Audubon | NORTH CAROLINA

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To Whom It May Concern,

Thank you for the opportunity to review and comment on the draft Environmental Impact Statement for the Wilmington Harbor Navigation Project (CEQ ID: EISX-202-00-K7P-1755163795). Audubon North Carolina is the state office of the National Audubon Society, with 15 affiliated chapters and over 50,000 members statewide. We submit these comments on behalf of our staff and its appendixes and our members who support our mission to protect birds and bird habitat.

In short, the two action alternatives described in the DEIS would result in multiple unavoidable adverse impacts to human communities as well as wildlife and ecosystems. These impacts include increases in both sunny day and storm-related flooding impacting communities along the river's shoreline, loss of over 1,000 acres of wetlands, and increased destruction of bird nests and degradation of bird nesting habitat. The benefits forecasted would be marginal at best, with a slim projected 1.3 benefit-to-cost ratio, and would be realized only by large corporations that might save marginally on shipping costs, not by the residents of the Cape Fear Region. Speaking from the perspective of impacts to birds, other wildlife, and ecosystems, this project promises irreparable harm while proposing scant and uncertain offsets. Worse, the DEIS fails to accurately describe those impacts and, in some cases, omits including them altogether, even after years of stakeholder meetings. Better, more accurate, assessments should be made using all of the best available information, and the Corps should revisit the findings of the DEIS, not only regarding birds but also impacts to human communities and re-evaluate if this project is in the interest of the entire Cape Fear Region community.

The Audubon North Carolina coast program manages and monitors about 40% of North Carolina's nesting coastal waterbirds through direct ownership, leases, and collaborative agreements with public and private landowners. These sites range from Ocracoke Inlet south to Brunswick County and include the bird nesting islands and marshes on the Lower Cape Fear

River (Table 1). The birds on these river islands—in 2023, over 16,000 breeding pairs and their chicks—represent about 30% of North Carolina's nesting coastal waterbirds.

Table 1. Bird nesting sites on the Lower Cape Fear River.

Island	Dredge Status	Material Last Received	Notes
Battery Island	Natural with placement	2000	
Striking Island	Never received material	--	
Smith Island Shoreline	Never received material	--	The eastern river shoreline between Fishing Creek and Still Creek.
Shellbed Island	Never received material	--	Actually multiple marsh islands at the south end of The Rocks
South Pelican Island *	Natural with placement	2004	It appears that a small marsh existed prior to sediment placement
Ferry Slip Island *	Manmade	2022	
No Name Island	Unknown	Unknown	Contains rubble probably placed by people
North Pelican Island	Natural with placement	1950s	
North North Pelican Island	Natural with placement	1950s	
Tricolor Island	Unknown	Unknown	Unnaturally round, mostly organic substrate but there is a small sand patch
Misc. other Shorelines	Never received material	--	Zeke's Island west shore, shell rakes near Southport and Snow's Marsh

* = site with current dredge placement permit

The Audubon North Carolina coast program dates back to 1982, and our present coastal staff has about 15 years of experience working directly on the Cape Fear River, including multiple site visits per week during the March to August nesting season and at least monthly visits during the September to February non-breeding season. Audubon's work on the river includes monitoring breeding and non-breeding birds—productivity tracking to follow nests and chicks to success or failure, nest counts to census breeding populations, and counts of migrating and wintering shorebirds—habitat management and enhancement, often in partnership with the NC Wildlife Resources Commission; and a variety of research projects in cooperation with various agencies and academic partners. This work encompasses over 20 species of migratory waterbirds, most with some conservation status (Table 2).

The non-breeding species of the greatest conservation concern are migratory shorebirds that make stops to rest and regain body weight before continuing or that stay and overwinter in the area. These birds are dependent on sand and mudflats with abundant benthic invertebrates and high-tide roosting sites. Most species are long-distance migrants that nest in the Arctic, but some are mid-distance flyers such as American Oystercatchers that breed in the continental U.S. and Canadian Maritimes. These non-breeding species are found primarily at or below Military Ocean Terminal Sunny Point south to the mouth of the river. An exception is Eagles Island, where the impoundments provide foraging and roosting habitat for shorebirds.

The nesting season typically begins in March, though Brown Pelicans, Great Egrets, and American Oystercatchers can begin to occupy nesting territories in February. Though a variety of species breed throughout the project area, the nesting species that these comments focus on and

Table 2. Focal species monitored on the Cape Fear River by seasonal presence and conservation status.

	Seasonal Presence		
Species	**Breeding**	**Non-breeding**	**Conservation Status**
American Oystercatcher	x	x	SCGN, SC, SAR
Black Skimmer	x		SCGN, ST
Black-bellied Plover		x	SCGN
Black-crowned Night-Heron	x		SCGN
Brown Pelican	x	x	
Dunlin		x	NT
Glossy Ibis	x		SCGN, SC
Great Egret	x		
Gull-billed Tern	x	x	SCGN, ST
Laughing Gull	x	x	
Least Sandpiper		x	NT
Little Blue Heron	x		SCGN, SC, S-M
Marbled Godwit		x	SCGN, VU
Red Knot		x	SCGN, FT, ST
Royal Tern	x		SCGN, S-M
Ruddy Turnstone		x	NT
Sanderling		x	SCGN
Sandwich Tern	x		SCGN, S-H
Semipalmated Plover		x	LC
Semipalmated Sandpiper		x	NT
Short-billed Dowitcher		x	VU
Snowy Egret	x		SCGN, SC, S-M
Tricolored Heron	x		SCGN, SC
Western Sandpiper		x	LC
Whimbrel		x	SCGN, S-H
White Ibis	x		SCGN
Willet	x	x	SCGN, S-H
Wilson's Plover	x		SCGN, SC, S-H

SCGN = NC Wildlife Action Plan Species of Greatest Conservation Need, SC = state species of concern, ST = state threatened, FT = federal threatened (ESA), S-VH – SEAFWA Regional SGCN very high, S-H = SEAFWA Regional SGCN high, S-M = SEAFWA Regional SGCN moderate, NT = ICUN near threatened, VU = ICUN vulnerable, LC = ICUN least concern, SAR = USFWS species at-risk

Other listed avian species that occur on the Cape Fear River that we do not monitor include the Eastern Black Rail (FT), Piping Plover (FT), Clapper Rail (SCGN and S-M), Nelson's Sparrow (SCGN and S-M), Saltmarsh Sparrow (SCGN, S-VH, and SAR), and Seaside Sparrow (SCGN and S-H).

that are of the greatest conservation concern all nest south of Snow's Cut (Figures 1 and 2). Most species complete nesting in August, but Brown Pelicans can have chicks as last as mid-October. Nesting occurs across all habitat types found on the Cape Fear River, in marshes, on shell rakes, along sandy shorelines, and on dredged-material islands. (Note we are not discussing nesting that takes place on nearby barrier island beaches.) Nest site selection is determined by suitable substrate—which can be sand, shell, or wrack on the ground or various shrub and tree species—elevation above the high tide line, predator presence, and social factors as some species prefer to

nest with or far away from neighbors. Across all these habitats, many nests are very low and very close to the waterline (Figures 3 and 4).

Figure 1. 2025 locations of nesting American Oystercatcher pairs. (Colors represent different reproductive Outcomes, but the purpose is to illustrate typical spatial distribution.)

Figure 2. Typical locations of colonial waterbird colonies on the Cape Fear River.

Figure 3. Birds nesting in marsh habitats on the Lower Cape Fear River. A) An American Oystercatcher nesting on a shell rake on Striking Island. The black arrow shows where the high water line is. B) Laughing Gulls nesting on wrack in Striking Island. Mean high water line not visible because the wrack is on top of it.

