BETWEEN the TIDES

Friends of Fitzgerald Marine Reserve

September 2011

Mavericks: Big Waves and Tiny Creatures

by Sasha Greenawalt and Jan Pelinka

On Saturday, July 16, six intrepid tidepoolers managed to pull themselves out of bed for a 5:30 AM, -0.8 tide. Facing a wet, foggy morning, they ventured forth to explore Mavericks.

Mavericks, a winter destination for some of the world's best big wave surfers, is located about two miles from shore in Pillar Point Harbor just north of Half Moon Bay at the village of Princeton-By-The-Sea, and adjacent to the southern end of Fitzgerald Marine Reserve (FMR). Winter waves there routinely crest at over 25 feet and top out at over 80 feet. Few people know that Mavericks' namesake was a white-haired German Shepherd named Maverick who used to swim out with his owner while he was surfing. Fewer still realize that the rocky reef inshore of the famed surfing spot is a haven for nudibranchs* and other invertebrates

Pillar Point and the Mavericks rocks and tidepools just below and beyond the cliffs (circled). Photo courtesy of Martie Sautter.

Approaching Mavericks' tidepools, one feels the exhilaration of stepping beyond the borders of safety. They are accessible only at minus tides, and then by navigating through and around treacherously deep channels. The reef appears deceptively flat, and the incoming tide sweeps into the deep channels much faster than expected.

Nudibranch enthusiasts seek out these surge channels, and indeed, we found an array of creatures there. In no time we identified numerous species in all four nudibranch suborders (Doridina, Dendronotina, Arminia, Aeolidina). According to FFMR docent Julie Walters, species not often seen elsewhere are found here, such as *Doto amyra*, a tiny white nudibranch about 1/2" long with

Few people know that Mavericks' namesake was a white-haired German Shepherd named Maverick who used to swim out with his owner while he was surfing.

* Nudibranchs are soft-bodied, carnivorous mollusk with no shells. The word "nudibranch" comes from the Latin nudus, naked, and the Greek brankhia, gills.

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Friends of Fitzgerald Marine Reserve

P.O. Box 669
Moss Beach, CA 94038
Phone: 650.728.3584
www.fitzgeraldreserve.org

Our Mission:

To inspire the preservation of our unique intertidal environment through education and the support of research.

The graph displayed across the page bottoms shows tides for 9/6/2011 to 3/20/12. Where the date appears is midnight. The reefs are accessible for exploring during low tides—at least 0 or below. See: www.fitzgeraldreserve.org/resources.html and click on "high and low tides" for a more detailed tide chart. ***The fall–winter tides are in the late afternoon but the spring–summer low tides are in the early morning, so you have to rise and shine early!*** The lowest tides this period are:

-.70	9/29	6:49 pm
-1.41	10/28	6:33 pm
-1.72	11/25	4:31 pm
-1.55	12/24	4:20 pm
-.76	1/9	4:47 pm
-1.02	1/21	3:23 pm
-.50	2/7	4:20 pm
-.44	2/18	2:22 pm
-.23	3/12	8:30 am

Editor's Note

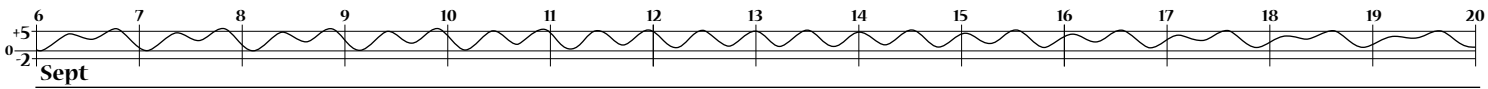
Your editor thanks Jenna Kinghorn for stepping back into the wheelhouse and piloting this issue of the newsletter off the shoals and on to the press. FFMR volunteers Jan Pelinka and Sasha Greenawalt were also instrumental in bringing this issue to fruition, and we hope they will join in the production and editing of future issues of the newsletter.

To keep this newsletter coming to you on a quarterly basis, WE NEED YOUR HELP! Have you read a great book that other Friends might be interested in? Why not write a review of it? How about getting to know your fellow volunteers by interviewing a few of them and writing profiles for the newsletter? Write about something special that happened on a tour you led, or submit a Creature Feature about one of your favorite tidepool animals. If you love to write but don't know what to write about, or you have great ideas but think you lack the time or skills to write about them, email Sasha or Jan for help at btt@fitzgeraldreserve.org.

You may want to also check out the newsletter on our website. The fabulous photos in this issue will be in full color. You won't want to miss seeing these gorgeous nudibranchs in all their colorful splendor!

www.fitzgeraldreserve.org

In this issue:



little bulblike projections on it, and *Dendronotus subramosus,* a light brown or sometimes orange nudibranch with tree-like branches on its back. Another docent, Scott Snow, said he'd seen more nudibranchs in one day at Mavericks than he'd seen in three years of tidepooling prior to that.

We were dismayed to discover two specimens of *Phidiana Hiltoni* (Hilton's Aeolid), a predator with a voracious appetite for other nudibranchs. If you would like to learn more about

Approaching Mavericks' tidepools, one feels the exhilaration of stepping beyond the borders of safety. They are accessible only at minus tides, and then by navigating through and around treacherously deep channels.

the threat of the Hilton, watch this video from the Academy of Sciences called "Killer Nudibranchs": http://www.calacademy.org/scienceoday/killer-nudibranch/.

