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Whimbrel migration tracking annual report: 2022

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WHIMBREL MIGRATION TRACKING ANNUAL REPORT: 2022

THE CENTER FOR CONSERVATION BIOLOGY
WILLIAM & MARY

The Nature Conservancy
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WHIMBREL MIGRATION TRACKING ANNUAL REPORT: 2022

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Project Partners:
Dominion Energy
The Center for Conservation Biology
The Nature Conservancy in Virginia

Front Cover Image: CCB biologist, Chance Hines, releasing a whimbrel near Willis Wharf, VA. Photograph by Bryan Watts.

The Center for Conservation Biology is an organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within today's social context. Our philosophy has been to use a general systems approach to locate critical information needs and to plot a deliberate course of action to reach what we believe are essential information endpoints.

The Nature Conservancy is a global conservation organization dedicated to conserving the lands and waters on which all life depends. Guided by science, the Conservancy creates innovative, on-the-ground solutions to our world's toughest challenges so that nature and people can thrive together.

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EXECUTIVE SUMMARY

Dominion Energy's (DE) Coastal Virginia Offshore Wind (CVOW) project, when completed, will consist of up to 180 turbines standing over 800 feet tall and covering approximately 177 square miles of ocean east of Virginia Beach, Virginia. The lease area is situated due southeast of Virginia's Eastern Shore where approximately 141,000 acres of protected coastal habitats and associated barrier island and coastal lagoon systems provide critical breeding, nonbreeding and migratory staging habitats for hundreds of thousands of shorebirds throughout the annual cycle. Recent evidence shows that whimbrel (*Numenius phaeopus*) leaving the Eastern Shore do transit the CVOW-C lease area during fall migration (Watts et al 2022) but additional information is needed to better understand the potential interactions between this species of conservation concern and the lease area. We attached GPS transmitters to 15 whimbrels during the 2022 autumn migration. We removed one transmitter from a bird that was wounded by a raptor and documented one aborted migration attempt. The bird that attempted to migrate flew within 7 km of the lease area, but achieved an altitude greater than rotor height within 2 km of departing the eastern shore and flew at >3,000 m high when near the lease area. The transmitters require North American cellular service and we are awaiting spring migration for whimbrel to return and transmit data from the remaining 13 birds. We will begin analyses of data from these birds and will also attach an additional 15 transmitters to whimbrel during the 2023 autumn migration.

BACKGROUND

Context

Dominion Energy's (DE) Coastal Virginia Offshore Wind (CVOW) project, when completed, will consist of up to 180 turbines standing over 800 feet tall and covering approximately 177 square miles of ocean east of Virginia Beach, Virginia. DE's Constructions and Operations Plan (COP) (BRI 2021) found the overall risk to most birds from CVOW to be minimal to low, primarily based on the lease area's location 27 miles from the nearest coast. While the distance from shore does reduce risk to many species, recent studies show that migratory species identified as having minimal to low exposure in the COP do transit the lease area (Loring et al. 2021, Loring et al. 2020, Watts et al. 2022) and highlight the potential for migratory species to have greater exposure risk than estimated in the COP. Appendix O of the CVOW-C Construction and Operations Plan states:

"The Lease Area is located within one of four major North American north-south migration routes (known as 'flyways') for many species of seabirds, shorebirds, waterfowl, raptors and songbirds (Menza et al. 2012). The Atlantic Flyway is located along the Atlantic coast of North America and includes US states and Canadian provinces that span the route from Canada to Central America, South America, and the Caribbean. Coastal and marine environments along the Atlantic Flyway provide important habitat and food resources for hundreds of avian species at stop-over sites, breeding locations, and wintering areas (Menza et al. 2012)."

More specifically, the lease area is situated due southeast of Virginia's Eastern Shore where approximately 141,000 acres of protected coastal habitats and associated barrier island and coastal lagoon systems provide critical breeding, nonbreeding and migratory staging habitats for hundreds of thousands of shorebirds throughout the annual cycle. Decades of research and monitoring by the Center for Conservation Biology, The Nature Conservancy (TNC), Virginia Tech and many others have shown this to be one of the most important regions for shorebird populations within the Western Hemisphere (WHSRN 2021). The area is a designated as a Western Hemisphere Shorebird Reserve Network site of International Importance (WHSRN 2021), and as an Audubon Important Bird Area of Global status.

