Avian Survey
Trip Report for Arctic Sunrise in the Sargasso Sea
May 2024

Bermuda Audubon Society

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Purpose

This report details observational expeditions conducted aboard the Greenpeace vessel, Arctic Sunrise, and aimed at recording seabird species during two voyages. The first voyage followed a transect from Nassau, Bahamas to Bermuda, and the second journeyed south from Bermuda. Both voyages occurred in May 2024.

The ship tour supported the efforts of Greenpeace UK to highlight the ecological importance of the Sargasso Sea and showcase its unique biodiversity. They are calling on the UK Government to pass the UN Global Oceans Treaty into UK law before June 2025. Ratification of this Treaty will lead to the establishment of ocean sanctuaries which would contribute to the global goal of protecting up to 30% of the world's oceans by 2030. In particular, the Treaty would allow for the protection of areas of international waters beyond national exclusive economic zones (EEZs).

Greenpeace, as part of the High Seas Alliance, has identified a number of priority sites to be protected in the first instance as soon as the Treaty comes into force. The Sargasso Sea is designated as one of these priority sites, and gathering data on species distribution across the Sea is critical to building the case for protection.

In addition to listing the species observed, this report provides a short description of the species' life histories to assist in understanding why these species were observed in the Sargasso Sea. We also provide a brief overview of issues relating to the High Seas Treaty and the Sargasso Sea.

Introduction

The oceans cover 71% of Earth's surface and are fundamental to the planet's health and a sustainable future. The oceans generate half of the oxygen we breathe, regulate weather patterns and climate, and act as a massive heat sink, absorbing 91% of the excess heat from climate change (Lindsey & Dahlman, 2023). Beyond their environmental functions, the oceans are a critical source of nutrition, providing 15% of the world's protein intake and providing jobs for millions of people. The oceans also underpin global trade and transportation, forming the backbone of the international economy. Protecting and maintaining the health of our oceans is not just an environmental imperative but a fundamental necessity for human survival and prosperity.

Despite their crucial role, the oceans have been severely mistreated in recent history. They have become the ultimate dumping grounds for much human and industrial waste. Pollution from land includes runoff, oil, pesticides, plastics, and other toxic chemicals that endanger ocean ecosystems and human health (Landrigan et al., 2020).

Whaling and overfishing threaten key marine species, while discarded fishing gear poses additional risks. The UN Food and Agriculture Organization (FAO) estimated that a third of the world's fish stocks are overexploited, stating that "Fishery resources continue to decline due to overfishing, pollution, poor management, and other factors…" (FAO, 2022). Within these numbers are regional and species-specific issues pointing to the need for better management of our fish stocks.

Offshore drilling has led to major oil spills which contaminated ecosystems and now deep-sea mining threatens not just deep ocean benthic marine communities, but the upper water column as well. The global shipping industry traveling over the oceans is responsible for a significant amount of greenhouse gas and nitrogen oxide emissions and is a source of ocean noise pollution. All these and other threats put our oceans at significant risk.

To mitigate threats to our oceans, Marine Protection Areas (MPAs) have become a valuable tool for managing marine ecosystems (Watson et al., 2014). Most MPAs occur within the EEZs of various nations with 18% of waters within national jurisdictions designated as protected. However, less than 2% of Areas Beyond National Jurisdiction are covered by MPAs (Protected Planet, 2024).

There is a widespread agreement among scientists and an increasing political recognition that by 2030, at least 30% of the global ocean should be designated as fully or highly protected areas, with the remaining 70% being managed sustainably (Cruz et al., 2023; Grorud-Colvert et al., 2021; Laffoley et al., 2022). After two decades of advocacy by organizations including Greenpeace, and in recognition of the need to protect Areas Beyond National Jurisdiction, the United Nations adopted the High Seas Treaty in June 2023. Officially known as the Agreement on Biodiversity Beyond National Jurisdiction, or 'BBNJ Agreement', this Treaty aims to establish a broad network of Marine Protected Areas (MPAs) on the high seas. The Treaty sets a framework which 'will help ensure that at least 30% of the ocean is effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas, and other effective area-based conservation measures by 2030' (The Nature Conservancy, 2023). However, for the agreement to take effect as international law, it must be ratified by sixty countries by 2025.

Greenpeace is promoting the ratification of the Agreement by the UK and other Governments. If the treaty is ratified, it is hoped that an MPA will be created in the Sargasso Sea, an area in the central Atlantic and bounded by the currents of the Gulf Stream, the North Atlantic Drift, the Canary Current and the North Equatorial Current. These currents create a gyre in the central Atlantic with rich and diverse ecosystems, which are key habitats for diverse migratory birds, sharks and cetaceans. European and American eels reproduce in the Sargasso Sea.

Hallett (2011) emphasized that the health and sustainability of the Sargasso Sea's environment are directly linked to Bermuda's economic well-being and food resources. Therefore, protecting and preserving this marine ecosystem is crucial for the island's continued prosperity and food security. The Sargasso Sea Commission has been advocating recognition and protection of this significant area since 2014 (www.sargassoseacommission.org). Current research, supported by the UN FAO Common Oceans Program and the Global Environment Facility (GEF), is building the rationale for a High Seas MPA in the Sargasso Sea.

The Sargasso Sea holds immense importance on a global scale. The economic contributions derived from its waters are substantial, totaling hundreds of millions of dollars. Specifically, the fishing industry within its boundaries generates approximately $160 million annually, while whale watching activities, involving whales that spend part of their lives in the Sargasso Sea, contribute around $500 million to the global economy. Although the precise values of its carbon sequestration, nutrient cycling, and oxygen generation functions remain to be completely quantified (Laffoley et al., 2011 and Pendleton et al., 2014), these ecological services undeniably support global economic stability and sustainability. Therefore, investing in the preservation and study of such ecosystems ensures the continued provision of these invaluable natural services.

One of the dominant ecosystems found in the Sargasso Sea is created by the namesake, the floating *Sargassum* algae. There are three forms of this pelagic brown algae *Sargassum natans I, S. natans VIII* and *Sargassum fluitans III*. *Sargassum* spp. can form large floating mats or may be dispersed in small clumps or windrows of varying lengths and widths. *Sargassum* creates a unique habitat for a wide range of marine life that live within or attached to the algae, including fishes, crustaceans, mollusks, hydroids, polychaetes, turtles and others. These mats also serve as a food source for other marine species, which also include seabirds. Seabirds have been found in higher numbers where *Sargassum* mats occur (Haney, 1986) and it has been observed that seabirds are

attracted for the foraging opportunities presented by the mats (Martin, 2016). Moser concluded that "Sargassum community is critical for feeding for some western North Atlantic seabirds." Four species of birds in particular could be considered Sargassum specialists including Audubon's Shearwater (*Puffinus Iherminieri*), Royal Tern (*Thalasseus maximus*), Bridled Tern (*Onych oprion anaethetus*), and Red-necked Phalarope (*Phalaropus lobatus*) (Moser, 2012). A close inspection of even a small sample of *Sargassum* from the open ocean will reveal that these mats and windrows can provide a rich food source for birds.

Pelagic seabirds are an excellent indicator species for the marine environment (Paiva, 2022). As wide-ranging top predators, they are sensitive to changes in the abundance of their food sources and other environmental factors. Changes in marine ecosystems caused by fluctuations in nutrient levels, temperature (Furness, 2016) or fisheries pressures (Votier et al., 2023) may be reflected in changes in seabird populations.

In support of Greenpeace's mission to highlight the importance of the Sargasso Sea to the UK Government, two conservationists from the Bermuda Audubon Society joined the *Arctic Sunrise* in Nassau, Bahamas for a voyage north to Bermuda. Our task was to document the seabird life along the transect from Nassau to Bermuda from 1 May 2024 to 5 May 2024. The observers were Paul Watson and Erich Hetzel. A second voyage to approximately 250 nm south of Bermuda followed on 12 May through 16 May.

Methods

Observers kept a continuous watch from under the ship's bridge during daylight hours (approximately from 0600h until 2000h) for birds and marine life in a proscribed transect (see below) and beyond. Observers were the two Audubon observers though infrequently only one. Occasionally several casual observers would assist in spotting. The only exception to this was a period between 0800 and 0830 local time each day when there were no observers.

The intended observation method was the Tasker approach (Tasker et al.,1983) as further defined by Lewis & Dunn (2020). All record times were noted in UTC, unless noted as local time. Sightings were later transcribed into eBird where they are recorded as local time which are used in the appendices.

eBird is the data entry and analysis website operated by Cornell Lab of Ornithology which supports citizen science in the research of worldwide bird life (www.ebird.com). When entering data into eBird, each group of sightings at a particular place and time is entered as a 'checklist' and each place is described using a name supplied by the observer if not already in existence.

The Tasker protocol considers only birds sighted within a 300 m 'box' extending from the observer's position forward and to one side of the ship at 90 degrees from the observer as 'in transect'. This method is ideal to avoid double counting of seabirds in dense concentrations and also for quantification calculations. Seabirds on this voyage were usually sparse and thus, for the purposes of this voyage, all birds were counted, though if they would be considered 'not in transect' this was noted in the record. The only exception to this was during second voyage south where large numbers of White-tailed tropicbirds were observed in sufficient numbers to require moving to 10 minute transects.

As a note, we saw relatively few birds that were 'not in-transect'. Most birds, even those approaching from the stern, would eventually cross the bow in flight. In addition, only a relatively low number of birds were observed sitting on the ocean and those were mainly White-tailed

tropicbirds, but they were noted in the raw data as required by the protocol but not transcribed into eBird. In most cases they would alight as the ship approached.

