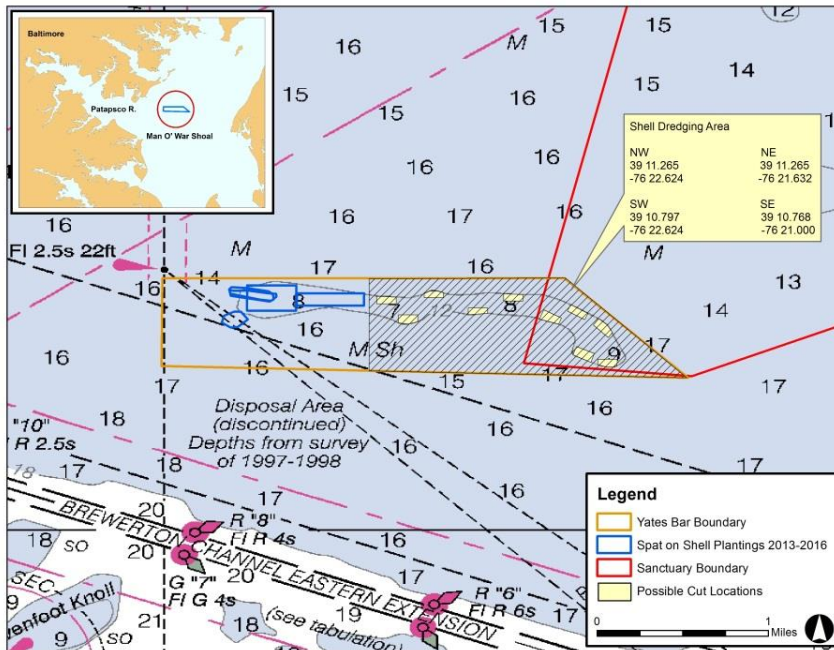


CENAB-OP-RMN (MAN O' WAR SHOAL DREDGING) 2009-61802-M04

In the Corps' letter dated December 9, 2016 questions were asked about the specifics of the dredging process, the structure of the bottom of the dredge cuts, revisions needed to "Attachment 1", and two actions under the National Marine Fisheries Service (the EFH and ESA consultations). DNR was provided until April 1, 2017 to respond. Each request in the letter is listed below with our response. "Attachment #1" refers to the detailed project description provided with DNR's application dated July 15, 2015.

1) "The application and the plans, must be revised to remove the area that has had shell plantings (...the western end of shoal) during the period of 2013 to 2016 to negate any potential shell dredging of these areas. Provide coordinates of both the areas that have been planted and the remaining shoal area that is subject to dredging."

The application and plans have been revised and are contained in the enclosed Attachment #1. The revised map with coordinates for the proposed dredging area is in Section 1.0, page 3. The list of planting coordinates is at the back of Attachment #1 in the Appendix. For convenience, the map and coordinates are included below for easy access. Please note that the plantings were seed oysters, not shell as stated in Question 1 above. Also, the seed plantings were never part of the dredging plan. DNR and the Baltimore County Oyster Committee worked to create harvestable sites there and the seeded areas were never part of the dredging plan. The plan has stated on page 1, "No dredge cut will occur on an area of the shoal that has been planted with wild oyster seed or hatchery oyster seed within the past 10 years". However, the site map contained in the July 2015 plan didn't make this distinction – the map has been corrected.



Revised

Man-O-War Site Map

- The proposed dredging area is shaded in gray, with coordinates shown on the map.
- The seed plantings made within the last 10 years are outlined in blue, with coordinates in the following table.

Coordinates for seed plantings on Man-O-War Shoal: Made within the last 10 years, shown in blue on the revised project map.

Date	PLANTING_Y	Name	SUBSTRATE_	VolPlntd_M	Acres	CornerNum	XcoordLon	YcoordLat
6/3/2013	2013	Man O War Shoals	HATCHERY SEED	28.02	6.9	1	39 11.244 N	76 23.327 W
6/3/2013	2013	Man O War Shoals	HATCHERY SEED	28.02	6.9	2	39 11.212 N	76 23.073 W
6/3/2013	2013	Man O War Shoals	HATCHERY SEED	28.02	6.9	3	39 11.138 N	76 23.087 W
6/3/2013	2013	Man O War Shoals	HATCHERY SEED	28.02	6.9	4	39 11.171 N	76 23.342 W
6/4/2013	2013	Man O War Shoals	HATCHERY SEED	18.34	4.8	1	39 11.244 N	76 23.327 W
6/4/2013	2013	Man O War Shoals	HATCHERY SEED	18.34	4.8	2	39 11.212 N	76 23.073 W
6/4/2013	2013	Man O War Shoals	HATCHERY SEED	18.34	4.8	3	39 11.138 N	76 23.087 W
6/4/2013	2013	Man O War Shoals	HATCHERY SEED	18.34	4.8	4	39 11.171 N	76 23.342 W
9/14/2015	2015	Man O War Shoals	HATCHERY SEED	9.56	4.8	1	39 11.107 N	76 23.371 W
9/14/2015	2015	Man O War Shoals	HATCHERY SEED	9.56	4.8	2	39 11.107 N	76 23.228 W
9/14/2015	2015	Man O War Shoals	HATCHERY SEED	9.56	4.8	3	39 11.015 N	76 23.228 W
9/14/2015	2015	Man O War Shoals	HATCHERY SEED	9.56	4.8	4	39 11.015 N	76 23.373 W
8/9/2016	2016	Man O War Shoals (East)	HATCHERY SEED	4.32	14.7	1	39 11.232 N	76 22.851 W
8/9/2016	2016	Man O War Shoals (East)	HATCHERY SEED	4.32	14.7	2	39 11.189 N	76 22.586 W
8/9/2016	2016	Man O War Shoals (East)	HATCHERY SEED	4.32	14.7	3	39 11.112 N	76 22.608 W
8/9/2016	2016	Man O War Shoals (East)	HATCHERY SEED	4.32	14.7	4	39 11.146 N	76 22.869 W
9/1/2016	2016	Man O War Shoals (West)	HATCHERY SEED	31.53	35.0	1	39 11.262 N	76 23.269 W
9/1/2016	2016	Man O War Shoals (West)	HATCHERY SEED	31.53	35.0	2	39 11.246 N	76 22.951 W
9/1/2016	2016	Man O War Shoals (West)	HATCHERY SEED	31.53	35.0	3	39 11.075 N	76 22.973 W
9/1/2016	2016	Man O War Shoals (West)	HATCHERY SEED	31.53	35.0	4	39 11.088 N	76 23.270 W

