



## The Pinniped Press

A newsletter by and for Noyo Center for Marine Science Volunteers

### In This Issue

A Year in Reflection  
Volunteer Opportunities  
Volunteer Appreciation Reception  
The Mendocino Subtidal Forest: Part 2

Volunteer Highlight: Donna Worster  
Calendar of Migrations  
What Washed In  
Did You know?

### A Year in Reflection

by Lynne Sullivan, Operations Manager

This year has been a big year for the Noyo Center. We had record numbers of visitors at the Discovery Center; launched several new exhibits, including a new and improved ocean immersion dome; engaged hundreds of visitors during Whale Fest; held four sold out Summer Camps; purchased, renovated, and opened a new cafe within the span of six months; mobilized dozens of volunteers logging an impressive number of volunteer hours; launched a new STAR research program; responded to an astounding number of marine mammal strandings, including several rare specimens of whales; were awarded a dizzying number of grants to continue our education efforts and advance the goal of developing an Ocean Science Center on the Noyo Headlands; launched a new, beautiful website; reached countless people through social media; and much more!

Thanks to everyone for all your contributions. Looking forward to what 2023 may bring!

### Noyo Center for Marine Science Volunteer Opportunities

- The Slack Tide Café: assist with bussing tables, washing dishes, and just generally helping out as needed. Help is needed between 11 am and 1 pm Thursdays through Mondays. You must get a food handler's certificate before you can start, which is easy to get online.
- The fundraising and events group can always use more help with your fresh ideas and energy.
- This newsletter, the Pinniped Press, could use more writers, photographers, and editors.
- For more information about volunteering please contact: [wendi@noyocenter.org](mailto:wendi@noyocenter.org)

## Volunteer Recognition

by Wendi Felson

The Noyo Center began working with volunteers in the very early days, around 2015. When the Crow's Nest opened in 2016, it was staffed with all volunteer docents, and remains that way to this day. Our volunteers have worked in the office, assisted with fundraising events, and now participate in several community science projects and Slack Tide Café operations. Today we have 96 active volunteers and nine of them have been with us since 2016.

Since 2016, our volunteers have contributed over 4,300 hours in various programs, including:

- 400 hours in turning Carine's into the Slack Tide Café. There now are 8 volunteers with food handler's certificates helping behind the counter.
- 1495 total hours with the Beach Survey Program; 22 volunteers; 344 surveys
- 1525 hours at the Crow's Nest; 31 docents
- 94 hours with the STAR Program; 16 volunteers
- 97 hours with the Red Tide Plankton/mussel program
- 400 hours with Carine's Landing restoration; 14 volunteers
- Pinniped Press: 19 volunteers and growing
- Fundraising/event planning: 21 volunteers

Give yourselves a big round of applause – the Noyo Center could not do all of this without you!

On December 3, 2022, a holiday party was held at the Slack Tide Cafe for all volunteers and staff. Noyo Center staff took care of the décor and food, and our board members joined them to celebrate our volunteers for the contributions they have made over the years. We presented pins to many of these individuals based on years of service.

Five Year Pins: Carin Berolzheimer, Charlene MacAllister, Donna Worster, Mary-Ellen Campbell, Peggy Martin, Sharen Parker, Steve Brekke-Brownell, Tony Boyd, Wendi Felson, Jeff Jacobson

Three Year Pins: Elizabeth Pippin, Alix Phillips, Cynthia Farrell, Heidi Baldassare, Kari Holman, Kianna Zielesch, Kristin Gordon, Linda Mercurio, Mark Farver, Mary Beth Arago, Maureen Gamma, Randi Roberts, Will Roberts.

One Year Pins: Aleya Spencer, Annette Gardner, Becky Stenberg, Dania Stoneham, David Alden, Ed Ritter, Havana Davidson, Jack Nolan, Jenais Zarin, Jim Halvena, John Matthews, Kaedn Strong, Margie Truter, Mary Jackson, Mary Meline, Royce Peterson, Mary Patyten, Michelle MacPherson, Sally Swan, Sarah Logan, Sarah Schoeneman, Drew Jackson.



