

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

M A R C H 2 0 1 3

The Weird and Wonderful

Unusual creatures or behaviors observed at Fitzgerald Marine Reserve

A Jet-Propelled Kelp Scallop

article and photos by Scott Snow

On the very busy Thanksgiving Saturday in 2012, while assisting the masses of visitors, I spotted a small orange shell lying perfectly still at the bottom of a shallow two-foot-wide tidepool. I looked at it closely and appreciated its beauty. It was an intact, closed scallop about 2-3 cm long. I assumed it was the common rock scallop (a juvenile who had not yet taken up its sessile lifestyle) so I did not even take a photo. It was located halfway to Cypress Point, in a pool out near the edge of the lagoon.

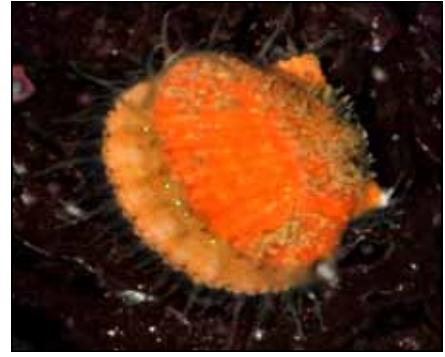
Maybe 40 minutes later I happened to be looking toward that same pool and saw a white streak zipping back and forth like a bullet under water. At first I couldn't believe my eyes. It was about as fast as the fastest sculpin, except with a jet stream in tow. It shot back and forth across the two-foot-wide pool five or six times before stopping suddenly on a leaf of kelp. There it sat, completely motionless, feeding with its mantle open, as if it had never moved at all. I blinked a few times to be sure I wasn't imagining what had happened. At this point I took some photos and later did some research.

I used my Beach Comber's Guide and quickly determined that it was a Kelp Scallop (*Leptopecten latiauratus*), but otherwise could not find much information anywhere on the web. It was not even in Wikipedia. My best result came from volume 23 of the Captain "Alan Hancock Pacific Expeditions," published in 1943. From this and other random sources I learned a great deal about scallops generally and this one in particular.

This particular species is located from Point Reyes down to parts of Mexico. It can be found in the low intertidal down to 850 m. It is vagile (moves about) its entire life, temporarily attaching to rocks or algae with byssal fibers. It feeds by sucking water through a siphon and filtering out plankton. It detects predators with its 40 or so primitive eyes around the rim of the mantle and with chemical sensors fixed to the ends of the 50 or so tentacles that extend out of the mantle when opened. If threatened it can escape by quickly and repeatedly opening and closing its shell to force out a jet stream of water. This jet propulsion allows it to travel up to three feet at a time, rest momentarily, and then do it again. For more information on this fascinating creature and my sources please see my Wikipedia entry at en.wikipedia.org/wiki/Leptopecten_latiauratus

Please send your Weird and Wonderful entries to newsletter@fitzgeraldreserve.org so they can be shared in our next issue. ♦

Editor's Note: We found an amazing youtube film of a scallop jetting away at: http://www.youtube.com/watch?v=_2iXHBuSIJY



Top: The kelp scallop, now quietly feeding, side view with eyes and tentacles visible. Bottom: Mantle view of the scallop. The eyes and tentacles are even more apparent in the color photos in this issue on our website: <http://fitzgeraldreserve.org/resources>

Maybe 40 minutes later I...saw a white streak zipping back and forth like a bullet under water.

Friends of Fitzgerald Marine Reserve

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

Board of Directors:

Bob Breen
Joseph Centoni
Linda Ciotti
Tom Ciotti, *President*
Marsha Cohen
Mary DeLong, *Vice President*
Susan Evans
Roger Hoppes
Bill Kennedy
Jenna Kinghorn
Karen Madsen
Dr. Tom Niesen
Hope Suchslan, *Treasurer*

Our Mission:

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

Newsletter Editors:

Janet Pelinka
Sasha Greenawalt

Design and Production:

Martie Sautter
Sautter Graphics and Print

Webmaster:

Sandy Emerson

Academy of Science Returns to Mavericks

Once again scientists at the California Academy of Sciences in San Francisco are planning to conduct intertidal surveys of the tidepools at Mavericks. Many of you who participated in last year's surveys may have fond memories of working for three days side by side with Academy scientists, finding and, with their help, identifying many species of animals.

The survey dates for this year follow. (You are not required to participate in all dates.)

- **Thursday, March 7, 12 noon-3 pm:** Refresher and training. They are planning fun activities related to species ID, protocols and use of iNaturalist.
- **Friday, May 10, early morning (time tbd):** Select species surveys at established plots.
- **May 25-29, 2-3 days tbd, early morning (time tbd):** Taxa bioblitzes throughout the reef. Some of the lowest low tides of the year occur on these dates.



Viewed from north of Pillar Point, this photo shows the rocks and tidepools at Mavericks (circled), just below and beyond the cliffs. Photo courtesy of Martie Sautter.

