The Sea Star Wasting Syndrome

by Sasha Greenawalt & Janet Pelinka

The current sea star die-off has shaken biologists and ecologists on the east and west coasts of the United States, and the extent is shocking. The “wasting syndrome”—which in places has caused up to 90% mortality sometimes in less than two weeks—is devastating populations of 12 different species of sea stars, and, to a much lesser degree, sea urchins and sea cucumbers. In Howe Sound, British Columbia, an area once overpopulated with dozens of sunflower stars per square meter, tens of thousands of these stars have died since summer.

Similar events have occurred in the past, but nothing of this magnitude and affecting such a broad expanse of coastline has ever been documented. Sea star wasting has been seen this year off the coast of Alaska, Vancouver, Washington and California on the west coast, and in waters from New Jersey to Maine on the east coast, but as of this publication, no one has been able to link the outbreaks on both coasts. While illnesses typically begin in one region and jump to other locations, this syndrome has arrived in different west coast areas almost simultaneously, sometimes eliminating entire populations. It appears to be transmitted through water, as animals in several aquariums that draw water from the sea, including the Monterey Bay Aquarium and Seymour Marine Discovery Center in Santa Cruz, have been affected by the syndrome.

The course of the disease in sea stars is predictable. First there is a limp appearance due to loss of turgor. White lesions appear on the star’s aboral surface, initially at the junctions of the arms with the central disk. Lesions enlarge until the entire animal fragments and body parts dissolve. The progression is rapid and death typically occurs within a few days.

Researchers suspect a microbial agent is involved. They are struggling to identify the agent and also the conditions which might make sea stars susceptible to it. Several hypotheses have been posited regarding those conditions: localized warm water events, low oxygen levels in coastal waters, environmental toxins, and ocean acidification.

In a study at the Bamfield Marine Sciences Centre in British Columbia, scientists housed *Pisaster ochraceus* stars at different temperatures in the laboratory and caged sea stars subtidally at two depths. Prevalence and infection intensity were always higher in warm temperature treatments. In addition, the sea stars in a sheltered inlet showed significantly higher disease prevalence while wave-exposed sites had consistently low...
Sea Stars continued

disease prevalence. The relative absence of wasting disease along the Oregon coast could suggest that the disease may proliferate in quieter, calmer waters seldom found on that state's coast. A team of researchers will survey Oregon's coast in January to determine if it remains the exception to the outbreak.

Overpopulation is also hypothesized as a contributing condition. In a university press release reported by Zachary Stieber in Science News in October, Marta Gomez-Chiarri, a University of Rhode Island professor, says, “There was a big increase in sea star numbers about three or four years ago and often when you have a population explosion of any species you end up with a disease outbreak. When there’s not enough food for them all it causes stress, and the density of animals leads to increased disease transmission.”

Thus far the cause remains unknown. As Benjamin Miner, biology professor at Western Washington University at Bellingham has stated, “Every time you come up with what seems like a reasonable hypothesis, it’s challenged because other affected places don’t match.” And since little published research on this topic exists, scientists are starting nearly from scratch. Research funding has been provided by the National Science Foundation to scientists and universities seeking to determine if a microbial causative agent is involved. Samples have been sent to Cornell University, where molecular sequencing work is being conducted to identify suspect viruses and bacteria. A press release on December 22 from the UC Santa Cruz (UCSC) Department of Ecology and Evolutionary Biology reported that “pathology samples are being evaluated by a working group of veterinary pathologists from the Wildlife Conservation Society, Northwest Zoopath, Roger Williams University, University of California Davis, University of Connecticut and the US Geological Survey to define the disease process and help determine the underlying cause. Funding from the National Science Foundation and WA Sea Grant is also supporting infectiousness experiments at Western Washington University.”

