



The Pinniped Press

A Newsletter by and for Noyo Center for Marine Science Volunteers
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Volunteer Opportunities

A new Volunteer Steering committee is being set up to include people from each of our programs and activities.

Volunteers are needed for the monthly collection of mussels as part of the Red Tide program for the CA Dept of Public Health. This is an irregular event depending on the tides.

There are a couple more beaches/bluffs that have openings for a Beach Survey Program volunteer.

If you are interested in any of these opportunities, contact Volunteer Coordinator Wendi Felson at [EMAIL](#)

Kelp Restoration

Jim Rolfe

In three previous articles, I outlined the decline of our local kelp forests, along with some of the other flora and fauna traditionally found there. Since the primary cause of kelp loss has been attributed to climate change, we should assume this trend will continue, and hope for, governments, NGO's, and stakeholders, to find ways of mitigating the loss.

Beside the Noyo Center, the organizations responding most significantly to the kelp crisis so far have been the Calif. Dept. of Fish and Wildlife (CDFW), The Nature Conservancy (TNC), the Ocean Protection Council (OPC), Gulf of the Farallones National Marine Sanctuary, and Reef Check Foundation. The focus, thus far, has been on central and northern California, where the combination of warmer water, algae blooms, and a wasting disease led to significant declines in kelp north of Point Conception.



Kelp Restoration – continued

TNC in collaboration with Oregon State University, established six key principles to follow in addressing the issues of kelp die-off. They were published in the Elsevier Marine Policy Journal (Dec. 2021) as “Ecosystem-based Management (EBM) for Kelp Forests.”

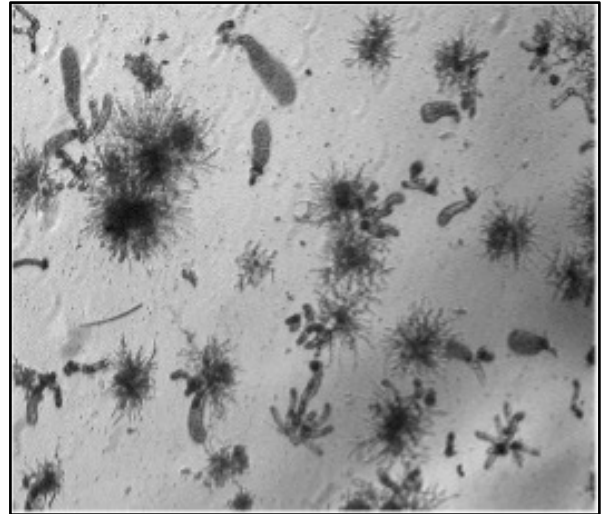
- Monitor biologically relevant temporal and spatial scales.
- Assess and address cumulative impacts.
- Manage across spatial and institutional scales.
- Co-manage with users.
- Employing rapid “adaptive management” and/or precautionary principles.
- Manage food web connections.

By definition, “climate change” is a moving target, affecting the cyclical nature of the Alaskan/California and Humboldt Currents. Even with these rational EBM guidelines, some stakeholders dispute the cause-and-effect principles, making it difficult to implement a solution. Should we “adapt” to the current changes by ‘buffering’ the ecosystem to keep what’s already there; or transform it into something else that’s more likely to survive the new climate reality? It has become a social and political question, which often raises passionate debate, and controversial conclusions. However, this should not delay basic investigative research which can inform decisions specific to our AOC.

The reproductive cycle (see inset) of both large forest kelps is the same; however, giant kelp (*Macrocystis pyrifera*) can reproduce year-round during its life span. This suggests an “adaptive” advantage if warmer waters are going to prevail in our AOC. Should we seed with giant kelp spores, as bull kelp dies out? Like all ‘simple’ solutions, this one is full of “unintended consequences” we don’t yet understand, and therefore, should only be employed after rigorous local testing for cumulative impacts and analysis.

The primary goal of kelp recovery should be to preserve the existing nearshore spore bank and facilitate a natural recovery once the ocean conditions recover, something the Noyo Center is engaging in now. Whether that is even possible appears to be unlikely in the immediate future. An initial recovery program was started in 2018 by CDFW, the Waterman’s Alliance (WA) and Noyo Center for Marine Science (NCMS).

