September 5, 2016

Rear Admiral L.L. Fagan, Commander
First Coast Guard District
United States Coast Guard
408 Atlantic Avenue
Boston, MA 02110

Admiral Fagan,

Thank you for the opportunity to comment on the advanced notice of proposed rulemaking, "Anchorage Grounds, Hudson River; Yonkers, NY to Kingston, NY".

The purpose of our public comment is to document on-going river bottom disturbances that occur due to anchoring activities in the Hudson River (specifically at the Hyde Park Anchorage Ground), and to address the potential impact that anchoring could have on Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) riverine habitats. In 2012, the New York Bight and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon were declared endangered species under the Endangered Species Act (ESA) (77 Federal Register 5880). The type of river bottom anchor disturbances that we document at the Hyde Park Anchorage Ground would be expected to occur in all of the proposed anchorage grounds, thus impacting a sizeable portion of the Hudson River and a variety of fish species including the ESA listed Shortnose Sturgeon (*A. brevirostrum*).

River Bottom Disturbance Due to Anchoring

As part of a collaborative sturgeon research effort involving Delaware State University, the Hudson River Foundation, the New York State Department of Environmental Conservation (NYSDEC) and the University of Delaware, we have conducted high-resolution side-scan sonar surveys within the Hyde Park reach of the Hudson River, as well as reconnaissance profiling at selected locations along the river between Marlboro and Catskill, NY. The Hyde Park reach, which numerous studies and reports suggest contains the largest extant spawning site for adult Atlantic Sturgeon, and very likely provides key foraging and refuge habitats for earlier life stages (Van Eenennaam et al. 1996; Bain 1997; Bain et al. 2000), contains the Hyde Park Anchorage

Ground which was designated in 1999 by the United States Coast Guard as a commercial anchorage restricted to vessels >20 m in length (Figure 1).

While conducting side-scan sonar surveys in 2013, 2014, and 2016 during the Atlantic Sturgeon spawning season to estimate sturgeon abundance and to map river bottom features (e.g., sediment types, bedrock exposures) in order to better characterize key bottom habitats, it was consistently noted that while within, or in the vicinity of, the Hyde Park Anchorage Ground there was noticeable disturbance to the river bottom (Figure 2). The disturbances include oblong-shaped depressions with dimensions on the order of 1 to 3 meter (m) widths, 5 to 10 m lengths and 1 to 2 m depths that are caused by anchors settling into the river bottom with minimal drag after being dropped. Even more pronounced are linear depressions with depths estimated of 1 to 2 m, widths that range from 1 to 3 m and lengths of up to 300 m that are attributed to dragging of anchors along the bottom while vessels are in the process of anchoring or at anchor (Figure 2). The observed anchor drag scars are of varying widths, suggesting that vessels of different sizes and or hull configurations, which influence hydrodynamic drag, are utilizing the anchorage (Figure 2).

The observed bottom disturbances were positively linked to anchoring activities as shown by side-scan sonar data collected on June 23, 2016, the last day of our 2016 side-scan sonar survey, as a tugboat/barge anchored at the Hyde Park Anchorage Ground while we were in the vicinity. We were able to image the anchoring process and document the formation of an anchor drag scar during anchor setting. As shown in Figure 3 in a side-scan profile that was collected within approximately 30 minutes of the dropping of the anchor, the bottom depression created was on the order of 4 m in width and 20 m in length.

An examination of the side-scan sonar data suggests a temporal evolution in the bottom disturbances resulting from anchoring activities. Shown in Figure 4 (A) – (D) are examples of observed anchor scars that range in age from recent (A) to older (D). Recent anchor drag scars are indicated by their pronounced edges and visibly disturbed sediment within a central trough (Figure 4 (A)). With time, and due to bottom current activity in association with sediment erosion and deposition, central troughs become smoothed. However, the scars still maintain distinct edges (Figure 4 (B)). With continuing time, scar edges become less pronounced and the central troughs are infilled with sediment (Figure 4 (C)). Older anchor scars, as shown in Figure

4 (D) have central troughs that have been nearly, or completely, infilled with edges that transition into textures that are similar to the surrounding sediments.

There are limited data to determine specific length of time intervals associated with the evolution of anchor scars from recent (A) to older (D). We are able to document the relative age of anchor scars off Port Ewen, NY in an area that is proposed for the Big Rock Point Anchorage Ground. In late November, 2015 in response to public complaints concerning unauthorized vessel activities in this area of the River, further anchoring was prohibited. We surveyed this region in June, 2016 and visible anchor scars (at least 6 to 7 months old) are imaged (Figure 5). While further research is warranted to better constrain the length of time that bottom disturbance occurs due to anchoring, it is apparent that anchor scars are not ephemeral, and are present on scales of months, to perhaps years.

The general distribution of the bottom disturbance due to anchoring activities in the Hyde Park Anchorage Ground are shown in Figure 6. Red lines in the figure indicate "recent" (relative to the 2013 survey) anchor drag scars (i.e., scars with characteristics shown in (A) and (B) in Figure 4). Orange lines indicate "older" (relative to the 2013 survey) anchor drag scars (i.e., scar types shown in (C) and (D) in Figure 4). It should be noted that numerous scars are observed outside of the officially designated anchorage ground. These are located predominantly to the north and the west of the anchorage (Figure 6). Shown in Figure 7 are adult Atlantic Sturgeon, as identified from the side-scan sonar images and confirmed by acoustic telemetry, that were present within, and in the vicinity of, the Hyde Park Anchorage Ground during the 2013 and 2014 field seasons. The contacts were classified as adult Atlantic Sturgeon based on body shape (e.g. fin shape and placement) and size (>1.5m). In all likelihood there are additional Atlantic Sturgeon life stages (e.g. larval and early juvenile) that occupy the Hyde Park river reach which are beyond the resolution capabilities of our system.