For those interested in the details, other species we identified were *Acanthodoris nanaimoensis* (Rufus-tipped Dorid), *Aegires albopunctatus* (White Spotted Dorid), *Cuthona divae*, *Dialula sandiegensi* (San Diego Dorid), *Doriopsilla albopunctata* (White Spotted Sea Goddess), *Doris montereyensi* (Monterey Dorid), *Flabellina trilineata* (Three Lined Aeolid), *Geitodoris heathi* (Heath's Dorid), *Hallaxa chani* (Chan's Dorid), *Hermissenda crassicorni* (Horned Dorid), *Peltodoris nobilis* (Sea Lemon), *Rostanga pulchra*

…docent Scott Snow said he'd seen more nudibranchs in one day at Mavericks than he'd seen in three years of tidepooling prior to that.

(Red Dorid), *Triopha catalinae* (Clown Dorid), and *Triopha maculata* (Spotted Dorid, Spotted Triopha). Thanks to Susan Evans for providing this detailed list.

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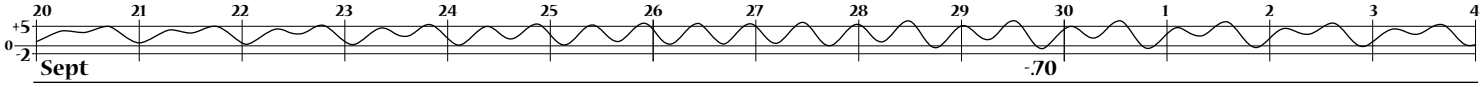
Tidepool explorers must be patient and persistent to discover tiny creatures such as this rufus-tipped nudibranch. Photo courtesy of Scott Snow.

The rocky reef at Maverick's is home to many types of nudibranchs, including this bushy-backed nudibranch. Photo courtesy of Scott Snow.



Mavericks Tidepools *continued from page 3*

Along with nudibranchs we discovered 6-rayed stars, brooding anemones, strawberry anemones, cup corals and a kelp crab. Sandi Meyers reached into deep water for a brittle star. Julie Walters found two young sea stars (about 4" in diameter), and a pink coralline algae-covered crab with long spider-like legs. Jan Pelinka found a bright orange sea scallop less than 1/2" in diameter. On our way out Sasha Greenawalt uncovered a very red and healthy gumboot chiton. Julie's daughter, Amy, may have caught the volunteer naturalist bug when she found a beautiful *Hermissenda*.

When the incoming tide forced us to reluctantly pull our heads out of the tidepools, we saw three kayakers surfing the infamous waves of Mavericks nearby. It was a perfect ending to a rewarding day. ◆

Amy Walters may have caught the volunteer naturalist bug when she found this beautiful Hermissenda. Photo courtesy of Julie Walters.

The tidepools continue north below the Pillar Point Bluffs but access is limited to very low tides. Photo courtesy of Martie Sautter.

Chromodoris willani – from Wikipedia, the free encyclopedia

Colorful nudibranchs

Nudibranchs are one of the most colorful creatures on earth. For more information and to view more photos of these beauties you can check out some of these sites—click on the url to go to the site:

http://ngm.nationalgeographic.com/2008/06/nudibranchs/doubilet-photography

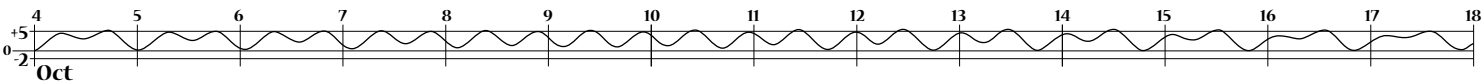
http://ocean.nationalgeographic.com/ocean/photos/nudibranchs/

http://www.sergeyphoto.com/underwater/nudibranchs.html

http://en.wikipedia.org/wiki/Nudibranch

http://www.fotosearch.com/photos-images/nudibranch.html

http://www.marinelifephoto.com/nudibranchs1.htm



Father's Day Fun at FMR

by Jenna Kinghorn

Editors' Note: Many thanks to Ranger Sarah Lenz and volunteers Jenna Kinghorn, Julie Walters, Kelly Huber, Kumi Ishida, Linda Barre, Karen Madsen, Sandi Meyer, Carol Davies, Carol Ferguson, Ron Olson, and Beth Carlson for helping with this Family Fun Day.

Event organizers were concerned that holding a Family Fun Day (FFD) on Father's Day might lower our turnout. On the contrary, about 20 visitors of all ages arrived at Fitzgerald Marine Reserve (FMR) bright and early on Sunday, June 19, 2011. They were greeted by a cadre of volunteer naturalists eager to share their love of tidepool creatures in general and "Super (sea) Stars and Enchanting Echinoderms" in particular.

We learned that not all sea stars have five arms—the sunflower star can have more than 20!—and talked about sea stars' ability to re-grow arms

We divided into small groups and headed for the tidepools to hunt for our resident "spiny skinned" invertebrates. Our hunt turned up many sea stars, including bat stars, ochre stars, pink stars, leather stars, and the "godzillas of the tidepools," sunflower stars. Visitors got to see the tube feet of these creatures in action, holding tight to rocks, moving around, and holding prey. We learned that not all sea stars have five arms—the sunflower star can have more than 20!—and talked about sea stars' ability to re-grow arms. We found sea stars hunting in the mussel beds, discussed how they can use their tube feet and arms to pry open bivalves to eat, and were even shown photos of a sea star's stomach digesting a fish outside of its body!

