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Virginia Sea Turtle & Marine Mammal Stranding Network 2022 Grant Report

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VIRGINIA AQUARIUM FOUNDATION STRANDING RESPONSE PROGRAM

Virginia Sea Turtle and Marine Mammal Stranding Network 2022 Grant Report

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A Final Report to the
Virginia Coastal Zone Management Program
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The mission of the Virginia Aquarium & Marine Science Center is to inspire conservation of the marine environment through education, research and sustainable practices. The Aquarium is operated by the City of Virginia Beach in cooperation with the Virginia Aquarium Foundation (VAQF).

The Virginia Aquarium Research & Conservation Section is responsible for directing the organization's efforts in these areas. With primary support from the VAQF, the Section's Stranding Response Program is dedicated to conservation of marine animal species through stranding response, research, rehabilitation, and education.

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Introduction

All marine mammals and sea turtles are designated as protected species by the Marine Mammal Protection Act (1972) and/or the Endangered Species Act (1973). The Virginia Aquarium & Marine Science Center Stranding Response Program (VAQS) holds permits from state and federal authorities for all activities in this report related to marine mammal and sea turtle stranding response and research. VAQS has been responding to marine mammal and sea turtle strandings (more than 9,750) in Virginia since 1987. The Aquarium and the Darden Marine Animal Conservation Center are located in Virginia Beach, VA. VAQS responds to all marine mammal strandings in Virginia and maintains the state marine mammal stranding database. In addition, VAQS and their cooperators coordinate the Virginia Sea Turtle Stranding and Salvage Network throughout Virginia. All state sea turtle stranding data are recorded by VAQS and entered into the national sea turtle stranding database. For the purposes of this report, VAQS uses the following definition: *Sometimes marine animals wash ashore sick, injured or dead. At other times, they become entrapped or entangled and are unable to return to their natural habitats without assistance. These events are known as Strandings*.

VAQS uses staff, volunteers and cooperating organizations to report, record, document, recover, examine and/or rehabilitate stranded animals. The organization and training of primary response cooperators is crucial to the stranding network. Rapid response to strandings can result in the rescue of live animals and the collection of valuable data from dead animals that may otherwise be lost due to decomposition and/or scavenging. Formalized in 1991, the VAQS Stranding Response Team (Team) is composed of staff and volunteers trained to respond to stranded animals. VAQS staff provides training programs for approximately 80 Team volunteers and personnel from cooperating agencies and organizations. Instruction in biology, ecology, and both live and dead stranding response protocols are provided for marine mammal and sea turtle species found in Virginia. These cooperative training efforts have included the U.S. Coast Guard, U.S. Fish and Wildlife Service (USFWS), NOAA Fisheries Service (NMFS), The Nature Conservancy, Virginia Marine Resources Commission, Virginia Department of Wildlife Resources (VDWR), Virginia Institute of Marine Science (VIMS), state parks, national wildlife refuges, regional law enforcement authorities, and lifeguards. As a result of these long-standing efforts, VAQS continues to maintain and improve statewide marine animal stranding response networks.

Marine mammal groups and species found in Virginia include cetaceans (dolphins, porpoises and whales), phocids (seals), and sirenians (manatees) (Appendix V: Virginia Species Lists). Marine mammal strandings occur in all months of the year. During the 1990s, Virginia averaged 63 marine mammal strandings per year with a high of 106 in 1994. Since then, stranding numbers have increased dramatically. For the years 2000-2012, Virginia averaged 100

marine mammal strandings per year. This could represent increasing marine mammal mortality, though it also may be the result of an improved state-wide stranding response network. The historic total from 2013 of 427 strandings was caused by a bottlenose dolphin unusual mortality event (UME) resulting from a morbillivirus outbreak. Since then, Virginia has averaged 98 strandings per year during 2014-2022 (Figure 1).

It is important for organizations such as VAQS to examine stranded marine mammals because these species are very challenging to study in the wild. Stranding trends, including probable causes of marine mammal mortalities, are monitored through stranding records. Little is known about the natural history of many marine mammal species and strandings provide a rare opportunity to thoroughly examine these animals. With the advent of new techniques such as molecular genetic analyses, stranded animals provide a wealth of information about wild populations that are difficult and very costly to study *in situ*. In some species, such as pygmy/dwarf sperm whales and beaked whales, data collected from stranded animals often provides the best and only information available on the species' natural history. Stranding records can represent viable measures of the biological diversity and the spatial and temporal changes that are occurring in adjacent waters, especially when long-term datasets are developed and maintained (Pyenson 2010; Pyenson 2011; Pikesley *et al* 2012). In addition, stranding data can indicate seasonal trends in presence and suggest areas of high concentration of marine mammal species such as bottlenose dolphins and harbor porpoises (Read and Murray 2000). Spatial and temporal trends in marine mammal mortalities, such as those caused by unusual mortality events and/or fisheries interactions, can also be monitored from stranding records, and these records are often used in federal stock assessment reports and take reduction planning. Each stranded marine mammal is thoroughly examined, whenever possible, including body measurements, external appearance, and internal condition (via necropsy). Data and tissues are collected for life history, histology, bacteriology, virology and toxicology studies. Samples collected by VAQS have been supplied to the Smithsonian Institution, Armed Forces Institute of Pathology, NMFS, and numerous other organizations and researchers.

In addition to dead strandings, the VAQS Team responds to live marine mammals each year. The level of response depends on the type of animal. Sick or injured baleen whales and toothed whales larger than eight feet in length are virtually impossible for VAQS to rescue and often must be humanely euthanized. Some smaller cetaceans can be relocated and released or rescued if found quickly and in suitable condition. They must be supported in water as soon as possible and treated for shock. Successful cetacean rehabilitation requires large tanks, experienced personnel, and access to sophisticated equipment. VAQS is not equipped to conduct long-term rehabilitation of a cetacean. As soon as possible, animals that are good candidates for rehabilitation are transferred to other qualified facilities. Phocids (seals), on the other hand, are amphibious animals and can be transported in dry containers such as canine

kennels. The VAQS Darden Marine Animal Conservation Center will have a seal triage room for short-term stabilization of a seal, and a seal rehabilitation room with a deep in-ground pool and raised haul-out area capable of long term holding of one adult phocid. Both the seal triage and rehab rooms are currently being completed. Due to unforeseen funding and supply chain challenges, completion of this project has been delayed, but the seal triage pools are currently being fabricated. The VAQS Team also responds to live marine mammal emergencies in neighboring states. The most recent example was August 2021 when NOAA requested VAQS respond to Delaware to lead the humane euthanasia and postmortem examination of an endangered fin whale.

Five species of sea turtles (loggerhead, Kemp's ridley, leatherback, green, and hawksbill) have been recorded in Virginia (Appendix V: Virginia Species Lists). Sea turtle strandings occur primarily in the late spring, summer and fall. The VAQS Team responded to an average of 86 sea turtle strandings per year during the 1990s. Since then, strandings have increased dramatically. Since 2000, Virginia has recorded over 6,200 live and dead sea turtle strandings, with an average of 264 per year for the last ten years.

Sea turtles are examined in much the same way as marine mammals. Data are recorded for all strandings, and necropsies are performed on many stranded carcasses. Sea turtle stranding trends, including probable causes of mortalities, are monitored through stranding records. Stranded sea turtles are checked for flipper and PIT tags and results are reported to NMFS and the Cooperative Marine Turtle Tagging Program. A small number of sea turtles nest on Virginia beaches each year. These are primarily loggerheads, though several green and Kemp's ridley sea turtles have been recorded nesting recently in Virginia. The VAQS Team participates in a nesting beach monitoring program in Virginia Beach with the U.S. Fish and Wildlife Service, Back Bay National Wildlife Refuge, and Virginia Department of Wildlife Resources. Live strandings of sea turtles have also increased and the VAQS Team has successfully rehabilitated and released many of the stranded turtles. In recent years, VAQS developed the Virginia Pier Partner Program to better respond to the large numbers of sea turtles that are incidentally caught by recreational anglers each year. This program has been very successful in promoting safe handling, recovery and rehabilitation of hooked sea turtles and providing outreach to anglers and pier owners about proper hooked sea turtle response techniques. The program has also allowed for the collection of data on fishing practices that are associated with hooked sea turtles and resulted in a recent publication on the findings (see Appendix I: Professional and Education Activities). As a result of its success, other stranding network organizations in the region are contacting VAQS to learn more about the program. From 2000-2012, an average of 11.5 live sea turtle strandings were recorded in Virginia each year. Since that time and the development of the Pier Partner Program, Virginia has averaged 64 live strandings per year, with peaks of 92 live sea turtle strandings in 2017 and 2022. In

addition, VAQS Team expertise in sea turtle rehabilitation has resulted in many turtles (more than 65) that have stranded outside Virginia being transferred to VAQS for rehabilitation and release.

In addition to stranding response, VAQS conducts research on marine mammals and sea turtles. One example is participation in photo-identification programs, a non-invasive technique that takes advantage of naturally occurring marks on animals. Photo-ID is used to study both bottlenose dolphins and large whales, primarily humpback whales, in the nearshore waters of Virginia and North Carolina. With the support of additional grants and donations in recent years, VAQS has been able to conduct numerous satellite and acoustic tagging projects with yearling loggerheads and rehabilitated sea turtles. Marine mammal and sea turtle entanglement and human interaction-based research continues to be conducted at VAQS and with external collaborators, resulting in publications both recently completed and in progress.

VAQS Team staff and volunteers present the results of their research at national and regional workshops, at professional meetings, and in numerous publications (Appendix I: Professional and Education Activities). In addition, VAQS research has been presented to more than 16 million people through innovative Aquarium exhibits and public programs. In 2015, a major new exhibit area, *Stranded*, devoted to the stranding response program opened at the Aquarium. Staff and volunteers present educational programs for the public related to stranding events and provide outreach on response and research throughout the year during active stranding response efforts. On a continual basis, staff provide training/assistance and gain valuable experience in live animal rehabilitation and response by cross-training and working with staff at other stranding network facilities. VAQS staff also serves on federal management and scientific teams studying the interactions of protected species with commercial fisheries and other potentially threatening human activities. They regularly use their expertise and data to comment on projects that may have an impact on regional marine mammal and sea turtle populations, including a proposed naval undersea training range off Virginia's eastern shore, the potential to open mid-Atlantic areas to offshore oil and gas drilling, and offshore wind energy development. Virginia stranding data was included in the mid-Atlantic Ocean data portal developed to support the Mid-Atlantic Ocean Action Plan. Finally, public and private organizations conducting natural resource surveys and environmental assessments routinely utilize the VAQS stranding database and expertise for information regarding protected species in Virginia.

Stranding Response Methods

When examining dead stranded marine mammals and sea turtles, the VAQS Team follows data collection protocols developed by NMFS (Appendix IV: Stranding Network

Datasheets) and by VAQS staff. For marine mammals, Level A data are collected on all strandings and recorded in the marine mammal stranding database. Level A data include:

- observer
- date
- location
- species
- total body length
- sex
- condition
- weight
- findings of human interaction*
- sample collection and dissemination
- carcass disposition

*Findings of human interaction consist of clues on a carcass that the animal had previously interacted with humans or human activities, sometimes resulting in injuries and/or the death of the animal. The most common types of human interactions are fishery entanglements, vessel strikes, and marine debris ingestion. Special data collection protocols and forms have been developed by VAQS for assessing human interactions in marine mammal and sea turtle strandings.

More involved level B and C data are also recorded when appropriate. The information is collected utilizing specialized data sheets and are often shared with other collaborating research organizations. These higher level data can include:

- age
- extensive body measurements
- descriptions and photographs of external & internal appearance
- parasite and pathology occurrence
- stomach contents
- reproductive status
- genetic information
- tissue contaminant levels
- information for specific research projects

In order to provide timely, accurate, and usable information, VAQS compiles these data in a relational database. The computer system, database, and software allow for analytical study of the data, including GIS mapping. When combined with the extensive VAQS photo and

video catalogs, the long-term marine mammal stranding database can be an invaluable tool for scientists, natural resource managers, and other state and federal agencies.

Sea turtle data are collected in much the same manner as for marine mammals (Appendix IV: Stranding Network Datasheets). In addition to the Level A, B, and C data listed above, the VAQS Team also examines sea turtle carcasses for several types of tags. PIT tags and wire tags require specialized equipment in order to be detected.

Live marine mammals and sea turtles have become an increasing part of stranding response for the VAQS Team. Live stranding response is quite different from responding to dead animals. While time is important when responding to a fresh dead stranding, timely response is crucial to the welfare and survivability of live stranded animals. Once a live stranding is confirmed, staff and volunteers respond as quickly as possible. Cooperating agencies, especially on Virginia's eastern shore, have immensely improved the VAQS Team's ability to efficiently respond to live strandings. Whenever possible, live stranded animals that are candidates for rehabilitation are brought to the Darden Marine Animal Conservation Center where they are immediately treated for life-threatening conditions. VAQS veterinary staff and live animal care personnel have developed protocols and data sheets for live animal response and rehabilitation. VAQS staff have established an excellent working relationship with medical diagnostic service companies and with local vet clinics that provide valuable support services in the form of blood and sample analyses, diagnostic imaging, and supplies of less common drugs. In addition, the medical team works with several specialized veterinarians and technicians, including eye specialists and advanced diagnostic technicians, on special cases.

Discussion of 2022 Stranding Data

Marine Mammals

A total of 113 marine mammal strandings were recorded during 2022 (Table 1). In the past ten years, the number of marine mammal strandings has varied from a low of 75 (2012) to a high of 116 (2019), not including the historic year of 2013, when Virginia experienced the highest number of marine mammal strandings in the state's recorded history due to a bottlenose dolphin Unusual Mortality Event (UME) (Figure 1). Temporally, marine mammal strandings occur in all months of the year, but numbers typically drop in late fall and winter. Some marine mammal species (*i.e.* large whales, harbor porpoises, common dolphins and seals) tend to strand seasonally, while others (*i.e.* bottlenose dolphins) can occur at any time of the year (Figure 2) with, but peaks in spring and summer. Bottlenose dolphins comprise the majority of the marine mammals that strand each year, but the Virginia stranding database is very diverse and now includes 32 species (Appendix V: Virginia Species Lists). In 2022, bottlenose dolphin strandings were on par with average and comprised 72% of total marine

mammal strandings (Figure 3). Spatially, marine mammal strandings tend to occur throughout Virginia's ocean and bay waters, but most commonly along Virginia's eastern shore, the southern shore of the Chesapeake Bay mouth, and the southern Atlantic coast (Figure 4). Strandings in 2022 followed those patterns, with eastern shore strandings more focused along the southern tip (e.g. Fisherman's Island and Kiptopeke State Park) and northeast coastlines of the eastern shore. Though not known, it is likely that a significant portion of those strandings occur further north and/or west within the Chesapeake Bay and are driven by the bathymetric and oceanographic features (e.g. currents) within the bay. Pictures and descriptions of notable marine mammal strandings from 2022 are included in Appendix II: Highlights of the Year – Marine Mammals.

Marine mammals are divided into nine data groups for analyses. These data groups are: (1) bottlenose dolphin – the most common marine mammal in Virginia, (2) harbor porpoise – a historically common small cetacean, (3) common dolphin – a primarily oceanic species, (4) large whales – primarily baleen whales such as humpback, fin, sei, minke, and North Atlantic right whales, (5) other delphinids – primarily oceanic species with low stranding rates such as pilot whales, and pelagic dolphins, (6) other kogiid and ziphiid – pygmy sperm whales, dwarf sperm whales, and numerous beaked whale species, (7) unknown delphinids – used when decomposition, scavenging or other factors preclude identification, (8) phocids – harbor, harp, hooded, and gray seals, (9) manatees – these animals have previously been rare sightings with limited seasonal presence, however recent increases in stranding occurrences may indicate range expansion for this species. Live stranded animals are included in these analyses and are also addressed separately below.

Live strandings

In 2022, Virginia had 9 known live marine mammal strandings (Table 2). The first live stranded animal was a harp seal pup that was collected from Norfolk in February for rehabilitation and immediately transferred to the National Aquarium. Despite treatments, the animal expired naturally. Five common dolphins were discovered alive as part of a mass stranding of 18 animals in March (see Common Dolphins section for additional information). A young bottlenose dolphin stranded alive in Norfolk in May, but expired naturally approximately 5 minutes after stranding. The animal was in poor body condition and necropsy findings suggested it died of infectious causes. In August, an unknown delphinid stranded in Sandbridge and was reportedly pushed back out by the public twice before being reported to the VAQS hotline. Upon response, staff were unable to locate the animal. No additional reports of the animal were received; however, no photographs were obtained by the reporting party that could be used to compare and/or match to subsequent strandings. This animal is suspected to have been a newly born calf based on descriptions that indicate it likely had a small section of

the umbilical cord still attached. An additional unknown delphinid stranded on Wallops Island in November and was also pushed out by members of the public prior to contacting VAQS; no further sightings of this animal were reported.

Bottlenose dolphin

Bottlenose dolphins (*Tursiops truncatus*) are the most common marine mammals sighted in Virginia waters. They are also the most commonly stranded marine mammal in the state. Historically, most bottlenose dolphins have stranded from April to October, which is concurrent with their seasonal appearance in Virginia coastal waters (Barco *et al*. 1999; Figure 2). In recent years, bottlenose dolphin strandings have occurred in all months of the year. In 2022, 81 bottlenose dolphin strandings were recorded in Virginia (Figure 5) and strandings occurred in every month of the year. This is close to the average number of strandings for a single year in Virginia, excluding the UME years of 1987 and 2013. The UME that began in 2013 impacted bottlenose dolphins from New York to Florida and continued into April of 2015. Bottlenose dolphin strandings in 2022 occurred primarily along the Atlantic Ocean, throughout the eastern shores of the Chesapeake Bay, and southern edge of the eastern shore (Figure 4). Of the 81 bottlenose dolphin strandings in 2022, 35% (n=28) of the strandings occurred on the eastern shore, 20% (n=16) in Virginia Beach, 10% (n=8) in Norfolk, and 36% (n=29) in other parts of the Chesapeake Bay or its tributaries.

Sex was determined for 45 of the stranded bottlenose dolphins. Females comprised 22% (n=10) and males comprised 78% (n=35) of the known sex animals. This male bias could be explained by the fact that male reproductive organs can sometimes be more easily visualized in photographs from the reporting party in cases when no response was possible. Of the 36 stranded dolphins with recorded lengths (including estimated lengths), 22% (n=8) were less than 160 cm (known as “young of the year”, YOY), the approximate size of a one-year old dolphin (Figure 5). One additional dolphin was classified as YOY due to presence of fetal lines in caller photos. This was a lower proportion of YOY animals compared to the previous year, which was 35% YOY for all measured bottlenose dolphins. Past examination of YOY has revealed evidence of infanticide in the form of broken bones, hemorrhage and organ damage (Dunn *et al.* 2002). In dolphins that were moderately decomposed or fresher (n=56), signs of human interaction could not be determined in 71% (n=40), were positive in 23% (n=13), and were not observed in 5% (n=3). Of the 13 human interaction cases, one was previously freeze branded, 10 were positive for fisheries interaction, and two were entangled (fishery interaction status could not be confidently determined).

Harbor porpoise

Harbor porpoises (*Phocoena phocoena*) were observed only occasionally in Virginia stranding records during the 1980s. Increases in harbor porpoise strandings occurred along the mid-Atlantic coast in 1993-1994, and the increases were most dramatic in Virginia (Cox *et al.* 1998, Swingle *et al.* 1995). In some years, harbor porpoises have been the second most commonly stranded marine mammals in Virginia. Harbor porpoises typically strand in late winter and early spring and occur along the ocean shorelines. During 1999, 40 harbor porpoise strandings were recorded in Virginia, but in 2000, that number dropped precipitously to only four. Strandings increased again in 2001 with 30 strandings, followed by only six harbor porpoise strandings in 2002. Subsequent years have seen the numbers vary widely, from a high of 22 strandings in 2005, to a low of zero strandings in 2020 and 2021 (Figure 6). In 2022, there was one identified harbor porpoise stranding for the first time since 2019. This animal was found by a cooperating organization moderately decomposed and scavenged, so a cause of stranding could not be determined.

Common Dolphins

Common dolphin strandings have varied in frequency throughout the years; a total of 20 stranded in 2022, which was the highest number in our recorded history, except for 2008 during which the same number stranded (Figure 7). A temporal and geographic mass stranding event of short-beaked common dolphins occurred along the Eastern Shore of Virginia from Virginia Beach to Accomack County predominantly between March 13th, 2022 and March 23rd, 2022. Four dolphins stranded either alive or fresh dead on March 13th in Virginia Beach or on the bayside of Northampton County. A large group of around 11-12 individuals were observed swimming in Taylor Creek in Accomack County on March 14th and a deceased dolphin in early moderate decomposition was discovered on Fisherman Island on the same day. Over the next week nine more dolphins were reported ranging from alive to early moderate decomposition; seven of these strandings occurred on the bayside of Northampton and Accomack Counties, one was ~32 NM offshore Cape Henry, and the other was on the oceanside in Chincoteague. Four additional carcasses in advanced states of decomposition were reported through April 25th on the bayside of Accomack and Northampton Counties; these are presumed to have been part of the original group, but were not discovered or reported until days/weeks later. In total, 18 dolphins were recorded during this event, five of which were alive at the time of the stranding. Nine animals were recovered and necropsied, one was frozen for later examination, one was examined in the field, and due to inaccessible locations or advanced states of decomposition, six received limited external examinations through documentation received from the reporting parties. The day before the first reported stranding, a storm occurred in the area with sustained heavy onshore winds that may have contributed to this offshore species' presence in and

around Chesapeake Bay. Based on the stranding locations and their relative condition codes, it is believed that a group of animals was separated near the mouth of the bay around March 13th or prior. Of those, some stranded quickly near the mouth of the bay, others headed north within the bay, while others remained outside of the bay and stranded soon after.

Separate from the mass stranding, two additional common dolphins were reported during 2022. The first stranded in Suffolk in August, but could not be recovered. The second stranded fresh dead in December in Hampton. A full necropsy was performed and results are still pending, but the animal is suspected to have succumbed to infection.

Large whales

Large whales strand in Virginia on an annual basis. With the exception of the sperm whale, large whales are typically baleen whales such as humpback, fin, sei, or minke. Some of the large whales normally found in Virginia are endangered species. As a result of the logistics involved in the examination of large whales, an extensive large whale response protocol was created (Blaylock *et al.* 1996). The protocol was developed in response to increased strandings of humpback whales in Virginia and North Carolina in the early 1990s (Swingle *et al.* 1993, Barco *et al.* 2002). The response protocol has since been further modified and specifically applied to North Atlantic right whales (McLellan *et al.* 2004).

Overall, an average of two large whale strandings occurred in Virginia between 1991 and 2015, while 7.7 large whale strandings occurred annually in Virginia between 2016 and 2021 (Figure 7). As a result of the number of humpback whales stranding in 2016 and 2017 throughout the northeast region, Unusual Mortality Events were declared by the National Oceanic and Atmospheric Administration for multiple large whale species. In 2022, there was only one large whale stranding in Virginia. This animal was a deceased and scavenged humpback whale that was sighted ~54 miles offshore Virginia during an aerial survey. This animal was not examined and therefore a cause of stranding could not be determined.

Though large whale stranding numbers were lower in 2022 compared to previous years, there is still a strong funding need for management of costly events such as necropsy, monitoring, and disentanglement, as well as the need for a statewide logistics plan for dealing with such events (e.g. towing/landing sites, disposal, etc.). While UME federal funds have helped offset some of the costs associated with these responses, those federal funds are temporary and only cover reimbursement of expenses unrelated to salary. In addition to costly equipment rentals and purchases, large whale strandings require considerable human capital to manage competently and safely. Although the beginning of 2023 has seen an increase in whale strandings, unless that trend continues it is likely the humpback whale UME will be declared closed, resulting in cessation of available funding in support of response to those events.

Other delphinids / kogiids & ziphiids

Other delphinid species generally include pelagic delphinids (e.g. pilot whale, spotted dolphin, Risso's dolphin, common dolphin, etc.). Kogiid and ziphiid species includes both *Kogia* and all beaked whale species. These strandings typically occur along the ocean and lower bay shorelines and sometimes involve live animals. In 2022, no animals belonging to these categories were known to have stranded. However, there were six unidentified cetaceans that stranded in 2022.

Phocids

Phocid strandings have generally increased in Virginia since the early 1990s, and 2022 was an average year compared to the prior 10 years. There were four phocid strandings recorded in Virginia during 2022 (Figure 2 & Figure 8). These included one harbor seal (*Phoca vitulina*), one gray seal (*Halichoerus grypus*), and two harp seals (*Pagophilus groenlandicus*). Of these, one juvenile harp seal stranded alive; the remaining seals stranded deceased. The live seal was first monitored, but its conditioned worsened and the decision was made to collect the animal for rehabilitation. Blood was collected on site and the seal was immediately transported to the National Aquarium in Baltimore, MD for rehabilitation. Unfortunately, the animal died overnight.