Potential Impact on Atlantic Sturgeon from Anchorage Bottom Disturbance

Our preliminary work clearly indicates that there are disturbances in Atlantic Sturgeon bottom habitat due to anchoring activities in the Hyde Park reach of the Hudson River. Based on the timing and location relative to presumed spawning habitat of our 2013, 2014, and 2016 surveys, we know that these disturbances are present during time periods in which egg, larval and reproductively active adult Atlantic Sturgeon are in the vicinity. What is not well-

established at this time is the magnitude of their disruption to Atlantic Sturgeon, and the overall impact of these disturbances on the benthic communities that are an important food source for Atlantic Sturgeon while they are in the vicinity of their spawning area.

Atlantic Sturgeon spawning sites are confined to well-oxygenated areas with flowing water and bottom substrate such as cobble, coarse sand, hard clay, and bedrock (National Marine Fisheries Service (NMFS), 2016). While our on-going work seeks to better constrain potential spawning habitat, the exact location of spawning is unknown and larval Atlantic Sturgeon are purported to stay in close proximity to the bottom of the river nearby spawning locations (NMFS, 2016). Additionally, recent results from our surveys suggest that Atlantic Sturgeon in the Hudson River use sand waves as an important habitat for staging, resting and holding of spawning condition adults. We are still analyzing the importance of sand wave habitat to Atlantic Sturgeon, an illustrative example is shown in Figure 8. Anchorage grounds in, or in close proximity to, Atlantic Sturgeon spawning areas, such as the Hyde Park Anchorage Ground, have the potential to negatively impact spawning Atlantic Sturgeon by: 1) disrupting their spawning behavior, 2) causing injury/mortality of eggs and early larval life stages, 3) adversely modifying bottom habitat for Atlantic Sturgeon foraging.

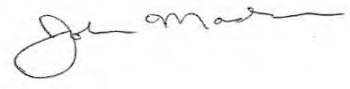
The locations of the contemplated anchorage grounds (using corrected positions for some of the coordinates that were supplied in the Federal Register) were compared to the existing information about spawning and wintering areas for Atlantic Sturgeon, including relevant literature (Dovel and Berggren 1983; Van Eenennaam et al. 1996; Bain 1997; Bain et al. 2000), NYSDEC acoustic tracking data from 152 Atlantic Sturgeon, gill net sampling data from 2006-2015 for adult Atlantic Sturgeon, and gill net sampling data from 2003-2015 for juvenile Atlantic Sturgeon. The only existing or contemplated anchorage grounds that occur in identified spawning areas in the Hudson River are the existing anchorage ground near Hyde Park and the proposed Milton Anchorage Ground near Milton, NY. A 10 kilometer (6 mile) reach around the Hyde Park anchorage contains the densest spawning aggregation of Atlantic Sturgeon in the Hudson River (Bain 1997, Van Eenennaam et al. 1996). The Hudson River stock is thought to be the largest Atlantic Sturgeon population of any river on the Atlantic coast (Kahnle et al. 2007; Dunton et al. 2016). We would like to express significant concerns about the continued, increased, or potential disturbance of the river bottom in such sensitive areas for an endangered fish.

Haverstraw Bay has long been considered an important overwintering area for river resident juvenile Atlantic Sturgeon (Bain 1997; Dovel and Berggren 1983; Sweka et al. 2007; NYSDEC unpublished data). Juvenile Atlantic Sturgeon use this area during the winter months. Given the impact of anchoring activities, we are concerned that the Tompkins Cove and Montrose contemplated anchorages have been located in an area of important Atlantic Sturgeon wintering habitat.

Major Findings and Recommendations

- Bottom disturbances due to anchoring activities can be observed in the existing Hyde Park Anchorage Ground. The anchorage ground is located in the vicinity of spawning and sand wave habitats that are critical for Atlantic Sturgeon. The contemplated Milton Anchorage Ground is also located in the vicinity of identified Atlantic Sturgeon spawning habitat (Bain et al. 2000). We recommend that these anchorage grounds be relocated, or not available for anchoring while the region is occupied by Atlantic Sturgeon.
- The contemplated Tompkins Cove and Montrose Anchorage Grounds could potentially impact overwintering river resident Atlantic Sturgeon.
- Given the anchor scarring that is observed outside of the Hyde Park Anchorage Ground, it is important to ensure compliance with established anchorage boundaries in order to minimize impact to Hudson River bottom habitat and affected species.
- There is a need to improve scientific understanding of the temporal evolution of bottom disturbances due to anchoring activities so that the overall impact of anchoring on the sediments, benthos, and higher trophic levels can be determined.

We thank you for the opportunity to comment. If you require additional information please do not hesitate to contact us directly.