The press release also stated, “It is very important to capture the timing of new disease clusters since so little is known about the rate and patterns of disease spread in the ocean. Detailed data will allow testing of hypotheses about potential causes.” Groups from the Multi-Agency Rocky Intertidal Network (MARiNE)* are conducting surveys at long-term monitoring areas on the west coast, and various agencies and trusts have provided funding for additional surveys in other areas. Pete Raimondi, chair of the UCSC Department of Ecology and Environmental Biology, believes that knowing “if it’s a single point of initiation that

The lowest tides this period are:
-1.24 1/30 4:13 pm 6th lowest tide of 2014
-0.71 2/27 3:06 pm
-0.17 3/27 2:52 pm
-0.34 4/1 6:27 am
-0.71 4/18 7:30 am
-0.87 4/30 6:08 am
-1.37 5/16 6:29 am 4th lowest tide of 2014
-0.98 5/29 5:52 am -1.24 low tide 4:13 pm 6th lowest tide of 2014

The winter afternoon low tides change to morning low tides in March. There are almost equally low tides several days before and several days after the noted low tide dates.

To see the spectacular color of the creature photos in this newsletter, be sure to check it out on our website: http://fitzgeraldreserve.org/resources

The graph displayed across the page bottoms shows tides for 01/20/14 to 6/8/14. Where the date appears is midnight. The reefs are accessible for exploring during low tides—at least +1 or below. See: http://fitzgeraldreserve.org/resources and click on “Tides” for a more detailed tide chart.

The winter afternoon low tides change to morning low tides in March. There are almost equally low tides several days before and several days after the noted low tide dates.
spreads, or multiple points of initiation ... will really be helpful in understanding what the delivery mechanism is.” Raimondi is one of the leading scientists involved in the search and a coordinator of the coastwide surveys. Information gathered by this field work is entered into the MARINe sea star wasting Tracking Map. Additional surveys are being conducted by various aquariums, programs, divers and concerned citizens and by those who are participating as citizen scientists. To see the results of this large collaborative effort visit seastarwasting.org.

One of the known effects of this event will be a consequence of the *Pisaster ochraceous* die-off. This keystone species has prevented mussel beds from encroaching into and eventually dominating the lower subtidal areas, thus preventing other species from colonizing and inhabiting these zones. It is thought that the devastation of the sea star population and the resultant increase of the mussel population on the sea floor will have a marked effect on nearshore communities, including kelp forests.

No one knows the long-term impact of the present die-off. Historically, recovery has been difficult. In 1978 one species of sea star affected by the disease in the Gulf of California, the predatory sea star *Heliaster kubiniji*, became locally extinct in some areas of the gulf, and some populations had not recovered by the year 2000. Previous die-offs (1983-84 and 1997) were associated with the warm waters of those El Nino years in Southern California, and sea stars there took decades to return to their former numbers. Recovery from the current event is especially unpredictable considering the rapid progression and magnitude of the syndrome and the relatively cool Pacific surface waters of the past 15 years.

To upload photos or tweet observations of sick or healthy sea stars go to: www.inaturalist.org/projects/pisaster-disaster-tracking-starfish-wasting-disease.

* The Multi-Agency Rocky Intertidal Network (http://www.marine.gov) is a large consortium of research groups working together to collect compatible data that are entered into a centralized database. MARINe is funded entirely by the independent contributions of its members. ♦

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**December 2013 Nudibranch Survey** by Julie Walters

Perfect conditions, plus 12 wonderful volunteers, made for one of our best nudibranch surveys yet. Under sunny skies, with a low tide of -1.1, a record 175 nudibranchs were recorded over a two-hour period at Pillar Point on December 30th.

Volunteers included Jan Pelinka, Sasha Greenawalt, Karen Madsen, Sandi Meyer, Brenna Green from the California Academy of Sciences, Maria Schaeffer (former Fitzgerald Park aide), Tom Ciotti, Dave Lizarraga, Susan Evans, Julie Walters, Joni Mauer and Paul Reidl (our official photographer).

The most common species seen was the *Triopha maculata* (53 individuals) which is easy to spot because of its bright orange color. The second most common species was the Sea Lemon with 28 counted.