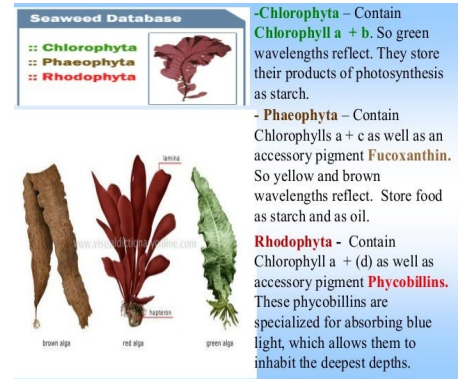
**Congratulations to all of you and many thanks!**

# The Mendocino Subtidal Forest: Part 2

by Jim Rolfe

In Part 1 we learned that bull kelp and abalone are indicators of a healthy subtidal ecosystem, and that cooler upwelling waters are necessary for kelp abundance. Also, a “perfect storm” of events culminating with the warm water “blob” of 2014, caused a massive kelp die-off which starved abalone and created massive purple urchin barrens along our coast.

All marine algae use sunlight to photosynthesize nutrients for their growth, but have vastly different size, color, and habitat characteristics. Being mostly ‘autotrophic’ plants, they synthesize all their required nutrients from the liquid environment. The Jepson Herbarium (UC Berkeley) ‘eFlora’ website lists 235 species of algae found along our coast and classifies them as Red, Green, or Brown algae. The color classification is based on accessory pigments found along with the chlorophyll in the algae cell walls, which reflect either red, green, or yellow/brown light waves.



**Seaweed Database**

- Chlorophyta
- Phaeophyta
- Rhodophyta

**-Chlorophyta** – Contain Chlorophyll a + b. So green wavelengths reflect. They store their products of photosynthesis as starch.

**-Phaeophyta** – Contain Chlorophylls a + c as well as an accessory pigment **Fucocanthin**. So yellow and brown wavelengths reflect. Store food as starch and as oil.

**Rhodophyta** – Contain Chlorophyll a + (d) as well as accessory pigment **Phycobillins**. These phycobillins are specialized for absorbing blue light, which allows them to inhabit the deepest depths.

Labels in image: brown alga, red alga, green alga



Many of these 3 types occur mostly in the intertidal zone such as **Sea Palms** (*Postelsia palmaeformis*), which is a brown algae commonly found among mussel beds by colonizing open areas of rock. They have a complex relationship when male and female gametophytes settle into the mussel beds, which protect them from wave exposure. When mussels are cleared from the rock by predation or wave action, the diploid sporophytes resulting from gamete release begin to grow in the clearings.

Some are both intertidal and subtidal such as **Turkish Washcloth** (*Mastocarpus papillatus*), which is a red algae that has short stipes with rubbery blades covered in small bumps. It is edible, and often is harvested to make carrageenan. It forms a black tar-like crustal form during the early phase of its lifecycle. Like most red algae species, it uses phycoerythrin to photosynthesize which allows it to grow deeper than plants using other pigments.



And there are green algae such as **Sea Lettuce** (Green), a species of Chlorophyta with over 4,300 species, of which only 10% are marine plants. It has worldwide distribution in both tropical and temperate waters. When high nitrate levels occur, it can be a prolific nuisance as it washes up on beaches, decays, and releases methane, and hydrogen sulfide.

When optimal temperature and nutrient levels prevail, Bull Kelp (*Nerecystis luetkeana*) can dominate the subtidal zone with a root-like 'holdfast' anchored up to 100' below. The holdfast grows a long 'stipe,' which is solid and narrow and then gradually increases in diameter and becomes hollow as it approaches the water surface. At the top of the stipe is a bulb filled with carbon monoxide that keeps the stipe upright. Blades (up to 15-ft long) emerge from the top of the bulb and float near and on the surface, forming dense canopies that capture light waves and reduce light rays reaching the bottom, accounting for the much slower growth rate of the algae found there. The resulting 'forest' provides a vertical habitat zone for a multitude of sea birds, mammals, fish, invertebrates, and bottom dwelling algae.

Under optimum conditions, Bull kelp grows up to 3" per day with maximum growth occurring from late winter to spring due to nutrient availability from upwelling. Growth decreases from summer to fall, when it reaches maturity, which allows the blades to develop spore patches (called *sori*) that drop to the seafloor to repeat the cycle.



Perhaps the most important bottom dweller is Coralline algae which can be found in both zones. These algae deposit calcium carbonate (limestone) in most of their cell walls, which gives them the appearance and rough texture of coral. The red corallines can take two different forms: an articulated upright form, and a crustose form. Both forms begin as a crustose stage with the articulated forms developing branched flexible fronds emanating from a holdfast. The flexible fronds have un-calcified joints that enable them to withstand wave motion.