The intent was to reduce purple urchin density in Caspar Cove, Albion Cove, and Noyo Bay, as a means of reducing grazing pressure on bull kelp. Results of the purple urchin removal in the Caspar and Noyo test areas (the Albion plot was dropped as too expensive/difficult), revealed minimal kelp recovery. The reason for this has to do with the annual reproduction cycle of the bull kelp. An area cleared of purple urchin in summer would need to be maintained to prevent reinvasion throughout that year, into the spring the following year when bull kelp begins to grow again, and all the way until fall when it becomes reproductive and releases spores. Rough winter ocean conditions made getting in the water for 5 months very challenging. For these and other environmental reasons, the removal effort was a very costly project and not deemed sustainable. The question became, without a natural predator, how can we incentive the ongoing removal of urchin by putting them to some use?



A microscopic view of kelp in larval (gametophytes) stages. Both “giant” and “bull” kelp employ a strategy of male and female plants. The gametophytes reproduce to form juvenile sporophytes which grow into adult kelps. Bull kelp is an annual plant, and giant kelp has a life span of 2 to 4 years. Another advantage of giant kelp is its tolerance of warmer waters that occur along southern California and Mexican coastlines. Photo: Jordan Hollarsmith, UC Davis MBL



Kelp Restoration – continued

As a result, NCMS is proceeding with three “adaptive” projects as reported in Wendi Felson’s October 2023 PP article, “From Café to Field Station.” The projects are abalone brood stock rearing, purple urchin ranching, and seaweed tumble tanks which are intended to support the two rearing programs. All three projects are funded primarily from House appropriation funds through Rep. Jared Huffman’s “Community Projects” initiative (administered by NOAA). Additional partners are CDFW, Bodega Marine Lab (BML), Moss Landing Marine Lab (MLML), Kashia Band of Pomo, Scripps Institute of Oceanography, and Reef Check.



Photo: Tristin Anoush McHugh; Bennett Bugbee; TNC

The seaweed tumble tanks are a very important project since they are providing the food source—a red algae called Dulce will be the primary seaweed grown—for the abalone and the urchin without having to harvest from the already limited natural supplies. In addition, MLML has cultivated bull kelp through tumble culture, so this may have potential as a bull kelp restoration technique in the future. This seaweed is also popular for cooking and could be sold as an aquaculture product as well.

Survey buoys are expensive but worthwhile investments. In lieu of high-tech buoys, Reef Check divers will survey proposed restoration plots for existing condition data and provide follow-up monitoring of seeded plots. Success or failure of these experiments will depend not only on water temperature, but on ocean pH, carbonate ion concentration, and calcium carbonate dioxide emissions over time. Dr. Jordan Hollarsmith notes that “Just because giant kelp grows in Baja doesn’t mean populations in Northern California or Alaska will be resistant to these heat wave events,” “They are the same species, but each population might be distinct, which has consequences for how giant kelp will respond to changes in climate.” Noyo Center, in partnership with The Nature Conservancy, recently deployed a buoy in Albion Cove. This equipment provides valuable data for many purposes, including work testing kelp enhancement techniques.

The buoy **LIVEFEED** data is available to the public.



Photo: Tristin Anoush McHugh; Bennett Bugbee; TNC



Photo: Tristin Anoush McHugh; Bennett Bugbee; TNC



Sunflower Sea Stars

Toni Rizzo

The sunflower sea star (*Pycnopodia helianthoides*) is the second largest sea star, measuring up to three feet across and weighing up to five kg (13.4 pounds). Sunflower sea stars range in color from purple to brown, orange, and yellow. Juveniles start with five arms and by maturity grow up to 24 arms. Sunflower sea stars can live up to 65 years.

Sunflower sea stars live in the intertidal and subtidal coastal waters of the Northeast Pacific Ocean from the Aleutian Islands to as far south as northern Baja California. They are found up to a depth of 435 meters (1427.17 feet) in rocky kelp forests, sand, and mud flats. Sunflower stars are broadcast spawners, mating between March and July. The males and females release their gametes into the water where fertilization takes place by chance. They are the key predator to the purple urchin on the Mendocino Coast.



Photo: NOAA Fisheries

Sunflower sea stars capture prey by moving on their 15,000 tube feet at up to three meters (9.8 feet) per minute! Their prey includes snails, abalone, sea cucumbers, cockles, and sea urchins. These voracious predators can even dig clams out of the muddy seafloor. Although sea urchins defend themselves by nibbling on the star's tube feet, purple urchins seldom escape, while red urchins' long spines help them get away. Parts of the sunflower sea star's skeleton are disconnected, allowing the mouth to open wide and the body to enlarge to engulf large prey. Sunflower stars can even swallow an entire sea urchin, digest it, and expel its shell.