Like other echinoderms, sea stars are found in all of the salt water regions of the planet, and can live at depths ranging from the intertidal zone we were exploring to thousands of feet deep in the ocean.

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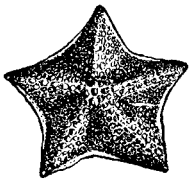
Common Sea Star

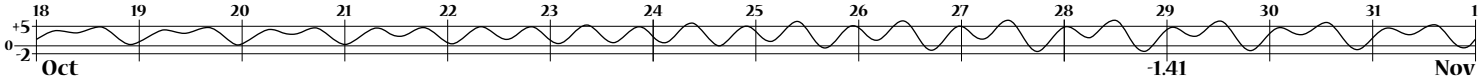


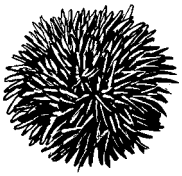
Sea Bat

Parents and kids were enthralled by the beautiful creatures we discovered in the tidepools.

Some FFD tidepoolers were treated to a visit with an octopus exploring one of the deeper pools.

Parents seemed to have as much fun as kids during our FFD.





Sea Urchin

Father's Day *continued from page 5*

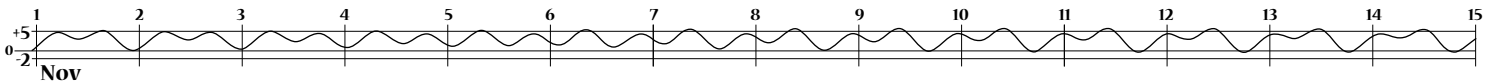
…a hungry bird had made a meal by picking up a sea urchin, flying into the air with it, and dropping it on the rocks to smash it open and expose the urchin's internal organs for the bird to feast on.

We also found purple sea urchins burrowing into FMR's reef, and could see that they have tube feet, like their relatives the sea stars. We learned that they use their spines to burrow into the rock and to move around, as well as to defend themselves. A sea urchin that has been tumbled upside down by a wave can turn itself over using its spines. There were several sea urchin tests, or shells, shattered on the rocks, evidence that a hungry bird had made a meal by picking up a sea urchin, flying into the air with it, and dropping it on the rocks to smash it open and expose the urchin's internal organs for the bird to feast on.

After about 90 minutes of exploring the reef, we returned to the picnic area where another crew of volunteers had set up snacks and prepared craft materials. While we enjoyed a snack of fresh fruit, volunteer Kumi Ishida carved ➤

Artists of all ages took part in our Super Stars FFD.

Parents, kids and volunteers all got in on the fun of sculpting intertidal creatures.



up a banana and used its peel to show us how a basic body plan of a tube (sea cucumber) can evolve into a sphere (sea urchin) and then flatten into a circle (sand dollar) and finally become a multi-rayed body (sea star). This helped demonstrate how echinoderm bodies are organized with radial symmetry, like a wagon wheel, rather than the bilateral symmetry our human bodies show.

After our snack, volunteers helped kids and parents use colorful modeling compound to sculpt all kinds of tidepool creatures, from echinoderms to fish and octopuses. Artists went home with their sculptures as souvenirs.

Families and volunteers all reported having a good time, and a few thought they might have accidentally learned something.

Our final Family Fun Day for 2011 will be **California Coastal Cleanup Day, Saturday, September 17.** Meet at 9 a.m. at Mirada Surf in El Granada on the west side of Highway One at Coronado Street. Bring your own bucket to reduce waste! Contact Ranger Sarah Lenz at slenz@co.sanmateo.ca.us or 650-728-3584 to pre-register. ◆

Our final Family Fun Day for 2011 will be ***California Coastal Cleanup Day, Saturday, September 17.***

Sea stars and sea urchins were popular subjects for our FFD artists.

Spring/Summer at Fitzgerald Marine Reserve

by Bill Kennedy

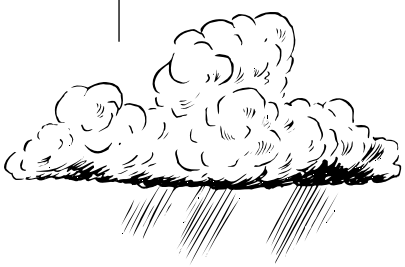
A Busy Season

In spring and summer along our coast, the better low tides (better, that is, for tidepooling) occur near sunrise, and we had some "really good" low tides. There are more excellent low tides coming in October, November and December. These will be late afternoon tides. Check out our handy tide chart at the bottom of these pages.

There are more excellent low tides coming in October, November and December.

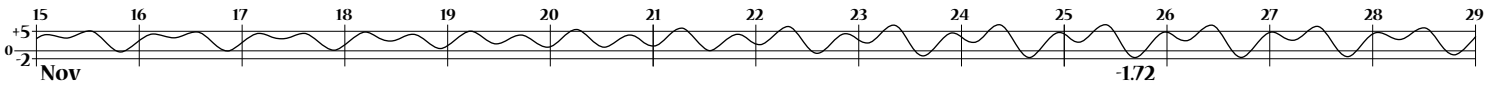
Sparkling clear weather greeted visitors on some of the good and really good low tides; but masses of visitors were undeterred even when there was rain, and our volunteers were busy. We saw (and some of us slipped and fell on) the always-anticipated flush of algae, in all their variety. And we enjoyed the harbor seals *(Phoca vitulina)* and their new pups—always a source of amusement—through their breeding season.