2) “Attachment #1 needs additional editing/revisions to accurately present the proposed project and its conclusions concerning the project’s impact on the aquatic resources and fisheries. This includes revising all of the assessments of impacts to correlate with the proposed revision that sediment and shell bits are to be pumped back into the dredge cuts. As questioned by NMFS, HCD, “How is the use of the habitat that remains the same or different than what is there now, particularly for federally managed species with designated essential fish habitat in the area and their prey?”

Attachment #1 has been revised and is enclosed. It now states that the dredge cuts will be partially filled with sediment/shell fines from the dredging process, such that the bottom of the cuts will have a soft sediment layer. The prior statement that a shell layer would be left exposed at the bottom of the cuts was incorrect. The original author of the document wasn’t aware of the specifics of shell dredging and incorrectly assumed the bottom of the cuts would have a layer of shell.

In addition to clarifying the bottom type in the cuts, the text in the revised Attachment #1 also addresses impacts of this softer sediment layer in the cuts and the creation of variable topography due to shell dredging. See the following subsections within Section 4.0 (“Potential Effects of Removing Shell from Man-O-War Shoal”):

- Section 4.1, “Water Quality”: discusses the plume, plume size, TSS, impacts and other water quality issues.
- Section 4.2, “Oysters”: discusses the retention of silt in the cuts, such that it doesn’t cover oysters
- Section 4.3, “Benthic Community”: discusses impacts to and recovery of benthic invertebrates in the cuts.
- Section 4.4, “Fish Communities”: discusses impacts to (or lack of) EFH and various species.
- Section 4.5, “Commercial Fishing”: discusses impacts of the cut bottoms to crabbers and crabbing gear.
- Section 4.6, “Recreational Fishing”: discusses habitat change due to cuts, use of cuts by fish (also covered in 4.4), and the use of cuts by fishermen.

A brief summary of environmental studies from earlier permit review cycles is enclosed. However, consult each Section above for detailed data.

3) “Please confirm whether the State of Maryland law allows for deposition of sediment and shell bits back into the dredge cut as proposed.”

The deposition of sediment and shell fines (bits) back into the dredge cut is allowed under Maryland law.

Title 5, Subtitle 11, of the Environment Article, Section 5-1102(c) states "... a person may not redeposit in an unconfined manner dredged material into or onto any portion of the water or bottomland of the Chesapeake Bay or of the tidewater portion of any of the Chesapeake Bay's tributaries except when used for a beneficial use project undertaken in accordance State and federal laws." "Beneficial use of dredged material" is defined at 5-1101(a)(3) to include the following uses: (i) the restoration of underwater grasses; (ii) the restoration of islands; (iii) the stabilization of eroding shorelines; (iv) the creation or restoration of wetlands; and (v) the creation, restoration, or enhancement of fish and shellfish habitats."

DNR consulted the Maryland Department of Environment staff who oversee and review dredging permits. They replied that the use of the “elephant trunk” on the dredge, that directs sediment and shell fines into the newly made dredge cuts, would deposit the material back into the cuts and the material would be "confined" (confinement being an important aspect of a dredging project). DNR adds that studies of old dredge cuts conducted by the Maryland Geological Survey showed that the sediment remained in the cuts and didn't drift out, even after many years. See the section entitled “Potential Effects of Dredging Shell” at the end of Section 4.2 in Attachment #1, in particular Figures 10 and 11 and the text that accompanies them. The sediment and shell fines are confined in the cuts based on those surveys.

Related to the Title 5 citation above, but not directly raised in Question 3, is the concept of beneficial use. The shells dredged from the cuts are one component of the dredged material brought up by the dredge. The shells are removed, barged to other locations, and planted to improve oyster habitat and the oyster population; constituting a beneficial use as described in (v) above.