Positions were recorded either from the ship's navigational GPS or a handheld Garmin GPS and recoded to the nearest 0.1 minute of latitude and longitude.

Certain species were possibly ship-attracted, particularly White-tailed Tropicbirds and the Brown Booby. When we believed that the White-tailed Tropicbirds birds were circling the ship or reappearing, we did not count those individuals.

Generally, the ship was steaming during the voyages, though there were periods where we drifted to facilitate eDNA sampling; *Sargassum* sampling; the removal of 'ghost' fishing gear; or we drifted at a point of interest.

Appendix 1 & Appendix 2 contains a tabular list of all birds observed and provides both the English common name and the Latin species name.

Appendix 3 & Appendix 4 provide a list of each sighting record using local time. Note that the Location names (numbers) are intentionally not always continuous and are for eBird data entry purposes. These locations can be referenced in eBird.

Refences to IUCN Conservation status can be found at the Birdlife International website https://datazone.birdlife.org

The distance from Spanish Wells, Eleuthera Bahamas to Hogfish Beacon at the SW end of Bermuda is 1892 km or 746 nm. The average cruising speed of the ship was approximately 9 knots.

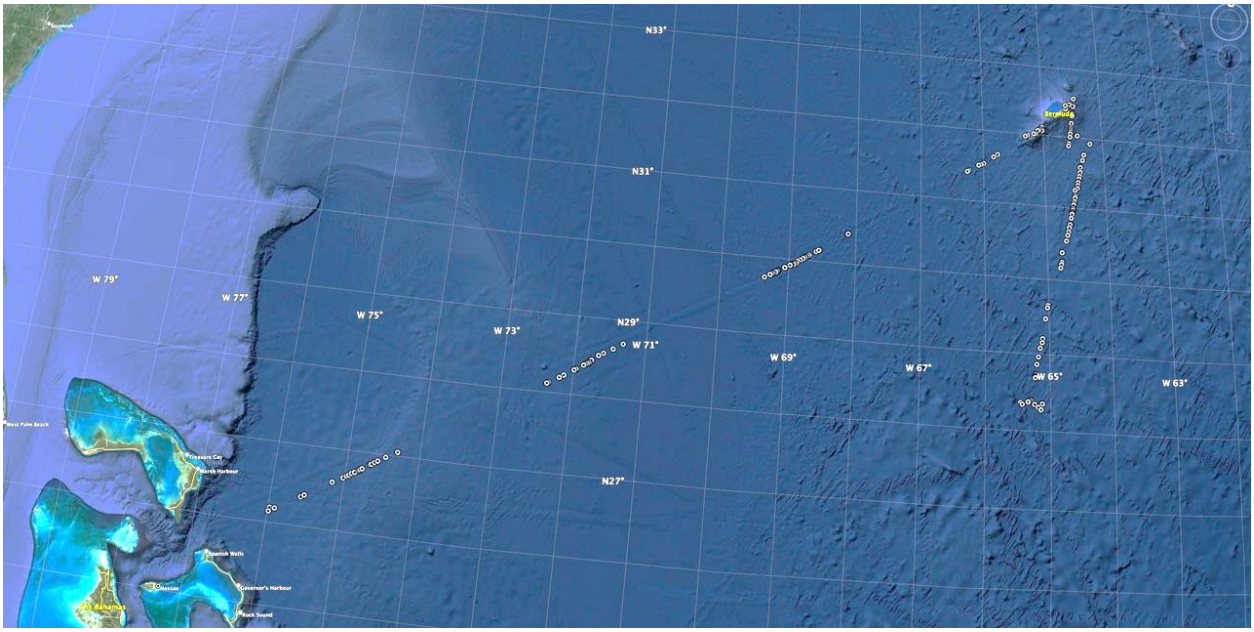

Figure 1. Route of Arctic Sunrise with the positions of observations displayed. Voyage One is represented by the west track from the Bahamas and Voyage Two with the east track. Each circle on the map represents an observation point.

Observations for Voyage One
The ship departed Nassau on 30 April 2024 at 1700h EDT. The Nassau Harbour bird counts were not included in this report, though notably over 500 Laughing Gulls were observed within the Harbour. Due to the evening departure of the ship, we passed close to the northern tip of Eleuthera and out to the open ocean at around midnight. As a result of the nighttime passage, many tropical species which we had hoped to observe in this area were not observed.

The observations which follow include brief descriptions of the species' natural histories. These descriptions are from Cornell University *Birds of the World* website at www.birdsoftheworld.org unless otherwise noted. That website is extensively footnoted.

In total for the voyage 142 individual birds were observed representing 19 species.

May 1 – Day One
Observations began at dawn on 1 May 2024. The weather on this day was fair with a sea state of 4, OKTAS clouds ranging from 3 – 8 and wind 10 knots from the east, increasing slightly during the day. The ship's heading was approximately 60 degrees with the speed averaging at approximately 9 knots. Local time at this longitude was UTC-4 (EDT).

In total on the first day twenty-eight (28) individual birds were sighted comprised of twelve (12) species. Most numerous were storm petrel species as a group, which included three (3) Wilson's and one (1) Leach's. As a single species the most numerous birds sighted were four (4) Great Shearwaters. There were also two (2) White-tailed Tropicbirds, two (2) Sooty Shearwaters, one (1) Manx Shearwater; two (2) Audubon's Shearwaters; two (2) Arctic Terns, two (2) Pomarine Jaegers, one (1) Parasitic Jaeger, one (1) Laughing Gull, one (1) Gray Catbird and six (6) birds that could not be identified to species level which included terns, storm petrels and a jaeger.

The first bird sighted on this day was an Audubon's Shearwater which is a tropical species of shearwater. This sighting was approximately 100 km NE of Eleuthera. A second Audubon's Shearwater was sighted six hours later at approximately 200 km from Eleuthera. Along with the Manx Shearwater, which the Audubon's resembles, the Audubon's Shearwater is the smallest shearwater species we expected to observe on this voyage. The Audubon's Shearwaters breed in Brazil, Panama and throughout the West Indies, including the Bahamas and we had anticipated seeing this species near the Bahamas. Population estimates range widely from 3,000 pairs to 20,000 pairs, but the species conservation status has not been evaluated based on IUCN criteria. The Audubon Shearwater was once a breeding bird of Bermuda but was extirpated within living memory (D. Wingate pers. comm.). These birds tend to follow the Gulf Stream north when not breeding, so we did not anticipate sighting this bird once we left the EEZ of the Bahamas, though they are not unknown to wander and are seen in Bermuda on occasion.

The unexpected bird of the day was the Gray Catbird sighted flying alongside the port side of the boat for several minutes at 9:20 EDT flying against the wind in a NE direction approximately 150 km from Eleuthera. The Gray Catbird is a common breeding bird in Bermuda, but it has long been suspected that there are also migratory Catbirds arriving in Bermuda (D. Wingate D pers. comm, May 2024). This bird is a common North American passerine which migrates south into the southern US, Central America and the Caribbean in winter. Based on eBird records there have only been a handful of other sightings of these birds at sea. Some of those are ship landings closer to the US coast by ships that appear to be heading to or from Bermuda. eBird records and Bermuda banding data of fall Gray Catbird with low body weights indicating possible recent arrival in Bermuda (P Watson unpublished) point to the need to investigate possible intentional Gray Catbird overwater migration.

Great Shearwaters are transequatorial migrants that are austral breeders. Their conservation status is Least Concern with as many as 15 million birds thought to exist. These are commonly observed during sea watches from the shore of Bermuda in the spring with peak numbers being seen in May and June as recorded in eBird.

We observed two (2) Sooty Shearwaters, a species that breeds in vast colonies on islands in the southern Pacific and Atlantic Oceans, specifically off southeast Australia, New Zealand, and Tierra del Fuego in South America. Although some breeding sites for the Sooty Shearwater support over 2.5 million pairs, the species is still classified as Near Threatened. This classification is supported despite an estimated global population of around 20 million birds, as recent studies indicate a declining trend and it has been suggested that this species should be categorized as 'vulnerable' (Scott et al., 2008). These birds breed during the southern hemisphere summer and are found across all the world's oceans. They are less common in the central north and central south Atlantic. Known as one of the most prevalent seabirds, they migrate northwest following the prevailing winds after breeding season and reach the eastern Atlantic late in the local summer. In Bermuda, sightings of these birds typically peak in May.

One (1) Manx Shearwater was observed. The Manx is another long-distance pelagic migrant. This bird is also the most northern breeding shearwater. Though it breeds in North America, the largest concentrations are found in Europe from the Faroe Islands to the Canary Islands. They spend the northern winter in the in the southern Atlantic off the eastern coast of South America. Peak migration past Bermuda occurs in March and April but continues through May and early June. We would assume that the few Manx we observed were migrating to breeding grounds in North America, through migration routes of the various populations are not well understood. The Manx Shearwater is not considered threatened and is listed as Least Concern.

Three (3) Wilson's Storm Petrels were seen. The Wilson's Storm Petrel is one of the most common seabirds in the world. This austral breeder is found in most oceans, migrating north in the austral winter, though rarely found north of 45 degrees latitude in the Pacific. In the Atlantic, the Wilson's Storm Petrel is a common seabird bird to observe from April until June in Bermuda. Based on eBird records and older studies (Powers, 1983) it would appear that the Wilson's Storm Petrel is more common on the waters of the North American Continental shelf in the northern summer. Feeding mainly on fish and crustaceans at the surface by 'dipping' or picking items from the surface of the water, these birds often appear to walk on the water. Given their diet, it could be conjectured that this bird's diet could be more associated with *Sargassum* mats in the north Atlantic than many others and there are a few observations to confirm this. With a population estimated at between 4 – 10 million, the Wilson's Storm Petrel has a conservation status of Least Concern.

