Audubon | NORTH CAROLINA

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U.S. Army Corps of Engineers
Wilmington District
Attn: Wilmington Harbor 403
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Dear Mr. Walters and Ms. Hill,

Thank you for the opportunity to participate in the early scoping public comment period for the Wilmington Harbor, NC Navigation Project. As the state office of the National Audubon Society, Audubon North Carolina protects birds and their habitat throughout the state, including through its coastal islands and sanctuary program. Through a combination of direct ownership, leases, and management agreements, Audubon North Carolina manages sites that support 35-40% of the state's nesting coastal waterbirds annually. Among these sites are bird nesting islands on the Lower Cape Fear River (LCFR). As the primary bird management entity in the LCFR, Audubon North Carolina collects data on the abundance and distribution of both nesting and non-breeding birds and is in the unique position to observe changes to these sites, as well as changes to conditions on the river over time.

With this in mind, we seek to provide the USACE with both bird data and habitat quality information relevant to existing conditions and likely impacts of the proposed project. We will also describe our concerns regarding broader ecosystem impacts that would indirectly or cumulatively affect birds as well as others areas of interest, including already developed areas in and around Wilmington. In addition to this letter, we entered specific point data into the ArcGIS tool to assist in identifying areas of interest and we are willing to provide any additional relevant data that isn't transmitted with this letter or to serve on any stakeholder group or technical committee in order to represent birds on the LCFR.

**1. The importance of the LCFR to colonial nesting migratory birds.**

The LCFR is home to one of the largest concentrations of colonial (i.e., group) nesting waterbirds in North Carolina, with 30-38% of the state's nesting colonial waterbirds occurring

there annually over the past decade. This data is collected during the tri-annual Colonial Waterbird Census, which is coordinated by the NC Wildlife Resources Commission, and results are served in a database that is partially funded by the USACE.

Colonial waterbird nesting occurs primarily on 10 islands below Snow's Cut, between latitude 34.023 and latitude -33.890 (Table 1). In some years, there is also nesting on Bald Head Island's river-facing beach.

Table 1. Islands where nesting colonial waterbirds occur annually.

| Island | Latitude | Longitude | Type |
|---|---|---|---|
| Tricolor Island | 34.01899 | -77.93076 | natural |
| North North Pelican Island | 34.00736 | -77.93398 | natural/received dredge |
| North Pelican Island | 33.99824 | -77.93477 | natural/received dredge |
| No Name Island | 33.98388 | -77.93996 | natural/received dredge |
| Ferry Slip Island | 33.97346 | -77.94124 | Dredge |
| South Pelican Island | 33.93600 | -77.97344 | Dredge |
| Shellbed Island | 33.91602 | -77.97843 | Natural |
| Striking Island | 33.90718 | -77.99512 | Natural |
| Battery Island | 33.91033 | -78.00988 | natural/received dredge |
| Smith Island | 33.89338 | -77.98611 | Natural |

Of the ten islands, two are extensive natural marsh complexes (Smith, which is a general term for the marshes on the eastern shore of the river north of Cape Creek and south of Still Creek, and Shellbed, which is a multi-lobed marsh west of Muddy Slough) that have received no anthropogenic alterations and one, Striking, is an entirely natural island dominated by *Spartina* marsh. Four are natural in origin, but have received some dredged material prior to the 1960s. They are predominantly marsh through the natural process of vegetative succession. One, Tricolor Island, is presumed to be natural, but may have received dredged material at some point. The remaining two, Ferry Slip and South Pelican Islands, were created by deposition of dredged sand around 1969/1970.

Because these islands offer a variety of habitats for nesting—from open sand that mimics beach habitat to dense tree and shrub thickets—they attract a variety of species (Table 2). Some of the islands require regular management to maintain appropriate habitat for target species. For example, the open, sandy habitat on Ferry Slip and South Pelican Islands is necessary for Royal and Sandwich Terns, which nest on only 5-6 islands in the state, and that habitat is maintained through regular vegetation management and periodic dredge events that place clean sand (i.e., sand free of seeds) on them.

