Photo by JP Rouja

Bermuda Ocean Use Survey Results

Appendix 3: Additional Commercial Fishing Data

July 2023

BERMUDA OCEAN
PROSPERITY PROGRAMME

seasketch

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INTRODUCTION

From September 2020 to February 15, 2021, the Bermuda Ocean Use Survey collected data on how the residents of Bermuda use and value marine spaces and resources. The survey was open to all Bermuda residents. In addition, seven marine sectors were identified that encompass the various ocean uses affected by or involved in marine resource management. These included:

1. Commercial Fishing
2. Recreational Fishing
3. Aquaculture
4. Passive Recreation and Conservation
5. Swimming, Snorkeling, and Diving
6. Tourism, Boating and Sports
7. Utilities, Infrastructure and Development

These data were used in the Marine Spatial Plan (MSP) development process when designating Marine Protected Areas (MPAs). A Draft MSP was made available to the public in September 2022 and a public consultation period was held until December 31, 2022 to gather feedback. A major concern raised by the commercial fishing sector during these consultations was that the complexities of the fishing industry had not been adequately captured for consideration when designing the MPA network. To address concerns from commercial fishermen, the Ocean Use Survey was reopened from November 2022 to March 2023 to gather additional details on fishing methods and gear types, which had not been provided by respondents in earlier surveys. This appendix presents the heatmaps resulting from these additional surveys.

METHODS

A staff member from the Bermuda Government's Department of Environment and Natural Resources (DENR) met with commercial fishermen at a time and location to suit their needs during a four-month period from November 2022 to March 2023. During these meetings, the DENR staff member provided paper versions of the Ocean Use Survey, ensuring that an adequate level of detail was recorded in order to properly consider the different complexities of the commercial fishing industry. Respondents were asked to identify areas they thought were particularly valuable for the following gear types:

- Trolling
- Bottom fishing
- Vertical lining
- Bait fishing
- Trapping
- Catch and release
- Shark fishing

As appropriate, respondents were also asked to identify the target species or group for each gear type. For example, respondents could identify separate areas for trolling that were important for either rockfish or pelagic fishes. Respondents also identified where in Bermuda they are based (east, central or west) so that fishing patterns could be examined accordingly. Where respondents identified areas as important at certain times of year, this was also recorded.

These data were then digitised using the online [SeaSketch](#) mapping platform and analysed using the methods described in the [Bermuda Ocean Use Survey Results 2021](#) report to produce a set of heatmaps that show what areas are considered most valuable for fishing in Bermuda. The updated heatmaps can be broken down by gear type, species, and base location of respondents.

These heatmaps will be used to modify the MPA network to ensure that the complexities of the commercial fishing industry are considered and that all various types of fishing have adequate spaces to continue operating successfully. They will also be used as a tool for decision-makers when designing Bermuda's MPA network. For example, data from the updated Ocean Use Survey will be incorporated into a computer model that calculates areas to prioritise for protection while, at the same time, avoiding the most valuable fishing areas.

Results from this additional outreach to the commercial fishing industry included 75 commercial fishers, which represents 38% of this industry. Of that total, 60% of full-time fishers (36 respondents) and 29% of part time fishers (39 respondents) completed a survey. These targets meet the statistical requirements to be considered a good representation of this sector.

- Nine (9) surveys from 2020 and 2021 were retained because the level of detail provided was adequate for analysis, or because the original respondent could not be reached.
- Sixteen (16) respondents repeated the survey and provided a higher level of detail than was provided in their original survey response.
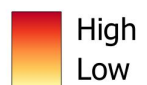- Thirty (30) new surveys were completed with a high level of detail.

RESULTS

Results are shown in the following heatmaps.

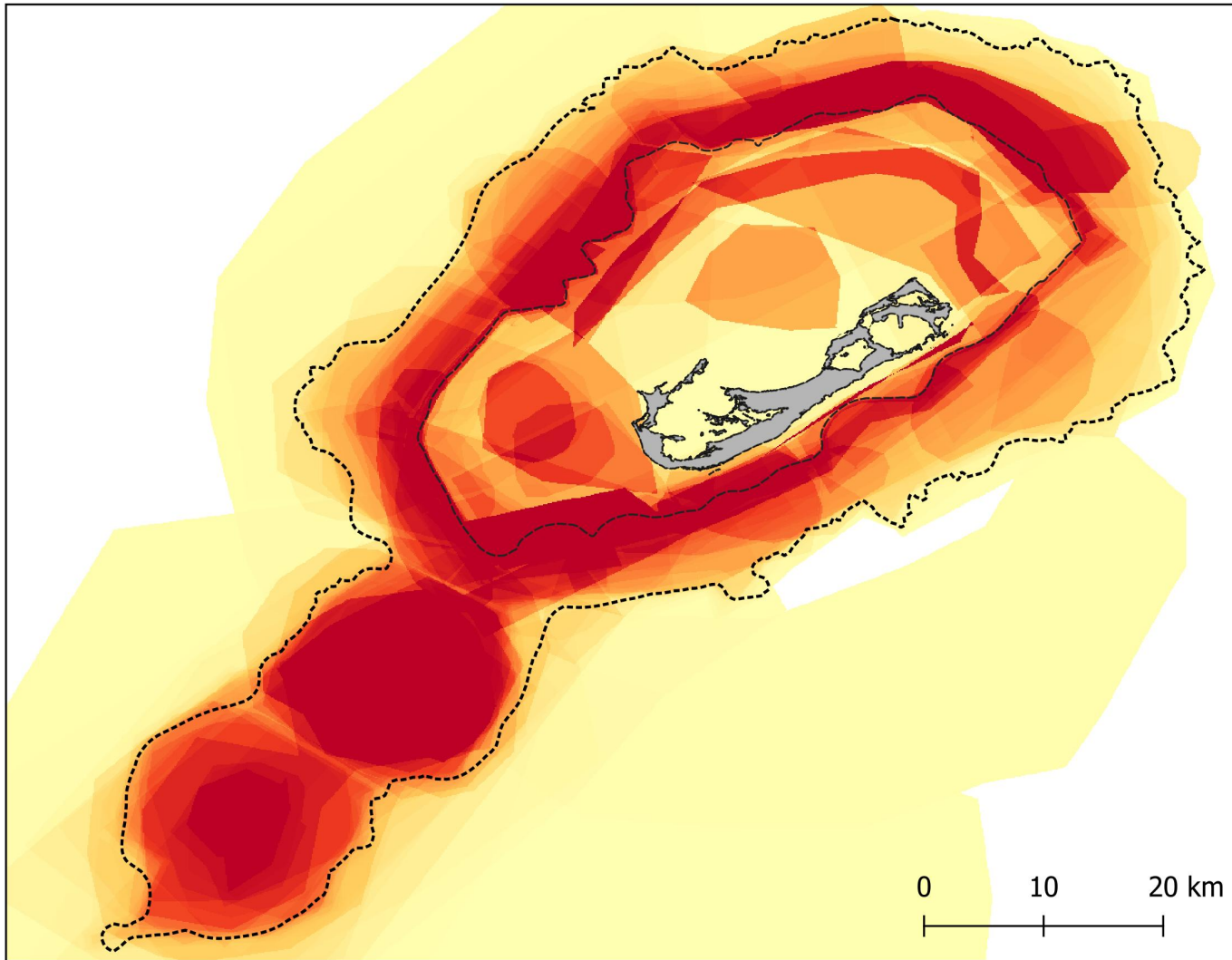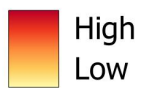# Commercial Fishing - All Responses, Weighted

