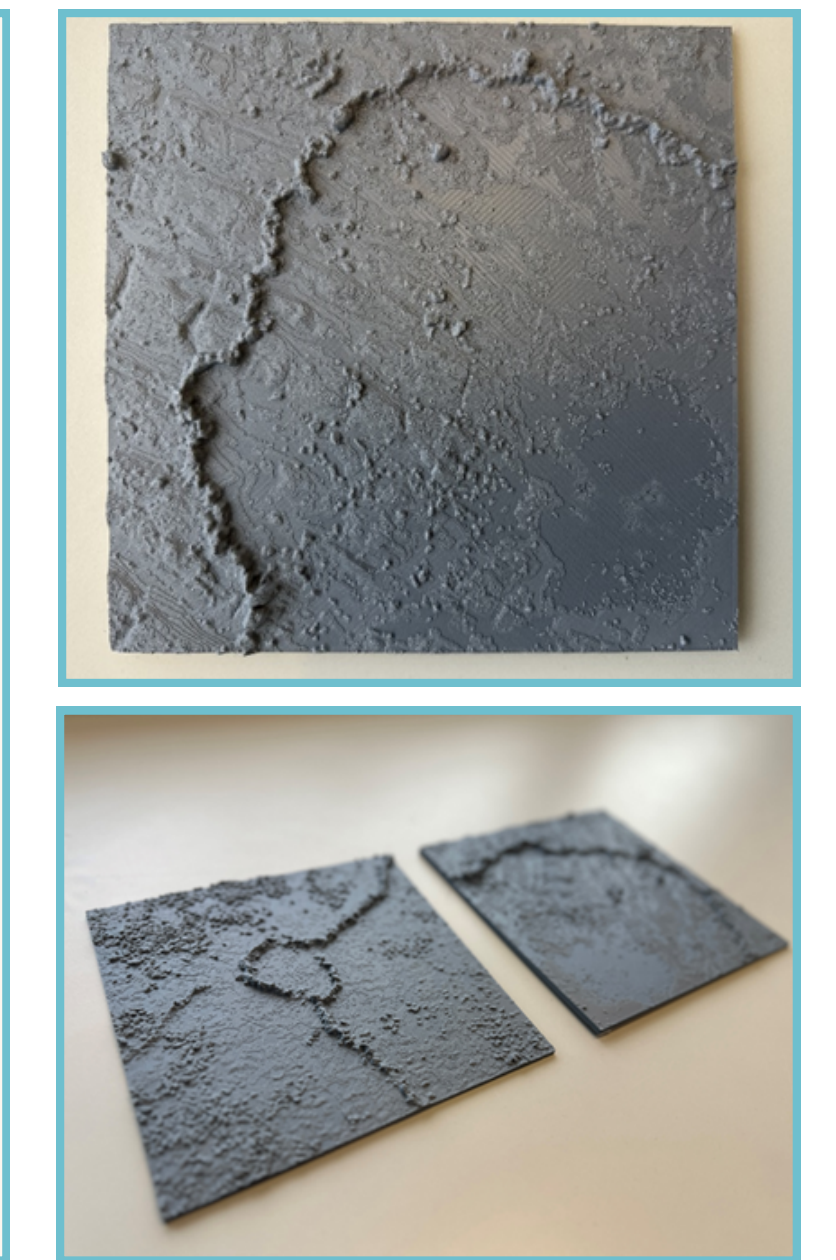
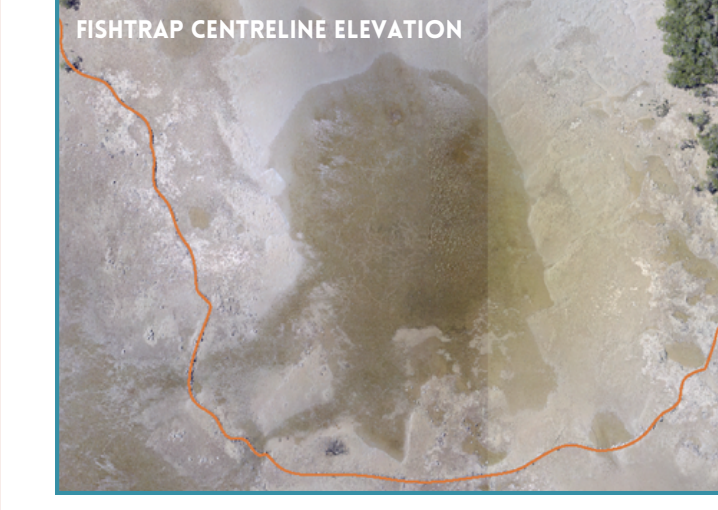
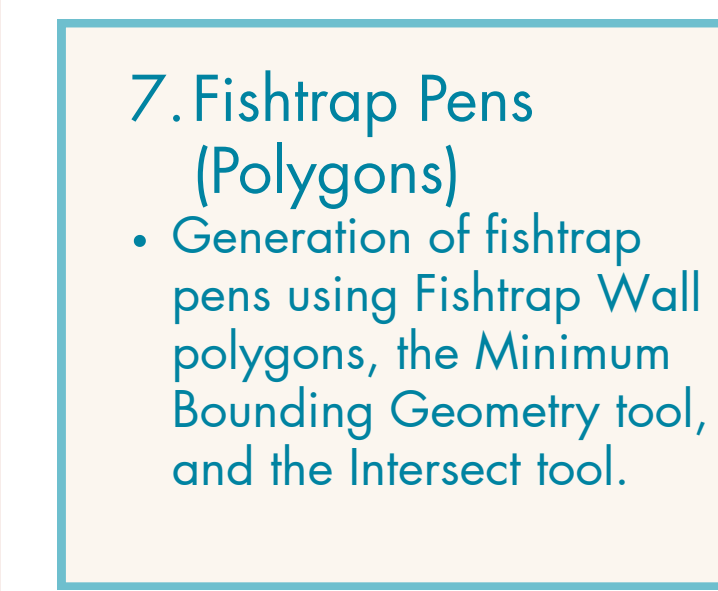


FIG 12. ARCGIS PRO MODEL FOR ELEVATION DATA EXTRACTION ALONG FISHTRAP CENTRELINES AT INTERVALS USING PERCENTAGE AND REGULAR SPATIAL DISTANCE.



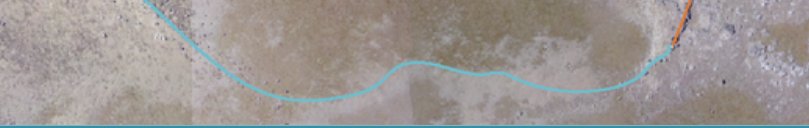
6. Fishtrap Walls (Polygons)

- Digitisation of the shape and volume of the walls that the Fishtrap Centrelines align with by reshaping a generated buffer (1m)



7. Fishtrap Pens (Polygons)

- Generation of fishtrap pens using Fishtrap Wall polygons, the Minimum Bounding Geometry tool, and the Intersect tool.



8. Fishtrap Vegetation (Polygons)

- Generation of three buffer zones to identify the presence of mangroves inside Fishtrap Pen areas, within 10m, and between 10- to 30m.

References

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