4) “Since specific dredge cut locations have not yet been determined, the EFH Assessment must apply to the entire extent of the shoal that has the potential of being dredged as proposed by this project. As discussed, recent data on oyster density and use is necessary for an accurate assessment rather than limiting conclusions based on 1995 survey data. A patent tong survey is to be completed of the entire potential dredge area to provide data that will be used in completing the EFH Assessment and making the final permit decision.” (EFH = Essential Fish Habitat)

To facilitate completion of the EFH Assessment a patent tong population survey was conducted on December 20, 2016 to provide more recent data on the oyster population density on Man-O-War shoal. All of the area proposed for shell dredging was surveyed, as shown on the map below. No oysters were found throughout the entire area, the result of the killing freshet of 2011 and the lack of subsequent spat set since then. 87 patent tong samples of 1 square meter size were collected in the proposed area. Of these, 17 samples were collected in the sanctuary portion and 70 were collected in the non-sanctuary portion. These results and the map below are included in the revised Attachment #1 in Section 4.2, Figure 7.

Man O War Shoal Survey December 20, 2016

Results in the Proposed Area:

Proposed Dredging Area: 87 samples no live oysters Sample Size=1 sq m

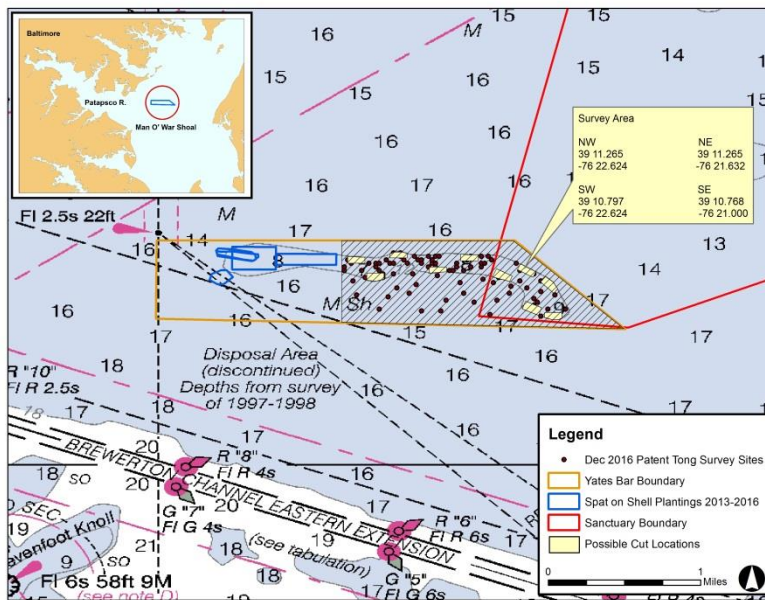
Results divided into sections of the Proposed Area:

On the Shoal – non sanctuary 50 samples no live oysters

On the Shoal – sanctuary 17 samples no live oysters

Off the Shoal – deeper water 20 samples no live oysters

TOTAL 87 samples no live oysters



Man-O-War Shoal Survey Sites:

Patent tong survey conducted by DNR December 20, 2016.

87 samples – zero oysters

5) **“Please provide a description of how the dredge cut locations are determined, which includes the measures taken to avoid and/or minimize impacts to existing aquatic resources. Provide from past core samples, the percentage of silts, sand, clays, shell, etc. in the area of the proposed cuts. Also of interest is a description of the specific factors, etc. that MDNR will use to determine where the dredged shell is to be placed.”**

Cut Locations: In the previous shell program from 1960-2006, dredge cut locations were determined by the dredging contractor after he conducted extensive surveys of the permitted areas using a sounding pole to probe the bottom and locate areas with dense shell. This method is low-tech but it predated modern electronics and also served the program well for 46 years: shells were consistently found and acquired. The contractor was knowledgeable about operating the dredge effectively and was successful at locating dredge cut sites. Because the entire permitted area was approved by the agencies for shell dredging (ie, environmental issues had been addressed across the entire shoal) there was no need to avoid a particular site where a cut was to be made. The process of locating cut sites for this project will be similar, but will benefit from advanced electronics that are now available to digitally survey and map the potential cut sites. Side scan sonar or similar sonar equipment, as well as GPS, will be used. The GPS component will be important to make sure the cuts don’t go too far into the width of the shoal. Additionally, oyster surveys can be conducted with either an oyster dredge or patent tongs to detect any viable population that needs to be specifically avoided, should a spat set occur and create a population.

Measures to avoid/minimize impacts to aquatic resources: The entire shoal is being reviewed by the agencies, not specific cut locations, so if the project is approved then cut locations can occur anywhere within the approved area. However, cut locations can be guided by any new oyster surveys in order to avoid impacts should a spat set occur and create a population in the future. A spat set will be detected during the Fall Survey and can trigger additional targeted surveys for potential cut sites. To avoid or minimize impacts generally, the project is designed to only cut into the shoal 1/3 of its width. This will retain a central uncut ridge or wall so the shoal still functions as a long and continuous barrier to the tide. Cutting through the shoal would risk unforeseen impacts as the tide ripped through. Another measure is to leave undredged bottom between cuts in order to enhance the 3D topography of the shoal’s perimeter. Variable 3D topography is utilized by many fish species and is often targeted by fishermen because such

bottom holds fish. Measures to avoid or minimize impacts are more a matter of dredging technique and pattern (as just described), and less about an exact location for a specific cut. These concepts and design aspects are presented in Section 1.0 page 2 and Section 3.0 of Attachment #1.