Fishing Value

High
Low

Land

----- 2000m contour

—— 55m depth contour

0   10   20 km
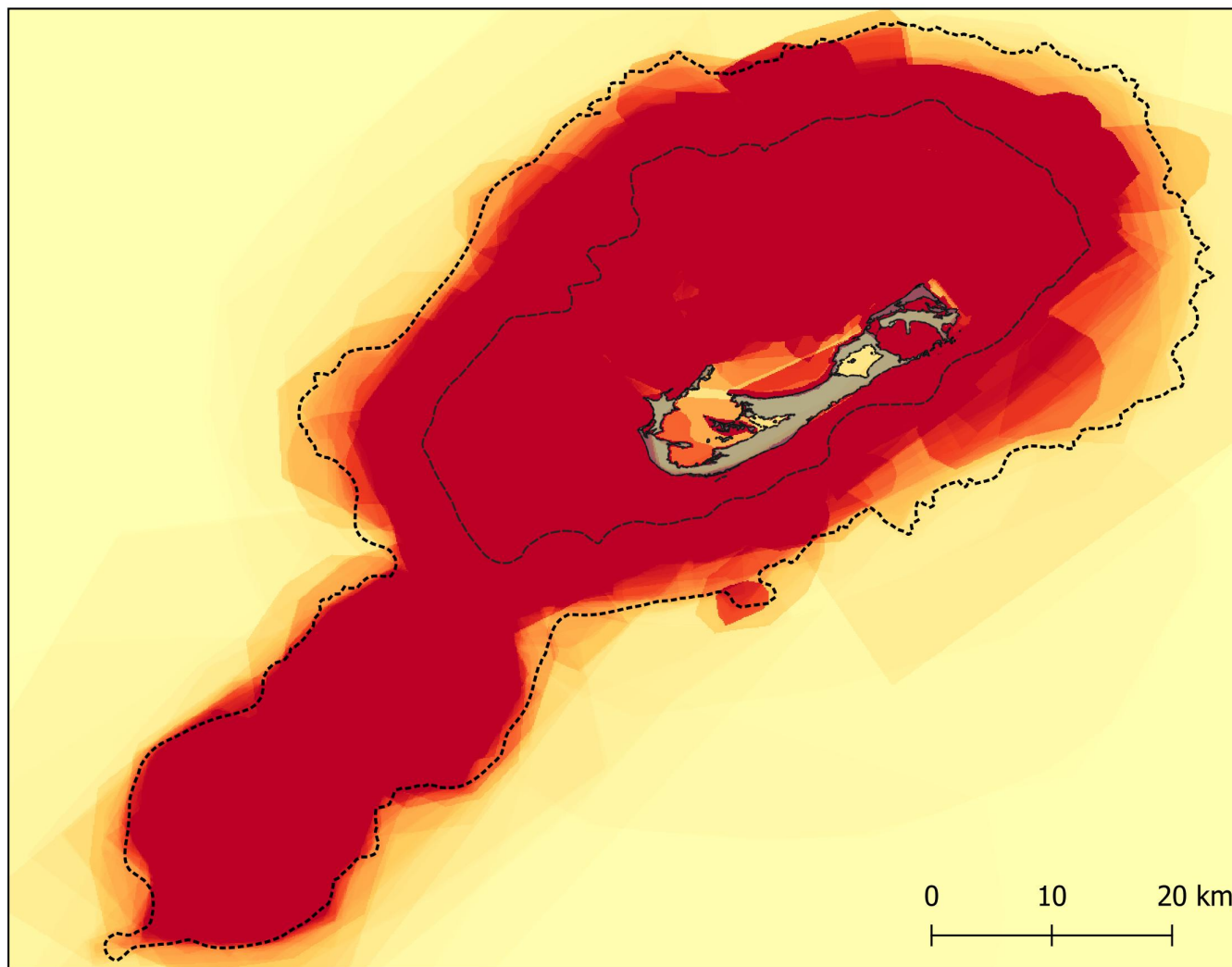
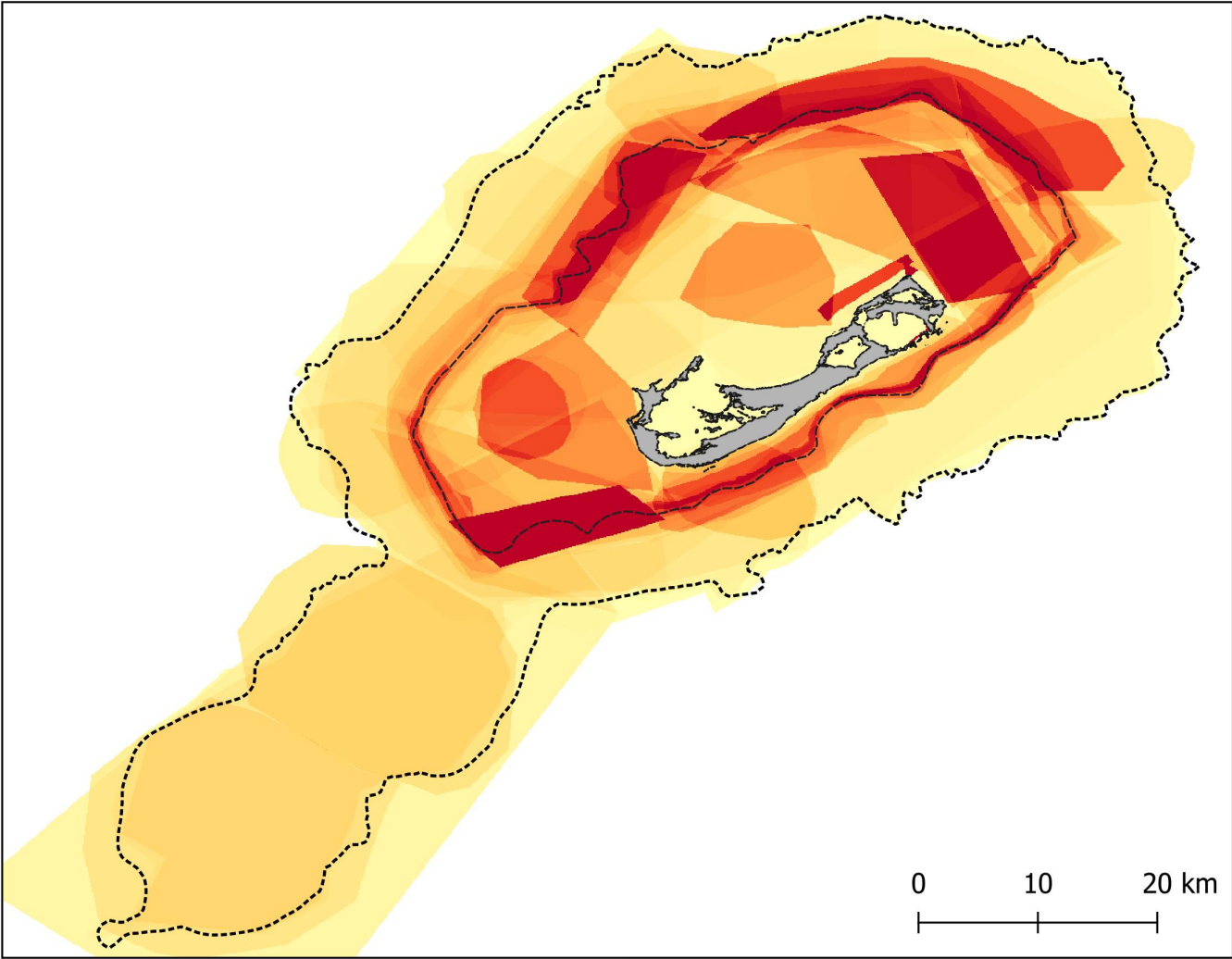# Commercial Fishing - Trolling for Pelagic Species, Weighted