One (1) Laughing Gull was seen and this would be the only sighting we would have of this species. This is a common Caribbean and Atlantic species and year-round resident in the Bahamas. As noted above, a large number were seen in Nassau Harbour at the time of the ship's departure. Breeding from Mexico and as far north along the US coast as Maine this Gull's conservation status is Least Concern. These Gulls are occasional vagrants in Bermuda.

Two (2) Arctic Terns were sighted early on this day. This Arctic Ocean breeder has one of the longest migrations of any bird species. Arctic Terns breed in the high latitudes of the Arctic Ocean and then migrate to the Antarctic Ocean during the northern winter. It is stated that this is at least a 40,000 km annual round trip migration. Away from the breeding colonies these terns are pelagic and commonly seen when passing Bermuda in the spring. With a global population estimated at more than 2 million individuals, the conservation status of this species is Least Concern.

May 2 – Day Two
The second day of the voyage dawned clear and bright with light winds at 10 knots from the East with a sea state of 2 -3. The time shifted to Atlantic Daylight Time so our time was UTC -3. Our heading remained unchanged at 60 degrees. The first sighting of the day was recorded approximately 520 km NE of Eleuthera.

On Day Two we observed forty (40) individual birds from nine (9) species. The storm petrels represented the largest numbers of birds with eighteen (18) seen. These included nine (9) Wilson's and seven (7) Leach's Storm Petrels and three (3) others which could not be identified to species. Other previously observed species seen included eight (8) White-tailed Tropicbirds, two (2) Great Shearwaters, One (1) Manx Shearwater, one (1) Parasitic Jaeger and one (1) unidentified jaeger. The new species for this voyage was one (1) Sooty Tern, one (1) Barn Swallow and six (6) Sabine's Gulls.

The Sooty Tern is a tropical tern which breed in the West Indies, including the Bahamas. They breed widely in the tropical and subtropical equatorial belts across all the oceans of the world. Pelagic when not nesting, their movements are not well understood, however they are not normally observed out of their equatorial range. The Sooty Tern, which once bred on every tropical island group, has been extirpated from many, including Bermuda, due to habitat loss, the introduction of predators, and hunting. When Bermuda was first discovered in 1609, one of the *Sea Venture* colonists recorded the abundant presence of what is believed to be Sooty Terns. They are rarely observed in Bermuda now. The Bermuda Audubon Society has a long-term program that uses sound and decoys to encourage Sooty Terns to breed again on government-protected islands. The Sooty Tern has a conservation status of Least Concern.

Seven (7) Leach's Storm Petrels were seen. This seabird is a northern hemisphere breeder, found nesting on northern islands from Japan, Alaska, California, the northeastern US and Canada, Norway and the UK and other locations. It is estimated that there are more than six million nesting pairs. The Leach's Storm Petrel exhibits a similar feeding behavior to the Wilson's Storm Petrel. Unlike the Wilson's Storm Petrel, this bird does not migrate far into the opposite hemisphere during its winter, though eBird has few winter data points for this species. The conservation status of the Leach's Storm Petrel is Vulnerable due habitat degradation by human activities and predatory mammals. There is no record of Leach's Storm Petrel nesting in Bermuda. In 2016 however one bird did occupy a Bermuda Petrel (*Pterodroma cahow*) burrow for three consecutive years (Nonsuch Expeditions, 2019).

A Barn Swallow was observed flying north. Barn Swallows and other swallow species are seen in Bermuda during the spring as they migrate north, although they do not breed in Bermuda. It was therefore not surprising to see one on this voyage.

The most interesting birds observed on Day 2 were the six (6) Sabine's Gulls. Though seen at 300m distance, a picture confirmed this small gull's distinctive colouration patterns. Breeding mainly at high latitudes of Alaska, Canada, Greenland, Spitzbergen and Russia, this gull spends the winters foraging in the sub-tropical and tropical upwelling zones. Usually, a coastal migrant, these gulls are only rarely observed at sea. This gull is listed as Least Concern with a stable global population of between 300,000 – 700,000 individuals. Due to their small numbers and coastal migration patterns, they are rarely seen at sea or in Bermuda, so this was an exciting observation.

Notably on Day Two we stopped to make observations at a noncontinuous windrow of *Sargassum* that was approximately one kilometer long by up to several meters in width. Breaks in the windrow were up to several meters in length. We stopped the vessel and a RHIB was deployed so that divers

could go under the mat to film and make observations. Later we accompanied the RHIB to collect plastic from the *Sargassum*. In doing so we were able to observe the rich diversity of life in the algae. During the 2 hours we were stopped, we observed four (4) Wilson's and three (3) Leach's Storm Petrels (included above) feeding on fauna living in the *Sargassum* mats. In addition, one (1) Great Shearwater and one (1) White-tailed Tropicbird were observed in the area. The Great Shearwater was actively feeding on fish that were along the edge of the mats.

The Sargassum mat contained a large amount of plastic debris. Most of this material appeared to be less than 20mm in size, such items as bottle caps and plastic fragments, but also included larger shoes, buoys, disposable lighters, plastic utensils, strands of rope, entire plastic bottles, along with numerous large and small unidentifiable fragments. Most concerning to the authors was the fact that when the Sargassum was disturbed, there appeared to be a 'snow' of micro plastics falling from it.

To close out the day we observed a pod of twenty or more Pilot Whales for over an hour. These were short-finned pilot whales (*Globicephala macrorhynchus)* that are known to frequent the tropical and temperate seas and live in stable groups of related individuals.

May 3 – Day Three
Day three dawned clear and calm and continued that way throughout the day, with only scattered clouds (OKTAS 4). Winds were further reduced during the day to 3 knots and then to flat calm later. Dawn was a bit later based on local time so, observations began around 0700 ADT.

The first sighting of the day, a Leach's Storm Petrel, was observed approximately 851 km NE of Eleuthera and 519 km SW of Bermuda. Eight (8) species of birds were observed on Day 3 and fifty-five (55) individuals. Most numerous were the storm petrels with eighteen (18) Leach's and nineteen (19) Wilson's observed. Five (5) White-tailed Tropicbirds, one (1) Great Shearwater, one (1) Manx Shearwater, one (1) Sooty Shearwater, one (1) Roseate Tern, one (1) Parasitic Jaeger, and eight (8) birds that could not be identified to species were seen during the day.

Several new birds were seen on May 3. The most notable sighting was the Roseate Tern in the early afternoon as it flew up alongside and then over the bow of the ship. The Roseate Tern has a conservation status of Least Concern. It is estimated that there are approximately 200,000 individuals that breed in just a few scattered tropical locations that include the West Indies, the Indian Ocean Islands and the South China Sea to Thailand. They also breed along the northeastern US and Canadian coasts in a few large colonies and consistently at one location in the UK.

The sighting of the Roseate Tern from the *Arctic Sunrise* was significant, as this species has resumed breeding in Bermuda and was expected to arrive there this year in May. Like the Sooty Tern, the Roseate Tern was a common breeding bird in Bermuda during early colonial times. Unfortunately, it was extirpated by the colonists. One-hundred and sixty-nine years after they were last seen breeding in Bermuda, in 2018, a pair of Roseate Terns nested on Pearl Island in the Great Sound of Bermuda. That pair successfully raised one fledgling which departed in late August that year. Since that year, a pair have returned every year, sometimes with one additional tern. One year there were two pairs of Roseate Terns that bred on Pearl Island. Unfortunately, after three years of successfully raising fledges, the subsequent years' eggs have been infertile. When we observed this tern flying northeast, we were hopefully that it was on its way to Bermuda. Since our return to Bermuda, up to five Roseate Terns have been observed on Pearl Island.

On this day we also sighted one warbler and one species that could have been either a warbler or a vireo. Neither of these small songbirds could be identified to species. The first was logged as a New

World Warbler and the second as an unidentified passerine. These birds are commonly seen in Bermuda in the fall, as the Atlantic flyway to Central and South America passes directly over the Island. In the spring, warblers and other passerines heading to breeding grounds in the eastern US and Canada tend to follow a coastal route going north, rather than flying over the open ocean. However, some do stray over the water and find their way to Bermuda.

Six (6) White-tailed Tropicbirds were seen. These beautiful birds with long white tails are common breeding birds in Bermuda and the Bahamas. In Bermuda they breed from April until August. Consequently, we had expected to see them on foraging expeditions for the duration of the journey. White-tailed Tropicbirds are found in most tropical and subtropical seas of the world. Definitive population estimates are lacking, but in Bermuda is believed the population exceeds 2,000 breeding pairs. The conservation status of the White-tailed Tropicbird is Least Concern with a global population estimated to be less than 200,000 pairs.

The day's end brought completely flat calm seas which allowed a rare treat for the ship's crew to briefly swim in the sea. During the swim, we caught sight of a Parasitic Jaeger and a Tropicbird overhead, treating us to an impromptu performance. These Arctic breeders aptly earn their name due to their kleptoparasitic tendencies. Jaegers relentlessly pursue other birds until the harassed bird regurgitates their food, which the jaegers then consume. For nearly a minute, we had a front-row view of this spectacle as the Parasitic Jaeger chased the Tropicbird. Jaegers trail migrating seabirds, making sightings in Bermuda quite common in the spring as the shearwaters stream past Bermuda. In winter, they head to the southern latitudes where they continue to harass seabirds, although some remain north of the equator during this season as well.