A Weather Update



As we noted in the last issue of the newsletter, there is nothing average or typical in our experience of the weather in any particular year on our coast. By the end of February this year, our cumulative rainfall was nearly up to the average for the period November 1 through March 1. We wrote that we'd "see whether March delivers this year."

March delivered, as did May and June, so that by the end of June our cumulative rainfall for the period July 1, 2010 through June 30, 2011 was about three inches higher than the average "water year." (This amounts to about 15% higher: nearly 23 inches total, as compared with about 20 inches average.) ◆



Sea Otters

story by Jenna Kinghorn, art by Kelly Huber

When I first began visiting Fitzgerald Marine Reserve more than twenty years ago, I was puzzled by the lack of sea otter sightings. The fluffy sea otter, *Enhydra lutris,* was abundant along the rocky shores of Monterey and Carmel and Big Sur. Why was this poster child for conservation missing from my stretch of the coast? This turns out to be a question with no easy answer.

The sea otter surfaces and floats on its back, using its chest as a kitchen counter and dining table.

I supposed that the population of sea otters in the Monterey area wasn't yet big enough to push otters north into our area. That entire populace had grown from a tiny remnant community of about 40 individuals. They had miraculously escaped the fur hunters who nearly exterminated the species between 1741 and the beginning of the 20th century. Historically, sea otters ranged from northern Japan all the way around the northern Pacific Rim to Baja, Mexico. I assumed that their numbers would continue to grow, and that eventually population pressure would send some of them north to establish a colony near Half Moon Bay, and so on up the coast. But the growth of the Monterey population has stalled in recent years, owing to increased mortality, and to date at FMR only an occasional lone male has shown up and hung around briefly before disappearing.

If its meal is a crab, the sea otter quickly rips off the legs with claws to disarm its prey, then methodically tears the animal apart, chomping through the crunchy exoskeleton and sucking every last morsel from within.

Some have suggested that sharks off Año Nuevo stop their northward movement, but recent research indicates that sharks are mainly there in the fall, so that doesn't seem likely to be involved either.

Nutritional Challenges?

A 2007 report comparing the sea otter population in central California with populations at San Nicolas Island, CA and Glacier Bay, AK concludes that sea otters in the central California population are faced with food and/or nutritional shortages. (O.T. Oftedal, *et al.,* "Nutritional Constraints on the Southern Sea Otter in the Monterey Bay National Marine Sanctuary.") The study noted that diets at the population level are composed of the diets of many individuals, and individuals within the population may tend to specialize. In expanding populations where food is not limited, such as at San Nicolas Island, individuals tend not to specialize. In central California individual otters had widely varying diets, suggesting that food may be limited.

The study also found that the nutritional quality of the sea otters' diets in central California was not as high as in the other populations. Sea otters require an enormous amount of dietary energy, and the central California otters' diets were comparatively low in fat, resulting in a lower energy content and forcing a need to consume larger amounts of prey. The prey of central California otters was lower in some vitamins and minerals, as well.

While the report acknowledged that further study is needed, it concluded that nutritional imbalances could impair reproductive performance, immune function, disease resistance, or the capacity to manage toxin or contaminant stresses.

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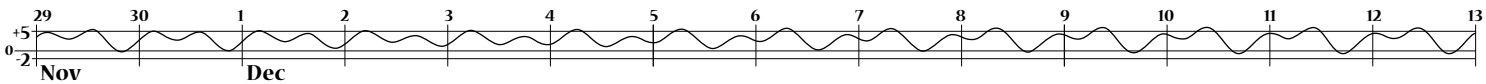

Many sea otter carcasses that wash ashore show evidence of poor nutrition, and some researchers think that sea otters are nutritionally limited in Central California. (See sidebar *Nutritional Challenges?* for more about this.)

FMR would provide a sumptuous pantry for sea otters, which eat many types of invertebrates. Individual sea otters develop preferences for just a few foods; abalone, crab, and sea urchins top the menu. Sea otters are known to locally reduce the abundance of their preferred prey, and this has at times put them in conflict with human fishermen.

Individual sea otters develop preferences for just a few foods; abalone, crab, and sea urchins top the menu.

Sea otters have very sensitive noses, but they find their favorite foods mainly by touch. A sea otter dives down to rocky reefs and uses its front paws (which lack fur on the pads) to reach into crevices, feel along cracks, and pat the undersides of ledges. When it finds something tasty, it pries the item off the reef—often using a rock as a hammer if the creature has a strong grip like an abalone's—and tucks it into a pocket-like pouch under an armpit. Then the sea otter surfaces and floats on its back, using its chest as a kitchen counter and dining table.

Dining on a starfish.

If its meal is a crab, the sea otter quickly rips off the legs with claws to disarm its prey, then methodically tears the animal apart, chomping through the crunchy exoskeleton and sucking every last morsel from within. The spines of the purple sea urchin are no barrier either; the otter simply bites right through them and opens up the hard test. (Otters that specialize in sea urchins end up with purple teeth!) Abalone flesh is easily stripped from the shell, and to eat a sea star the otter simply bites the end off a leg and sucks out the soft parts.

Opening a closed-up clam is a more formidable task, For this, the sea otter will find a large, flat rock to carry to the surface and rest on its chest. Using the rock as an anvil, the otter hammers the hard-shelled clam against the rock until it breaks, and then slurps out the meat.