Fishing Value
- High
- Low

Land
- - - - - 2000m contour
———— 55m depth contour

0   10   20 km

Commercial Fishing - Trolling for Rockfish, Weighted

Fishing Value

- High
- Low

Land

- - - - 2000m contour
- ——— 55m depth contour

0   10   20 km

Commercial Fishing - All Bottom Fishing, Weighted

Fishing Value

High
Low

Land
2000m contour
55m depth contour

0   10   20 km
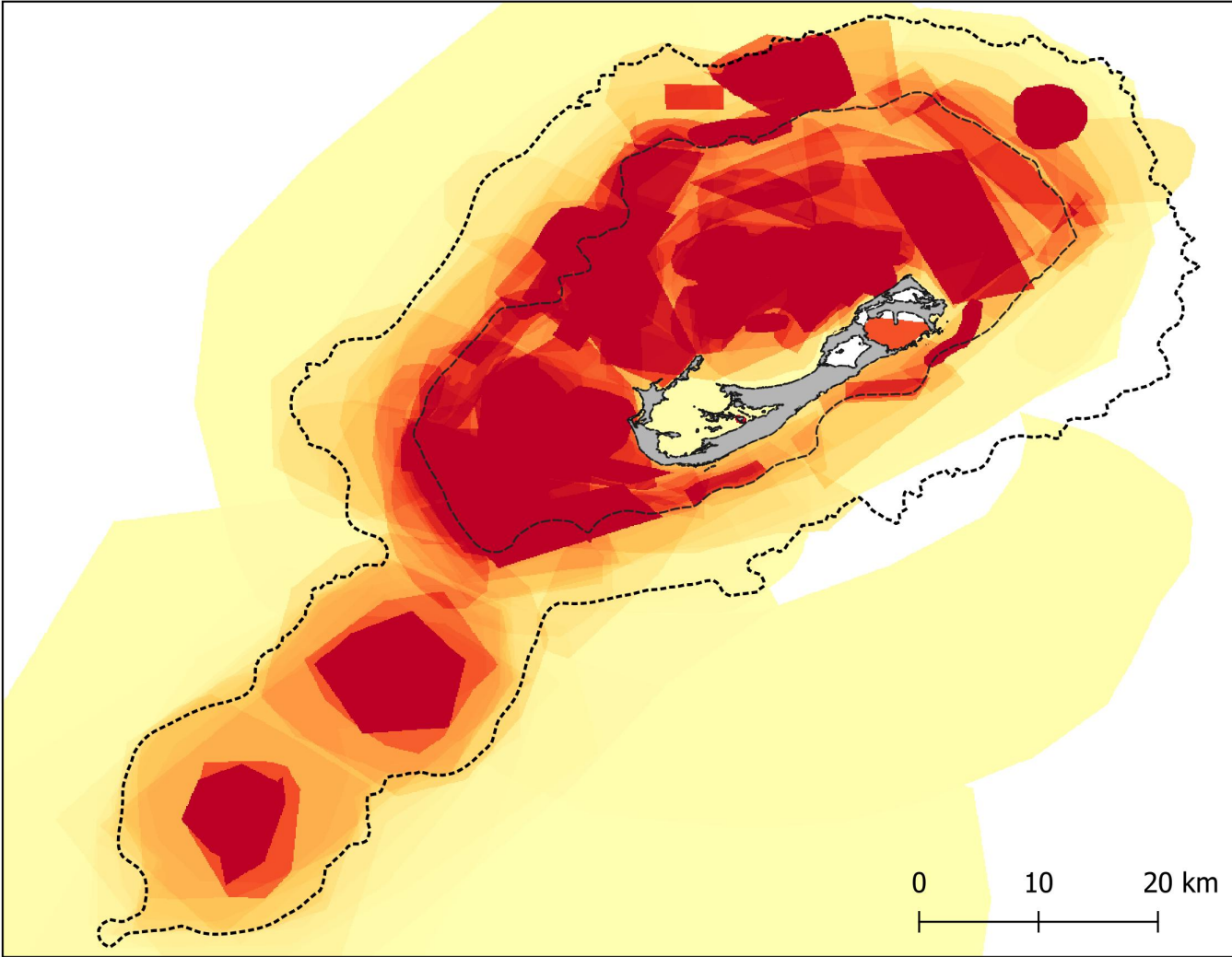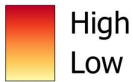
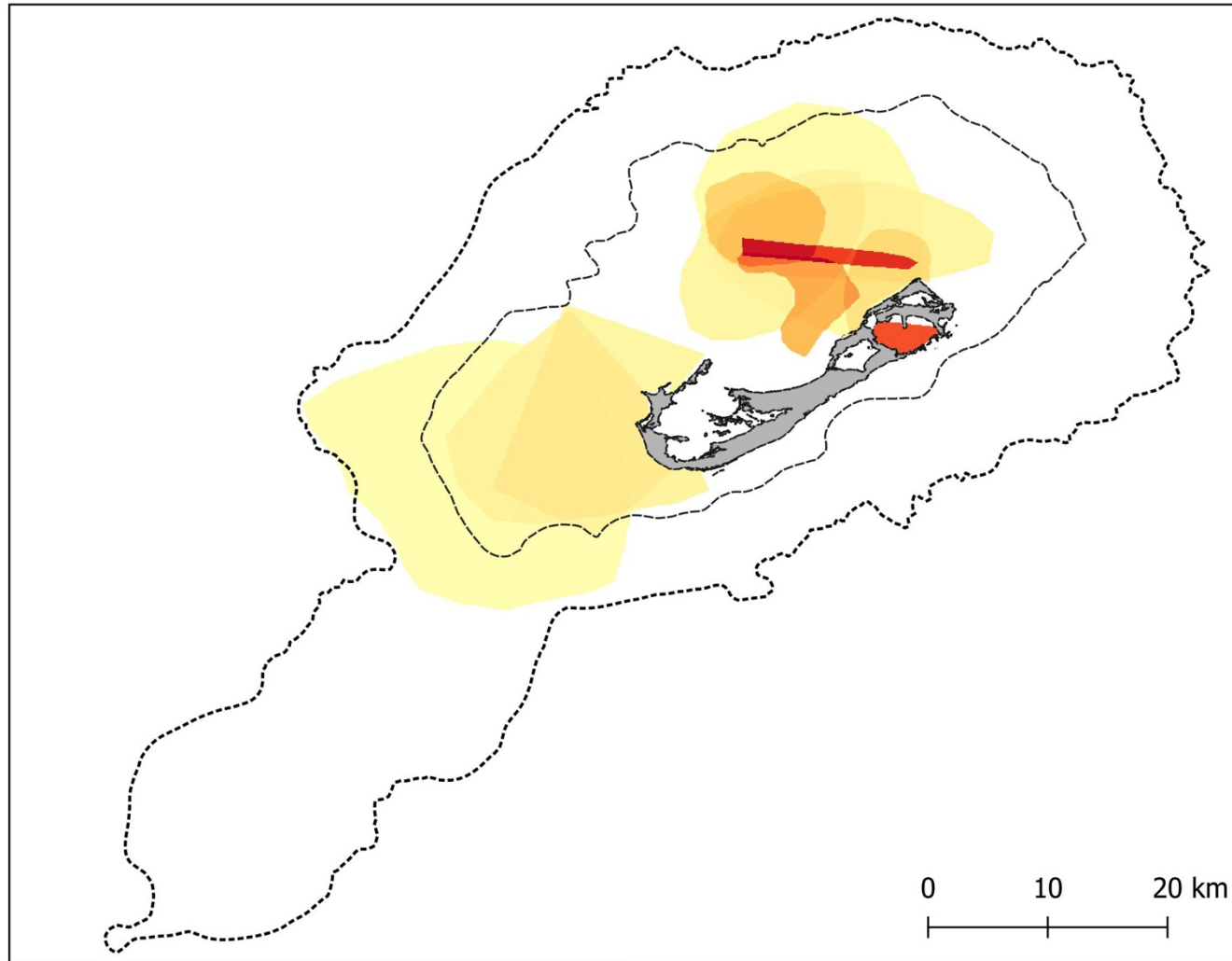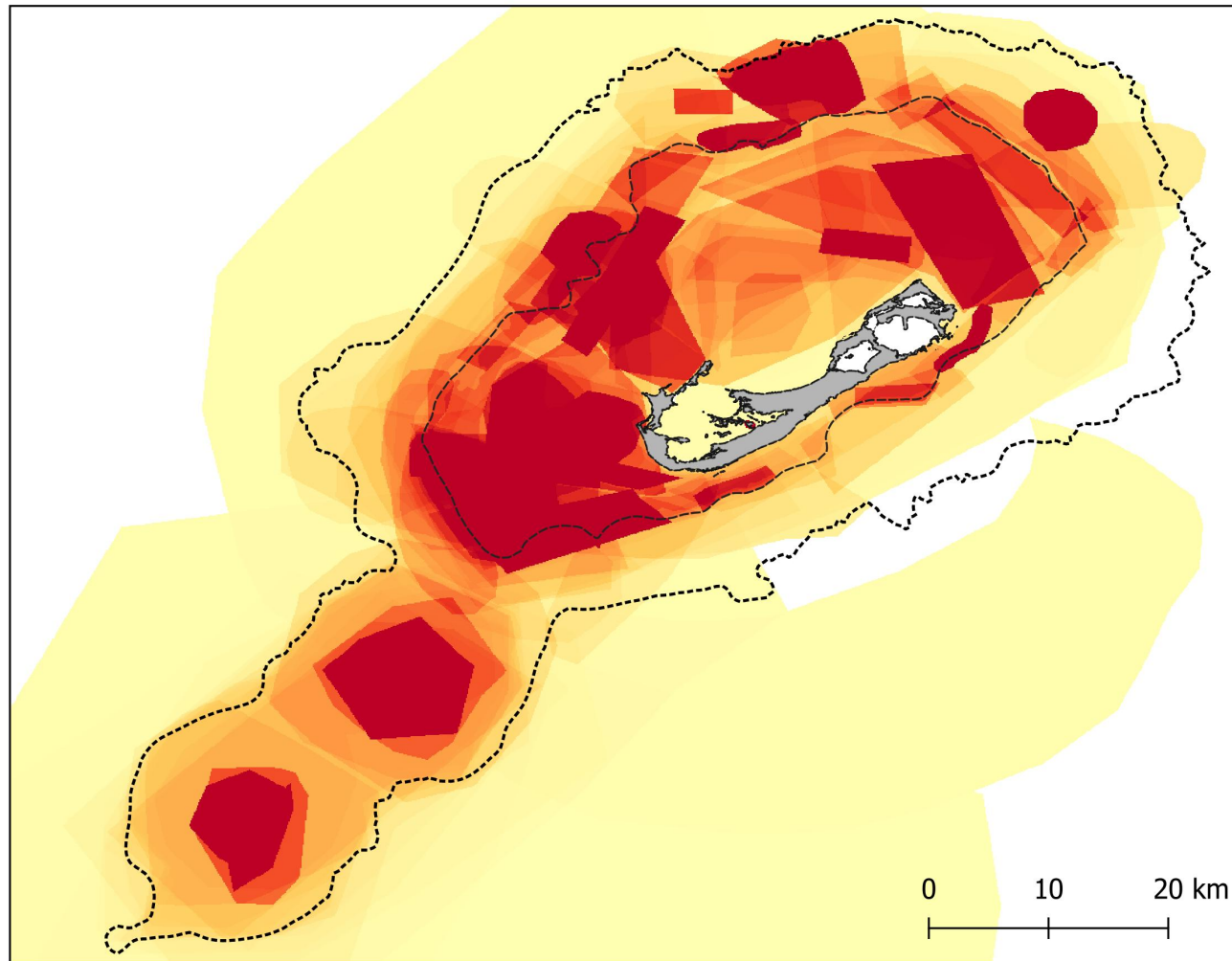# Commercial Fishing - Bottom Fishing (snappers only), Weighted
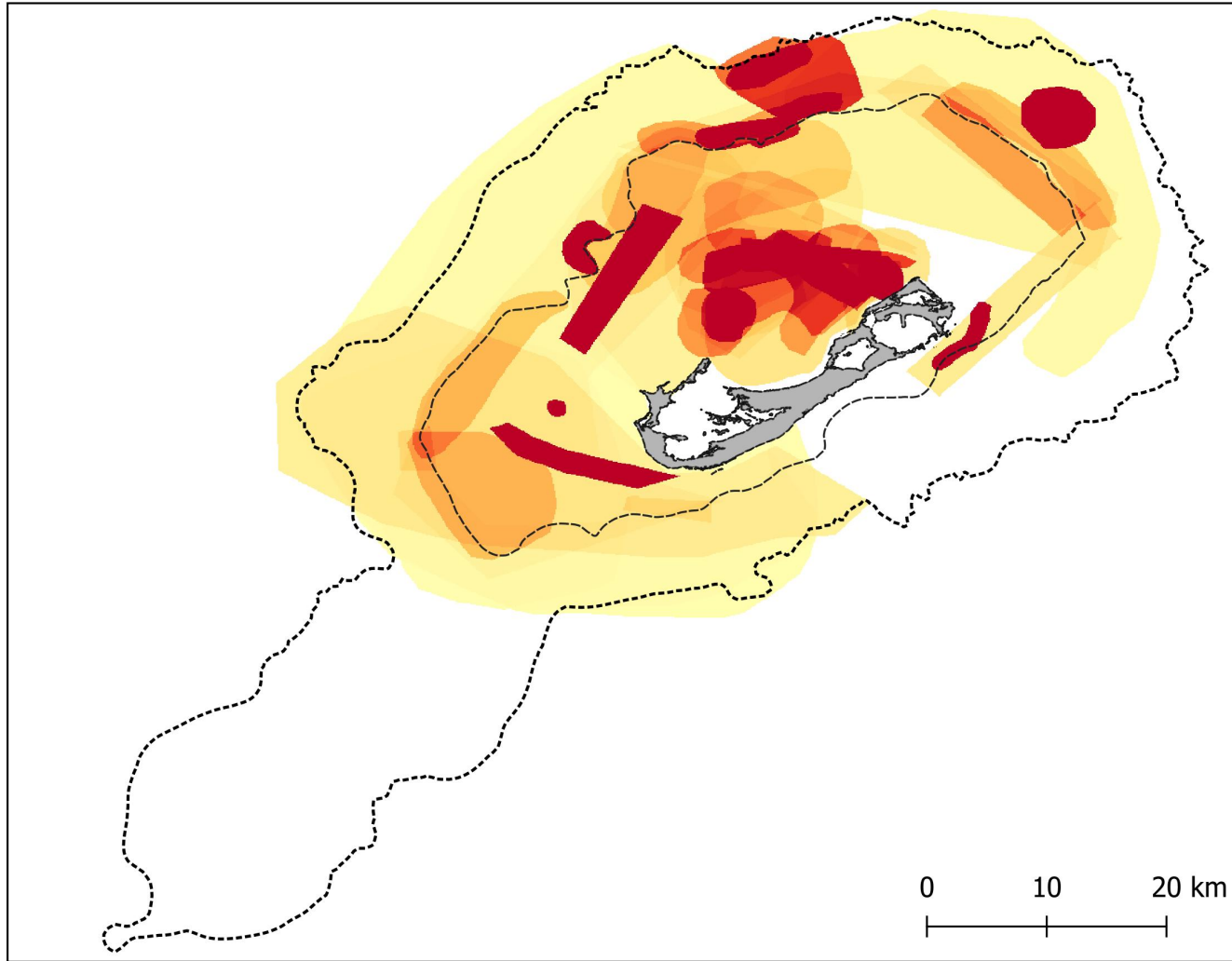
Fishing Value