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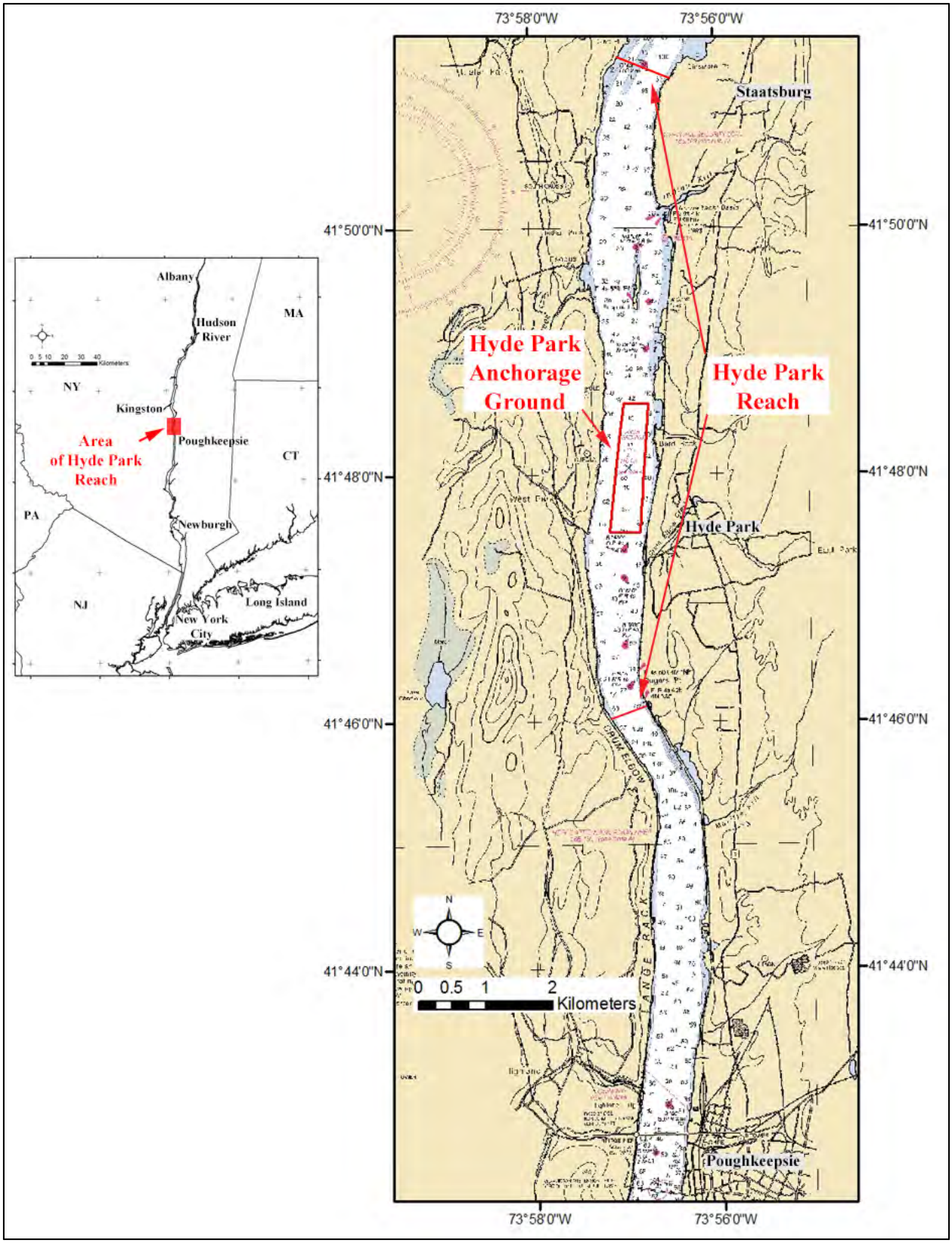

Figure 1. General location of the Hyde Park reach and the Hyde Park Anchorage Ground.