An outbreak of sea star wasting syndrome from 2013 to 2017 caused large population declines along the Pacific coast and in other areas. The syndrome is caused by an unknown, virus-sized microorganism that is spread through direct contact and indirect contact via water. Healthy stars actively flee from diseased individuals when they encounter them. Wasting syndrome begins with white lesions, followed by the arms curling, bending, and breaking off. Within days, the star dissolves into a gooey mess.

Wasting disease is thought to be caused by increased ocean temperatures, decreased pH, pollution, and other physical and chemical changes. Depletion of sunflower sea star populations has upset the marine ecosystem balance, affecting a variety of species, and resulting in a significant (100x normal) increased purple urchin populations.



Photo: Michael L. Baird



Photo: Ed Gullekson



Sunflower Sea Stars - continued

Without predators, urchins consume most of the kelp, resulting in urchin barrens and the depletion of kelp-dependent herbivores such as abalone.

The International Union for the Conservation of Nature (IUCN) added the sunflower sea star to its Red List in 2021, classifying the species as critically endangered. NOAA Fisheries has completed a status review of the sunflower sea star and is proposing to list it as threatened throughout its range under the Endangered Species Act. Meanwhile, researchers continue to monitor outbreaks and population status. Observations of healthy and sick sea stars can be reported at: <https://marinedb.ucsc.edu/ssd/public/observation-log/create>.

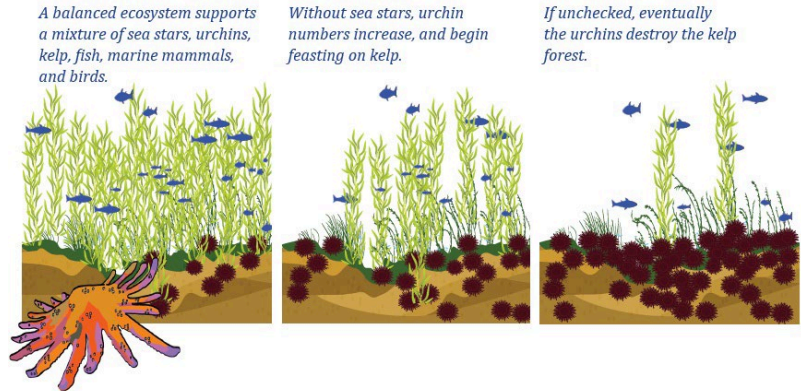


Image: NOAA Fisheries

Help Our Kelp

Dobie Dolphin

The Help Our Kelp Act, introduced in the House of Representatives (HB5487) and the Senate (SB2807) on September 14, 2023, requires the Secretary of Commerce to establish and carry out a grant program to conserve, restore, and manage kelp forest ecosystems.

The Help Our Kelp Act establishes a new NOAA grant program to fund conservation, restoration, and management projects focused on kelp forest ecosystems. It authorizes \$5 million per year for FY2024 through FY2028.

Grants will be open to members of the fishing industry, institutions of higher education, nonprofit organizations, Indian Tribes or tribal organizations, State agencies and local governments.

Eligible projects include those which address:

- The greatest regional declines in kelp forest ecosystems
- Long-term socioeconomic resilience related to kelp forest ecosystems.
- Kelp forest seeding
- Predator control through targeted urchin removal
- Recovery of sunflower sea stars
- Monitoring and assessment of kelp forest ecosystems
- Integration of Indigenous knowledge and cultural practices into restoration and monitoring of kelp forest ecosystems through consultation with Indian Tribes

The bills are now in committee, and we will be tracking their progress.

In related positive kelp news, last year, Representative Jared Huffman secured \$2 million for the Greater Farallones National Marine Sanctuary Kelp Recovery Project. This funding will be used to restore bull kelp along the Sonoma and Mendocino coasts with large-scale urchin removal, kelp planting, and community engagement. There's hope that the ecological balance can be restored, and kelp forests will flourish once again.



Photo: Gustavo Gerdel (<https://www.GustavoGerdel.com>)



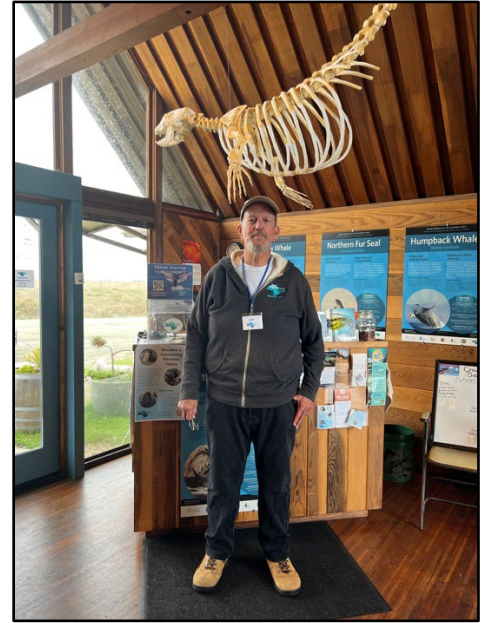
Volunteer Highlight: Jack Nolan

Linda Francis

Jack believes in volunteering, being involved in his community and is a dedicated locavore. He started volunteering for Noyo Center three years ago by serving beer at the annual Salmon BBQ. He is now a docent at the Crow's Nest, enjoying the work there, especially the interactions with the visitors who come from all over the country and beyond.