High
Low

Land

------- 2000m contour

———— 55m depth contour

0   10   20 km
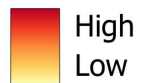
Commercial Fishing - Bottom Fishing (turbot only), Weighted

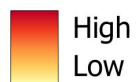**Fishing Value**

High
Low

Land

------- 2000m contour

——— 55m depth contour

0   10   20 km

Commercial Fishing - Bottom Fishing (species other than snapper and turbot), Weighted
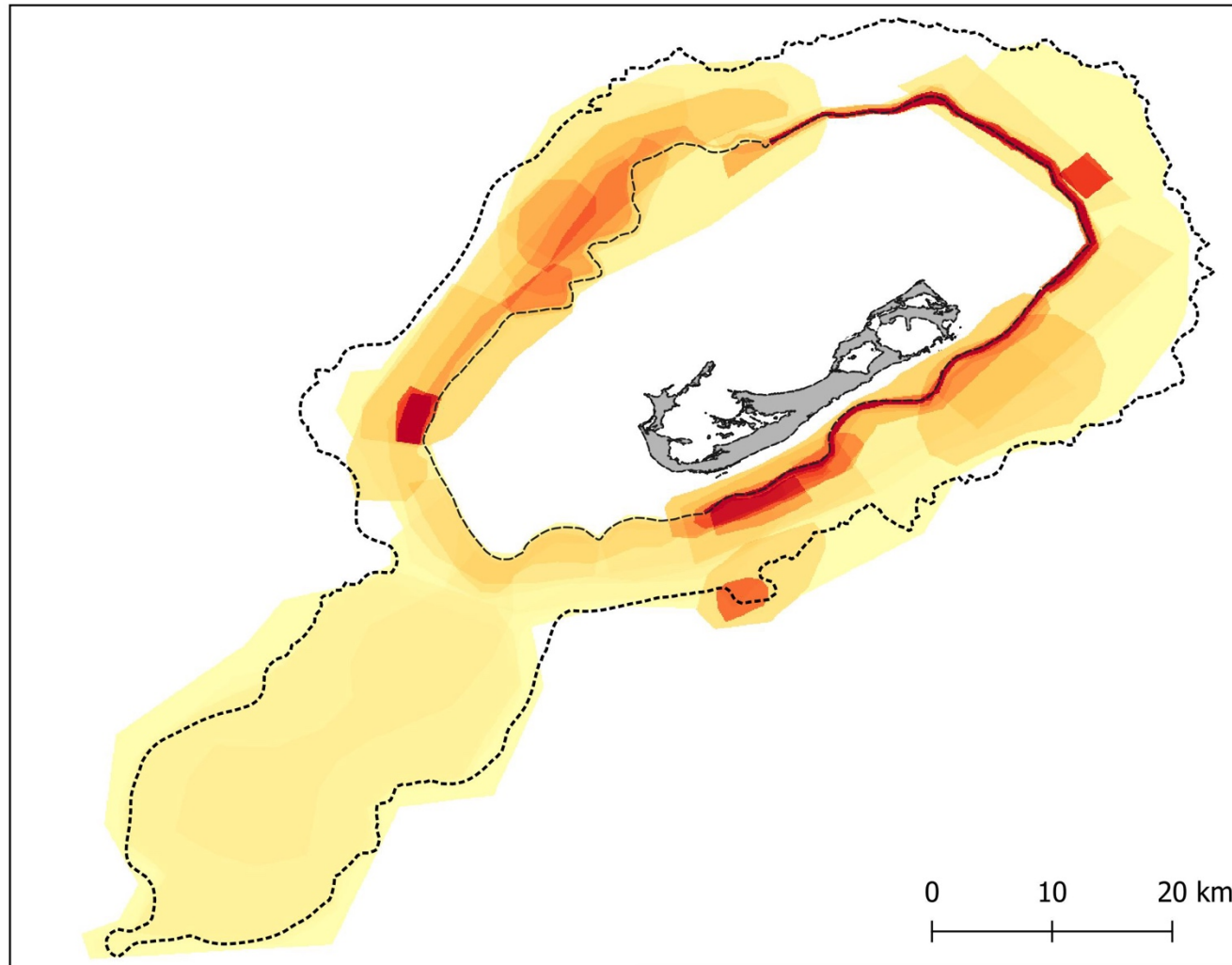

Fishing Value

High
Low

Land
- - - - - 2000m contour
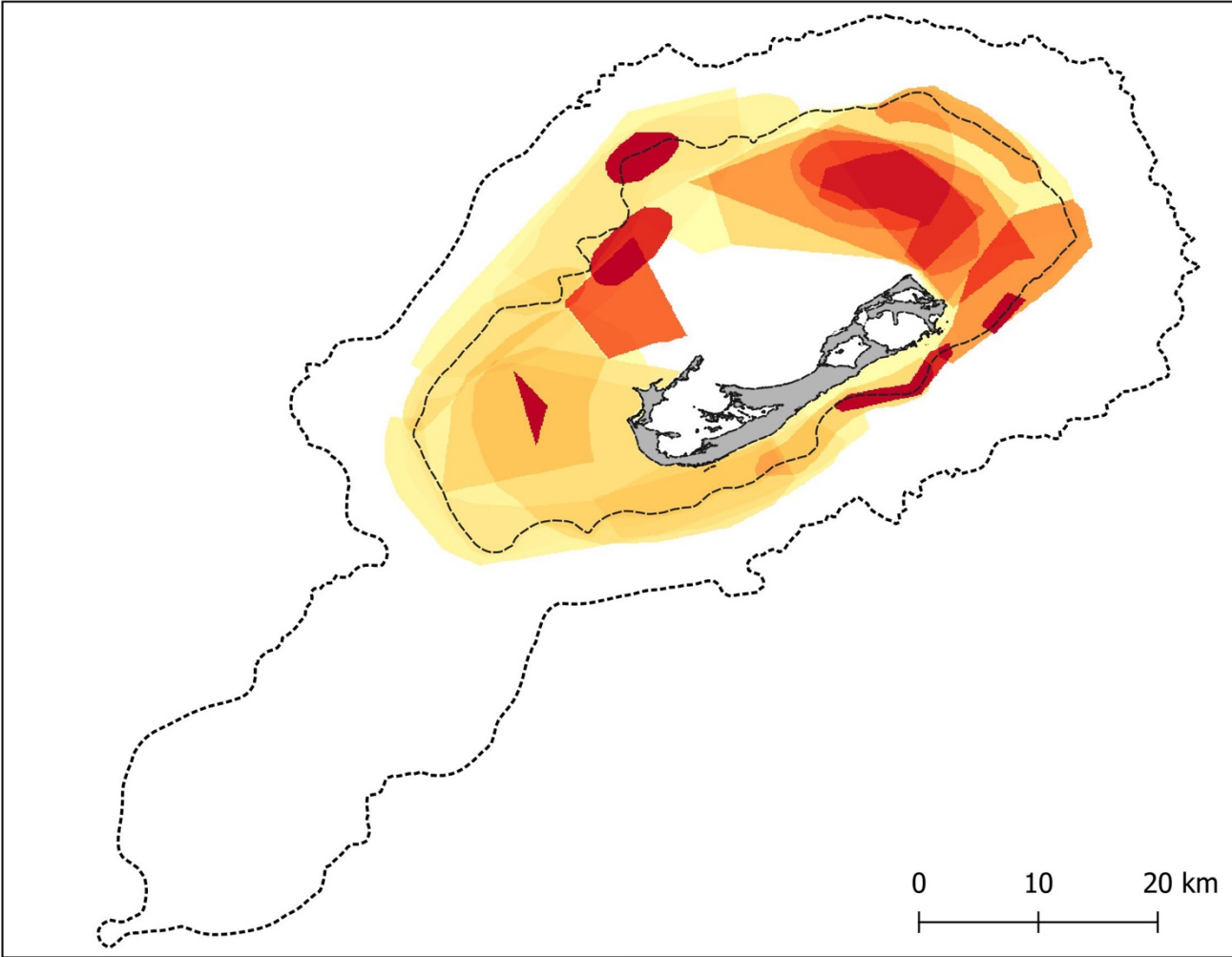——— 55m depth contour