Regular sightings of seals in Virginia continue to be common occurrences in winter and early spring and there is current interest in studying the growing winter aggregations of phocids. Improved education and training of stranding network personnel have decreased the unwarranted interference with otherwise healthy seals which have hauled-out to rest on Virginia shorelines, piers, jetties and rock islands. Harbor and gray seals were included in the Northeast U.S. Phocid Unusual Mortality Event declared in 2018. The UME declaration was based in part on significantly elevated harbor and gray seal stranding numbers, as well as coinfections with morbillivirus (a form of distemper) and avian influenza virus. The UME is currently "non-active" and pending closure. However, an additional phocid UME was declared for the Northeast US in 2022, affecting harbor and gray seals. To date, the total number of animals involved has been 330, with harbor seals being the predominant species affected, and all identified cases limited to Maine waters. The cause of this UME was identified as highly pathogenic avian influenza (HPAI). No seals stranded in Virginia after the declaration of this UME, however the UME remains open, and a stranded bottlenose dolphin in Florida tested positive for HPAI which is the first documented case of HPAI infection in a cetacean.

Manatees

Florida manatees (*Trichechus manatus)* have been sighted seasonally, typically mid-summer to early fall, in Virginia waters since the early 1990s. Frequency and volume of reported sightings has increased over the last decade, with an average of 10 reported sightings annually from 2010 through 2020. In 2022, there were 17 reported sightings of manatees in Virginia. These were all seen as individuals or pairs and several were matched to each other via photo ID efforts. Seasonality of presence is also broadening, as recent year sightings have occurred as early as March and as late as December.

In October 2018, Virginia conducted its first stranded manatee necropsy in over 30 years. The necropsy exam revealed that the cause of death for this animal was likely blunt trauma inflicted via impingement by the gate of a canal lock. Two additional manatee strandings occurred with live manatees in 2019. This year, though sightings continued, no manatees were reported stranded.

These mortalities in conjunction with sightings reports in VA strongly suggest that manatees are expanding their range to include regular seasonal residence in VA. Due to the rapid temperature drops and unfamiliar territory, manatees traveling to VA are likely to experience regular challenges related to cold stress. Additionally, state laws and practices in VA do not incorporate measures to reduce manatee morbidity and mortality. As a threatened species under the Endangered Species Act, increasing and prolonged presence of manatees in Virginia's waterways may lead to significant conflicts between manatees and human activity. Additionally, manatees may present a future challenge for VA wildlife managers because of the special federal permits required to work with manatees, and the logistical challenges of manatee stranding response (e.g. specialty equipment and training).

Sea Turtles

During 2022, there were an above average number of sea turtle strandings (324) in Virginia (Table 3, Table 4). This is the highest number of annual sea turtle strandings since 2004 (359 strandings). Since 2000, Virginia has experienced both extremely high (531 in 2003) and relatively low (173 in 2011) numbers of sea turtle strandings. The previous ten years saw an average of 255 sea turtle strandings per year, whereas the new ten-year average is 264 per year. Virginia remains an area of high sea turtle mortality as measured by strandings (Figure 9). During 2022, 15 sea turtle strandings were documented by stranding network cooperators trained by VAQS. Cooperators' reports are entered into the state sea turtle stranding database and the responder's affiliation is listed. This year, cooperators from Back Bay National Wildlife Refuge, Chincoteague National Wildlife Refuge, Eastern Shore National Wildlife Refuge, The Nature Conservancy, and Virginia's Department of Wildlife Resources responded to strandings, with additional reports from Kiptopeke State Park and False Cape State Park.

Similarly to the previous year, June was the busiest month of 2022 with 91 strandings (28% of the year's total), followed by October with 50 (15%), May with 45 (14%), and November with 44 (14%). This year saw the second busiest October on record for sea turtle strandings in Virginia (second to 2015 with 55 strandings). The overall 2022 stranding season showed a bimodal distribution similar to historic patterns (Figure 12).

Loggerheads (*Caretta caretta*, n=139) continued to be the most common sea turtle species to strand in Virginia. This was followed very closely by Kemp's ridleys (*Lepidochelys kempii*, n=133), with the highest recorded number of Kemp's ridley strandings in a calendar year in Virginia's history. Kemp's ridley strandings more than doubled from last year (m=63 in 2021). This could be due to the record-breaking number of hooked turtles seen in Virginia 2022, most of which were Kemp's ridley turtles. Similar to 2015 (n=69) and 2019 (n=47), green turtle strandings (*Chelonia mydas*, n=41) experienced a year of high volume, greatly increasing from last year (n=14 in 2021). Additionally, leatherbacks (*Dermochelys coriacea*, n=1), and individuals unidentified to species (n=10) were reported stranded in 2022 (Figure 11). The distribution of strandings was primarily along the southern eastern shore, southern ocean-facing beaches, and lower bay shorelines (Figure 12 & Figure 13). Improved efforts by VAQS to recruit and train cooperators have greatly enhanced stranding response on the eastern shore of Virginia, which was where 23% (n=75) of the statewide sea turtle strandings were found. Accomack County accounted for 4.6% (n=15) and Northampton County for 18.5% (n=60) of the statewide total. Strandings in Virginia Beach and Norfolk contributed to 54% (n=175) of the total. The remaining 23% (n=74) originated from the western shores of the Chesapeake Bay north of the James River.

VAQS has continued to prioritize the recognition and documentation of human interaction in stranded sea turtles. In 2022, signs of human interaction were documented in 46% of cases (n=149), not present in 5% (n=16), and could not be determined in 49% (n=159). Documentation of some types of human interaction, most notably evidence of entanglements, can be more challenging to assess in sea turtles due to their hard shells and keratinized skin. Additionally, decomposition often precludes a thorough human interaction evaluation. In some cases, carcasses were fresh enough to conduct thorough necropsies, during which time anthropogenic injuries such as vessel, dredge, or entanglement lesions can be thoroughly investigated. Necropsies of stranded turtles sometimes reveal internal signs of human interaction in the form of fishing lures, hooks, line and plastic debris in the gastrointestinal tract. Fishing equipment can be from recreational or commercial (such as long-line) gear and may have been actively fishing or discarded "ghost" gear. As in the past years, VAQS continues to investigate the impacts that recreational and commercial fishing have on sea turtles in Virginia.

Turtles for which probable causes of stranding/death could be determined (n=176, 54% of total) consisted of human induced stranding (n=144, 82%) and naturally caused stranding (n=32, 18%). Human induced strandings were almost entirely made up of recreationally hooked turtles (n=71, 49%) and turtles with acute anthropogenic trauma, such as from a watercraft vessel or dredge (n=65, 45%). Similarly to 2020, 2022 saw several (n=10) instances of sea turtle remains recovered from an active dredging vessel. VAQS recovered all 10 of these partial carcasses to sample for evidence of wound vitality and is currently analyzing the results. Other human causes of stranding included chronic hooking, acute entanglement, and chronic entanglement. Naturally caused strandings were made up of 59% cold stunning cases (n= 19), but also included infectious/disease (n=11). Although total sea turtle stranding numbers increased by over 50% from the previous year, the number of cold stunned cases decreased (n= 31 in 2021). It is unknown what exactly caused the increase in total sea turtle stranding numbers, but the record-high hooked turtle strandings contributed. Pictures and descriptions of some of the notable sea turtle strandings in 2022 are included in Appendix III: Highlights of the Year – Sea Turtles.

Live strandings

In 2022, live strandings of sea turtles continued to dramatically increase (n=92) after 2020 saw the lowest live stranding numbers (n=34) since 2014. This year's number of documented live sea turtle strandings was the highest ever recorded in Virginia (since 1988). Of these, 71 live stranded turtles in 2022 were incidentally caught by recreational hook and line fishers. One possible explanation for these high numbers could be higher traffic at the local piers after the peak of the COVID-19 pandemic in 2020-2021. Live stranded turtles in 2022 included 60 Kemp's ridleys, 17 loggerheads, 9 greens, and 6 of unidentified species (Table 4). The most common cause of stranding for admitted patients was incidental capture via recreational hook and line (n=71), followed by infection/disease (n=9) and cold stunning (n=7). This year was a particularly low year for cold stunned turtles in rehab.

Of the 92 turtles that stranded alive, 77 were successfully recovered for rehabilitation. This included: 56 rehabilitated and released by VAQS, 4 transferred to collaborating facilities and released, 5 transferred and still in rehabilitation, 9 still undergoing rehabilitation at VAQS, and 3 that died in rehabilitation. In 2022, one sea turtle stranded and was admitted into rehabilitation on two separate occasions during the summer season. In addition, 10 sea turtles that stranded in Virginia in 2021 were released after successful rehabilitation by VAQS and partner facilities, and one sea turtle rehabilitation patient from 2021 was euthanized in 2022.

After seeing hooked turtle numbers taper in 2019 and 2020, 2021 and 2022 have each brought gradually more hooked turtle reports and rehabilitation admits, with 2022 (n=71) breaking 2018's (n=66) previous hooked turtle record (Figure 14). As mentioned previously, this

could be at least partially due to the presumed increase in tourism following the peak of the COVID-19 pandemic. We were able to successfully implement our immediate release criteria, initiated in 2017, for many of these animals. This procedure has allowed us to conserve resources and limit rehabilitation time for otherwise healthy hooked turtles. The percentage of rehabilitated hooked turtles that met these criteria were 16% in 2018, 27% in 2019, 25% in 2020, 33% in 2021, and 20% in 2022.

VAQS Activities During 2022

Due to the ongoing COVID-19 pandemic, VAQS' professional, educational, and outreach activities continued to be modified this year. Activities focused largely on virtual events and in-house trainings, though some in-person necropsy and rehabilitation demonstrations were held for VAQ summer camps and other student groups. Trainings in 2022 provided important information to Virginia Aquarium outreach instructors, VAQS Team volunteers, and to other cooperators in the state stranding network. Owing to pandemic guidelines, many of the extramural trainings for state cooperators were not held but are being planned for 2023.

In April of 2022, VAQS hosted a virtual version of the annual Greater Atlantic Regional Stranding Conference. This was a three-day event that included regional marine mammal and sea turtle business meetings and scientific presentations. Past and present VAQS staff gave three oral presentations on marine mammal and sea turtle science. Location of attendees ranged from Florida to Maine, including staff and volunteers from rehabilitation and response organizations, as well as staff from NOAA Fisheries.

In August of 2022, an official dedication was held for the Darden Marine Animal Conservation Center, which VAQS moved into in June 2021. This dedication included the Governor of Virginia, VAQ staff, city council members, state representatives, the Virginia Beach mayor, and the donors after whom the building is named. Construction and improvements have continued throughout 2022. The new facilities were well utilized this year due to the high number of stranding events in 2022. At highest occupancy, VAQS had 27 sea turtle patients in rehabilitation.

In October of 2022, the VAQS senior scientist helped lead a transboundary North Atlantic right whale (NARW) necropsy workshop held in Cape Cod, MA that was hosted by NOAA and DFO Canada. As a steering committee member of the transboundary NARW necropsy committee, the senior scientist was responsible for presenting and leading two half-day portions of the workshop that included experts and trainees from all US and Canadian coasts. The senior scientist was in charge of topics on cause of death determination and international training needs for current and future large whale necropsy teams and team leaders.

Throughout the year VAQS conducted trainings on sea turtle and marine mammal biology, ecology and stranding response protocols. Additionally, lectures were presented and consultations given on the topics of marine mammal and sea turtle necropsies, stranding response, marine mammal anatomy, sea turtle rehabilitation, findings from sea turtle and marine mammal research, conservation biology, and federal efforts to manage and protect marine mammals. The aforementioned presentations were given to diverse audiences ranging from K-12 groups, to graduate and undergraduate students, professional and social groups, and even an NPR podcast accessible around the world.

VAQS staff provided either informal or formal (e.g. graduate committee member) guidance to several undergraduate and graduate students, and provided federal consultations for sensitive investigations related to human interactions and large whales. VAQS staff continue to participate as stranding network liaisons and investigative team members on four separate federally managed marine mammal unusual mortality events. A VAQS senior scientist continued to serve as one of 12 members appointed by the secretaries of Commerce and the Interior to the federal Working Group for Marine Mammal Unusual Mortality Events (WGMMUME), guiding investigations on a national scale. In addition, this staff member has been acting as the Working Group liaison to the east coast stranding network dealing with the 2017-2022 North Atlantic Right Whale Unusual Mortality Event. Furthermore, this scientist was also requested by NOAA-NMFS as Steering committee member for three separate transboundary (US & Canada) committees related to large whale necropsy leadership, training, and case reviews.

A complete list of all professional, educational, and training activities is included in Appendix I: Professional and Education Activities.

Grant funds were used in conjunction with funds from the Virginia Aquarium Foundation as well as city, state and federal funds to staff the Aquarium's Darden Marine Animal Conservation Center with a full-time veterinary technician, rehabilitation manager, field response and volunteer manager, data and operations manager, two stranding response technicians, and two part-time stranding assistants. In recognition of the services VAQS provides to the city and state, the City of Virginia Beach's Aquarium budget now includes two VAQS staff, namely the senior scientist who coordinates stranding response to sea turtle and marine mammal strandings in Virginia, and the staff person responsible for field response. During 2022 we were able to fully reintegrate volunteers into our daily operations after deviations due to the pandemic, which included regular response and husbandry shifts, in addition to the on-call program we operated last year. VAQS Team volunteers logged more than 9,400 hours during 2022, up from 7,000 in 2021. Additional specialty volunteers continue to be trained to provide support and enhance response to special, predictable stranding events with increased logistical demands, such as live sea turtles caught by recreational anglers at

fishing piers and large whale necropsies. Created and managed by the volunteer manager, the on-call system greatly enhances the Team's readiness and rapid response capabilities.

VAQS staff continues to conduct advanced necropsies on freshly deceased sea turtles and marine mammals to investigate causes of mortality and to determine baseline health information for regional populations. Causes of death/stranding are being consistently collected, reviewed, and compiled. VAQS staff performed 147 necropsies on marine mammals and sea turtles in 2022.

Continued efforts were made to increase efficiency and consistency of cause of strand and human interaction data across marine mammals and sea turtles. Last year, VAQS created a completely new internal sea turtle stranding database to work with the new national Sea Turtle Stranding and Salvage Network (STSSN) data form and online database. In 2022, we continued to refine this database and data collection, including better standardization of human interaction status and cause of stranding determinations. We continue to report sea turtle stranding data to NMFS on a bi-weekly basis. Significant future work will be necessary to effectively merge previous data into the new database design.

Summary

Data collected by VAQS and the Virginia stranding network continue to be critical to the long-term monitoring efforts for sea turtle and marine mammal populations in the mid-Atlantic region. Freshly stranded cetaceans continue to be extensively sampled as part of cooperative research (involving the University of North Carolina at Wilmington, NOAA Fisheries Take Reduction Teams, WGMMUME) to better assess marine mammal health. These studies are crucial to developing a better understanding of the overall health status of marine mammal populations in the wild. Stranding response and data collection from Virginia were crucial to the identification and response to the bottlenose dolphin UME that began in July 2013 along the east coast. Virginia also experienced the highest number of bottlenose dolphin mortalities (n=382) associated with the UME. Studies associated with the vast amount of data and samples collected from stranded marine mammals will continue to help researchers better understand the impact of these mortalities on coastal bottlenose dolphin stocks. In addition, the unprecedented levels of mortalities have also provided a wealth of potential data for further understanding many aspects of the life history of these iconic regional marine mammals.

VAQS continues to expertly monitor stranded animals for signs of human interaction, such as entanglements in fishing gear and vessel interactions. Beginning in 2016, VAQS staff noticed previously undescribed internal lesions in bottlenose dolphins. As a result of the dedicated efforts and staff expertise, VAQS identified novel lesions related to entanglement of bottlenose dolphins in fishing gear. These lesions have been combined with other pathologic

findings to compose a forensic matrix for increasing confidence in fisheries interaction identification. More detailed data collection continues to better understand the prevalence and presentation of these lesions. Historic data from 2016 and 2019 have been analyzed to examine prevalence of such findings in fisheries interaction cases. Results have been presented at national stranding and marine mammal biology conferences in 2017 and 2019 and were published in July 2020 in a peer-reviewed marine science journal. For these and other reasons, VAQS staff serve as expert members on three federal Take Reduction Teams working to reduce the incidental mortalities of marine mammals in commercial fishing operations. The changes to the rules regulating pound net leaders, supported by VAQS research efforts, are reducing the incidental takes of dolphins and sea turtles in Chesapeake Bay. One staff member is also one of only a few federally recognized large whale necropsy team leaders on the Atlantic and Gulf coasts of the U.S and is currently serving as an investigative team member and stranding network liaison for National Marine Fisheries Service on all currently open unusually mortality events (UMEs) (e.g. North Atlantic right whale, minke whale, humpback whale, and seals).

Though total sea turtle strandings were low in both 2020 (n=216) and 2021 (n=212), 2022 had the greatest number of strandings (n=324) since 2004 (n=359). Rebounding numbers this year suggests that although there could be an ecological explanation for the low numbers in the previous two years, the impacts of the COVID-19 pandemic may have played a role in how many tourists/residents were out on the beaches and the water reporting strandings. Continued monitoring of Virginia sea turtle strandings in the future will provide valuable information to help understand the causes of sea turtle mortalities and whether changing numbers represent a significant and predictable trend or only a temporary change.

Data collected from strandings provide excellent information on life histories of the many species of marine mammals and sea turtles that inhabit Virginia waters. Stranded animals are the only source of this type of scientific information for many species of marine mammals. The True's beaked whale stranding in 2003, the melon-headed whale strandings in 2008, the Sowerby's beaked whale strandings in 2009, and the pygmy killer whale strandings in 2013 provide excellent examples of the unique opportunities that strandings provide to study rare and previously unknown species from Virginia. Additionally, the January 2018 stranding of a critically endangered North Atlantic right whale resulted in documentation of a fisheries interaction take due to Canadian snow crab fisheries, highlighting the importance of such investigations.

Managing the Virginia stranding network for federally and state protected marine mammals and sea turtles continues to be a priority for VAQS and is vitally important for the state and federal agencies who depend on this information. Federal funding from NOAA Fisheries for the marine mammal stranding network through the Prescott Stranding Grant

Program is insufficient and always under threat of elimination, especially given current federal budget constraints as a result of the COVID-19 pandemic. Additionally, newly passed amendments to the MMPA data provision requirements will likely increase the already high data reporting burden to NOAA. Unfortunately, the federal UME contingency fund is dwindling and the multiple current and recurring UMEs are sure to deplete it without significant actions. It is possible that this funding stream will disappear unless Congress and NOAA continue to act to maintain the only federal funding available to the national marine mammal stranding network. This is especially concerning since the significant expenses involving large whale stranding events have largely been offset through reimbursements by this fund. However, as previously noted, once the UMEs are closed, funds for support of large whale stranding response (e.g. excavator rental, tow boat rental, etc.) will not be available. Without this fund, annual large whale stranding events costing many tens of thousands of dollars may fall on state and municipal entities to support. At a time when marine mammal strandings are at record levels, and stranding data are crucial to monitoring ocean health and supporting fishery management and ocean resource-use planning efforts, stranding network organizations like VAQS are trying to operate with the continuing threat of declining or eliminated federal financial support. There remains much work to do and it is hoped that management efforts informed by quality stranding data will begin to reduce the high levels of sea turtle and marine mammal mortalities related to human activities in Virginia and elsewhere in the region. Continued monitoring and reporting of trends in strandings of protected species will be priorities for the Virginia Aquarium Stranding Response Program in 2023.

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Tables

*Table 1: Marine mammal strandings in Virginia during 2022, n=113. Notes: length measured in centimeters; * indicates estimated length; ND=not determined; F=female, M=male, U=unknown sex.*

Field Number	Date	Species	City/County	Latitude	Longitude	Condition	Sex	Length
VAQS20221001	1/1/2022	Bottlenose dolphin	Newport News	37.0559	-76.51846	dead	M	ND
VAQS20221002	1/5/2022	Bottlenose dolphin	Virginia Beach	36.92444	-76.04855	dead	U	ND
VAQS20221003	1/31/2022	Bottlenose dolphin	Accomack	37.92715	-75.38824	dead	U	ND
VAQS20221004	2/1/2022	Bottlenose dolphin	Accomack	37.96784	-75.28871	dead	U	292*
VAQS20221005	2/17/2022	Harp seal	Norfolk	36.96884	-76.28914	live	F	92
VAQS20221006	3/2/2022	Humpback whale	Virginia Beach	36.60565	-74.89559	dead	U	ND
VAQS20221007	3/2/2022	Common dolphin (short-beaked)	Northampton	37.42146	-75.95061	dead	M	209
VAQS20221008	3/13/2022	Common dolphin (short-beaked)	Northampton	37.27315	-76.02085	dead	F	185
VAQS20221009	3/13/2022	Common dolphin (short-beaked)	Virginia Beach	36.92666	-76.00359	dead	F	210
VAQS20221010	3/13/2022	Common dolphin (short-beaked)	Northampton	37.41428	-75.98532	live	F	203
VAQS20221011	3/13/2022	Common dolphin (short-beaked)	Northampton	37.27615	-76.01672	live	M	168
VAQS20221012	3/14/2022	Common dolphin (short-beaked)	Northampton	37.08487	-75.97357	dead	F	196
VAQS20221013	3/15/2022	Common dolphin (short-beaked)	Accomack	37.65858	-75.82966	live	F	165
VAQS20221015	3/15/2022	Common dolphin (short-beaked)	Northampton	37.51113	-75.95427	dead	F	198
VAQS20221014	3/16/2022	Common dolphin (short-beaked)	Virginia Beach	36.93789	-75.31879	dead	U	ND
VAQS20221016	3/19/2022	Common dolphin (short-beaked)	Accomack	37.84458	-75.66333	live	M	220
VAQS20221017	3/20/2022	Common dolphin (short-beaked)	Northampton	37.35926	-75.99265	dead	F	163
VAQS20221018	3/20/2022	Common dolphin (short-beaked)	Accomack	37.64263	-75.81554	dead	F	210
VAQS20221019	3/20/2022	Common dolphin (short-beaked)	Northampton	37.41591	-75.96233	dead	U	ND
VAQS20221020	3/22/2022	Bottlenose dolphin	Accomack	37.76583	-75.54167	dead	U	190.5*
VAQS20221021	3/23/2022	Harp seal	Northumberland	37.78326	-76.30917	dead	U	ND
VAQS20221022	3/23/2022	Common dolphin (short-beaked)	Accomack	37.85251	-75.37843	live	F	194
VAQS20221023	3/25/2022	Common dolphin (short-beaked)	Accomack	37.6517	-75.82116	dead	U	ND
VAQS20221024	3/29/2022	Common dolphin (short-beaked)	Northampton	37.48729	-75.96123	dead	U	ND
VAQS20221025	4/4/2022	Unidentified delphinid	Suffolk	36.91444	-76.48044	dead	U	ND
VAQS20221026	4/6/2022	Bottlenose dolphin	Virginia Beach	36.7475	-75.94333	dead	F	259
VAQS20221027	4/12/2022	Bottlenose dolphin	Accomack	37.85117	-75.46712	dead	M	256
VAQS20221028	4/12/2022	Bottlenose dolphin	Mathews	37.32776	-76.30212	dead	U	ND
VAQS20221029	4/18/2022	Common dolphin (short-beaked)	Accomack	37.77634	-75.72571	dead	U	ND
VAQS20221030	4/19/2022	Gray seal	Northumberland	37.84886	-76.32189	dead	U	ND
VAQS20221031	4/22/2022	Bottlenose dolphin	Virginia Beach	36.57347	-75.87213	dead	F	176
VAQS20221048	4/22/2022	Harbor porpoise	Northampton	37.36929	-75.72431	dead	F	170*
VAQS20221032	4/25/2022	Common dolphin (short-beaked)	Accomack	37.66154	-75.82429	dead	U	ND
VAQS20221034	4/25/2022	Bottlenose dolphin	Accomack	37.75847	-75.54585	dead	U	ND
VAQS20221035	4/25/2022	Bottlenose dolphin	Accomack	37.75507	-75.54836	dead	U	ND
VAQS20221033	4/28/2022	Bottlenose dolphin	Virginia Beach	36.89881	-76.04592	dead	M	171