The crustose forms (over 1600 species worldwide) grow mainly on rocks, but also attach to plants and shells. They are very slow growers, and even under ideal conditions in the intertidal, only expand up to 3 inches per year. Since most invertebrates cannot eat calcified algae, the crustose corallines appear to have a competitive advantage. But they are poorly understood by ecologists, and recent discoveries show how important they are to the ecosystem.

As fixed organisms, the crustose corallines are prone to overgrowth by "fouling" algae on top of them. They have limited defenses to such fouling, and mostly depend on waves to dislodge the 'fouler,' or more reliably, upon 'grazers' to eat the encrusting algae. Some corallines can slough off a surface layer of cells which may be another antifouling mechanism to serve the same function as herbivore grazing, which may explain the patchy appearance of crustose coralline communities.

There are many invertebrates commonly found atop crustose coralline, including limpets, snails, chitons, whelks, anemones, and sea cucumbers. As omnivores, they perform the grazing the corallines need to clear themselves of 'fouling' algae. Abalone, however, have a unique dependence on red crustose coralline to provide a key chemosensory cue for their larval development. Once they encounter the neurotransmitter GABA (gamma-aminobutyric acid), they are prompted to settle, metamorphose, and grow into shelled mollusks. The tiny larval abalone feeds on secretions from the red coralline until they develop mouth parts and a shell. Once they mature to eating non-calcified algae, they become mobile and start their life's journey below the kelp forest.





**Crustose Coralline (Red)** is usually pink to red in color, but can also occur as purple, yellow, and blue. They cover more intertidal and subtidal surface area than any other algae species in the world. Their ability to calcify in low light levels make them some of the deepest photosynthetic organisms in the ocean.

**Corallina officinalis (Red)** usually attaches to rock and grows in tufts up to 5" in length. It grows as articulated pinnate branches with lateral fronds consisting of cylindrical segmented stipes each a little longer than broad. The fronds are usually pinkish to red-purple, and sometimes bleach to white when exposed to sunlight. They provide a habitat for many small animals which feed on the microorganisms dwelling in its dense tufts.



Look for a follow up article on the role invertebrates play in the health of our coastal ecosystem.

For further information visit the following:

<https://ucieps.berkeley.edu/seaweedflora/pages/Mendocino.html>

<https://wildlife.ca.gov/Conservation/Marine/Life-History-Inv-And-Plants>

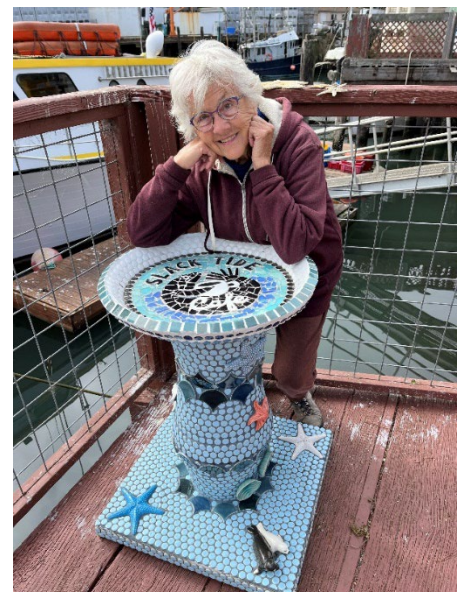
For a concise flora/fauna guide visit: <https://seanet.stanford.edu/rocky-shores>

## **Volunteer Highlight: Donna Worster**

By Linda Francis

I met this 90-year-old dynamo on a lovely winter day at Pomo Bluff where we sat on a park bench while she shared her fascinating life story with me.

Donna nee Hunt was born in 1932 in Oakland. She spent her childhood years in the Bay Area. She graduated high school in 1949 and went to work in the phone company where she met and then married Norm Yates. She and Norm had two sons and a daughter. Norm's various jobs kept the family on the move -- from the Bay Area to Reno and Sparks to San Jose and back to San Francisco.



One day in 1966 during dinner while Donna and the kids were discussing their plans for the week, which included getting three kids to three different schools in three different areas, she realized this was no way to raise a family. There must be a better way.

So, when Norm, now in the insurance industry, came across an insurance company for sale in the “quaint” town of Fort Bragg they decided to check it out. They loaded the kids into the car, met with the seller, signed a contract to purchase the business, purchased vacant land in Inglenook, built a house and got some farm animals. In addition to raising kids and tending to farm animals, Donna helped run the family business. After thirty years of marriage and working together, Norm and Donna divorced.