0   10   20 km

Commercial Fishing - Vertical Lining, Weighted

Fishing Value
High
Low

Land
2000m contour
55m depth contour

0   10   20 km

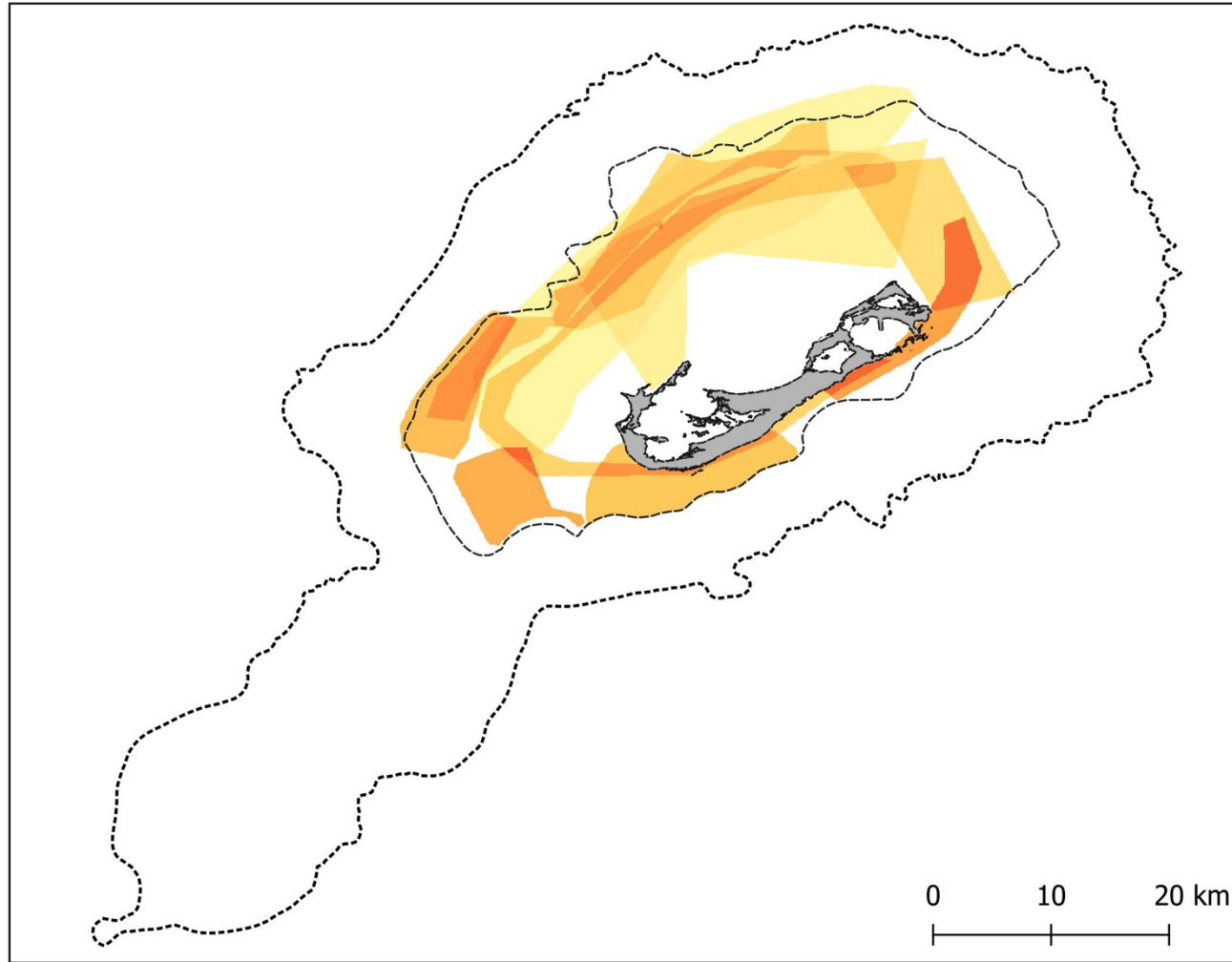# Commercial Fishing - Trapping for Spiny Lobster, Weighted