One unknown whale was seen just at midday. Later in the afternoon two humpbacks (*Megaptera novaeangliae*) were seen breaching once and then disappeared.

May 4 - Day Four
Dawn found us approximately 174 km or 94 nm from Bermuda, continuing on a northeast heading of 57 degrees at a speed of 9 knots. The skies had scattered clouds. Our heading later shifted to 70 degrees as we turned for Plantagenet Bank, locally called Argus Bank by Bermudians. The winds were light at 10 knots though increasing to 15 knots later in the day.

This penultimate and the final day were the most surprising days of the journey, notable for the relative absence of birds. This lack of sightings was surprising considering our proximity to Bermuda and our later arrival at Bermuda's southern offshore marine banks which are located just south of the island. Commonly referred to as 'the Banks,' by Bermudians, these areas are well-known aggregation points for whales, fish, and seabirds. Plantagenet Bank is the furthest from the Island at 23 nm and Challenger Bank is 14 nm from Bermuda. Both rise to approximately 50 m from the surface.

During the entire day we saw only fourteen (14) birds in transect from seven (7) species. These were three (3) Leach's Storm Petrels, four (4) White-tailed Tropicbirds, one (1) Manx Shearwater, one (1) Pomarine Jaegar, one (1) Parasitic Jaegar, one (1) Barn Swallow and one (1) South Polar Skua. Two (2) additional Jaegers were seen that could not be identified to species. Other White-tailed Tropicbirds were seen in the distance but were not counted to avoid count duplication.

The South Polar Skua sighting was notable and was a species we had assumed we would have observed sooner. This species is another long-distance migrant, breeding on the margins of the Antarctic continent and migrating north in the austral winter for the higher latitudes of the Atlantic and Pacific. In addition, it can be found in the Indian Ocean during its winter. South Polar Skuas

tend to be pelagic when not breeding, with a diet that is assumed to be fish actively caught and meals scavenged from other birds. We did manage to get a good picture of this bird as it flew alongside the vessel. The conservation status of the South Polar Skua is Least Concern.

In the morning, prior to reaching the Argus Bank, one porpoise of unknown species swam rapidly up to the port side of the boat and then disappeared. Later that afternoon one humpback whale was sighted south of Argus Bank. While on the Banks we did observe one humpback whale on Argus and at least five humpbacks on Challenger Bank. In the evening, we drifted across Challenger Bank and were treated to a whale show as a mother humpback, a calf and a bull circled the boat continuously for several hours.

May 5 - Day Five

The final day found us at dawn still drifting on Challenger Bank. Whales were still in the distance spouting. The wind was light at 5 knots from the north and the skies were overcast. Few birds were seen this day, which was very unusual. We had expected to see at least many White-tailed Tropicbirds, but we counted only two (2) in transect, though some were seen in the distance. We did have one (1) Northern Parula Warbler, land on the boat in the morning. This likely migrant was happy to finish its trip to Bermuda with the aid of the vessel and it was seen leaving the ship when we docked at Front Street, Hamilton in the late afternoon. One (1) Skua was seen in the distance but could not be identified.

The only bird of note this day was one (1) Brown Booby. This is a pantropical breeding species which is found in all oceans. It also breeds widely in the West Indies. The distribution of nonbreeding birds is not well understood, though they are known to range thousands of miles from their breeding colonies. Most often reported along the coasts, they are occasionally seen in Bermuda. The Brown Booby feeds on flying fish by plunge diving. The conservation status of this species is Least Concern.

Two to three humpback whales were seen in the distance early in the day while still on Challenger Bank. A pod of approximately six Bottlenose Dolphins (*Tursiops truncatus*) and three unidentified whales were seen late in the afternoon just prior to entering to the channel at the east end of Bermuda,

Voyage Two
The second voyage on the Arctic Sunrise took the vessel approximately 250nm south of Bermuda on a south-southwest track and east of the north bound track of the first voyage (figure 1). We left Bermuda on the afternoon of 12 May 2024, and returned to Bermuda on the morning of 16 May 2024. The mission of this voyage was a continuation of the first with the aim to find larger mats of *Sargassum Sp*.

On the second voyage we observed 148 individual birds from 9 species.

Methods
All observations methods for this second voyage were consistent with the first voyage.

Due to the numbers of White-tailed tropicbirds sighted on 12 May transect times were increased to ten minutes from 1536h ADT through to 1917h ADT on 12 May and cumulative counts during this period were recorded.

Observations For Voyage Two

May 12 - Day One
Winds were North at 5 knots with a sea state of 0 on departure. Winds increased slightly later to 9 knots from the West Northwest and skies were OKTAS 4 – 5. After heading north for a very short distance, we turned south to an eventual heading of 190 degrees. This was the general track south from then on.

White-tailed Tropicbirds dominated the day with forty-three (43) being observed exclusively beginning at 1505h ADT and continuing until1917h ADT. No other species were observed during this time frame.

Other birds observed within the first several hours and within 5 - 10 miles of Bermuda included two (2) Sooty Shearwaters, one (1) Wilson's Storm Petrel and one (1) Barn Swallow.

May 13 - Day Two
At approximately 160 nm south of Bermuda, winds were NW at 15 knots with a sea state of 4 to 5 and skies were OKTAS 4. The heading remained at 190 degrees.

Seven (7) species and twenty-four (24) individual birds were observed this day. Most numerous were eleven (11) Wilson's Storm Petrels and seven (7) White-tailed Tropicbirds. Also seen were one (1) Audubon's Shearwater, one (1) Cory's Shearwater, one (1) Leach's Storm Petrel, and one (1) Barn Swallow. In addition, one (1) passerine that could not be identified which was likely a vireo species and one (1) storm petrel which could not be identified were observed.

A pod of six unidentified porpoises were seen this day.

The engines were stopped and we drifted during the evening hours.

May 14 - Day Three
Dawn found us approximately 210 nm south of Bermuda with clear skies and the wind North at 5 knots. The sea state was 1 to 2.

A ‘U’ shaped search pattern was conducted to try to locate a *Sargassum* mat that was thought to exist in this general area. This began where we had drifted to during the previous night. This search pattern will account for the seemingly random nature of the data points from this day.

Four (4) species and only eleven (11) individual birds were seen. Most numerous were six (6) Wilson’s Storm Petrels and three (3) White-tailed Tropicbirds. In addition, one (1) Sooty Shearwater was observed along with one (1) storm petrel which could not be identified.

A Sperm Whale (*Physeter macrocephalus*) was briefly seen in the distance in the afternoon.

The ship turned north on the reciprocal course at the end of the day. At this point the second voyage was displaced approximately 357nm to the east of the track from the first voyage, which was measured as the distance between points data points GP 157 and GP 25.

May 15 - Day Four
The winds were calm with a sea state of 1 and with clear skies. Our heading was 30 degrees. Shifted only slightly to the east, this day’s track filled in the area covered overnight between day one and day two.

Most numerous birds observed on this day were thirty-five (35) Wilson’s Storm Petrels and sixteen (16) White-tailed Tropicbirds. Also observed were two (2) Leach’s Storm Petrels, two (2) Manx Shearwaters, two (2) Sooty Shearwaters, a (1) South Polar Skua, a (1) Parasitic Jaeger, a (1) Long-tailed Jaeger, and one (1) Jaeger that could not be identified. One (1) Cliff Swallow was also observed.

For this voyage only the Cliff Swallow was a new species. This is another migrating swallow species that is observed in Bermuda often in the spring.

One Leatherback Sea Turtle was sighted at 0720 EDT at 30^{0} 14.4N 64^{0} 47.5W

One Sperm Whale was observed within 100 m of the ship approximately eight miles distant from Alton Hill Towers (located at 32.249, -64.862) at dusk. A photograph by Tavish Campbell, one of the voyage photographers, confirmed the identification.

No observation were taken on May 16th due to our close distance off the east end of Bermuda and our early entry into port.

Discussion
The purpose of these voyages was to record observations of seabirds. Data was entered into the Cornell Laboratory of Ornithology eBird system where it becomes part of the global effort to monitor populations and track bird migrations through the efforts of ‘citizen science’. These voyages constitute only two continuous data transects, so long term conclusions regarding bird populations cannot be drawn solely from these observations. The value of these observations will come in analyzing repeated transects over many years.

The importance of the Sargasso Sea to pelagic seabirds cannot be overstated. Migrating seabirds depend on food foraged on their journeys north and south which must sustain them until they reach either their breeding or feeding grounds. If there are significant changes in the trophic dynamics of the Sargasso Sea, there will likely be a cascade effect through the entire ecosystem which would

impact avian populations as well. Monitoring seabird populations is therefore critical to understanding the health of the Sargasso Sea.

Examination of species data on the Cornell University's eBird system and the Ocean Biodiversity Information System (OBIS) data reveals that there are relatively few data records for seabirds in the open ocean. Due to the difficulty in reaching the open ocean, most sighting data for seabirds are concentrated on the continental shelves. The need for increased data input has been noted by other authors (Hartman et al., 2022). As a result, analyzing the current population dynamics or even discussing the life history of many pelagic species presents considerable challenges. These difficulties arise primarily due to the often dispersed nature of seabird breeding colonies, which are located on remote islands scattered globally. When these species depart from their breeding sites to the open ocean, tracking them is difficult as they effectively disappear into the expansive marine environment. The need to increase data on birds at sea may be more acute when considering the establishment of MPAs in the open ocean and in the case of this expedition, the Sargasso Sea.