Field Number	Date	Species	City/County	Latitude	Longitude	Condition	Sex	Length
VAQS20221036	4/29/2022	Bottlenose dolphin	Accomack	37.59358	-75.6526	dead	U	ND
VAQS20221037	4/29/2022	Bottlenose dolphin	Accomack	37.86011	-75.3958	dead	M	201
VAQS20221038	5/1/2022	Bottlenose dolphin	Northumberland	37.78528	-76.30178	dead	U	ND
VAQS20221039	5/1/2022	Bottlenose dolphin	Accomack	37.86307	-75.44915	dead	F	223
VAQS20221054	5/1/2022	Bottlenose dolphin	Northumberland	37.93172	-76.31123	dead	U	ND
VAQS20221040	5/2/2022	Bottlenose dolphin	Accomack	37.831	-75.49	dead	M	221
VAQS20221041	5/2/2022	Bottlenose dolphin	Accomack	37.828	-75.493	dead	U	163
VAQS20221042	5/2/2022	Bottlenose dolphin	Accomack	37.82855	-75.49124	dead	M	197.2
VAQS20221043	5/6/2022	Bottlenose dolphin	Hampton	37.07163	-76.27929	dead	U	294*
VAQS20221044	5/6/2022	Bottlenose dolphin	Virginia Beach	36.88357	-75.98305	dead	U	168
VAQS20221045	5/9/2022	Bottlenose dolphin	Virginia Beach	36.75626	-75.94696	dead	M	173
VAQS20221046	5/9/2022	Bottlenose dolphin	Middlesex	37.5737	-76.358	dead	F	210
VAQS20221047	5/10/2022	Bottlenose dolphin	Virginia Beach	36.92652	-76.16235	dead	F	208
VAQS20221049	5/15/2022	Bottlenose dolphin	Accomack	37.89436	-75.33845	dead	M	ND
VAQS20221050	5/16/2022	Bottlenose dolphin	Virginia Beach	36.90414	-75.98808	dead	M	249.2
VAQS20221051	5/16/2022	Bottlenose dolphin	Virginia Beach	36.93198	-76.03338	dead	U	ND
VAQS20221052	5/20/2022	Bottlenose dolphin	Norfolk	36.9325	-76.19711	live	M	155
VAQS20221053	5/22/2022	Bottlenose dolphin	Northampton	37.18822	-75.99808	dead	U	ND
VAQS20221056	5/25/2022	Bottlenose dolphin	Norfolk	36.93162	-76.19254	dead	U	ND
VAQS20221055	5/26/2022	Bottlenose dolphin	Norfolk	36.93708	-76.21507	dead	M	112
VAQS20221057	5/26/2022	Bottlenose dolphin	Norfolk	36.95152	-76.24466	dead	U	ND
VAQS20221058	5/27/2022	Bottlenose dolphin	Hampton	37.00535	-76.30216	dead	U	114
VAQS20221059	5/27/2022	Bottlenose dolphin	Lancaster	37.62021	-76.30654	dead	M	ND
VAQS20221060	5/28/2022	Bottlenose dolphin	Northumberland	37.9221	-76.29126	dead	U	ND
VAQS20221061	5/29/2022	Bottlenose dolphin	Virginia Beach	36.73468	-75.93878	dead	F	106.5
VAQS20221062	5/29/2022	Bottlenose dolphin	Mathews	37.47259	-76.27342	dead	M	ND
VAQS20221063	5/30/2022	Bottlenose dolphin	York	37.27944	-76.58222	dead	M	ND
VAQS20221064	5/30/2022	Unidentified delphinid	Lancaster	37.62333	-76.34456	dead	U	ND
VAQS20221065	5/31/2022	Harbor seal	Accomack	37.91703	-75.37304	dead	M	137
VAQS20221067	6/1/2022	Bottlenose dolphin	Accomack	37.61531	-75.61409	dead	M	201
VAQS20221066	6/2/2022	Bottlenose dolphin	Northampton	37.17131	-75.84036	dead	U	ND
VAQS20221070	6/2/2022	Bottlenose dolphin	Northampton	37.0961	-75.98001	dead	M	ND
VAQS20221068	6/4/2022	Bottlenose dolphin	Hampton	37.07139	-76.27938	dead	U	ND
VAQS20221069	6/6/2022	Bottlenose dolphin	Virginia Beach	36.78312	-75.95694	dead	M	100
VAQS20221071	6/13/2022	Bottlenose dolphin	Northumberland	37.7328	-76.31142	dead	U	ND
VAQS20221072	6/15/2022	Bottlenose dolphin	York	37.2375	-76.50483	dead	U	ND
VAQS20221073	6/18/2022	Bottlenose dolphin	Norfolk	36.89706	-76.31463	dead	U	ND
VAQS20221074	6/19/2022	Bottlenose dolphin	Norfolk	36.92978	-76.1803	dead	F	125
VAQS20221075	6/24/2022	Bottlenose dolphin	Northumberland	37.94533	-76.33951	dead	M	ND
VAQS20221076	6/24/2022	Bottlenose dolphin	Lancaster	37.61988	-76.30325	dead	M	ND
VAQS20221077	6/25/2022	Unidentified small cetacean	Northampton	37.12353	-75.9545	dead	U	ND
VAQS20221078	6/26/2022	Bottlenose dolphin	Gloucester	37.26474	-76.41775	dead	M	121
VAQS20221079	6/27/2022	Bottlenose dolphin	Northampton	37.2295	-76.0495	dead	U	ND
VAQS20221080	7/3/2022	Bottlenose dolphin	Northumberland	37.87501	-76.24223	dead	U	ND
VAQS20221081	7/10/2022	Bottlenose dolphin	Northumberland	37.84264	-76.25133	dead	M	216
VAQS20221082	7/13/2022	Bottlenose dolphin	Hampton	37.00932	-76.29974	dead	M	267
VAQS20221083	7/14/2022	Bottlenose dolphin	Richmond	37.81556	-76.67315	dead	M	ND
VAQS20221084	8/2/2022	Common dolphin (short-beaked)	Suffolk	36.83836	-76.55047	dead	U	ND
VAQS20221085	8/4/2022	Bottlenose dolphin	Gloucester	37.24755	-76.50066	dead	U	ND
VAQS20221086	8/18/2022	Unidentified delphinid	Virginia Beach	36.71878	-75.93277	live	U	ND
VAQS20221087	8/26/2022	Bottlenose dolphin	Northampton	37.14901	-75.97493	dead	M	ND
VAQS20221088	8/27/2022	Bottlenose dolphin	Northumberland	37.82339	-76.30001	dead	M	ND
VAQS20221089	8/28/2022	Bottlenose dolphin	Hampton	37.01203	-76.32615	dead	U	ND
VAQS20221090	9/2/2022	Bottlenose dolphin	Northampton	37.23732	-76.02925	dead	M	229
VAQS20221091	9/3/2022	Bottlenose dolphin	Northampton	37.12758	-75.95021	dead	U	ND
VAQS20221092	9/7/2022	Bottlenose dolphin	Hampton	37.05875	-76.28254	dead	U	ND
VAQS20221093	9/8/2022	Bottlenose dolphin	Norfolk	36.93033	-76.18534	dead	U	ND

Field Number	Date	Species	City/County	Latitude	Longitude	Condition	Sex	Length
VAQS20221094	9/13/2022	Bottlenose dolphin	Northampton	37.15356	-75.97599	dead	M	197
VAQS20221095	9/21/2022	Bottlenose dolphin	Northampton	37.1636	-75.98214	dead	M	199
VAQS20221096	9/24/2022	Bottlenose dolphin	Virginia Beach	36.62771	-75.88949	dead	U	ND
VAQS20221097	9/25/2022	Bottlenose dolphin	Virginia Beach	36.93095	-76.02145	dead	U	ND
VAQS20221098	9/28/2022	Bottlenose dolphin	Virginia Beach	36.90042	-76.05264	dead	F	185
VAQS20221099	10/10/2022	Bottlenose dolphin	Virginia Beach	36.91033	-76.08727	dead	M	154
VAQS20221100	10/16/2022	Unidentified delphinid	Northampton	37.16119	-75.97978	dead	U	ND
VAQS20221101	10/18/2022	Bottlenose dolphin	Northampton	37.13686	-75.97214	dead	M	205
VAQS20221102	10/26/2022	Bottlenose dolphin	Middlesex	37.57103	-76.33956	dead	M	ND
VAQS20221103	10/29/2022	Bottlenose dolphin	Norfolk	36.96916	-76.29373	dead	M	ND
VAQS20221104	11/1/2022	Bottlenose dolphin	Hampton	37.07383	-76.27824	dead	F	179
VAQS20221105	11/6/2022	Bottlenose dolphin	Newport News	36.98604	-76.39159	dead	M	ND
VAQS20221106	11/7/2022	Unidentified small cetacean	Accomack	37.88499	-75.4229	live	U	ND
VAQS20221107	11/12/2022	Bottlenose dolphin	Northampton	37.19656	-76.00767	dead	M	217
VAQS20221108	11/13/2022	Bottlenose dolphin	Northampton	37.19889	-76.01028	dead	M	197.3
VAQS20221109	11/26/2022	Bottlenose dolphin	Northampton	37.13655	-75.97198	dead	U	ND
VAQS20221110	12/9/2022	Bottlenose dolphin	Northampton	37.10945	-75.97032	dead	U	ND
VAQS20221111	12/12/2022	Common dolphin (short-beaked)	Hampton	37.08593	-76.27215	dead	M	220
VAQS20221112	12/13/2022	Bottlenose dolphin	Virginia Beach	36.63833	-75.89472	dead	U	ND
VAQS20221113	12/17/2022	Bottlenose dolphin	York	37.14556	-76.42258	dead	F	ND

Table 2: Live stranded marine mammals recorded by VAQS in Virginia in 2022, n=9.

Field Number	Species	Strand Date	Final Disposition
VAQS20221005	Harp seal	2/17	Transferred to another facility for rehabilitation, died naturally
VAQS20221010	Common dolphin	3/13	Died at site, full necropsy
VAQS20221011	Common dolphin	3/13	Euthanized, full necropsy
VAQS20221013	Common dolphin	3/15	Euthanized, full necropsy
VAQS20221016	Common dolphin	3/19	Euthanized, full necropsy
VAQS20221022	Common dolphin	3/23	Euthanized, full necropsy
VAQS20221052	Bottlenose dolphin	5/20	Died at site, full necropsy
VAQS20221086	Unidentified delphinid	8/18	Unknown, pushed back out by public
VAQS20211106	Unidentified cetacean	11/7	Unknown, pushed back out by public

Table 3: Dead sea turtle strandings in Virginia during 2022, n=232. Notes: length measured in centimeters; ND=not determined; F=female, M=male, U=unknown sex.

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length
VAQS20172275.1	05/28/2022	Loggerhead	Accomack	37.686872	-75.868769	U	ND
VAQS20222001	02/09/2022	Loggerhead	Northampton	37.09664	-75.98001	F	55.3
VAQS20222002	02/23/2022	Kemp's ridley	Northampton	37.203502	-76.010598	U	ND
VAQS20222003	02/27/2022	Loggerhead	Northampton	37.39817	-75.96802	U	64
VAQS20222010	05/03/2022	Loggerhead	Virginia Beach	36.976677	-75.999378	U	ND
VAQS20222011	05/06/2022	Loggerhead	Virginia Beach	36.91978	-76.13134	M	69.5*
VAQS20222016	05/10/2022	Kemp's ridley	Norfolk	36.93279	-76.20111	U	57.2
VAQS20222017	05/11/2022	Kemp's ridley	York	37.211307	-76.468393	F	49.7
VAQS20222018	05/12/2022	Kemp's ridley	Virginia Beach	36.92022	-76.13383	F	61.5
VAQS20222019	04/22/2022	Green	Northampton	37.372567	-75.713778	U	ND
VAQS20222020	05/13/2022	Kemp's ridley	Virginia Beach	36.961117	-76.025017	U	ND
VAQS20222021	05/13/2022	Kemp's ridley	Virginia Beach	36.91244	-76.10869	F	47.9
VAQS20222024	05/15/2022	Loggerhead	Virginia Beach	36.977879	-76.00635	U	ND
VAQS20222025	05/17/2022	Loggerhead	Accomack	37.81988	-75.50129	U	68.6
VAQS20222026	05/17/2022	Loggerhead	Accomack	37.80326	-75.51614	M	94
VAQS20222027	05/19/2022	Kemp's ridley	Hampton	37.001206	-76.365869	M	48.6
VAQS20222029	05/20/2022	Loggerhead	Middlesex	37.581125	-76.406873	F	77.7
VAQS20222030	05/19/2022	Loggerhead	Mathews	37.48094	-76.26685	U	ND
VAQS20222032	05/19/2022	Kemp's ridley	Northumberland	37.842201	-76.249349	U	45*
VAQS20222034	05/22/2022	Loggerhead	York	37.26312	-76.5083	U	ND
VAQS20222039	05/24/2022	Loggerhead	Virginia Beach	36.5527	-75.8683	F	67*
VAQS20222040	05/26/2022	Loggerhead	Virginia Beach	36.91202	-76.0843	F	67*
VAQS20222041	05/26/2022	Loggerhead	Norfolk	36.93111	-76.19155	F	76
VAQS20222042	05/28/2022	Loggerhead	Mathews	37.327694	-76.303034	U	ND
VAQS20222043	05/28/2022	Loggerhead	Virginia Beach	36.91153	-75.98975	F	58.9
VAQS20222044	05/28/2022	Kemp's ridley	Hampton	37.00978	-76.3003	F	40.7
VAQS20222050	05/31/2022	Kemp's ridley	Virginia Beach	36.61318	-75.88358	U	ND
VAQS20222052	06/01/2022	Loggerhead	Mathews	37.32415	-76.341867	U	ND
VAQS20222053	06/02/2022	Kemp's ridley	Northampton	37.188051	-75.998093	U	36.2
VAQS20222056	06/03/2022	Loggerhead	Northampton	37.214632	-75.811194	U	ND
VAQS20222057	06/03/2022	Kemp's ridley	Virginia Beach	36.706179	-75.927893	F	60.7
VAQS20222059	06/04/2022	Kemp's ridley	Norfolk	36.954816	-76.250101	F	29
VAQS20222060	06/04/2022	Loggerhead	Virginia Beach	36.91594	-76.1204	U	45*
VAQS20222062	06/04/2022	Loggerhead	Northampton	37.222788	-76.011934	F	85.6
VAQS20222066	06/05/2022	Loggerhead	Northampton	37.320819	-76.017396	U	ND
VAQS20222069	06/05/2022	Loggerhead	Gloucester	37.26793	-76.38114	U	ND
VAQS20222073	06/06/2022	Kemp's ridley	Norfolk	36.96344	-76.26503	U	56.5*
VAQS20222074	06/06/2022	Loggerhead	Mathews	37.510256	-76.283371	U	ND
VAQS20222075	06/06/2022	Loggerhead	Poquoson	37.11	-76.22	U	ND

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length
VAQS20222076	06/06/2022	Loggerhead	Lancaster	37.68483	-76.32438	U	MD
VAQS20222077	06/07/2022	Kemp's ridley	Hampton	37.087247	-76.270844	U	ND
VAQS20222078	06/07/2022	Loggerhead	Virginia Beach	36.973183	-76.1028	U	ND
VAQS20222079	06/07/2022	Loggerhead	York	37.169315	-76.409822	U	ND
VAQS20222082	06/08/2022	Kemp's ridley	Virginia Beach	36.908732	-75.988971	U	26
VAQS20222086	06/09/2022	Kemp's ridley	York	37.223	-76.403	U	ND
VAQS20222087	06/09/2022	Kemp's ridley	Northampton	37.19632	-76.00747	F	29.3
VAQS20222089	06/10/2022	Loggerhead	Virginia Beach	36.92529	-76.15361	F	69
VAQS20222090	06/10/2022	Loggerhead	Virginia Beach	36.918901	-76.129778	U	41.5
VAQS20222091	06/10/2022	Loggerhead	Middlesex	37.613099	-76.535561	U	ND
VAQS20222092	06/10/2022	Kemp's ridley	Virginia Beach	36.91311	-76.07876	F	29.9
VAQS20222093	06/09/2022	Loggerhead	Virginia Beach	36.97235	-76.097767	U	ND
VAQS20222094	06/10/2022	Loggerhead	Northampton	37.198917	-76.00974	U	ND
VAQS20222099	06/11/2022	Loggerhead	York	37.223607	-76.332538	U	ND
VAQS20222100	06/11/2022	Loggerhead	Northampton	37.468329	-75.95909	U	81*
VAQS20222101	06/11/2022	Loggerhead	Northampton	37.325511	-76.016115	U	53.1
VAQS20222102	06/11/2022	Kemp's ridley	Virginia Beach	36.907387	-75.988918	F	22.9
VAQS20222103	06/11/2022	Kemp's ridley	Virginia Beach	36.91309	-76.07879	U	ND
VAQS20222106	06/11/2022	Loggerhead	Northumberland	37.817042	-76.266908	U	ND
VAQS20222107	06/12/2022	Loggerhead	Newport News	36.983778	-76.394602	U	ND
VAQS20222108	06/12/2022	Loggerhead	York	37.198488	-76.393566	U	ND
VAQS20222110	06/12/2022	Loggerhead	Gloucester	37.254772	-76.445311	U	ND
VAQS20222113	06/13/2022	Unidentified	Hampton	37.032684	-76.293745	U	ND
VAQS20222114	06/10/2022	Loggerhead	Accomack	37.902418	-75.334108	U	85.1
VAQS20222115	06/15/2022	Loggerhead	Virginia Beach	36.59978	-75.87898	U	ND
VAQS20222118	06/17/2022	Kemp's ridley	Northampton	37.248391	-76.021015	F	25.2
VAQS20222119	06/17/2022	Loggerhead	Northampton	37.192958	-76.003954	U	ND
VAQS20222122	06/19/2022	Loggerhead	Norfolk	36.9502	-76.24249	U	48.1
VAQS20222123	06/19/2022	Kemp's ridley	Virginia Beach	36.91362	-76.07359	F	34.4
VAQS20222124	06/19/2022	Kemp's ridley	Norfolk	36.93038	-76.1856	M	24
VAQS20222126	06/20/2022	Loggerhead	Virginia Beach	36.967875	-76.086233	U	ND
VAQS20222128	06/20/2022	Loggerhead	Virginia Beach	37.009617	-76.044217	M	ND
VAQS20222130	06/24/2022	Kemp's ridley	Hampton	37.0486	-76.28621	F	49
VAQS20222131	06/23/2022	Loggerhead	Northampton	37.158285	-75.977896	M	ND
VAQS20222133	06/25/2022	Loggerhead	Norfolk	36.968599	-76.281357	U	ND
VAQS20222135	06/25/2022	Kemp's ridley	Virginia Beach	36.743834	-75.942755	U	ND
VAQS20222137	06/28/2022	Kemp's ridley	Virginia Beach	36.919031	-76.055129	M	30.4
VAQS20222139	06/29/2022	Loggerhead	Virginia Beach	36.767183	-75.951267	M	103.8
VAQS20222140	06/29/2022	Loggerhead	Northampton	37.159945	-75.978814	U	66*
VAQS20222141	06/28/2022	Loggerhead	Accomack	37.69725	-75.57908	U	ND
VAQS20222142	07/02/2022	Kemp's ridley	Virginia Beach	36.912114	-76.107967	U	ND

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length
VAQS20222143	07/05/2022	Loggerhead	Virginia Beach	36.59	-75.876389	U	ND
VAQS20222144	07/04/2022	Loggerhead	Northampton	37.16048	-75.97951	U	ND
VAQS20222145	07/06/2022	Kemp's ridley	Hampton	37.034922	-76.292867	U	ND
VAQS20222146	07/06/2022	Loggerhead	Accomack	37.78786	-75.54032	U	ND
VAQS20222148	07/08/2022	Kemp's ridley	Norfolk	36.963755	-76.287922	F	30.1
VAQS20222149	07/09/2022	Kemp's ridley	Hampton	37.086925	-76.271588	F	25.5
VAQS20222151	07/11/2022	Loggerhead	Virginia Beach	36.922176	-76.051333	U	ND
VAQS20222153	07/11/2022	Loggerhead	Virginia Beach	36.913311	-76.077534	U	ND
VAQS20222154	07/11/2022	Unidentified	Middlesex	37.527276	-76.329968	U	ND
VAQS20222156	07/13/2022	Loggerhead	Virginia Beach	36.925236	-76.048317	F	91.3*
VAQS20222157	07/14/2022	Loggerhead	Accomack	37.849831	-75.393488	U	76.2
VAQS20222158	07/15/2022	Loggerhead	Virginia Beach	36.9818	-76.140117	M	ND
VAQS20222159	07/16/2022	Kemp's ridley	Northampton	37.2515	-76.087	F	55.1
VAQS20222160	07/16/2022	Loggerhead	Northumberland	37.798917	-76.266733	U	ND
VAQS20222161	07/16/2022	Kemp's ridley	Norfolk	36.91752	-76.12632	F	48.2
VAQS20222162	07/20/2022	Kemp's ridley	Gloucester	37.245183	-76.481483	U	ND
VAQS20222163	07/22/2022	Loggerhead	Northampton	37.244167	-76.018333	U	ND
VAQS20222164	07/26/2022	Kemp's ridley	Accomack	38.00706	-75.385276	U	28*
VAQS20222165	07/27/2022	Unidentified	Gloucester	37.268072	-76.385174	U	ND
VAQS20222166	07/29/2022	Kemp's ridley	Virginia Beach	36.916802	-76.122878	U	ND
VAQS20222167	07/30/2022	Kemp's ridley	Accomack	37.91074	-75.382269	U	ND
VAQS20222168	08/04/2022	Loggerhead	Accomack	37.91637	-75.380985	F	68*
VAQS20222169	08/05/2022	Loggerhead	Virginia Beach	36.924832	-76.00084	F	67.2*
VAQS20222170	08/09/2022	Loggerhead	Virginia Beach	36.96365	-76.06885	U	ND
VAQS20222171	08/11/2022	Loggerhead	Virginia Beach	36.96975	-76.097617	U	ND
VAQS20222172	08/11/2022	Kemp's ridley	Northampton	37.49151	-75.96059	U	ND
VAQS20222173	08/12/2022	Loggerhead	Northampton	37.08917	-75.97917	U	ND
VAQS20222174	08/13/2022	Loggerhead	Virginia Beach	36.666944	-75.908611	U	ND
VAQS20222175	08/14/2022	Loggerhead	Norfolk	36.957331	-76.253343	U	ND
VAQS20222176	06/15/2022	Loggerhead	Mathews	37.314516	-76.274441	U	ND
VAQS20222177	08/15/2022	Kemp's ridley	Virginia Beach	36.919721	-76.13149	F	37.5*
VAQS20222178	08/17/2022	Loggerhead	Virginia Beach	36.91126	-76.10442	U	84.8
VAQS20222179	08/16/2022	Loggerhead	Accomack	37.989496	-75.271989	U	86.1
VAQS20222181	08/18/2022	Loggerhead	Norfolk	36.93988	-76.22345	U	ND
VAQS20222182	08/19/2022	Loggerhead	Virginia Beach	36.963767	-76.076183	U	ND
VAQS20222183	08/20/2022	Loggerhead	Virginia Beach	36.74438	-75.94212	F	87*
VAQS20222184	08/20/2022	Loggerhead	Virginia Beach	36.931333	-76.007133	U	ND
VAQS20222185	08/20/2022	Loggerhead	Lancaster	37.63889	-76.30222	U	ND
VAQS20222186	08/22/2022	Leatherback	Accomack	37.809877	-75.50991	U	ND
VAQS20222187	08/23/2022	Kemp's ridley	Virginia Beach	36.729745	-75.937043	U	ND
VAQS20222188	08/27/2022	Loggerhead	Norfolk	36.981667	-76.145	U	ND

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length
VAQS20222189	08/30/2022	Kemp's ridley	Norfolk	36.962599	-76.263062	M	43*
VAQS20222190	08/30/2022	Loggerhead	Norfolk	36.93208	-76.19413	U	83*
VAQS20222191	08/31/2022	Kemp's ridley	Norfolk	36.93868	-76.220188	U	ND
VAQS20222192	08/30/2022	Loggerhead	Northampton	37.105317	-76.100333	U	ND
VAQS20222193	08/31/2022	Loggerhead	Virginia Beach	36.720678	-75.933515	F	82.4
VAQS20222194	08/31/2022	Loggerhead	Virginia Beach	36.728579	-75.936613	M	72.4
VAQS20222195	09/02/2022	Loggerhead	Lancaster	37.66071	-76.53354	U	ND
VAQS20222196	09/03/2022	Kemp's ridley	Accomack	37.87649	-75.35416	U	46
VAQS20222197	09/05/2022	Kemp's ridley	Norfolk	36.964552	-76.266967	U	ND
VAQS20222198	09/08/2022	Kemp's ridley	Norfolk	36.952949	-76.24736	M	32.2
VAQS20222199	09/09/2022	Kemp's ridley	Virginia Beach	36.91227	-76.10793	F	29.4
VAQS20222200	09/10/2022	Loggerhead	Virginia Beach	36.582429	-75.873854	U	ND
VAQS20222201	09/14/2022	Kemp's ridley	Hampton	36.993453	-76.383486	U	ND
VAQS20222202	09/15/2022	Loggerhead	Virginia Beach	36.9192	-76.12989	M	73
VAQS20222203	09/15/2022	Unidentified	Norfolk	36.968995	-76.288463	U	ND
VAQS20222205	09/16/2022	Kemp's ridley	Norfolk	36.93663	-76.213283	U	28.4
VAQS20222206	09/16/2022	Kemp's ridley	Norfolk	36.94872	-76.24002	M	25.3
VAQS20222207	09/16/2022	Loggerhead	Norfolk	36.95113	-76.24433	M	104.8
VAQS20222208	09/17/2022	Loggerhead	Virginia Beach	36.843996	-75.969059	M	100*
VAQS20222209	09/18/2022	Kemp's ridley	Norfolk	36.96363	-76.26527	F	27.4*
VAQS20222210	09/17/2022	Kemp's ridley	Virginia Beach	36.8004	-75.63164	U	ND
VAQS20222212	09/20/2022	Kemp's ridley	Northampton	37.250153	-76.022235	U	42*
VAQS20222213	09/25/2022	Kemp's ridley	Virginia Beach	36.930834	-76.04018	U	ND
VAQS20222215	09/29/2022	Loggerhead	Virginia Beach	36.84527	-75.97248	M	ND
VAQS20222216	09/29/2022	Kemp's ridley	Norfolk	36.931144	-76.189665	F	63*
VAQS20222217	10/01/2022	Green	Northampton	37.247927	-76.020791	U	27.8
VAQS20222218	10/03/2022	Kemp's ridley	Virginia Beach	36.913496	-76.113234	U	58*
VAQS20222219	10/03/2022	Loggerhead	Norfolk	36.931158	-76.190231	F	96.5
VAQS20222221	10/06/2022	Loggerhead	Northampton	37.430935	-75.980828	U	ND
VAQS20222222	10/07/2022	Loggerhead	Northampton	37.362014	-75.990658	U	ND
VAQS20222224	10/08/2022	Loggerhead	Virginia Beach	36.79535	-75.96034	F	68.4*
VAQS20222225	10/08/2022	Kemp's ridley	Northampton	37.4306	-75.9809	U	ND
VAQS20222227	10/10/2022	Loggerhead	Virginia Beach	36.934117	-76.168017	F	55.7
VAQS20222229	10/11/2022	Kemp's ridley	Norfolk	36.95784	-76.25478	F	37.6
VAQS20222230	10/12/2022	Loggerhead	Virginia Beach	36.964933	-76.118683	U	ND
VAQS20222231	10/13/2022	Loggerhead	Northumberland	37.937748	-76.323111	U	ND
VAQS20222232	10/14/2022	Kemp's ridley	Virginia Beach	36.916447	-76.061533	U	22
VAQS20222233	10/14/2022	Kemp's ridley	Hampton	37.039237	-76.289959	U	ND
VAQS20222234	10/13/2022	Loggerhead	Middlesex	37.554586	-76.300314	M	ND
VAQS20222235	10/15/2022	Kemp's ridley	Virginia Beach	36.90854	-75.98884	M	44.8
VAQS20222236	10/14/2022	Loggerhead	Northampton	37.41519	-75.98276	U	ND