A couple of interesting observations about this survey: We saw only four of the *Phidiana hiltoni*, a cannibalistic nudibranch that typically eats other nudibranchs such as the *Hermissonida*. The quantities of this nudibranch have actually decreased since the last count, while the quantity of one of its prey, the *Hermissonida crassicornis*, has increased.

It wasn’t all nudibranchs during our time on the reef; we were excited to see four octopuses (including one that a seagull was attempting to eat), two gumboot chitons and some beautiful lined chitons. During our survey we also took note and documented sea stars for the sea star wasting project and uploaded them to iNaturalist.

If you are a Fitzgerald volunteer, and are interested in participating in our next nudibranch survey, please contact Julie Walters at juliebw2@gmail.com. Also, follow us on our facebook page: “Fitzgerald Marine Reserve Nudibranch Surveys.” ♦

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An ochre star in an advanced stage of disintegration.

Another ochre star with advanced wasting.
A little less than a year ago I was beginning my last two quarters at UC Davis and was looking to the future. I knew I did not want to enter a graduate program immediately after graduation, so I looked into almost every local environmental/open space/park agency and program I could for job opportunities. Several positions looked promising, but I felt a tug back to San Mateo County Parks. For the previous three summers I had worked as a Park Aide at San Mateo County’s Memorial Park in the beautiful redwoods. When I was hired, my supervisor approached me about taking over the Naturalist position that was vacant at the time. Terrified at first, I gradually eased into public speaking and took on a leadership role, required of someone leading naturalist activities for campers. For those summers, I led campers on hikes, helped them create art masterpieces, and sang with them at campfires while roasting marshmallows.

At UC Davis I enjoyed many incredible class projects, internships, and volunteer opportunities, but my favorite was my volunteering at the California Raptor Center. There, I assisted in the rehabilitation and care of injured raptors. I learned to handle tamed birds and wild, releasable birds as well. I also participated in several of the Open House days for the center, giving presentations on the natural history of various species of raptors and on the actual history of how the specific birds had come to be in our care. The lessons and information I gained in college opened my eyes to the beauty in many habitats and animal species. San Mateo County Parks encompass a large number of habitats and species that are all rare and beautiful, but that could benefit from activities similar to those I had worked on at Memorial. I felt that I could have a greater impact if I branched out and worked at several San Mateo County Parks.

In a very long and hopeful email, I expressed my wishes to Park Superintendent Scott Lombardi. He and Carla Schoof, Volunteer Programs Coordinator, agreed to meet me and discuss the possibility of a short term position in February. This past June, I graduated with a Bachelors of Science in Wildlife, Fish and Conservation Biology from UC Davis. A week after graduation I returned to work at Memorial Park leading the naturalist activities as before, except that three of my weekly workdays were split between the main office in Redwood City, the Sign Shop at Coyote Point, and working with District IV staff at Fitzgerald Marine Reserve and San Pedro Valley Park.

Since I began this summer I have been working with office staff and field staff to create interpretive materials, activities, and panels for several parks, including Fitzgerald. I have also worked with Carla Schoof to create volunteer positions for FMR that are intended to support the Friends of FMR and FMR staff. These volunteers will greet those who walk down the ramp to the tide pools and also position themselves at the seal cone line. The greeters will inform visitors about the MPA, the seals, and observation-only tide pool exploration. The reserve’s staff, the Friends of FMR, and I are working together to bring back Family Fun Days. I also look forward to assisting Kathleen Hayes with the Junior Naturalist week-long day camp this coming summer!