Coring report: At the November 22, 2016 meeting with the permitting agencies a coring report from 1988 was discussed. It was thought to contain data on the sediment size grain composition but instead it only has data on the shell volumes in the core samples. Page 14 of the MGS report states, “No grain size analyses of the sediments in the vibracores were performed.” A copy of the report is enclosed and contains a map of the coring sites, records of each core taken, and a discussion on the estimated volume of shells for Man-O-War Shoal and other bars. Some of the field sheets in the back of the report contain brief notes about sediment type in the core.

Specific Factors for Locating Shell Plantings: Attachment #1 covers this topic in Section 1.0 pages 1-3 and in Section 5.0, particularly the beginning of 5.2 and all of 5.3. Decisions on planting sites are guided by the goal of the planting (sanctuary, fishery, aquaculture) and the purpose of the shells (provide a base for hatchery seed or habitat for a natural spat set). Beyond goals and purpose are site specific practical considerations such as the existing bottom type, the salinity, and the history of spat set and disease mortality in the area. A primary consideration is the firmness of the bottom – can it hold shells or will they sink into the sediment? Of course, soft sediments are avoided. Planting decisions are based on habitat mapping surveys and field knowledge of the sites. They are coordinated with the State’s partners: other agencies, environmental groups, industry groups, and the public.

6) “Concerning the testing, please describe how the final reference sites are selected and address what specific assurances there are that each of them will be undisturbed by the proposed dredging. Recognize that our evaluation of this application will include consideration of the need for additional requirements/ permit conditions concerning the dredging and testing (i.e. monitoring, turbidity shut-down threshold, specific time-of-year restriction, etc.)”

Final Reference Sites Selection and Non-Disturbance by Dredging: Reference sites will be located as far from dredging as possible. This can be accomplished by placing the reference sites at the far western end of the proposed dredging area. On the site map shown under Question 1 this would be where the two western most theoretical cuts are located near the number “7”. Recall, the cuts on the map are for diagrammatic purposes only, to convey the concept of dredging the perimeter of the shoal to leave alternating irregular bottom. The cuts on the map are not final locations. With the reference sites located on the far western end, dredging can begin on the eastern end in Year 2 and work westward during that year, and continue westward in Year 5. As the program moves westward, cut locations will be selected to not interfere with the reference sites, maintaining a buffer distance from them; distance to be discussed and agreed upon by DNR and the Corps. An earlier suggestion that a reference site could be located on the far eastern end is no longer considered viable because with one on the far western end, dredging will need to begin on the far eastern end to keep dredging as far from the reference site(s) as possible. It is also possible to locate one of the reference sites on another bar entirely. Sevenfoot Knoll oyster bar is approximately 2 miles to the southwest of Man-O-War shoal, across the shipping channel.

Conditions: It is understood that the Corps may need to place conditions on the permit as noted at the end of Question 6.

7) **“For the Corps to complete informal consultation under Section 7 of the Endangered Species Act (ESA) with the NMFS, Protected Resources Division (PRO), please provide the Corps the following information (NOTE: We recognize some of this may be in Attachment #1 but it would be helpful to reference the related page(s). There may be a need for additional but minor clarification when writing our documentation):”**

- **For the dredging operation, specify the kind and number of vessels to be used, the number of trips per day, the dredging time of year, whether sonar is used, the use of any pile-driving activity in the vicinity of MOW action area, and the potential for discharge of pollutants (e.g., fuel spills).**

Dredging Vessel Traffic: This section is based on the historic shell dredging program from 1960 – 2006. The main vessel on site is the shell dredge (a barge), which is kept in place by 2 spuds and 2 anchors. Stern spuds are used alternatively, one at a time. Lowering and securing a spud is accomplished by gravity sinking the spud into the bottom, not by pile driving or vibracoring. Lifting the spuds is done by cables and pulleys. Anchors are used off the bow of the dredge, one to port and one to starboard. Next to the shell dredge, large barges are secured in order to receive the shells as they come off the dredge’s washing apparatus. There is one barge on the port side of the dredge and one on the starboard side. The barges are moved about using tugboats. There is generally one tug boat per day on site to drop off empty barges or take full ones to the planting sites. A crew boat, about 50’ long, operates daily to transport workers and supplies to and from the dredge, making at least two trips per day, up to four or five.


Dredging Time Span: Shell dredging historically occurred from about mid-May through September, in order to provide shell planting during the oyster’s spawning season and capitalize on natural reproduction. For this permit the operational window is requested to be year round for greatest flexibility to meet the needs for the three aspects of the program: sanctuaries, fishery, and aquaculture. However, it is understood that the permitting agencies may require Time-of-Year restrictions.