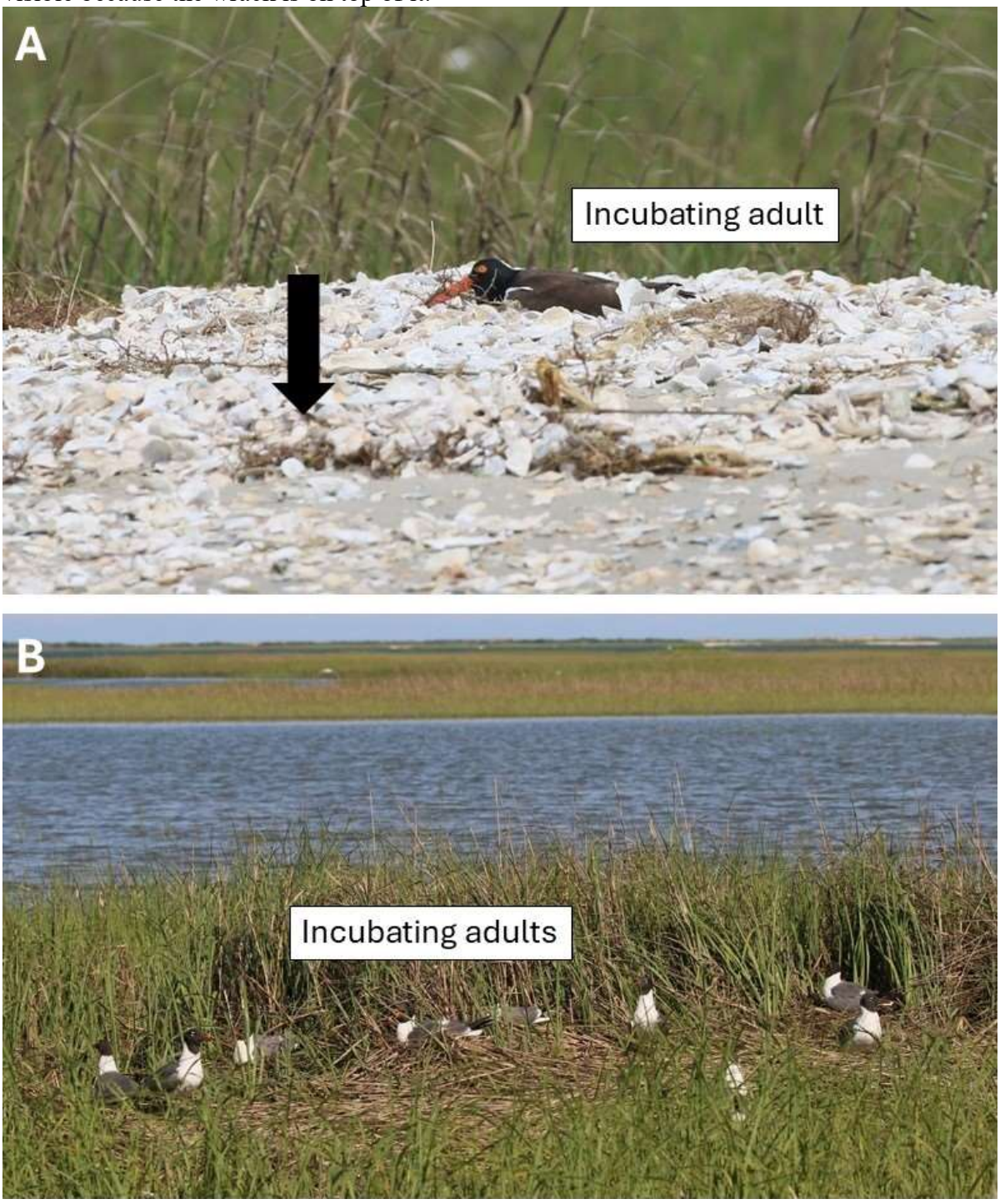

Figure 4. An American Oystercatcher nest laid in sandy habitat on Ferry Slip Island. The black arrow shows where the high water line is.

Foraging and roosting by a wide variety of species occurs year-round throughout the river channel, its islands, and shorelines, from above the Port to the Atlantic Ocean. Roosting—resting and preforming feather maintenance necessary for survival—can take place on nearly surface, from logs sticking out of the water to sandy shorelines, to docks. The site must be predator-free at the time and not contain disturbances such as dogs or children that are prone to chasing birds. Likewise, foraging may take place in many habitats, from piscivorous birds diving for fish in the river channel, to wading birds stalking small aquatic prey along a marsh edge, to sandpipers probing in sand or mud to extract benthic invertebrates. How valuable a foraging or roosting site is considered to be would depend on the specific species using it, the number of individuals using it, its proximity to other resources, how unique or limited that type of foraging or roosting habitat is, and other factors.

As the managing organization with the most direct knowledge of birds and bird habitat on the Lower Cape Fear River, Audubon North Carolina staff have attended all available stakeholder meetings, planning meetings, and public sessions regarding this project since its inception in 2019 and provided input at each juncture. Bird data is also available through many sources, including databases, state and federal agencies, and NGOs including Audubon North Carolina

and the Bald Head Island Conservancy. Although we have made every effort to provide relevant information through these various channels, the following issues exist within the DEIS.

1. The DEIS does not accurately describe how nesting birds use the Lower Cape Fear River.

Section 3.15 of the DEIS describes birds that use the ocean beaches within the project area and lists species that nest on two of the dredged material islands, Ferry Slip and South Pelican. However, as described above and illustrated in Figures 1 and 2, birds nest throughout the Lower Cape Fear River in a variety of habitats. This makes them more vulnerable to multiple impacts from the action alternatives, including flooding from ship wakes and habitat degradation or loss from shoreline erosion. Therefore, correctly understanding where nesting occurs on the river and in what habitats is necessary to accurately describing impacts to them. It is not at all clear from the DEIS that the Corps has this fundamentally necessary understanding.

The focus on two of ten bird nesting sites on the Cape Fear River may stem from the Corps' primary experience with birds coming from its work on dredged-material islands. These sandy islands do support large numbers of migratory waterbirds and are essential to maintaining healthy state and regional populations of many species. However, a "bird island" does not have to be a sandy island or beach, and while many species prefer sparsely vegetated sand for nesting, many other species actually require vegetative structure.

To remedy this, the Corps has access to the Colonial Waterbird Database. This resource, which the Corps funds and the NC Wildlife Resources Commission maintains dates from the 1960s to the present and is the most complete source of nesting bird data for coastal North Carolina. (Despite the name, it includes non-colonial shorebirds as well as colonial species.) The Corps may also wish to consult descriptions of the Important Bird Areas—scientifically designated sites that are of regional, national, or global importance to birds—that exist within the project area (https://nc.audubon.org/sites/default/files/static_pages/attachments/iba_coastal.pdf). There is also additional, and in some cases better and more recent data for non-breeding birds, that the Corps could access should it request them from federal agencies, state agencies, and NGOs.

The DEIS also fails to mention the Eastern Black Rail, a federally threatened species, at all. However, the marshes behind Fort Fisher State Recreation area have been identified as Black Rail habitat, and according to NC State Parks staff, there were two detections of this highly secretive and difficult to monitor marsh bird at Fort Fisher in 2015. (See the Black Rail Conservation Plan at https://www.ncwildlife.gov/2025-black-rail-draft-conservation-plan/open.)

2. a) The DEIS does not accurately describe how vessel wakes change observably with ship size and weight. It also omits to include how vessel wakes interact with shorelines and impact birds. Therefore, it fails to accurately assess project impacts to nesting migratory waterbirds.

As we explained above, Audubon North Carolina staff are on the river, in small outboard motorboats, year-round at bird-nesting sites south of Snow's Cut. The only hydrologic data collection at these sites in the past 15 years has been a UNC-Wilmington senior capstone class project and a UNC-Wilmington master's project, both under the direction of Dr. Ryan Mieras and in partnership with Audubon. Outside of that, the best information available about how ship

wakes behave when they interact with the shorelines of these islands is observations made by the people who are there.

The DEIS uses a model to predict how shorelines along the river channel will be impacted by ship wakes (Section 3.3.3.). The two parameters it says it generated are bed shear stress, which is reported, and water surface elevation, which is mentioned but not reported in the body of the DEIS. However, these parameters do not describe how ship wakes behave in the vicinity of bird-nesting islands or how they interact once they hit their shorelines.

When a ship travels up or down the river, the water it displaces forms a tsunami-like wave that travels outward towards the two opposite shores. When the displacement wave encounters shallower water (probably about ≤2 m), it first forms a standing wave up to about a meter in height (Figure 5). On the shoreline, the waterline first recedes (as during a tsunami), exposing several meters of wet substrate in less than a minute. Then, within a few minutes, the water rushes back in, and the water level rises almost instantaneously, often above the high-high water mark. A series of waves then crash onto the shore, further pushing water up the shoreline into what had been dry ground. This run-up inundates dry sandy shores and floods high marsh (see Figure 9 for a visual example). The speed and velocity with which this process happens can tear anchors out of the substrate and ground boats, so it is not safe to be at anchor on the bird-nesting islands when a ship passes.

These wake events vary in severity with many factors—tide height, direction of ship travel, direction of tide and current, etc.—which could be studied if there were a desire to understand their impacts better. Despite the variation in individual ship wake events, based on 15 years of direct observation, these wakes have become visibly more extreme with each step up in size of container ship, from the Yang-Ming Unity in 2016, to the HMM MV Hyundai Hope in 2020, to the ZIM Mount Rainer in 2025. It is also observable that ships that are riding visibly lower in the water (with the bulb on their prow mostly or entirely submerged) throw more severe wakes than ships with the bulb riding high; the larger ships throw more severe wakes than smaller tankers and MOTSU transports. The DEIS forecasts more heavily loaded ships to transit the river under the preferred alternative, which based on this pattern of observations will result in more severe wake events, resulting in an increase in wake-induced nest and chick loss and habitat degradation.

These ship-driven wakes impact shorelines throughout the river, even those that seem distant and unlikely to be affected (Figure 6). Audubon North Carolina staff have observed waves impacting the north-facing shore of Striking Island at heights great enough to overwash nests (and put boats small at risk of being grounded above the high tide line). Impacts at the more distant sites tend to be more serious at high tide, when the wakes can cross areas that would be shallower when the tide is out. The most greatly impacted sites, however, appear to be North North Pelican Island, North Pelican Island, No Name Island, Ferry Slip Island, South Pelican Island, and Battery Island, but Shellbed and Striking Island also receive flooding events (Figure 7).

Figure 5. Ship-wake waves on or near bird nesting islands. A) A wave crossing a shoal near Ferry Slip Island. B) A standing wave off of North Pelican Island. C) A wave beginning to strike North Pelican Island. D) A wave striking the north tip of North North Pelican Island with pelican heads just visible above the crest. E) A wave striking the northwest shore of Shellbed Island.