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length
VAQS20222238	10/15/2022	Loggerhead	Northampton	37.10042	-75.97959	U	74.6
VAQS20222239	10/15/2022	Kemp's ridley	Northampton	37.04573	-76.06015	U	ND
VAQS20222241	10/16/2022	Loggerhead	Northumberland	37.952935	-76.386633	M	ND
VAQS20222242	10/16/2022	Green	Northampton	37.171089	-75.987471	F	33.8
VAQS20222244	10/17/2022	Kemp's ridley	Virginia Beach	36.879943	-75.98192	M	37.8
VAQS20222245	10/20/2022	Loggerhead	Northampton	37.19181	-76.00278	U	ND
VAQS20222246	10/20/2022	Green	Northampton	37.192268	-76.003229	U	ND
VAQS20222247	10/20/2022	Green	Northampton	37.192268	-76.003229	U	ND
VAQS20222248	10/20/2022	Loggerhead	Northampton	37.11892	-75.97003	M	101.1
VAQS20222249	10/21/2022	Loggerhead	Northampton	37.427229	-75.981605	U	ND
VAQS20222250	10/21/2022	Loggerhead	Northampton	37.164583	-75.983911	U	ND
VAQS20222251	10/23/2022	Kemp's ridley	Virginia Beach	36.896636	-75.986671	M	38.2
VAQS20222252	10/24/2022	Loggerhead	Norfolk	36.93984	-76.2235	F	64.6
VAQS20222253	10/18/2022	Loggerhead	Northumberland	37.93541	-76.31845	M	ND
VAQS20222254	10/24/2022	Kemp's ridley	Norfolk	36.95029	-76.24301	U	48.5
VAQS20222255	10/22/2022	Loggerhead	Norfolk	36.940434	-76.225152	U	ND
VAQS20222256	10/24/2022	Loggerhead	Northampton	37.311487	-76.015017	F	75.6
VAQS20222257	10/24/2022	Green	Accomack	37.927651	-75.317135	U	30.5
VAQS20222258	10/26/2022	Green	Virginia Beach	36.854166	-75.974776	F	27.5
VAQS20222259	10/27/2022	Loggerhead	Virginia Beach	36.914408	-76.068942	M	48.7*
VAQS20222260	10/29/2022	Kemp's ridley	Virginia Beach	36.829071	-75.969312	U	21.6
VAQS20222261	10/30/2022	Green	Norfolk	36.967455	-76.275425	U	31.9*
VAQS20222263	10/30/2022	Kemp's ridley	Virginia Beach	36.591389	-75.876944	U	50*
VAQS20222265	10/30/2022	Green	Virginia Beach	36.914184	-76.070639	U	ND
VAQS20222266	10/29/2022	Loggerhead	Middlesex	37.561105	-76.337034	M	49.8
VAQS20222267	11/01/2022	Loggerhead	Northampton	37.44167	-75.98014	U	ND
VAQS20222268	11/02/2022	Loggerhead	Northampton	37.433667	-75.980593	U	ND
VAQS20222269	11/03/2022	Kemp's ridley	Norfolk	36.96913	-76.29198	U	ND
VAQS20222272	11/04/2022	Loggerhead	Virginia Beach	36.92829	-76.0457	F	71.6
VAQS20222273	11/04/2022	Green	Norfolk	36.95849	-76.255965	F	31.5
VAQS20222274	11/04/2022	Loggerhead	Northampton	37.363026	-75.990813	U	ND
VAQS20222275	11/04/2022	Kemp's ridley	Virginia Beach	36.913731	-76.073353	U	56
VAQS20222276	11/06/2022	Loggerhead	Northampton	37.43579	-75.97969	F	70.8
VAQS20222277	11/06/2022	Green	Northampton	37.2021	-76.01222	U	ND
VAQS20222278	11/06/2022	Green	Norfolk	36.965174	-76.27965	F	26.2
VAQS20222279	11/06/2022	Green	Northampton	37.21861	-76.01208	M	28.9
VAQS20222280	11/07/2022	Loggerhead	Virginia Beach	36.711931	-75.929541	F	85.1
VAQS20222281	11/06/2022	Kemp's ridley	Hampton	37.002887	-76.357401	U	ND
VAQS20222282	11/08/2022	Loggerhead	Virginia Beach	36.903158	-75.987888	F	75.3
VAQS20222283	11/08/2022	Green	Virginia Beach	36.917468	-76.058727	M	33.2
VAQS20222284	11/08/2022	Green	Norfolk	36.969071	-76.293698	F	25

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length
VAQS20222285	11/08/2022	Loggerhead	Virginia Beach	36.91364	-76.073397	F	60
VAQS20222286	11/08/2022	Loggerhead	Virginia Beach	36.93077	-76.04018	F	90.5
VAQS20222287	11/10/2022	Green	Virginia Beach	36.9166	-76.1231	F	28.3
VAQS20222289	11/10/2022	Green	Virginia Beach	36.91797	-76.12682	M	27.2
VAQS20222290	11/11/2022	Green	Norfolk	36.95441	-76.24915	F	29.9
VAQS20222291	11/12/2022	Loggerhead	Virginia Beach	36.68986	-75.92156	F	63.6
VAQS20222292	11/13/2022	Loggerhead	Virginia Beach	36.81751	-75.96608	M	80.2
VAQS20222293	11/13/2022	Green	Northampton	37.195054	-76.006118	F	27.3
VAQS20222294	11/13/2022	Loggerhead	Hampton	37.003011	-76.357671	U	ND
VAQS20222295	11/13/2022	Green	Northampton	37.196557	-76.007668	U	ND
VAQS20222296	11/14/2022	Loggerhead	Northampton	37.21327	-76.01302	M	63.3
VAQS20222297	11/14/2022	Green	Northampton	37.21342	-76.01294	U	28.3
VAQS20222299	11/16/2022	Kemp's ridley	Norfolk	36.908287	-76.301047	U	ND
VAQS20222301	11/19/2022	Green	Northampton	37.215028	-76.01275	F	32.1
VAQS20222302	11/19/2022	Green	Virginia Beach	36.92136	-76.05218	F	27.3
VAQS20222303	11/19/2022	Green	Northampton	37.191528	-76.002338	F	28.4
VAQS20222304	11/19/2022	Green	Northampton	37.19121	-76.001752	U	27.9
VAQS20222305	11/20/2022	Loggerhead	Virginia Beach	36.626	-75.888167	M	82.8
VAQS20222306	11/21/2022	Green	Northampton	37.247385	-76.020255	U	ND
VAQS20222308	11/25/2022	Green	Northampton	37.128389	-75.969806	U	ND
VAQS20222309	11/21/2022	Green	Northampton	37.135	-75.972	U	ND
VAQS20222313	12/06/2022	Kemp's ridley	Northampton	37.19605	-76.00691	U	ND
VAQS20222314	12/09/2022	Loggerhead	Norfolk	36.95663	-76.25292	M	50.5
VAQS20222316	12/23/2022	Green	Norfolk	36.963704	-76.274908	F	28.3
VAQS20222318	12/27/2022	Kemp's ridley	Northampton	37.1972	-76.008392	M	26.2
VAQS20222319	12/27/2022	Green	Hampton	37.011276	-76.29988	U	32.2
VAQS20222320	12/30/2022	Green	Norfolk	36.848043	-76.296777	U	28.8
VAQS20222321	12/30/2022	Kemp's ridley	Norfolk	36.848043	-76.296777	U	29.1
VAQS20222322	12/26/2022	Green	Virginia Beach	36.69077	-75.92138	U	ND

Table 4: Live stranded sea turtles recorded by VAQS in 2022, n=92. Notes: Sea turtles that stranded in 2021 with a disposition in 2022 are also listed, n=11. Length measured in centimeters; ND=not determined; F=female, M=male, U=unknown sex.

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length	Live Fate	Dispo Date
VAQS20212149	09/16/21	Kemp's ridley	Hampton	37.03642	-76.29059	U	31.6	Released	6/4/2022
VAQS20212152	09/19/21	Loggerhead	Virginia Beach	36.72122	-75.93385	U	50.2	Released	5/23/2022
VAQS20212163	10/18/21	Kemp's ridley	Norfolk	36.96249	-76.27176	U	49.6	Released	4/8/2022
VAQS20212179	11/08/21	Loggerhead	Virginia Beach	36.92742	-76.16647	U	66.5	Released	9/20/2022
VAQS20212182	11/13/21	Loggerhead	Northampton	37.32336	-76.01626	F	85.7	Released	9/27/2022
VAQS20212185	11/16/21	Loggerhead	Northampton	37.42194	-75.98299	U	51.9	Released	1/26/2022

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length	Live Fate	Dispo Date
VAQS20212188	11/20/21	Loggerhead	Northampton	37.42442	-75.9823	F	75	Euthanized	9/6/2022
VAQS20212195	11/27/21	Loggerhead	Accomack	37.86713	-75.36448	U	26.4	Released	4/8/2022
VAQS20212193	11/27/21	Loggerhead	Accomack	37.86740	-75.36296	U	28.7	Released	4/8/2022
VAQS20212198	12/01/21	Loggerhead	Accomack	37.87029	-75.35965	U	48.7	Released	1/26/2022
VAQS20212203	12/11/21	Loggerhead	Norfolk	36.96401	-76.2574	U	28	Released	6/1/2022
VAQS20222004	04/30/22	Kemp's ridley	Norfolk	36.96256	-76.2588	U	44.7	Released	9/27/2022
VAQS20222005	04/30/22	Kemp's ridley	Norfolk	37.03631	-76.2905	U	35.9	Released	6/11/2022
VAQS20222006	04/30/22	Kemp's ridley	Hampton	36.96398	-76.2574	U	34.3	Released	6/1/2022
VAQS20222007	05/01/22	Unidentified	Norfolk	36.91966	-76.1316	U	ND	Unable to recover	
VAQS20222008	05/01/22	Kemp's ridley	Virginia Beach	36.84382	-75.9697	U	ND	Unable to recover	
VAQS20222009	05/02/22	Kemp's ridley	Virginia Beach	36.84367	-75.9703	U	47.8	Released	5/3/2022
VAQS20222012	05/06/22	Unidentified	Virginia Beach	36.84368	-75.9704	U	ND	Unable to recover	
VAQS20222013	05/06/22	Kemp's ridley	Virginia Beach	37.03626	-76.2904	U	36	Released	5/25/2022
VAQS20222014	05/07/22	Kemp's ridley	Hampton	36.84355	-75.9714	U	39.2	Released	8/3/2022
VAQS20222015	05/07/22	Kemp's ridley	Virginia Beach	37.00058	-76.3072	U	42.4	Released	5/9/2022
VAQS20222022	05/14/22	Kemp's ridley	Hampton	37.01194	-76.4582	U	39	Released	8/22/2022
VAQS20222023	05/14/22	Kemp's ridley	Newport News	37.56115	-76.3113	U	28	Released	6/28/2022
VAQS20222028	05/17/22	Loggerhead	Middlesex	36.8437	-75.9705	F	66.2	Unable to recover	
VAQS20222031	05/20/22	Kemp's ridley	Virginia Beach	37.03595	-76.2896	U	42.8	Released	5/20/2022
VAQS20222033	05/22/22	Kemp's ridley	Hampton	37.03592	-76.2896	U	36.9	Transferred	6/2/2022
VAQS20222035	05/23/22	Kemp's ridley	Hampton	36.84373	-75.9704	U	43.4	Released	7/20/2022
VAQS20222036	05/23/22	Kemp's ridley	Virginia Beach	36.84373	-75.9704	U	33.9	Released	5/25/2022
VAQS20222037	05/23/22	Kemp's ridley	Virginia Beach	36.96283	-76.2586	U	24.8	Released	6/1/2022
VAQS20222038	05/23/22	Kemp's ridley	Norfolk	36.96199	-76.2594	U	25.5	Released	6/1/2022
VAQS20222045	05/29/22	Kemp's ridley	Norfolk	36.70778	-75.928	M	28.3	Died in rehab	6/10/2022
VAQS20222046	05/29/22	Kemp's ridley	Virginia Beach	37.0091	-76.2998	U	22.9	Released	6/17/2022
VAQS20222046.1	07/01/22	Kemp's ridley	Hampton	36.84361	-75.9709	U	22.8	In rehab	
VAQS20222047	05/30/22	Kemp's ridley	Virginia Beach	36.96273	-76.2576	U	28.6	Released	6/1/2022
VAQS20222048	05/30/22	Unidentified	Norfolk	36.84369	-75.9707	U	ND	Unable to recover	
VAQS20222049	05/30/22	Kemp's ridley	Virginia Beach	36.84378	-75.9697	U	23.5	Released	8/11/2022
VAQS20222051	06/01/22	Kemp's ridley	Virginia Beach	36.84359	-75.971	U	24.6	Released	6/2/2022

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length	Live Fate	Dispo Date
VAQS20222054	06/03/22	Kemp's ridley	Virginia Beach	36.84367	-75.9704	U	29.7	Released	8/3/2022
VAQS20222055	06/03/22	Kemp's ridley	Virginia Beach	36.84371	-75.9703	U	25.1	Released	8/30/2022
VAQS20222058	06/04/22	Kemp's ridley	Virginia Beach	36.84371	-75.9703	U	29.3	Released	6/9/2022
VAQS20222061	06/04/22	Kemp's ridley	Virginia Beach	36.8152	-75.966	U	21.4	Released	6/5/2022
VAQS20222063	06/04/22	Kemp's ridley	Virginia Beach	37.0363	-76.2904	U	25.3	Released	8/19/2022
VAQS20222064	06/04/22	Kemp's ridley	Hampton	36.8437	-75.9711	U	25.6	Released	8/11/2022
VAQS20222065	06/05/22	Kemp's ridley	Virginia Beach	36.83088	-75.967	U	27.4	Released	6/7/2022
VAQS20222067	05/30/22	Kemp's ridley	Virginia Beach	36.92814	-75.9995	U	ND	Unable to recover	
VAQS20222068	06/05/22	Loggerhead	Virginia Beach	37.0366	-76.2912	U	ND	Unable to recover	
VAQS20222070	06/05/22	Kemp's ridley	Hampton	37.0366	-76.2912	U	29.6	Released	6/24/2022
VAQS20222071	06/05/22	Kemp's ridley	Hampton	37.0366	-76.2912	U	25.4	Released	9/22/2022
VAQS20222072	06/05/22	Kemp's ridley	Hampton	37.03636	-76.2905	U	43.4	Released	8/11/2022
VAQS20222080	06/07/22	Kemp's ridley	Hampton	36.96348	-76.2575	U	28.9	Released	9/27/2022
VAQS20222081	06/08/22	Kemp's ridley	Norfolk	36.84377	-75.9698	U	40	Released	6/9/2022
VAQS20222083	06/08/22	Kemp's ridley	Virginia Beach	36.84377	-75.9698	F	25.8	Euthanized	10/6/2022
VAQS20222084	06/08/22	Kemp's ridley	Virginia Beach	36.84377	-75.9698	U	28.1	Released	8/3/2022
VAQS20222085	06/08/22	Kemp's ridley	Virginia Beach	36.84371	-75.9703	U	30.3	Released	6/25/2022
VAQS20222088	06/09/22	Kemp's ridley	Virginia Beach	37.03639	-76.2907	U	27.8	Released	8/4/2022
VAQS20222095	06/10/22	Unidentified	Hampton	36.84371	-75.9702	U	ND	Unable to recover	
VAQS20222096	06/10/22	Kemp's ridley	Virginia Beach	36.84366	-75.971	U	24.6	Released	8/3/2022
VAQS20222097	06/10/22	Kemp's ridley	Virginia Beach	37.03605	-76.2897	U	21.6	Released	6/11/2022
VAQS20222098	06/11/22	Kemp's ridley	Hampton	36.84371	-75.9702	U	23.6	Released	10/21/2022
VAQS20222104	06/11/22	Kemp's ridley	Virginia Beach	37.0362	-76.2902	U	25.4	Released	6/14/2022
VAQS20222105	06/11/22	Loggerhead	Hampton	36.84371	-75.9703	U	ND	Unable to recover	
VAQS20222109	06/12/22	Kemp's ridley	Virginia Beach	37.0364	-76.2907	U	26.2	Released	6/13/2022
VAQS20222111	06/12/22	Kemp's ridley	Hampton	37.00072	-76.3072	U	28	Released	6/13/2022
VAQS20222112	06/12/22	Unidentified	Hampton	36.91785	-76.1242	U	ND	Unable to recover	
VAQS20222116	06/15/22	Kemp's ridley	Virginia Beach	37.03599	-76.2896	U	ND	Unable to recover	
VAQS20222117	06/16/22	Kemp's ridley	Hampton	37.0366	-76.2912	U	34.1	In rehab	
VAQS20222120	06/17/22	Loggerhead	Hampton	37.0366	-76.2912	U	58	Released	6/24/2022

Field Number	Strand Date	Species	Location	Latitude	Longitude	Sex	Length	Live Fate	Dispo Date
VAQS20222121	06/18/22	Kemp's ridley	Hampton	37.0366	-76.2912	U	28.1	Released	6/24/2022
VAQS20222125	06/19/22	Kemp's ridley	Hampton	37.0366	-76.2912	U	25.3	In rehab	
VAQS20222127	06/20/22	Kemp's ridley	Hampton	37.03626	-76.2902	U	32.8	Released	12/11/2022
VAQS20222129	06/23/22	Kemp's ridley	Hampton	36.69434	-75.9222	U	29.2	Released	7/1/2022
VAQS20222132	06/24/22	Kemp's ridley	Virginia Beach	36.96348	-76.2575	U	24.3	Released	6/24/2022
VAQS20222134	06/26/22	Kemp's ridley	Norfolk	37.03595	-76.2896	U	26.6	In rehab	
VAQS20222136	06/26/22	Kemp's ridley	Hampton	37.03656	-76.2912	U	22.9	Released	6/27/2022
VAQS20222138	06/28/22	Loggerhead	Hampton	37.03595	-76.2896	U	47.5	Released	12/11/2022
VAQS20222147	07/07/22	Kemp's ridley	Hampton	36.96336	-76.2581	U	28.4	Released	10/21/2022
VAQS20222150	07/10/22	Unidentified	Norfolk	37.03598	-76.2896	U	ND	Unable to recover	
VAQS20222152	07/11/22	Loggerhead	Hampton	36.96181	-76.2596	U	62.8	Released	8/11/2022
VAQS20222155	07/12/22	Kemp's ridley	Norfolk	37.03654	-76.2911	U	ND	Unable to recover	
VAQS20222180	08/17/22	Green	Hampton	36.96259	-76.2589	U	27.9	Released	8/19/2022
VAQS20222204	09/16/22	Loggerhead	Norfolk	37.3764	-75.7666	U	ND	Unable to recover	
VAQS20222211	09/19/22	Kemp's ridley	Northampton	37.0366	-76.2912	U	21.2	Released	10/21/2022
VAQS20222214	09/27/22	Kemp's ridley	Hampton	36.91524	-76.0656	U	23.9	Released	9/28/2022
VAQS20222220	10/05/22	Kemp's ridley	Virginia Beach	37.93855	-76.3865	U	52.9	In rehab	
VAQS20222223	10/07/22	Loggerhead	Northumberland	36.96208	-76.2596	U	56.7	Transferred	12/17/2022
VAQS20222226	10/10/22	Loggerhead	Norfolk	36.82499	-75.9835	F	50.5	Euthanized	10/28/2022
VAQS20222228	10/11/22	Green	Virginia Beach	37.09865	-75.9799	U	33.6	In rehab	
VAQS20222237	10/15/22	Loggerhead	Northampton	36.96392	-76.2574	U	70.2	Transferred	12/17/2022
VAQS20222240	10/15/22	Kemp's ridley	Norfolk	37.16564	-75.9883	U	ND	Unable to recover	
VAQS20222243	10/16/22	Green	Northampton	36.60944	-75.8825	U	28.2	Released	10/21/2022
VAQS20222262	10/30/22	Loggerhead	Virginia Beach	36.62621	-75.8889	U	62.8	Transferred	12/17/2022
VAQS20222264	10/30/22	Loggerhead	Virginia Beach	36.93587	-76.2106	U	53.1	In rehab	
VAQS20222270	11/04/22	Loggerhead	Norfolk	36.91574	-76.1798	U	53.7	Released	12/11/2022
VAQS20222271	11/04/22	Loggerhead	Norfolk	36.57667	-75.8733	U	65.3	Transferred	12/17/2022
VAQS20222288	11/10/22	Loggerhead	Virginia Beach	36.89625	-76.0928	U	65.3	In rehab	
VAQS20222298	11/14/22	Loggerhead	Virginia Beach	36.9133	-76.077	U	59.2	In rehab	
VAQS20222300	11/17/22	Green	Virginia Beach	37.88101	-75.3496	U	28.1	In rehab	
VAQS20222307	11/22/22	Green	Accomack	36.90246	-76.0624	U	27.2	In rehab	
VAQS20222310	11/26/22	Green	Virginia Beach	37.24838	-76.0209	U	30.6	In rehab	
VAQS20222311	12/04/22	Loggerhead	Northampton	36.89831	-76.0448	U	48.8	In rehab	
VAQS20222312	12/05/22	Green	Virginia Beach	36.9655	-76.2687	U	27.4	In rehab	
VAQS20222315	12/22/22	Green	Norfolk	36.81821	-75.9668	U	28.5	In rehab	
VAQS20222317	12/26/22	Green	Virginia Beach	36.96401	-76.2574	U	30.8	In rehab	

Figures

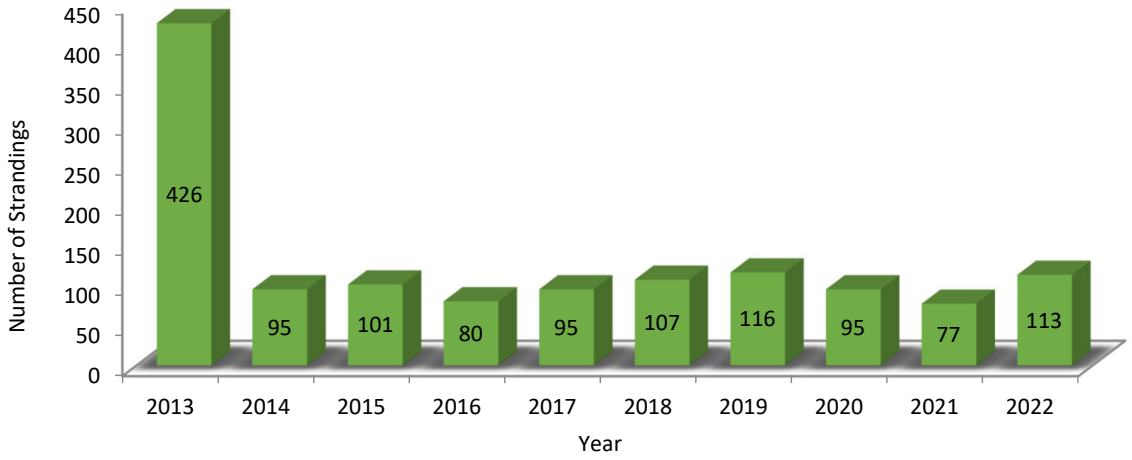


Figure 1: Yearly frequency of marine mammal strandings in Virginia, 2013-2022.