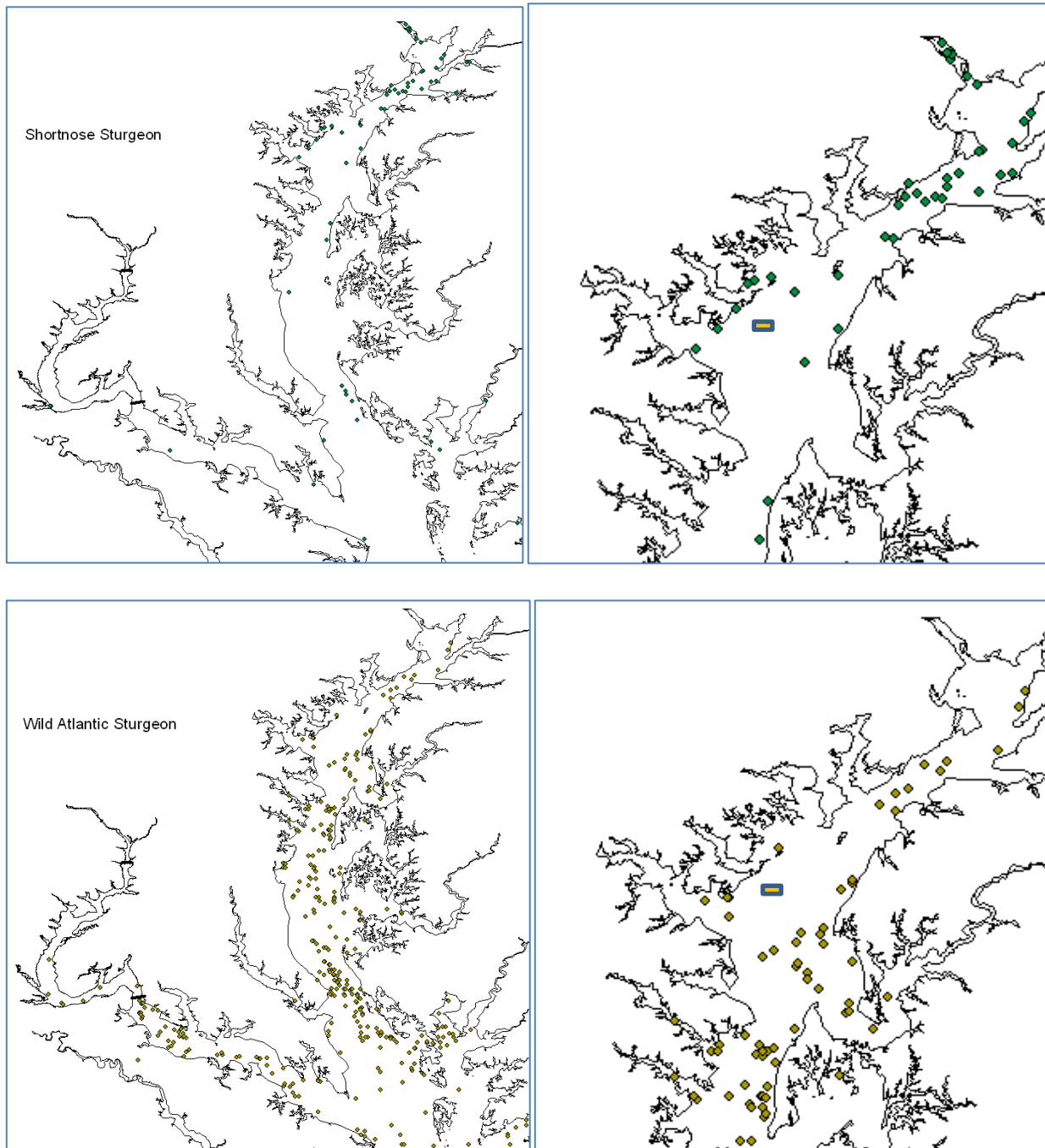
Pollutants, etc: There is a risk of spills due to the numerous powered vessels operating in the dredging area, in addition to the dredge which also has engines to run its equipment. The shell dredge and other vessels will all have USCG required oil spill response equipment and they will use all the required procedures, such as oil absorbent material, oil spill curtains, notification of the USCG, etc., should a spill occur. The crew boat and tugs will use standard off the shelf fathometers as opposed to actual SONAR.

- **Address potential injury or mortality of sturgeon or sea turtles due to capture, impingement, or entrainment and measures taken to avoid these instances. Provide a detailed description of the proposed shell dredging operation, including the disposal of the remaining sediment and shell fines.**

Sturgeon: Shortnose and Atlantic sturgeon are both on the Endangered Species List and they both occur in the upper Bay. A catch reward program conducted by USFWS from 1996-2006 documented numerous locations where they were unintentionally caught in fishing gear. For shortnose sturgeon, of 73 captures during the study, 51 were above the Bay Bridge. For Atlantic sturgeon, a total of 1,395 were caught in the time period, but the data weren’t separated below and above the Bay Bridge, however the map below shows they occur mostly below the bridge. The study from 1996-2006 is presented simply to show the geographical overlap of shell dredging and sturgeon, not to suggest population numbers. From the study and its information on range, sturgeon are a concern for the proposed program. In the prior shell dredging program, no deaths of sturgeon were observed. In 1999 a monitoring program was initiated to provide NMFS information on the potential for capture, impingement, or entrainment. On-board observers were required 2 days per week to gather baseline data on the issue and to assess if it warranted further

attention. With NMFS guidance, forms were developed, emergency contacts were established, and observations were made at least 2 days per week. Forms and results of that 1999 program are enclosed. Given the zero incidence, impacts on sturgeon were not viewed as a major concern and observations ended. Also, due to their preference for freshwater rivers and mud bottom (not the habitat at Man-O-War Shoal) sturgeon are unlikely to be entrained. This was confirmed by the observations in 1999.

