



THE PINNIPED PRESS

A newsletter by and for Noyo Center for Marine Science Volunteers

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Volunteer Opportunities:

We are currently in need of volunteers to work in all capacities at the Slack Tide Café: Barista, sandwich maker, dishwasher, prep work. All shifts.

Volunteers are needed to table at a Celebrate the Coast event at the Mendocino College Station on the Stornetta Lands property. The event is on Saturday, May 6th from 10 am to 3 pm. If you are interested contact wendi@noyocenter.org

Fundraising is a top priority for the Noyo Center, and it has been a tough winter for all non-profits. Ways you can help:

- Become a sustaining member of the Noyo Center or increase your monthly donation, and tell your friends, or gift a membership.
- Rent the Slack Tide Café for your next meeting, reunion or birthday party starting at \$400.
- Host a home party with friends and family to raise funds and learn about the Noyo Center.
- Reach out to your friends who own a business in town (bank, restaurants, inns, retail stores, etc.) and ask if they might be interested in sponsoring the Noyo Center at events, exhibits, restaurant nights, etc. – let us know.
- Join the Noyo Center's Fundraising committee.
- Start a birthday fundraiser for the Noyo Center on Facebook.

Pinniped Press Logo: New Look!

Thank you, Sharon Bowers, for creating our awesome new logo for The Pinniped Press. Nice work, Sharon!

The Mendocino Subtidal Forest: Part 3

By Jim Rolfe

In Part 2 we noted there are some 235 species of algae found along our coast, which are classified as Red, Green, or Brown. Of particular importance is red Coralline algae, which plays an essential role in the life-cycle of abalone. This is our third and final part of the series.

So, what does a healthy subtidal ecosystem look like, and what is missing from pictures of urchin barrens? To help answer this, California passed the Marine Life Protection Act of 1999, which set aside marine protected areas (MPAs).

In 2004, they legislated the Ocean Protection Council (OPC) which was tasked with creating a science-based policy for the resource management of 124 MPAs stretching from San Diego to Crescent City. The intent was to protect the abundance and diversity of native marine life, and the habitats they depend on, by limiting the amounts and types of activities allowed. See: <https://www.noyocenter.org/our-new-marine-protected-areas>

There are currently 15 Mendocino county MPAs, and 1 Special Closure Area. My favorite is Russian Gulch State Marine Conservation Area (est.2012), where 50-yrns ago, I shore picked abalone. It's one of the smallest MPAs and has been surveyed by the Reef Check Foundation for its bio-data, starting in July 2014, and annually since then. By reviewing these surveys, we can get a snapshot of an ecosystem's species, abundance, and yearly carry-over. Each MPA will record its unique data from ecosystem variations due to location, substrata, water temperature, acidity, salinity, and nutrient levels. These surveys are the essential data for management decisions by OPC with enforcement by Calif. Dept. of Fish & Wildlife. See: <https://www.reefcheck.org/about-reef-check/>



Russian Gulch SMCA encompasses two rocky headlands and one bay. It covers a half square mile of shallow habitat just west of the State Park. The rocky coastline is full of coves, rock islands, caves, and inlets. It extends three-quarters of a mile west of its small beach and has a maximum depth of 95 feet. 90% of the subtidal area is rock base with cobble and boulder. Different NGO and agency sources list species not found on the Reef Check data sheets, so we can't assume it's the extent of the biota found there. See: <https://www.inaturalist.org/places/russian-gulch-state-marine-conservation-area>

The 2014 Russian Gulch survey followed warm-water events, and a wasting disease that radically altered the Sonoma/Mendocino ecosystems starting in 2012, so it likely is not an accurate record of marine life that was historically located there. Whatever the circumstance, it does provide a baseline for the existing biota in the 6 transect areas established by Reef Check. Crustose and articulated coralline was the most dominant algae with woody-stemmed kelp (*Pterygophera californica*) the most dominate brown algae. Recorded in small amounts was Bull kelp and *Laminaria* (brown) in very small numbers.

Woody-stemmed kelp is a dominant species found under Bull kelp forests, that creates its own canopy. It can attain a height of 6-ft and survive up to 25-years. Like land trees, its age can be measured by counting the annual growth rings in its stipe. Smooth blades arrange themselves below a terminal blade of the stipe which attaches with a holdfast. Their growth rate is based on the availability of light, and various algae may attach to its blades to get a head start.