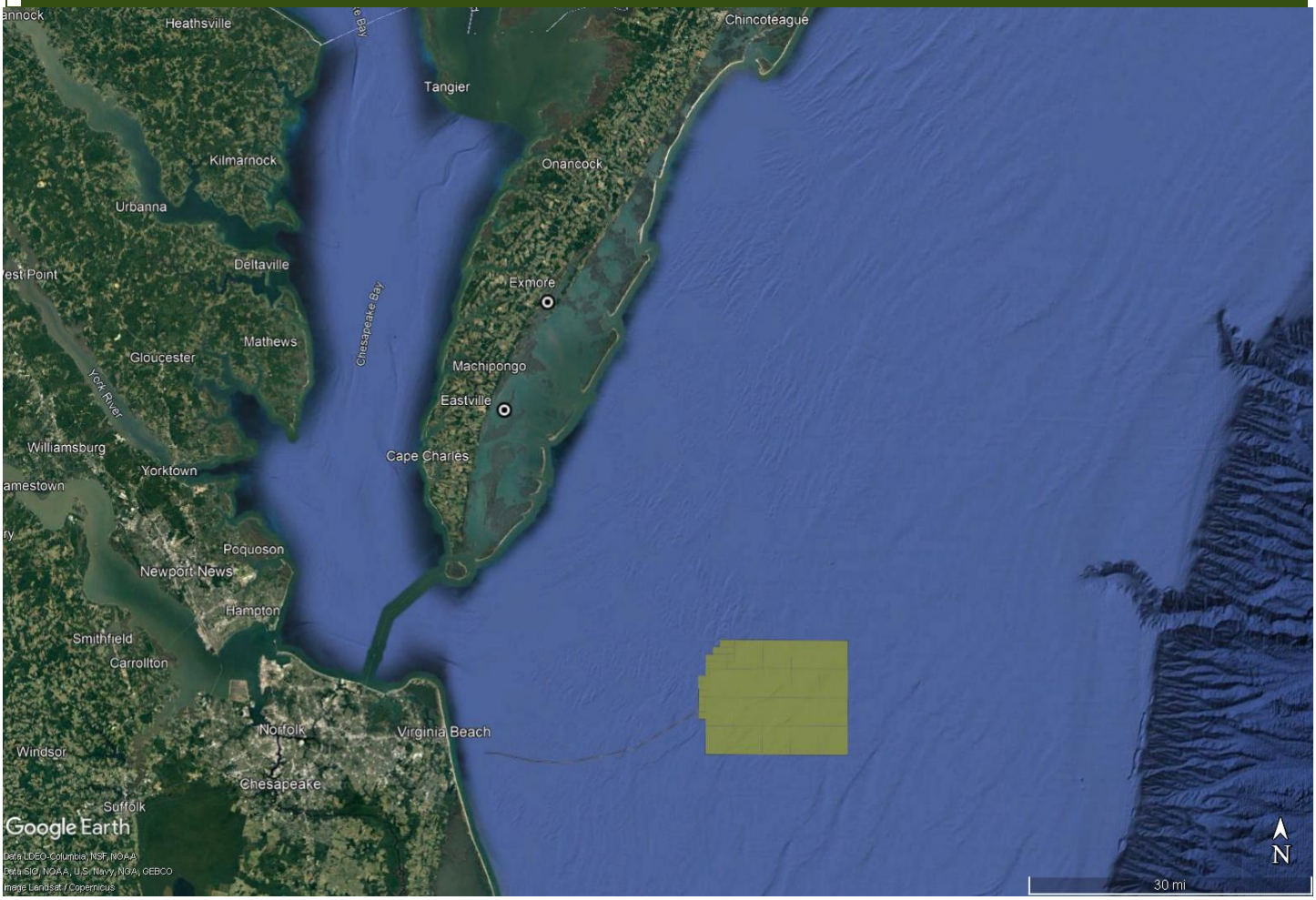
Recent evidence shows that whimbrel (*Numenius phaeopus*) leaving the Eastern Shore do transit the CVOW-C lease area during fall migration (Watts et al 2022). Additional information is needed, however, to better understand the potential interactions between this species of conservation concern and the lease area. Importantly, past data does not include altitude measurements which can now be acquired with improved tracking technology. Whimbrel represent a suite of migratory species that likely cross over the outer continental shelf during fall southbound migration from the Eastern Shore of Virginia to nonbreeding areas in Central and South America. Additional information about their migratory pathways will advance our understanding of the likelihood and severity of exposure risk of this broader suite of species to the CVOW project and inform future efforts to avoid and minimize negative impacts to these populations.