Table 2. Colonial nesting bird species on the LCFR. ST = state threatened SC = state species of concern SGCN = species of greatest conservation need

| Species | Conservation Status |
|---|---|
| Brown Pelican | SGCN |
| Great Egret | - |
| Snowy Egret | SC, SGCN |
| Tricolored Heron | SC, SGCN |
| Little Blue Heron | SC, SGCN |
| Cattle Egret | - |
| Black-crowned Night-Heron | SGCN |
| Yellow-crowned Night-Heron | SGCN |

| | |
|---|---|
| White Ibis | SGCN |
| Glossy Ibis | SC, SGCN |
| Laughing Gull | - |
| Herring Gull | SGCN |
| Great Black-backed Gull | SGCN |
| Royal Tern | SGCN |
| Sandwich Tern | SGCN |
| Least Tern | SGCN |
| Gull-billed Tern | ST, SGCN |
| Black Skimmer | SC, SGCN |

Due to the quantity and variety of nesting habitat, as well as the surrounding productive saltmarsh, thousands of pairs of colonial waterbirds nest on the river annually (see attached Excel file, *CFR CWB 2014-2023.xls*). This includes over 20% of North Carolina's Brown Pelican, Glossy Ibis, Laughing Gull, Little Blue Heron, Royal Tern, Sandwich Tern, Snowy Egret, Tricolored Heron, and White Ibis populations, over 20% of its coastal Black-crowned Night-Heron population, and nearly 20% of its coastal Great Egret population. We provided summary data from within the past 10 years, or the 2014, 2017, and 2020 census counts. However, due to the pandemic, not all of the LFCR sites could be counted in 2020 so those numbers are incomplete. The 2023 census results are still being collected and tabulated, and can be provided when they are complete and finalized.

These islands are managed and monitored by Audubon North Carolina staff, and have been since the 1980s. Threats to nesting birds include human recreational disturbance (e.g., landing on the islands by people and/or dogs); depredation by a variety of predators including gulls, crows, and eagles; and loss or degradation of habitat through a variety of means, including anthropogenic alterations to the river as well as hurricanes and tropical storms. Surrounding foraging habitat which is also critical to sustaining nesting populations, including oyster reefs and saltmarsh, are also affected by human activity, pollution, and development.

**2. The importance of the LCFR to solitary nesting migratory birds.**

In addition to robust populations of colonial nesting species, the river supports solitary, non-colonial nesting birds as well. Most significantly, 22-27% of North Carolina's nesting American Oystercatchers nest on the LCFR (see attached Excel file, *CFR census AMOY 2013-2022.xls*). They are state-listed as a Special Concern species and are also a Species of Greatest Conservation Need (SCGN), and like colonial waterbirds they are counted statewide on an every-three-years basis. On the LCFR, oystercatchers nest on all of the islands list above, as well as a few additional sites such as the marsh shoreline near the Elizabeth River and Dutchman's Creek. In marsh habitats, they use shell rakes (linear deposits of shell that form along the shoreline) or small pockets of sand or wrack, but they also select dredged-material islands because the sandy habitat mimics beaches. Other solitary nesting species on the LCFR include 1-2 Wilson's Plovers (State Threatened, SCGN) on Caswell Beach and Bald Head Island and an abundance of Willets (SGCN), Clapper Rails (SGCN), and Seaside Sparrows (SGCN) in the marsh. Unlike colonial species and American Oystercatchers, these later three species are not part of a regular survey effort, but we observe them annually throughout the LCFR during other monitoring work. All of these solitary nesting species face the same threats as the colonial nesting species.

**3. The importance of the LCFR to non-breeding migratory birds.**

During spring and fall migration (generally early March-mid to May and mid-July to mid-November) as well as winter (mid-November to February), the LCFR supports large numbers of non-breeding migratory shorebirds, including federally threatened Red Knots. We are not able to survey as regularly for non-breeding birds as for breeding birds, especially during late spring when Red Knot populations peak in the Cape Fear region, but they can be seen from fall through late May on the LCFR, including for example flocks totaling 371 individuals on Smith and Striking Islands and a shoal east of Battery Island on May 29. In addition to these locations, Red Knots are also often seen on the river-facing beach of Bald Head Island.

In addition to hosting nesting American Oystercatchers, the LCFR also supports one of the largest wintering flocks in the state. In the past 10 years fall and winter (September-February) Audubon North Carolina roost counts have averaged 274, with a high count of 470. Because it supports more than 1% of the biogeographic population of American Oystercatchers, the LCFR would qualify as a Western Hemisphere Shorebird Reserve Network site.

