

INTRODUCTION

- Glacier Bay National Park (Fig.1), as a Marine Protected Area (MPA), is phasing out commercial fishing of Pacific halibut (*Hippoglossus stenolepis*) within the park. The species continues to be commercially harvested outside of the bay.
- Conservation of local fish populations within an MPA can be impaired when fish exit the refuge into an active fishery.
- Movements of halibut within, and possibly out of, Glacier Bay are poorly understood.
- Fish movement was studied using two types of tags: Pop-up satellite tags were used to examine seasonal movements and acoustic tags were used to examine short-term, fine scale movements.
- This study focuses on the summer movements of these double-tagged fish.

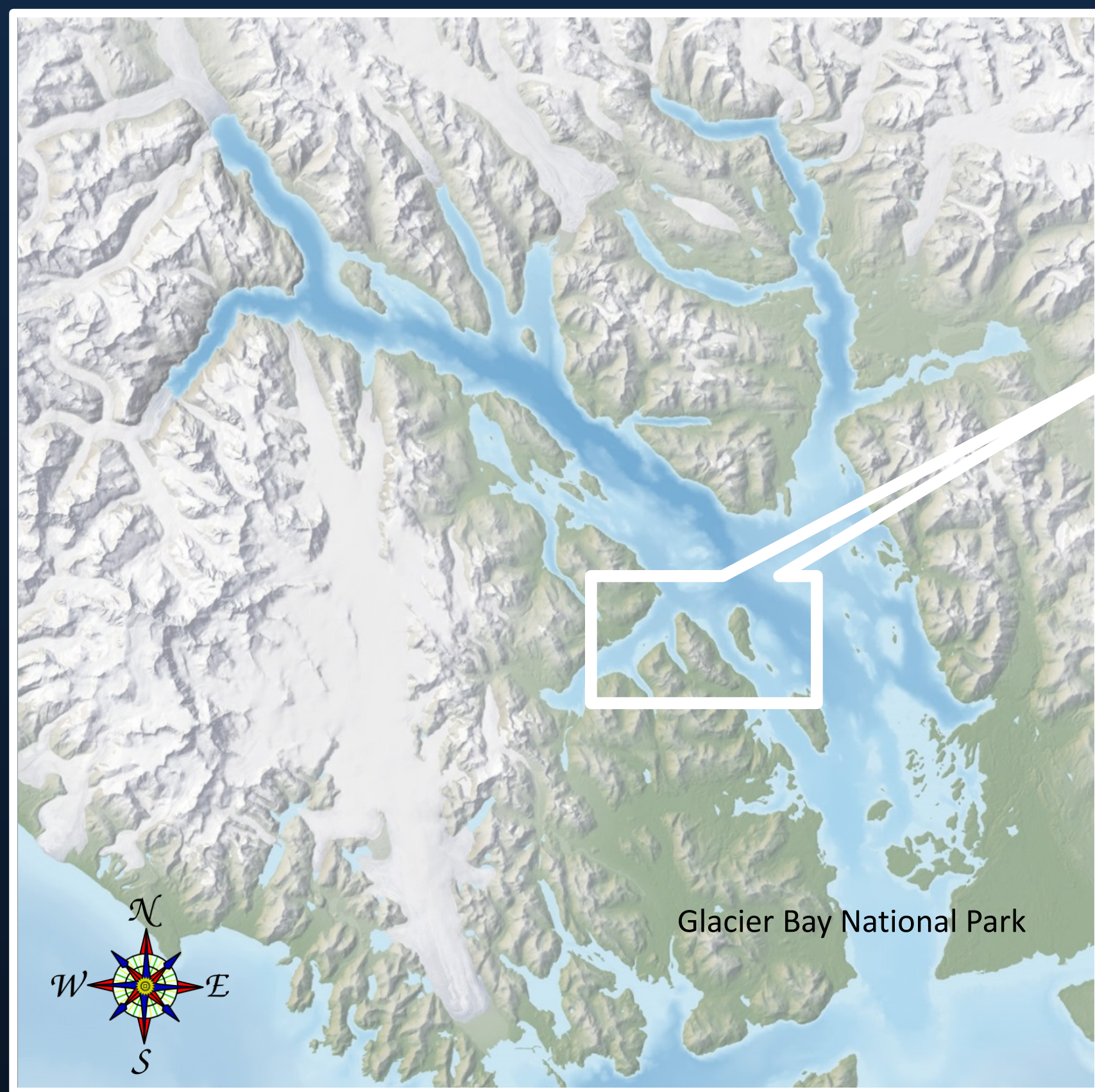


Figure 1. Glacier Bay in Southeast Alaska has been a region of extensive commercial fishing for many years.