The invertebrates recorded in the 2014 Survey are classified as "mobile" and "sessile". Sessile invertebrates are stationary and include barnacles, mussels, sponges, corals, and anemones. Being immobile they are primarily filter feeders, relying on current and tidal surge to drift the plankton and other nutrients they feed on using feathery limbs to capture prey. They favor an open rocky base, but some will prefer vertical walls which may provide a greater volume of drift nutrients. The only sessile organisms recorded in the 2014 survey was 1 "large" anemone, which may be the largest and most abundant local species, the 'Giant Green' anemone.

The Mendocino Subtidal Forest: Part 3 (continued)

The Giant Green can grow to a column width of up to 7" dia. and a height of 11". The crown of tentacles can reach 9.5" in dia., with the column widest at the foot to provide a stable holdfast. They tend to live solitary lives but are occasionally found in groups. They can move slowly using their basal disks, but usually stay sessile. Primarily a carnivore, they use stinging cells in their tentacles to stun prey and as protection from predators. Their main predators are leather sea stars and the nudibranch.

The mobile invertebrates found in the 2014 Reef Check Survey were limited to Bat Stars, Red Abalone, Red Urchins, Gumboot Chitons, Sea Cucumbers, and 1 lone Purple Urchin (this was one year *before* the marine heat wave that ultimately resulted in the overpopulation of purple urchin). I wanted to speculate that the orientation of the deeply indented Russian Gulch cove might cause warmer waters and its deleterious effects, but the Survey on July 7 was a sunny day with 11 deg. C (52 deg. F) water. The optimum temperature range for these invertebrates is 8 deg. C to 12 deg. C maximum, so warm water may not be the reason for a scarcity of grazers. Constant monitoring of water temperature, acidity and salinity would reveal the factors in what is happening to this ecosystem, due to climate change. What the 2014 Survey does show is a baseline that sets the stage for the tremendous increase of Purple Urchins beginning in 2017 and extending into the 2021 Survey.

The Bat star comes in a wide variety of solid and mottled colors, including red, orange, yellow, brown, green, and purple. It can grow up to 8" dia. and typically has 5 webbed, triangular arms, but can have up to 9. Like all sea stars it can regenerate an arm lost to a predator, which includes other sea stars and cone snails. As a scavenger, it's an important omnivore, consuming dead animals and algae from the seafloor. It also hosts Polychaete worms living in the arm grooves on its mouth (oral) side.



Giant Green Anemone
(*Anthopleura xanthogrammica*)



Red Abalone (*Haliotis rufescens*)

The Red is the largest of the region's seven abalone species and the most common on the Mendocino coast. Reds mature at between 3 and 6 years and may live up to 54 years. With no predation, Reds will inhabit any rocky base and feed on algae, but prefer crevices when preyed on. Warm water seriously affects sperm production, so monitoring ocean warming trends is vital for management plans. A chronic wasting disease called withering syndrome (WS) has also been detected in red abalone along the Mendocino coast, but the recent steep decline in their population is due to the lack of kelp. The \$44million recreational fishery—the last in the state of California—was closed in 2016 and will not likely in coming years..



Bat Star (*Patiria minata*)



Red Urchin
(*Mesocentrotus franciscanus*)

Red urchins (much larger than the purple urchin) vary in color from orange-red to dark burgundy, and are typically found from low-tide up to 600-ft deep. A mouth with special jaws and 5 teeth is located on its underside. It's a ravenous consumer of kelp and algae and often be found in clumps up to 10 and are implicated in devastating kelp beds. They can regenerate lost spines and have a 30-yr lifespan, with some specimens in Oregon found to be over 200-yr old. Due to harvesting, they are usually outnumbered by Purple urchins. The commercial red urchin fishery, once the second largest fishery in Fort Bragg, is now in federal disaster relief as they too have been out competed by purple urchin.



Calif. Sea Cucumber
(*Apostichopus californicus*)

Calif. sea cucumbers can grow to a length of 20" and a width of 2". The soft cylindrical body has an endoskeleton, covered with a leathery skin that varies from red-brown to yellow-orange.

The Mendocino Subtidal Forest: Part 3 (continued)

The mouth has 20 retractable tentacles for feeding on algae, and 5 rows of tube feet for attaching and moving. They are solitary nocturnal animals, with separate sexes. When alarmed, they eviscerate internal organs through their anus, which can regenerate within days. They are harvested commercially as a Chinese delicacy.