Other migratory shorebirds that use the LCFR include the Black-bellied Plover (SGCN), Semipalmated Plover (SGCN), Willet (SGCN), Whimbrel (SGCN), Marbled Godwit (SGCN), Ruddy Turnstone (SGCN), Sanderling (SGCN), Dunlin, Western Sandpiper, Semipalmated Sandpiper (SGCN), Least Sandpiper, and Short-billed Dowitcher (SGCN). We have not conducted surveys for these species in the spring, and there is little fall or winter count data, but high counts for the fall and winter of 2022/2023 are in Table 3 for species that exceeded 50 individuals. High counts are made during high tide roosting, when migrating and wintering shorebirds seek safe emergent habitat, such as spits, sandbars and other open landforms to rest and preen at. On the LCFR, regularly used roost sites are Ferry Slip and South Pelican Islands, the sandbar east of Battery Island, the Bald Head Island beach, and the small, sandy Smith Island beach. Of note, counts of Short-billed Dowitchers consistently exceed the 1,500 individual threshold needed to qualify the LCFR as a Western Hemisphere Shorebird Reserve Network site.

Table 3. High counts of shorebirds on the LCFR for species that exceeded 50 individuals, October 2022-February 2023.

| Species | High Count |
|---|---|
| Black-bellied Plover | 385 |
| Semipalmated Plover | 481 |
| Willet | 84 |
| Ruddy Turnstone | 236 |
| Sanderling | 177 |
| Dunlin | 3266 |
| Western Sandpiper | 762 |
| Least Sandpiper | 153 |
| Short-billed Dowitcher | 3742 |

Semipalmated Sandpiper and Whimbrel are generally only present during spring migration, and data is not available for this season. However, from incidental observations made during the course of other work, flocks totaling over 1,000 Semipalmated Sandpipers occur on the river in

the late spring. Whimbrel are less congregatory in the LCFR, but numbers would very likely exceed 50 if counts were done in April and May.

**4. Observations of post-Panamax ship wakes on the LCFR.**

Because Audubon North Carolina staff spend a great deal of time on the river, we have the opportunity to observe the varying sizes and characteristics of wakes from different types of ships. Beginning with the advent of the Yang Ming calling at the port in 2016 (*Port City Daily*, "Expansion allows Port of Wilmington to welcome its largest ship to date, the Yang-Ming Unity") and continuing with the HMM beginning to call in 2020 (*Port City Daily*, "In Pictures: Largest ship in its history ushers Port of Wilmington into the 'big ship era'"), we have noticed a dramatic difference in the size and severity of ship wakes thrown by passing container ships. This provides a preview of what the proposal to deepen and widen the port would do to conditions on the LCFR.

These effects include 2-3' tall steep waves that break over shoals that are 4-5' deep. These waves appear to churn up the sandy bottom that they pass over. Once they collide with an island or the mainland shoreline, they create the surf and run-up effect mentioned above. Waves not absorbed by an island continue to the mainland shoreline where, depending on where they are striking, they refract off the shoreline and return in the opposite direction. This can be observed at the Federal Point shoreline, north of the Fort Fisher ferry terminal. When ship wakes enter the embayment, they impact the western side of Ferry Slip Island, then the mainland marsh shoreline, then the eastern side of Ferry Slip Island as they refract back towards the channel. On some occasions, some wave energy comes back towards the shoreline after being deflected by Ferry Slip Island. The effects of wakes are not limited to shorelines immediately proximate to the navigational channel, such as along Battery Island's western shoreline. They also travel across the river over 1,500 meters to create tsunamis and run-up on Shellbed and Striking Islands as well. Therefore, it's important to take into consideration that these wakes impact all of the bird nesting sites on the LCFR, not just those that are a stone's throw from the navigation channel—as well as other saltmarsh shoreline that is valuable as nursery habitat for marine life and flood protection for upland habitats and human development.

These tsunami events are difficult to observe closely because it's hazardous to be in shallow water in a boat or to have a boat anchored on an island during the wake events. How these wakes act at islands and the general increase in wake energy also aren't well captured in previous reports. Earlier analyses, including the 2019 Section 203 Feasibility Study and the Environmental Impact Statement for the 2000 deepening and widening project, failed to reflect these impacts. However, they are non-trivial effects that are already impacting the LCFR and that deepening and widening would increase.