San Mateo County Parks, Fitzgerald and Memorial in particular, have always been a big part of my life and introduced me to nature. My main goal is to instill the same curiosity and love for nature in visitors to our parks that rangers, volunteers, and naturalists once did and still do for me. These last six months have been a great pleasure, and I can’t wait to see what the future brings.
Most everything you see or use as plastic—computers, iPhones, sunglasses, water bottles, toothbrushes, hairbrushes, scrub brushes, and the list goes on—most likely began as tiny BB-sized pellets called nurdles. Nurdles are pre-production plastic pellets and resin materials that are used in the manufacture of thousands of the products we use. They are the most efficient form for shipping a solid to end-use manufacturers and they melt uniformly, a necessary feature in using molds. Approximately 60 billion pounds of nurdles are manufactured annually in the United States, one pound of pellets equaling 22,000 nurdles.

Because these raw materials for plastic goods are produced in one place and the final products are produced in another, nurdles must be shipped all around the world. Careless handling of these plastic pellets cause them to spill, blow, escape through cracks and out the doors of manufacturers. At some manufacturing sites pellets have been seen piled up against fences much like snowdrifts. In 2012 a typhoon caused a cargo ship to dump 150 metric tons of nurdles into the ocean; they eventually washed up on Hong Kong beaches. That same year another large spill occurred due to a freight train derailment in Lancaster, Pennsylvania.

Nurdles are too small to be removed from wastewater and they make their way to the sea, where they are major contributors to marine debris and to beach pollution. They form a serious threat to marine life. Mistaken for fish eggs, they are ingested by marine mammals, fish, mussels, barnacles, lugworms, sea turtles, and 70 species of birds. But they are indigestible and can block their digestive systems, leading to starvation and death. Some studies have found concentrations of toxins in plastic debris from 1000 to 1 million times that of the ambient seawater.

California was first to pass a law that regulates nurdles. In 2007 AB 258, California’s Nurdle Control Law, was enacted, forcing manufacturers to take responsibility by establishing best management practices for manufacturers and transporters of preproduction plastic pellets. But nurdles still persist in oceans and on beaches all over the world and remain a common beach contaminant. One study found that sand particles sized 1-15mm found on remote Hawaiian beaches were 72% plastic. In 2009 the United Nations stated that there were 13,000 nurdles floating in every square mile of the ocean.

Closer to home, in 2009 a surprise inspection was held at four San Leandro plastic manufacturers and piles of pellets were found scattered about. Two years later the San Francisco Bay Regional Water Quality Control Board, the State Water Resources Control Board and the US Environmental Protection Agency worked together on the enforcement of AB258 (EPA Region 9 News Release 10/18/2011). The first result of this collaborative effort was an ordered cleanup of Oyster Bay Regional Shoreline in San Leandro, home of the endangered California Clapper Rail and Salt Marsh Harvest Mouse. The cleanup was paid for by the four companies responsible for the pellet spillage. According to the 2011 news release government agencies will continue similar inspections statewide and eventually nationally.

So what is to be done? Ideally, legislation like California’s AB258 would be enacted throughout the world wherever plastic pellets are produced and distributed, and laws would be strictly enforced. However, as we do not live in an ideal world, we as individuals must accept responsibility and change both how we produce and consume plastic. Seeking alternatives for plastic items we use is one way to start.

**Nurdles**

*by Sasha Greenawalt*

In 2009 the United Nations stated that there were 13,000 nurdles floating in every square mile of the ocean.
This summer I had the experience of a lifetime in Costa Rica, a country eight times smaller than California and bordered by both the Pacific Ocean and the Caribbean Sea. In the summer, sea turtles such as the Loggerhead, Leatherback, Pacific Green/Black turtle and the Olive Ridley nest on its shores. The nesting season varies, but summertime attracts visitors from all over the world.

I visited Playa Matapalo in early July to volunteer for an organization called Asociación de Voluntarios para el Servicio en Areas Protegidas, or ASVO. I travelled three hours from the main capital of San Jose to get to the volunteer site. Small houses were scattered throughout the landscape, all within a hundred yards of the ocean. I arrived at the volunteer site to learn that there had been only a few sea turtle sightings. The hatchery remained empty. I felt somewhat disappointed, but couldn’t help but enjoy the scenery and all the wildlife that surrounded me. Coordinators from the ASVO camp told me that the Olive Ridley was the most prominent sea turtle on the Pacific Coast, and its nesting season was just beginning in July.

