

# BETWEEN *the* TIDES



F r i e n d s   o f   F i t z g e r a l d   M a r i n e   R e s e r v e

March 2008

## Oil Spill Had Relatively Small Impact on Reserve

by Jenna Kinghorn

Fitzgerald Marine Reserve (FMR) staff and supporters breathed a collective sigh of relief around the New Year, when it became clear that the reserve had escaped the *Cosco Busan* oil spill relatively unscathed.

“Because we are within the Monterey Bay Marine Sanctuary and are one of the lucky beaches included in the Beach Watch program, I and another team started surveying a section of FMR daily at dawn as soon as we heard about the spill,” said Ranger Sarah Lenz. “The daily surveys went on for 11 days and were an excellent way to monitor the effects of the spill at FMR.”

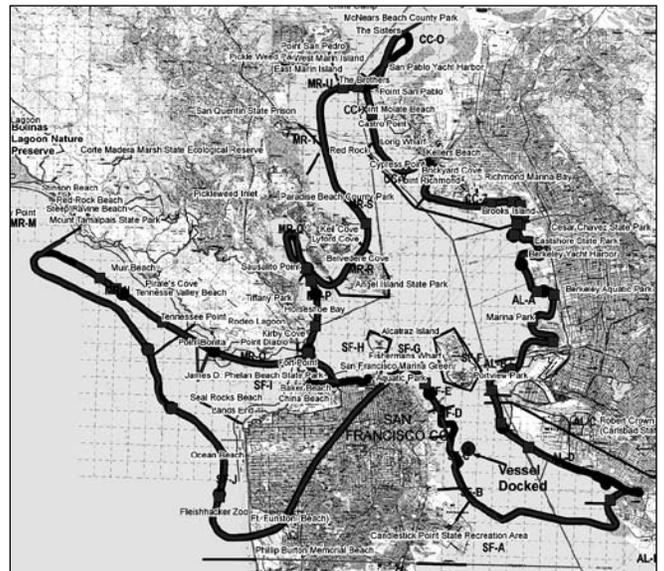
The cargo ship *Cosco Busan* hit a bay bridge pylon on November 7, 2007, and spilled a total of 58,000 gallons of the heavy bunker oil into San Francisco bay. (Bunker oil is the toxic black goopy substance left behind when crude oil is refined into gasoline, diesel and jet fuel; like many large vessels, the *Cosco Busan* uses bunker oil as fuel.) Hazardous materials (HAZMAT) crews from various agencies worked to contain the spill, but the bay’s legendary tidal currents swept slicks of it out the Golden Gate, and over the next few weeks some of it came to rest on beaches up and down the coastlines of Marin and San Mateo counties.

A Unified Command post was set up to keep the public apprised of changes and coordinate the efforts of government agencies and private cleanup crews hired by the company owning the *Cosco Busan*. Unified Command used computer models to predict where oil was likely to be carried by the tides and weather. Frequent flights over the area by aircraft with crews trained to spot evidence of oil slicks were used to track the oil’s progress.

“The computer models and overflights were good and accurate,” Sarah said. Ranger Steve Durkin, Sarah, and their San Mateo County Department of Parks colleagues participated in daily conference calls with state Office of Emergency Services (OES) representatives to monitor the spill status and clean-up efforts.

### Staff and Volunteers Prepared Beach for Incoming Oil

The reserve was notified through Unified Command on November 13, 2007 that oil was likely to hit FMR beaches within a week. “We put out an appeal for help in raking back the thick wrack line of algae, which was recommended by the Department of Fish and Game as a



*The flight path followed by aircraft tracking the progress of the oil spill.*

*continued on page 3*

# Friends of Fitzgerald Marine Reserve

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

## Advisory Board:

Dr. Jean Demouthe  
Dr. John E. McCosker  
Jan Roletto  
Dr. Mary Wicksten

## Board of Directors:

John Albers-Mead  
Robert Breen  
Linda Ciotti  
Tom Ciotti  
Tina Conway  
Mary DeLong, *President*  
Denise Dowsett  
Steven J. Durkin,  
*San Mateo County Parks*  
Ellen Gartside  
Kelly Huber, *Vice President*  
Jenna Kinghorn,  
*Newsletter Editor*  
Pam Larkin  
Sarah Lenz, *Secretary*  
Dr. Tom Niesen  
Hope Suchsland, *Treasurer*

## 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 3/17/08 to 10/11/08. Where the date appears is midnight. The reefs are accessible for exploring only during low tides. See:

www.fitzgeraldreserve.org/resources.html and click on "high and low tides," for a more detailed tide chart. **Note:** the lowest tides this period are:

-1.89 5/7 6:46 am

**\*\* -2.11 6/4 5:45 am**

-1.84 7/3 5:33 am

-1.26 7/31 4:33 am

**\*\*2nd lowest tide this century and lowest thru 2026 !**



FRIENDS OF FITZGERALD MARINE RESERVE

To: Senator Dianne Feinstein  
Congressman Tom Lantos  
Congresswoman Anna Eshoo

From: Mary DeLong, President, Friends of Fitzgerald Marine Reserve

On behalf of the Friends of Fitzgerald Marine Reserve, I want to thank you and all the people on your staffs for securing \$669,750 for the Fitzgerald Marine Reserve Interpretive Center in a federal appropriation request. With this help we will be able to proceed with our vision to build an interpretive center that will let us better share the intertidal experience with school children and the public and protect this sensitive reef.