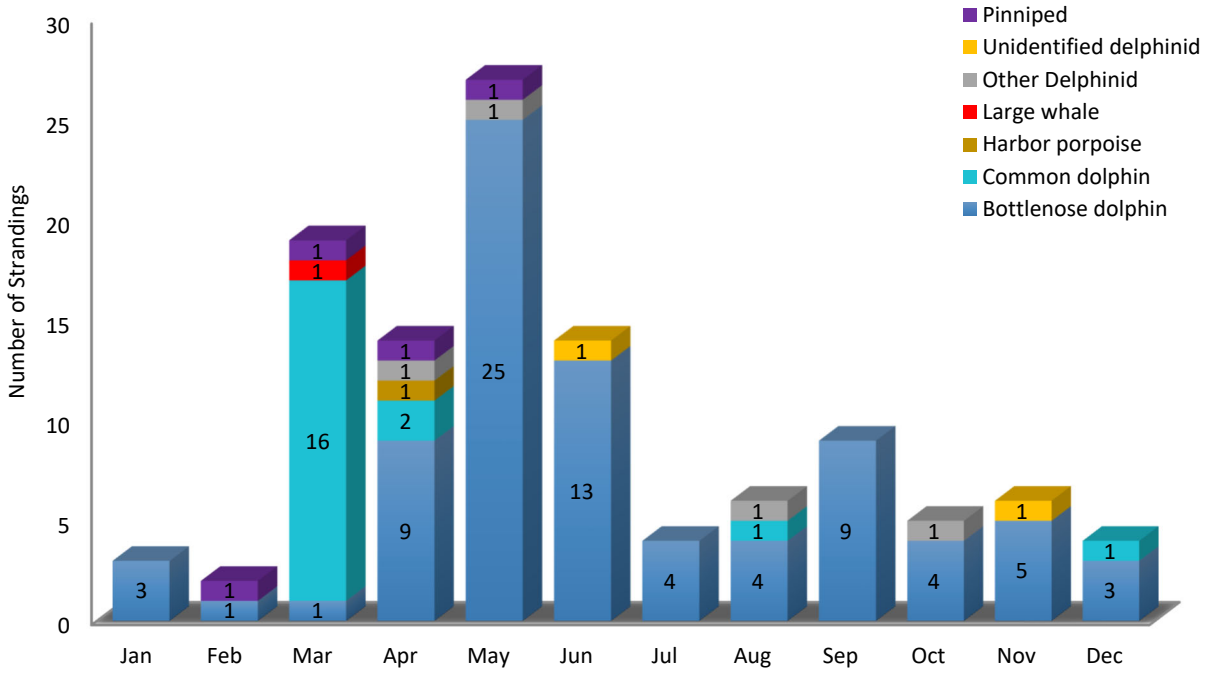


Figure 2: Monthly frequency of marine mammal strandings by species group in Virginia during 2022.

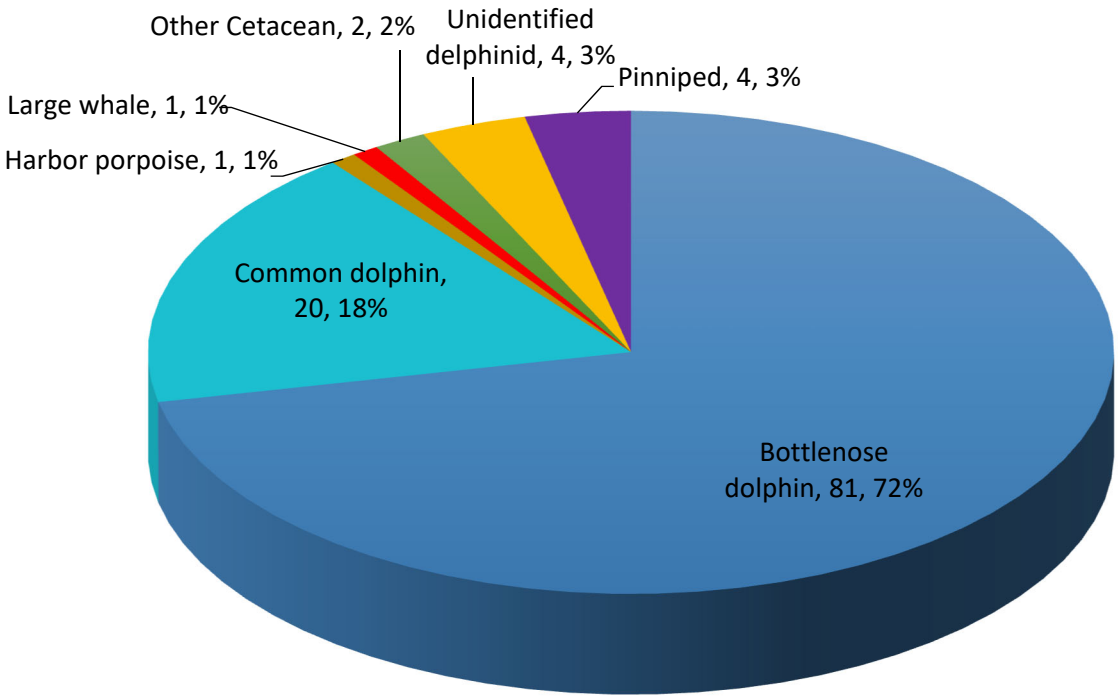


Figure 3: Marine mammal stranding groups in Virginia during 2022.

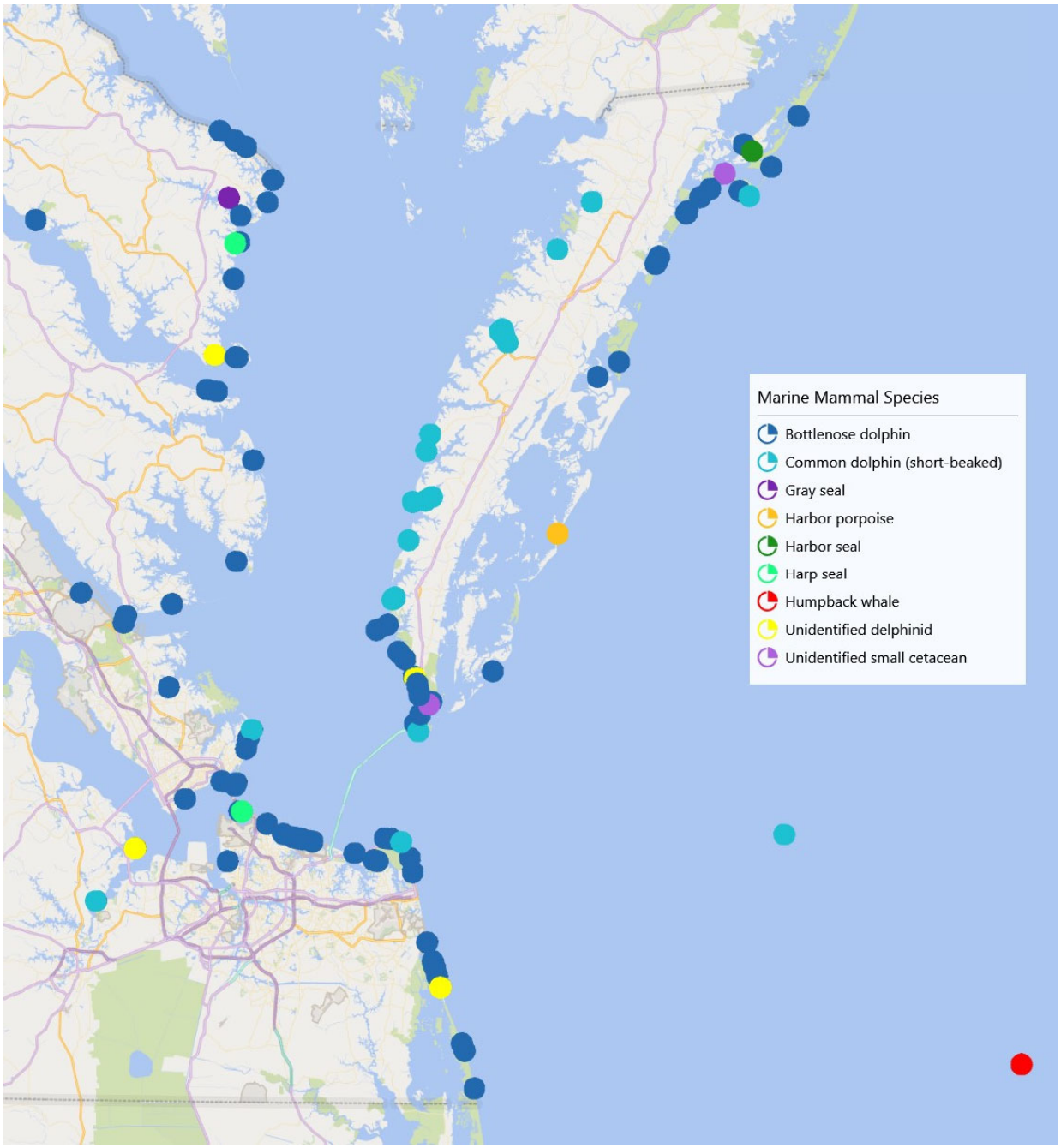


Figure 4: Locations of Virginia marine mammal strandings in 2022.

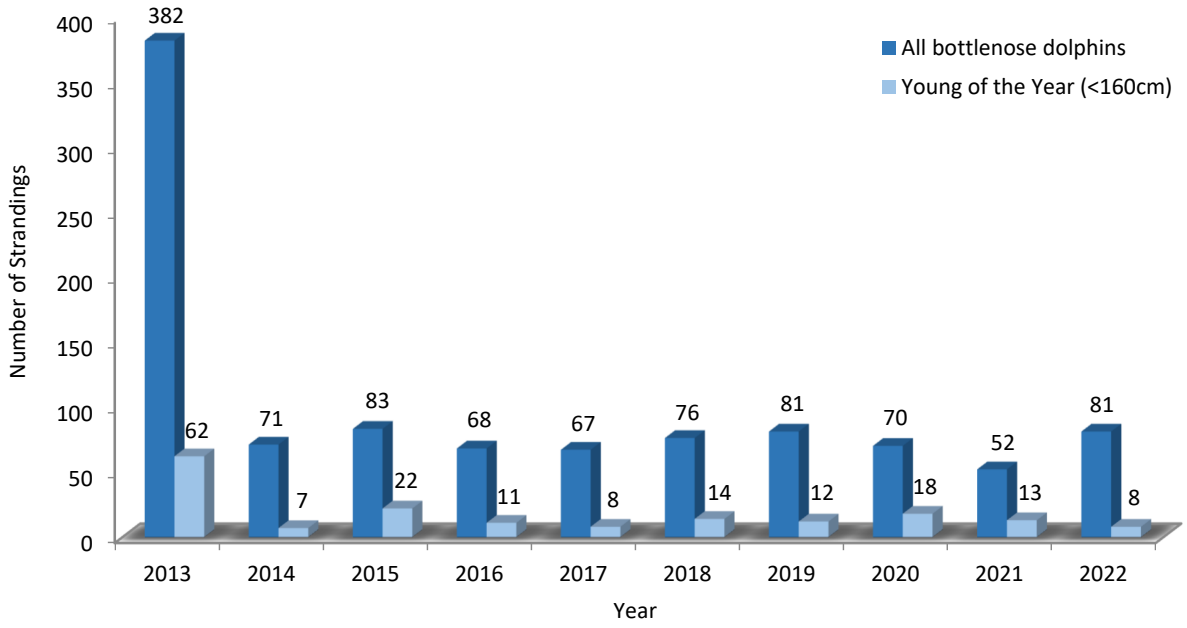


Figure 5: Yearly stranding frequency of bottlenose dolphin in Virginia, 2013-2022.

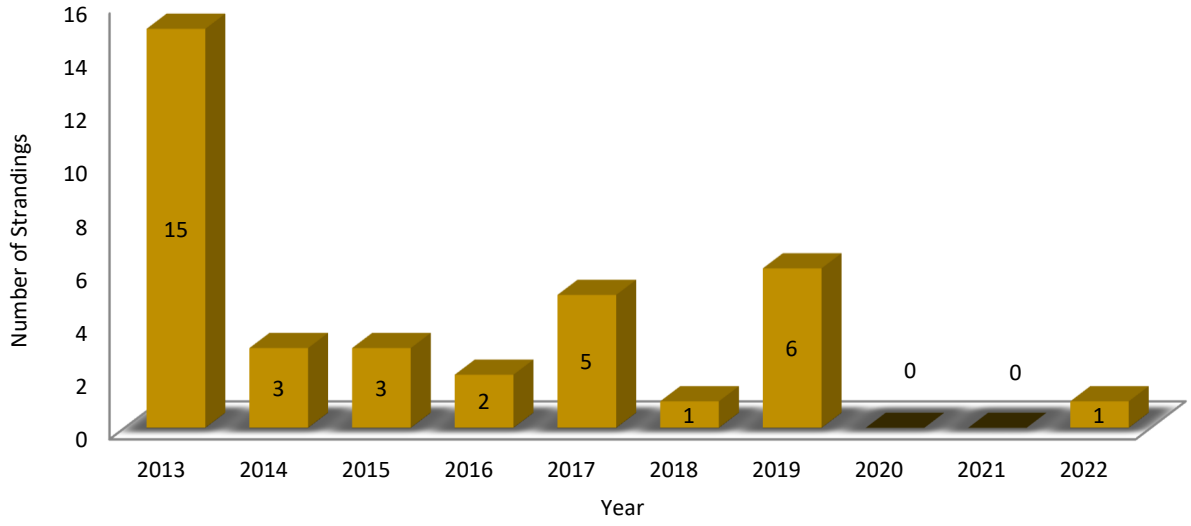


Figure 6: Yearly stranding frequency of harbor porpoise in Virginia, 2013-2022.

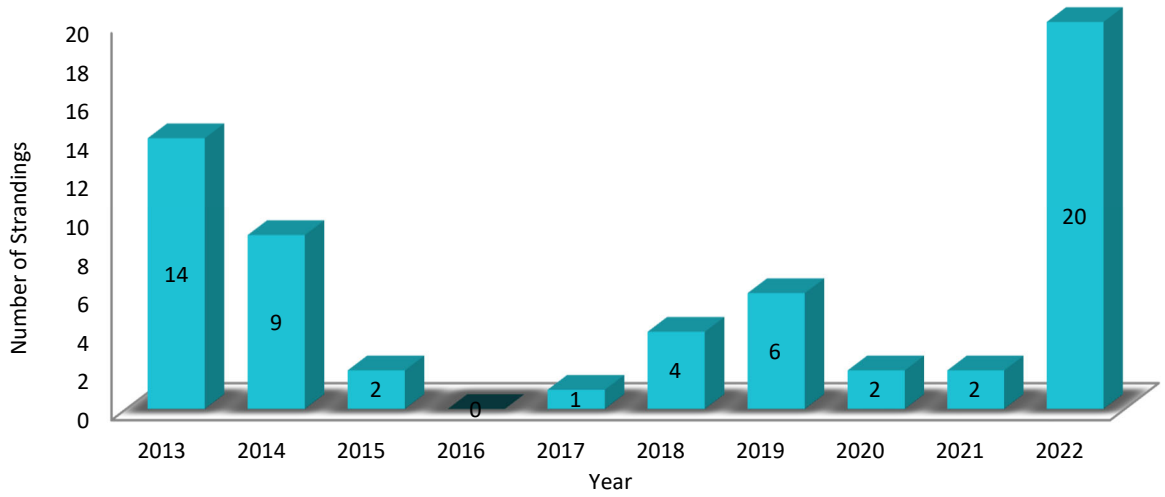


Figure 7: Yearly stranding frequency of common dolphins in Virginia, 2013-2022.

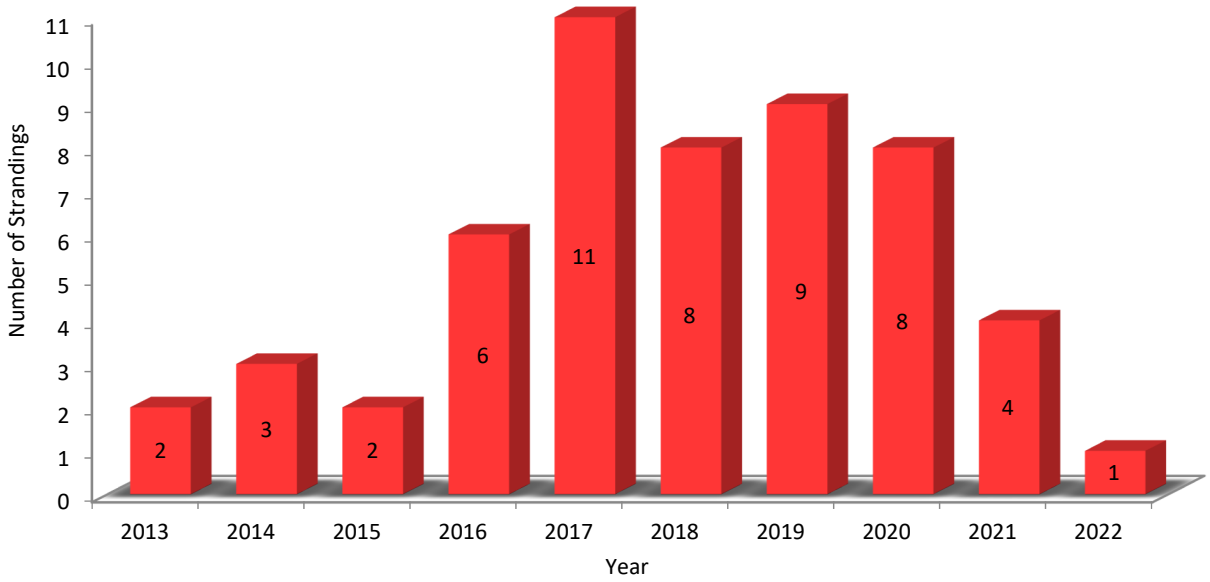


Figure 8: Yearly stranding frequency of large whales in Virginia, 2013-2022.

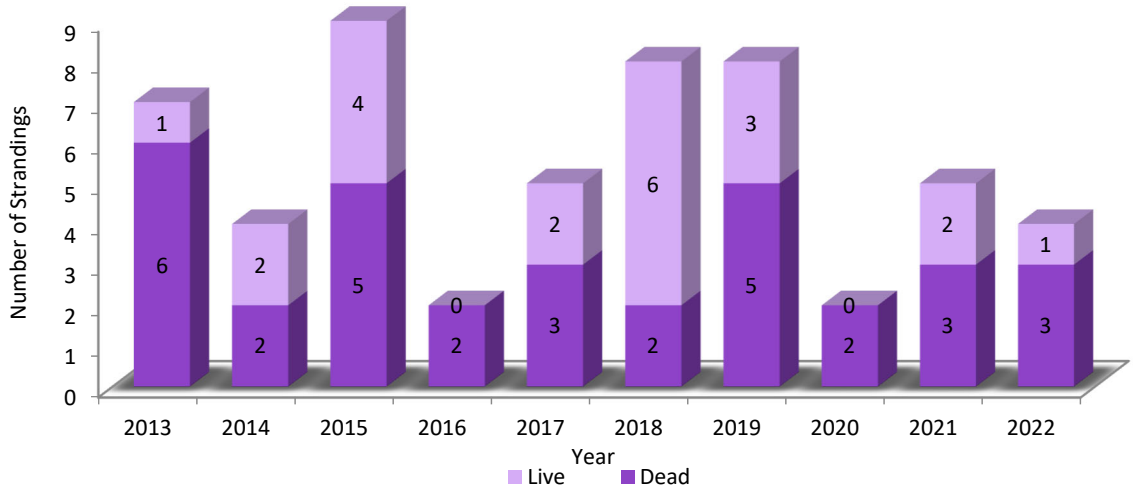


Figure 9: Yearly stranding frequency of phocids in Virginia, 2013-2022.

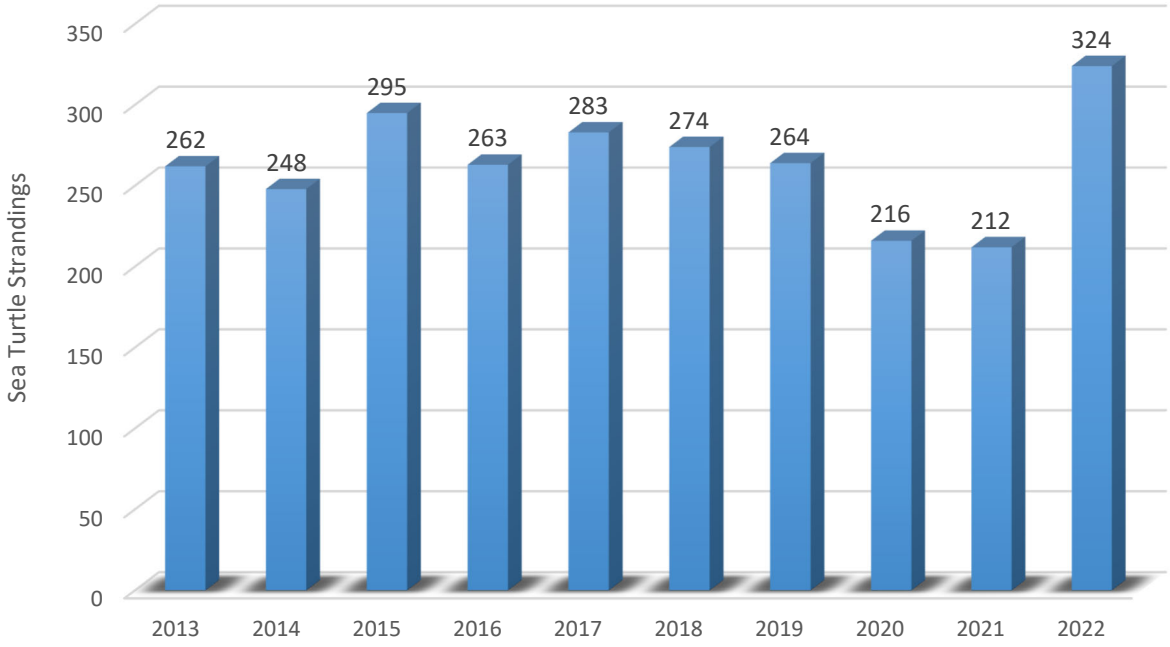


Figure 10: Yearly frequency of sea turtle strandings in Virginia, 2013-2022.

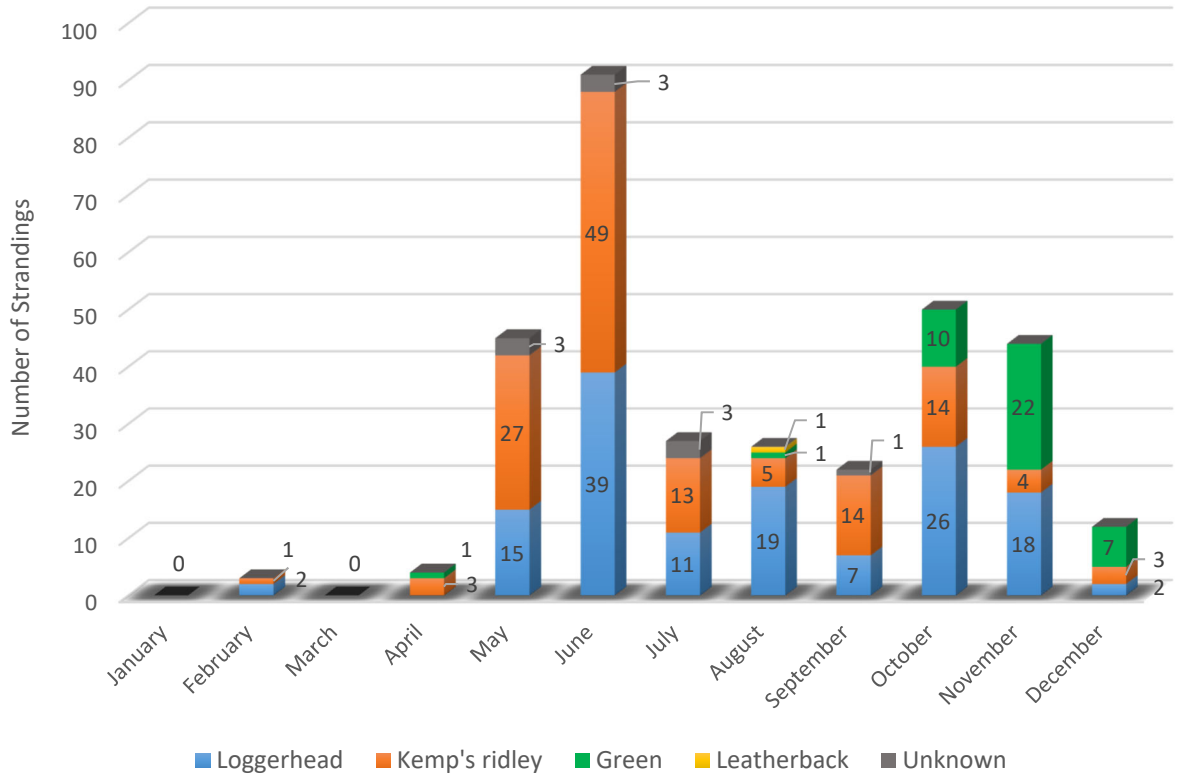


Figure 11: Monthly frequency of sea turtle strandings by species in Virginia during 2022.