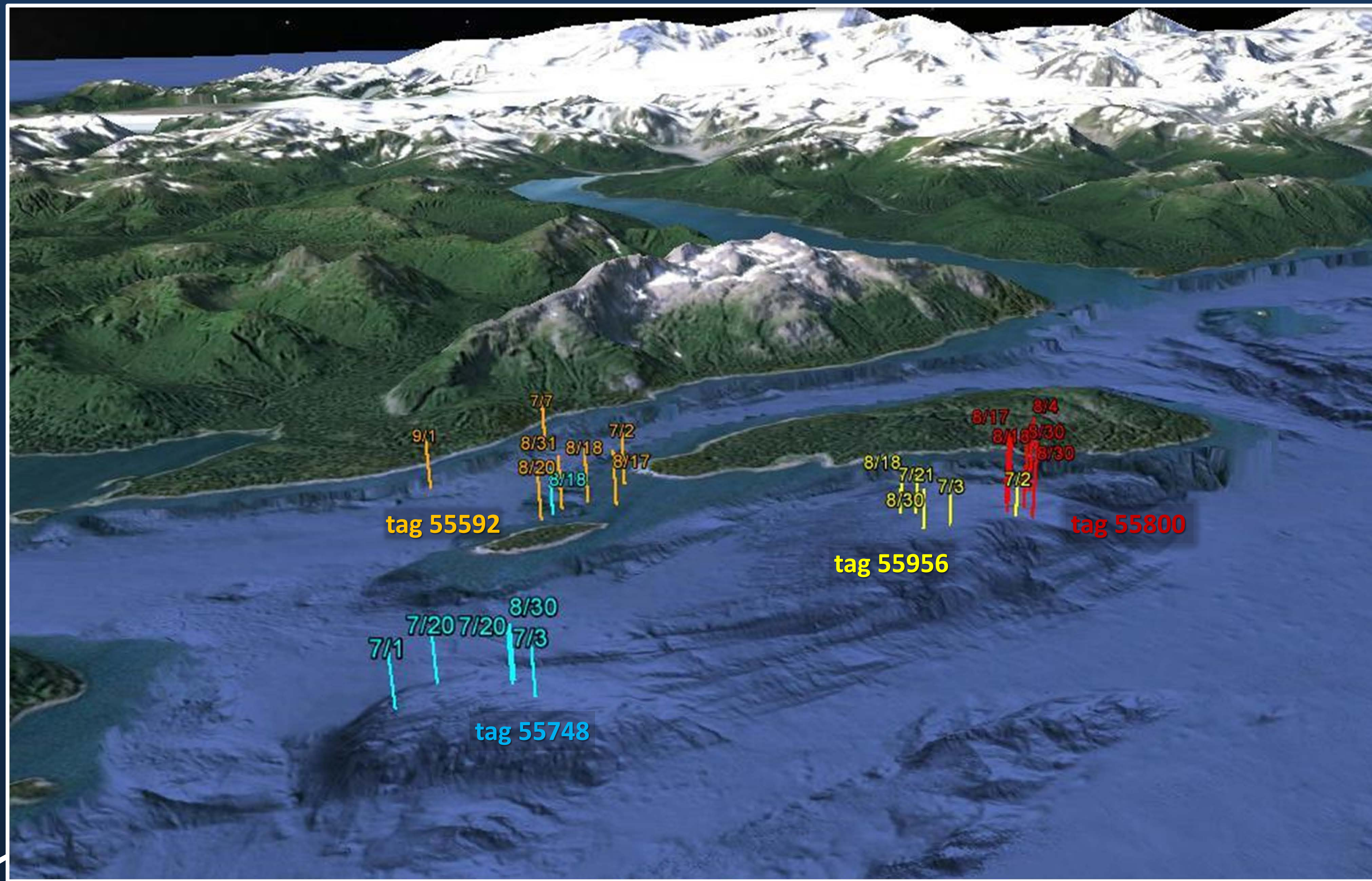


Figure 2. Examples of purported foraging home ranges for four of the 15 Pacific halibut that were tagged with acoustic transmitters and tracked for two months in Glacier Bay National Park. Each color represents a different tag and the dates indicate where the fish was observed on that date.

METHODS

- Fifteen adult halibut (105 – 170 cm FL) were captured in the central part of Glacier Bay, ~ 35 km from the park entrance (Fig.1).
- Each fish was implanted with an acoustic transmitter (Fig. 3) and actively tracked every other week for two months.



Figure 3. Lotek M-16-50 acoustic tags (inset) were inserted into the peritoneal cavity through a 3 cm incision below and posterior to the operculum on the eyed-side of the fish.

DISCUSSION

- There was no evidence that any of the tagged fish left Glacier Bay during the summer.
- Short term movements described active fish that often traveled up to 1 km during the day but occupied relatively small home ranges over the course of the summer feeding season.
- All of the home ranges were located wholly within the park and far from its boundary, therefore, movement out of the MPA by these halibut is unlikely during the summer.

