

ASSESSMENT OF DEMERSAL REEF FISHERIES IN THE COMMONWEALTH OF DOMINICA



Introduction

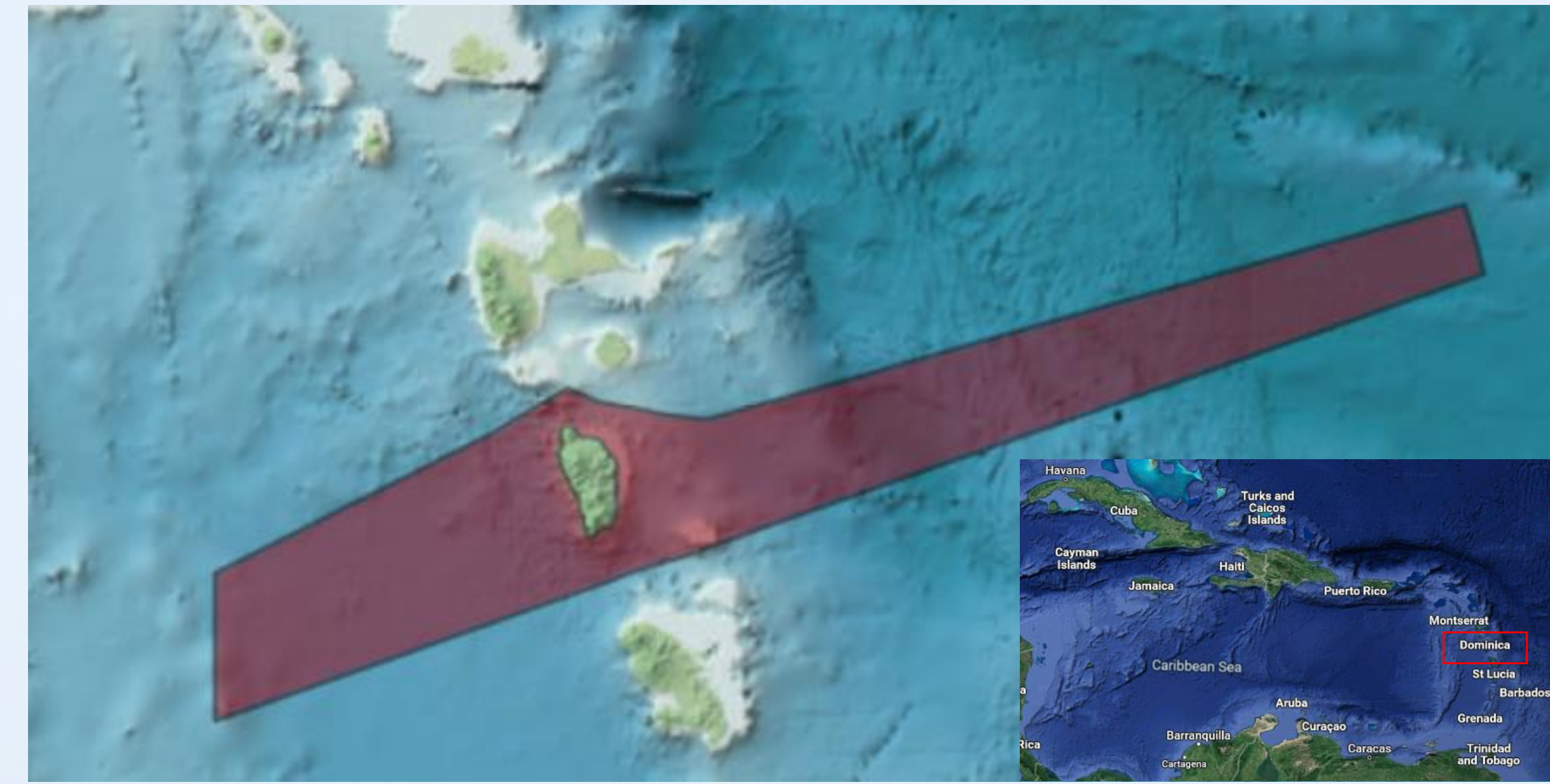


Figure 1. Map of the Commonwealth of Dominica showing range of Exclusive Economic Zone (EEZ). Inset: Location of Dominica in the wider Caribbean. Source: IMIS, 2023.