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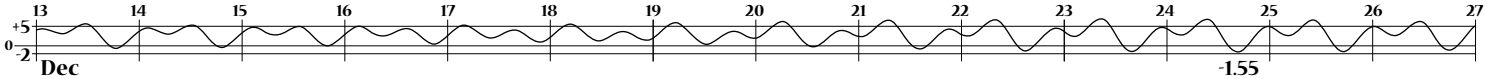
A sea otter wraps iteslf in kelp to keep from drifting while it eats.

The Chicken or the Egg?

One of the reasons we may not have sea otters off the San Mateo coast is that we don't have the lush kelp forests that exist in Monterey and Big Sur waters. Sea otters can display a strong relationship with kelp forests; although as carnivores they don't feed on kelp, they do hunt for many of their prey species in the kelp beds. They also use the kelp forests as places to rest, twining strands of kelp around themselves and their babies to keep from drifting away during sleep. (Of course, sea otters are not completely dependent on kelp. The large numbers of otters at Moss Landing are not in kelp, and sea otters are seen far out in the middle of Monterey Bay, far from kelp.)

But it turns out that sea otters serve the kelp forests, too. Sea otters eat sea urchins. Sea urchins eat giant kelp. In areas where sea otters thrive, so do kelp forests—apparently because sea otters keep the sea urchin population in check! In places where sea otters are missing, sea urchin populations may explode and consume the kelp so rapidly and thoroughly that kelp forests cannot be established. (Then again, other predators on sea urchins, such as spiny lobsters and sheepshead fish, can keep sea urchin populations in check and help kelp forests thrive even in the absence of sea otters.)

So, if we had sea otters along the San Mateo coast, might we also have flourishing kelp forests? This question is as unanswerable as that old philosophical standby, which came first, the chicken or the egg?



Water Quality Conundrum

Some researchers believe that poor water quality may be an underlying cause of the mysterious deaths of many sea otters in the past few years. Water quality is compromised by many human activities. We use pesticides and fertilizers. Our vehicles contaminate roads with exhaust and leaked oil and toxic particles worn off our brake pads. We dump everything from potentially disease-carrying pet feces to heavy-metal-bearing electronics and batteries into our landfills. Then the rains come along and wash all this material downslope and downstream into the ocean. San Mateo County's coastal waters have serious quality issues, and beach closings and warning postings are common.

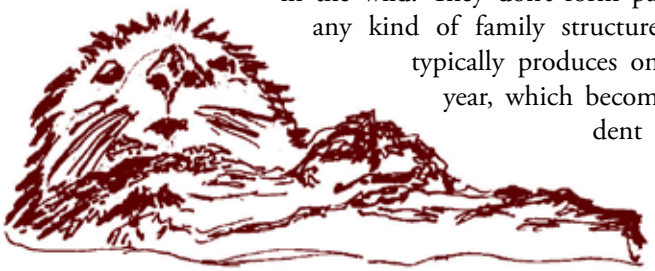
Marinas, harbors where boats are kept in the water, are notorious for poor water quality. Copper, lead, arsenic, zinc, and tin all leach into the water from fuel, anti-fouling bottom paint, and wood preservatives. Fueling mishaps, bungled sewage handling, poor dock and on-boat storage practices, and simple boat maintenance—pressure washing, bottom scraping, painting, and oil changes—all take a toll on water quality. Marinas are typically protected from strong currents (so that boats and the docks they are tied to remain intact), which means the contaminants tend to remain in place and become concentrated.

This is why it's so surprising to routinely see a large gathering (raft) of sea otters just inside the breakwater at Elkhorn Slough in Moss Landing, about midway along the coast between Santa Cruz and Monterey. These animals, which many researchers are convinced are sensitive to pollution, are spending long hours floating on their backs, resting and grooming, in Moss Landing Harbor!

Surely San Mateo County's nearshore waters can't be any less hospitable? With the otters doing so well in Moss Landing Harbor (and in Monterey Harbor) it is difficult to believe that the waters off the north coast of Santa Cruz and most of the San Mateo coast could be polluted enough to prevent sea otters from moving north. Can Princeton Harbor be so much worse than Moss Landing? It seems there must be other reasons why the otters have not yet expanded northward.

Sea Otters *continued from page 9*

The sea otter is a mustelid, a member of the weasel family, and can live to be 15-20 years old in the wild. They don't form pair bonds or any kind of family structure. A female typically produces one pup each year, which becomes independent between six and nine months.

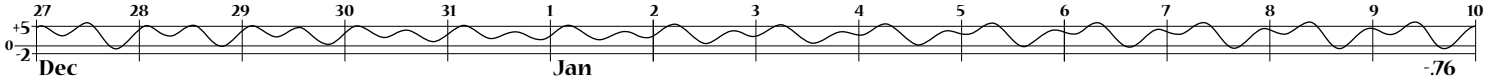


Although their land-dwelling ancestors returned to the sea only 5 to 7 million years ago—a short span of time in evolutionary terms—they are completely adapted to living in the ocean. Unlike pinnipeds such as harbor seals, the sea otter does not need to come ashore to rest, breed, give birth or rear young thanks to some unique anatomical adaptations. (Sea otters *do* come ashore to rest, however. They have often been seen snoozing on the rocks of Hopkins Marine Station in Pacific Grove. I once saw one curled up on a rock in the Great Tide Pool just outside the Monterey Bay Aquarium. And it's not uncommon to see them resting on the muddy banks of Elkhorn Slough.)