The Fitzgerald Marine Reserve is a place of wonder. In the unique habitats between the tides live hundreds of fascinating animals and plants. Visitors both young and old, local and from far away leave with a sense of astonishment after discovering that a sunflower star has thousands of tube feet or an anemone can live for more than 100 years. A simple hermit crab will fascinate children for hours.

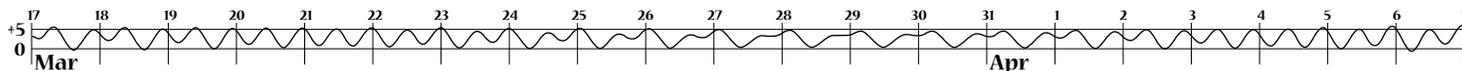
The Friends of Fitzgerald have been a support group for the Fitzgerald Marine Reserve for more than twenty years. Our mission is to protect the reef and the best way to do that is to educate the public and help them take care of the animals and plants that live there. Volunteer naturalists lead tours for school children and other groups and are available to interpret the tidepool environment for individual visitors and families. Many visitors do not realize that mussels, urchins, anemones and limpets are living animals, and that they are often living underfoot as one wanders among the tidepools. Once people understand this, they want to be good stewards. We teach basic tidepool etiquette such as not pulling a sea star off a rock, not stepping on animals, and not walking directly through a tidepool. Such lessons go a long way toward protecting the animals and the habitats in which they live.

We collaborate with the Reserve staff, San Mateo County, the California Department of Fish and Game, the Gulf of the Farallones Marine Sanctuary and the public to keep this special park as vibrant as possible.

An interpretive center is vital to keeping the Fitzgerald Marine Reserve a healthy marine habitat the public can enjoy for many years to come. A reef lab for school groups as well as a gallery of informative exhibits will enable our visitors to learn so much that they will start being good stewards before they even step onto the reef. Visitors who may not be nimble enough to navigate the reef's slippery rocks will have a new opportunity to learn about the intertidal area. We will have a place to train our volunteers and offer community lectures. The interpretive center will enhance the experience of all visitors who come to Fitzgerald Marine Reserve.

We like to say, "We have an ocean of information to share." Thank you again for your help in making our dream of sharing it a success.

See Article on Page 12



## Oil Spill *continued from page 1*

preventive move. The wrack line is a very special ecosystem that supports shorebirds, isopods, and many other minute critters of the beach. To save that ecosystem from being contaminated we assembled a team of 20 people to rake the algae so that it was above the high tide line at Seal Cove Beach.” If the kelp wrack had been oiled, it would have been classified as hazardous waste and removed during cleanup.

County Parks staff worked together with rake-and-shovel-wielding volunteers from the Friends of Fitzgerald Marine Reserve (FFMR) and concerned members of the community to move hundreds of cubic feet of decaying kelp beyond the reach of high tide—and thus beyond the reach of the oil floating in on the tide.

---

*“Finger printing” oil involves decoding its chemical makeup. Petroleum carries distinct chemical markers that can tie even a small sample back to its source of origin.*

---

“On November 18, 2007, we saw the first tar balls on FMR beaches,” Sarah said. “As soon as we spotted the first signs of oil, we closed the beach. We notified Unified Command, the OES, and San Mateo County Environmental Health. Because of my training with the Gulf of the Farallones National Marine Sanctuary Beach Watch program, I was able to collect three samples that could be used to ‘finger print’ the source of the oil.”

---

*When the oil was confirmed to be from the Cosco Busan... We had The O’Brian Group HAZMAT clean up crew out at the reserve on that very day.*

---

“Finger printing” oil involves decoding its chemical makeup. Petroleum carries distinct chemical markers that can tie even a small sample back to its source of origin. Such finger printing is an important step in getting companies to take responsibility for cleanup costs.

When the oil was confirmed to be from the *Cosco Busan*, Sarah said, “The response from the Unified Command was swift. We had The O’Brian Group HAZMAT clean up crew out at the reserve on that very day. They did a sweep of the beach and picked up any tar balls they found.”

### Tar Balls Washed Ashore

The oil that did show up at FMR washed ashore in the form of tar balls ranging in size from the point of a pencil up to three inches across. “The consistency was still tacky and they were very pungent. At Moss Beach the tar balls washed all the way up to the bluff.”

The tar balls were concentrated on the Moss Beach and Seal Cove beaches. The O’Brian Group picked up very few from the southern portion of FMR. Workers did find several birds coated in oil.

FMR reopened to the public on Nov. 20th, although over the course of the following weeks The O’Brian Group came out to do follow-up cleanups. “The crews were very diligent and professional,” Sarah noted.

In January more tar balls washed up on San Mateo county beaches. Shoreline Cleanup and Assessment Technique (SCAT) teams were sent out to survey and clean the beaches, and finger printing revealed that the tar balls were not related to the *Cosco Busan* oil spill. Tar balls wash up on coastal beaches every year, especially following storms, and often come from natural petroleum sources in the ocean floor.