The AVSO camp consisted of two houses that held a total of around 40 volunteers. Each day, coordinators assigned 4-5 volunteers and an experienced leader to patrol a section of the beach. Playa Matapalo is about 3.35 miles long, with rivers to the north and the south. Just beyond the northern river lies Playa Linda, only 2 miles in length. Since sea turtles are mainly visual animals and lay their eggs only at night, all beach patrol shifts were scheduled after 06:00 PM and volunteers were asked to wear darker colors. If any turtles were found, we were to dig up the nests and bring any eggs back to the volunteer-made hatchery near the volunteer camp.

The first few days of patrolling weren’t difficult, though there weren’t any sea turtles or clues of newly buried nests on either beach. Nonetheless, between the countless stars that scattered the night sky and the bioluminescent algae that littered the sand on the beach, I was happy.

On the third day of patrolling, there was a thickness in the air I could not explain. In the distance, lightning bolts danced across the sky while we gathered for our patrol. As we started off towards the beach, puddles from the daily rains made surprising obstacles that seemed to bother only the new volunteers. Rocks and stumps tricked our eyes in the darkness and after an hour and a half of walking, my excitement began to fade—until I saw my first sea turtle.

At first glance, a motionless rock appeared to be breaking the waves. However, a lightning bolt off in the distance revealed a large Olive Ridley sea turtle. As her flippers slapped onto the sand, the other volunteers started shouting in excitement; the somewhat deaf Olive Ridley paid no mind. The “Lora,” as the locals call the Olive Ridley sea turtle, searched for a suitable place to dig her nest. As the turtle began digging into the sand, I saw her shell lift and sink with every breath she took. Her powerful back flippers hollowed out a place for her nest, while the other volunteers began filling out survey forms and getting tags ready. After an initial survey of the landscape, we took shell measurements. The turtle’s shell was 84 cm across and 63 cm from head to tail (2 ft. 9 5/64 inches across by 2 ft. 51/64 inches long).

After about 15 minutes from her initial dig, the Olive Ridley started laying eggs. I was lucky enough to catch them with a gloved hand. I could grab only about 9 eggs before she started covering her nest with sand. As she returned to the Pacific, we waved farewell. Surprisingly,

**Turtle Diary**

by David Lizarraga

David Lizarraga in front of the hatchery with a basket over the nest to protect the eggs.
she had been out of the water for only 30 minutes, whereas a normal nesting time could be almost an hour long. After she left, we excavated the nest she left behind and placed her eggs with the other nine in a plastic bag. I counted a total of 111 eggs —eggs that were no larger than a ping pong ball and somewhat soft to the touch.

As we walked nearly halfway to the hatchery, I noticed the swaying of the palm trees and that the birds and insects had grown silent. In front of us, I could hear rain on wet sand. A soft drizzle turned into a downpour and soon I was thoroughly soaked. However, my worries shifted to the exposed eggs that we had been carrying back. Luckily, after walking about a mile or more, we managed to get under the minimal shelter of the hatchery. We decided to wait out the rain for about 30 minutes. When we realized it wasn’t going to stop, we chose a section of the hatchery in which to bury a nest so the eggs would be safe in the warm sand.

I dug about an arm’s length into the warm sand while I shivered in the cooler rain. I didn’t mind being cold or wet, but the rain was definitely relentless. After hollowing out a site for the nest, I gently set the eggs inside, and covered them with sand. I then placed a tarp on top of the newly covered nest to prevent predators from digging it up. As I got back to my room and dried off, I was still in awe from the amazing experience that I was lucky to be a part of.

If you have any questions about my experience, you can email me at daveml@ucdavis.edu.