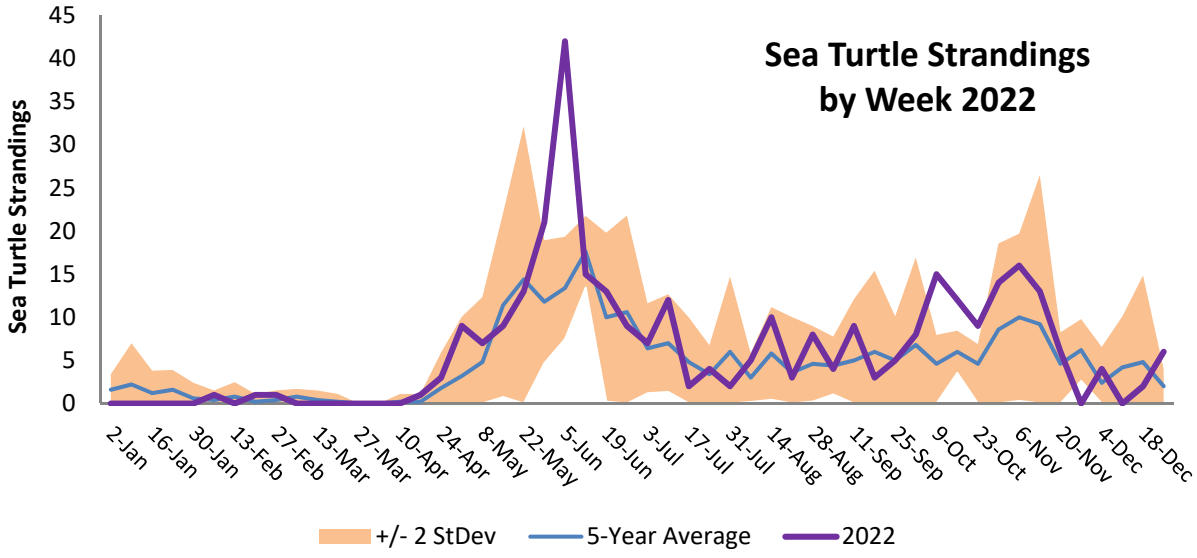


Figure 12: Sea turtle strandings in 2022 by week compared to the 5-year average.

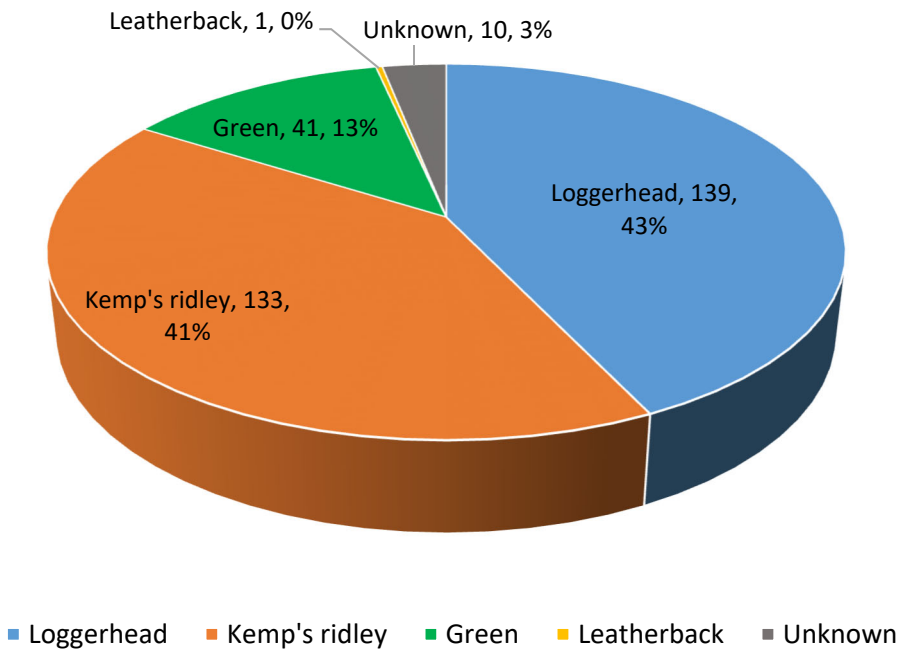


Figure 13: Frequency of sea turtle species among Virginia strandings in 2022.

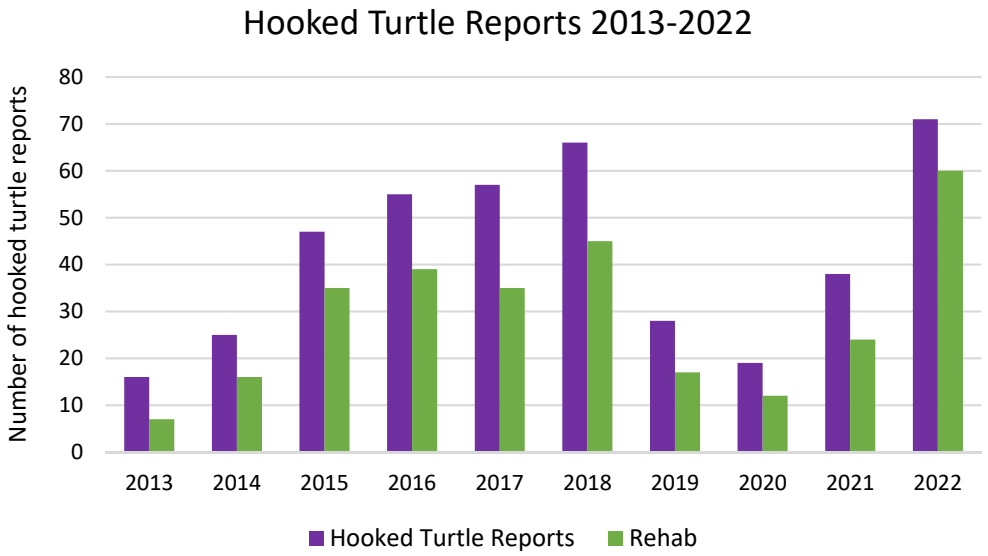


Figure 14: Hooked sea turtle reports and rehabilitation admits from the beginning of the Pier Partner Program (2013) to present.

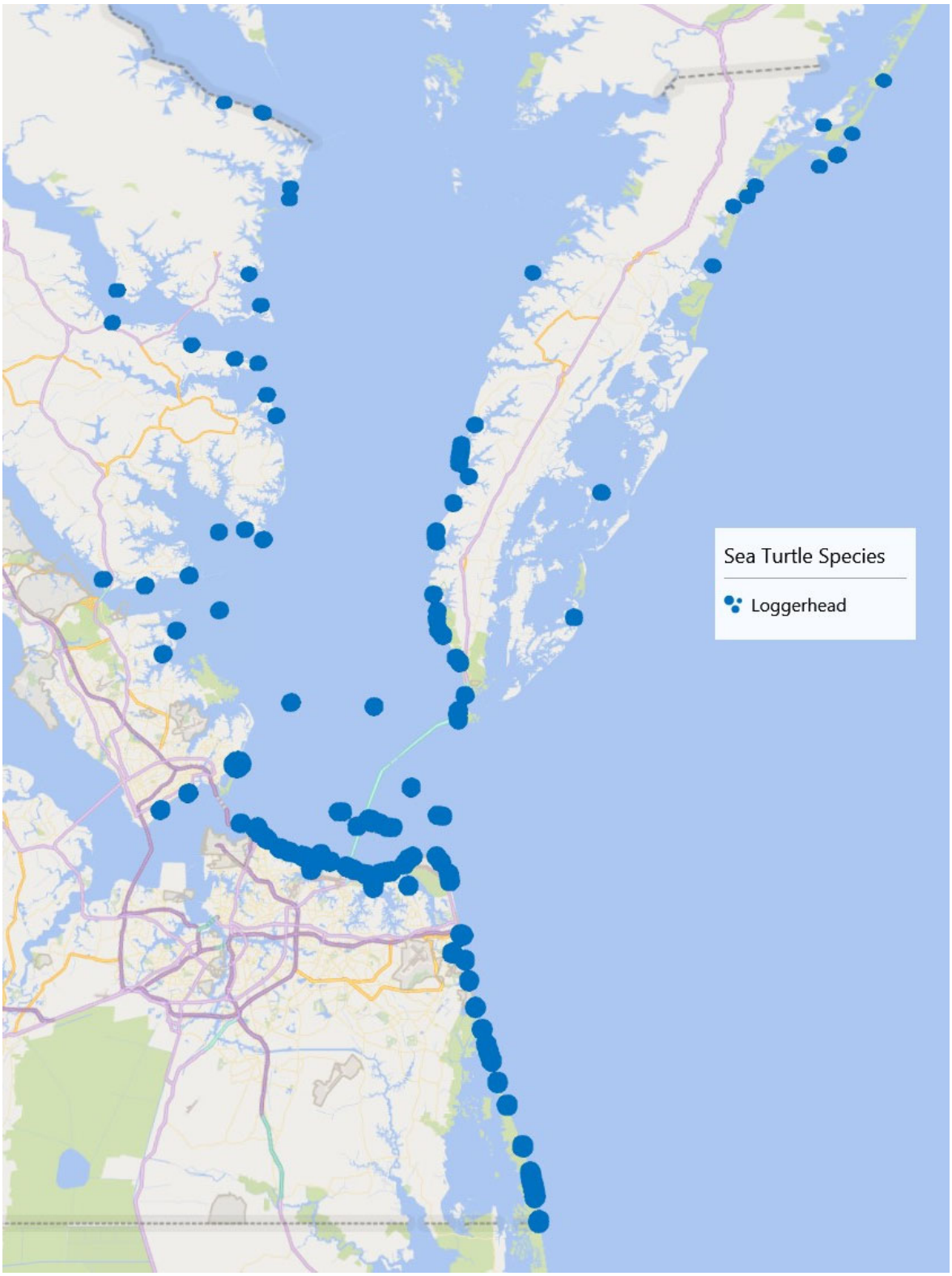


Figure 15: Locations of loggerhead sea turtle strandings in Virginia in 2022.

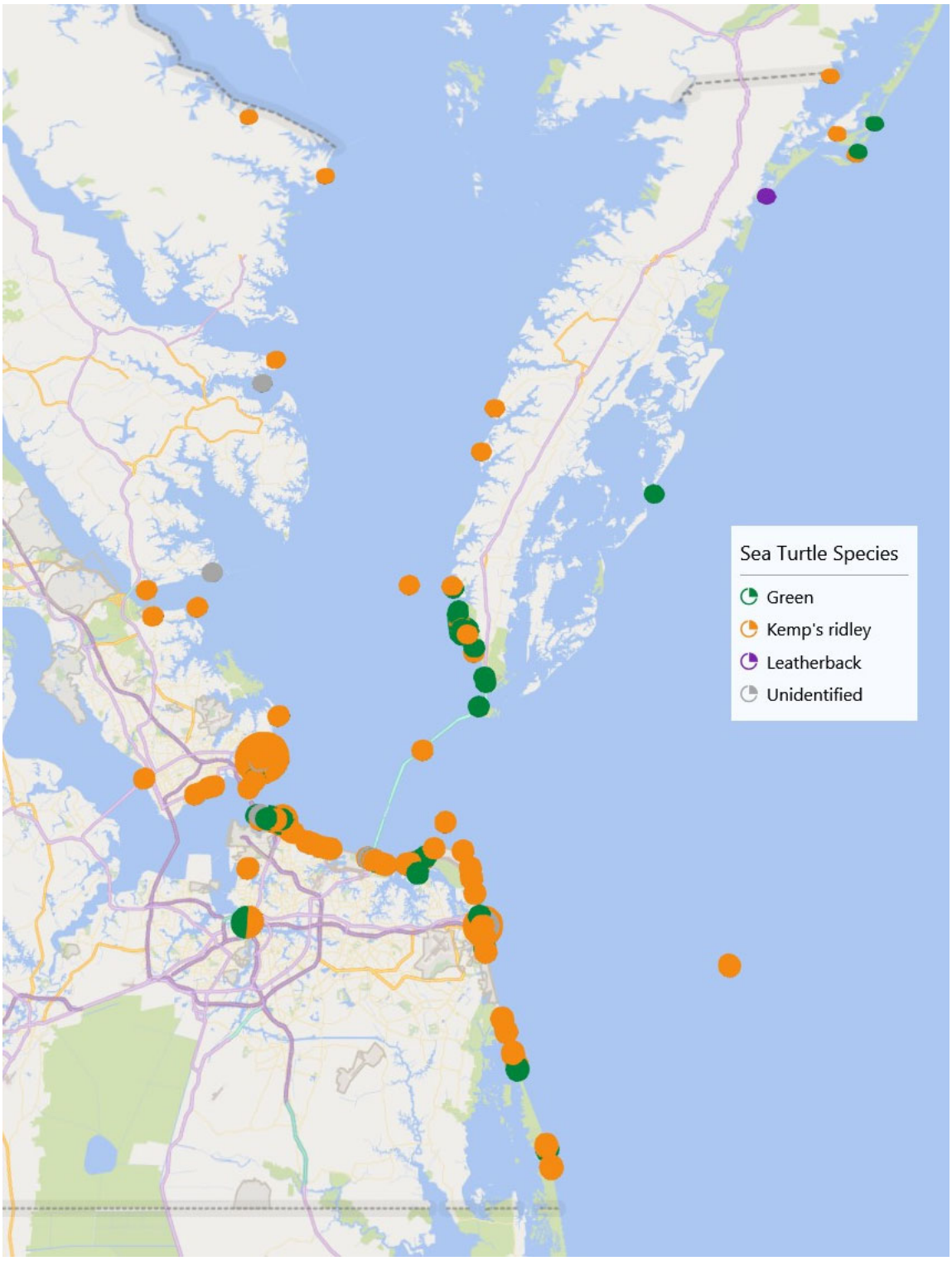


Figure 16: Locations of Virginia sea turtle strandings in 2022, excluding loggerheads.

Appendix I: Professional and Education Activities

Stranding Center Tours & Group Presentations	**Date**	**Attendance**	**Location**
DMACC tour for GARSCON	4/5/2022	25	Virtual
BBNWR Staff	4/26/2022	8	DMACC
VAQ Marine Explorers Camp Necropsy Demo	7/13/2022	10	DMACC
Yuck That's Gross Camp	7/29/2022	12	DMACC
DMACC tour for dedication	8/25/22	10	DMACC
Virginia Aquarium Talks and Events	**Date**	**Attendance**	**Location**
Clean the Creek Stranding Presentation	3/26/22	10	VAQ
Volunteer Recruitment Event	2/3 and 2/23	35	Virtual
Anatomy of a Stranding	4/28/22	20	hybrid
Recent Sea Turtle Publications	3/1/22	50	hybrid staff meeting
Conferences and Meetings	**Date**	**Attendance**	**Location**
RWSE Sea Turtle sub-committee kick off meeting	1/19/22	100	virtual
US Navy Sea turtle density modeling workshop	1/13/22	10	virtual
VAQS hosted GARSCON	4/5-4/7	96	virtual
GARSCON Scientific Talk- Sea Turtle Section	4/6/22	90	virtual
GARSCON Scientific Talk - Marine Mammal Session	4/5/22	90	virtual
RWSE Marine mammal committee meetings	monthly Mar-May	60	virtual
NMFS Green turtle DPS critical habitat data review	5/3/22	15	virtual
International Association for Aquatic Animal Medicine Annual Conference	5/16-26/2022	100	virtual
Southeast US Stranding Network Conference (NOAA invited expert): Large whale necropsy training	10/6/22	100	virtual
Staff Training	**Date**	**Attendance**	**Location**
EzyLift and compressor training for new staff	1/11/21	2	DMACC
Inclusion and diversity Empower Hour Training	2/23/22	30	Virtual
DEA Webinar: Supporting Medication Assisted Treatments	2/24/22	6	Virtual
KultureCity Sensory Training	2/1/22	8	Virtual
Animal Welfare Professional	6/1/22	8	Virtual
Contingency Planning	8/1/22	8	Virtual
Radiation Safety	2/1/22	8	Virtual
Stranding Response Team & Cooperator Meetings & Trainings	**Date**	**Attendance**	**Location**
Cold Stunned Sea Turtle and Seal Training for Volunteers	1/1/22	35	Virtual
New Volunteer General, Response, and Husbandry training	4/30/22	22	VAQ and DMACC

Intern and Fellow General, Response, and Husbandry training	5/1/22	2	DMACC
Sea Turtle Nesting Volunteer Training	5/9/22	20	VAQ
Intern General, Response, and Husbandry training	6/14/22	1	DMACC
New Volunteer Pier Partner Training	6/25/22	6	DMACC
New Volunteer Pier Partner Training	6/24/22	2	DMACC
Batten fellow dolphin necropsy training	6/27/22	1	DMACC
Necropsy staff neonatal dolphin forensics training	7/12/22	6	DMACC
Undergraduate necropsy training and DMACC tour (G Silber)	7/26/22	12	DMACC
Sea Turtle Nest Monitoring Joint Training w/BBNWR & Dam Neck	8/10/22	40	VAQ
New Volunteer General, Response, and Husbandry training	10/29/22	35	VAQ and DMACC
Intern Husbandry Training	12/6/22	1	DMACC
Intern General and Response Training	12/6/22	1	DMACC
Other	**Date**	**Attendance**	**Location**
NOAA NARW mortality vs serious injury detection rates consultation	1/6/22	4	Virtual
Large Whale Entanglement Risk Simulator Expert Elicitation Roundtable (BOEM, NOAA, Duke Univ)	1/19-1/20	71	Virtual
NPR Curious State podcast (Doug Fraser) on large whale strandings	2/11/22	4	DMACC
Subject matter expert for NOAA Consultation on Pelagic Longline Take Reduction Team (reviewing guidelines for Serious Injury determination)	4/8/22	9	Virtual
Atlantic Large Whale Take Reduction Team Phase II meeting (gillnets and other trap pots)	5/9-5/13	108	Virtual
Transboundary Large Whale Necropsy Steering Committee	6/28/22	7	Virtual
NOAA Marine Mammal Deterrent Workshop	6/1-6/2	~100	Virtual
Southern Right Whale mortality consultation for Australia	10/1/22	5	Email
UME Working Group Annual Meeting	11/15-11/16	13	Virtual
ALWTRT Public Meetings	11/17-11/18	1	Virtual
ALWTRT Take Reduction Plan Vote	12/1-12/2	76	Virtual
Ujax bottlenose dolphin HI consultations	12/13/22	1	Email

Scientific Publications and Presentations (current and past VAQ staff in bold)

Publications

- **Costidis**, Sharp, Moore, McLellan, Henry, Knowlton, Pettis, Landry, Patterson, Long, Good, Taylor, Bettridge, Rowles, Spradlin, Wilkin, Fauquier, 2022. A proposal to the Working Group for Unusual Marne Mammal Mortality Events: Rationale and Protocol for Including Free-Swimming Cetacean Morbidity Cases in Unusual Mortality Events

Using the North Atlantic Right Whale Unusual Mortality Event as an example. Technical Memorandum (Passed NOAA General Council review. Currently in use).

- **Rose**, **Bates**, **McNaughton**, **O'Hara**, **Barco**, 2022. Characterizing Sea Turtle Bycatch in the Recreational Hook and Line Fishery in Southeastern Virginia, USA. Published in Chelonian Conservation and Biology, 21(1):63-73. https://doi.org/10.2744/CCB-1476.1
- **Zorotrian**, Stern, Gao, **Costidis**, Fontaine, Deming, Harms, Adams. 2022. Initial Validation of the Abaxis VetScan VS2 for Postmortem Biochemical Analysis of Delphinidae Vitreous Humor (Accepted with minor revisions)

Presentations (as Primary Presenter)

- **Daniel, Costidis, Barco**. Up in the air: Are weather balloons an underrepresented source of sea turtle mortality and marine debris? Greater Atlantic Regional Stranding Conference, 4/6/2022.
- **Rowlands,** McLellan, Rommel, **Costidis**, Yopak, Koopman, Glandon, Pabst. Comparative morphology of the spinal cord and associated vasculature in shallow versus deep diving cetaceans. Greater Atlantic Regional Stranding Conference, 4/5/2022.

Presentations (as Coauthor)

- Keenan et al. A gross and histologic description of the circumvallate gustatory papillae and taste buds of four odontocete species. Biennial Marine Mammal Conference **(Costidis)**
- Fauquier et al**.** Large whale transboundary unusual mortality events: Best practice and investigation through coordination and collaboration. Biennial Marine Mammal Conference **(Costidis)**
- Spradlin et al**.** Including serious injuries and morbidity in the ongoing unusual mortality event of North Atlantic Right Whales: 2017-present. Biennial Marine Mammal Conference **(Costidis)**
- Denk et al**.** Comparative morphology of the melon in mesoplodon beaked whales. Biennial Marine Mammal Conference **(Costidis)**

Scientific Review Work

- **Peer review journals**: Journal of Morphology, Disease of Aquatic Organisms, Frontiers in Veterinary Medicine **(Costidis)**

Appendix II: Highlights of the Year – Marine Mammals

On 6 July 2022 a dolphin was sighted free-swimming approximately 135 km up the James River near the Varina-Enon Bridge southeast of Richmond, VA. Virginia Aquarium Stranding Response (VAQS) staff obtained photos of the animal, but no response was mounted as the animal was free-swimming with no apparent entanglement or injuries. On 13 July 2022, VAQS received a report of a fresh dead stranded bottlenose dolphin in Fort Monroe, VA

(VAQS20221082). The animal was retrieved the following day and was stored overnight until VAQS staff performed a complete external exam, human interaction evaluation, and necropsy on 15 July 2022. At the time of necropsy, the dolphin was matched to the individual sighted on 6 July 2022 via the dorsal fin (Figure 17). In addition to two distinctive V-shaped notches on the trailing edge of the dorsal fin, the animal was freeze-branded on the right side of the dorsal fin. With the help of the Mid-Atlantic Bottlenose Dolphin Photo ID catalog curator, it was matched to a known individual with the ID FB412. This animal was originally captured and freeze-branded 22 years earlier.

Figure 17: Right side of the dorsal fin. Left photo was taken 6 July 2022. Right photo was taken at time of carcass retrieval 14 July 2022. Matched via distinctive notches at trailing edge, freeze brand at ventral aspect, and healed rake marks at dorsal tip. Note: hole in dorsal fin is an artifact of carcass recovery.

This animal exhibited external signs of emaciation including prominent ribs, scapulae, and transverse processes bilaterally, post-nuchal concavity, and epaxial concavity bilaterally (Figure 18). There was severe tooth wear bilaterally. Human interaction (HI) status could not be definitively determined due to postmortem sunburn and decomposition, but no signs of HI were observed. Decomposition also hindered examination for external pathologies. However, two ulcerative lesions with irregular rounded margins (presumed freshwater skin disease) were sampled for histopathology (Figure 19).

Figure 18: Right lateral aspect of body depicting emaciated body condition. Note severe prominence of scapula and transverse processes and post nuchal/epaxial concavity.

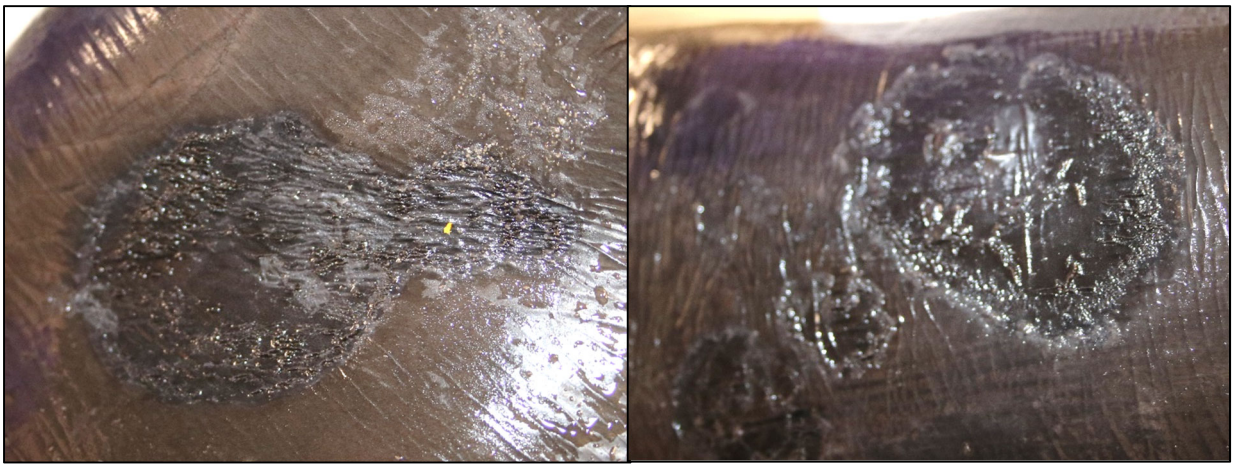


Figure 19: Close up of presumed freshwater skin lesions on cranial base of left side of dorsal fin (left photo) and on the dorsum just cranial to dorsal fin (right photo). Photos brightened for clarity.