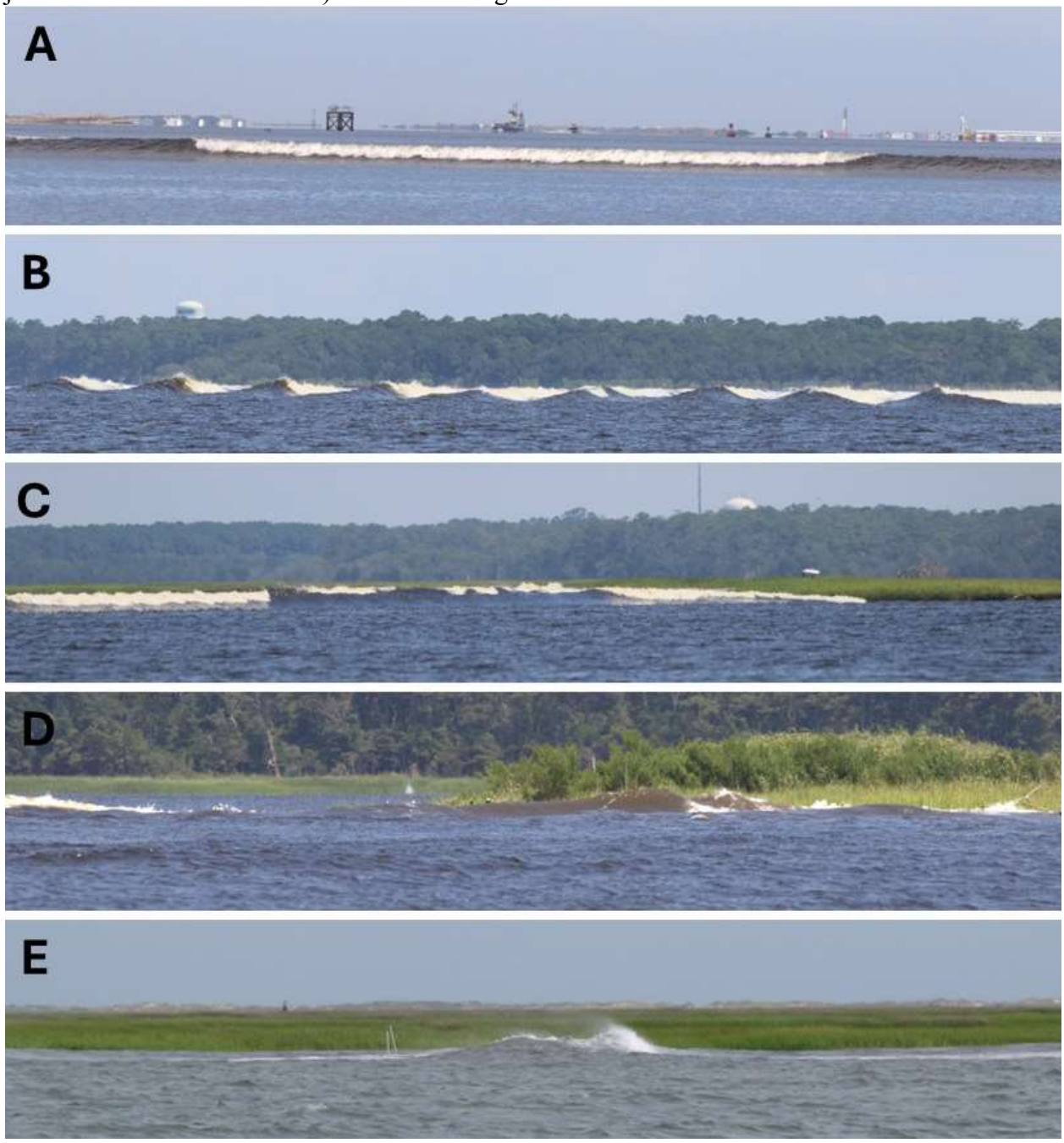

Figure 6. Shorelines on or near bird nesting islands where Audubon North Carolina staff have observed breaking ship wakes. This is not a complete depiction of shorelines ship wakes impact.

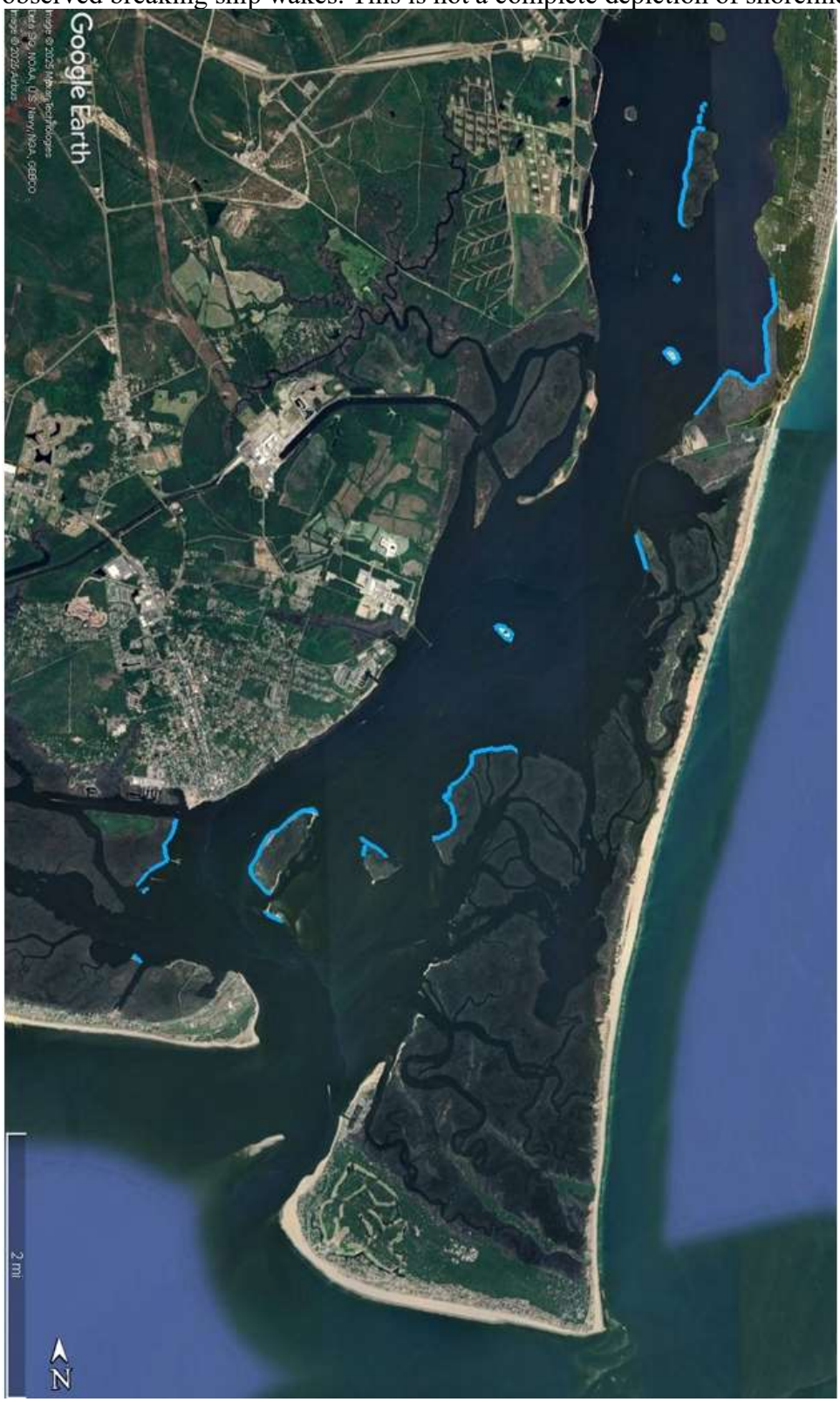

Figure 7. The wake from Figure 3E flooding a nesting shell rake on Shellbed Island. The light-colored substrate visible on the left-hand side of the photo and obscured by the wave on the right-hand side is the nesting area being affected.

During or following wake events, staff have seen nests swept away, colonies disappeared, nesting areas inundated, and chicks flooded (Figures 8-10). More typically, because 24/7 observation isn't possible, a nest or colony simply disappears and all that is left is a new high-water mark that is above where a nest has been. Storms and king tides flood nests and chicks as well of course, but they also make more nests vulnerable to loss from wakes because the base water level is high when they are occurring. So, the Corps cannot dismiss all water-related nest and chick loss as a natural phenomenon.

The Corps' models do not contain parameters that measure run-up or the volume of water that enters nearshore shallow waters and floods the shoreline above the high tide line, or how hard waves strike vegetated shorelines. In other words, they do not capture the impacts that matter when considering impacts to nesting birds and the shoreline habitats they nest on. Ideally, there would have been quantitative data collection and a detailed study of how these wakes behave on the islands' shorelines, but in the absence of any new data collection by the Corps—a decision that was relayed to stakeholders at the beginning of the Corps' process—observations are the best available information available and the Corps should take them seriously.

Figure 8. An American Oystercatcher nest on South Pelican Island being flooded by a ship wake. A) The adult incubating. B) The adult leaves the nest as it sees or hears the wave. C) The nest is destroyed. D) The nest is gone. The adults returned to look for the eggs repeatedly for over 24 hours.