The sea otter's back feet have lengthened into powerful, flexible paddles. It does most of its swimming on its back. The sea otter even sleeps in this position, often wrapped in a frond of kelp to keep itself from floating away on a current. (See sidebar *The Chicken or the Egg?* for more about the sea otter's relationship with kelp beds.) Tiny pups use their mom's chest as a playpen, baby cradle, and—when nursing—cafeteria. Whether awake or asleep, sea otters often raise their front paws out of the water, sometimes looking like victims of a holdup in progress. This incredibly cute pose is also incredibly practical: their sensitive paw pads, well-adapted for finding food and handling tools, lack fur for insulation. The animal would rapidly lose precious body heat if its front paws were submerged while it rested.

Otters that specialize in [eating] sea urchins end up with purple teeth!

A sea otter has an extremely high metabolism—in the wild it needs to eat 25% of its weight every day. Females typically weigh in at 44 pounds, ➤



and males tip the scales at 65 pounds. This means they spend a lot of their waking time foraging for food. And when they are not feeding or sleeping, they are grooming.

A sea otter lacks the thick blubber we associate with other marine mammals, the pinnipeds and cetaceans. It relies instead on fur so thick that one square inch holds as many hairs as the entire coat of a house cat! Staying warm and dry is a high priority for an animal living in the cold Pacific, and a sea otter spends more than half of its waking time rubbing, washing, and blowing air into its thick fur. The trapped air provides insulation and extra buoyancy.

They also use the kelp forests as places to rest, twining strands of kelp around themselves and their babies to keep from drifting away during sleep.

The sea otter can groom every square inch of its own coat because its skin fits like a loose bag, making it possible for the sea otter to actually pull its back around to the front to work on it with teeth and paws.

A mother grooms her baby vigorously, and blows so much air into the pup's fur that it floats atop the water like a cork while she dives for food.

A mother grooms her baby vigorously, and blows so much air into the pup's fur that it floats atop the water like a cork while she dives for food. (See sidebar *Wanted: Adventurous Females* for more about the importance of breeding females to establishing a sea otter colony.)

Unfortunately the diligent care of a mother otter doesn't always pay off. Annual counts in 2008, 2009, and 2010 revealed the population of sea otters in California waters has been dropping. A trend of increasing pup deaths is especially worrisome, and the 2010 pup count was down 11 percent from the 2009 pup count. Researchers have not been able to pinpoint the causes of many sea otter deaths.

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Some scientist are certain that poor water quality from oil, sewage, agricultural runoff, and other human-made pollutants plays an important role. (See sidebar *Water Quality Conundrum.*) A recent study concludes that the deaths of some sea otters are linked to toxins from

continued on page 12

Wanted: Adventurous Females

If you spot a sea otter in the vicinity of FMR, it is almost guaranteed to be a male. Male sea otters, particularly younger ones, are far more likely to swim great distances and penetrate into new territory. They usually travel alone, although sometimes a small group sallies forth from their established sphere. Even though these daredevils may like what they find—and what sea otter wouldn't like the buffet bar of FMR's reefs?—they won't be able to establish a colony without female companionship.

And female sea otters, it turns out, are very geographically conservative. They don't often go into unknown territory. They don't swim the long distances that males have been known to bag. It will be a day to celebrate if and when we spot a few females exploring our coastline with babies in tow, for they will be key to establishing a colony along our stretch of the coast.

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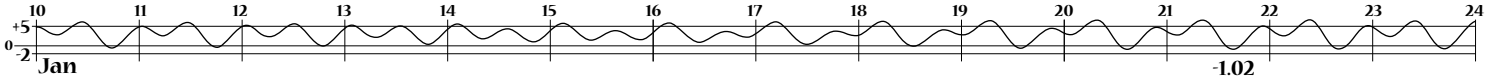


Gina Holmes

Volunteer Gina Holmes, pictured walking in the 2010 Pumpkin Festival Parade, passed away in February 2011.

Our dear friend (and Friend of FMR) Gina Holmes passed away in February. Gina shared her love of animals and of nature in many ways, particularly as a volunteer naturalist at FMR, and in her sculptures and jewelry. Participants in Half Moon Bay parades remember her artistic contributions to FFMR's entries.

Volunteer naturalist Susan Evans writes that Gina was in her 2007 volunteer training class, and remembers, "I was always amazed at her creative and artistic abilities when it came to decorating floats or the docents for the HMB parades! She was such a kind and caring person whom I will greatly miss."

Ranger Sarah Lenz writes, "Gina was a joy to see at the Marine Reserve. It was obvious that she loved to share the wonders of Fitzgerald with the school kids during their field trips. I enjoyed seeing Gina's radiant smile every time she was at the park and the kids loved her too. Her contributions are immeasurable."

We miss Gina, and remember her well and often.

I enjoyed seeing Gina's radiant smile every time she was at the park and the kids loved her too.

— Ranger Sarah Lenz

Sea Otters *continued from page 11*

I'll continue scanning FMR's waters with my binoculars, hoping to spot a raft of sea otters.

Some researchers believe that the central California coast, including FMR, is capable of sustaining 13,000-15,000 sea otters. So why aren't they here?

freshwater cyanobacterial blooms that wash into the sea. (See http://www.physorg.com/news203595019.html. But the evidence is not clear cut, and other researchers are not persuaded of the effects of pollutants, generally, on sea otters.

Some researchers believe that the central California coast, including FMR, is capable of sustaining 13,000-15,000 sea otters. So why aren't they here?

We just don't know.