The internal examination revealed an empty gastrointestinal tract, abdominal herniations, ascites, dark red and flocculent cerebrospinal fluid, joint lesions, presumptive thyroid pyogranuloma, presumptive lymphoid activation, bloody pulmonary lymph, and fluid and froth in the airways. Though the source of some of the findings is unknown, the emaciated body condition, lack of prey in the gastrointestinal tract, lymph node activation, and joint lesions are strongly supportive of an ongoing infection. Brucellosis is suspected due to the severity and presentation of the joint lesions and thyroid pyogranuloma. Debilitation from the illness may have led to this animal being sighted alive and swimming in an inland river area in which dolphin sightings are rare.

On 12 April 2022 a bottlenose dolphin (VAQS20221027) was reported by staff of the Wallops Island Nasa Facility partially buried and within the tide line. The animal was recovered the following day and was stored in the cooler overnight until a full exam and necropsy were performed on 14 April 2022. The rostrum and mandible exhibited multiple circumferential monofilament wraps (Figure 20). The dorsal fin and both pectoral flippers exhibited multiple impressions, lacerations, and abrasions on the leading edges, including X-shaped markings. Multiple overlapping impressions and abrasions were present on the flukes (Figure 21).

Multiple regions of circumferential impressions appeared to corkscrew around the peduncle (Figure 22). The lesions appeared to be a combination of thin monofilament line and thicker multifilament line. In addition to the entanglement lesions, the flukes were severed bilaterally with a sharp implement (Figure 21) with no obvious signs of tissue reaction at the incision sites.

Figure 20: Dorsal view of rostrum and melon showing multiple monofilament entanglement lesions that extended circumferentially.

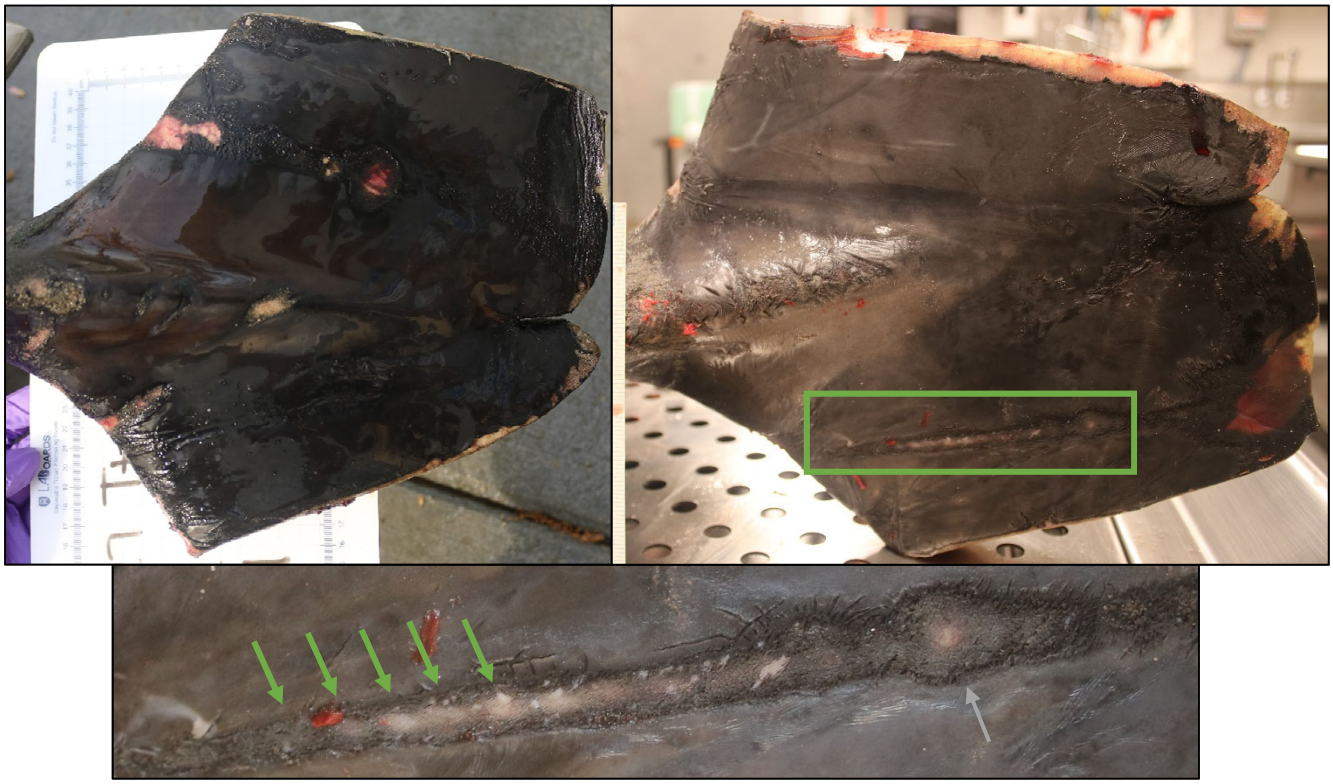


Figure 21: Dorsal (top left) and ventral (top right) views of the flukes showing multiple entanglement lesions, including abrasions from multifilament rope. Abraded section on right ventral fluke (bottom, detail of region in orange box) exhibited scalloped margins with regular intervals (orange arrows) suggestive of patterning from a rope, as well as larger focal regions (green arrow) suggestive of rope overlap and/or associated gear.

Figure 22: Left lateral (top) and right lateral (bottom) view of peduncle, showing multiple entanglement lesions, including monofilament impressions (right, detail of region in blue box) with knot impression (arrow).

The extensive nature of the entanglement lesions, combining both monofilament and multifilament impressions, abrasions, and lacerations present on all appendages, the peduncle, and the rostrum were consistent with antemortem entanglement in a presumptive gillnet. The lack of tissue reaction surrounding the fluke incisions suggest they occurred postmortem. Such postmortem defects are often associated with suspected fisheries entanglements and are believed to be caused by fishermen cutting the dolphin free of the gear entanglement. Internal findings, including bilateral pulmonary petechiae, pulmonary edema, and one peri-umbilical herniation, also support the intense struggle and trauma typical of peracute underwater entrapment. The infection of the left scapulohumeral joint and the atlanto-occipital joint were chronic and may have been indicative of a chronic bacterial infection (brucellosis).

Appendix III: Highlights of the Year – Sea Turtles

In 2022, VAQS veterinary staff performed five esophagostomies to remove embedded fishing hooks in sea turtles (two loggerhead, three Kemp's ridley) in rehabilitation. This was notable as only one of these procedures was performed annually in 2020 and in 2021. Esophagostomy is typically the last resort after a hook cannot be removed via manipulation or via endoscope, as it is an invasive procedure that generally prolongs rehabilitation time. In addition, 2022 was the first year that VAQS performed an esophagostomy on an otherwise

diseased turtle that was not incidentally captured. A hook was found in this animal's esophagus via radiographs at the time of admit. This is the only animal of the five that has not since been released, but the esophagostomy site has healed completely. The remaining four turtles were incidental recreational fishing captures, and were released after an average rehabilitation time of 136 days (4.5 months). See below for representative photos of these cases.

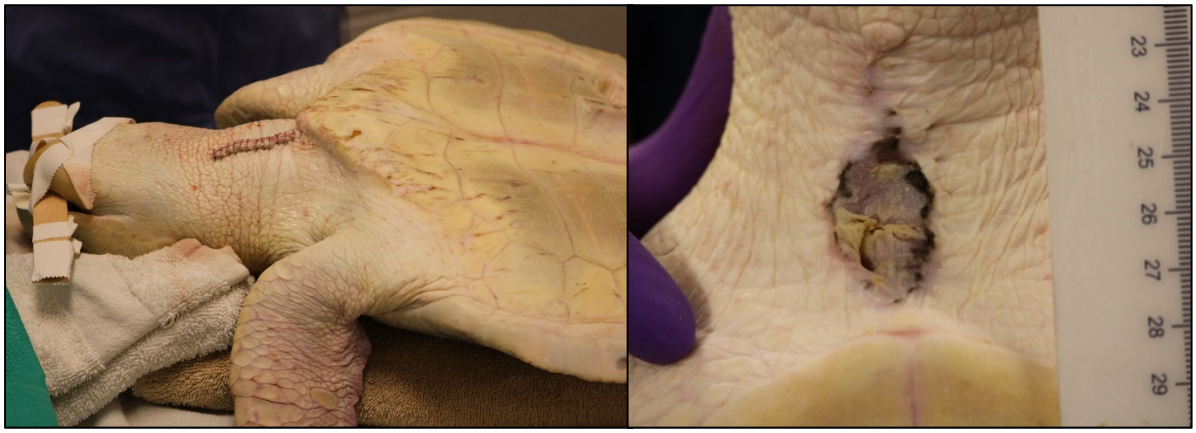


Figure 23: Kemp's ridley rehab patient "Timbits" just after surgery (left) and healed surgery site during pre-release tagging (right).

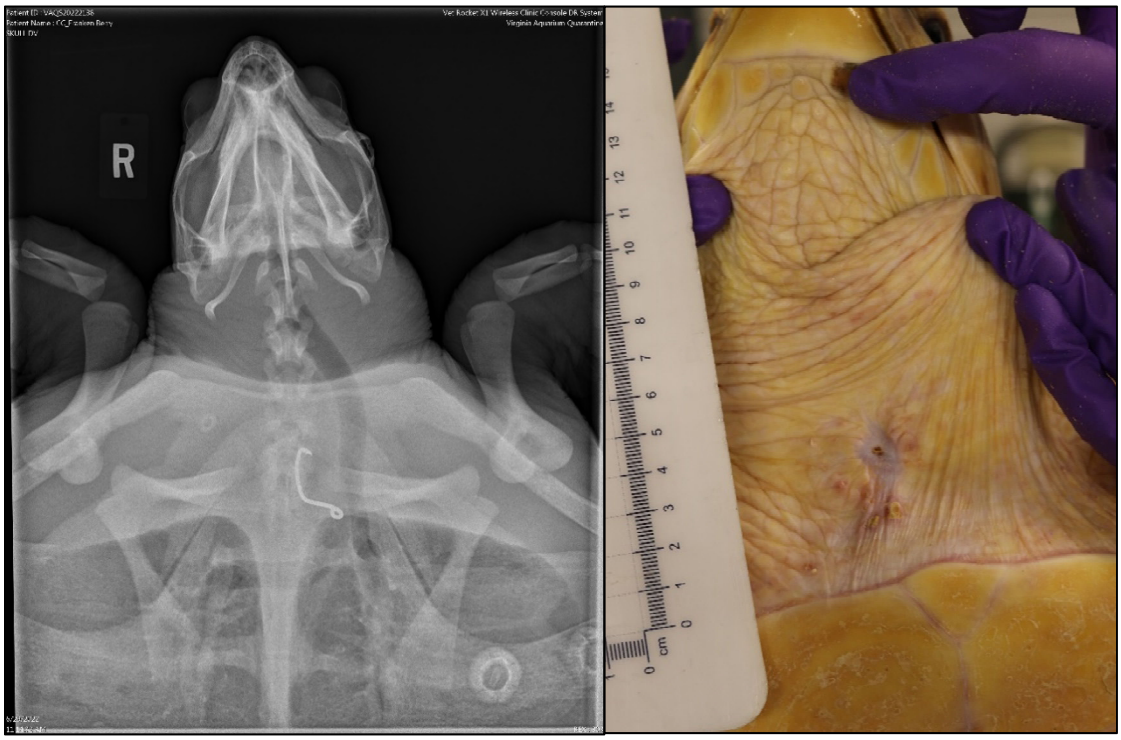


Figure 24: Loggerhead rehab patient "Franken Berry" admit radiographs showing a fishing hook in caudal esophagus (left) and healed surgical site during pre-release tagging (right).

In November 2021, VAQS responded to a cold stunned loggerhead sea turtle VAQS20222188 “Hammer”. This animal initially presented with typical cold-stunning symptoms, including lethargy, respiratory acidosis, dehydration, high blood glucose, and low blood potassium levels. Admit radiographs were consistent with those previously seen in cold stunned sea turtles, including evidence of bilateral bronchopneumonia.

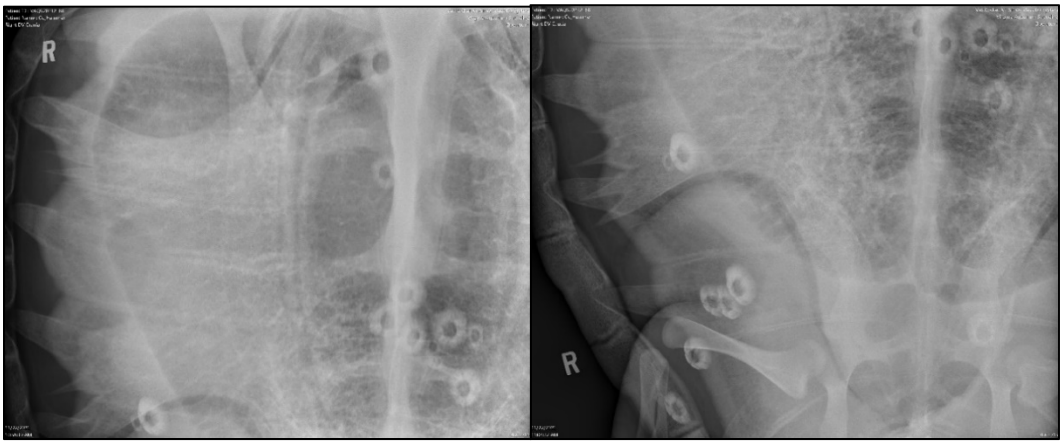


Figure 25: Radiographs of right lung during admit. Left: cranial aspect, right: caudal aspect.

Approximately two weeks post-admit, the animal began to expel mucoid to caseous material along with sediment from the mouth and presented with irregular sounding breaths. Radiographs on December 7th, 2021 combined with a subsequent ultrasound showed complete consolidation or collapse of the right lung.

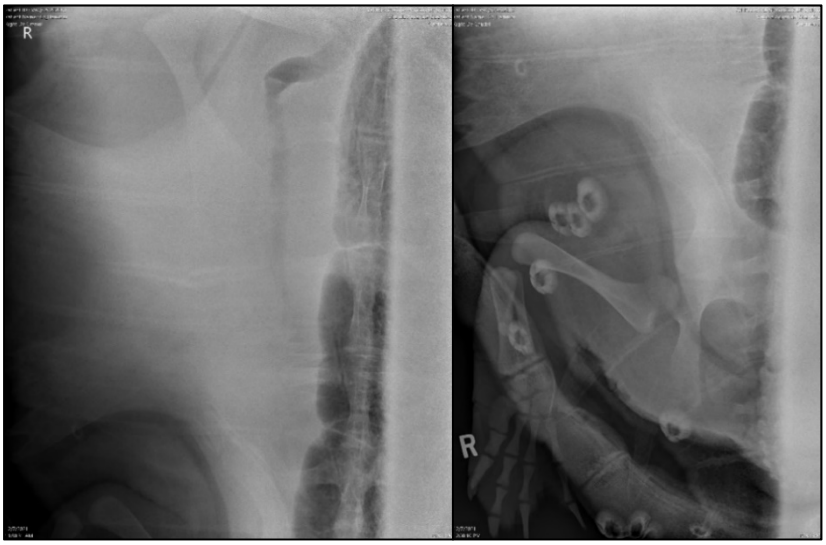


Figure 26: Radiographs of right lung ~2.5 weeks after admit. Left: cranial aspect, right: caudal aspect.

On December 14th, 2021 the animal was sedated for a CT scan. This showed that the lung was consolidated, rather than atelectic (collapsed). The lung margin was visualized and roughly normal size, but no air space was present. Serial radiographs mid- December showed variable inflation in different sections of the right lung lobe.

In the coming months, radiographs were re-checked frequently and indicated slow, but positive progression in more inflated areas of the right lung. The animal's blood values and activity level were improving. Through the beginning of February 2022, the cranial right lung continued to appear partially inflated. By the end of March, right lung inflation had slightly increased at the cranial aspect and the animal's activity and appetite had significantly improved. On June 30th, another CT scan was performed. This confirmed that inflation of the right lung had plateaued.

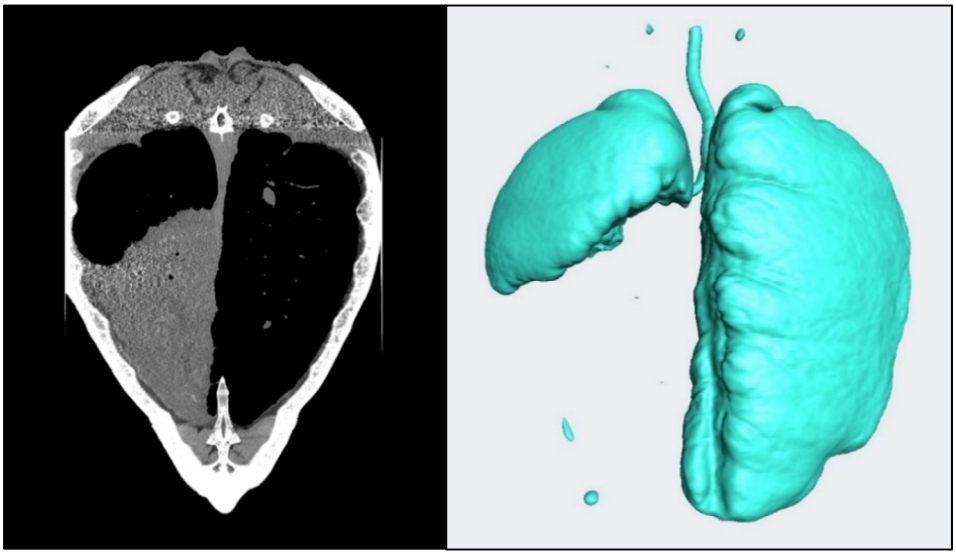


Figure 27: Left: image from June 30th CT scan showing a partially inflated right lung. Right: 3D reconstruction of lungs (generated with Amira Software) via CT imaging by VAQS senior scientist showing a partially inflated right lung.

On July 26th, a bronchoscopy was performed with the assistance of two veterinarians from a partner veterinary hospital. This revealed a large fibrino-caseous plug occluding the primary bronchus. Once this was manually extracted, copious clear mucoid fluid filled the airways. Culture results from the bronchoscopy included several non-specific organisms with moderate to heavy growth. After this bronchoscopy, there was a mild improvement in appetite and increased aeration in some pockets of the right lung post-bronchoscopy. Appetite and buoyancy continued to improve, but radiographs on August 11th showed no inflation in the right lung for the first time since 2021.

A second bronchoscopy was performed on September 6th. This found another large fibrino-caseous plug occluding the right primary bronchus. Once this was removed, scoping further distally revealed copious mucoid fluid filling the airways, and numerous multifocal fibrino-caseous plugs extending through the openings of the secondary airways and occluding respiratory surfaces. Overall mucosa condition was pale, edematous and most secondary airways were completely constricted. The new findings strongly indicated a poor prognosis with euthanasia as the most humane course of action. Euthanasia was performed via FatalPlus solution and potassium chloride.

Necropsy showed normal to robust body condition. The left lung was not collapsed and appeared emphysematous. Lung tissue was reddened, edematous, and firm in texture. The primary bronchus contained clear mucus and tan caseous material that likely originated in the right lung. The right lung was ~5x larger than the left and the primary bronchus was dilated ~50% larger than the left with caseous plugs present and associated mucosal and/or submucosal hemorrhage. Right bronchus was filled with thick mucus and caseous material. Airways were distended and contained caseous casts. Cut surfaces were edematous and pale with scant functional lung tissue visible.

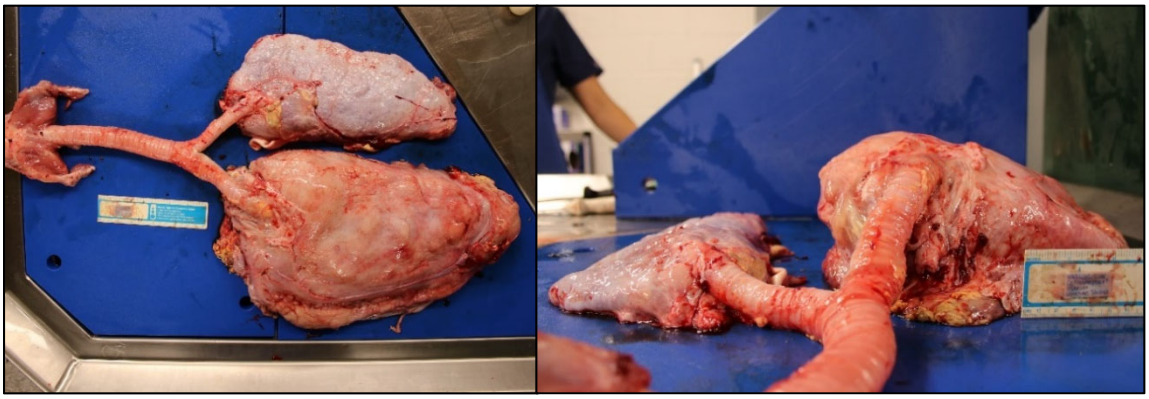


Figure 28: Dorsal (left) and cranial (right) view of left and right lungs. Note right lung ~5x larger than left.

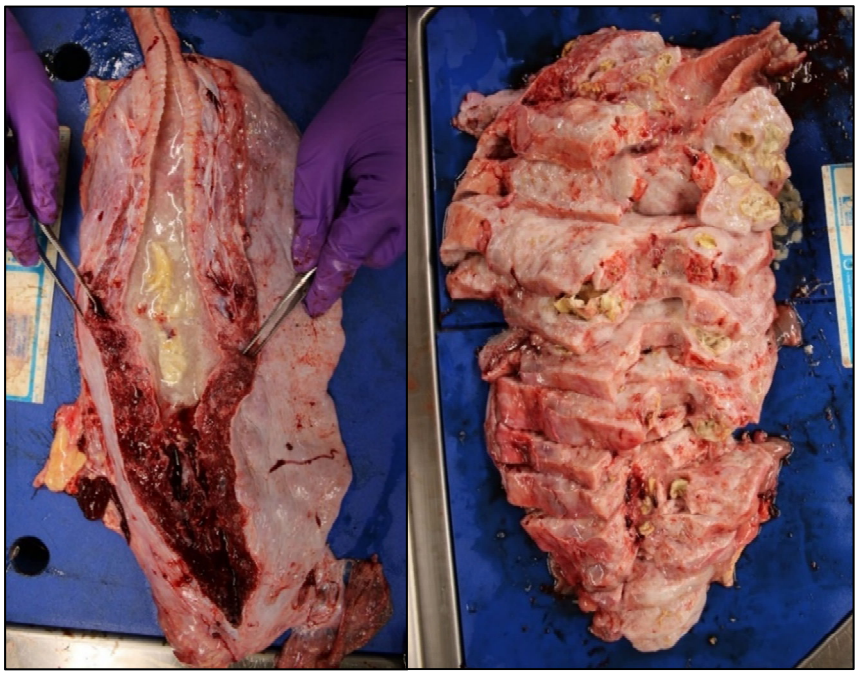


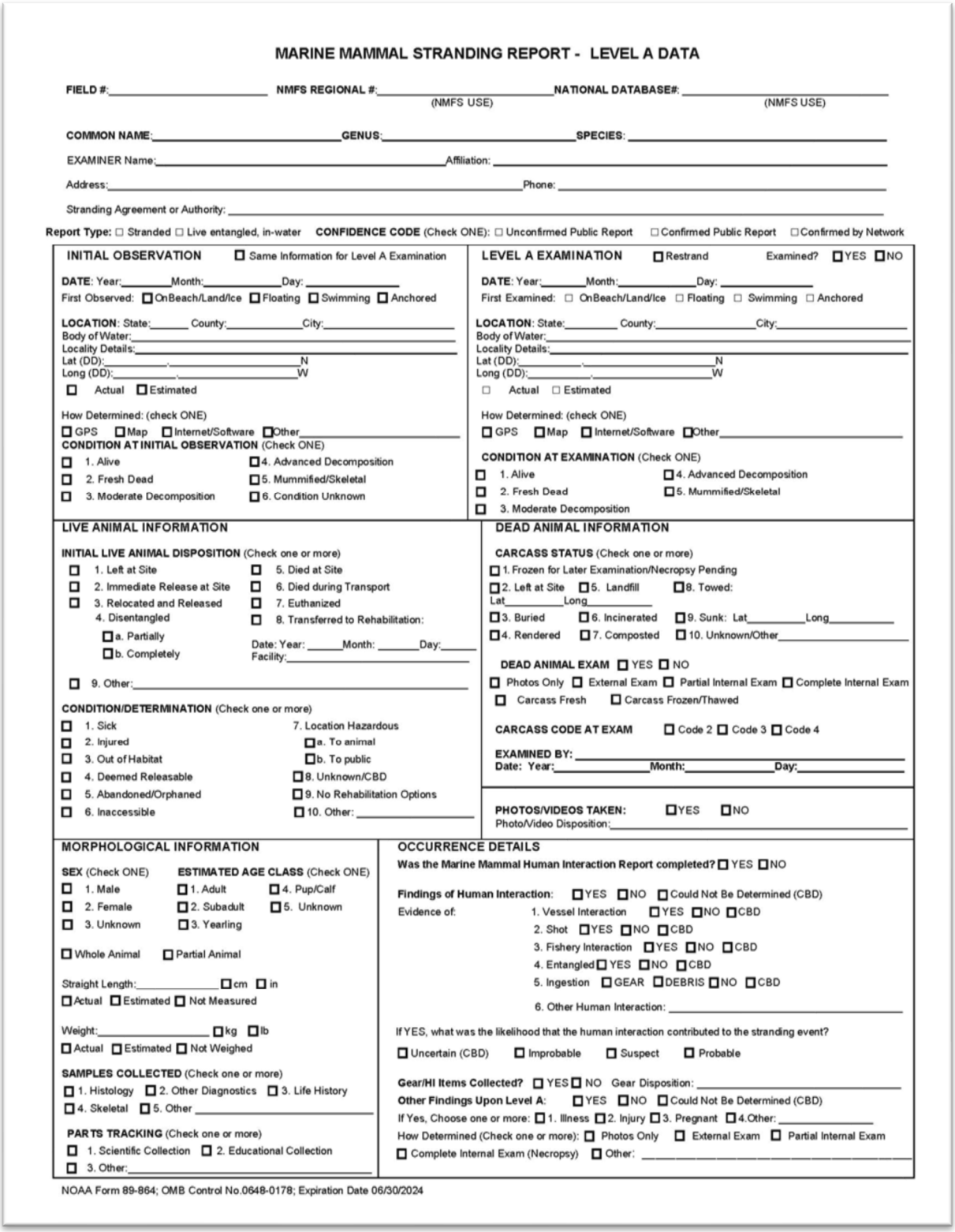
Figure 29: Cut surfaces of left and right lungs in respective orientation.