### HAZMAT Training to Be Offered to Volunteers

A side-effect of the *Cosco Busan* oil spill was an increased awareness among Bay Area community members of the fragility of our coastline and the likelihood of future oil and chemical spills. Many members of the public were frustrated when they were turned away from volunteer cleanup efforts by government officials. Oil is a toxic substance and requires special handling. It typically takes several days of classroom and field work to complete HAZMAT training, and certification must be updated annually. ➤



*Tarballs sketch the high tide line. Pushing the kelp wrack higher up the beach preserved sensitive habitat from destruction.*



*Safely handling spilled oil requires special garb and training in Hazardous Materials. Photo courtesy of Bob Dang from the California Dept of Fish and Game web site.*



*A set of keys next to one of the larger tarballs that washed ashore at FMR.*

## Oil Spill *continued from page 1*

See page 5 for information on how to volunteer for training. "Fitzgerald Marine Reserve is well looked after by many citizens and agencies that have a true passion for this special place," Sarah said in the aftermath of the oil spill. "We are very fortunate!"

### Now Comes Natural Resource Damage Assessment

Now that the initial cleanup has been concluded, the process of damage assessment, restoration and mitigation begins. Representatives of the State of California Department of Fish and Game, the State Lands Commission, the U.S. Fish and Wildlife Service, the National Park Service, the Bureau of Land Management, and the National Oceanic and Atmospheric Administration will assess injuries to wildlife and habitat and human use losses caused by the spill.

This process is called the Natural Resource Damage Assessment (NRDA) and will be a long-term effort that will take into consideration impacts to birds, mammals, rocky intertidal areas, sandy beaches, salt marshes, and eelgrass habitats. It will look at loss of recreation due to beach closures, lost fishing opportunities, and other human uses that were adversely affected by the oil spill. The process will include



*Thousands of birds were covered in oil. This grebe struggles to preen the oil off of its feathers, but the feat is impossible as the oil sticks to the plumage and prevents the bird's feathers from insulating it properly. Photo by Ingrid Taylar.*

input from local cities, counties, and other organizations. The result will be restoration projects designed to bring wildlife and habitats back to full health using funds provided by the owner of the *Cosco Busan*.

---

*The result will be restoration projects designed to bring wildlife and habitats back to full health using funds provided by the owner of the Cosco Busan*

---

An example of such a mitigation project is the repair of the Seal Cove stairs. On September 26, 1998, the vessel *M/T Command* spilled 3,000 gallons of bunker fuel, which subsequently washed up along 15 miles of beach and caused

---

*The Seal Cove stair repair project will be funded by mitigation money from the M/T Command oil spill in 1998.*

---

injury to many sea birds, sandy beaches, and rocky intertidal habitat areas. The owners of the *M/T Command* agreed to a financial settlement in December 1999, and some of those funds are available for use at FMR. "The stair repair project will be funded by mitigation money from the *Command* oil spill," Sarah explained. That project is expected to take place during the summer of 2008. ♦

## 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).

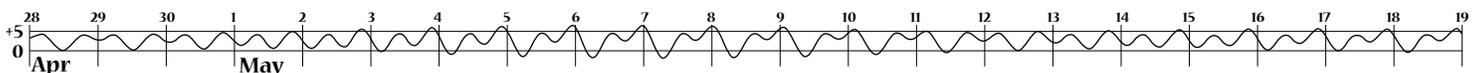
- Please contact me about volunteer opportunities.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Email \_\_\_\_\_



# Hazardous Materials Training Offered

In May, the U.S. Coast Guard will offer FMR volunteers a three-day HAZWoper training course in exposure to and handling of hazardous materials. The Occupational Safety and Health Administration (OSHA) has developed this HAZWoper program to protect individuals working at hazardous sites and devised extensive regulations to ensure their safety and health. This certification will enable Park Rangers and FMR volunteers to assist in oil spill cleanups or other hazardous events.

**Dates:** May 20, 21 and 22 (You must attend all three days to be certified.)

**Time:** 9am to 4pm

**Location:** Pacifica Police Department, 2075 Coast Highway

**Carpooling** is recommended as parking is limited. Please bring a lunch.

**RSVP:** to Ranger Sarah Lenz 650-728-3584 or slenz@co.sanmateo.ca.us

**Registration** due by April 20, 2008

*Many members of the public were frustrated when they were turned away from volunteer cleanup efforts by government officials. Oil is a toxic substance and requires special handling.*  
— from "Oil Spill" pg. 3

## Junior Rangers in July

Our 2008 Junior Rangers program will run mornings from July 21 – July 25. The half-day program for 8-11 year olds includes:

- Visits from the Whale Bus and the Shark Mobile
- Tidepool exploration every day
- Nature observation skill building
- Crafts including fish-printing, sculpting, and painting
- Fun games that demonstrate the food web and other ecological concepts
- Education about conservation and how we can improve the health of the ocean
- Science instruction in marine biology, ecology, geology, and oceanography

For further information or to register, contact Ranger Sarah Lenz at 650-728-3584 or slenz@co.sanmateo.ca.us. Scholarships are available.