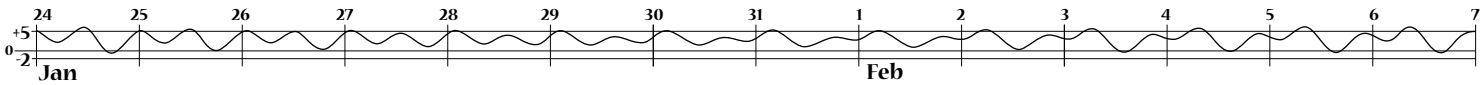
A raft of sea otters.

Decades of research have given us remarkable insights into the lives of sea otters. Researchers have followed individuals from birth to death. They've come to understand the anatomical adaptations that let sea otters live in a hostile environment. They've learned how to raise orphaned pups that can be released into the wild. They've tracked otters traveling hundreds of miles. They've observed feeding patterns and hunting methods.

But when it comes to why the population continues to hover below 3,000 (to be de-listed from the Endangered Species Act, the annual count would have to be at least 3090 animals for three years in a row), the conclusion of one report after another is: "Further study is needed."

So scientists will continue to scrutinize sea otter behaviors and probe their habitats. Researchers will perform necropsies on dead otters, and veterinarians will try to cure sick ones. Scholars will sample water and analyze food sources. Conservationists will put their findings into action to improve water quality and preserve existing sea otter habitat.

And I'll continue scanning FMR's waters with my binoculars, hoping to spot a raft of sea otters. ◆



Devil's Teeth by Susan Casey

Henry Holt and Company, LSC, 2005; 291 pages, $25.00

reviewed by Susan Evans

Called "the devil's teeth" by passing sailors, the Farallon Islands are ten 89 million-year-old granite islands that form part of the ragged edge of the continental shelf 27 miles west of the Golden Gate Bridge. These islands suffer 30-knot winds, 15-foot waves and blanketing fog. In Devil's Teeth, Susan Casey gives a compelling description of the islands and her adventures there. She reflects, "I became haunted by the Farallones in 1998 when I happened to see a BBC documentary… about the Farallon sharks." She describes the islands as "the spookiest, wildest place on earth."

"Every September one of the world's largest and densest congregations of great white sharks assembles in the waters surrounding the Farallon Islands."

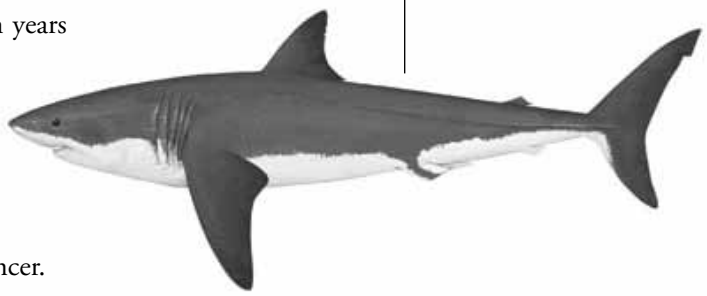
I really enjoyed Casey's descriptions of Farallon Islands history, a tug-of-war starting in the early nineteenth century between fortune hunters, federal agencies, scientists and naturalists. Fur trading begun around 1810 reduced the seal population to near extinction in 30 years. Then the scarcity of food during the California gold rush created a lucrative market for the abundant murre eggs on the Farallones. Casey recounts wild stories of piracy, gang rivalry and bloodshed over the softball-sized eggs. In 1881 the government, which had erected the first lighthouse on the islands in 1855, finally took full control and removed all eggers. The military arrived in 1905, and by 1941 there were more than 20 buildings and a town of close to 100 people.

Then in 1969 the southeast Farallon Island (the largest) was designated a National Wildlife Refuge and the over-whelming project of restoration began. Now there exists only one habitable 120-year-old building, and the islands are sanctuary to thousands of birds: murres, auklets, cormorants and pigeon guillemots. Marine mammals such as northern elephant seals, fur seals, harbor seals, California and Stellar sea lions and Riso's dolphins abound in the waters. Casey beautifully details the wildlife, and her writing of the history is peppered with humorous anecdotes, tales of murder, hardships and heart-wrenching sacrifices.

Fur trading begun around 1810 reduced the seal population to near extinction in 30 years.

The author soon moves her focus to the famed inhabitants of the waters of the islands. "Every September one of the world's largest and densest congregations of great white sharks assembles in the waters surrounding the Farallon Islands," explains Casey. The same sharks return every year and remain for 3 months. Sharks have been around for 400 million years (they predate trees!) and are resistant to infections, circulatory diseases and cancer.

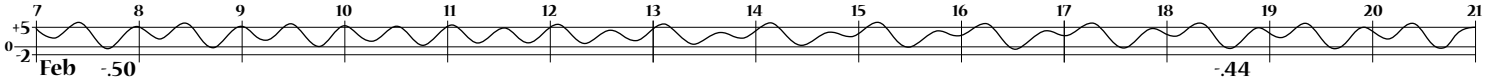
"the spookiest, wildest place on earth."



Casey's story details the sharks' life patterns, the frequency of their visits to the islands, and how island scientists study their habits. The book follows the careful work of scientists Peter Pyle and Scot Anderson of the Farallon Islands Great White Shark Project.

Casey provides captivating narrative about the perilous history of the sharks, her adventures on the island and in its surrounding seas, her interactions with the scientists, and her encounters with the great white shark. Her stories are brought to life with 16 pages of brilliant photographs. ◆

...the islands are sanctuary to thousands of birds: murres, auklets, cormorants and pigeon guillemots. Marine mammals such as northern elephant seals, fur seals, harbor seals, California and Stellar sea lions and Riso's dolphins abound in the waters.