Donna later met Ray Worster, who was her tax accountant. Ray was a widower with five daughters ranging in age from ten to twenty. He needed help. They married in 1981. Donna moved to Ukiah where Ray’s home and office were located. Wanting to be together, Ray taught Donna the tax business. She ran the office for 33 years.

When Ray died in 2015, Donna moved to their vacation cabin on the coast. Widowhood left Donna with a rocking chair and struggling with solitude. With her curious mind and boundless energy, combined with her long history in Mendocino County, she drew upon her many contacts in the area, and connected them with her love for the Noyo Center.

As a volunteer for the Noyo Center, Donna is a docent at the Crow’s Nest and conducts the monthly docent’s meetings, is the author of Poop Deck News, helps with fundraising, does beach surveys, writes for the Pinniped Press newsletter, and gardens at the Slack Tide Cafe. She may best be described as an all-around No.1 supporter of the Noyo Center.

Of all the things that Donna loves about the Noyo Center, she is most passionate about “Betty Blue”, the 73’ blue whale that washed ashore on the Mendocino Coast in 2009, and whose bones are currently in storage until she gets a home where she can be displayed for all to enjoy. Donna says, “Betty Blue’s bones are in my thoughts. She deserves a place to rest with a view of the ocean.” That home, and the Noyo Center’s plans for an Ocean Science Center on the bluff overlooking the Pacific are in the works, and with Donna’s energy and focus the creation of Betty Blue’s final resting place is in good hands.



Photo by Larry Wagner, 2009



# Marine Mammal Calendar

By Teresa Skarr

The new year is almost here, and we want to share tips about when you might expect to see marine mammals from our coast. In general, marine mammals follow their food and move between feeding grounds and pupping/calving. However, as our education staff reminds us, “Marine mammals don’t read books,” meaning that they can be seen at unexpected times. This makes me smile, picturing a whale reading “Migrating for Dummies.” In addition, conditions are constantly changing; temperatures and food sources can vary a lot from year to year. Please take the following points as general estimates about when we expect to see various marine mammals.



## Fall-Winter

- Gray whales can be seen as early as November and into February migrating south. Gray whales sometimes begin the northern migration as early as February.
- You may see Humpbacks and Blue whales off the coast in summer and fall depending on the food supply.

## Spring

- Gray whale mothers and calves are often the last to migrate north in the spring, and generally seen closer to shore than they are during their southern migration.
- March through May is pupping season for harbor seals.
- CA sea lions and Stellar sea lions pupping in mid-June.
- Elephant seals can be found at rookeries to the north and south of us December-January.



## Summer

- Blue whales can sometimes be seen; though they’re usually far out to sea, their spouts can be up to 30 feet high. They spend winters in Mexico and come here for food in summer.
- Northern elephant seals come ashore during spring and summer to shed their outer layer of skin and fur.
- Summer is pupping season for Stellar sea lions and California sea lions.

## Fall

- Gray whales swim south to Baja starting in November.
- White-sided dolphins can sometimes be seen farther out to sea.

**Year-round**

- Orcas
- Stellar sea lions
- Harbor seals
- California sea lions, though some males migrate north in the winter



**Science Talk: What Washed Ashore in 2022?**

By Nancy Lloyd

On December 14, 2022, a year-end summary of marine strandings was presented by Sarah Grimes, the Noyo Center Stranding Coordinator. Sarah was joined by her guests Sue Pemberton of Cal Academy of Sciences and Allison Liu from CalPoly Humboldt State University. The full presentation is now available on video by [visiting our website](#).

While the total count of 66 specimens on the portion of Mendocino County shoreline that is monitored by Noyo Center’s Sarah Grimes stayed roughly the same in 2022 as in 2021, the diversity of species made this year more demanding and impressive.

Locally we saw the following marine mammals wash ashore:

- |                      |                         |
|----------------------|-------------------------|
| California sea lions | Guadalupe fur seal      |
| Harbor seals         | Northern elephant seals |
| Sperm whale          | Steller sea lion        |
| Hubbs beaked whale   | Striped dolphin         |
| Humpback whales      | Northern fur seal       |

Allison Lui from Cal Poly Humboldt State University reported that they responded to 127 dead marine mammals, of which 41% were California sea lions and 9% Stellar sea lions. They also responded to 3 humpbacks and 1 gray whale along their coast.

Reporting activity further down from Sonoma County and the Bay area to the central coast, Sue Pemberton noted the most famous whale death in 2022 was “Fran”, the humpback whale who had been a familiar and well-loved visitor to Monterey Bay and San Francisco Bay over her lifetime. Fran was apparently the tragic victim of a ship strike, which is a fate far too common on our coastline.