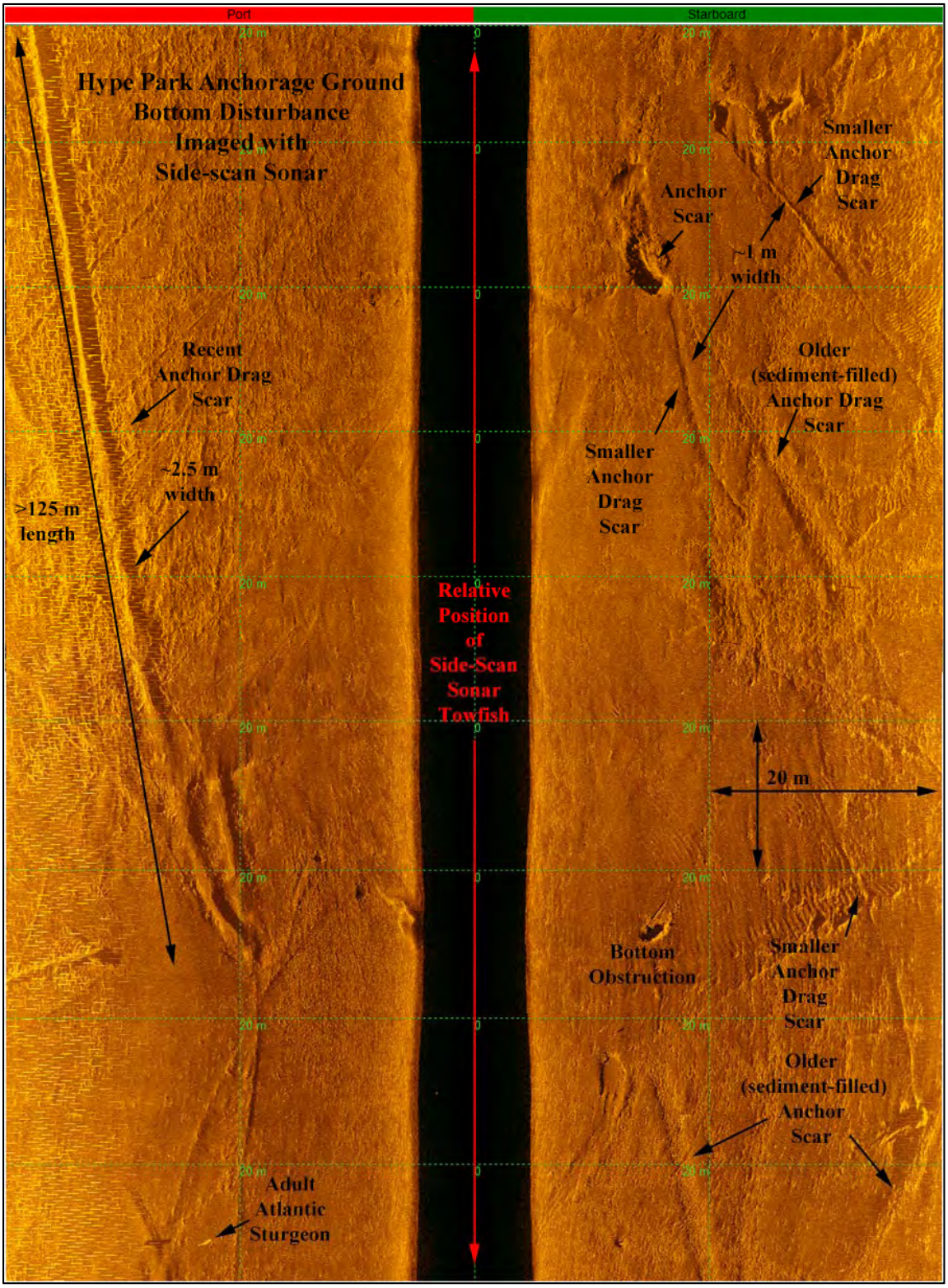

Figure 2. Example of Hyde Park Anchorage Ground river bottom disturbance due to anchoring activities.

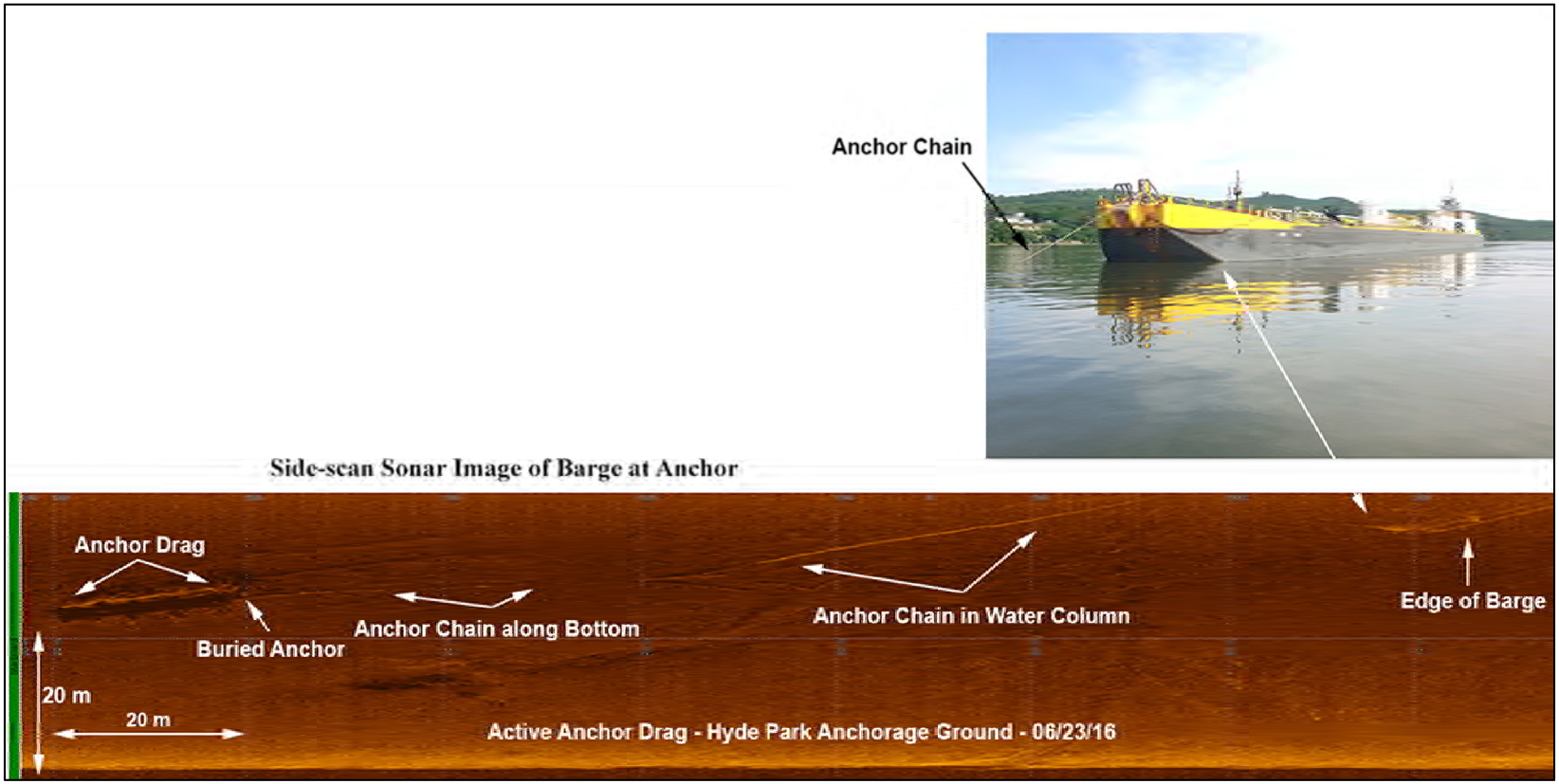

Figure 3. River bottom disturbance due to recent (< 30 minutes) anchoring activities.