Fortunately, technology has recently evolved to allow researchers to track birds using both datalogging and satellite tracking technology (Gould et al., 2024). This technology is providing excellent insights into the foraging and the migratory behaviors of many bird species. However, all technologies have their limits. In the case of bird tracking devices and the resulting studies, there are concerns regarding gaps in data which result due factors including the cost of devices, bird weights, species behaviors and limited numbers of studies that result (Scarpignato et al., 2022).

We would suggest that commercial and research vessels at sea could provide an untapped resource in studying seabirds. At any one time there are possibly as many as 50,000 ships at sea in the world. Automatic Information System (AIS) data for ships would indicate that number is possible (www.marinetraffic.com). Given that crew on those vessels must stand watch, if even a fraction of those ships reported seabird sightings, it would vastly improve the amount of data available. The accuracy of citizen science has been questioned but does correlate reasonably well with professional observations (Aceves-Bueno et al., 2017; Walker et al., 2020) and has proven to be a valuable tool for avian research. This of course would require a degree of training and self-study, but additions at any level from commercial shipping could help expand the knowledge of seabird movements. Beginning with research vessels at sea might provide a start. It should be noted that 30 years of data regarding Gulf Stream currents have been gathered by the weekly trips of the CV Oleander from Bermuda to New Jersey (Rossby et al., 2019).

The most curious, though anecdotal, observation we had on the first voyage was the lack of seabirds as we neared Bermuda. This was clearly an anomaly as on the second voyage both on departure and arrival the bird sightings were more numerous.

The low number of individual birds seen on the third day of Voyage Two was likely because we remained in a very small 'box' searching for Sargassum mats for a large part of the day. This may indicate the value of moving surveys, as opposed to remaining stationary and counting birds moving past, especially for storm petrels.

We had hoped to see a greater number of shearwaters and storm petrels on both voyages. We saw no Great Shearwaters during the second voyage and relatively few Sooty and Cory's with only seven and one respectively observed. Amos (1991) lists May as the beginning of the Great Shearwater migration, with their frequency peaking beginning in mid-May and continuing until the first weeks of June. This peak is reflected in the eBird observations as well, with the counts rising rapidly in mid May and peaking around June 1. It is possible however that the *Arctic Sunrise* voyages were too early to catch the migration peak of the Great Shearwater.

Amos reported Great Shearwater numbers as high as 760, 560 and 364 birds per hour in 1984, 1975 and 1969 respectively. A local fisherman reported that in 'one year back in the 80's', the skies were dark with shearwaters, with them being so numerous that fishing was impossible, as they would dive for any bait that was thrown in the water (K. Winter, pers. comm., May 2024). Amos' observations would have been shore-watch measurements, as is the method for the majority of Bermuda's eBird records for Shearwaters, though the observers will be different. In more recent years the average birds per hour at the peak of migration has been under 200 per hour. To date this year (June 2024) the reported rates have been only a fraction of that. We are concerned that this could indicate declining numbers in the Great Shearwater population.

Sooty Shearwater appearances begin in May and rise quickly to a peak in mid-May. We reported only a small number of Sooty Shearwaters. We would expect a lower number of Sooty versus Great Shearwaters based on historic patterns. Amos reported hourly maximas of 73, 63 and 60 birds per hour in 1983, 1989 and 1981 respectively. However, the numbers appeared exceptionally low given that we were transiting very near the peak of migration.

In the northern breeders, Manx Shearwaters migrate north earlier than the others, peaking in mid March, so seeing low numbers of this species was expected. Cory's Shearwater sighting in Bermuda tends to persist through the year which would be expected given their strictly northern hemisphere lifecycle. With the start of breeding season however, Cory's Shearwater sightings peak in the eBird data in the first week of June.

Smith (Smith, 2017) made a voyage to 100nm west of Bermuda from 13 – 15 May 2016. The purpose of that voyage was to collect *Sargassum spp*., though none was found. Bird counts were also maintained. The present authors were the observers on that voyage and can report that method was to count all birds seen regardless of location or distance. On that voyage a low number of Great and Cory's Shearwaters were seen and a greater number of Sooty Shearwaters (11). Those observations are similar to the observations on our voyages, but still reflect relatively low numbers. The largest discrepancy was a low number of Storm Petrels reported by Smith on that voyage.

In 2013 Smith (Smith et al., 2015) completed a round-trip voyage to 75nm south of Bermuda. On that voyage they reported forty-three (43) birds observed with the thirteen being (13) White-tailed Tropicbirds and the greatest number being twenty-six (26) shearwaters of unidentified species. This was a much larger number of shearwaters than we observed on our transect of similar with a longer southward bearing. In this earlier report however fewer storm petrels were observed.

It is possible that our voyages in 2024 were too early to observe the early migrant birds or that their migration was slightly delayed. This possibility was borne out by a Bermuda Audubon Pelagic trip off the east end of Bermuda on the 25th of May, 2024. On that brief expedition, we observed twenty-five (25) Great, thirteen (13) Cory's, six (6) Sooty and two (2) Manx Shearwaters in just under 2 hours while covering less than 3 miles distance. It must be noted that, in this instance, we counted all birds that were seen regardless of their distance or direction of travel from the vessel (eBird, https://ebird.org/checklist/S177088174). Those numbers remain much lower than Amos reported.

Clearly there is variability in all the reports which points to the need for more continuous monitoring during the migration period. However, we remain concerned regarding the low numbers of Sooty and Great Shearwaters observed on the present voyages. It is possible that the observations are anomalous, but we would recommend that Atlantic populations be reevaluated if these decreased numbers persist. Increased monitoring could be achieved by employing the members of ships' crews or by having trained observers on commercial ships.

While the numbers of Great Shearwaters are believed to be stable, there is wide agreement that populations of Sooty Shearwaters are declining globally (Australian Government, 2023; Veit,1997). Overall declines may be occurring even as some subpopulations may be increasing (Clark et al. 2019). Causes are cited as multifactorial, but climate change induced factors are potentially having the largest impacts. (McKechnie, 2020). Citing large knowledge gaps about the populations of Sooty Shearwaters, researchers are calling for increased monitoring of this species to inform conservation efforts (Rey et al. 2024).

We did not observe any large Sargassum mats during our two voyages. *Sargassum spp.* ecology in the Atlantic has been undergoing significant changes since at least 2011. A large influx of *S. natans VIII* and *S. fluitans III* has been inundating the Caribbean Sea since 2011 resulting in economic and ecological impacts. This mass of *Sargassum* has been termed the Great Atlantic Sargassum Belt (GASB) (Wang 2019). While the amount of *Sargassum* in the low latitudes of the Atlantic has been increasing, the amounts seen in Bermuda, even in the winter months when it was historically prevalent, appears to have been decreasing at least since 2015 (Smith, 2017; pers. comm.), though there was one significant influx during the spring of 2019 (Lagen, 2019). The annual *Sargassum* density around Bermuda needs to be studied in more detail to understand how it relates to the GASB and whether it will have any impacts on the ecology. The Sargassum Watch program collects and analyzes daily satellite images of *Sargassum* around Bermuda (https://optics.marine.usf.edu/cgi-bin/optics_data?roi=BERMUDA&current=1) but the data have not been extracted to assess any temporal patterns (R. Smith, pers. comm.)

As noted in the observations, large amounts of plastics were found in association with the *Sargassum* mat we observed. It has been documented that both Sooty and Great Shearwaters ingest large amounts of plastics (Bond et al., 2014) and that this leads to the accumulation of chemicals associated with those plastics, as shown in sampling of preen oil glands in seabirds (Yamashita et al., 2021). Data indicates that ingested plastic in seabirds was directly ingested rather than through their prey catch (Robuck et al., 2022). Ingested plastic has been known to cause physical blockage of bird digestive systems and has been documented to cause a nonlethal condition termed 'Plasticosis' which involves the physical scarring in the digestive systems of seabirds (Charlton-Howard, 2023). These and many other physical and toxicological affects including deleterious reproductive effects from plastics have been well documented (Wang et al, 2021). Plastics ingestion by seabirds is an increasing problem which is mirroring increases in plastic production and accumulation in the ocean, and it is predicted to affect 99% of seabird species by 2050 (Wilcox, 2015). Modelling has predicted that, due to plastics prevalence in the marine environment, seabirds may become endangered by 2056 and critically endangered by 2062 (Ding et al., 2020).

Other mortality events which were once considered 'normal' appear to be increasing. Shearwater die-offs have historically occurred on a regular basis, but from 2001 to 2011 there was a threefold increase in mortality events along the United States east coast (Haman et al., 2013). These mortality events have continued with the latest event being in June 2022 where large numbers of dead Great Shearwaters were found in Bermuda and along the US east Coast (The Wildlife Society 2022). These were believed to be the result of reduced forage resources and not Avian Influenza.

Unfortunately, seabirds are exposed to all environmental crises at the same time. A warming planet is affecting food sources within marine ecosystems. There is an increase in toxic pollutants entering the marine environment, the most obvious of these being plastics which have been documented to impact marine ecosystems. In most articles the standard final recommendation is to conduct more studies. While we would echo that recommendation, we would also conclude that it is past time to

act. We would recommend that countries ratify the Agreement on Biodiversity Beyond National Jurisdiction, so the world can begin to offer protection to areas of the high seas.