Jack also does a twice monthly beach survey at Seaside Beach near the Ten Mile River. In addition to finding lots of footwear, his most memorable find was a big commercial crab pot that washed up after the big surf occurring with the simultaneous with a king tide, which also brought a huge redwood stump observed at the same location.

Born and raised in Sacramento, his interest in marine biology began as a kid, when his dad, originally from the Half Moon Bay and Santa Cruz areas, frequently took the family out to the coast. His love and interest in marine biology grew stronger in high school because of a biology program visiting Moss Beach where they did a grid survey from the terrace to the tide pools. In addition to his interest in biology, he is an avid fisherman, both for salmon in the Sacramento River or bottom fishing off the coast.



Jack Nolan

Early in his career Jack was working in real estate when he was hired for a position at the [California State Library](#), a job he loved, and held for twenty years. which is not an ordinary library. The library was founded in 1850 by the California State Legislature. It collects, preserves, generates and disseminates a wide array of information, and today it is the central reference and research library for state government and the Legislature. The library is home to everything from a [Gutenberg Bible](#) to menus from the old Palace Hotel. The Library & Courts Building opened in 1928 and is one of the most beautiful state government buildings in California. It is considered the second most valuable building in California's portfolio, second only to the Capital itself.

Jack knows this history well because during the last five of his twenty years at the library he engaged in the huge project to restore the building. His part included moving anything from dueling pistols and other assorted treasures, including 27 miles of books, all of which had to be moved out of the building via one set of double doors. He said it was a great project to be involved in, both daunting and interesting. As the Facilities Manager, he not only engaged in the move, but was involved in the many interesting conversations between "antiquarians" and "digitals" on what should be kept or not.

Jack retired twelve years ago. He and Donna, his wife of 35 years, and their dog Dave, moved to Mendocino two years later. While they still have a condominium in Sacramento, they spend most of their time here and don't anticipate moving back to Sacramento Valley. He goes back now and again to check in on the bar that he and Donna own called The Hilltop Tavern, which is on the corner of 48th and Folsom. It's an "everyone knows your name" kind of place, and if you plan to stop by, give him a call first so he can buy you a drink. Almost gives one an excuse to head to Sacramento. Thanks Jack!



Education and Experience

Donna Worster

Writing about “other things and places that the Noyo Center engages in” is one of the challenges I accepted when Pinniped Press was started a year ago. My column was titled, “Did you know” and my ramblings have evolved since then. On October 15, our fundraising event at the Marine Field Station was the first opportunity to bring a partial viewing of our research ability to those interested in our future plans. I accepted the challenge and in this month’s issue would like to share my experience.



When I arrived at the Field Station on event day, preparations were underway, and I was able to help Sarah Grimes arrange our newest specimen for display—a Hubb’s beaked whale, still wet from her hot tub cleaning. You might recall that this very rare specimen washed ashore on Jughandle State Beach in May, 2022, and our team collected this unusual deep diver for research and for our collection. The skeleton was laid out so we could see how she might look when she is fully articulated and on display in a museum setting. I also checked with our leader Sheila as she fussed with a fish tank set up to demonstrate what a “tumble tank” for growing kelp might look like. Sue Coulter and Michael Hicks were busy arranging displays around the perimeter of the big exhibit room facing the harbor, which were highlighting some of the interactive exhibits our educators have been using in programming with visiting students and the after-school program. I returned to my job for the day, a table in the front room that was set with information about the Noyo Center and our monthly membership program, greeting guests and to ascertain if a monthly contribution would fit their giving style. We signed up three new members that found that it would.

Later in the week, I caught Sue Coulter at the Discovery Center who was busy storing her props from the Sunday event. I asked her to give me more detailed information about her exhibits and presentation from the Sunday event. The following is a recap of her enthusiastic response.