FFMR Parade Group Wins Blue Ribbon

An orange octopus crawls along Main Street in Half Moon Bay. Photo courtesy of Mike Davis.

We stood there, biting our tentacles, cerata quivering, anxiously awaiting the announcement. Then it came. We had finally won the Half Moon Bay Fourth of July Parade blue ribbon!

Our quest began several years ago when a small group of Friends of Fitzgerald Marine Reserve (FFMR) volunteers marched in the parade simply wearing tidepool uniforms (green FFMR volunteer jackets and rubber boots) and carrying a "Friends of Fitzgerald Marine Reserve" banner. The first inspiration for costumes came one year when Mary DeLong dressed up as a mermaid and Julie Barrow borrowed a sea star costume from another ocean conservation organization. In subsequent years marchers got increasingly creative with their outfits. The mermaid and sea star costumes kept coming back, worn by different people. Some volunteers wore hats decorated with plastic sea stars and paper-mache sea anemones. Carol Ferguson crafted an umbrella into a giant jelly.

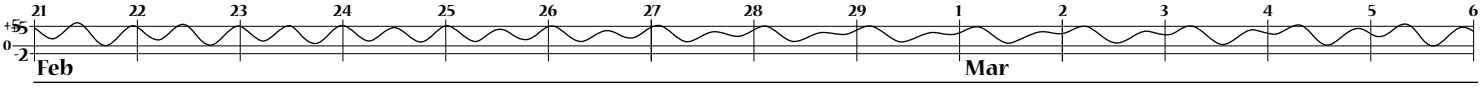
Jukebox the dog dressed up as a nudibranch. Photo courtesy of Jill Morris.

FFMR's creativity finally paid off in 2011 with the blue ribbon. Even more costumes had appeared, with Carol Davies dressed as a mermaid, Betty Sills as a red octopus, Carol Ferguson a moon jelly, Leighton Nakata dancing around as a purple ochre sea star, and Dave Karlin as the rarely seen orange octopus.

The highlight was Jukebox the dog dressed up as a Hopkins rose, the vividly colored nudibranch. Decked out in a costume made of pink fabric and balloons, Jukebox marched proudly alongside his owner, FFMR volunteer Jill Morris. Others who marched in tidepool gear included Linda Ciotti, Tom Ciotti, Ann Hurley, Susan Evans, Beth Carlson, Marsha Cohen, Bill Kennedy, Tom Niesen, and Jack Vidosh.

While the ribbon was a satisfying result, the real purpose for our participation has been to make people aware of our organization and encourage others to join. Thanks to everyone who made this fun event possible.

Volunteer Betty Sills has undertaken the role of Creative Director for our group's appearance in the **2011 Pumpkin Festival Parade** on **Saturday, October 15.** Be on Main Street in Half Moon Bay for the parade's noon start to see the latest round of FFMR creativity in action. ◆



Volunteer Naturalist Training Classes for Fitzgerald Marine Reserve

"I enjoy being able to instill a sense of excitement and love for the natural world to others, children and adults alike. Even in the tiniest tidepool, there is so much life to discover and share."
— Volunteer Naturalist
Darlene Wong

Experience the Wonder

Volunteer naturalists share the wonders of Fitzgerald Marine Reserve with school groups and the general public. As a volunteer you will be helping to protect our rich, unique intertidal environment and inspiring our visitors' imaginations and understanding. Instruction covers marine biology, ecology and interpretive strategies and will prepare you well to become a tidepool docent.

Friends of Fitzgerald Marine Reserve will be offering volunteer naturalist training classes beginning January 7, 2011. If you wish, we can arrange a tour of the reserve and demonstrate what it's like to be a docent.

REGISTRATION FOR 2012 FFMR VOLUNTEER NATURALIST TRAINING CLASS

The 2012 FFMR Volunteer Naturalist Training Class is tentatively scheduled to begin January 7 and will run for approximately 8 Saturdays. The location will be in the Half Moon Bay/Moss Beach area. Space is limited—your registration form and fee must be received prior to the deadline to hold a space. Registration deadline is December 15, 2011

Mail the completed registration form with $50 check made payable to FFMR to:

FFMR Training Class, P.O. Box 669, Moss Beach CA 94038

Name: _____

Address: _____

City, State, Zip: _____

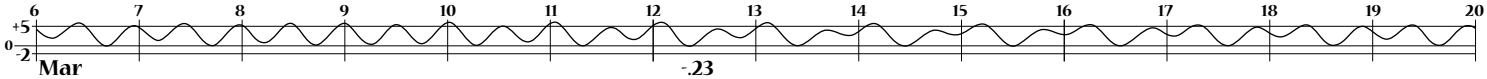
Phone: _____

Email: _____

How did you hear about FFMR's training class? _____

_____

For more information email: volunteer@fitzgeraldreserve.org or check out our website at www.fitzgeraldreserve.org.



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Family Fun Day—June 19

See full article with lots of photos beginning on page 5.

Although it was Father's Day, a great group showed up for a fun day of tidepooling, snacks and sculpting tidepool creatures.

Our final Family Fun Day for 2011 will be California Coastal Cleanup Day, Saturday, September 17.

Friends of Fitzgerald Marine Reserve

Membership Secretary, P.O. Box 669, Moss Beach, CA 94038

Contribution Levels:

❑ $25 ❑ $100 ❑ $1000
❑ $50 ❑ $500 ❑ 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 _____

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