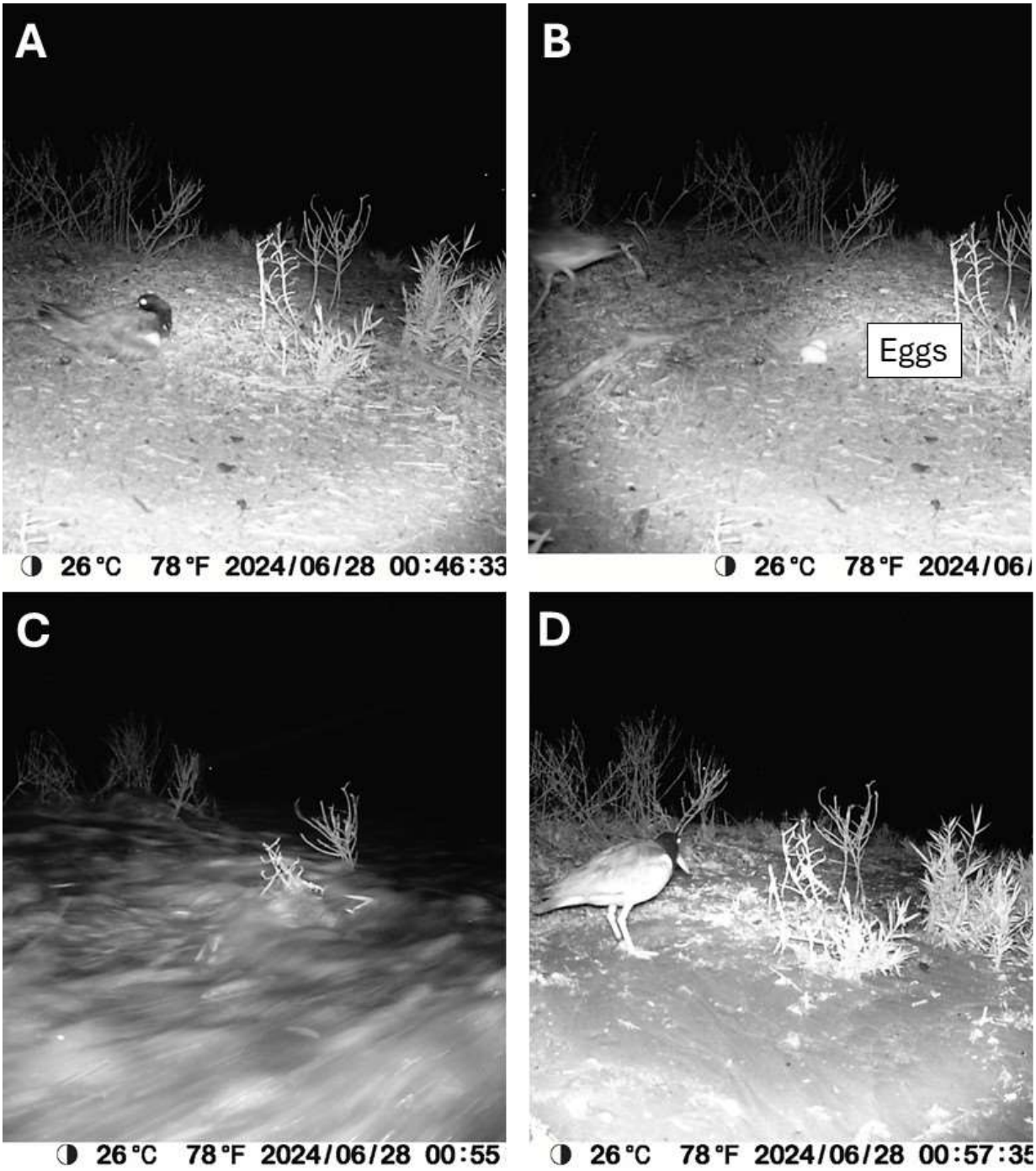

Figure 9. An American Oystercatcher nest on Ferry Slip Island being flooded by a ship wake. A) The adult incubating. B) The first wave strikes the shore. C) The second wave cresting. D) The second wave breaking on the shore. E) The run-up floods the nest. F) The run-up receding.

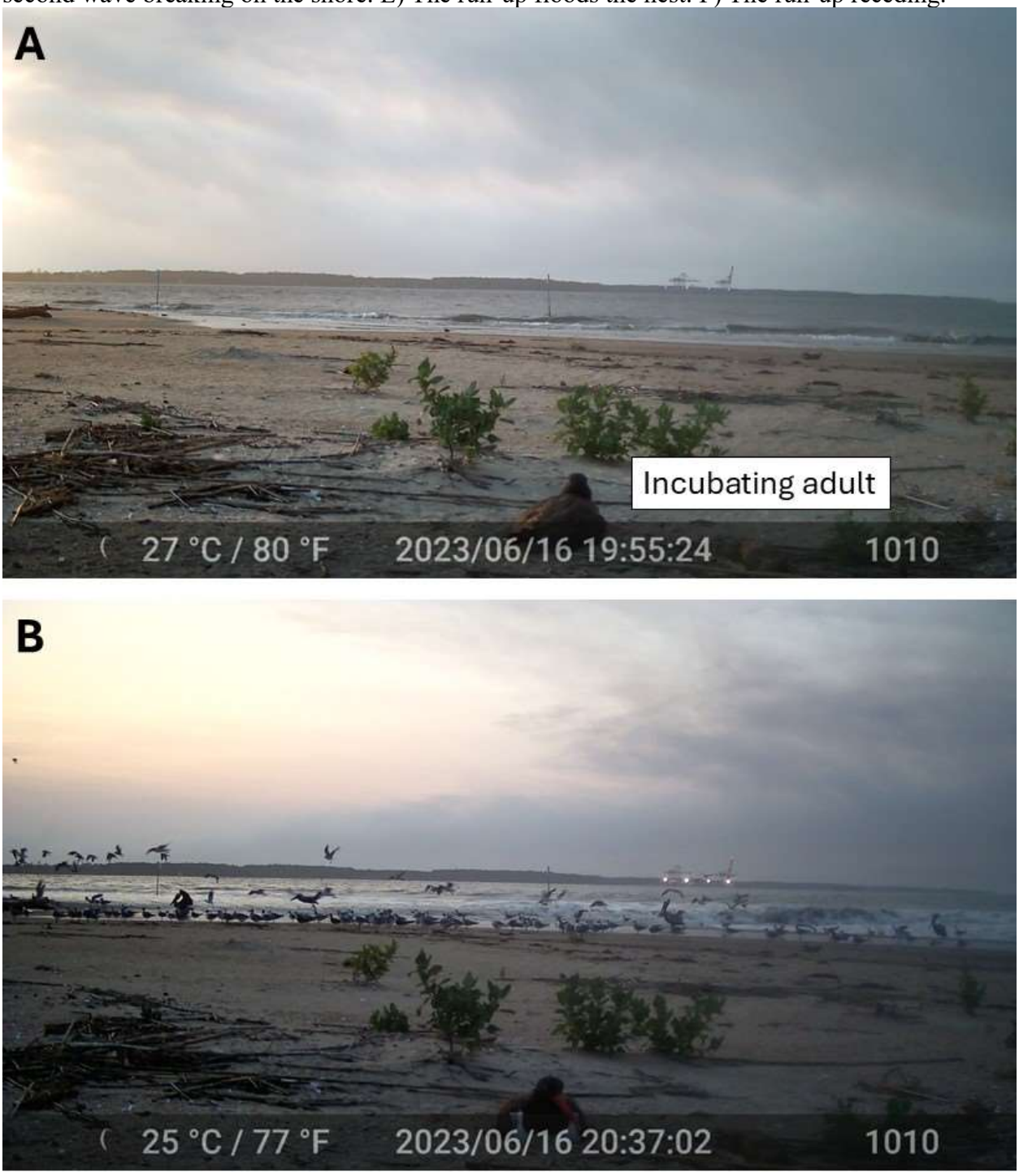


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Figure 10. The north end of North North Pelican Island awash after the passage of a ship. Note the sand is soaked from the wave. The sandy area in the foreground had previously been vegetated and supported nesting Great Egrets and Brown Pelicans.

When birds select a nest site, they can use their own observations of the high tide line to avoid predictable flooding, but ship wakes are unpredictable, stochastic events and so birds cannot take them into account. Even if they could, nesting habitat, especially on marsh islands, is not far above the high-water line. This makes them more susceptible to inundation even at their high points. The DEIS must consider size scales relevant to affected resources, so changes in wave or water surface elevation even on the scale of an inch or two can determine if a nest or chicks is swept away or survives. The DEIS also must consider not just average characteristics but the most extreme cases, as it only takes one Post-Panamax III-caused wake to destroy nests along the affected shoreline. Finally, the wakes also affect shoreline vegetation and physical characteristics. Violent inundation from a series of wakes crashing onshore uproots shrubs and suspends shoreline sediment in the water column, adding to the impacts of storms.

By reporting only on modeled bed shear stress, the DEIS avoids describing any of these observable impacts that have been discussed at multiple meetings. The impacts to coastal birds that the Corps projects in Section 4, *which all relate only to beach placement*, are therefore incomplete and inaccurate:

> Channel deepening would not be expected to result in impacts on intertidal or supratidal waterbird habitats under AA1. Beach placement for Oak Island, Caswell Beach, and Bald Head Island would be the same as the NAA. Carolina Beach and Masonboro Island placement would cause additional burial and temporary loss of intertidal benthic invertebrate infauna within the beach fill templates, thereby reducing the availability of benthic infaunal prey for shorebirds. The placement of material in and around important bird islands and Masonboro Island would have a short-term negative impact to feeding

and roosting birds during construction but with a significant long-term improvement to overall bird habitat by providing resilience to ongoing shoreline erosion [Table 4-1].

To the contrary, although direct mortality takes place now, additional direct mortality, along with habitat impacts, should be expected under both action alternatives.

2. b) It is not at all certain that the assumptions in the model used by the DEIS will accurately reflect what happens if the project takes place.

The DEIS uses modeling to predict how ship wakes will change if either of the action alternatives is implemented. Section 3.3.3. describes how the model was used to estimate changes in bed shear stress and states that water surface elevations were also calculated as a stand-in for wave height. In the body of the DEIS, there is no further mention of water surface levels, so it is unclear what the Corps projects those to be. It does, however project less total bed-shear stress based on 1) more distance between the hull of the ships and the channel bottom and 2) fewer trips up the river.

The model used in the DEIS projects greater under-keel clearance if an action alternative is implemented; however, the objective of the preferred action alternative is to allow the same amount of cargo to come up the river channel on more heavily loaded ships. When loaded more heavily, the ships would ride lower in the water than they do at present. Shippers, wanting to maximize their efficiency (as the DEIS explains is the reason for the project), would logically load the ships to the greatest extent possible, which, again logically would be to the under-keel clearances they tolerate today. Therefore, it is difficult to understand how the project will reduce bed shear stress unless the project includes a binding restriction on clearances that aligns with the Corps' model.

Similarly, the DEIS's projection that there will be fewer ship passages up the river channel will not constrain what happens in reality if more frequent trips turn out to be preferred by the Port and shippers. This may be due to more TEUs arriving at the Port than projected, or the same amount or even fewer TEUs—national economic policy does at present lean heavily on high tariffs—being delivered in more trips.

3. The DEIS does not fully consider the impact of wetlands conversion, especially as regards impacts to bottomland forest-dwelling songbirds.

Bottomland forests in the project area support high densities of breeding songbirds such as the Northern Parula, Prothonotary Warbler, and Yellow-throated Warbler. The Prothonotary Warbler and Yellow-throated Warbler are North Carolina Species of Greatest Conservation Need and knowledge gaps have been identified for the Northern Parula. The DEIS forecasts the loss of 1,071 acres of freshwater wetlands under its preferred alternative. This would result in the loss of a substantial amount of habitat for these and other songbird species, as they do not use ghost forests or higher salinity wetlands. Their habitats are already under pressure from logging and development, as well as the weakening of wetlands protection at the state and federal level. To offset these losses, an equivalent number of acres of forested bottomland wetlands should be acquired and protected. Presently, the Mitigation Plan does not propose protecting an equivalent

amount of habitat for these species as would be lost and the DEIS does not include impacts to songbirds further upriver.