MAPS: Capture locations of Shortnose and Atlantic sturgeon reported through the reward program by commercial fishermen (1996-2006).  Man-O-War approximate location, not to scale



From: Mangold, M.F., S.M. Eyler, S.P. Minkinen, B. Richardson, 2007. Atlantic Sturgeon Reward Program for Maryland Waters of the Chesapeake Bay and Tributaries 1996-2006, U.S. Fish and Wildlife Service, Maryland Fishery Resources Office, Annapolis, Maryland 26 pages.

Sea Turtles: During the sturgeon observation program, no sea turtles were entrained. However, sea turtles can occur in the upper bay. The species seen in Maryland are Loggerhead, Leatherback, Kemp's Ridley, and Green. The migratory season is May to October but only a few have ever been found above the Bay Bridge. DNR responds to turtle strandings which provides a database on distribution. Since 2011, an average of 14 sea turtle strandings per year occurred in the Chesapeake Bay (MD and VA) and 11 per year on the Atlantic Coast. Since 1992, about 2 turtles per year were stranded above the Bay Bridge. In Baltimore County (where Man-O-War is situated) two strandings have occurred, one in 1996 and one in 2006. There was a Loggerhead stranding in Havre de Grace in 2013. The Chesapeake Bay is an important summer foraging area for Loggerheads between the ages of five and fifteen, and they can be found in the Chesapeake Bay south of Baltimore from May to November. The most common cause of death as a result of human interaction is watercraft strikes (74%), which are more common in summer due to the higher concentration of people on the Bay/at the beach enjoying water sports. Sea turtles can occur at varying depths so the shell dredging operation could be a concern. However, the risk is very low given their sparse occurrence in the upper bay, plus none were noted during the observation program for sturgeon. Still, an observation program could be put in place as a safeguard and to document if this is or isn't a major issue.

Description of the operation: The operation of the dredge, the washing and sorting of the shells, and the discharge of the silt/fines are discussed in Attachment #1, Section 1.0 page 2. That text is included here:

"Dredging Process and Methodology - Dredging will be conducted by a hydraulic cutterhead shell dredge that uses a rotating cutterhead to dislodge the bottom material, which is silt and shells and shell bits called "fines". Behind the cutterhead, a suction pipe moves the loosened material onto the dredging barge into a washing and sorting apparatus. The shells are washed using ambient bay water pumped into rotating washing drums. At the same time the shells are sorted using a set of screens, with the silt, water, and the smallest of the fines going through the screens into an "elephant trunk" discharge pipe directed into the cut. The cut is partially backfilled by this process. The shells and larger sized fines that are captured by the screens are directed by conveyor belts to barges tied to the side of the dredge. Shells that are retained (also called whole shells) are larger than 1". Fines that are retained are between about 1/4 inch to 1 inch. Smaller fines are discharged with the silt and wash water.

A cut is made by the dredge moving side to side as it also moves forward, with the side movement defining the cut width and the forward movement defining the cut length. Each cut will be no wider than 500 feet and extend no more than one-third of the distance through the shoal (Figures 1 and 2). The cut depth is determined by lowering the cutterhead deeper into the bottom as the shells are dredged. The initial depth of the cut will be approximately 30 feet deep, based on past shell dredging projects, but the cut will then be partially backfilled by sediment and fines from the shell washing & sorting process on the dredge, resulting in a final cut depth of 10 to 15 feet deep. The surface area of an average cut will be about 3.2 acres (approximately 500' x 275') due to limitations at Man-O-War on the width and length of cuts. However, exact lengths and acreages will vary depending on where the cut is made.

The number of dredge cuts to be made is estimated at 10 (~32 acres total), but it will be dependent on how much shell each dredge cut contains. DNR will continue to make dredge cuts until the target bushels of shells is met. Undredged bottom will be left between cuts, creating a pattern of dredged and undredged bottom. This arrangement of alternating dredge cuts is intended to provide irregular topography along the perimeter of the shoal in order to increase the habitat surface area of the shoal, i.e. "structure" that can be utilized by various fish species and colonized by benthic biota. Water quality will be monitored during the dredging process as specified in the BACI plan in Section 7.0. No dredge cuts will occur on an area of the shoal that has been planted with natural oyster seed or hatchery oyster seed within the past 10 years, as these areas are not included in the proposed dredging area."

- **Address turbidity in the "action area" including its impacts on foraging (e.g. smothering prey species), the increase of total suspended solids (TSS) and its duration and impacts, the extent of the resulting turbidity plume including its location (use of coordinates?), and the "direction" of its dispersion.**

Turbidity, plume characteristics, plume duration, and potential impacts are discussed in Attachment #1 in the following sections:

- Section 4.1, "Water Quality": discusses the plume, plume size, TSS, impacts and other water quality issues.
- Section 4.2, "Oysters": discusses the retention of silt in the cuts, such that it doesn't cover oysters
- Section 4.3, "Benthic Community": discusses impacts to and recovery of benthic invertebrates in the cuts.
- Section 4.4, "Fish Communities": discusses impacts (or lack of) to EFH and various species.
- Section 4.5, "Commercial Fishing": discusses impacts of the cut bottoms to crabbers and crabbing gear.
- Section 4.6, "Recreational Fishing": discusses habitat change due to cuts, use of cuts by fish (also covered in 4.4), and the use of cuts by fishermen.

A brief summary of environmental studies from earlier permit review cycles is enclosed. However, consult each Section above for detailed data.