Fishing Value
High
Low

Land
2000m contour
55m depth contour

0   10   20 km

Commercial Fishing - Trapping for Guinea Chicks, Unweighted

Area weighted
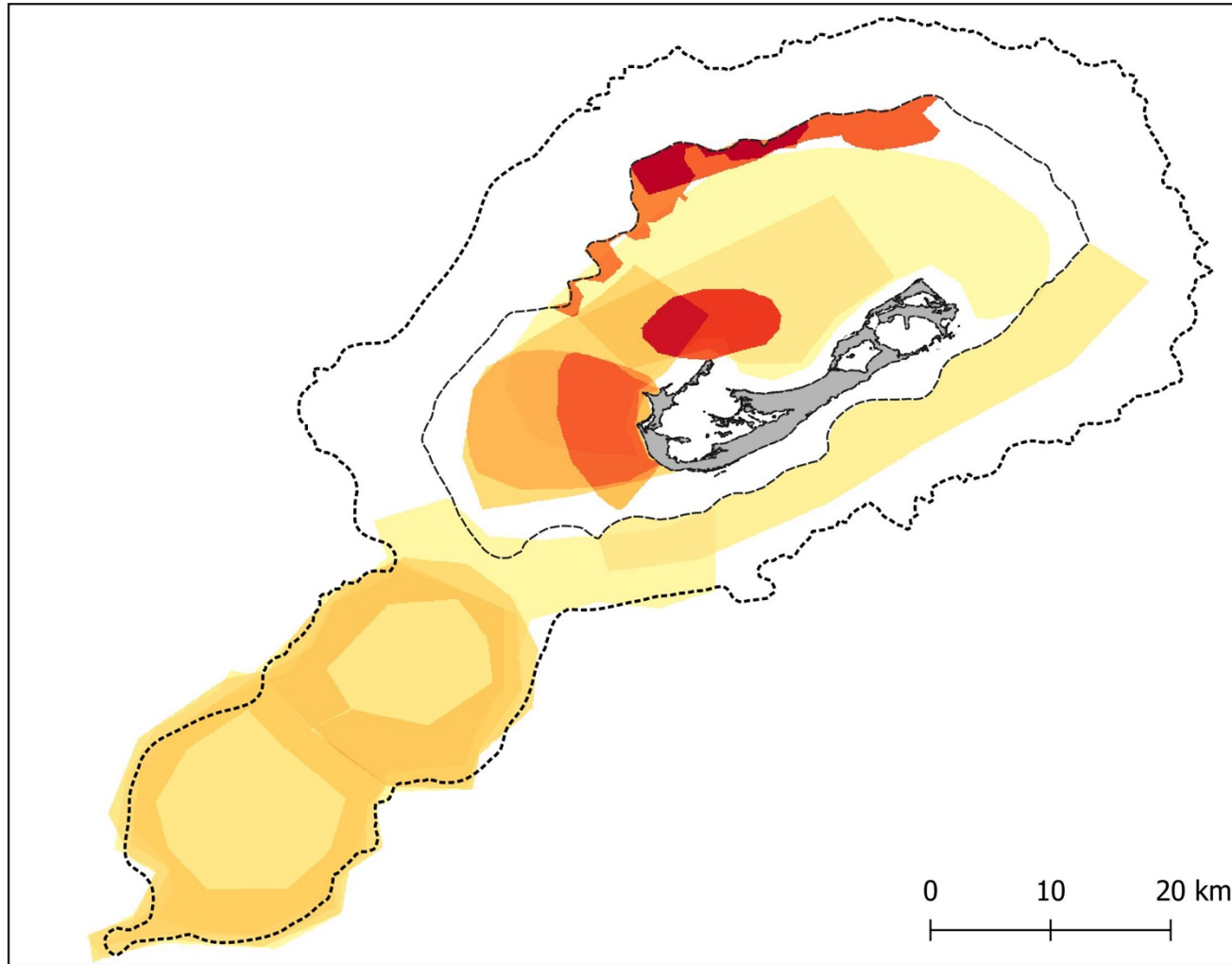High
Low

Land
----- 2000m contour
—— 55m depth contour

0   10   20 km

Commercial Fishing - Shark Fishing, Weighted

Fishing Value

High
Low

Land

2000m contour

55m depth contour

0   10   20 km

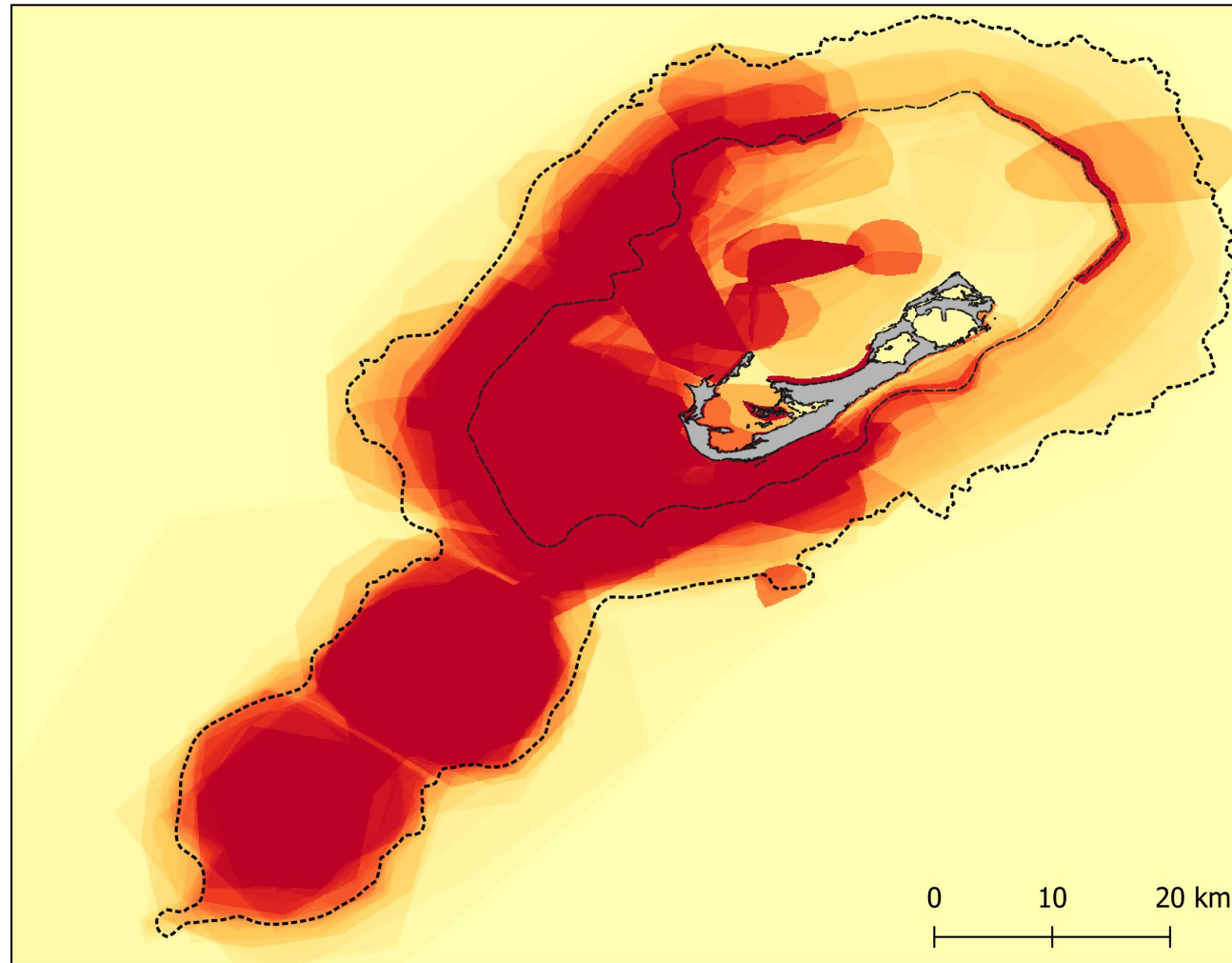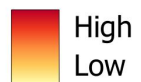# Commercial Fishing - Bait Fishing, Weighted
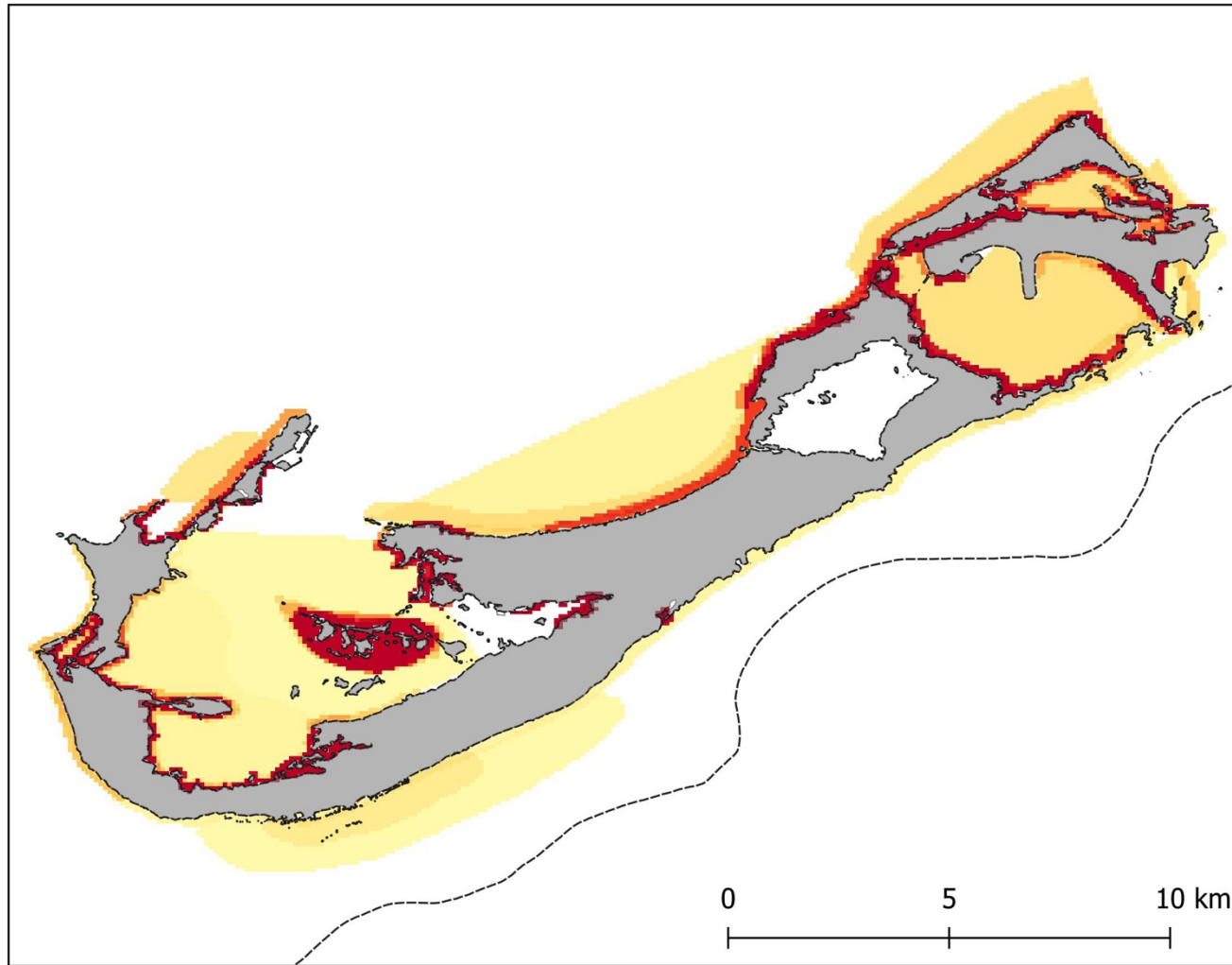
Fishing Value
High
Low