METHODS

Study Area

The focal area for the effort is Virginia's Eastern Shore (Figure 1), which is a major autumn staging zone for whimbrels preparing for trans-Atlantic flights towards their wintering grounds (Watts et al 2021). We targeted roosting areas used for past studies (Watts et al 2021) as well as roosting areas observed during the 2022 staging period near Willis Wharf and Red Bank, VA.

Figure 1. Study area with capture locations used during the 2022 autumn migration on Virginia's Eastern Shore. The yellow shaded area represents the CVOW-C lease area and the black and white dots represent whimbrel capture areas.



Capture Protocol

We used arrays of noose carpets (2'X4') and noose lines (25' long) to capture whimbrel. Noose carpets were constructed from galvanized welded wire garden fence with 2"X4" mesh and nooses made of 20 or 30 lb test monofilament were tied every few inches along the mat. Noose lines were constructed from parachute chord and 20 pound monofilament. Noose carpets and noose lines were set along shell rakes and firm mud embankments that whimbrels used for roosting during high tide or as the tide rose and covered mud flats that whimbrels use for foraging. We set noose lines and noose mats ≥2 hours prior to high tide and observed the traps constantly with spotting scopes and binoculars from boats and positions in nearby marshes. As whimbrels were captured in traps, we boated to the capture locations, extracted whimbrels from the nooses, and placed the birds in transport boxes. Whimbrels are subject to capture stress, particularly during hot weather, so we transported most birds to a parking area at nearby boat launches for processing. We processed a few birds that were captured during cool temperatures in the boat. Processing included measuring wing chord, tail length, bill length, collecting 5 breast feathers to genetically sex birds, applying a federal aluminum band, a field readable flag, and a transmitter. After processing was complete, birds were tested to confirm they were mobile after transmitter attachment and released at the processing location.