**5. Impacts of deepening and widening the navigational channel on nesting birds, bird habitat, and other natural resources.**

Given the abundance and diversity of bird life found on the LCFR, it's critical that the evaluation process fully consider the range of impacts that deepening and widening the navigational channel would have. These include:

A. Direct loss of nests and chicks from ship wakes.

Audubon North Carolina staff work on the river, visiting sites in outboard motorboats to monitor nesting and non-breeding waterbirds. This has afforded the opportunity to observe the effect of wakes from passing ships on important bird sites. In addition to temporarily flushing non-breeding shorebirds when wakes flood roosting or foraging areas, wakes flood nesting areas. This happens when the displacement wave caused by the movement of water below the river's surface creates a tidal wave, sucking water away from the shoreline then causing it to rush back suddenly and (from a bird's perspective) without warning. The surface waves land onshore as tall yet typical storm- or wind-driven waves, but the additional water from the tidal wave effect causes run-up which floods additional area quickly and violently. These effects are especially extreme at high tide.

When these wakes hit nesting islands, they flood nests and chick-rearing areas. Eggs are washed out of nests or inundated in situ. Both events can cause eggs to fail, either by immediate loss (the egg is out of the nest and cannot be recovered by the parent birds) or by preventing the development of the embryo inside through addling (shaking eggs causes their development to terminate, especially early or late in incubation). Chicks are also washed from their nests or nursery areas, drowned, or soaked, which can lead to hypothermia. Royal and Sandwich Tern, American Oystercatcher, and Willet chicks in particular spend a great deal of their time at the water's edge in order to stay cool during hot weather, which makes them more vulnerable to wakes than chicks that mature in traditional stick nests located in shrubs or trees. However, these stick-nest species, especially Brown Pelicans, will nest in low-lying shrubs along the edges of the marsh islands and so their nests are impacted as well.

In evaluating how any proposed action will impact nesting birds, it's critical to keep in mind the scale at which these effects are significant for birds. Inches separate nests and chicks from flooding or success. Therefore, even small changes in wave height or run-up and small losses in area or elevation due to erosion, change how well or poorly birds may do in a given year.

B. Habitat loss and degradation from enhanced erosion caused by ship wakes and increased energy in the system.

A greater number of more severe wake events caused by the deepening and widening of the navigational channel would have erosional impacts on island and mainland shorelines all along the LCFR, from the mouth of the river to the turning basin. Additionally, a deeper, wider channel brings more water and therefore more current and more energy into the LCFR system, which in turn would also cause more erosion along the shoreline. Increased erosion decreases the size of bird-nesting islands, erodes roosting areas used by non-breeding birds, and impacts the amount and integrity of saltmarsh on the LCFR. Besides bird habitat, there are many other vital ecosystem services that intact, healthy saltmarshes and other estuarine shorelines provide, including nursery habitat for fish, crustaceans, and other invertebrates; flood protection; water filtration; and recreational and commercial use by fishers.

To our knowledge, shoreline change rate studies have not been conducted for most of the LCFR. However, loss of saltmarsh is easy to observe through direct observation over time or aerial imagery such as on Google Earth. Islands where this is visible include especially North North Pelican, North Pelican, Shellbed, Striking, Smith, and Battery. During site visits, it's also easy to observe shell rakes on marsh islands—where oystercatcher nesting is concentrated—losing elevation over time. In 2017, Audubon North Carolina partnered with UNC-Wilmington students who conducted a shoreline change rate analysis for the southern portion of Battery Island, and found an overall net loss of shoreline adjacent to the main nesting colony, with an average loss of 1.79 meters from 2008-2017.

We also note that the plans presented call for a widening the channel in the immediate vicinity of Battery Island, which is already imperiled by erosion caused by ship wakes and storms. Further widening the channel not only would increase already high erosion on Battery Island (and along the Southport shoreline), but also make it more difficult to protect what remains, as less space would be available to rebuild the shoreline or install protective measures.

Finally, the LCFR supports an abundance of Diamondback Terrapins, which nest in most of the same locations that American Oystercatchers and other bird species do. Their low-lying marsh and shell rake nesting habitats are not well studied but are likewise impacted by ship wakes and increased erosion.

C. Impacts and opportunities of dredging to create and maintain a deeper and wider channel.

Deepening and widening the navigational channel would require a very large initial dredging project, followed by more dredge events to maintain greater channel depths. A deeper channel may require more frequent maintenance dredging than take place now. Dredging comes with a many well-known environmental costs, including increases in turbidity; direct and indirect mortality of organisms in the water column and in the benthos; and potential loss of sediment from ecosystems dependent on it for habitat maintenance.