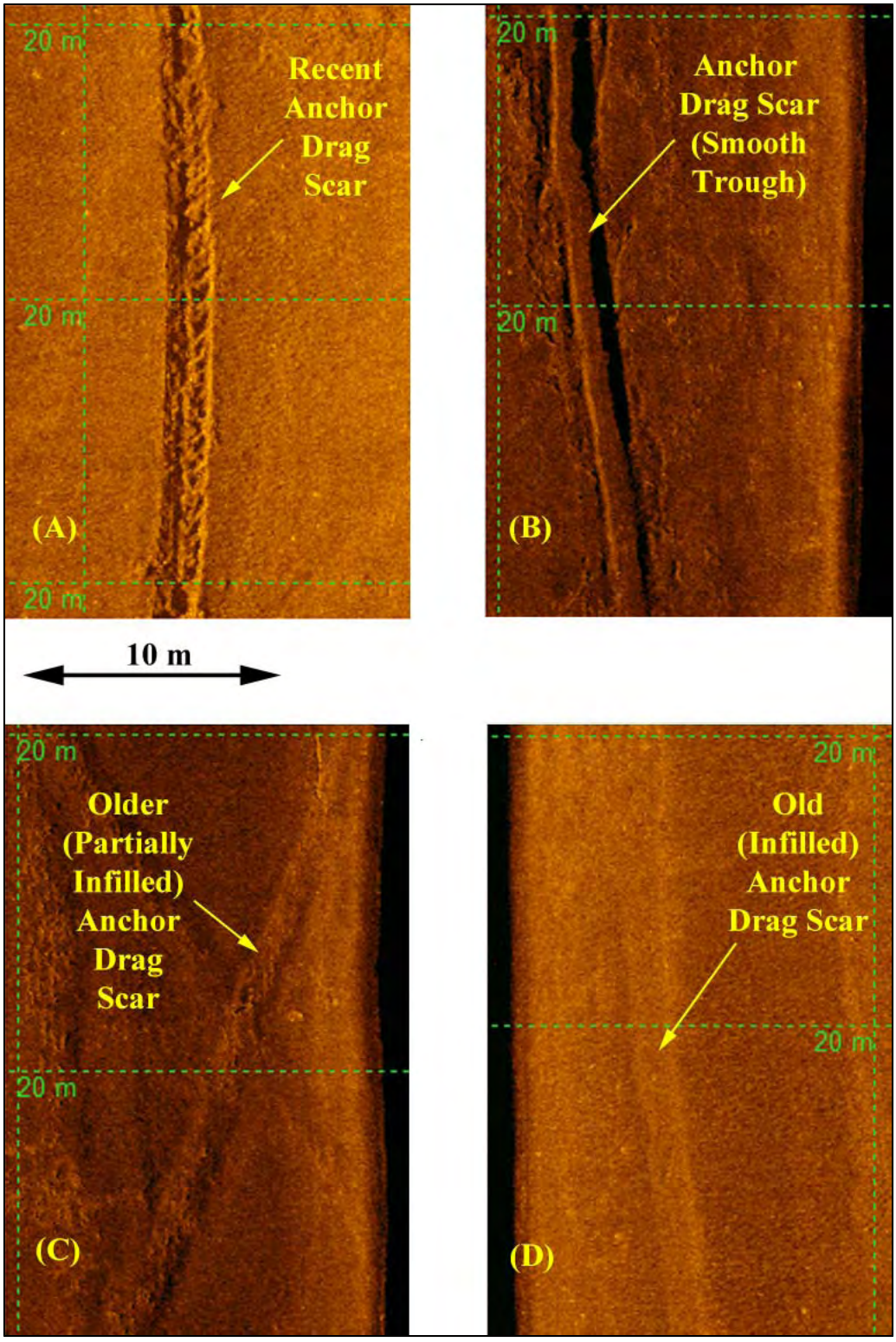

Figure 4. Relative age of anchor drag scars. Shown in (A) recent drag scar with pronounced edges and disturbed sediment within central trough. With time, and due to bottom current activity, sediment erosion, and deposition, anchor scars develop less pronounced edges and smoothed troughs (B), and are eventually infilled by sediments (C) and (D).