ASVO’s website is http://www.asvocr.org/english/ •

Update: David’s nest hatched on Tuesday, August 27. Out of 111 eggs, there were 105 hatchlings.

This turtle article interested me since I recently visited my sister on Singer Island, Florida, one of the largest nesting sites for loggerhead turtles. The entire beach is lined with condo buildings but no lights are allowed to shine out on the beach at night. Each morning as I walked the beach I would find 10 or so new trails of flipper prints and new nests. Volunteers come and mark the nests and return to help the hatchlings make it to the water’s edge.

There’s a terrific turtle rescue center (Loggerhead Marine Life Center—http://www.marinelife.org) on the next island up, Jupiter Island. In the Information Center full-size models of Leatherbacks, Loggerheads, Ridley’s and Green Turtles line the walls and many displays provide much more info. Outside we found pools of rescued hatchlings, young green turtles and a couple of injured loggerheads. The facility has a complete state-of-the-art surgery and many staff and volunteers to care for the turtles.

The real thrill of the summer for me occurred while I was snorkeling in the ocean by my sister’s condo where discarded concrete walls have formed a reef populated with schools of colorful fish. All of a sudden two pre-adult (50-75 lbs) green turtles swam near me and I was privileged to accompany them on their wanderings for a while.

People ask about my nephew’s wedding but I end up telling them about the turtles! •
In September a barbecue luncheon was held to recognize and celebrate the volunteer efforts put forth by FFMR naturalists, recently graduated and seasoned veterans. A delicious lunch was served at the Half Moon Bay Yacht Club, graciously arranged by Carol Davies.

Linda Ciotti began by thanking everyone for participating in the FFMR program, leading 75 tours and volunteering 3495 hours during the 2012-2013 tour season at the reserve. Naturalists also donated another 400 hours to San Mateo County for non-tour related activities. Tom Ciotti gave a summary of the MPA program, announced that scholarships had been awarded to four high-school seniors, and spoke about the revival of the Junior Ranger Program at FMR. Rob Cala then shared his video about the reserve.

Betty Cosgrove, a ten-year veteran naturalist, was recognized for having received the Volunteer Leadership Award called the “CuriOdyssey” from the Coyote Point Museum for her many years of service to that group.

The “Ginny Award” was presented to Carol Ferguson, another ten-year veteran naturalist, who has not only led innumerable tours, but also acted as Merchandise Manager for five years.

Sandra Sun, a graduate of the 2013 training class, received the “Sea Star Award.” Upon completion of her training Sandra immediately began to lead tours, and she continues to be a presence at the reserve. When a desperate plea for help is issued, Sandra can be counted on to reply.

A number of door prizes were awarded which included jewelry, gift bags, and gift certificates. Docents received their annual volunteer pins.

It was a beautiful sunny day and after the luncheon was over some of us sat at tables outside the club to enjoy the warmth from the sun and the camaraderie of fellow naturalists.
iNaturalist.org - The marriage of Nature and Technology

by Julie Walters

Have you ever been out tidepooling or hiking and seen a plant or animal and you weren’t sure what it was? Now there is a website and smartphone application that can help you out. It’s called iNaturalist.org.

Here’s how it works:
1. Take a photo of the plant or animal that you would like to know more about.
2. Go to iNaturalist.org, set up an account, upload your photo, give any details in terms of size and color, then click “ID please.”
3. An expert will respond with an answer.
4. Once identified, you will be able to see other locations of where this species has been observed. You can also go to a link which will provide facts and information on the species.

If your camera or smartphone has a GPS, the location will be automatically uploaded to the iNaturalist site and will help scientists and researchers document the location of different species. This is especially critical to study migration, food supplies, disease and the effects of global warming.

