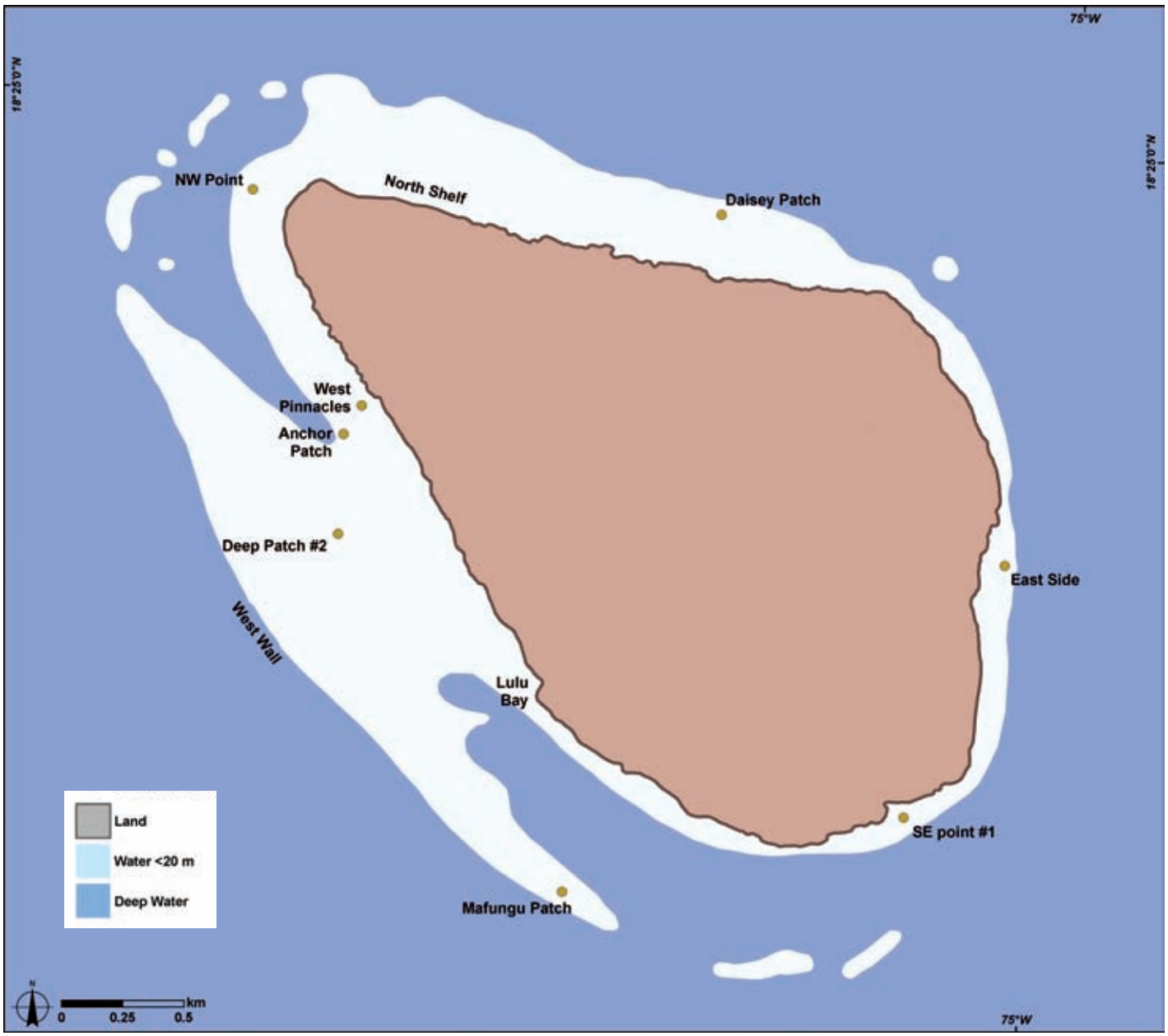

Figure NI-1. A map of Navassa Island. (See Figure 4 for geographical context.) Map: A. Shapiro. Source: Miller et al. (2005).