Land
— — 55m depth contour

0   5   10 km

Commercial Fishing - Areas fished by west-based fishers, Weighted

Fishing Value

High
Low

Land

- - - - 2000m contour

——— 55m depth contour

0   10   20 km

Commercial Fishing - Areas fished by central-based fishers, Weighted
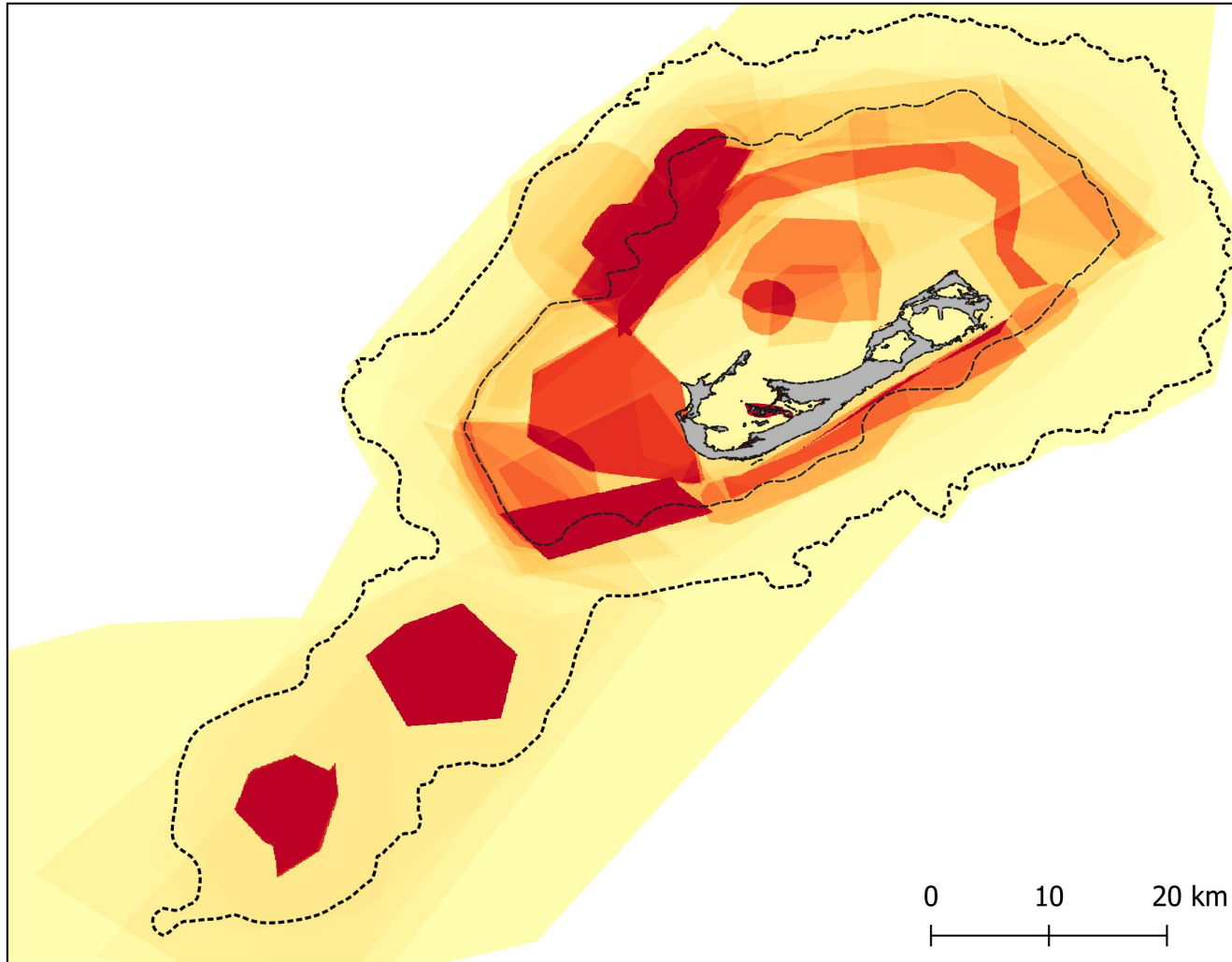

Fishing Value

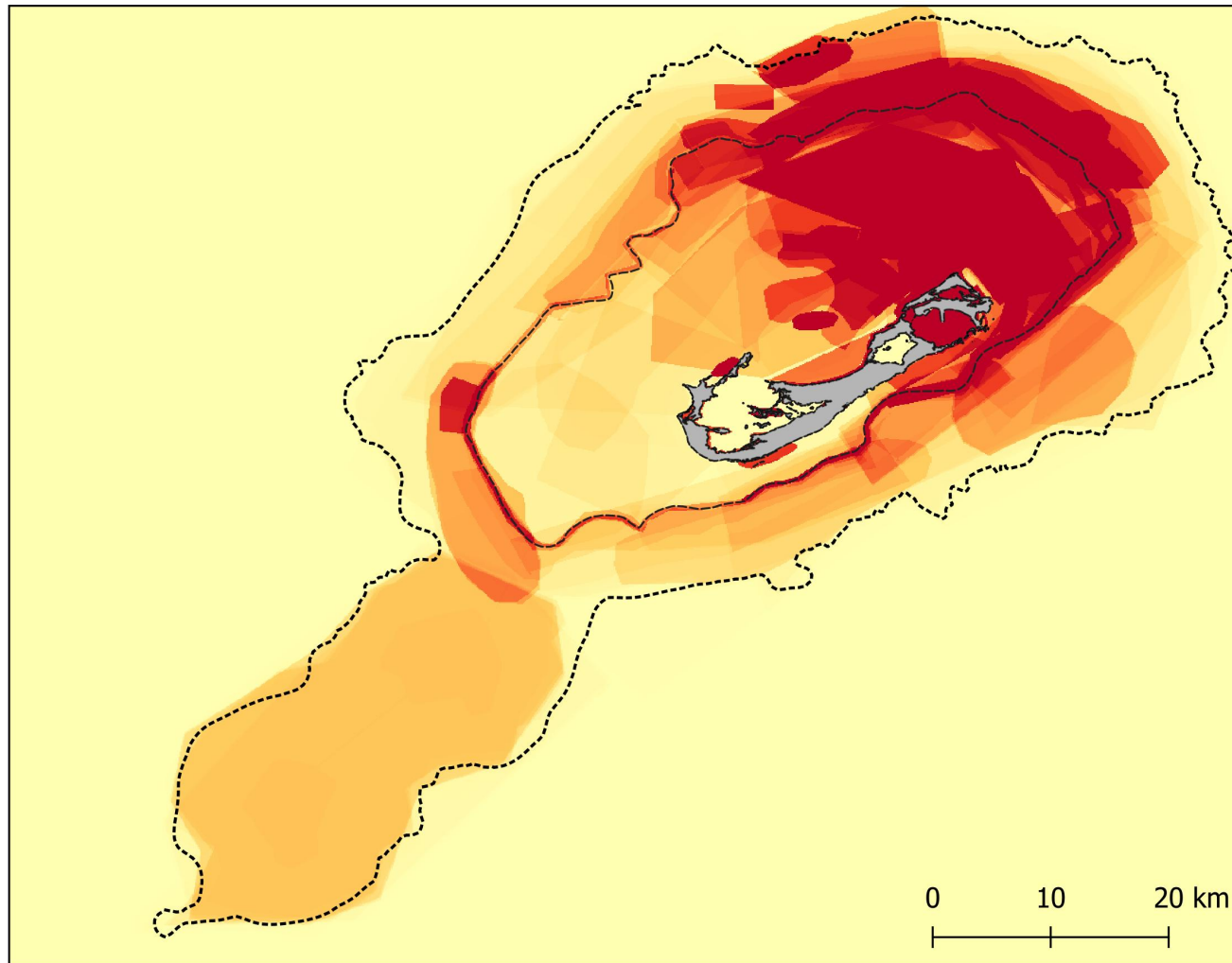- High
- Low

Land

2000m contour

55m depth contour

0   10   20 km

Commercial Fishing - Areas fished by east-based fishers, Weighted

Fishing Value

High
Low

Land
2000m contour
55m depth contour

0   10   20 km