Overall, this case was invaluable from a clinical perspective. VAQS staff were able to utilize and compare diagnostic imaging techniques including radiography, computerized tomography (CT), ultrasonography, and bronchoscopy. Comparing bloodwork and imaging

benchmarks to the animal's clinical presentation over time taught us valuable lessons to use in future cases.

Appendix IV: Stranding Network Datasheets

A. Marine Mammal Level A data sheet



MARINE MAMMAL STRANDING REPORT - LEVEL A DATA

FIELD #:_____ NMFS REGIONAL #:_____ (NMFS USE) NATIONAL DATABASE#: _____ (NMFS USE)

COMMON NAME:_____ GENUS:_____ SPECIES: _____

EXAMINER Name:_____ Affiliation: _____

Address:_____ Phone: _____

Stranding Agreement or Authority: _____

Report Type: ☐ Stranded ☐ Live entangled, in-water CONFIDENCE CODE (Check ONE): ☐ Unconfirmed Public Report ☐ Confirmed Public Report ☐ Confirmed by Network

INITIAL OBSERVATION ☐ Same Information for Level A Examination

DATE: Year:_____Month:_____Day: _____

First Observed: ☐ OnBeach/Land/Ice ☐ Floating ☐ Swimming ☐ Anchored

LOCATION: State:_____ County:_____City:_____

Body of Water:_____

Locality Details:_____

Lat (DD):_____._____N

Long (DD):_____._____W

☐ Actual ☐ Estimated

How Determined: (check ONE)

☐ GPS ☐ Map ☐ Internet/Software ☐ Other_____

CONDITION AT INITIAL OBSERVATION (Check ONE)

☐ 1. Alive ☐ 4. Advanced Decomposition

☐ 2. Fresh Dead ☐ 5. Mummified/Skeletal

☐ 3. Moderate Decomposition ☐ 6. Condition Unknown

LEVEL A EXAMINATION ☐ Restrand Examined? ☐ YES ☐ NO

DATE: Year:_____Month:_____Day: _____

First Examined: ☐ OnBeach/Land/Ice ☐ Floating ☐ Swimming ☐ Anchored

LOCATION: State:_____ County:_____City:_____

Body of Water:_____

Locality Details:_____

Lat (DD):_____._____N

Long (DD):_____._____W

☐ Actual ☐ Estimated

How Determined: (check ONE)

☐ GPS ☐ Map ☐ Internet/Software ☐ Other_____

CONDITION AT EXAMINATION (Check ONE)

☐ 1. Alive ☐ 4. Advanced Decomposition

☐ 2. Fresh Dead ☐ 5. Mummified/Skeletal

☐ 3. Moderate Decomposition

LIVE ANIMAL INFORMATION

INITIAL LIVE ANIMAL DISPOSITION (Check one or more)

☐ 1. Left at Site ☐ 5. Died at Site

☐ 2. Immediate Release at Site ☐ 6. Died during Transport

☐ 3. Relocated and Released ☐ 7. Euthanized

4. Disentangled ☐ 8. Transferred to Rehabilitation:

☐ a. Partially Date: Year: _____Month: _____Day:_____

☐ b. Completely Facility:_____

☐ 9. Other:_____

CONDITION/DETERMINATION (Check one or more)

☐ 1. Sick 7. Location Hazardous

☐ 2. Injured ☐ a. To animal

☐ 3. Out of Habitat ☐ b. To public

☐ 4. Deemed Releasable ☐ 8. Unknown/CBD

☐ 5. Abandoned/Orphaned ☐ 9. No Rehabilitation Options

☐ 6. Inaccessible ☐ 10. Other: _____

DEAD ANIMAL INFORMATION

CARCASS STATUS (Check one or more)

☐ 1. Frozen for Later Examination/Necropsy Pending

☐ 2. Left at Site ☐ 5. Landfill ☐ 8. Towed:

Lat_____Long_____

☐ 3. Buried ☐ 6. Incinerated ☐ 9. Sunk: Lat_____Long_____

☐ 4. Rendered ☐ 7. Composted ☐ 10. Unknown/Other_____

DEAD ANIMAL EXAM ☐ YES ☐ NO

☐ Photos Only ☐ External Exam ☐ Partial Internal Exam ☐ Complete Internal Exam

☐ Carcass Fresh ☐ Carcass Frozen/Thawed

CARCASS CODE AT EXAM ☐ Code 2 ☐ Code 3 ☐ Code 4

EXAMINED BY: _____

Date: Year:_____Month:_____Day:_____

PHOTOS/VIDEOS TAKEN: ☐ YES ☐ NO

Photo/Video Disposition:_____

MORPHOLOGICAL INFORMATION

SEX (Check ONE)

☐ 1. Male

☐ 2. Female

☐ 3. Unknown

ESTIMATED AGE CLASS (Check ONE)

☐ 1. Adult ☐ 4. Pup/Calf

☐ 2. Subadult ☐ 5. Unknown

☐ 3. Yearling

☐ Whole Animal ☐ Partial Animal

Straight Length:_____ ☐ cm ☐ in

☐ Actual ☐ Estimated ☐ Not Measured

Weight:_____ ☐ kg ☐ lb

☐ Actual ☐ Estimated ☐ Not Weighed

SAMPLES COLLECTED (Check one or more)

☐ 1. Histology ☐ 2. Other Diagnostics ☐ 3. Life History

☐ 4. Skeletal ☐ 5. Other _____

PARTS TRACKING (Check one or more)

☐ 1. Scientific Collection ☐ 2. Educational Collection

☐ 3. Other:_____

OCCURRENCE DETAILS

Was the Marine Mammal Human Interaction Report completed? ☐ YES ☐ NO

Findings of Human Interaction: ☐ YES ☐ NO ☐ Could Not Be Determined (CBD)

Evidence of:

1. Vessel Interaction ☐ YES ☐ NO ☐ CBD
2. Shot ☐ YES ☐ NO ☐ CBD
3. Fishery Interaction ☐ YES ☐ NO ☐ CBD
4. Entangled ☐ YES ☐ NO ☐ CBD
5. Ingestion ☐ GEAR ☐ DEBRIS ☐ NO ☐ CBD
6. Other Human Interaction: _____

If YES, what was the likelihood that the human interaction contributed to the stranding event?

☐ Uncertain (CBD) ☐ Improbable ☐ Suspect ☐ Probable

Gear/HI Items Collected? ☐ YES ☐ NO Gear Disposition: _____

Other Findings Upon Level A: ☐ YES ☐ NO ☐ Could Not Be Determined (CBD)

If Yes, Choose one or more: ☐ 1. Illness ☐ 2. Injury ☐ 3. Pregnant ☐ 4.Other: _____

How Determined (Check one or more): ☐ Photos Only ☐ External Exam ☐ Partial Internal Exam

☐ Complete Internal Exam (Necropsy) ☐ Other: _____

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GE# _____ (NMFS Use)

Group Event: ☐ YES ☐ NO

If Yes, Type: ☐ Cow/Calf Pair ☐ Mass Stranding ☐ UME # Animals:_____☐ Actual ☐ Estimated

TAG DATA		ID#	Color	Type	Placement* (Circle ONE)	Applied	Present	Removed
Tags Were:								
Present at Time of Stranding (Pre-existing):	☐ YES ☐ NO				D DF L R LF LR RF RR V	☐	☐	☐
Applied during Stranding Response/Release:	☐ YES ☐ NO							
Applied during Rehabilitation/Release:	☐ YES ☐ NO				D DF L R LF LR RF RR V	☐	☐	☐
Absent but Suspect Prior Tag:	☐ YES ☐ NO							
					D DF L R LF LR RF RR V	☐	☐	☐
					D DF L R LF LR RF RR V	☐	☐	☐

* D= Dorsal; DF= Dorsal Fin; L= Left Lateral Body R= Right Lateral Body LF= Left Front; LR= Left Rear; RF= Right Front; RR= Right Rear; V= Ventrum

ADDITIONAL IDENTIFIER: _____ (If animal is restranded, please indicate any previous field numbers here)

ADDITIONAL REMARKS:

DISCLAIMER

THESE DATA SHOULD NOT BE USED OUT OF CONTEXT OR WITHOUT VERIFICATION. THIS SHOULD BE STRICTLY ENFORCED WHEN REPORTING SIGNS OF HUMAN INTERACTION DATA.

DATA ACCESS FOR LEVEL A DATA

UPON WRITTEN REQUEST, CERTAIN FIELDS OF THE LEVEL A DATA SHEET WILL BE RELEASED TO THE REQUESTOR PROVIDED THAT THE REQUESTOR CREDIT THE STRANDING NETWORK AND THE NATIONAL MARINE FISHERIES SERVICE. THE NATIONAL MARINE FISHERIES SERVICE WILL NOTIFY THE CONTRIBUTING STRANDING NETWORK MEMBERS THAT THESE DATA HAVE BEEN REQUESTED AND THE INTENT OF USE. ALL OTHER DATA WILL BE RELEASED TO THE REQUESTOR PROVIDED THAT THE REQUESTOR OBTAIN PERMISSION FROM THE CONTRIBUTING STRANDING NETWORK AND THE NATIONAL MARINE FISHERIES SERVICE.

PAPERWORK REDUCTION ACT INFORMATION

PUBLIC REPORTING BURDEN FOR THE COLLECTION OF INFORMATION IS ESTIMATED TO AVERAGE 30 MINUTES PER RESPONSE, INCLUDING THE TIME FOR REVIEWING INSTRUCTIONS, SEARCHING EXISTING DATA SOURCES, GATHERING AND MAINTAINING THE DATA NEEDED, AND COMPLETING AND REVIEWING THE COLLECTION OF INFORMATION. SEND COMMENTS REGARDING THIS BURDEN ESTIMATE OR ANY OTHER ASPECT OF THE COLLECTION INFORMATION, INCLUDING SUGGESTIONS FOR REDUCING THE BURDEN TO: CHIEF, MARINE MAMMAL AND SEA TURTLE CONSERVATION DIVISION, OFFICE OF PROTECTED RESOURCES, NOAA FISHERIES, 1315 EAST-WEST HIGHWAY, SILVER SPRING, MARYLAND 20910. NOT WITHSTANDING ANY OTHER PROVISION OF THE LAW, NO PERSON IS REQUIRED TO RESPOND, NOR SHALL ANY PERSON BE SUBJECTED TO A PENALTY FOR FAILURE TO COMPLY WITH, A COLLECTION OF INFORMATION SUBJECT TO THE REQUIREMENTS OF THE PAPERWORK REDUCTION ACT, UNLESS THE COLLECTION OF INFORMATION DISPLAYS A CURRENTLY VALID OFFICE OF MANAGEMENT AND BUDGET (OMB) CONTROL NUMBER.

NOAA Form 89-864; OMB Control Number 0648-0178; Expiration Date: 06/30/2024

B. Sea Turtle Stranding and Salvage Network (STSSN) data sheet (slightly modified for VAQS' specific use)

SEA TURTLE STRANDING AND SALVAGE NETWORK — STRANDING REPORT

OBSERVER'S NAME AND CONTACT INFORMATION:
First _____ M.I. _____ Last _____
Email _____
Affiliation _____
Phone number (____) _____

STRANDING DATE: *Use two digits for date fields.*
Year 20[__][__] Month[__][__] Day[__][__]
Turtle number by day[__][__][__] *Use three digits.*
VAQS Field Number: _____

STRANDING LOCATION:
State _____ County _____
Latitude _____ ☐ est Longitude _____ ☐ est
Location description _____

SPECIES: (check one, do not guess)
☐ Loggerhead (CC) ☐ Kemp's ridley (LK)
☐ Green turtle (CM) ☐ Olive ridley (LO)
☐ Leatherback (DC) ☐ Unidentified
☐ Hawksbill (EI)

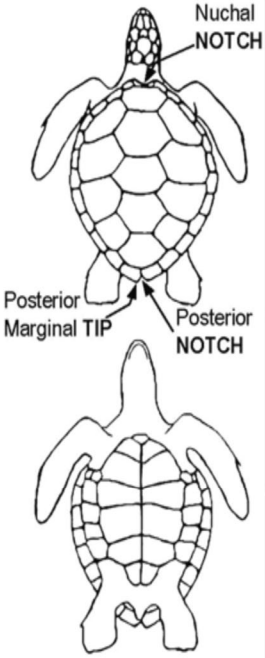
CIRCUMSTANCES OF ENCOUNTER: (check one)
Traditional Stranding
☐ Found washed ashore or washing ashore ☐ **Post-hatchling Washback**
☐ Found floating/struggling at water surface
☐ Found underwater ☐ **Cold-stunning**
Incidental Capture
☐ Caught by recreational fisherman
☐ Found in the intake canal of power plant
☐ Found in dredge equipment
☐ Entangled in line of pot/trap buoy
☐ Caught in commercial hook/line fishery
☐ Caught in commercial net fishery
☐ Captured during **relocation** efforts
☐ Captured during **research** efforts
☐ **Other** _____

NECROPSY:
Necropsied? ☐ Yes ☐ No ☐ Pending
Necropsy Date? _____
Necropsy Prosectors: _____
Necropsy type: ☐ Partial ☐ Complete

PHOTOS: (submit photos to state coordinator)
☐ YES (indicate below the completeness of photo series) ☐ NO
☐ Dorsal aspect visible ☐ Ventral aspect visible
A complete photo series includes photographs of the dorsal and ventral aspects of the turtle, and all injuries or anomalies.

CONDITION: (check one)
☐ Alive
☐ Mildly decomposed
☐ Moderately decomposed
☐ Severely decomposed
☐ Dried carcass
☐ Skeletal

SEX: (check one)
☐ Female
☐ Male
☐ Unknown
How Determined?
☐ Necropsy
☐ Tail Length



TAGS:
Contact state coordinator before disposing of a tagged turtle!
Flipper tags found? ☐ YES ☐ NO
Check all 4 flippers. If found, record tag number & location.
1. _____
2. _____
3. _____
PIT tag scan performed? ☐ YES ☐ NO
Check all 4 flippers. If found, record tag id & location.
1. _____
2. _____
Possible tag scars? ☐ YES ☐ NO
Check all locations of possible tag scars:
☐ Front left ☐ Front right ☐ Rear left ☐ Rear right
Living tag found? ☐ YES ☐ NO
If found, photograph & record scute number & side.
_____
Tracking gear found? ☐ YES ☐ NO If present, describe.
Do not dispose of turtle or remove gear; consult STSSN coordinator.
_____

EXAMINATION DETAILS:
Type of examination: (check one)
☐ In-person exam by STSSN participant
☐ Evaluated from photographs submitted by the public
Completeness of body: (check all that apply)
☐ Complete
☐ Missing head
☐ Missing one or more flippers (100%)
☐ Missing 50% or more of the shell (body)
☐ Not determined
Mouth checked? ☐ YES ☐ NO ☐ UNKNOWN

WEIGHT: (do not estimate weight)
Measured weight: _____ **kg**

TAIL MEASUREMENT:
Did the tail extend past the carapace?
At least 5cm/2in (LK or LO), 10cm/4in (CC, CM, EI), or 15cm/6in (DC)
☐ YES, directly measured: _____ **cm**
☐ NO ☐ NOT DETERMINED

CARAPACE MEASUREMENTS:
All measurements in cm, check box if estimated
Using calipers
Straight length (notch-tip) _____ ☐ est
Minimum length (notch-notch) _____ ☐ est
Straight width (widest point) _____ ☐ est
Using non-metal measuring tape
Curved length (notch-tip) _____ ☐ est
Minimum length (notch-notch) _____ ☐ est
Curved width (widest point) _____ ☐ est

FATE OR FINAL DISPOSITION:
If the stranded turtle was alive, choose one of the following:
☐ Alive, immediately released
☐ Alive, taken to rehabilitation facility; where?
_____
☐ Died before reaching rehabilitation facility
If the turtle was found dead or died, choose one of the following:
☐ Dead and left where found; marked? ☐ YES ☐ NO
If marked, describe: _____
☐ Dead; buried, rendered, or otherwise disposed of
☐ Dead and salvaged; location of salvaged remains?
_____
Salvaged for necropsy? ☐ YES ☐ NO

Revised: 19-Jan-21 **Clear Form**

ANTHROPOGENIC MATERIAL

Was there any man-made material found on the turtle (e.g., fishing gear, tar, or oil)? ☐YES ☐NO **If yes, were photos taken?** ☐YES ☐NO

If man-made material was present, please answer the following questions. (check all that apply)

Were any fishing hooks present on the turtle? ☐YES ☐NO — Where were the hooks located? ☐Mouth ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

If yes, was the gear collected? ☐YES ☐NO

Was line <0.5 cm dia. present on the turtle? ☐YES ☐NO ☐ — Where was the line located? ☐Mouth ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail ☐Cloaca

If yes, was the gear collected? ☐YES ☐NO

Was the turtle entangled in line ≥0.5 cm dia.? ☐YES ☐NO Where was the line located? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

If yes, was the gear collected? ☐YES ☐NO

Was the turtle entangled in fishing net? ☐YES ☐NO — Where was the net located? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

If yes, was the gear collected? ☐YES ☐NO

Was there any tar or oil present? ☐YES ☐NO — Where was the tar or oil located? ☐Mouth ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

If yes, were any samples collected? ☐YES ☐NO

Was there any other man-made material present? ☐YES ☐NO — Where was the material located? ☐Mouth ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

Please describe the material: _____

INJURIES

Were any injuries externally evident? ☐YES ☐NO **If yes, were photos taken?** ☐YES ☐NO

If injuries were evident, please answer the following questions. (check all that apply)

Were there any definitive vessel-strike injuries evident? ☐YES ☐NO — Where were these injuries located? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

Were there any blunt force injuries evident? ☐YES ☐NO — Where were these injuries located? ☐Head ☐Carapace ☐Plastron

Were there any shark-bite injuries evident? ☐YES ☐NO — Where were these injuries located? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

Were there any amputations of unknown cause evident? ☐YES ☐NO — Where were these amputations located? ☐Front left flipper ☐Front right flipper ☐Rear left flipper ☐Rear right flipper

How many amputations were present? _____

Was there an incised wound evident? ☐YES ☐NO — Where was the wound located? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

(e.g., clean cuts, as created by knife; typically longer than wide)

Was there a perforating or penetrating wound evident? ☐YES ☐NO — Where was the wound located? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

(a wound that is typically deeper than wide)

Was there a wound indicative of entanglement or ingestion of anthropogenic material without this material being present? ☐YES ☐NO — Where was the wounds located? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

Was there a furrow on the edge of the beak? ☐YES ☐NO

Was there some other type of injury evident (not already described)? ☐YES ☐NO

Please describe: _____

DISEASES AND LEECHES

Were any diseases or leeches externally evident? ☐YES ☐NO **If yes, were photos taken?** ☐YES ☐NO

If diseases or leeches were evident, please answer the following questions. (check all that apply)

Were there any fibropapilloma-like tumors present? ☐YES ☐NO **If yes, were photos taken?** ☐YES ☐NO

Were eye tumors present? ☐YES ☐NO

Were mouth tumors present? ☐YES ☐NO

Did any of the tumors have a papillary texture? ☐YES ☐NO

Were there any non-fibropapilloma-like tumors present? ☐YES ☐NO **If yes, were photos taken?** ☐YES ☐NO

Please describe: _____

Were there any external skin lesions evident? ☐YES ☐NO **If yes, were photos taken?** ☐YES ☐NO

Which of the following best describes the lesions? ☐Superficial crusts on the skin surface ☐Deep lesions exposing underlying tissue ☐Both superficial crusts and deep lesions were present ☐Neither

Which best describes the extent of superficial crusts? ☐Found only in single area or in a few small, isolated areas ☐Found over large areas

Where were the superficial crusts found? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

Which best describes the extent of the deep lesions exposing underlying tissues?

☐Found only in single area or in a few small, isolated areas ☐Found over large areas

Where were the deep lesions found? ☐Head ☐Neck ☐Carapace ☐Plastron ☐Front flipper ☐Rear flipper ☐Tail

Were there any leeches or leech eggs evident? ☐YES, small isolated egg patches or few adults ☐YES, large egg patches or many adults ☐NO **If yes, were photos taken?** ☐YES ☐NO

ADDITIONAL COMMENTS: _____

Appendix V: Virginia Species Lists

A. Marine mammal species in stranding records from Virginia, U.S.A. (Virginia Aquarium Marine Mammal Stranding Database, Potter 1991).

Common Name	Scientific Name	ESA Status
Order: Sirenia		
Family: Trichechidea		
West Indian manatee	*Trichechus manatus latirostris*	Threatened
Order: Cetacea		
Suborder: Mysticeti		
Family: Balaenidae		
North Atlantic Right whale	*Eubalaena glacialis*	Endangered
Family: Balaenopteridae		
Fin whale	*Balaenoptera physalus*	Endangered
Sei whale	*Balaenoptera borealis*	Endangered
Bryde's whale	*Balaenoptera brydei*	Endangered
Humpback whale	*Megaptera novaeangliae*	Not Listed
Minke whale	*Balaenoptera acutorostrata*	Not Listed
Suborder: Odontoceti		
Family: Physteridae		
Sperm whale	*Physeter macrocephalus*	Endangered
Pygmy sperm whale	*Kogia breviceps*	Uncertain
Dwarf sperm whale	*Kogia sima*	Uncertain
Family: Ziphiidae		
Cuvier's beaked whale	*Ziphius cavirostris*	Uncertain
Gervais' beaked whale	*Mesoplodon europaeus*	Uncertain
True's beaked whale	*Mesoplodon mirus*	Uncertain
Sowerby's beaked whale	*Mesoplodon bidens*	Uncertain
Blainville's beaked whale	*Mesoplodon densirostris*	Uncertain
Family: Delphinidae		
Long-finned pilot whale	*Globicephala melas*	Not Listed
Short-finned pilot whale	*Globicephala macrorynchus*	Not Listed
Risso's dolphin	*Grampus griseus*	Not Listed
Bottlenose dolphin	*Tursiops truncatus*	Not Listed
Atlantic white-sided dolphin	*Lagenorhynchus acutus*	Not Listed
Pygmy killer whale	*Feresa attenuata*	Not Listed
Melon-headed whale	*Peponocephala electra*	Not Listed
Rough-toothed dolphin	*Steno bredanensis*	Uncertain
Common dolphin	*Delphinus delphis*	Not Listed
Striped dolphin	*Stenella coerubeoalba*	Not Listed
Pantropical spotted dolphin	*Stenella attenuata*	Not Listed
Atlantic spotted dolphin	*Stenella frontalis*	Not Listed

Common Name	Scientific Name	ESA Status
Family: Phocoenidae		
Harbor porpoise	*Phocoena phocoena*	Not Listed
Order: Carnivora		
Suborder: Pinnipedia		
Family: Phocidae		
Harbor seal	*Phoca vitulina*	Not Listed
Gray seal	*Halichoerus grypus*	Not Listed
Hooded seal	*Crystophora cristata*	Not Listed
Harp seal	*Pagophilus groenlandica*	Not Listed

B. Sea turtle species in stranding records from Virginia, U.S.A. (Virginia Aquarium Sea Turtle Stranding Database).

Common Name	Scientific Name	ESA Status
Class: Reptilia		
Order: Testudines		
Family: Dermochelyidea		
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Family: Cheloniidae		
Green sea turtle	*Chelonia mydas*	Threatened
Loggerhead sea turtle	*Caretta caretta*	Threatened
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered