Propeller Scarring of Seagrass in Florida Bay

National Park Service
U.S. Department of the Interior

South Florida Natural Resources Center
Everglades National Park

Everglades National Park (ENP) encompasses over 500,000 acres of marine environments, including most of Florida Bay. The ENP portion of Florida Bay was federally designated as submerged wilderness in 1978. Much of Florida Bay supports submerged aquatic vegetation comprised of seagrass that provides vast areas of habitat for recreationally and commercially important fish and invertebrates.

Florida Bay is a premier shallow-water recreational fishing destination and it is heavily used by recreational boaters for access to productive fishing areas. While the primary stressors in Florida Bay are related to watershed management, recreational boat use has also damaged seagrass resources in the bay. Park managers have long recognized the need for better information on the extent and pattern of propeller scarring of seagrass beds in order to protect and restore this critical resource properly.

To obtain information on propeller scarred seagrass for use in developing the park's General Management Plan (GMP), a public process, and to assist with developing a park-wide seagrass restoration strategy, we analyzed aerial imagery of Florida Bay. The results provide information on the pattern and relative density of seagrass scarring and allow us to determine if scarring damage is increasing or decreasing. We also used high resolution imagery, available for only a small portion of the bay, to estimate how well our study detected existing scars. Finally, we used geospatial analyses to help determine if scarring density was related to water depth and proximity to shorelines, boat ramps, marked and unmarked navigational channels, and boating activity.

General Results

- We detected approximately 12,000 seagrass scars.
- Scar lengths ranged from approximately 6.6 to 5250 feet.
- The total length of scars was approximately 325 miles.
- Scars are present throughout the shallow areas of Florida Bay.
- Substantially more scarring was identified in this study than in a previous study conducted in 1995.
- High resolution imagery suggests that our primary imagery may substantially underestimate total scarring distance.

Propeller scar from boat. Photo by Brett Seymour, NPS

Upper Photo: Scars surrounding the north end of Lower Arsnicker Key
Photo by Lori Oberhofer, ENP

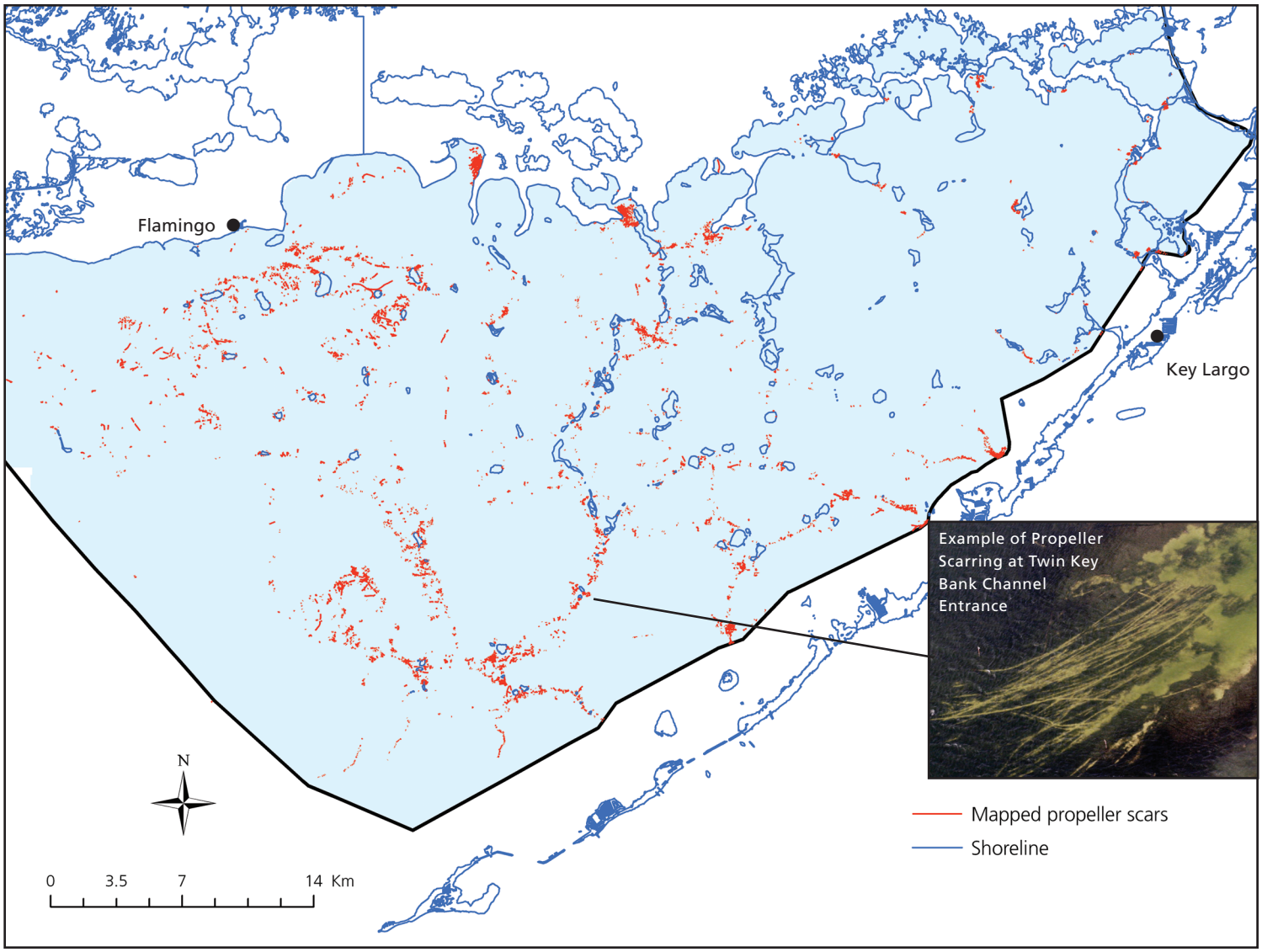
Patterns and Associations

- The majority of scarring was identified in depths below 3.0 feet and scarring was found to increase as depth decreased.
- Scarring is similar around marked and unmarked channels.
- Dense scarring is more likely in close proximity to marked and unmarked channels and shorelines.
- There is more scarring in areas that are most heavily used by recreational boaters.
- Scarring density was not related to proximity to boat ramps in the Florida Keys or Flamingo.
- Scarring may be increasing in specific sites in Florida Bay.
- A propeller dredged channel, identified in 1995, has been steadily increasing in size.

The complete report of this study is available on the parks's homepage (**www.nps.gov/ever**). Click on "General Management Plan" and then "GMP Documents" to access. The report can also be found under the South Florida Natural Resources Center portion of the website (**www.nps.gov/ever/naturescience/technicalreports.htm).**

Summary and Recommendations

- Seagrass scarring in Florida Bay is widespread with dense scarring found in shallow depths, near all navigational channels, and around areas most heavily used by boaters.
- Although seagrass damage assessments using aerial imagery often underestimate scarring, they provide useful information on pattern and relative density of scarring.
- Because scarring may be increasing over time, new management strategies are warranted to protect submerged wilderness resources and reduce stressors as part of an overall approach to ecosystem management in Florida Bay.
- An adaptive approach, initially focused on the most heavily scarred areas, should consider monitoring scarring at specific indicator sites in response to a variety of management techniques including new education, signage, and enforcement efforts; and boating restrictions, such as pole/troll zones.
- Results from this study should assist in managing other shallow water marine areas in the park.



Overview of propeller scarring in Florida Bay, Everglades National Park.