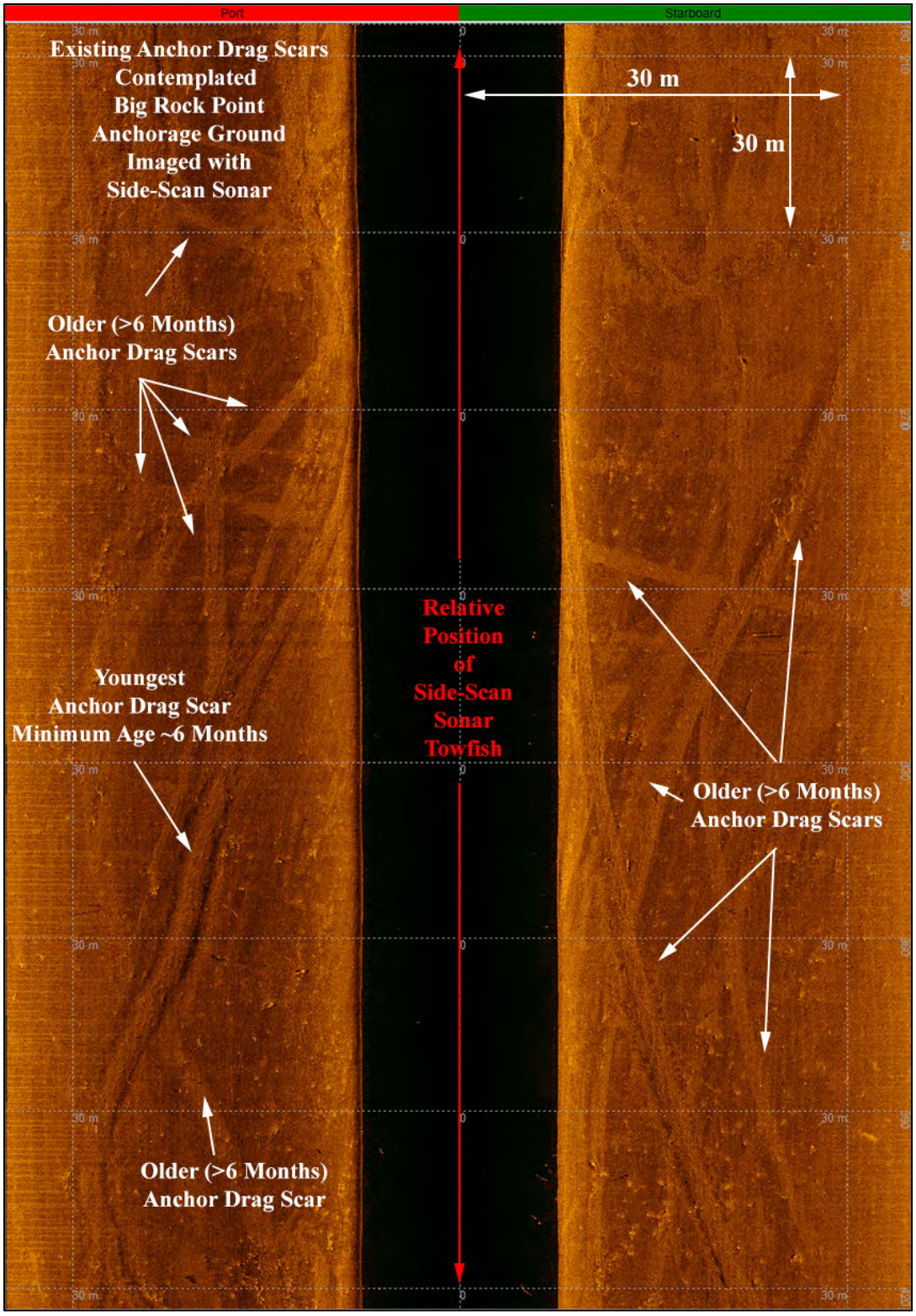

Figure 5. Anchor drag scars in contemplated Big Rock Point Anchorage Ground. Imaged with side-scan sonar in June, 2016. Last anchoring activities were in November, 2015.