There are many different scientific researchers who are using iNaturalist for specific projects. Here are a few that I am contributing to: “Fitzgerald Marine Reserve Seastar Count,” “Intertidal Biodiversity Survey at Pillar Point” (through the California Academy of Sciences), “Pisaster Disaster-Tracking Starfish Wasting Disease,” and “San Mateo County Bio-Blitz.”

iNaturalist has been a great tool for tracking “Seastar Wasting Disease” which is spreading on the west coast. I would encourage everyone to look for ochre stars when they are tidepooling at different beaches. Upload your photographs of seastars (healthy or unhealthy ones) to iNaturalist.org. This will help scientists track the disease’s location and extent.

Special thanks to Ken-ichi Ueda, who is one of the creators of iNaturalist.org. Some of you may know Ken-ichi from our nudibranch surveys at Pillar Point.

Observations are entered with basic information. Each can be expanded to give more detail. Each set is accompanied by a map indicating locations of observations. A fun way to discover, teach and learn.
Most everyone has heard of Sesame Street’s Ernie and his “rubber ducky.” Or seen a small yellow duck perched on the rim of a bathtub. Or watched one lazily floating in a tub of bubbly water. But not many would visualize a little toy creature with bright blue eyes and a vacant stare bobbing along in the waves of the Pacific Ocean, or imagine this appealing three-inch plaything pushed by ocean currents through the Northwest Passage to make land on our eastern shores. But Donovan Hohn could, and he wrote an interesting, fanciful, humorous and thought-provoking book about his attempt to follow the duck’s imagined path.

This true story of Moby Duck began January 6, 1992, when a ship called the Ever Laurel departed Hong Kong carrying shipping containers stacked six high, its destination the Port of Tacoma. More than 500 miles off the tip of the Aleutian Islands it is likely that the ship met with hurricane force waves 36 feet high. At some point steel cables snapped and two columns of containers went overboard. One of the containers (8 feet wide and 20-40 feet long) broke open; it contained thousands of small packages carrying a message that read: “THE FIRST YEARS. FLOATEES. THEY FLOAT IN TUB OR POOL. PLAY & DISCOVER. MADE IN CHINA. DISHWASHER SAFE.” Each package housed four hollow plastic animals about three inches long. Set adrift were 7200 red beavers, 7200 green frogs, 7200 blue turtles and 7200 yellow ducks.

Thirteen years later, Donovan Hohn, a well-known journalist and teacher, was grading student papers when he came across an essay about the container spill, the tracking of the rubbery toys’ predicted paths by Seattle oceanographers, and the ducks’ hypothetical journey through the Arctic. Hohn fantasized about these tiny animals continuing to make their way through the vast Pacific Ocean. “I pictured the ducks...coasting through the Arctic on floes of ice. I imagined standing on a beach somewhere in Newfoundland...looking out and seeing a thousand tiny nodding yellow faces....”

At some point steel cables snapped and two columns of containers went overboard….Set adrift were 7200 red beavers, 7200 green frogs, 7200 blue turtles and 7200 yellow ducks.

Before long he was on the phone with Dr. Curtis Ebbesmeyer, retired oceanographer and editor of the quarterly newsletter Beachcomber Alert, inquiring about a possible duck sighting (later thought unreliable) on the coast of Maine. Invited by Ebbesmeyer to participate in Alaska’s annual Beachcombers’ Fair, Hohn abandoned his intentions of writing an article from the comforts of home, left his job, promised his wife to return in time for the birth of his expected first child, and began a three-year adventure that took him from his home in New York to Washington, Hawaii, China, and from Nova Scotia north to the Arctic and into the Northwest Passage.

This author self-effacingly describes himself as a “weakling with a bad back,” one horrified of sharks, afraid of heights. Yet he ends up in the most challenging situations, like fighting ten-foot waves at the tip of the Kenai peninsula, snorkeling from a catamaran in deep Pacific waters, and assisting a ship’s crew in a nighttime North Atlantic gale where he says he “kept falling down, stumbling into the crane, or into the starboard rail.”