NAVASSA

Navassa Island is a small (5 km^2), uninhabited, oceanic island between Jamaica and Haiti (Figure NI-1). Navassa Island is under the jurisdiction of the FWS and has been managed as a component of the Caribbean Islands NWR since 1999. The dolomite island's cliffs plummet to about 25 m deep before a submarine terrace slopes out gradually. Thus, Navassa lacks typical Caribbean patterns of reef zonation and inshore and backreef habitats including mangroves, sandy beaches, and seagrass which are important in the life history of several reef fish groups. Small shoulders of shallow reef habitat (10 to 15 m) are found at the northwest point and Lulu Bay, but the primary reef habitats are reef walls formed by the cliffs and large boulders that have been dislodged from the cliffs. A 2002 survey documented 10 to 20% live coral cover in shallow habitats (10 to 20 m) and 46% live coral cover at the 25 to 30 m terrace; deeper reef slopes at shelves greater than 30 m farther offshore have not been well described. Dominant corals are *Montastrea* spp., *Agaricia* spp., *Porites porites*, and, at shallow sites, the elkhorn coral, *Acropora palmata.*

Because of its isolated and uninhabited status, Navassa has been presumed to provide a relatively pristine

example of an unimpacted reef that may serve as a valuable reference site for determining Caribbean coral reef structure and function. Land-based pollution and recreational uses are essentially absent. However, reefs on the east coast (and to a lesser extent, the southwest and west coasts) are exposed to persistent swells and seemingly regular storms and hurricanes. A fall 2004 NOAA/FWS research cruise documented storm damage to *A. palmata* colonies in the shallow shoulder of Lulu Bay. The same cruise documented relatively high prevalence of coral disease, despite the lack of land-based pollution and other anthropogenic stressors.

Fishing is the primary threat to Navassa's reefs. Subsistence fishing appears to have been ongoing since at least the 1970s and current activity by migrant Haitian fishers is substantial (but unquantified). A 2002 survey noted the virtual absence of large fish – the average total length was 4.6 cm and only 11 of 1,227 fish were longer than 24 cm. A less extensive survey in 2000 found that 92% of snapper and 23% of parrotfishes were longer than 40 cm. These results suggest that fishing impacts are substantial and rapidly increasing. Interviews with Haitian fishers in 2004 provided preliminary data on catch, frequency of fishing, and gear types. Large commercial foreign flagged fishing trawlers have been observed within NWR waters, which include a 12 mile area of open ocean around the island. The primary research priority in Navassa is the assessment of reef status and fishing activity and impact over time.[5]

5 Introductory material was taken, with slight modifications, from Miller et al. (2005).

Research Needs

NAVASSA	FISHING
Management Objective	***Research Need***
Conserve and manage fisheries to prevent overfishing, rebuild stocks, and minimize destructive fishing. *See Jurisdiction-Wide Section for additional research needs.*	Conduct capture-recapture studies to provide estimates of total population numbers of large resident species.
	Interview local fishers to provide anecdotal information in order to discern trends in catch effort and perhaps size shifts in target species.
	Collect size data for the most commonly taken species as they are landed in the nearest fishing villages in Haiti.
	Determine usage patterns of Navassa marine resources (i.e., catch and effort data for fishing activities).
	Determine what other fishery sectors (besides the Haitian subsistence sector) are active in Navassa and the impact they are having on the resource.
	Conduct a sociocultural assessment of Haitian communities from which primary fishing activity originates.
	Understand the relationship of declining fish assemblage and reef benthic community structure and condition.
	Develop a habitat map for the 12-mile radius around the island that is under Federal jurisdiction to identify essential fish habitat.

NAVASSA	POLLUTION
Management Objective	***Research Need***
Reduce the impacts of pollutants on coral reef ecosystems by improving the understanding of their effects.	Understand physical oceanic processes affecting Navassa water quality.

NAVASSA	COASTAL USES
Management Objective	***Research Need***
Not Applicable to Navassa. Aside from subsistence fishing, there are no coastal uses.	

NAVASSA	INVASIVE SPECIES
Management Objective	***Research Need***
Minimize the introduction and spread of alien species.	*See Jurisdiction-Wide Section for research needs.*

NAVASSA	CLIMATE CHANGE
Management Objective	***Research Need***
Minimize the effects of climate change on coral reef ecosystems.	Compare and contrast the prevalence of and impacts from bleaching events in Navassa with other U.S. jurisdictions, using Navassa as a reference site due to its low level anthropogenic impacts, other than fishing.

NAVASSA	EXTREME EVENTS
Management Objective	***Research Need***
Identify causes and consequences of diseases in coral reef ecosystems and mitigate their impacts.	*See Jurisdiction-Wide Section for research needs.*