4. The Beneficial Use Plan (Appendix D) is inadequate.

The Corps defines beneficial use of dredged material as placement of sediment or other dredged materials "in a beneficial way with respect to the ecosystem and environment." It has established an agency-wide goal of 70% beneficial placement by 2030 and the DEIS states that about half of the material dredged in the preferred alternative would be used beneficially. However, in order to determine how to place material beneficially, it is first necessary to assess existing conditions; identify at-risk habitats or ecosystems; describe threats and habitat enhancement, restoration, or creation needs; and determine if use of available material would address any identified threats and needs. Appendix D, which is the Beneficial Use Plan, provides a very cursory four-paragraph general overview of current site conditions, describes in more detail the types and quantities of material the Corps anticipates finding, and dives into a series of placement project descriptions.

In the spring of 2024, a group of stakeholders was convened by the Corps to help with this process; however, there were just two short meetings, with the promise of more that never materialized. The general impression was that the project was left incomplete. The result is a series of projects, many of which the group never asked for and some of which seem to have been lost in translation. Though we appreciate the Corps' desire to use dredged material in an environmentally beneficial way, the plan needs a lot more work and would benefit from input from subject matter experts.

The preferred alternative would produce about 35.2 million cubic (CY) yards of dredged material. There are three main types of material: sand, fine sediment, and hard material. We will discuss each type below, and the sites where each type is proposed to be placed.

<u>Sand / Beach and Bird Island Placement</u>

About 5.8 million cubic yards (CY) of the projected 35.2 million CY of dredged material that the preferred alternative would produce is projected to be beach-quality sand. According to the quantities described in Table 2-7 of the DEIS (the quantities in the narrative of the Beneficial Use Plan do not align), about 4.6 million CY would go on Brunswick County beaches and 300,000 would be placed on Masonboro Island's southern half. Another 563,000 CY would go to two sandy dredged material islands that support nesting birds, Ferry Slip and South Pelican. This totals about 5.4 million CY, leaving about 400,000 CY left over.

Ferry Slip and South Pelican Islands: Sandy Sediment Placement
Ferry Slip and South Pelican Islands are owned by the State of North Carolina, allocated to the North Carolina Wildlife Resources Commission, and managed by Audubon North Carolina through a signed agreement. Both islands are considered Important Bird Areas (a scientifically validated designation by the National Audubon Society and BirdLife International) due to the proportion of the state's nesting waterbirds that they support. In the spring and summer, they provide sparsely vegetated sandy habitat that some species, including the Royal Tern, Sandwich Tern, Gull-billed Tern, and Black Skimmer require and that other species, including the

American Oystercatcher and Willet readily use. During the non-breeding season they, along with other emergent shoals and islands from Ferry Slip south, support regionally significant numbers of non-breeding shorebirds. They are primarily used as roost sites—high tides congregating locations where birds can maintain their feathers and rest safely—by migratory shorebirds.

The Plan's description of the proposed material placement does not specify the target size of the islands above mean high water. As they are important for nesting birds, and as their existing permitted size is 7 acres above mean high water, that is the metric that is most useful in evaluating the Corps' proposal, not total footprint. Because the Corps had previously informed Audubon North Carolina that should any maintenance dredging project exceed the islands' combined capacity, 100% of the sand would be taken to the ODMDS, we have attempted to expand each island's permitted area above mean high water to 15 acres (total 30 acres for both). This is the maximum size that we would prefer these islands to be above the high water line, regardless of the overall intertidal plus dry land footprint. So, we would appreciate more clarity from the Corps on this subject. As in the past, we anticipate and ask that any projects placing material on these islands would be done in coordination with Audubon North Carolina and the NC Wildlife Resources Commission.

Masonboro Island: Sandy Sediment Placement

Audubon North Carolina has a permanent seat on the Masonboro Island Reserve Local Advisory Committee and works closely with Reserve staff to monitor birds on the site. The barrier island supports state-significant numbers of nesting American Oystercatchers and Wilson's Plovers, in addition to large assemblages of Arctic-breeding shorebirds during spring and fall migration. The Corps constructed two jetties at Masonboro Inlet, on the island's north end. The north jetty, which is on Wrightsville Beach, was built in 1966, and the south jetty, which is on the north end of Masonboro Island was built in 1980. In 2000, the Corps released a special report (Special Report: Impact of Navigation and Storm Damage Reduction Projects on Masonboro Island, North Carolina) that found that both the jetties and dredging at Carolina Beach Inlet at the south end of the island were contributing significantly to a sediment budget on Masonboro Island. Longshore currents were not able to transport sand naturally down the coast, resulting in narrowing that the Corps details in its report. Despite the average deficit of 206,000 CY/year, the Corps has not placed material on the north half of the island since 2009. Though Corps staff have expressed a desire to do additional placements to make up for the artificial sand deficit, and a history of placements in 1986, 1994, 2002, 2006, and 2009, none have been made. Therefore, the primary impact of Corps projects on Masonboro Island have been negative, without adequate actions being made to remedy them. This now presents an opportunity for a beneficial use project.

In 2019 and 2021, the Corps has placed sand on stretches of beach on the southern half of Masonboro Island. These placements, though well intentioned and helpful to the Corps in disposal of excess material, did not have a beneficial impact because the sand did not remain on the island for a meaningful length of time. The proposed placement box is to the north of these previous placements, which may help with sediment retention, but additional study would help the Corps to determine the best location and method (beach placement or nearshore) for a beneficial use project. Ideally, the location of the box would be farther north, to allow for the existing longshore current to move sand more naturally down the island. Because the site is a

conservation property with specific enabling laws, the Corps should coordinate closely with Reserve staff to develop any beach or nearshore placement project; ensure that best practices are followed to minimize impacts to birds, sea turtles, and benthic infauna; and develop and implement a robust pre- and post-project monitoring plan.

Battery Island

Battery Island is an Important Bird Area that is home to one of the largest wading bird colonies in North Carolina. It is globally significant for White Ibis, with as many as 14,000 nesting pairs, and eight other wading bird species along with American Oystercatchers, Wilson's Plovers, and Willets. It received dredged material island sometime prior to 1960, creating a 30-acre elevated sandy area on the southern portion of the island where eventually shrubs and trees formed a dense thicket that attracts the nesting wading birds today.

Battery Island is well known by the community of Southport, which overlooks it on the opposite bank of the river. It is also well known for its eroding shoreline. Due to concerns about increased erosion following the previous deepening and widening project, the USFWS funded the placement of 5,400' of geo-textile tubes along its entire western and southern shoreline in conjunction with the placement of about 22 acres of beach-quality sand along the same area. A shoreline change rate analysis in 2017 found that nearly all of the island's shoreline had experienced overall erosion. In the most recent era analyzed, 2008-2017, the shoreline transects in front of the nesting colony eroded an average of 1.79 m, with a mean shoreline change rate of -0.2 m/year ± 0.16 m (York *et al.* unpublished data). The presence of geo-textile tubes did not prevent erosion, even in the time step when they were new. Visible erosion has continued along the island's shoreline from a variety of causes, including storms, ship wakes, and other boat traffic.

Not only will the channel be deeper, with heavier ships passing Battery Island, the DEIS proposes to widen the channel in this area by 550'. Despite the obvious need for measures to protect the shoreline and the mature trees that the wading birds require to nest in, the Beneficial Use Plan surprisingly does not include any placement for Battery Island. Though a one-time placement it would not be a permanent solution to the problem, it would be a stopgap and could be repeated, as this part of the river is dredged frequently. Battery Island and its shoreline have been discussed at meetings with no explanation in the DEIS or elsewhere regarding its omission.

To address this problem at this important site, we advise that the Corps plan to place beach-quality sand on the same affected 5,400' of western and southern shoreline whenever a federal dredge project is scheduled in the adjacent reach of the river. The project would likely require less than 400,000 CY of sand, which falls within the amount not assigned to any of the beach-placement projects listed in the Plan.

<u>Fine Sediments (Mud/Clay/Silt) / Intertidal Flat Creation</u>

By far the largest amount of material by type is fine sediments: small-grain muds, clays, and silts that cannot be placed on beaches. This is clearly the sediment type that the Corps found most challenging to dispose of, as there is so much of it and because unlike sand, it does not have a long history of being used in large quantities as beach fill. The result is a series of proposed sub-

tidal (in-water) placements. Because these were not placement concepts that the stakeholder group championed, they may simply represent the easiest, least-cost disposal alternative and if anything prevents the use of the disposal areas at the scale proposed, the cost of the project would increase. As the Plan explains: "with the ODMDS approximately seven miles offshore, the cost to place material in beneficial use areas along the river, beaches, and other banks of waterways like the AIWW is generally less costly."

First, it is not technically clear that this placement method would work, as there are no descriptions of the equipment or configuration the Corps would use to do the work, there is no containment proposed for the fine sediment during or after pumping, and there are no references to other similar projects that have been successfully completed. The Wilmington District has a great deal of experience working with sandy material in North Carolina and is familiar with how it stacks, de-waters, and settles during and after construction, but this material may not behave in the same way; for example, it is possible that the sediment would erode and wash away quickly rather than cohere into a sub- or intertidal mudflat. This has been seen even on small, low dredge islands created in high energy settings similar to the Cape Fear River, such as at Wainwright Slough, NC in 2017 and in the Altamaha River, GA in 2022. In both of these examples, small islands were created, but in challenging settings that might be helpful for the Corps to review, as both were Corps projects. In short, because beneficial use is linked directly both to the economic cost analysis and the environmental impact of the project, the Corps should show that this is technically feasible, just as it must consider whether the channel deepening is technically feasible as well.