Conclusions

Given its vast size and central location in the Atlantic Ocean, the global significance of the Sargasso Sea should be evident. The Sargasso Sea is a vital marine environment, supporting diverse marine and avian communities and plays a crucial role in global climate regulation. The ratification of the Agreement on Biodiversity Beyond National Jurisdiction is imperative to begin protecting this unique resource for the future. As part of this effort, enhanced monitoring of the pelagic seabird populations that depend on the Sargasso Sea is essential. Ensuring the health of the Sargasso Sea will have benefits for biodiversity and climate stability globally.

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Erich Hetzel
Paul Watson

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Appendix 1 – Table of sightings Voyage One by Species

May 1 – May 5 2024

2	Arctic Tern	Sterna paradisaea
2	Audubon's Shearwater	Puffinus lherminieri
2	Barn Swallow	Hirundo rustica
1	Brown Booby	Sula leucogaster
1	Gray Catbird	Dumetella carolinensis
7	Great Shearwater	Ardenna gravis
1	Laughing Gull	Leucophaeus atricilla
29	Leach's Storm-Petrel	Hydrobates leucorhous
4	Manx Shearwater	Puffinus puffinus
1	Northern Parula	Setophaga americana
4	Parasitic Jaeger	Stercorarius parasiticus
3	Pomarine Jaeger	Stercorarius pomarinus
1	Roseate Tern	Sterna dougallii
6	Sabine's Gull	Xema sabini
3	Sooty Shearwater	Ardenna grisea
1	Sooty Tern	Onychoprion fuscatus
1	South Polar Skua	Stercorarius maccormicki
21	White-tailed Tropicbird	Phaethon lepturus
31	Wilson's Storm-Petrel	Oceanites oceanicus

ADDITIONAL TAXA

5	jaeger sp.	Stercorarius sp. (jaeger sp.)
1	new world warbler sp.	Parulidae sp.
1	passerine sp.	Passeriformes sp.
1	skua sp.	Stercorarius sp. (skua sp.)
6	storm-petrel sp.	Oceanitidae/Hydrobatidae sp.
1	swallow sp.	Hirundinidae sp.
6	tern sp.	Sterninae sp.

Appendix 2 – Table of sightings Voyage 2 By Species

May 12 – May 15 2024

1	Long-tailed Jaeger	Stercorarius longicaudus
1	Parasitic Jaeger	Stercorarius parasiticus
1	South Polar Skua	Stercorarius maccormicki
69	White-tailed Tropicbird	Phaethon lepturus
55	Wilson's Storm-Petrel	Oceanites oceanicus
2	Leach's Storm-Petrel	Hydrobates leucorhous
1	Cory’s Shearwater	Calonectris diomedea
7	Sooty Shearwater	Ardenna grisea
2	Manx Shearwater	Puffinus puffinus
1	Audubon's Shearwater	Puffinus lherminieri
3	Barn Swallow	Hirundo rustica
1	Cliff Swallow	Petrochelidon pyrrhonota

ADDITIONAL TAXA

1	jaeger sp.	Stercorarius sp. (jaeger sp.)
2	storm-petrel sp.	Oceanitidae/Hydrobatidae sp. (dark-rumped)
1	passerine sp.	Passeriformes sp.