Gumboot Chiton (*Cryptochiton stelleri*)

The Gumboot is the largest chiton growing up to 14" and weighing over 4 lbs.! It ranges from Big Sur north to Alaska and south from Kamchatka to Japan. Its underside consists of a large foot with gills found in grooves along the outer edge. It clings to rock, moving slowly in search of algae. It's nocturnal and lives up to 40 yrs. It has few natural predators, the most common being the Lurid Rock snail, but also includes sea stars, sea otters and some octopi.

The baseline surveys of the Russian Gulch ecosystem should be the starting point for any kelp or seaweed restoration projects in support of returning grazers and filter feeders to the subtidal forest floor.

There are 8 more years of Reef Check data with a few new invertebrates appearing in the yearly counts. For example, in 2015, a small number of Rock scallop and Flat abalone were counted, followed in 2017 with Wavy/Red turban snails, Warty sea cucumbers, and Pinto abalone. An explosion of urchins appeared in the 2017 survey, which prompted Reef Check to begin "Urchin only" surveys beginning in 2018. Both Red and Purple urchins increased their numbers significantly over the next 4 years, almost equally, with Purples only slightly more numerous. One reason for this outcome may well be that harvesting Reds within the MPA was not allowed. Only by the constant monitoring of this ecosystem with all its variables, can we hope to understand the fundamental biotic process the algae grazers play in the structure and function of invertebrate communities, and their role in the overall health of the ecosystem.

Bringing about a healthy, stable ecosystem is the goal I have, and why I volunteer for the Noyo Center.

Volunteer Highlight: Kate Bean

By Linda Francis

Kate Bean was born and raised in Oakland and El Cerrito. After high school she headed to UC Berkeley but dropped out after her freshman year. She wanted to explore other opportunities in her quest to learn new things, which is a hallmark for how she lives her life. For ten years she worked in the building trades and auto repair. She resumed her education at Sonoma State University where a field trip to Death Valley got her hooked on both deserts and geology. Given SSU had only one geology class she headed to Humboldt State University where she earned a BA in Geology.

The Geology department hired her to run the seven-week senior fieldwork camp in the Inyo Mountain and Mono Lake area for five summers. During the school year she was also the safety officer, tech assistant, and soils lab manager. To earn a bit more income she taught African inspired dance classes in Arcata.



Kate Bean

Armed with her geology degree Kate began exploring the myriad of employment opportunities now available to her. As a hydro engineer she worked with the USFS to assess the landslide sediment risk to the watershed from old logging roads along the Trinity River. She then moved to Oahu and other opportunities, including a position as a member of a geological engineering firm on the island, hired to assure oil refineries' repair and maintenance systems for oil spill recovery were working. While on Oahu, she also worked as a toxicology chemist at the sanitary waste center there.

During her time on Oahu, she also spent four years studying sculpture at the University of Hawai'i at Mānoa, exploring clay, bronze, marble and fiber art.

Volunteer Highlight: Kate Bean (continued)

When her father died in 1998, she moved back to El Cerrito to care for her ailing mother until 2000. While there she studied horticulture at Merritt College with an emphasis on aesthetic urban pruning and had her own landscaping business until 2005 when she met someone adventurous, and they decided to relocate to Honduras. She rented out the home she inherited and in 2006 they hauled a truck and trailer to Central America and spent the next 8 years growing coffee and bananas, building a homestead within a Lenca Indian cultural preserve, and traveled in Central and South America.

Driven by health issues resulting from years working in pre-OSHA industries, Kate moved back to Oakland but found after her years in the campo, urban living no longer fit. She started house sitting for friends in Mendocino and found it much to her liking.

In 2016 she sold the family home in Oakland and bought her home in Little Valley beyond the fog line giving her all the sun she needed to bring an existing orchard back to life and to grow most of her food. These activities keep her busy, plus the work of keeping the local puma and bears out of her gardens. The local foxes she doesn't mind so much. Kate got involved with the Noyo Center upon learning about Kelp forests and urchins. She helped with urchin counts and weighing urchin gonads. She worked on the remodel of the Slack Tide Café and does regular beach surveys. Kate loves what the Noyo Center does and is glad such a great science organization and community asset is here. She also likes that volunteering gets her out meeting people and to the beach.