*Photos from previous Junior Ranger camps: top left: The kids reconstruct a pygmy sperm whale skeleton; upper right: Park Aide Dominic Marconi and campers explore a tidepool; left, Campers show off the fish-print t-shirts they created (from a real (dead) fish).*

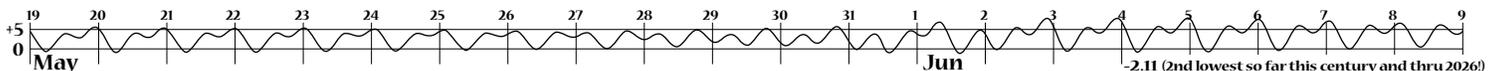
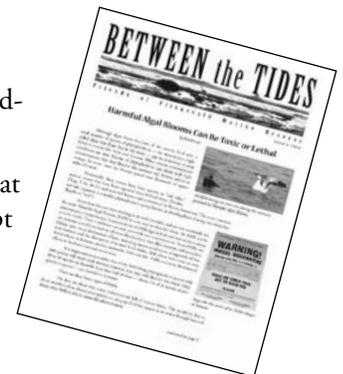
## Articles and Photos Needed

*Between the Tides*, this quarterly newsletter, is always looking for volunteers to write and research articles about items related to the intertidal zone and conservation. Articles run a maximum of 800 words (longer articles can be run as a series over several issues; shorter articles are always welcome). Subjects run the gamut from reminiscing about visits to the tidepools in years past, to descriptions of encounters with

animals, to book reviews, to the politics of funding our parks.

We also welcome photos taken at Fitzgerald Marine Reserve. (We do not accept poetry or fiction at this time.)

Contact editor Jenna Kinghorn at tydpoolz@comcast.net or 650-728-1421 for more information.



# Hermit Crabs

by Jenna Kinghorn  
 sketches by Kelly Huber

The hermit crab is one of the most popular reef dwellers found at Fitzgerald Marine Reserve (FMR), and for many years was part of the Friends of Fitzgerald Marine Reserve logo. Ranging in size from smaller than a pea to as big as a golf ball, they can be found scuttling around in tidepools, hiding out under rock overhangs or clumps of algae, and scaling the steep sides of rocks like miniature mountain climbers.

Although they are called “crabs,” hermit crabs are actually not close relatives of the “true crabs.” (See the December 2007 issue of *Between the Tides*).

An anatomical difference that sets the hermit crab apart is its exposed, shell-less abdomen. While the abdomen of a “true crab” is folded under the carapace and protected, a hermit crab must protect its soft abdomen by hiding it. The abdomen is lopsided and twisted and fits nicely into the spiral interior of an empty gastropod shell. The animal anchors itself in its adopted shell using two hooks on its tail, which wrap around the columella running up the center of the snail shell.

At FMR a hermit crab typically finds the shell of a periwinkle, black turban snail, or brown turban snail, although sometimes you’ll see them carrying around abodes that once belonged to dire whelks and top snails. (Elsewhere, hermit crabs have been documented living in discarded artifacts such as bullet casings and lipstick holders!) Once in a while a hermit crab will clothe itself in a discarded worm casing or dislodged barnacle.

The hermit crab’s growth is limited by the size of its shell. A hermit crab grows quickly when it’s young and may need to change shells every month or so. As it gets older, its growth slows until it only changes shells about every

18 months. When a hermit crab comes across a potential new shell, it carefully examines the shell inside and out using its claws and antennae. When it determines that the shell is empty and otherwise suitable, it quickly lets go of its old shell and twists its body into the new one. If it’s a good fit, it walks away with a new home.

Competition for new shells can be fierce, and observant tidepoolers may witness two or more hermit crabs fighting over an empty shell that they both want to move into. The opposing hermit crabs will both grab hold of the abandoned shell and wage a tug-of-war. Whichever hermit crab manages to twist its body into the shell first wins!

Sometimes you may find several hermit crabs fighting over a shell that is still inhabited by a hermit crab. This is usually a case where a female is about to molt, and several males are fighting for the right to mate with her when she does so. Often a large male will win the tug-of-war and proceed to drag his mate around with him for several days until she finally molts!

When the female molts, she lays hundreds of eggs inside her shell, and the male deposits hundreds of male gametes to fertilize them. The female’s shell becomes a cradle of sorts, in which the mother-to-be gently swishes water over clusters of developing eggs to keep them clean and give them oxygen.

When they hatch, hundreds of pencil-point-size larvae float out of their mother’s shell and begin to drift in the ocean’s currents, becoming part of the plankton that forms the basis of the sea’s food web. A baby hermit crab which manages to eat some of its fellow planktonic life forms while avoiding being eaten will go through many, many molts as it changes shape and grows. When it gets to be about the size of a pea, it loses its swimming fins and becomes too heavy to float. Then it falls to the ➤

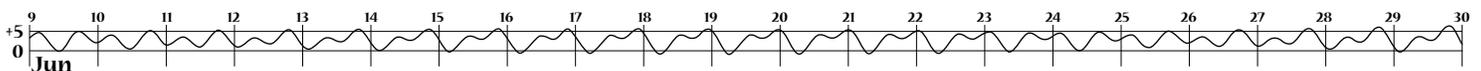


A hermit crab without its shell.



This small hermit crab, dwarfed by a volunteer naturalist’s fin-gertips, is probably very young.

*The female’s shell becomes a cradle in which the mother-to-be gently swishes water over clusters of developing eggs to keep them clean and give them oxygen.*





*A hermit has strong claws and two pairs of well-developed walking legs.*

bottom of the ocean and hides in sand or mud until it's able to find a suitable shell to live in.

The shell provides the hermit crab with camouflage as well as protection—unless you happen to see the hermit crab in motion, it is hard to tell it apart from the snails it lives among!

When it is threatened, a hermit crab can pull most of its body into its shell.