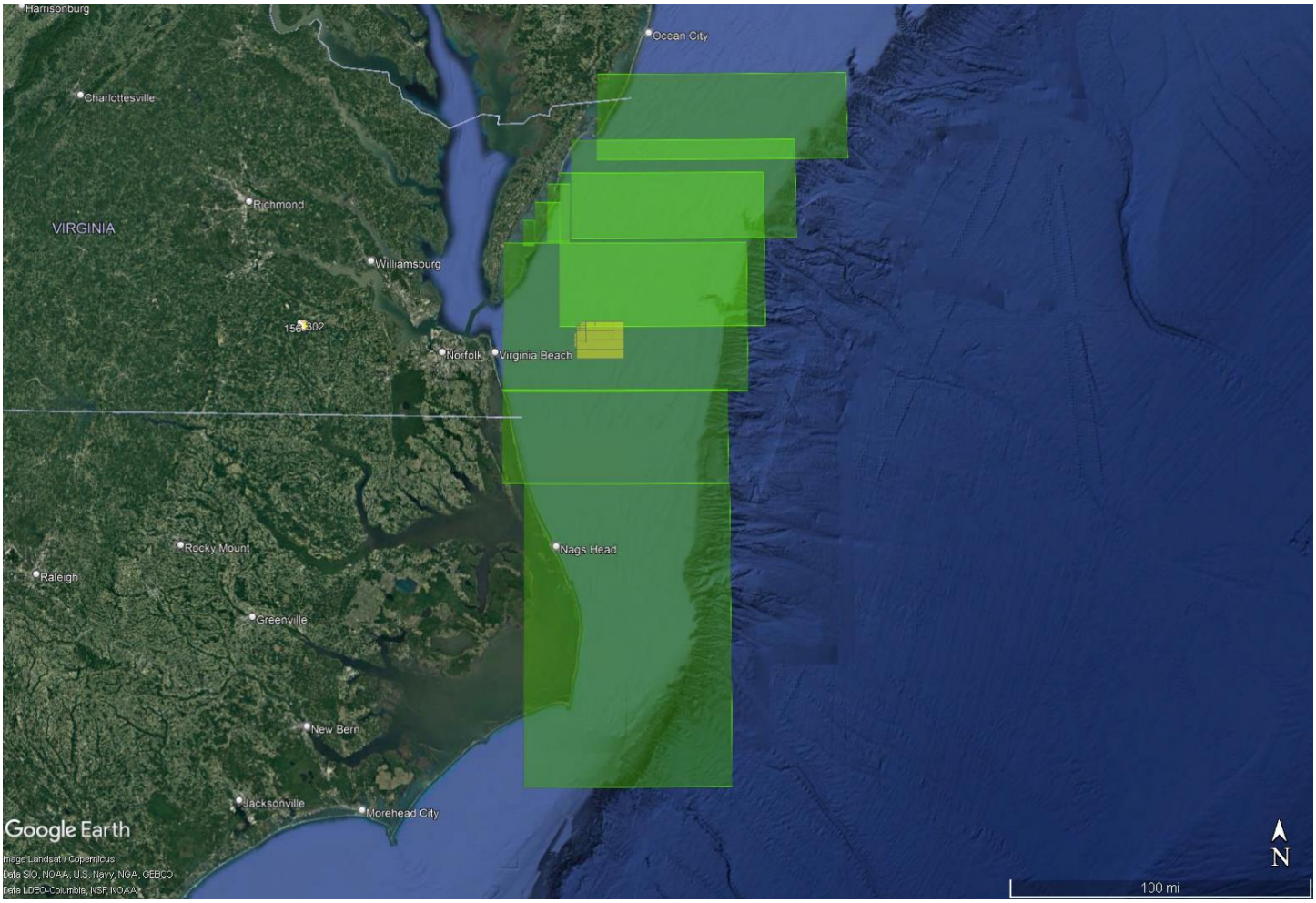
Tracking Details

The transmitter used for tracking the birds was an Ornitrack-9 tag (9.4 g) and we used a modified version of the Rappole and Tipton technique (Rappole and Tipton 1991) to attach the transmitter. This transmitter communicates to GSA networks through cellular communications towers and movements can be viewed at an online dashboard operated by Ornitella. Transmitters were programmed to record date, time, latitude, longitude, altitude, instant acceleration (x, y, and z-axes), speed, direction, magnetic field strength (x, y, z-axes), battery voltage, and temperature during intervals ranging from once per 15 seconds to once per hour, depending on location and battery power (Table 1). More frequent observations occurred at higher battery power and within geofenced areas that we constructed to cover coastal areas extending out to the continental shelf (Figure 2).

Table 1. Data collection frequency for transmitters at various battery levels and when transmitter is within or outside geofenced areas.

	Data Collection Frequency	
Battery Power	Within Geofence	Outside Geofence
75-100%	0.25 minutes	10 minutes
50-74%	0.5 minutes	15 minutes
25-49%	1 minutes	30 minutes
0-24%	2 minutes	60 minutes

Figure 2. Geofenced areas constructed to cover the continental shelf outside of the state of Virginia during the 2022 autumn migration. The yellow shaded area represents the CVOW-C lease area.