His initial intention was merely to write an entertaining story about a rubber duck lost at sea. Soon this intention became a quest that ultimately involved taking part in a beach clean-up on a remote island, trawling for plastics...
in the southern Pacific Ocean, watching tiny plastic beads heated to molten blobs and molded into rubber toys in China, riding on a container ship following the route of the Ever Laurel, assisting a blind senior scientist in suboceanic exploration in the Labrador Sea, and traveling through the Northwest Passage on an Arctic icebreaker.

Hohn also had a more personal quest. He offers that he “had other, vaguer, more philosophical reasons for shipping out,” hoping “that it might refresh my capacity for awe.” Hohn cleverly draws parallels between his quest and that of Ishmael’s travels; passages from Moby Dick are inserted throughout the book.

As one tags along on his journey a great deal can be learned about ocean gyres, Irminger Rings, mesoscale eddies, 50-foot long “ghost” nets, the carbon molecule, nurdles, the enormous task of cleaning vast amounts of trash in the ocean and on beaches and much, much more. When he speaks of the persistence of plastic he informs us that “No one knows exactly how a synthetic polymer will persist at sea. Five hundred years is a reasonable guess. Globally, we are currently producing 300 million tons of plastic every year, and no known organism can digest a single molecule of the stuff, though plenty of organisms try.”

In the end Hohn doesn’t offer us much good news; he gives us no answers but instead drives home an environmental message of caution. He warns, “Plastics have won….What lingering anxieties remain, we leave at the curb-side with the recycling. Never mind that only 5% of plastics actually end up getting recycled. ….By offering the false promise of disposability, of consumption without cost, it has helped create a culture of wasteful make-believe, an economy of forgetting.”

While he meets many dedicated scientists, researchers, beachcombers and participants of hard-working cleanup campaigns, he ultimately concludes that however noble, their efforts will never eliminate the vast amount of ocean debris that exists today. Rather he believes that we must address the source by examining our values and attitudes regarding what we consume and how we manage our trash.

Hohn cleverly draws parallels between his quest and that of Ishmael’s travels; passages from Moby Dick are inserted throughout the book.

Moby Duck is not merely a distressing work. Hohn’s writing is often witty and peppered with surprising humor. He gives us a hilarious account of his snorkeling adventure: “In no time I was sucking ocean through my snorkel and commenced to hyperventilate….I splashed madly—in the sort of way that, I’d read, tends to attract sharks, whose sensory organs are well-attuned to the panic of seals….” He comically describes donning an Arctic survival suit and “feeling like a cosmonaut, or astronaut, or aquanaut—some sort of naut.”

As he ends his journey, on his way back to New York, Hohn hangs wanted posters containing his e-mail address in Nuuk and Resolute, Cambridge Bay, and on every bulletin board he can find in the Canadian Arctic Archipelago requesting that anyone finding a rubber duck washed up on a beach contact him. Read the book to find out who replied.

Friends of Fitzgerald Marine Reserve
Membership Secretary, P.O. Box 669, Moss Beach, CA 94038, or through our website: www.fitzgeraldreserve.org

Contribution Levels:

- $25
- $50
- $100
- $500
- $1000
- $5000
- Other

I want to double the value of my gift through my employer’s matching gift program (please enclose the matching gift forms).

Name ________________________________
Address ________________________________
City ________________ State __ Zip ________________

Email ________________________________
Gray skies did not dampen the spirits of FFMR participants as they marched in this year’s parade with big smiles and great enthusiasm. Heading our contingent as banner holders were Ann Hurley and Yvette Gilletti. Proudly representing sea creatures were Joni Mauer (Oyster Catcher), Michael Liang (Purple Sea Star), Jeanette Hyer (Bull Whip Kelp), Kris Liang (Green Sea Anemone), Carol Ferguson and Tom and Linda Ciotti (Jelly Fish), Diana Proctor (Blue Sea Anemone), and Susan Evans (Octopus). Presiding over it all was Dave Karlin decked out as King Neptune. The next parade will be in July. Join in to proudly represent FFMR. You can create, copy or just wear your FFMR jacket. It’s great fun.