The hermit crab is a decapod, meaning it has 10 legs. The first and largest pair of legs are claws. The right claw is usually larger, and the pair is shaped to block the opening of the shell as the animal tucks its body away. These claws are also used for defense and for gathering food.

The next two pairs of legs are well-developed walking legs. An adult hermit crab cannot swim—it must walk when it wants to go somewhere, carrying its shell or dragging it along behind. The remaining pairs of legs are usually small and remain hidden inside the shell.

Hermit crabs of many species live all over the world, and FMR is home to a number of species. You can identify the blue-banded hermit crab (*Pagurus samuelis*) common at FMR by noting its hairy legs with blue lines. Other commonly seen hermits are the hairy hermit (*Pagurus hirsutiunculus*), which has white-lined legs, and the grainy-hand hermit (*Pagurus granosimanus*), which is brown with bluish spots.

Hermit crabs can be herbivorous, but most are opportunistic scavengers. In the tide pools at the reserve, it is common to see hermit crabs by the dozen swarming over dead or dying animals. Sometimes a visitor's first reaction to such a sight is "disgusting!" This behavior has earned the hermit crab the nickname of "garbage man of the sea," but by recycling nutrients and preventing waste build-up, the hermit crab performs an important function in the intertidal habitat. Our volunteer naturalists like to point out that it's just part of the cycle of life on the reef. ♦

## An Ambassador for the Intertidal World

Meeting a hermit crab up close and personal is often the highlight of a visit to FMR. Because they are relatively hardy animals, you can hold a hermit in your hand! Things to remember when you are handling a hermit crab:

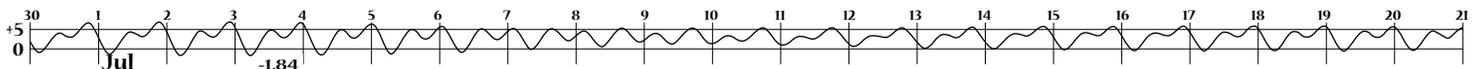
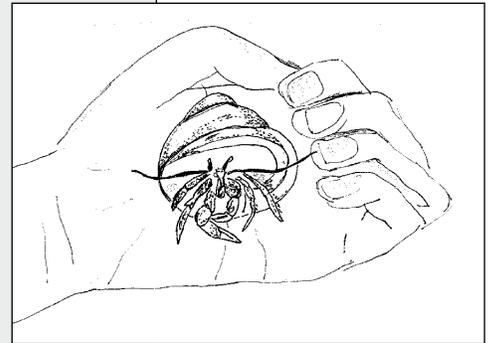
- Sometimes hermits are very shy and yours may stay tucked away in its shell. You must hold very still and be quiet to entice it to come out and explore your hand.
- Its claws are very tiny; even if it pinches you it won't hurt.
- It moves very quickly in unexpected directions sometimes, which can startle you. If the one you are holding moves very quickly on your hand, you might accidentally drop it!
- Or it might run right off the edge of your hand!
- For these reasons, it's important to keep your hand very low and close to the water, so that the hermit crab will only fall a few inches and plop safely back into its tidepool if you lose hold of it. If it falls from a few feet high and hits a rock, its shell might break!
- Hold your hand close to the water and move your eyes close to your hand for a good look. It's fun to watch a hermit crab cautiously extend its antennae and legs to explore its world!
- They need water to breathe. Never hold your hermit captive for more than a minute!
- Always return your hermit to where you picked it up.

Feeling tiny crab feet scuttling over the palm of your hand will make you happy there's a special place like FMR in this world! ♦

---

*Feeling tiny crab feet scuttling over the palm of your hand will make you happy there's a special place like FMR in this world!*

---



# FFMR Welcomes Three New Board Members

Volunteers Denise Dowsett and Ellen Gartside and Ranger Sarah Lenz have all recently been voted onto Friends of Fitzgerald Marine Reserve's (FFMR) Board of Directors. We asked them to tell us a little bit about themselves and their goals for FFMR.

## Denise Dowsett

Denise is a very recent addition to the ranks of FFMR volunteers, having just graduated in the spring 2007 training class. She was born in Singapore and lived there until she was nine. "Being an island state surrounded by water and being on the equator, swimming and water figured prominently in my life! In those days the beaches didn't have many tourists and were littered with tiny, brightly colored shells. We immigrated to the U.S. in 1969 and naturally gravitated to California. I don't think I could live too far from salt water."



*New board member  
Denise Dowsett and friend.*

Denise went to Castilleja High School in Palo Alto, and then got a BS in Biology at Yale. "After I graduated from Yale, I went to Jamaica and lived at the Yale/Johns Hopkins co-sponsored lab in Discovery Bay, and spent four months diving 2-3 times a day, studying symbiosis between giant sea anemones and snapping shrimp. An extra month was spent taking fish and coral censuses on sea mounts; in those days I actually knew the Latin names for the various corals and fish in the area and was able to tick off the count on a little underwater clip board."

---

*And voila, here  
I am full circle,  
indulging my  
love for the ocean  
again...*

---

—Denise Dowsett

---

Deciding that she wasn't cut out to be in a lab for the rest of her life, Denise next worked in marketing for high tech companies in Silicon Valley. She then pursued an MBA at J.L. Kellogg School of Business in Evanston, IL and became a brand marketer for Gallo Winery for a few years before returning to

Silicon Valley for more high tech marketing. "My last position was as Director of International Marketing at Yahoo! International Division."