Based upon past shell dredging studies the general trend is that sediment loads are higher in the plume than outside, higher at the bottom than the surface, and impacts on fish are insignificant and in some studies more fish were caught in the plume than outside. TSS levels in the plume were well below levels that may adversely affect biota (Section 4.1, last paragraph). Plume sizes trend around 7 acres to 24 acres and generally orient uptide and downtide. The presence of the plume is unlikely to result in any significant biological or ecological effects and it is likely to dissipate within several hours after dredging ceases. These are general trends - detailed specifics are in the sections noted above which contain approximately 20 pages of data and discussion.

Regarding Man-O-War shell dredging impacts in particular for the site, the data from past studies are clear that impacts are minimal. However, only field studies conducted during dredging will provide data for the shoal itself. Field sampling is built into the project in Year 1 and Year 3 as discussed in Section 7.0 in Attachment #1. It is understood that after reviewing the data the permitting agencies may apply shut-down protocol to the dredging operation should turbidity levels or plumes exceed desirable levels, combined with protocol to re-start dredging after the issues resolve.

BELOW ARE QUESTIONS ASKED BY NMFS

A - We appreciate the clarification in MDNR's responses to our questions and in the meeting that the proposed dredged shell is not the sole material to be used to meet habitat needs and the estimated 11 million bushel need for restoration (8.5M bushels), Industry (2M bushels) and aquaculture (0.5M bushels) over the life of the five-year permit. As discussed in the meeting, if MDNR has not yet determined what the shell allocation to each use will be, they should describe how they will make that determination.

Shell Allocation Process: The process to determine an allocation plan began at the public hearings when DNR solicited input on three possible ratios for allocating the shells among sanctuaries and the fisheries (Section 5.1). No consensus was achieved at the hearings. Responses ranged the gamut of possibilities, even beyond the three allocation ratios that were proposed, and the number of responses was minimal compared to the large attendance at the hearings. As a result, DNR will develop an allocation plan by working with the Federal partners, the public, and the industries. The plan, or "blueprint", will consider

specific sites (bars), the bottom condition and acres involved, and the use of both shell and alternate materials. Some of the variables that will be taken into account for allocating all the different materials (including shells from Man-O-War) will be proximity of the source of the materials to the bars, timeliness of availability, and costs and resources available to move (and if needed store) the shell or other materials for planting. The result will provide an estimated number of bushels for sanctuaries and the fisheries. For example, the next two tributaries in the large scale restoration program are a priority. A "blueprint" plan will be developed as was done for the three tributaries already underway. Industry and aquaculture needs will also be discussed and developed. DNR will consult with its many partners as plans and shell needs are developed.

The estimated bushel volumes in Section 5.4 and cited above in Question A were projections of overall need, not actual volumes to be used from Man-O-war shoal (the 5 year permit would only allow up to 5 million bushels). The "blueprint" planning process with DNR's partners will be based on the 5 million bushels available volume and will allocate accordingly, but as stated above and in earlier responses the planning process will also include other materials.

B - Attachment 1 states that MDNR intends to use the shell "primarily to restore oyster habitat and oyster populations" but their answers to our questions don't make it clear that this will be the case. For example, the response to NMFS (22) says that "if the ratio of shells allocated to aquaculture is minimal and to sanctuaries is maximized, then there is an overall emphasis given to sustainable uses for the shells" - but it doesn't say that the use of shell for sanctuaries will be maximized.

Shells for Restoration: DNR's responses have been clear about the emphasis on restoration, particularly when compared to aquaculture which is the focus of the question above. Section 1.0 and Section 2.0 (last paragraph) in Attachment #1 emphasize restoration. Section 5.4 provides estimated shell needs that show aquaculture is by far the smallest potential user of shells (see the data in Question A above, which is also contained in Section 5.4). These estimates, a total of 11 million bushels with aquaculture being .5 million, are projections not limited by just the 5 million bushels under this permit; which makes the point even clearer. Based on 5 million bushels (the limit of this permit) and scaling back aquaculture proportionally, it will use a very small volume of the total volume of shells.

The confusion may center around the use of the word "if" DNR's August 2016 reply (NMFS 22). "If" raises uncertainty about the volume of shells for aquaculture vs restoration. But it wasn't used to suggest an uncertain outcome. It was used knowing that aquaculture would be the least user and a minor user based on the information in the paragraph above. This is a re-wording: "If the ratio of shells for aquaculture is minimal (which it is) then the amount for sanctuaries will demonstrate an emphasis given to sustainable uses for the shells". "If" was a confusing word choice without the parenthetical notation of the obvious. Another way to phrase it would be "Given that the ratio". Clearly, aquaculture is projected to be a low level user of shells from Man O War.

C - MDNR should explain why they don't intend to continue monitoring during dredging in year 5, should it continue.

No Monitoring Year 5:

No monitoring is planned for Year 5 because by this time the program would have been reviewed based on monitoring data from the prior years as well as the report issued in Year 4, and the project would be cleared to proceed. If the monitoring data weren't supportive of shell dredging, Year 5 dredging wouldn't be occurring at all. See page 2, paragraph 1 of Attachment #1. See Section 7.0, Table 13, row 5.