Appendix 3

Arctic Sunrise Voyage One - Nassau to Bermuda Data Records

Date	Time	Common Name	Scientific Name	Count	Location	Latitude	Longitude	Duration (Min)	Distance Traveled (km)	Observation Details
2024-05-01	6:18 AM	Audubon's Shearwater	Puffinus lherminieri	1	GP 1	26.1416667	-75.9533333	5	0.3	
2024-05-01	6:50 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 2	26.1883333	-75.8833333	1	0.3	
2024-05-01	7:39 AM	Arctic Tern	Sterna paradisaea	2	GP3	26.2483333	-75.7783333	5	0.3	Seen clearly flying east
2024-05-01	9:12 AM	Sooty Shearwater	Ardenna grisea	2	GP 4	26.365	-75.5466667	1	0.3	Seen clearly at 150 m
2024-05-01	9:20 AM	Gray Catbird	Dumetella carolinensis	1	GP 5	26.3916667	-75.5	1	0.3	All gray passerine was following the ship for more than 5 minutes. Came very close within 100m
2024-05-01	9:20 AM	storm-petrel sp.	Oceanitidae/Hydrobatidae sp.	1	GP 5	26.3916667	-75.5	1	0.3	Mainly dark, but unable to follow to confirm. Most likely Wilson's
2024-05-01	12:20 PM	Audubon's Shearwater	Puffinus lherminieri	1	GP 6	26.5916667	-75.1416667	1	0.3	
2024-05-01	1:17 PM	Great Shearwater	Ardenna gravis	1	GP 7	26.66	-75	1	0.3	Seen clearly but not in transect > 300m
2024-05-01	1:37 PM	Great Shearwater	Ardenna gravis	1	GP 8	26.6883333	-74.9516667	1	0.3	Seen Close
2024-05-01	1:49 PM	Great Shearwater	Ardenna gravis	1	GP 9	26.7033333	-74.925	1	0.3	.
2024-05-01	2:02 PM	Laughing Gull	Leucophaeus atricilla	1	GP 10	26.7283333	-74.8916667	1	0.3	
2024-05-01	2:44 PM	Parasitic Jaeger	Stercorarius parasiticus	1	GP 11	26.745	-74.8516667	1	0.3	Seen close.
2024-05-01	3:04 PM	storm-petrel sp.	Oceanitidae/Hydrobatidae sp.	2	GP 12	26.7766667	-74.795	60	0.3	.
2024-05-01	3:12 PM	Great Shearwater	Ardenna gravis	1	GP 13	26.7866667	-74.7783333	1	0.3	.
2024-05-01	3:21 PM	tern sp.	Sterninae sp.	2	GP 14	26.8	-74.755	1	0.3	
2024-05-01	4:00 PM	jaeger sp.	Stercorarius sp. (jaeger sp.)	1	GP 15	26.8616667	-74.6516667	1	0.3	Distant Bird not in transect
2024-05-01	4:07 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 16	26.87	-74.6366667	1	0.3	
2024-05-01	4:20 PM	Pomarine Jaeger	Stercorarius pomarinus	2	GP 17	26.895	-74.595	1	0.3	Pic to come
2024-05-01	4:20 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 17	26.895	-74.595	1	0.3	
2024-05-01	4:35 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 18	26.9166667	-74.555	1	0.3	
2024-05-01	5:15 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 19	26.975	-74.4516667	1	0.3	
2024-05-01	6:15 PM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 20	27.0516667	-74.2966667	1	0.3	See close
2024-05-01	6:15 PM	Manx Shearwater	Puffinus puffinus	1	GP 20	27.0516667	-74.2966667	1	0.3	Seen close
2024-05-02	7:47 AM	Great Shearwater	Ardenna gravis	1	GP 21	28.11	-72.345	1	0.3	Not in transact
2024-05-02	7:47 AM	storm-petrel sp.	Oceanitidae/Hydrobatidae sp.	1	GP 21	28.11	-72.345	1	0.3	
2024-05-02	7:55 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 22	28.1216667	-72.3233333	1	0.3	
2024-05-02	9:00 AM	Parasitic Jaeger	Stercorarius parasiticus	1	GP 23	28.1966667	-72.18	1	0.3	not in tranact
2024-05-02	9:00 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 23	28.1966667	-72.18	1	0.3	
2024-05-02	9:30 AM	White-tailed Tropicbird	Phaethon lepturus	4	GP 24	28.2316667	-72.1183333	1	0.3	
2024-05-02	10:47 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 25	28.3083333	-71.9816667	1	0.3	Seen close over the ship
2024-05-02	10:47 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 25	28.3083333	-71.9816667	1	0.3	
2024-05-02	10:49 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 26	28.3216667	-71.9566667	1	0.3	Not in transect
2024-05-02	10:49 AM	storm-petrel sp.	Oceanitidae/Hydrobatidae sp.	1	GP 26	28.3216667	-71.9566667	1	0.3	See Note 1
2024-05-02	11:35 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 27	28.38	-71.8533333	1	0.3	close but not in transect
2024-05-02	11:42 AM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 28	28.3916667	-71.8333333	1	0.3	
2024-05-02	11:55 AM	Sooty Tern	Onychoprion fuscatus	1	GP 29	28.405	-71.8066667	1	0.3	
2024-05-02	11:55 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 29	28.405	-71.8066667	1	0.3	
2024-05-02	12:00 PM	Leach's Storm-Petrel	Hydrobates leucorhous	2	GP 30	28.4166667	-71.7833333	1	0.3	
2024-05-02	12:00 PM	Sabine's Gull	Xema sabini	6	GP 30	28.4166667	-71.7833333	1	0.3	Picture to follow
2024-05-02	1:05 PM	Great Shearwater	Ardenna gravis	1	GP 31	28.4516667	-71.75	115	4.828	
2024-05-02	1:05 PM	Leach's Storm-Petrel	Hydrobates leucorhous	3	GP 31	28.4516667	-71.75	115	4.828	
2024-05-02	1:05 PM	Manx Shearwater	Puffinus puffinus	1	GP 31	28.4516667	-71.75	115	4.828	
2024-05-02	1:05 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 31	28.4516667	-71.75	115	4.828	
2024-05-02	1:05 PM	Wilson's Storm-Petrel	Oceanites oceanicus	4	GP 31	28.4516667	-71.75	115	4.828	
2024-05-02	3:40 PM	storm-petrel sp.	Oceanitidae/Hydrobatidae sp.	1	GP 32	28.52	-71.6566667	1	0.3	500nm not in transect
2024-05-02	4:05 PM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 33	28.555	-71.59	1	0.3	500 m not in transect
2024-05-02	4:53 PM	jaeger sp.	Stercorarius sp. (jaeger sp.)	1	GP 34	28.62	-71.46	1	0.3	Distant. Not in transect.
2024-05-02	6:15 PM	Barn Swallow	Hirundo rustica	1	GP 35	28.6933333	-71.3233333	1	0.3	Flew over the boat, very low.
2024-05-03	7:00 AM	Leach's Storm-Petrel	Hydrobates leucorhous	2	GP 36	29.7216667	-69.355	1	0.3	
2024-05-03	7:30 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 37	29.7616667	-69.2783333	1	0.3	
2024-05-03	7:35 AM	jaeger sp.	Stercorarius sp. (jaeger sp.)	1	GP 38	29.7716667	-69.2516667	1	0.3	
2024-05-03	7:45 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 39	29.7816667	-69.2316667	1	0.3	
2024-05-03	8:45 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 40	29.8	-69.1933333	1	0.3	not in transect
2024-05-03	8:45 AM	tern sp.	Sterninae sp.	2	GP 40	29.8	-69.1933333	1	0.3	not in transect
2024-05-03	9:05 AM	tern sp.	Sterninae sp.	2	GP 41	29.8133333	-69.1733333	1	0.3	Not in transect - distant
2024-05-03	9:09 AM	Sooty Shearwater	Ardenna grisea	1	GP 42	29.82	-69.1633333	1	0.3	Not in Transect. distant
2024-05-03	9:10 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP43	29.8216667	-69.1583333	1	0.3	Not in transect
2024-05-03	9:47 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 44	29.8683333	-69.0616667	1	0.3	
2024-05-03	9:49 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 45	29.8716667	-69.055	1	0.3	Not in transect
2024-05-03	10:14 AM	Leach's Storm-Petrel	Hydrobates leucorhous	3	GP 50	29.9066667	-68.985	1	0.3	Strd side only
2024-05-03	10:14 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 50	29.9066667	-68.985	1	0.3	port side only
2024-05-03	10:17 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 51	29.9116667	-68.9733333	1	0.3	
2024-05-03	10:30 AM	Leach's Storm-Petrel	Hydrobates leucorhous	2	GP 52	29.9133333	-68.9716667	1	0.3	
2024-05-03	10:30 AM	White-tailed Tropicbird	Phaethon lepturus	2	GP 52	29.9133333	-68.9716667	1	0.3	
2024-05-03	10:43 AM	new world warbler sp.	Parulidae sp.	1	GP 53	29.9183333	-68.935	1	0.3	Flew over the boat calling
2024-05-03	10:56 AM	Great Shearwater	Ardenna gravis	1	GP 54	29.9333333	-68.925	1	0.3	Not in transect
2024-05-03	11:14 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 55	29.9383333	-68.895	1	0.3	Off the stern. Not in transect
2024-05-03	11:17 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 56	29.9666667	-68.875	1	0.3	
2024-05-03	11:33 AM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 57	29.9866667	-68.8366667	1	0.3	Forward. Sitting on Sea
2024-05-03	11:50 AM	Leach's Storm-Petrel	Hydrobates leucorhous	2	GP 58	30.0083333	-68.795	1	0.3	
2024-05-03	11:50 AM	Manx Shearwater	Puffinus puffinus	1	GP 58	30.0083333	-68.795	1	0.3	
2024-05-03	11:50 AM	Wilson's Storm-Petrel	Oceanites oceanicus	5	GP 58	30.0083333	-68.795	1	0.3	
2024-05-03	12:00 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 59	30.0216667	-68.77	1	0.3	
2024-05-03	12:05 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 60	30.0283333	-68.7583333	1	0.3	
2024-05-03	12:07 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 61	30.0416667	-68.735	1	0.3	
2024-05-03	12:25 PM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 62	30.0566667	-68.7083333	1	0.3	.
2024-05-03	1:05 PM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 63	30.115	-68.6016667	1	0.3	
2024-05-03	1:05 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 63	30.115	-68.6016667	1	0.3	
2024-05-03	1:20 PM	Roseate Tern	Sterna dougallii	1	GP 64	30.1333333	-68.5666667	1	0.3	Circled boat very close. Photo
2024-05-03	1:25 PM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 65	30.1383333	-68.5516667	1	0.3	Distant. Not in transect
2024-05-03	5:20 PM	Parasitic Jaeger	Stercorarius parasiticus	1	GP 66	30.385	-68.13	92		Jaeger was shasing the WTTR continuously for a minute until WTTR regurgitated its food.
2024-05-03	5:20 PM	passerine sp.	Passeriformes sp.	1	GP 66	30.385	-68.13	92		Flew down strb side of vessel above eye level heading north. Yellowish buff colour. Some blurry photos were taken but not clear enough to ID bird. Most likely a vireo sp or warbler.
2024-05-03	5:20 PM	swallow sp.	Hirundinidae sp.	1	GP 66	30.385	-68.13	92		Distant not in transect.
2024-05-03	5:20 PM	White-tailed Tropicbird	Phaethon lepturus	3	GP 66	30.385	-68.13	92		One not in transect - distant
2024-05-03	5:20 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 66	30.385	-68.13	92		Not in transect.
2024-05-04	6:46 AM	Leach's Storm-Petrel	Hydrobates leucorhous	2	GP 67	31.3766667	-66.2783333	1	0.3	
2024-05-04	6:57 AM	Pomarine Jaeger	Stercorarius pomarinus	1	GP 68	31.39	-66.255	1	0.3	
2024-05-04	8:00 AM	Barn Swallow	Hirundo rustica	1	GP 69	31.475	-66.095	1	0.3	
2024-05-04	8:39 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 70	31.4866667	-66.0566667	1	0.3	
2024-05-04	9:13 AM	Parasitic Jaeger	Stercorarius parasiticus	1	GP 71	31.5033333	-66.0133333	1	0.3	
2024-05-04	10:25 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 72	31.61	-65.8516667	1	0.3	
2024-05-04	10:49 AM	jaeger sp.	Stercorarius sp. (jaeger sp.)	1	GP 73	31.6483333	-65.785	1	0.3	Within 200 m but unable to take to species.
2024-05-04	1:58 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 74	31.9116667	-65.3666667	1	0.3	
2024-05-04	2:22 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 75	31.9433333	-65.3183333	1	0.3	
2024-05-04	2:35 PM	South Polar Skua	Stercorarius maccormicki	1	GP 76	31.9566667	-65.2833333	1	0.3	Came from astern and flew within 50 m abeam strb side. Picture
2024-05-04	3:43 PM	Manx Shearwater	Puffinus puffinus	1	GP 77	31.9866667	-65.1766667	1	0.3	
2024-05-04	4:04 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 78	31.9883333	-65.145	1	0.3	
2024-05-04	5:21 PM	jaeger sp.	Stercorarius sp. (jaeger sp.)	1	GP 79	32.0366667	-65.1066667	1	0.3	300 m port side unable to determine species
2024-05-05	6:50 AM	Northern Parula	Setophaga americana	1	GP 80	32.0883333	-65.0416667	1		Found on-deck. Stayed with the boat even if disturbed. Continued on the boat all day to Hamilton where it was seen to fly off into a palm tree on Front Street.
2024-05-05	6:50 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 80	32.0883333	-65.0416667	1		Only one seen close. Several distant, not counted to avoid duplication. Not in transect.
2024-05-05	7:05 AM	Brown Booby	Sula leucogaster	1	GP 81	32.0633333	-65.06	1		Flew directly across the bow while drifting. Full adult. Picture
2024-05-05	9:26 AM	skua sp.	Stercorarius sp. (skua sp.)	1	GP 82	32.0466667	-65.0816667	1		Distant. Unable to determine species. Not in transect.
2024-05-05	10:17 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 83	32.0416667	-65.0366667	1	0.3	
			Total	142						