When she left Yahoo, she found out about FFMR and went through the docent training. "And voila, here I am full circle, indulging my love for the ocean again, doing some teaching (which I love) and hoping I'll instill the same passion for the ocean and environment in my kids. I've bought new marine biology books and renewed my SCUBA gear after not diving for almost 20 years. I will be on a 3-week trip to Central America in March to hike rainforests and dive reefs near Costa Rica, Honduras, Belize and Panama. I'm doing my best to stave off middle age."

Denise is the new Membership Secretary for FFMR. Her goals as a board member include increasing our membership, increasing member contributions, adding to our active volunteer population, and "spending our funds in targeted, effective ways that educate and raise awareness and support for increasing the health of our coastal ecosystems."

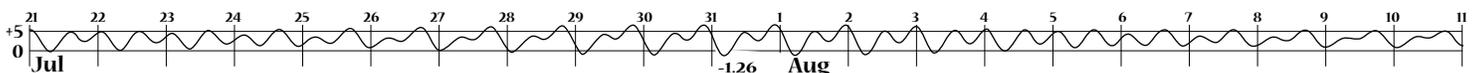
Denise lives in Menlo Park with her partner of 14 years, Rochelle; their two kids, Ethan (7) and Antonetta (5); a dog; and two turtles. In addition to volunteering for FFMR, she is the parent coordinator for the Las Lomitas Spanish classes and helps teach reading and math in her son's classroom.

## Ellen Gartside

Ellen Gartside has been a familiar face around Fitzgerald Marine Reserve since her days as a Park Aide in the early 1990s. Ellen grew up in Woodbury, New Jersey. "We spent our summers at the Jersey Shore, in Ocean City. I spent many hours on the beach fascinated by mole crabs and tellin clams, but it wasn't until I moved to California, in 1984, that I saw tidepools." ➤



*New board member  
Ellen Gartside helps kids examine  
water samples in a Surfrider-  
sponsored field trip in 2007.*



She received a BS from Cornell University in Plant Science in 1983 and in 1989 she began studying Marine Biology at San Francisco State University with Tom Niesen, earning a Masters Degree in Marine Biology and a Secondary Teaching Credential for Life Sciences. "Tom introduced me to Bob Breen and FMR. I worked at FMR as a Park Aide for three years during graduate school." She also co-taught the marine biology class at Half Moon Bay High with Bob for the first five years it was offered, and has taught marine biology at Skyline Community College and Foothill College.

In addition to volunteering with FFMR, Ellen has volunteered with the GFNMS Beach Watch program for 15 years. "I conducted intertidal surveys for the GFNMS for three years from Bodega Bay to Pigeon Point. As part of that project I was invited to assist with intertidal monitoring at the Farallon Islands and was fortunate to go back to the Farallons a second time to participate in the elephant seal monitoring there. My time on the Farallons has been one of the highlights of my career as a marine biologist."

Ellen also works with the Surfrider Foundation. "I was on the board of the San Mateo Chapter and started the Blue Water Task Force in San Mateo County, a volunteer-driven water quality monitoring program. One of our first projects was investigating San Vicente Creek and the sources of contamination that cause it to be posted at the mouth where it flows into the ocean at FMR. Since Surfrider began working on the creek, the number of weeks that it is posted has gone down significantly."

Ellen now lives in Half Moon Bay with several roommates and her cockatiel, Daffodil. Between her volunteer activities she enjoys gardening, hiking, roller blading, travelling, and beach combing for beach glass.

"I'm very excited to join the FMR Board. As a board member I hope to enhance the educational and interpretive programs we offer to our visitors."

## Sarah Lenz

While many of us can't wait to get away from our jobs on evenings and weekends, Ranger Sarah Lenz can't seem to get enough of

FMR. Maybe she's making up for an ocean-deprived childhood: "I was born in Omaha, Nebraska. We lived there and in Evergreen, Colorado until I was 13 years old."

Sarah first saw the ocean then, when her mother moved the family to Santa Cruz. "I went to Santa Cruz High School and may have spent more time at Cowell's Beach surfing rather than at school! I fell in love with the ocean and was always fascinated with the immense amount of energy on 'big surf' days."

Sarah received an Associates of Arts degree in Administration of Justice from City College of San Francisco. She went on to San Francisco State University and earned a Bachelors Degree in Physical Geography. "I had a field trip to Fitzgerald Marine Reserve with my oceanography class and I fell in love with it! I made a mental note to look into getting a job there someday."

Sarah's work history includes working for California State Parks at Ano Nuevo State Reserve, where she was involved with the Northern Elephant Seal program, and at Half Moon Bay State Beach, where she was involved with the Western Snowy Plover project. "Both parks had a strong emphasis on resource conservation, interpretation, and volunteerism."

As a new board member, Sarah says, "I am looking forward to an even better Junior Rangers Camp this year! I expect to be able to expand the program in the near future. The Harbor Seal monitoring program is coming together with the help of Linda Ciotti and Steve Durkin." The program will use binoculars and spotting scopes to give park visitors an opportunity to view the harbor seals without getting close to their haulout sites. "I enjoy organizing educational field trips for our volunteer naturalists and collaborating with other resource agencies to protect and enhance the valuable resources at Fitzgerald Marine Reserve."