Endangered Species Observer Daily Report Form

SHORTNOSE STURGEON MONITORING

FOR MD DNR SHELL DREDGING PROGRAM 1999
Upper Chesapeake Bay East of Pooles Island

DATE: _____ SHELL DREDGING AREA: _____

WATER TEMP: AM PM TIDE TIMES:
 SURFACE _____ _____ HIGH _____
 BELOW MID-DEPTH _____ _____ LOW _____

WEATHER: Wind _____ Cloud Cover % _____ Temp _____

DAILY BARGE DATA

<u>BARGE NUMBER</u>	<u>SHELL or FINES</u>	<u>TIME OF DAY</u>		<u>NUMBER OF STURGEONS</u>	<u>COMMENTS (live/dead, screens, etc.)</u>
		<u>START</u>	<u>END</u>		
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

DAILY FISH DATA (if any are taken) - see Mortality Record Form for additional info

<u>LENGTH</u>		<u>LIVE-DEAD</u>	<u>TIME TAKEN</u>	<u>CUTTER DEPTH</u>	<u>BARGE NUMBER</u>
<u>FORK</u>	<u>TOTAL</u>				
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

OBSERVER'S NAME: _____

DNR CONTACT: Christopher Judy, Director
 Md DNR Shellfish Division
 1-410-260-8259 (Beeper 410-731-1311) cjudy@dnr.state.md.us

MORTALITY RECORD FOR SHORTNOSE STURGEON
FOR MD DNR SHELL DREDGING PROGRAM 1999

=====

DATE: _____

TIME FISH WAS TAKEN: _____

LOCATION: DNR shell dredging area D F (circle one)
Upper Chesapeake Bay, Maryland
East of Pooles Island and west of Fairlee Creek

DREDGE TYPE: Hydraulic shell dredge

WHERE DISCOVERED: ___ On dredge (location _____)
___ On shell barge

DEPTH OF CUTTERHEAD BELOW WATER SURFACE WHEN TAKEN: _____ feet

FISH MEASUREMENTS:

Fork length (mm) =

Total length (mm) =

FISH CONDITION:

OBSERVER'S NAME: _____

PHOTOS TAKEN: Y N

=====

DISPOSITION OF DEAD CARCASS AND ANY TISSUE:

Tissue sent to:

Dr. Ike Wirgin
Institute of Environmental Medicine
New York University Medical Center
Long Meadow Road
Tuxedo, New York 10987 (914-351-2415)

Carcass sent to:

Bill Saul
Academy of Natural Sciences
Dept of Ichthyology
1900 Benjamin Franklin Parkway
Philadelphia PA 19103-1195 (215-299-1026)

CALL W/IN 24 HRS: NANCY HALEY (203-579-7067) or MARY COLLIGAN (978-281-9116)

DNR CONTACT: Christopher Judy, Director Md DNR Shellfish Division
cjudy@dnr.state.md.us 1-410-260-8259 (BEEPER 410-731-1311)

**WEEKLY REPORT
FOR MD DNR STURGEON MONITORING
AT SHELL DREDGING SITES D & F**

TO: Nancy Haley
NMFS, Protected Resources Division
212 Rogers Avenue
Milford, CONN 06460

cc: Regulatory Branch, COE
c/o Marion Gall
PO Box 1715
Baltimore, MD 21203

SUMMARY OF WEEKLY OBSERVATIONS 1999

<u>Date</u>	<u>Area</u>	<u>Hours Observed</u>	<u>High Tide</u>	<u>Water Temp</u>	<u>Sturgeon Taken</u>
7-7-99	F	7am - 2 pm	2:51 pm	28C	0
7-9-99	F	7am - 2 pm	5:20 am	28C	0
7-14-99	F	7am - 2 pm	9:36 am	23C	0
7-15-99	F	7am - 6:30pm	10:22 am	25C	0
7-19-99	F	12pm - 6pm	1:19 pm	81F	0 Dredge worked only 12 - 6
7-21-99	F	7 am - 10:30am	2:56 pm	84F	0 Dredge worked only 7 - 10:30
7-27-99	F	7 am - 6 pm	8:10 am	83F	0
7-29-99	F	9 am - 3:30pm	8:10 am	80F	0 Dredge worked only 9 - 3:30
8-4-99	F	9am? - 4:10pm	1:25 pm	81F	0
8-5-99	F	10am - 4:15pm	1:25 pm	82F	0
8-10-99	F	7 am - 5:30pm	7:47 am	78F	0
8-11-99	F	7 pm - 6 am	7:51 pm	78F	0 No work 9pm - 3am, breakdown
8-17-99	F	10:30am- 4pm	12:34 pm	81F	0 Barges were late
8-18-99	F	8:30pm - 6am	1:51 am	79F	0
8-23-99	F	8:45pm - 6 am	7:00 am	78F	0
8-24-99	F	8 am - 6 pm	7:00 am	78F	0
9-1-99	F	12:30pm-6pm	na	72F	0 Late start to days work
9-3-99	F	10:20am - 6:30pm	na	71F	0
9-7-99	F	7:30am - 6pm	na	74F	0
9-9-99	F	7pm-6:15am	na	75F	0

DNR's shell dredging permit requires observing 2 days per week and submitting reports.
Most recent data is in bold.

"na" for tide info means not available at this time.

SUBMITTED BY: Christopher Judy, Director
Shellfish Division, MdDNR
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Annapolis, MD 21401 410-260-8259 FAX 410-260-8279