Dominica is an island in the eastern Caribbean Sea between the French islands of Guadeloupe to the north and Martinique to the south in an archipelago known as the Lesser Antilles (Figure 1). Dominica's Exclusive Economic Zone (EEZ) has an area of 28,653 km² and the Territorial Sea measures twelve nautical miles from land (IMIS, 2023).

In recent years, several studies have been conducted on migratory pelagic species which include the dolphin, marlin and tuna species. These species are primarily being targeted using moored fish aggregating devices. The introduction of moored fads was done primarily to increase fish landings and secondly to reduce fishing pressure on the country's demersal fish stock. However, it was noted in an overview of the fish aggregating device (FAD) fishery in Dominica that fishing effort for demersal fishery was not reduced as planned (Defoe, 2020). Therefore, an analysis of recent trends in demersal fish stock, landings, effort and their composition are warranted.

Specific Objectives

1. Analyse catch and effort trends of demersal fish species from 2008-2020.
2. Map changes in catch composition, fishing grounds and effort of major demersal species.

Methodology

The landings datasets provided by the Dominica Fisheries Department collected from landing sites throughout the country, contained information on: Landing locations, date, species, boat number, boat type, fishing location, gear type, weight of catch landed in kg/lbs and expenditure. Calculations were based on 12 landing sites that had complete coverage out of 31 sites in total.

The dataset was corrected for name errors and compiled to obtain the following data:

1. Total fishing locations for demersal species
2. Distribution of catch locations by landing location
3. Estimation of catch and effort for demersal species

Results



Figure 2. Diversity of Reef Fish in Dominica

Catch Composition

A total of 189 species belonging to 47 families were identified in the landings data for the 11 - year period, demersal species accounted for 18% of total catch. Majority of the demersal landings belonged to family Haemulidae (37%), Lutjanidae (18%), Balistidae (10%), and Carangidae (8%). The overall findings indicate that for demersal fish species landings have been decreasing (Figure 4).

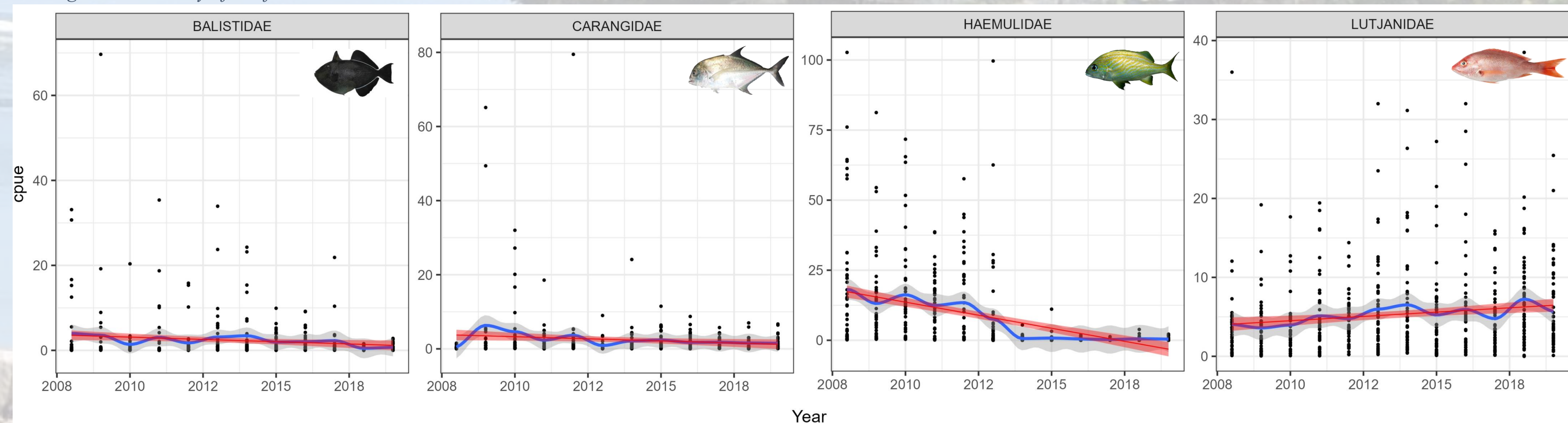


Figure 3. Chart showing catch per unit effort for demersal fish families Balistidae, Carangidae, Haemulidae and Lutjanidae for period of 2008-2020. Red line fitted to gam linear model. Blue line fitted with loess smoothing with a span of 0.2.