She now lives in Half Moon Bay with her eight-year-old German shepherd, Buck. ♦

---

*My time on the Farallons has been one of the highlights of my career as a marine biologist.*  
—Ellen Gartside

---



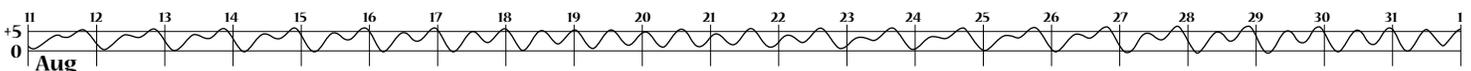
---

*I fell in love with the ocean and was always fascinated with the immense amount of energy on 'big surf' days.*  
—Sarah Lenz

---



*New board member Sarah Lenz working with Junior Rangers in 2007.*



# An Infinite Palette of Delights: An Artist Looks at the Tidepools

by Kelly Huber

**Editor's Note:** Kelly Huber is a long-time FFMR volunteer and an accomplished artist. (See the Volunteer Spotlight profile of her in the June 2007 issue.) Her pen-and-ink sketches appear regularly in the Creature Feature and on other pages of *Between the Tides*. I asked Kelly to write about how her art has been influenced by her time in the tidepools, and how her skills as a naturalist have been enhanced by her education as an artist. — JK

---

*The reef is chock full  
of magical wonders for  
all of the senses...  
the tidepools offer an  
infinite palette  
of delights.*

---

Every walk at Fitzgerald Marine Reserve (FMR) brings me more wonder and joy, as it is never quite the same each time. The reef is chock full of magical wonders for all of the senses, particularly the eyes. For somebody like me, who enjoys the outdoors and loves to draw and paint, the tidepools offer an infinite palette of delights. The best opportunities for witnessing this beauty seem to be on an overcast day early in the morning or late in the day during a very low minus tide, as the animals are most active at those times. I often take photos to help me remember what I've seen.

The plants and animals I encounter on my explorations are unique and fascinating. Each has highly evolved and sophisticated adaptations for its survival in a very challenging environment. When observing these plants and invertebrates in their habitats, I always contemplate their versatility and acknowledge that their colors and intricate biological structures—for instance, the spiral shells of snails, the grasping tube feet of sea stars and their relatives, the rainbow-hued stinging tentacles of anemones—reflect their struggle and quest for survival.

Some of the most colorful invertebrates in the tidepools have become subjects for my watercolors, gouache and colored pencil renderings. Take, for example, the brilliantly colored nudibranchs, also known as sea slugs—snails without shells. I love to discover them. I haven't detected a bright pink Hopkins' rose for eons, but I commonly see a number of others:

- The turquoise and orange Hermissenda
- The bright yellow sea lemon
- The yellow-edged Cadlina, which as its name implies is pale-white and edged in yellow
- The sea-clown, which runs pale-white to yellow with orange spots
- The spotted Triopha, which is bright red in its juvenile form
- The yellow-orange to brown white-spotted sea goddess

The Spanish shawl is a nudibranch I have painted and drawn on three occasions because of its gorgeous coloring of intense bluish-purples and oranges. This aolid nudibranch lives in slightly warmer waters, but has been sighted in Pescadero by some of our volunteer naturalists. Perhaps with the warmer waters of another El Nino, I'll spot more uncharacteristic invertebrates, fish and plants to feast my eyes upon!

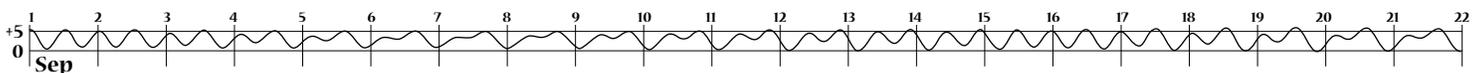
The nudibranchs' remarkable rainbows of color shout out "danger" to would-be predators. Even gulls, which aren't known for their refined tastes, don't like to choke down these creatures!

Some of the other beauties I often encounter in the tidepools are the giant green anemone; ochre stars in orange or purple; bat stars in orange, pink, purple or red; sunflower stars in orange or purple; and leather stars—blue-gray and mottled with orange or red. ➤

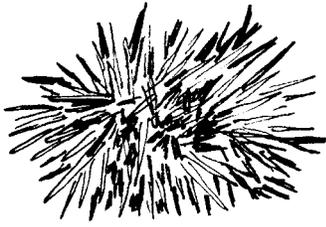
---

*When observing these  
plants and invertebrates  
in their habitats, I  
always contemplate  
their versatility and  
acknowledge that their  
colors and intricate  
biological structures  
reflect their struggle and  
quest for survival.*

---



The 2007 holiday night tidepool walk was incredibly inspiring for my artistic senses. Memories of that chilly night in December include witnessing fields of purple sea urchins and



a pool teeming with several species of sea stars, including three sunflower stars, ochre stars, bat stars, a leather star and a knobby star. We even found a ledge with half-a-dozen abalone tucked beneath it. Those of us lucky enough to witness this spectacle can count our blessings!

All of these plants and animals are beautiful to me in their own strange and bizarre ways. One of my scientific illustration teachers once rendered an ink drawing, using stippling, of some rockweed. Although it's a common algae that I see on every trip to the reef, it was such a beautifully depicted representation of this plant that I will never forget it. And I have to admit, in its own invasive way, coralline algae is quite lovely, too.