Finally, Kate is a dancer and has discovered the Argentine Tango, which will be taught again in Fort Bragg. Look for her here and join her in a dance!

What Washed In

by Nancy Lloyd

In late February at Manchester Beach, a pregnant adult harbor porpoise succumbed to a natural choking incident involving a rockfish. Sadly, the healthy porpoise and her fetus did not survive, but they were respectfully collected for ongoing research and potential displays.

Sarah Grimes encourages everyone to visit the **Discovery Center** in Fort Bragg for recently updated displays. Since these samples are typically accessible without protective museum cases, even youngsters can feel the textures with light one-finger touches. Some of the things that you will find at the moment are:

- A full rack of baleen from a humpback whale that washed ashore last September (pictured here)
- Hubb's beaked whale teeth from a response in May, 2022
- A scapula of blue whale (very large!)
- Skulls from seals and sea lions
- A minke whale found at Jug Handle Beach



Students learning about baleen at the Discovery Center

Sea Foam

By Peggy Martin

During our recent King Tide events (<https://www.coastal.ca.gov/kingtides/>), not only were there beautiful, sometimes scary, and dangerous tides, but there were large amounts of sea foam in some areas. Sea foam, also referred to as ocean foam, beach foam, or spume is a natural phenomenon that occurs in turbulent waters. The oceans are full of seaweed, kelp, algae, phytoplankton, animals, dissolved salts, proteins, fats, detergents, other pollutants, and more. When marine life dies, organic matter breaks down.

Sea Foam (continued)

Dissolved organic matter (from natural sources or human pollution) acts as a surfactant, or foaming agent, which makes the bubbles last longer. As the seawater is churned by breaking waves and wind the presence of the surfactants trap air, forming bubbles.

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Usually white or off-white in color, sea foam is generally a natural non-toxic by-product of saltwater agitation interacting with organic material on the ocean's surface and is often an indication of a productive ecosystem. It can sometimes be brown or reddish in color, depending on what's in the water. The foamy surf can contain pollution and viruses as stormwater from rivers and drains carry oil, detergent and sewage into the sea that accumulate on the sea surface microlayer and end up contributing to sea foam. Swimming in waters with thick sea foam can be very dangerous.



Sea foam on the rocks near South Virgin Beach

Inhaling sea foam can cause choking and breathing difficulties. In 2020 a king tide in Washington state, with 25-foot waves, churned up sea foam 3 feet high. In Australia, venomous sea snakes sometimes hide beneath the surface of the foam. In the Netherlands five people died in 2020 after getting trapped under a huge layer of sea foam while surfing. The foam was reported to be so thick it hampered rescue attempts and made it difficult for the surfers to get back on their boards to return to shore.

Algal blooms are one common source of thick sea foam. Sea bird die-offs off California in 2007 and in the Pacific Northwest in 2009, were found to be caused by soap-like foam from a decaying *Akashiwo sanguines* algal bloom. This bloom, which removes the waterproofing from the feathers of the sea birds, made it difficult for them to fly, and for many it led to the onset of fatal hypothermia.

It seems there is still much to learn about sea foam. There are even ideas about using it to increase the albedo (reflectivity of sunlight) of the ocean in order to limit global warming.

Fun Facts:

- Sea water is 96.5 percent water, 2.5 percent salt, and 1 percent of a lot of other things. According to NOAA, that 1% is made up of "proteins, fats, dead algae, detergents and other pollutants," plus other bits of organic and inorganic matter.
- Surfactants don't only cause bubbly beaches; they are responsible for keeping us alive! Pulmonary surfactants in our lungs work to stabilize alveoli, just as they stabilize air bubbles in the sea.
- The sea snakes in Australia have small fangs and generally are not aggressive. And while not likely fatal, bites from these snakes do contain venom and will still need urgent medical attention.
- Video: What Causes This Land Bubble Bath?: <https://www.youtube.com/watch?v=rZM6SrFlxn0>

Did you know?