The trends in CPUE for specific families of demersal fish varied (Figure 3). The CPUE for Lutjanidae showed a slight positive trend, while the CPUE for Balistidae, Haemulidae and Carangidae exhibited a negative trend. The CPUE trend was most pronounced for Haemulidae (grunts), which was the most abundant category in the catches indicating less availability.

Catch Locations

115 points were identified as catch locations (Figure 5). Variability of catch sites have been discovered with changes occurring annually. The areas with the highest reported catches included G7, H7 close to shore and coral reefs on the western side and K10 on eastern side of Dominica (Figure 5).

Geographical changes of catch locations are presented for three main sites Marigot, Portsmouth and Fond St. Jean (Figure 6). For all sites, the highest proportion of trips were within a 5 m grid of the landing site. The data indicates little overlap in fishing grounds for Marigot and Portsmouth, but some overlap between Marigot and Fond St. Jean.

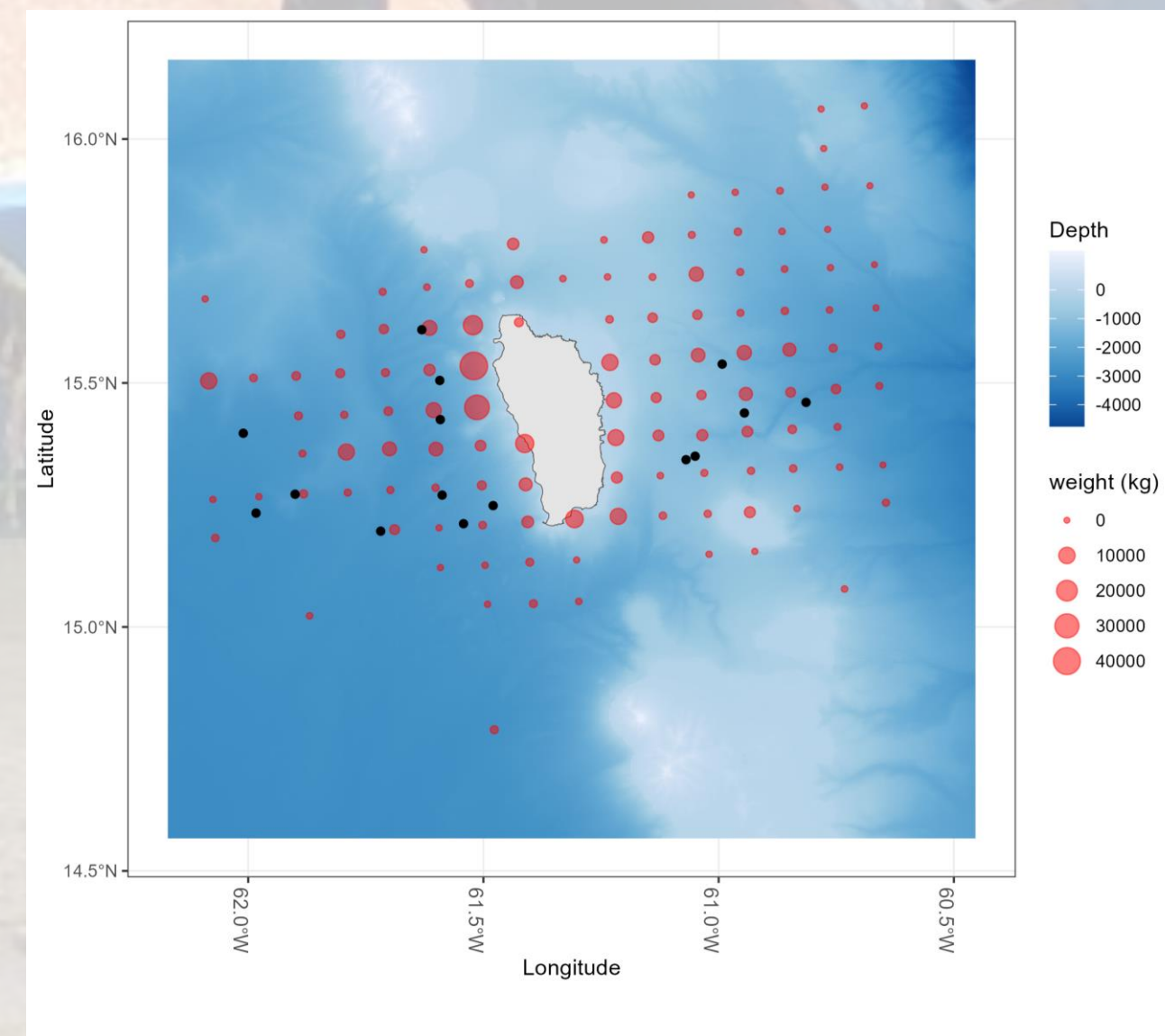


Figure 5. Map showing cumulative distribution of demersal catch locations. Black dots indicate locations of reported FADs.

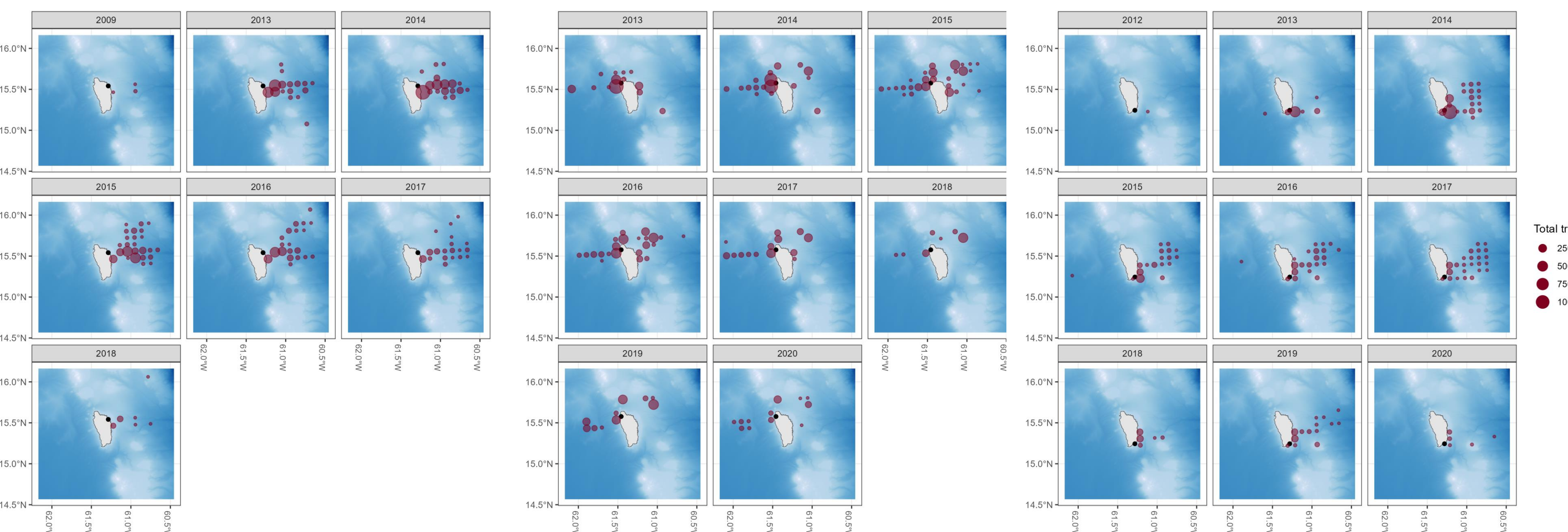


Figure 6. Map of changes in fishing effort for (A) Marigot, (B) Portsmouth (C) Fond St. Jean landing site. Red dots indicate number of trips to fishing locations determined from fishing grid system for Dominica. Black dot indicates location of landing site.