RESULTS

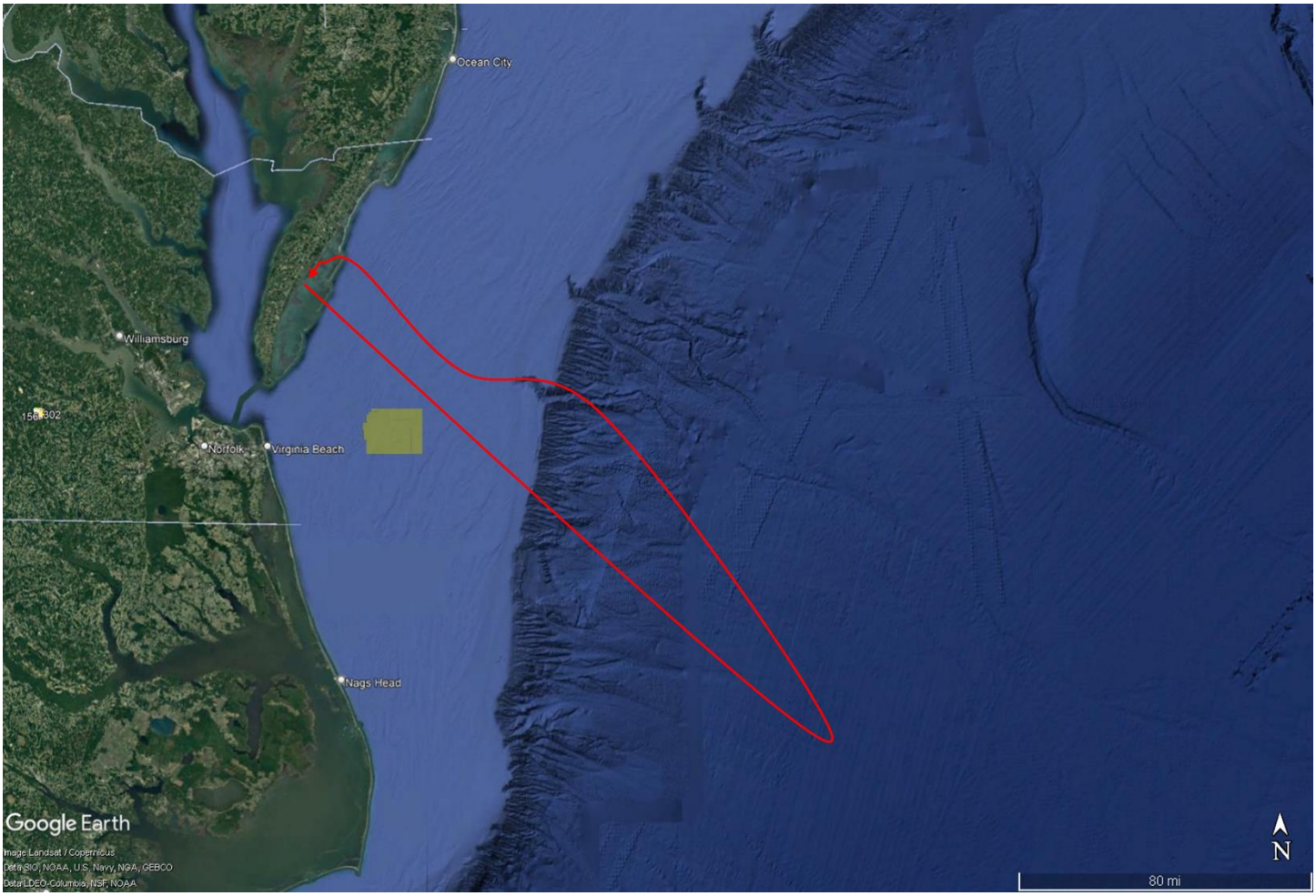
During the 2022 field season, we captured 18 whimbrel, including 13 female and 5 males. We attached transmitters to 15 birds including 12 females and 3 males. We monitored all birds through the online dashboard to confirm that the birds were alive and making normal movements to and from roosting areas and foraging areas.

We observed one bird restricted to making short movements for several days within a marsh that was typically used for nocturnal roosting. Though the bird had begun to make longer flights (> 1 km) we visited the location and located the bird to determine if the bird was impaired. The bird was captured by hand and exhibited evidence of an attack from a bird of prey (i.e, puncture wounds). The transmitter was removed but wounds appeared to be healing so the bird was released to recover on its own.

We detected one aborted transatlantic migration when a whimbrel began a migratory flight on Aug 29 at 5:45 PM EST but turned back on Aug 30 at 1:22 AM approximately 330 km southeast of the departure location, which was approximately 160 km west of the nearest portion of the continental shelf (Figure 3). The nearest that the bird's flight path was to the wind turbine lease area was seven kilometers from the northeast corner. It achieved an altitude higher than the turbine tip height from mean water level (245-265 m) at approximately 2 km east of Hog Island and continued increasing altitude to a maximum of approximately 3,500 m <4 km west of the outer continental shelf. The bird then began a descent near the continental shelf and reached an altitude near sea level at 50 km east of the continental shelf. This whimbrel continued flying near sea level for 140 km before turning around and returning to the eastern shore. The bird returned to the same general area where it departed from and exhibited typical movements until 07 September. We received transmissions on 22 September that were consistent with a mortality event. We have received no transmissions since then and were unable to locate the bird or tag at the last known coordinates.

For all other captured birds (n = 13), we continued receiving transmissions for an average of 19.3 (±2.4 SE) days after capture with the average last date of transmission being 26 August. Mismatched 4G cellular protocols between North and South America prevent data uploads on the birds winter grounds in Brazil. These birds will transmit data from autumn migration once they return to North American cellular network coverage during their spring migration.

Figure 3. Stylized track for bird that made aborted migratory flight near the CVOW-C lease area. The red line represents the flight track of the bird and the yellow shaded region represents the CVOW-C lease area.



FUTURE DIRECTION

Whimbrels will begin returning to North America in March 2023, which is when we will receive data collected during their trans-Atlantic flights as well as during winter and spring migration. We will apply 15 new tags as well as the tag recovered from the injured bird during the 2023 autumn migration.

ACKNOWLEDGMENTS

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