By Donna Worster

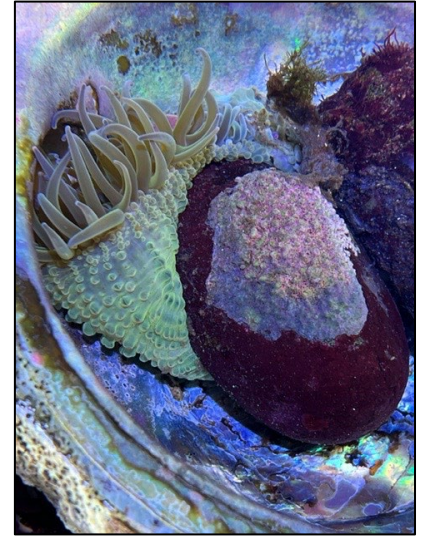
Aggregating anemone vs. giant green anemone? Which is a bully, and which has been known to divide to survive? Crow's Nest docents, staff and visitors had a firsthand experience witnessing some of the fascinating behavior of two different species of anemone living in our tidepool aquarium and documented some of it in photographs.

Here's the story:

One of the giant green anemones (*Anthopleura xanthogrammica*) in the tidepool aquarium was outgrowing the height of the outer rim and was put in the deeper inner tank to give it more space. The inner tank also housed an aggregating anemone, which has specialized tentacles called acrorhagi that are used solely to



deter other colonies from encroaching on their space. The presence of the giant green may have triggered a response causing the aggregating anemone to begin to clone itself. What happened next prompted someone to ask, "WHO PUT THAT ROCK ON THE AGGREGATING ANEMONE?" As the aggregating anemone began to clone itself, it started to appear on both sides of one of the large rocks in the aquarium. At this point we watched to see if both sides would continue to grow, and although only one side survived, a bat sea star benefitted from the detritus left behind. What a fascinating sight to see unfold in our tidepool world of a few square feet!



Docent Mary Glanville has put together ten facts that make for a good study of these amazing creatures which is too lengthy to print. See "Meet the aggregating anemone" on the web at: www.montereybayaquarium.org/animals/animals-a-to-z/aggregating-anemone.

Although not printed as a fact but interesting-- did the aggregating anemone feel threatened by the presence of the Giant Green? How did the Giant Green make its presence known? Should we put more anemones in the larger tank and cause a threatening situation so we can watch more aggregating anemones divide to survive? The "EDUCATION" part of our mission statement is challenged.

Science Book Club

The newly formed Science Book Club had our first meeting on March 26 at the Slack Tide Café. Our regular meetings will be on the third Sunday of each month at 5PM at the Slack Tide Cafe. Over the course of the next three meetings we will discuss *The Cultural Lives of Whales and Dolphins* by Hal Whitehead and Luke Rendell. The book is available for purchase at the Discovery Center or the STC.

The schedule for discussion for the next three meeting is as follows:

April 16: Chapters 1 - 6: Mammals of the ocean (though some of us skipped Ch 2 and got right to the animals Ch 3 - 6).

May 21: Chapters 7-10: The culture of these mammals

June 18: Chapters 11 - 12: Man's effect on culture and mammals

Save the dates and keep an eye out for any changes in discussion topics.

All are welcome! Happy reading!

Calendar

April 3, Monday, 9:30 am: Red Tide plankton collection, Slack Tide Cafe

April 3, Monday, 6 pm: Pinniped Press monthly zoom meeting: <https://us02web.zoom.us/j/85233724180>

April 8, Saturday, 10 am: New Volunteer Orientation, Slack Tide Café

April 12, Wednesday, 10 am: Docent's meeting, Crow's Nest

April 12, Wednesday, 6:30 pm: Beach Survey Program zoom meeting: <https://us02web.zoom.us/j/81628595428>

April 13, Thursday, 6:00 pm: Science Talk: Sea Otter Savvy presents *We Were Here: Sea Otter History, Recovery, and Community Outreach*. [Link to Science Talk registration](#)

April 16, Sunday, 5 pm: Science Book Club at Slack Tide Café.

April 24, Monday, 9:30 am: Red Tide Mussel collecting. MacKerricher State Park-meet at the "Enchanted Trail" (pullout on left just north of Montessori De Mar). Contact Sarah Grimes if you have questions or need more information- (707) 813-7925.

The Pinniped Press team:

Carin Berolzheimer, Sharon Bowers, Dobie Dolphin, Wendi Felson, Linda Francis, Jeff Jacobsen, Nancy Lloyd, Peggy Martin, Toni Rizzo, Jim Rolfe, Teresa Skarr, Donna Worster with Sarah Grimes and Trey Petrey.

If you have photo or writing skills or have a particular idea for an article or just want to join in with a great group, let me know: wendi@noyocenter.org

Thank you to all of our contributors!