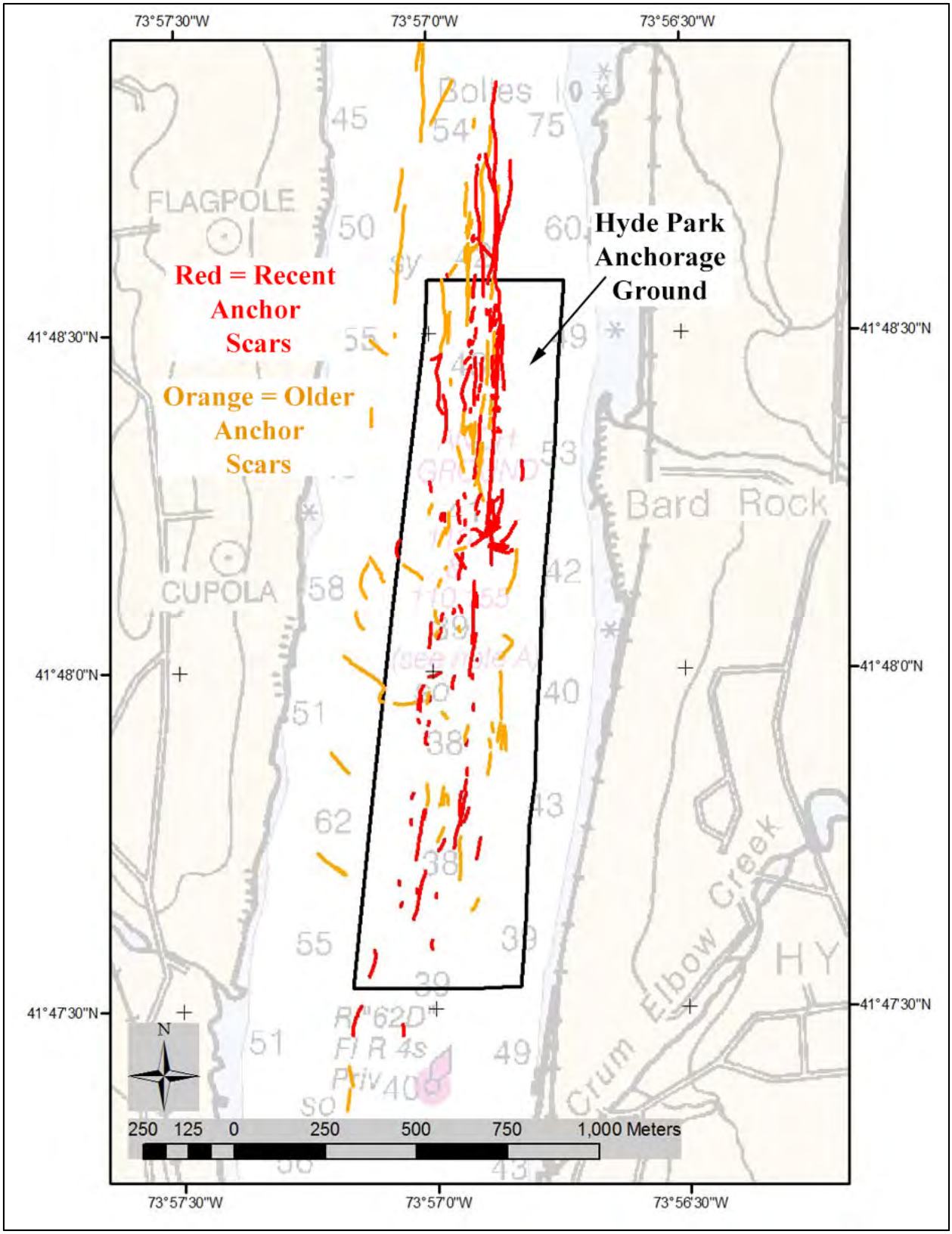

Figure 6. Distribution of anchor scars imaged during our 2013 side-scan sonar survey. Note presence of anchor scars outside of designated anchorage ground.

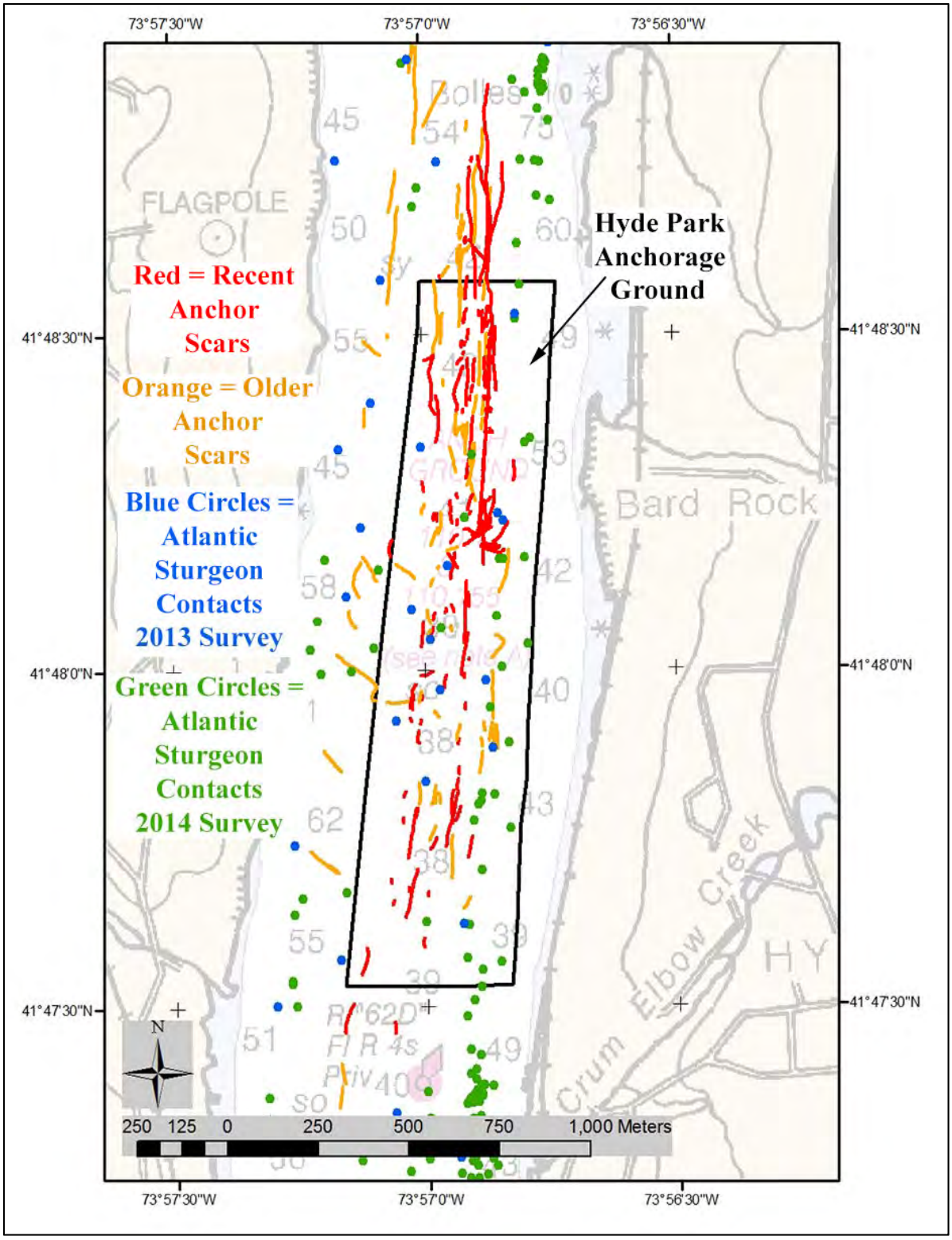

Figure 7. Adult Atlantic Sturgeon during spawning season identified in the vicinity of the Hyde Park Anchorage Ground.