Results

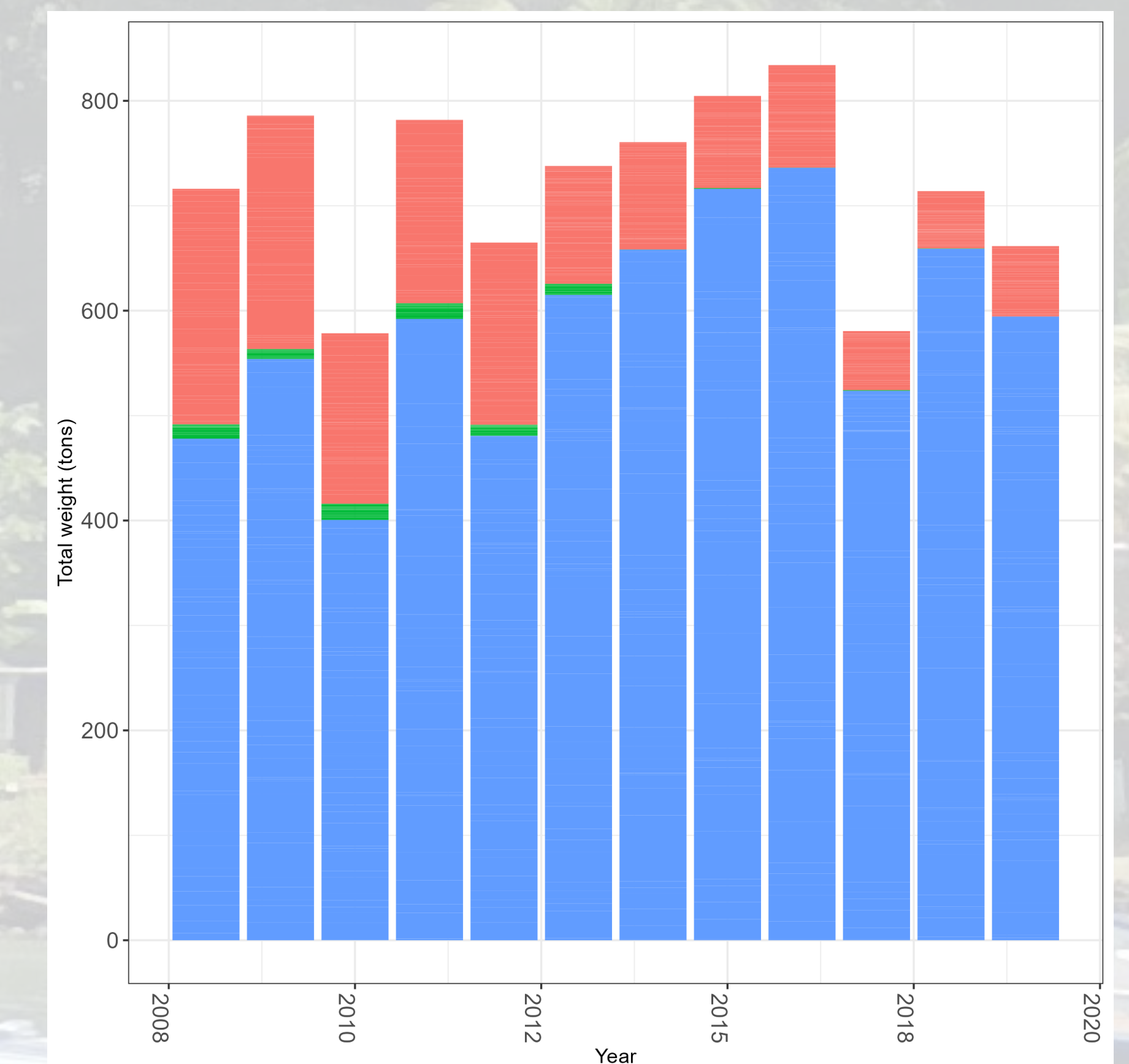


Figure 4. Comparison of landings between demersals (red), pelagic (blue) and others (green) (2008-2020).

Conclusion

Geographical distribution of demersal species and fishing effort showed widespread distribution around the island. The study suggest:

1. An indication of overfishing for grunts (Haemulidae).
2. At least three major catch locations/hotspots that might warrant further management.
3. Fishing pressure on near shore reef fisheries has not declined.

Recommendations

1. To implement biological data collection for major species and families.
2. Improvement/training on classification of species to reduce uncertainty in analysis.
3. Regular frame surveys for non-sampled sites should be established and ensure partial coverage of them.

Acknowledgements

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References

- Defoe, J. (2020). *Overview of fish aggregating device (FAD) fishery in Dominica*. Barbados: University of West Indies.
- Eastern Caribbean Central Bank (2022, 11 3). Retrieved from Eastern Caribbean Central Bank: <https://www.eccb-centralbank.org/statistics/dashboard-datas/>
- IMIS (2023, January 6). *Maritime Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 11*. Retrieved from Flanders Marine Institute (2019): <https://www.vliz.be/en/imis?module=dataset&dasid=6316>