Second, the Corps should reconvene the stakeholder group that it abandoned and consult with other subject-matter experts as needed to determine if these placements are beneficial to some at-risk aspect of the Lower Cape Fear River ecosystem. If the Corps feels that the creation of new marsh and elevation of existing marsh is important for the southern reaches of the river—a logical conclusion given the long-term effects of SLC—then it should propose beneficial use that will directly attempt to accomplish those things. This could involve experimenting with thin- and thick-layer placement on carefully selected marsh sites, making the placement areas smaller so that there would be emergent sediment that might recruit vegetation more rapidly, adding features such as living shoreline or plantings that would help to retain and recruit sediment.

Third, the range of grain size, organic components, and other properties are not well known, as the DEIS and Beneficial Use Plan discuss: "The amount of sediment being placed is estimated based on past geotechnical studies and geomorphology of the river" (Beneficial Use Plan, Section D.6). As mentioned above, new data should have been collected to develop a more detailed and clearly technically feasible plan. Further, the Plan states that intertidal fill is the most flexible beneficial use because any type of fill can be used. However, the properties of the fill would affect a wide range outcomes, such as how it might respond to placement, and what types of plants and invertebrates could be expected to recruit into it in the short- and longer term. All fine-grained material is not the same from an ecological perspective so the Corps should consult with subject matter experts, ideally with more information about the proposed sediments in hand, to learn more about this topic.

Fourth, the mudflat placement sites come with only very basic dimensional information: approximate footprint (area) and approximate quantity placed in the that footprint, with no evidence that bathymetry or other significant features (such as nearby shellfish beds) were studied. There are also no stated goals, either in terms of finished dimensions, including depth, or ecological outcome (e.g., placement location A is intended to become a marsh, and placement location B is designed to be a sub-tidal shoal that is between 0 and -1' at mlw, etc.) Instead, the Plan offers some vague forecasts that are not grounded in what is presently known about the sites or an assessment of the area's ecological needs. There is also no readily discernable mechanism for the material to help the marsh to gain elevation and keep up with SLC in the Plan as it is currently envisioned. The Corps should present more fully developed plans, as part of evaluating the impacts of the project is considering any offsets that would come with the action versus no action alternative.

Many species of shorebirds forage on intertidal mudflats, and additional flats could provide new foraging habitat to birds on the Cape Fear River. However, there are already a lot of intertidal flats on the river; for the reasons listed above it's not clear if these features will exist as intertidal areas after placement is complete; and it's not known if the benthic invertebrates the birds prey on will recruit well to them. Additional study is needed.

One well-known resource that will bear some of the most direct and severe impacts of the deepening and widening project are nesting birds. In addition to impacts from past dredging projects and the foreseeable impacts of the proposed new dredging, their nesting habitat is threatened by SLC. Therefore, it is an ideal candidate for beneficial use. The Corps should propose not just the placement of sediment on Ferry Slip and South Pelican Islands, but the creation of one or more bird nesting islands on the Lower Cape Fear River. In several cases large (>100 acre) intertidal, or possibly subtidal depending on ultimate outcome, mudflats are proposed in close proximity to existing marsh islands, most of which also support nesting birds. Instead of disposing of material in-water, it could be contained to expand the size of the existing marsh islands and create nesting habitat—as Figures 1 and 2 illustrate, not all bird islands are sandy islands. Some potential bird nesting island options are described more detail below as we provide feedback on the specific placement locations in the Beneficial Use Plan.

Islands 13, WH-DA 09, WH-DA 08, and WH-DA 07

No formal bird surveys are conducted on these sites, and they are not often visited by people using eBird, so data is limited, but generally the islands are used by non-breeding birds, such as Brown Pelicans, Double-crested Cormorants, and gulls for roosting and—where there is marsh edge—by wading birds for foraging. It is likely that songbirds, including Painted Buntings, nest on them during the spring and summer months, but no data exist. Audubon North Carolina staff do regularly observe intertidal flats in the vicinity of Snow's Cut, including on the north end of WH-DA08, and these do not attract the Arctic-nesting shorebirds that are of conservation concern. None of these islands are considered to be of especially high value for birds in general, as can be seen by the fact that none of them are classified as Important Bird Areas, whereas nearly the entire Lower Cape Fear River falls into one of eight Important Bird Areas (https://gis.audubon.org/portal/apps/sites/?_gl=1*ehn7i9*_gcl_au*MTQ0OTg1NTAxNS4xNzU3MDEwODE1LjEwMzU0MDI0NTMuMTc2MDQ5MzAzMC4xNzYwNDkzMDI5*_ga*MjM2N

TA0ODUzLjE3NDkyMzMxNTg.*_ga_X2XNL2MWTT*czE3NjIwMTM3MDIkbzc3JGcxJHQxNzYyMDEzNzA2JGo1NiRsMCRoMA..#/nas-hub-site/pages/data-review).

The Beneficial Use Plan proposes in-water placement of fine to coarse-grained sediment on the sides of Islands 13, WH-DA09, and WH-DA08 that face away from the river channel. Based on Google Earth imagery, it does not appear that these islands have experienced much erosion on the shorelines that do not face the river channel. They do, however, provide a buffer between the developed shoreline on the east bank of the river and the channel, but wakes cross to the mainland shore in the gaps between. Audubon North Carolina has been contacted by homeowners who are concerned about shoreline erosion just north of Snow's Cut and believe it has gotten worse in the recent past.

The islands north of Snow's Cut have received dredged material from other projects (1960s and/or 1970s), according to various Colonial Waterbird Atlases and reports compiled by Dr. James Parnell and his students. At some islands, these depositions led to a small amount (not generally ecologically significant) of bird nesting that did not persist over time, as vegetative succession made them unsuitable for the terns that colonized them. Their relatively large size—which favors colonization by mammalian predators—and established vegetation, as well as perhaps their location farther up the river channel makes them unlike to host nesting coastal waterbirds without heroic measures, and we do not suggest an attempt should be made to turn them into nesting islands.

The addition of material in front of the marshes on the eastern shorelines of the three northern sites (13, 09, 08) might create an intertidal flat, but whether it would attract foraging shorebirds is doubtful, as we do not presently see these species using the existing intertidal habitat around WH-DA08. This may be because those flats do not support populations of benthic invertebrates, or because there are no high-tide roost sites nearby. Consultation with invertebrate scientists and additional information and study would be needed to make more accurate predictions and to understand what type of benthic communities might recruit into them.

At WH-DA07, the Plan proposes an extensive mudflat, about a mile long stretching from just south of the southern end of WH-DA08 to the north side of Tricolor Island. This is problematic because the AIWW channel runs between WH-DA07 and WH-DA08 out to the Cape Fear River channel. If the material placed in this area does not stay within the boundaries drawn in the Plan, it has the potential to fill in the AIWW channel, an area that Audubon North Carolina staff have not seen dredged in 15 years. The potential to create problems for commercial and recreational traffic on the AIWW should be a red flag for the Corps. Meanwhile aerial imagery of WH-DA07 does not show much if any loss of shoreline from its eastern shoreline, and as with the other islands, WH-DA07's significance for birds is minimal at best. Instead of creating a large and possible unstable shallow area, this project would do better to concentrate on creating a larger, higher marsh system attached to the existing marsh island, Tricolor Island.

Tricolor Island is dominated by smooth cordgrass marsh but hosts a small number of nesting birds, including American Oystercatchers, Tricolored Herons, and very probably Seaside Sparrows (these later are not surveyed for). A smaller disposal area, with a higher, super-tidal elevation to start and potentially some living shoreline components, would be more likely to

remain in place and recruit marsh habitat. As is described below, previous Corps projects have created elevated areas within marshes on the Lower Cape Fear River that support nesting wading birds, and the same could be experimented with here in a more intentional way. A recent example of this "thick-layer" placement exists in New Jersey where the Seven Mile Island Innovation Lab—of which the Corps is a partner—where dredged material was used in unconventional ways to elevate existing marsh and create nesting habitat (https://amoywg.org/wp-content/uploads/2021/02/Collins-habitat-2020.pdf). This is an opportunity for the Plan to propose meaningful and creative placement strategies that would do more than furnish a least-cost disposal option.

North Pelican Island

The proposed beneficial use at North Pelican Island misunderstands how the island has changed over the past 10-20 years and does not address the nesting bird habitat that would be directly, indirectly, and cumulatively impacted by the preferred alternative.

North Pelican Island is the name given to the single, large (approx. 1.5 km long) island located just west of Peter's Point. To its north are two smaller marsh islands, collectively referred to as North North Pelican Island in the Colonial Waterbird Database. They are each about 0.2 km long and they may be lumped into the term "North Pelican" in the Plan. (We suggest referring to all of the islands in this area as the North Pelican Complex.) Another bird island called UNI, Cape Fear River 3 in the Colonial Waterbird Database and here called No Name Island is about 0.75 km south of North Pelican Island (Figure 11).

All of the North Pelican Complex islands were likely originally a naturally occurring shallow area or marsh where over time dredged material was placed due to its proximity to the navigational channel. Based on undigitized aerial imagery housed in the Wilmington District offices, the latest placement was in the mid-1950s. Photos show sediment—possibly predominantly sand based on its lighter coloration in black and white photos—being deposited onto marsh. This created an elevated berm along North Pelican Island's western shore and four or five elevated interior areas that were colonized by salt-tolerant trees, shrubs, and tall *Phragmities* (unknown species). The combination of elevation and vegetation attracted Brown Pelicans and long-legged wading birds, including White Ibis, Glossy Ibis, Great Egrets, and Tricolored Herons, Snowy Egrets, and Black-crowned Night-Herons to nest in the four elevated areas. (These colonies are numbered North Pelican #1-#4, south to north, in the Colonial Waterbird Database.) In addition, American Oystercatchers and Willets nest in solitary pairs along the berm along with colonies of Laughing Gulls. Seaside Sparrows aren't surveyed for but occur on the site and likely nest as well.

A similar dredge placement appears to have happened to the northernmost small island (North North Pelican) which is smooth cordgrass marsh with sand deposits on its northern and western sides. A similar group of waterbirds began to nest on it. The histories of these sites provide an excellent, though originally unintentional, example of how dredged material can be well used to create, restore, and enhance bird nesting habitat. The Corps' perfunctory concept of placing some silt behind North Pelican Island is inadequate to address the existing impacts that will be exacerbated by the preferred alternative.