Sue also reported an increase in sea lions strandings during the fall months due most likely to a bacterial disease known as leptospirosis. Among them were 3 large adult Steller sea lions, each about 11-foot long! On the other end of the size spectrum for victims, she also reports that coyotes sometimes kill pinniped pups on the beaches, so not all marine mammal threats come from the ocean.





Marine mammals are important sentinels of ocean health and climate change and responding to stranding events helps us monitor health and environmental trends that may impact humans. Thanks to all the team members who made this work possible!

All marine mammal stranding activities are conducted under authorization by the National Marine Fisheries Service through a Stranding Agreement issued to the California Academy of Sciences/Noyo Center for Marine Sciences and MMPA/ESA Permit No.18786-06, and the Marine Mammal Health and Stranding Response Program.

## Did You Know?

By Donna Worster

About plastics? Sue Coulter, Noyo Center's Education Coordinator, presented a Science Talk recently titled *Plastics: Impacts to Solutions*. There was much to learn about how I could and should change the way I discard my plastics. For instance, I didn't know that the recycled trash went through a scanner (I saw it in use on TV but didn't fully understand it), or that we should leave the caps on all bottles, and not to crush cartons as the machine has a scanner that picks up their outlines to identify them. And, that I should read the numbers in the triangle on plastic items. Our local trash hauler will take numbers 1-10 for recycling purposes, but others may simply go into the landfill.



Many everyday items can be made at home or bought in bulk to avoid purchasing more that are in plastic packaging. In her own household, Sue now makes her own yogurt and toothpaste. I recall that when I was at the San Mateo High School in 1947 I had an all-girls science class, and we made lipstick, toothpaste, and mouth wash. Maybe we were onto something.

A recording of the science talk is now available to view at:

<https://www.noyocenter.org/calendar/oceanography-ss4xj-hlwes>

*From "Points of Progress" in the Christian Science Monitor: The Netherlands Dutch engineers are using bubbles to prevent river trash from traveling downstream. On the Oude Rijn River in the coastal municipality of Katwijk, air bubbles rise from a perforated tube laid diagonally on the river bottom, which work with the current to direct pollution to one side of the riverbed for collection. The curtain of bubbles allows fish to swim through and has no effect on passing boats. Considering trial data, local officials expect between 86% and 90% of the plastic pollution to be removed. The startup behind the idea, The Great Bubble Barrier, piloted its design in an Amsterdam canal in 2018. It was installed as a supplement to dredging, which extracts 42,000kg (92,594 lbs) of plastic waste in Amsterdam every year. The technology is currently limited to waterways of a certain depth and where there is less ship traffic, but the company is working on scaling up the system." December 2022*

## Become a Member!



Blue Whale  
Membership  
\$100 per month



Sunflower Sea Star  
Membership  
\$50 per month



Orca  
Membership  
\$25 per month



Bull Kelp  
Membership  
\$15 per month

As a volunteer you help make the Noyo Center for Marine Science a great destination for visitors interested in marine science education and research. Your contribution of time, energy and knowledge all are invaluable. As we are moving into a new year and continuing to grow our outreach and education programming, we hope that you will consider becoming a sustaining member with the Noyo Center. Sustaining members are especially important to the organization as it allows us the added stability of regular monthly income to help with year-round expenses.

There are several options to choose from to become a sustaining member and more information is available by [visiting our website](#). Volunteers who become a sustaining member in the month of January will receive a Slack Tide Café coffee mug as our gift of appreciation. And, if you are already a sustaining member, please accept our sincere thanks, and we would like for you to have a STC mug as well!

## Calendar

- Monday, January 2, 6 pm, Pinniped Press meeting on Zoom:  
<https://us02web.zoom.us/j/82732113803>
- Tuesday, January 3, 9:30 am Red Tide Project Plankton collection demonstration, Slack Tide Café
- Tuesday, January 3, 2:30 pm Red Tide Mussel collection, meet at Enchanted Trail head, MacKerricher State Park (North of Montessori Del Mar School)
- Saturday, January 7, 10 am, New Volunteer Orientation at the Slack Tide Cafe
- Wednesday, January 11, 10 am, Docent's meeting, Crow's Nest deck
- Wednesday, January 11, 6:30 pm, Beach Survey Program meeting:  
<https://us02web.zoom.us/j/81404627268>
- Thursday, January 19, 6:30 pm, Science Talk: Algae; with [Kathy Ann Miller, PhD](#).