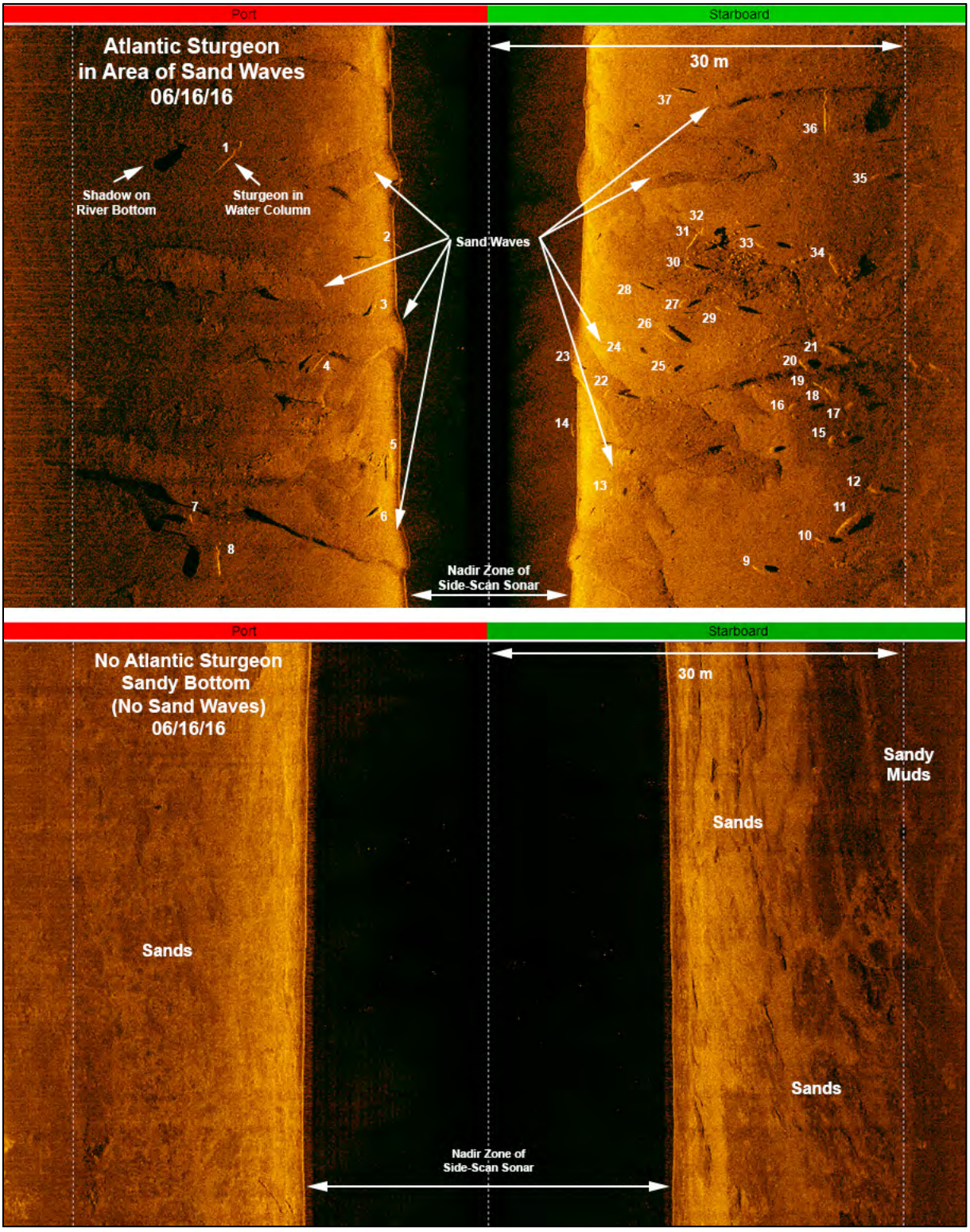

Figure 8. Comparison of abundance of adult Atlantic Sturgeon in sand wave habitat vs. sand habitat without sediment waves.

Literature Cited

Bain, M. B. 1997. Atlantic and shortnose sturgeons of the Hudson River: common and divergent life history attributes. In Sturgeon Biodiversity and Conservation (pp. 347-358). Springer Netherlands.

Bain, M. B., N. Haley, D. Peterson, J. R. Waldman, and K. Arend. 2000. Harvest and habitats of Atlantic sturgeon *Acipenser oxyrinchus* Mitchill, 1815, in the Hudson River estuary: Lessons for sturgeon conservation. Instituto Espanol de Oceanografia. Boletin 16: 43-53.

Dovel, W. L. and T. J. Berggren. 1983. Atlantic sturgeon of the Hudson Estuary, New York. J. New York Fish & Game 30(2): 140–172.

Dunton, K.J., Jordaan, A., Secor, D.H., Martinez, C.M., Kehler, T., Hattala, K.A., Van Eenennaam, J.P., Fisher, M.T., McKown, K.A., Conover, D.O., Frisk, M.G. 2016. North American Journal of Fisheries Management 36:62-73.

Kahnle, A.W.K., Hattala, K.H., McKown, K.A. 2007. Status of Atlantic sturgeon of the Hudson River Estuary, New York, USA. Pages 347-363 in J. Munroe, D. Hatin, J.E. Hightower, K. McKown, K.J. Sulak, A.W. Kahnle, and F. Caron, editors. Anadromous sturgeon: habitats, threats and management. American Fisheries Society, Symposium 56, Bethesda, Maryland.

National Marine Fisheries Service (NMFS). 2016. Endangered and Threatened Species; Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon. 81 Federal Register 35701.

Sweka, J. A., J. Mohler, M. J. Millard, T. Kehler, A. Kahnle, K. Hattala, G. Kenney and A. Higgs. 2007. Juvenile Atlantic Sturgeon Habitat use in Newburgh and Haverstraw Bays of the Hudson River: Implications for population modeling. Jour. of Fish Management 27:1058-1067.

Van Eenennaam, J.P., Doroshov, S.I., Moberg, G.P. 1996. Reproductive Conditions of Atlantic sturgeon (Acipenser oxyrinchus) in the Hudson River. Estuaries: 19, 769-777.