Education Zone inside the Field Station:

- Participants sift through sand collected from local beaches, capturing some macro-plastics in a sieve provided, then put some sand on a slide, looking under a microscope for evidence of even smaller microplastics and microfibers. Microfiber was found in the sand from Seaside beach.
- Next there was saltwater in glass cylinders, allowing guests to see which types of plastics sink and which float. Then a discussion followed about what animals are impacted by plastics depending upon where it ends up in the water column, surface of the ocean, birds, and schooling fish, etc.
- The team had created a trifold display that had photos from summer camps, the after-school program, and the Talking Trash Again program that the educators have been using in their in-school curriculum.
- A bulletin board displayed the results from the Brand Trash Audits that five hundred school kids participated in during the school year of 2022-23. The program included students from Three Rivers Charter School, Fort Bragg Middle and High School science classes, Dana Gray 5th grade classes and finally Mendocino High School science classes. There are plans to get this program into Mendocino K-8 school to reach 5th and 8th graders before the end of this year.

On Friday of the week following the fundraiser, I stopped by the Field Station and Sue was preparing the room for the days after school program. I observed a large fluffy rug, various large pillows, a bowl full of popcorn, and a platter of fresh watermelon and sliced oranges. She explained kids are always hungry after school and are better listeners when they are snacking. Some of the same exhibits were on display that we saw at the fundraising event on October 15 and Sue was eager to share these experiences with the kids, who had a lot more enthusiasm than me on a Friday afternoon.



Noyo Blue Fundraiser

The October 15th fundraising event at the Noyo Center Marine Field Station and Noyo Harbor Inn was a great success. Arriving at the Field Station visitors enjoyed demonstrations by our educators, a preview of one of our newest whale skeleton specimens, purple urchin education and Uni tasting, as well as some killer brussels sprouts served by the Noyo Harbor Inn. Guests then hiked up to the Inn for more delicious food, drinks, and an exciting live auction. We hope you enjoy a few photos from the event.



Crans Squires with the underwater ROV



Uni tasting with Sheila Semans, Elizabeth Gomez, Donna Kimball, and guests



Sarah Grimes and guests with the rare Hubb's Beaked Whale skeleton



Guests enjoying the deck of the Field Station



Sheila Semans, Linda Ruffing, Dave Turner



Alix Phillips and Mary Glanville



Sheila Semans addressing the crowd.



Auctioneer Rachel Britten



Sue Coulter, Donna Worster, Rachel Britten

CA Coastal Cleanup Day 2023 at Noyo Harbor Beach

Dobie Dolphin

[California Coast Cleanup Day](#) is in its 39th year, and on the Mendocino Coast it was a good day for a beach cleanup, not too cold or windy and not much variation in the tides. A group of women from the Native Daughters of the Golden West, in their matching red T-shirts, showed up to work with the Noyo Center group. One of the women is a fifth generation Fort Bragger, another is 92 years old.

When I wrote to thank the Native Daughters, out of curiosity I asked Susan Collins how her group heard about the beach cleanup and what prompted them to come. She replied, "I heard about Beach Clean Up Day on Facebook. I'm trying to find things that get our Parlor out into the community and encourage our members to take part. We are an organization of California born women, one of the oldest organizations in CA. We were very excited to help. Thank you for the opportunity."



Willits crew helping with the clean up

We were also joined by three teenagers whose mother brought them over from Willits. Noyo volunteers Alix Phillips, Monika Daniels, Richard Jacobs, Sara Quentin, and Peggy Martin rounded out the crew.

The trash we collected included 66 bottles and cans (to be recycled), over 125 cigarette butts, 12 pieces of clothing, almost 200 pieces of assorted trash (mostly plastic), innumerable amounts of Styrofoam along with lots of pampas grass, a tiny bird head's skeleton and six small mammal vertebrae.

Calendar

- Saturday, November 4th: New volunteer orientation: 10 am at the Field Station.
- Monday, November 6th: Pinniped Press meeting: 6 pm on [ZOOM LINK](#)
- Wednesday, November 8th: Docent's meeting, 10 am at the Field Station (not the Crow's Nest)
- Monday, November 13th: Mussel collection. 3 pm. Meet at the Enchanted trail head (first pullout after the Montessori School on HW1).
- Thursday, November 16: Science Talk: Ocean Plastics. 6:00 pm [ZOOM REGISTRATION](#)
- Saturday, November 18: Beach Survey Program Meeting, 11 - 1 pm at the Field Station

The Pinniped Press team: Jim Rolfe, Dobie Dolphin, Wendi Felson, Linda Francis, Toni Rizzo, and Donna Worster, with Trey Petrey.

If you have photo or writing skills or have a particular idea for an article, want to join a great group, or send a letter to the editor, write to Toni at: editor@noyocenter.org