Figure 11. The locations of North North Pelican Island, North Pelican Island, and No Name Island (yellow) and the colony locations on North Pelican Island (blue).

Contrary to what is stated in the Beneficial Use Plan, the eastern shoreline of North Pelican Island has not eroded significantly and is not an area of natural resource concern. This shoreline is smooth cordgrass dominated marsh with minimal intertidal shoreline, as can be seen in online aerial imagery. The southwest corner has experienced the greatest loss of area, visibly fragmenting following Hurricane Florence and possibly due to other storms prior to that—while the entire west-facing shoreline is the area of greatest concern from the standpoint of nesting migratory birds as well as loss of area in general. This shoreline parallels the navigational channel and is subject to sudden, stochastic inundation from the displacement wakes of passing ships. As described above, these wakes swamp nests of migratory birds, including American Oystercatchers, Willets, Brown Pelicans, and Laughing Gulls and wash over unflighted chicks.

In the past 10 or so years, the nesting areas on North Pelican and North North Pelican Islands have degraded in quality—both area and elevation—following the increase in container ship size and a spate of hurricanes. While the acute loss of peat-based marsh from the southwest corner of North Pelican Island was easily observable following Hurricane Florence, the rest of the islands have lost elevation and suitability for nesting birds more gradually. North North Pelican Island can no longer host nesting Brown Pelicans and Great Egrets, and the remaining Laughing Gulls, American Oystercatchers, and Willets as well as species like Seaside Sparrows that are not surveyed for but that are present in the spring and summer, see their nest sites swamped periodically with the passage of large container ships (refer to Figures 5 and 10). In 2025, Brown Pelicans completely abandoned North Pelican Island.

Due to these forces, which would worsen with the preferred alternative, beneficial use of dredged material would be logically placed on the western shoreline to restore the berm and on or near the existing elevated colony areas to restore them as well. While deposition would in the short-term cover marsh vegetation, it would help the island in the longer term by providing it with greater elevation to assist it in keeping pace with the exacerbated erosional forces as well as background SLC. Thin or thick-layer sediment placement is another option for areas of the island as well that are intended to remain smooth cordgrass-dominated. Examples of thin-layer placement exist around the U.S. and, as mentioned above, thick-layer placement has been used successfully in southern New Jersey by the Corps' Philadelphia District.

Considering the extreme wave energy the island experiences—essentially manmade tsunamis—more structural options may be warranted following study of the site. Wave attenuating structures, living shorelines, or a combination of some or all may be helpful in protecting both bird nesting habitat and the marsh in general, and some of the material needed for such structures could be available from a deepening and widening project. Design should be as naturalistic as possible and avoid the characteristics of seawalls. Placement of sediment near the eastern shoreline would not protect the island from the impacts of the preferred alternative and would not benefit nesting birds that have already been experiencing the inaccurately anticipated impacts of previous projects.

Owens Island

This placement area lies in the middle distance behind Ferry Slip Island and No Name Island. It is projected to be a 180-acre shallow or intertidal flat. It's stated purpose is to "renourish the eroding salt marshes on the western side of New Hanover County and to protect parts

of the cultural and historic resources of Fort Fisher," but it is placed offshore of the river's eastern shoreline, and there is probably not enough tidal or wind-driven energy to push that sediment on to the marsh shoreline. If the goal is to build the marsh shoreline that fronts Fort Fisher State Recreation Area and the cultural resources on the property, it would make more sense to place the material in closer proximity, directly on and adjacent to the existing marsh shoreline. Living shoreline and plantings could be added to help jumpstart marsh restoration and creation. Audubon North Carolina staff observe living oysters in that embayment, so at first glance recruitment to a living shoreline in the area seems likely.

Additionally, this intertidal placement area (and another large placement area at Ferry Slip Island) is very close to No Name Island, a small bird nesting island. This island consists of a mix of coarser sediment, marsh peat, and soft rock rubble, and therefore we believe it was either created from dredged material or received dredged material. As with North Pelican Island, the birds nesting on this island (American Oystercatchers and Laughing Gulls) are subject to overwash from ship wakes, storms, and SLC. Presently, only a small number of pairs can nest there. Therefore, it would be beneficial to elevate it and expand it, to create additional nesting habitat and improve what is there. Material presently designated for Owens Island and Ferry Slip Island could be used to create a larger island that would extend eastward from the existing No Name Island footprint.

Masonboro Island: Fine Sediment Placement

In addition to sand placement on Masonboro Island, the Beneficial Use Plan proposes fine sediment placement on the west side of the island in the vicinity of Johns Creek. This area is characterized by shallow, non-maintained creek systems that are navigable at high tide, mud flats, marsh, and shellfish beds. Placement of material in this area has the potential to negatively impact shellfish and impede public access to the area. The Johns Creek area has seen significant narrowing, but this would not address the problem that has been created by the manmade sandy sediment deficit discussed above. Further, there is healthy marsh, shellfish, and mudflat in the area already, so there is no need to place more material there. It is not desirable from a bird habitat perspective either, as birds can currently forage in the existing habitat.

Finally, intertidal placement at this location is not currently allowed per the terms and conditions of the Masonboro Island Reserve State Nature Preserve dedication letter. An amendment to the dedication letter would be needed to allow such an activity via the process defined in 07 NCAC 13H .0300-.0306. Additionally, placement would require approval by the Reserve and compliance with all federal, state, and local rules and regulations to minimize impact to the environment. We encourage the Corps to coordinate closely with the Reserve's staff to find other opportunities to benefit Masonboro Island. If in the future the Reserve chooses to investigate fine sediment placement, more detail regarding material type, placement methods, and pre- and post-project monitoring would be needed.

Ferry Slip and South Pelican Islands: Fine Sediment Placement

The Beneficial Use Plan proposes to place a huge amount of fine sediment in the intertidal and shallow water areas around both Ferry Slip and South Pelican Islands: 107 and 35 acres, respectively. For scale, the islands themselves are each currently about 3 acres above mean high water. <u>If beach-quality material must be placed in the shallow water or intertidal zone in order</u>

for the islands to receive sand at all, Audubon North Carolina is willing to accept it, as a stopgap to prevent the islands from missing a placement entirely. However, Audubon does not seek to place large quantities of fine-grained material around these islands, as it is of marginal benefit to birds at these sites (high energy area such as these are not likely to recruit benthic prey items that would be valuable for birds), is not likely to stay in place (again, due to the high energy at the sites), and at the scale the Corps proposes would actually impede access to the islands for necessary management, as there must be approaches available for shallow draft skiffs to pull up in order to perform vegetation management and monitoring activities.

Instead, we would suggest first looking at making No Name Island larger, as mentioned above, and if fine material must be placed on or adjacent to the existing sandy parts of Ferry Slip and South Pelican Island, we would ask the Corps look at creating areas elevated above mean high water, and to coordinate closely with Audubon North Carolina and the NC Wildlife Resources Commission. A major consideration is ensuring that beach-quality sand from operations and maintenance dredging can still be placed using the control of effluent method that the Corps employes for its usual bird island placement. Too much marsh, or other incompatible resources like shellfish, could prevent placement if turbidity or the outflow would destroy it.

Snow's Marsh Island
This 64-acre placement area is in a very high energy setting and is in close proximity to the National Gypsum Company's quay where large ships dock. The likelihood of it not staying put and the chance that it could interfere with the company's operations (an economic cost) are high. It should not be used.

We strongly encourage the Corps to study ambient wave energy in the river (not ship wakes). The stretch between Southport and the south end of MOTSU has some of the most intense currents and waves anywhere on the river.

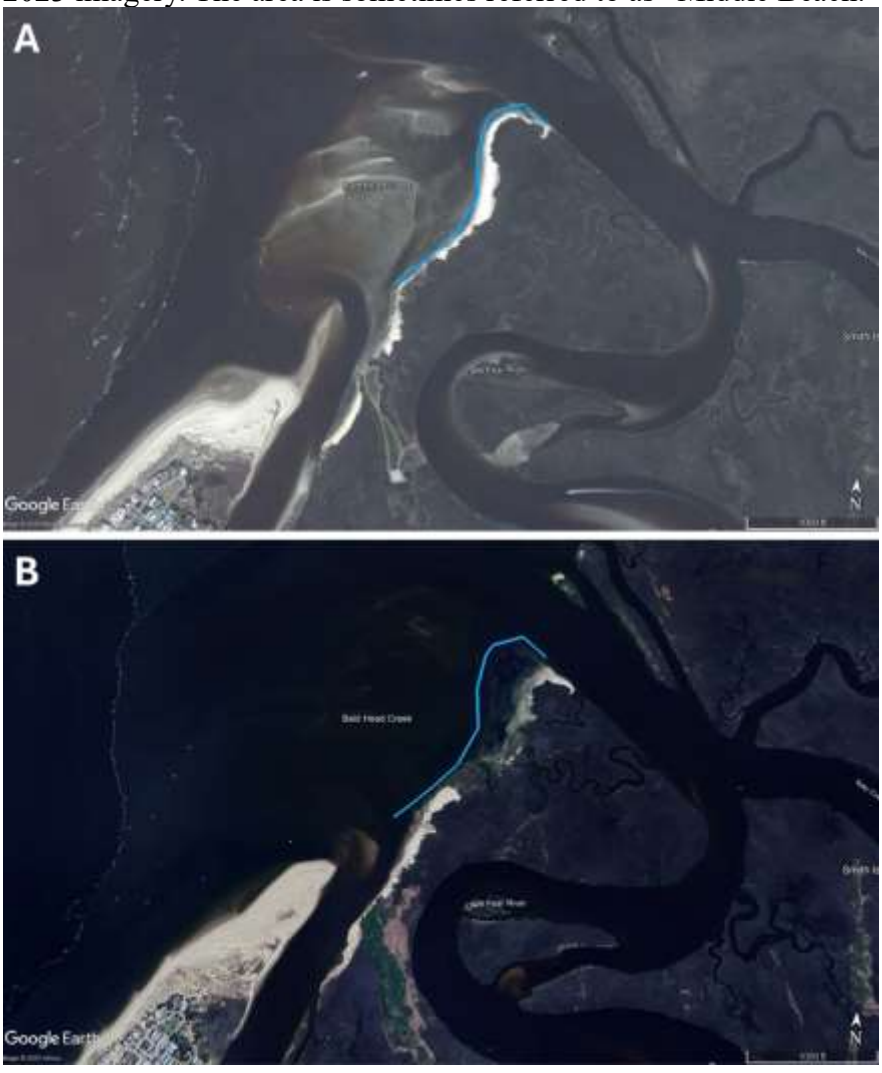
Lower Swash Island
In its description of this placement area, the Beneficial Use Plan states that it would protect "the intricate tidal creek system of Bald Head Island" from erosional forces. However, the map shows the area is actually about 5 km from Bald Head Island, just off of the north end of Shellbed Island near where the southern terminus of the Fort Fisher Rocks. It's not actually clear, therefore, what the rationale for this site selection was.