CONCLUSION

- The site fidelity of these fish during the summer, when commercial fishing occurs outside of the bay, suggests that MPA status will likely result in lower fishing mortality for Glacier Bay fish. Over time, this can result in greater stock density and larger fish size. Winter departures from the MPA, if they occur, probably would not expose the fish to significant harvest pressure because the commercial season is closed from November to March. Data provided this summer by the satellite tags will help characterize winter activity and its impact on the Glacier Bay Pacific halibut stock.

RESULTS

- All 15 fish were observed at least once during the tracking period.
- The number of observations per fish during the 2-month period ranged from 1 to 20.
- Horizontal displacements from the release locations in the first 48 hrs after tagging ranged from 214 m to 746 m.
- All of the fish were observed in shallow water (<100 m) close to their release locations (Fig. 2).
- Thirteen fish occupied relatively small, overlapping home ranges (Fig. 4). Two fish were not observed enough times to infer a home range

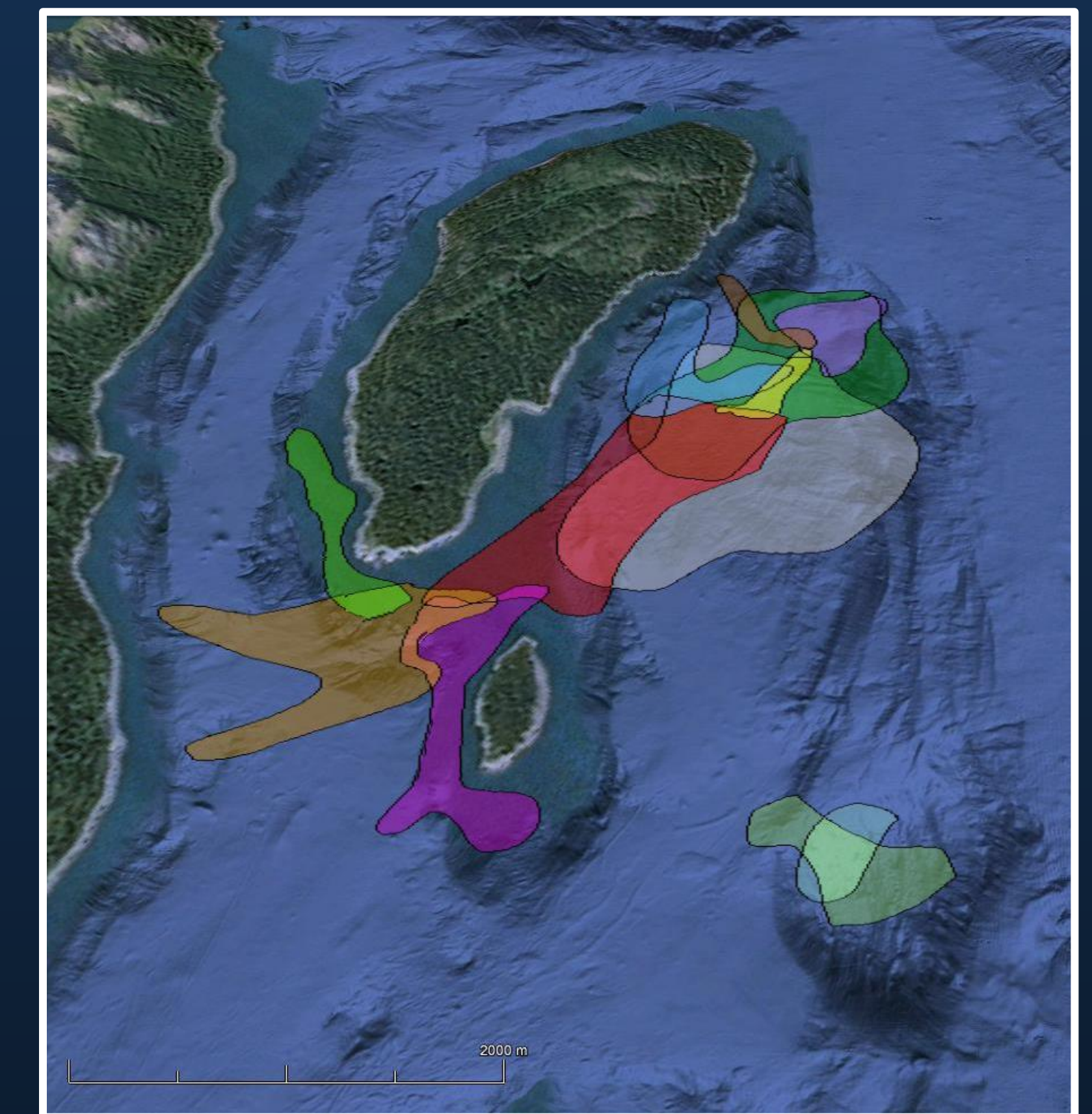


Figure 4. Home ranges of the tagged fish were concentrated in shallower waters and overlapped each other.

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