To decrease (though not eliminate) the adverse impacts of dredging, environmental windows have been established. If the need for maintenance dredging is greater, there may be greater pressure to ignore long-established environmental windows. Out of season dredging outcomes include greater sea turtle takes and more severe impacts to larval fish and invertebrates in the water column. Therefore, the analysis should be clear about expectations not only for how much initial dredging would take place and how frequently maintenance dredging would take place, but also when these events would happen.

By its nature, dredging disturbs sediments that have settled on the river bottom, re-suspending them in the water column for a period of time and potentially making them biologically available for uptake to plants and animals. The LCFR is a highly contaminated system, impacted by excessive loads of heavy metals such as mercury and arsenic as well as by legacy and novel PFAS that were discharged for decades without regulation. For example, Royal Tern, Sandwich Tern, Laughing Gull, and Brown Pelican chicks that died of natural causes in 2017 were all found to have elevated PFAS in multiple organs relative to seabirds in other contaminated and relatively pristine ecosystems (Robuck *et al.* 2020; DOI: 10.1021/acs.est.0c01951). The analysis

should consider the potential impacts of dredging on water quality and contaminant levels for wildlife as well as humans.

Sediment is literally the basis for all of the various habitats found in the LCFR. For foraging migratory shorebirds, including Red Knots, intertidal sandbars and mudflats are critical to their survival. Shoals provide habitat for juvenile fish and substrate for marsh plants to grow in. Retaining sediment in the ecosystem is beneficial to plants and animals and a variety of habitats, and hundreds of thousands of cubic yards of sediment are already removed from the LCFR annually by the current dredging regime. Sediment can also be used deliberately to create or restore habitat, such as when sand is placed on bird-nesting islands. Therefore, the analysis should be clear about expectations for how much additional material would be dredged from the river if the channel were deepened and widened and where the dredged material would be disposed of, so that impacts can be completely understood. A dredged-material management plan for the LCFR at its currently authorized depth would be a helpful point of comparison for any proposed changes, though at this time one does not exist.

Finally, as mentioned above, sediment can be used for habitat creation and restoration, such as when beach-quality sand is placed on Ferry Slip and South Pelican Islands. To the greatest extent possible, any proposed plans should make use of sediment to benefit ecosystems on the LCFR and retain sediment in the system.

D. Ecosystem-wide impacts of deepening and widening the navigational channel.

A deeper and wider navigational channel would result more water moving up river with each tidal cycle. With more water comes a wider tidal prism, resulting in higher high tides. These would exacerbate high-tide flooding throughout the LCFR system, potentially on bird nesting islands and even more so around the city of Wilmington where the river is considerably narrower and effects will be greater. Similarly, salinity will increase farther up river with a deeper channel, causing the conversion of freshwater wetlands to saltwater. The results of the last deepening project can be seen in in the ghost forest that surrounds Wilmington and the loss of bottomland forest habitat from the area.

Finally, any deepening and widening project would take place with background sea level rise. Such a project would intensify and accelerate the impacts of SLR on surrounding communities as well as natural ecosystems. The analysis must take into account the best, most current SLR projections and consider the additive effect of dredging on those projections.

E. The value of the LCFR ecosystem as it is.

The purpose and need of the project is couched in terms of enhancing an already robust economic asset, the Port of Wilmington. The economic analysis must not only make a credible case that this really is needed—and outweighs the phenomenal monetary and environmental cost of such a project—it should also consider the value of the ecosystem services that the LCFR provides in its current state. Additionally, it should incorporate the loss of value that environmental impacts would incur, as well as actual monetary costs of effects such as increased sunny day flooding to developed areas. There are methods and tools available to make such

calculations, and these can provide valuable insights into the real costs and benefits of any proposed alternative.

In conclusion, the LCFR stands out in North Carolina as a haven for waterbirds, especially nesting species. The islands they nest on are not replaceable—islands with appropriate nesting habitat are already being used so there are few options for birds to go elsewhere—and under pressure from a variety of sources, including anthropogenic threats. The same resources that attract the birds support myriad other wetland and marine species and provide valuable ecosystem services to the surrounding community. We ask the Corps to carefully and thoroughly evaluate how the proposed deepening and widening would affect these natural resources to ensure that the environmental review process is robust and accurate.

Sincerely,

Lindsay Addison
coastal biologist

Attached: *CFR CWB 2014-2023.xls*
*CFR census AMOY 2013-2022.xls*