Appendix 4

Arctic Sunrise Voyage Two

Date	Time	Common Name	Scientific Name	Count	Location	Latitude	Longitude	Duration (h	Distance '	Observation Details
2024-05-12	11:50 AM	Sooty Shearwater	Ardenna grisea	2	GP 100	32.385	-64.62	1	0.483	
2024-05-12	12:11 PM	Sooty Shearwater	Ardenna grisea	2	GP 101	32.43333	-64.5717	1	0.3	
2024-05-12	12:20 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 102	32.45222	-64.5528	1	0.3	
2024-05-12	1:29 PM	Barn Swallow	Hirundo rustica	2	GP 103	32.54	-64.4767	1	0.3	
2024-05-12	2:16 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 104	32.43	-64.4917	1	0.3	
2024-05-12	2:52 PM	Wilson's Storm-Petrel	Oceanites oceanicus	3	GP 105	32.33167	-64.5083	1	0.3	
2024-05-12	3:00 PM	White-tailed Tropicbird	Phaethon lepturus	4	GP 106	32.315	-64.5117	10	3	two flying ; two on sea
2024-05-12	3:10 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 108	32.29167	-64.515	10	3	
2024-05-12	3:30 PM	White-tailed Tropicbird	Phaethon lepturus	2	GP 109	32.23583	-64.5267	10	3	
2024-05-12	3:50 PM	White-tailed Tropicbird	Phaethon lepturus	4	GP 111	32.18167	-64.5358	10	3	
2024-05-12	4:20 PM	White-tailed Tropicbird	Phaethon lepturus	4	GP 114	32.10667	-64.5483	10	3	
2024-05-12	4:30 PM	White-tailed Tropicbird	Phaethon lepturus	5	GP 117	32.08667	-64.55	10	3	
2024-05-12	4:40 PM	White-tailed Tropicbird	Phaethon lepturus	3	GP 120	32.07167	-64.5533	10	3	
2024-05-12	4:50 PM	White-tailed Tropicbird	Phaethon lepturus	4	GP 122	32.05	-64.5583	10	3	
2024-05-12	5:00 PM	White-tailed Tropicbird	Phaethon lepturus	4	GP 124	32.02667	-64.5633	10	3	
2024-05-12	5:20 PM	White-tailed Tropicbird	Phaethon lepturus	5	GP 126	31.985	-64.5717	10	3	
2024-05-12	6:00 PM	White-tailed Tropicbird	Phaethon lepturus	3	GP 128	31.88167	-64.5983	10	3	
2024-05-12	6:10 PM	White-tailed Tropicbird	Phaethon lepturus	2	GP 130	31.86	-64.6033	10	3	Not in Transect
2024-05-13	7:35 AM	White-tailed Tropicbird	Phaethon lepturus	3	GP 132	29.64	-65.0383	1	0.3	
2024-05-13	7:54 AM	White-tailed Tropicbird	Phaethon lepturus	3	GP 133	29.61	-65.0467	1	0.3	
2024-05-13	9:50 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 134	29.46167	-65.08	1	0.3	
2024-05-13	11:40 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 135	29.185	-65.1333	1	0.3	Not in transect
2024-05-13	11:57 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 136	29.145	-65.14	1	0.3	
2024-05-13	12:27 PM	storm-petrel sp. (dark-rumped)	Oceanitidae/Hydrobatidae sp.	1	GP 137	29.07167	-65.1733	1	0.3	Could not ID
2024-05-13	1:11 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 138	28.95667	-65.2033	1	0.3	
2024-05-13	1:50 PM	passerine sp.	Passeriformes sp.	1	GP 139	28.85833	-65.23	1	0.3	Yellow green. Possible vireo
2024-05-13	2:35 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 140	28.72833	-65.2483	1	0.3	
2024-05-13	2:55 PM	Wilson's Storm-Petrel	Oceanites oceanicus	3	GP 141	28.715	-65.255	1	0.3	
2024-05-13	3:40 PM	Cory's Shearwater	Calonectris diomedea	1	GP 142	28.7	-65.2533	1	0.3	
2024-05-13	4:15 PM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 143	28.69	-65.2533	1	0.3	
2024-05-13	4:15 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 143	28.69	-65.2533	1	0.3	
2024-05-13	4:21 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 146	28.68333	-65.255	1	0.3	
2024-05-13	7:30 PM	Audubon's Shearwater	Puffinus lherminieri	1	GP 147	28.38667	-65.32	1	0.3	
2024-05-13	7:30 PM	Barn Swallow	Hirundo rustica	1	GP 147	28.38667	-65.32	1	0.3	Stayed on ship overnight. Flew away next morning at about 0715
2024-05-14	10:42 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 150	28.33333	-65.4617	1	0.3	
2024-05-14	10:50 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 151	28.355	-65.485	1	0.3	Not in transect. Aft of vessel
2024-05-14	11:40 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 152	28.36667	-65.3717	1	0.3	
2024-05-14	11:44 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 153	28.37	-65.36	1	0.3	
2024-05-14	12:50 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 154	28.35667	-65.1517	1	0.3	
2024-05-14	12:59 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 155	28.35	-65.1517	1	0.3	
2024-05-14	1:43 PM	storm-petrel sp.	Oceanitidae/Hydrobatidae sp.	1	GP 156	28.275	-65.1733	1	0.3	Unable to confirm ID
2024-05-14	2:00 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 157	28.305	-65.215	1	0.3	
2024-05-14	2:35 PM	Sooty Shearwater	Ardenna grisea	1	GP 158	28.34	-65.2717	1	0.3	Not in Transect > 500m
2024-05-14	4:30 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 159	28.38333	-65.3417	1	0.3	
2024-05-15	6:51 AM	Leach's Storm-Petrel	Hydrobates leucorhous	1	GP 160	30.15333	-64.8183	1	0.3	
2024-05-15	7:10 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 161	30.20333	-64.8033	1	0.3	
2024-05-15	7:20 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 162	30.23	-64.795	1	0.3	
2024-05-15	7:24 AM	Manx Shearwater	Puffinus puffinus	1	GP 163	30.24	-64.7917	1	0.3	
2024-05-15	7:33 AM	Long-tailed Jaeger	Stercorarius longicaudus	1	GP 164	30.36167	-64.7867	1	0.3	
2024-05-15	7:33 AM	White-tailed Tropicbird	Phaethon lepturus	4	GP 164	30.36167	-64.7867	1	0.3	
2024-05-15	7:33 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 164	30.36167	-64.7867	1	0.3	
2024-05-15	9:11 AM	South Polar Skua	Stercorarius maccormicki	1	GP 167	30.525	-64.7094	1	0.3	Flew over vessel. Clear views
2024-05-15	9:40 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 168	30.605	-64.685	1	0.3	Aft. Not in transect
2024-05-15	10:04 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 169	30.65	-64.6667	1	0.3	
2024-05-15	10:21 AM	Wilson's Storm-Petrel	Oceanites oceanicus	3	GP 170	30.71	-64.6533	1	0.3	One was aft of the vessel so not in transect
2024-05-15	10:38 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 171	30.75167	-64.64	1	0.3	
2024-05-15	10:43 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 172	30.76333	-64.635	1	0.3	
2024-05-15	11:17 AM	Wilson's Storm-Petrel	Oceanites oceanicus	3	GP 173	30.84333	-64.6167	1	0.3	
2024-05-15	11:41 AM	White-tailed Tropicbird	Phaethon lepturus	1	GP 174	30.89833	-64.6017	1	0.3	
2024-05-15	11:45 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 175	30.905	-64.5983	1	0.3	
2024-05-15	11:49 AM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 176	30.91833	-64.595	1	0.3	
2024-05-15	11:54 AM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 177	30.92833	-64.5917	1	0.3	
2024-05-15	12:03 PM	Manx Shearwater	Puffinus puffinus	1	GP 178	30.95333	-64.5867	1	0.3	
2024-05-15	12:10 PM	Sooty Shearwater	Ardenna grisea	1	GP 179	30.975	-64.58	1	0.3	
2024-05-15	12:10 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 179	30.975	-64.58	1	0.3	
2024-05-15	12:19 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 180	30.98333	-64.5758	1	0.3	
2024-05-15	12:32 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 181	31.025	-64.5667	1	0.3	
2024-05-15	12:40 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 182	31.045	-64.5617	1	0.3	
2024-05-15	12:52 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 183	31.07389	-64.5517	1	0.3	
2024-05-15	1:15 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 184	31.12833	-64.5367	1	0.3	
2024-05-15	1:25 PM	Cliff Swallow	Petrochelidon pyrrhonota	1	GP 185	31.15167	-64.53	1	0.3	
2024-05-15	1:25 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 185	31.15167	-64.53	1	0.3	
2024-05-15	2:10 PM	Wilson's Storm-Petrel	Oceanites oceanicus	3	GP 186	31.26167	-64.4933	1	0.3	Distant. Not in transect
2024-05-15	2:20 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 187	31.26833	-64.4867	1	0.3	
2024-05-15	2:34 PM	Wilson's Storm-Petrel	Oceanites oceanicus	2	GP 188	31.305	-64.4817	1	0.3	not in transect
2024-05-15	2:49 PM	Wilson's Storm-Petrel	Oceanites oceanicus	3	GP 189	31.345	-64.475	1	0.3	
2024-05-15	2:54 PM	jaeger sp.	Stercorarius sp. (jaeger sp.)	1	GP 190	31.355	-64.4717	1	0.3	Too distant to ID
2024-05-15	3:11 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 191	31.39667	-64.46	1	0.3	
2024-05-15	3:28 PM	White-tailed Tropicbird	Phaethon lepturus	2	GP 192	31.435	-64.4467	1	0.3	
2024-05-15	3:50 PM	White-tailed Tropicbird	Phaethon lepturus	2	GP 193	31.49167	-64.4317	1	0.3	
2024-05-15	4:20 PM	Sooty Shearwater	Ardenna grisea	1	GP 194	31.56	-64.425	1	0.3	Not in transect
2024-05-15	4:24 PM	White-tailed Tropicbird	Phaethon lepturus	2	GP 195	31.57	-64.4217	1	0.3	
2024-05-15	5:03 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 196	31.66333	-64.3817	1	0.3	Not in transect
2024-05-15	5:35 PM	Parasitic Jaeger	Stercorarius parasiticus	1	GP 197	31.74167	-64.3533	1	0.3	
2024-05-15	5:35 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 197	31.74167	-64.3533	1	0.3	Tropic bird was pursued by jaeger till it regurgitated its food. Caught mid air by jaeger.
2024-05-15	6:42 PM	Wilson's Storm-Petrel	Oceanites oceanicus	1	GP 198	31.90639	-64.24	1	0.3	
2024-05-15	7:46 PM	White-tailed Tropicbird	Phaethon lepturus	1	GP 199	32.00833	-64.4472	1	0.3	
			Grand Total	148						