I have certainly drawn many tidepool creatures and plants, but I particularly have the inkling now to draw in pencil (and subsequently in ink) three fascinating creatures, each of whose intricate beauty has amazed me over the years:

- The lined chiton (*Tonicella lineata*), usually found on coralline algae, can be pinkish to light purple with red, white and blue wavy lines on its plates. Its girdle is smooth, leathery and colorful.
- The leafy hornmouth (*Ceratostoma foliatum*) is a beautiful snail, with lots of detail in brown and white, and a fascinating structure to its shell.
- The sunflower star (*Pycnopodia helianthoides*) can be orange, purple or grayish blue in color, and its gliding motion is fascinating to watch.

The rocky reefs and marine habitat offer the artist and photographer mind-boggling opportunities for artwork. Between the contrasting colors and the details of the plants and animals,

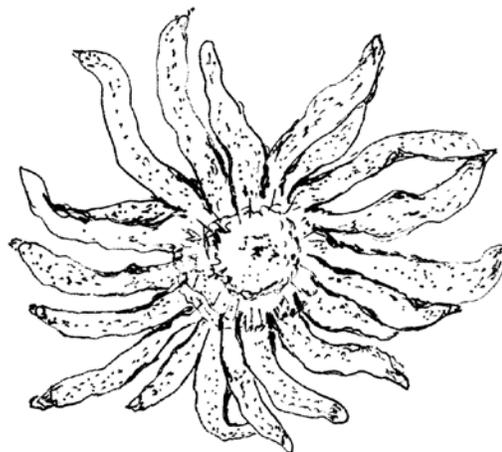
one can be mesmerized and challenged for days on end at FMR. I have great respect and admiration for both the inhabitants and the custodians of Fitzgerald Marine Reserve. ♦



*The lined chiton  
(Tonicella lineata)*



*The leafy hornmouth  
(Ceratostoma foliatum)*

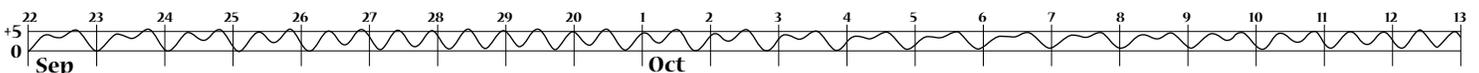


*The sunflower star  
(Pycnopodia helianthoides)*

---

*All of these plants and animals are beautiful to me in their own strange and bizarre ways.*

---



# Planned Interpretive Center Receives Federal Funds

As part of the Consolidated Appropriations Act of 2008 (P.L. 110-161), \$669,750 of a federal budget “earmark” has been designated for use in and around our planned Fitzgerald Marine Reserve Interpretive Center.

This is part of the federal budget allocation of the National Oceanic and Atmospheric Administration (NOAA), which will in turn distribute it to the Gulf of the Farallones National Marine Sanctuary (GFNMS) and the San Mateo County Department of Parks.

“NOAA will use 20% of the total allocation to fund new signs at Pillar Point Harbor,” says Julia Bott, Director of the San Mateo County Parks and Recreation Foundation. “The remainder will be NOAA’s contribution to the Fitzgerald Marine Reserve education center and will be dedicated to interior and exterior exhibits and signage.”

Senator Dianne Feinstein, Congressman Tom Lantos, and Congresswoman Anna Eshoo helped secure the funding. (See FFMR President Mary De Long’s thank-you letter to them on page 2.)

“The San Mateo County manager’s office routinely looks for opportunities to secure funding for county projects,” Bott explained. “Department of Parks and Foundation staff worked with the County Manager’s office on the budget submittal and secured letters of support. Having a completed concept plan provided the detail and ancillary materials to make the education center a competitive request.”

Receiving this funding is expected to smooth the way for further fundraising efforts to be conducted over the next few years. The total cost of the project is estimated at \$3 million. FFMR hopes the new interpretive center will open its doors in 2011. ♦



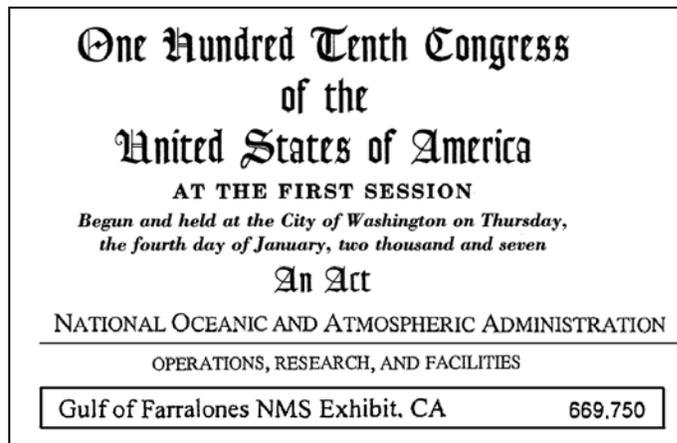
Senator  
Dianne Feinstein



Congresswoman  
Anna Eshoo



the late Congressman  
Tom Lantos



P.O. Box 669 • Moss Beach, CA 94038  
[www.fitzgeraldreserve.org](http://www.fitzgeraldreserve.org)



Non-Profit Org.  
U.S. Postage  
PAID  
Permit No. 12  
Moss Beach, CA 94038