The northern part of the Lower Swash Island placement area is in rather deep water—deep for an undredged part of the river—and the southern end is where a mudflat already exists. Further, there is oyster resource scattered all along the northern shoreline of Shellbed Island and a manmade oyster reef just behind the southern end of the Lower Swash polygon. Additionally, the area depicted on the map is rather deep, for the undredged part of the river, and the marsh edge in the area has a steeply scarped peat ledge, and it does not seem likely that it would replenish the marsh. This is also high-energy area, as northeast winds dominate in the winter and spring. If the sediment did not stay in place, it would have the potential effect of silting up the creeks that bisect Shellbed Island. Overall, this is not a location where we recommend sediment placement.

Instead, the Corps could consider experimental thin- or thick-layer placement in the Shellbed Island marsh, but only in close coordination with resource agencies and with a careful site selection process and monitoring program. Given that SLC projections show the near total loss of Shellbed and indeed the entire marsh system beyond it, work to investigate strategies that can help marsh that can't migrate stay in place longer is relevant and timely.

There is marsh shoreline that actually is in proximity to Bald Head Island, but it is farther south, and this area used to include a sandy beach which supported nesting American Oystercatchers and Willets, but has since disappeared allowing swell from the Atlantic Ocean to impact the marsh, which has since visibly retreated, especially following Hurricane Florence in 2018 (Figure 12). Placement, especially of sand, on the shoreline in this area would buffer the marsh and potentially restore lost bird nesting habitat as well as lost marsh. The open water in this area is shallow and the approach to the marsh edge is shallowly sloped, making it more likely that wave energy could attach it to the marsh than around the north edge of Shellbed Island, which is actually steep.

Figure 12. The shoreline just north of Bald Head Island's West Beach, showing A) 2015 and B) 2023 imagery. The area is sometimes referred to as "Middle Beach."



Southport Island
Given the quantity of material apparently envisioned for this site as well as for Lower Swash Island, consideration should be given to the creation of a new bird island between Battery and Striking Islands. Bird islands are often made of sand, but as can be seen on the Cape Fear River, they are also marshy with fine material and wetland plants predominating. A smaller more defined area for disposal would also be less likely to impact the navigation of recreational watercraft in the area east of Battery Island, which is a popular fishing spot. At low tide, passage around Battery and Striking Islands already requires local knowledge and it is impossible to fully traverse at low tide. Finally, the parts of flats system that already exists there are used by foraging shorebirds, and a smaller placement footprint would be preferable.

Fort Caswell
The intertidal placement areas in the Elizabeth River are in proximity to shellfish. Careful consideration should be given to placement location and methods to avoid impacting existing resources. Living shoreline would be likely to do well in the area, if installed as part of the project.

<u>Rock / Structure and Shoreline Protection</u>

The project would also yield a large quantity of rock—3.5 million CY of soft rock that is not proposed for offshore fish habitat creation. In the past some of this soft rock, which presents as various sportsball-sized chunks, has ended up on marsh islands, including No Name Island and the north end of North Pelican Island. In larger quantities and with study and coordination with resource agencies, it could provide structure for small invertebrates and fish and some naturalistic shoreline protection.

Considering impacts on human activities, the Cape Fear River is used by recreational boaters, primarily for fishing which usually requires boats leaving marked channels. The relatively sudden appearance of large shallow or intertidal areas would create a hazard to navigation. We strongly encourage the Corps to consider how, if created, these features would affect the safety of people boating on the river and include informational campaigns and signage to alleviate risk.

Finally, both in the Beneficial Use Plan and throughout the DEIS, the Corps proposes actions that would have remarkably large impacts on natural resources in the project area. It is absolutely essential that it work closely with resource agencies, site managers, academics, and other subject matter experts and stakeholders. Plans for beneficial use, mitigation, and other components of the projects should be produced in close collaboration with partners to ensure that they are using the best information available and arriving at the best outcome possible, even under difficult and imperfect circumstances.

In summary, the Beneficial Use Plan is at best incomplete. It does not appear to have received thorough consideration which does not give the impression that the Corps is serious about using material in a way that really would benefit local ecosystems. Although the DEIS touts beneficial use an offset to impacts on shorelines—"For beneficial use, AA1 includes placement of new work and O&M material along the riverbanks, offering significant benefits for shoreline stabilization and habitat enhancement."—in fact it actually proposes scant shoreline protection,

the vast majority of the placement in the river proper is on either the sides of islands facing *away* from the navigation channel or in open-water areas. Based on the Corps' maps and descriptions, it appears that less than 2 miles of approximately *50 miles* of shoreline would receive any attention from the Beneficial Use Plan. The Corps should fully consider what habitats within the project areas need, how (if at all) dredged material could meet those needs, and estimate the costs of projects that would be really useful, not of the least-cost, least-beneficial disposal methods that form the bulk of the current Plan.

5. The Mitigation Plan (Appendix M) is inadequate.

The DEIS forecasts the loss of 1,071 acres of freshwater wetlands under the preferred alternative but does not commit to protecting the same number of acres through acquisition and protection. Instead, some acres are gained through the proposed removal of invasive *Phragmites*. *Phragmites* is widespread in the area and is famously difficult to control. This would be especially true in the mitigation areas because nearby uncontrolled *Phragmites* would be available to recolonize, even if the plants within the target area were fully eradicated.

Although *Phragmites* monoculture is less beneficial to wildlife, including in most cases birds, than a native plant community, in North Carolina it can stabilize marsh and store carbon efficiently in comparison with native marsh plants (https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0173007). Therefore, decisions to manage *Phragmites* or pursue other projects may require nuanced decision-making, including consideration of what species (like the Eastern Black Rail) may be supported if it were removed, or if the cost of removal would preclude the opportunity to do other more beneficial projects (https://www.wypr.org/wypr-news/2019-10-17/as-climate-changes-scientists-re-think-phragmites). If the Corps deems that *Phragmites* removal does indeed compensate for lost acres, its management plan will need to be funded in perpetuity—and the costs factored into the economic analysis—as even a few years of treatments will not be sufficient to keep sites within the project area free from regrowth and recolonization.

6. The Corps does not appear to have a monitoring plan.

Following the previous deepening and widening project, there was a ten-year study monitoring the impacts of the project on the Cape Fear River and surrounding areas (https://people.uncw.edu/culbertsonj/). There is no such plan offered in the DEIS. While collecting data alone cannot address damage caused by a project, it is necessary to understand the impacts of an action in order to attempt to offset or otherwise address adverse results. Worse, if monitoring does not exist, then impacts—positive or negative—cannot be known. This is especially important since many of the likely impacts involve increased flooding in human communities, including disadvantaged communities. In addition to human development, there are many public trust properties that are in some form of ownership in order to preserve natural and cultural resources. These properties should be closely involved in developing and implementing a monitoring plan.

The DEIS should clearly commit to a substantive, long-term monitoring plan, including pre-project monitoring, and the cost of such work should be included in the economic analysis. A

reasonable first step would be to convene a working group of stakeholders and subject-matter experts to assist in the development of such a plan. Providing for monitoring is especially pertinent since the Corps informed stakeholders at the outset of the EIS drafting process that it had been determined that it would not collect any new data to inform the document. The Corps should make it clear that it will collect new data to inform its understanding of the project's impacts, if it goes forward.

7. The DEIS contains factual errors that should be corrected.

Environmental impact statements become part of the permanent record, and information presented within them carry additional weight, which makes it especially important to ensure that they contain factually accurate information and do not unintentionally misinform either the public or professionals using them as the basis of decisions. Speaking of sections discussing birds and wildlife, there are too many factual errors to flag and correct them all, but one in particular is causing confusion. Section 2.8 includes a paragraph titled Bird Island Placement. It states: "These islands are typically raised to higher elevations (no higher than 15 feet above MHW by law) than mudflats and may hold 15,000 to 29,000 cubic yards of material per acre."

There is no law that limits the height of "bird islands." Corps staff frequently work with agencies and NGOs with management responsibility to design and implement sediment placement on islands. Staff provide the Corps with guidelines based on conditions unique to each site and project. There are also various documents offering guidance for placement on islands (this is the most likely to be seen in North Carolina https://erdc-library.erdc.dren.mil/items/81b728f7-76d5-4ef8-e053-411ac80adeb3), and it appears that guidelines have been misconstrued to be law.

Overall, the DEIS proposes a project that is enormous in scale and impacts on human communities and natural ecosystems. For such a large and costly project, the economic benefit is slim, slim enough that any number of unaccounted for factors could upend the benefit-to-cost ration and render it unfeasible. Given the outsized environmental impacts, it would have been rational to expect a well thought out and robust set of offsets, from the mitigation plan to beneficial use, to other creative compensatory measures that might make this project more acceptable to the community. The DEIS does not offer robust and well planned offsets; what little it does propose lacks detail, clarity, and certainty. We respectfully conclude that the Corps should choose to protect birds, other natural resources, and local human communities—and not pursue this uneconomical project any further.

Sincerely,

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