- **June 9-11, 2 days tbd, early morning (time tbd):** Select species surveys at established plots. The scientists will be on the reef two days in this period.
- **Sunday, June 23 & Monday, June 24, early morning (times tbd):** Select species surveys at established plots. Some of the best low tides of the year occur on these dates.

"We're excited to get back out to the tidepools and we hope you are too. Let us know your interest and availability as we'll send updates with specifics closer to each survey date," say Academy scientists Alison Young and Rebecca Johnson. They plan to send updates with more specific information as the dates approach. Those interested in volunteering in this event are welcome but must contact Alison at (415)379-5807 or ayoung@calacademy.org. ♦

What is a Taxa bioblitz?

- A taxon (plural: taxa) is a group of one (or more) populations of organism(s), which a taxonomist adjudges to be a unit.
- A bioblitz is an intense period of biological surveying in an attempt to record all the living species within a designated area.

To see the spectacular color of the creature photos in this newsletter, be sure to check it out on our website:

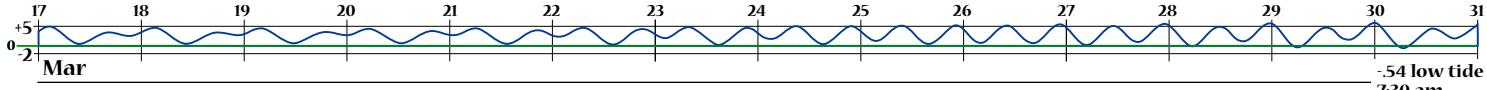
<http://fitzgeraldreserve.org/resources>

The graph displayed across the page bottoms shows tides for 03/17/13 to 08/03/13. Where the date appears is midnight. The reefs are accessible for exploring during low tides—at least 0 or below. See: <http://fitzgeraldreserve.org/resources> and click on "Tides" for a more detailed tide chart.

The winter afternoon low tides change to morning low tides in March. There are almost equally low tides several days before and several days after the noted low tide dates.

The lowest tides this period are:

-.54	3/30	7:30 am
-.27	4/12	6:39 am
-1.40	4/28	7:15 am
-.67	5/11	6:18 am
-1.86	5/26	6:12 am
lowest tide of the year		
-.72	6/9	5:59 am
-1.8	6/24	5:57 am
2nd lowest tide of the year		
-.47	7/8	5:38 am
-1.36	7/22	4:53 am



Special Tidepool Day

by Susan Evans

On Sunday, February 10, as part of the mentoring program for the 2013 training class, five FMR naturalists and nine training class students ventured out to Mavericks beach at Pillar Point. Unfortunately for us, the San Francisco Chronicle had run an article that morning encouraging people to spend the day at Mavericks! Thus, when we arrived, the parking lot was completely full. So we had to park and walk many extra blocks to reach the beach. Of the 14 training class students originally enrolled for this event, five had to cancel (including the two rangers in the training class who had to manage crowds at FMR).

Once on the beach, our group discovered a beautiful ostrich-feather hydroid with gorgeous golden brown plumes. At this point, two of the students realized that there was a small stream to



Ostrich-feather hydroid (photo from Internet)

cross and they were without boots! Out on the reef, many of us searched for nudibranchs. When we had a collection of them, Susan Evans talked about the large yellow sea lemon (*Peltodoris nobilis*) and the smaller orange sea lemon (both with black dots on the dorsum and white gills). Other nudibranchs found were *Acanthodoris rhodoceras*, *Acanthodoris nanaimoensis* (rufus-tipped) and the ringed dorid (*Diaulula sandiegensis*).

A knobby and a leather sea star were found, and Jan Pelinka talked about echinoderms. Diann Chethik spoke with some students about mussels, barnacles and chitons. Kris Liang and Ron Olson helped to find critters and educate the students. Ron cheered everybody up with his homemade cookies!

Despite a few obstacles, at the end of the day, everyone seemed to have had a fun, rewarding and delicious educational experience! ♦



Ron Olson shares treats.



Susan Evans discusses nudibranch features.



Acanthodoris rhodoceras



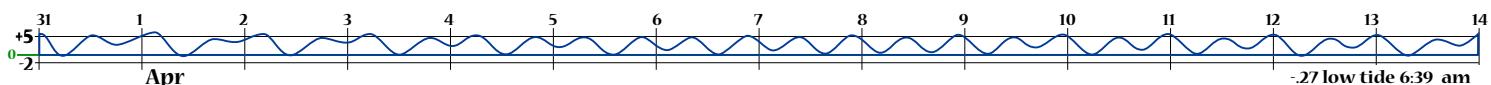
Susan Evans gathers students at the tidepools.



Diann Chethik discusses the mussel beds.



A sea lemon



The San Mateo County Marine Protected Area Council

What took years to establish now needs to be implemented.

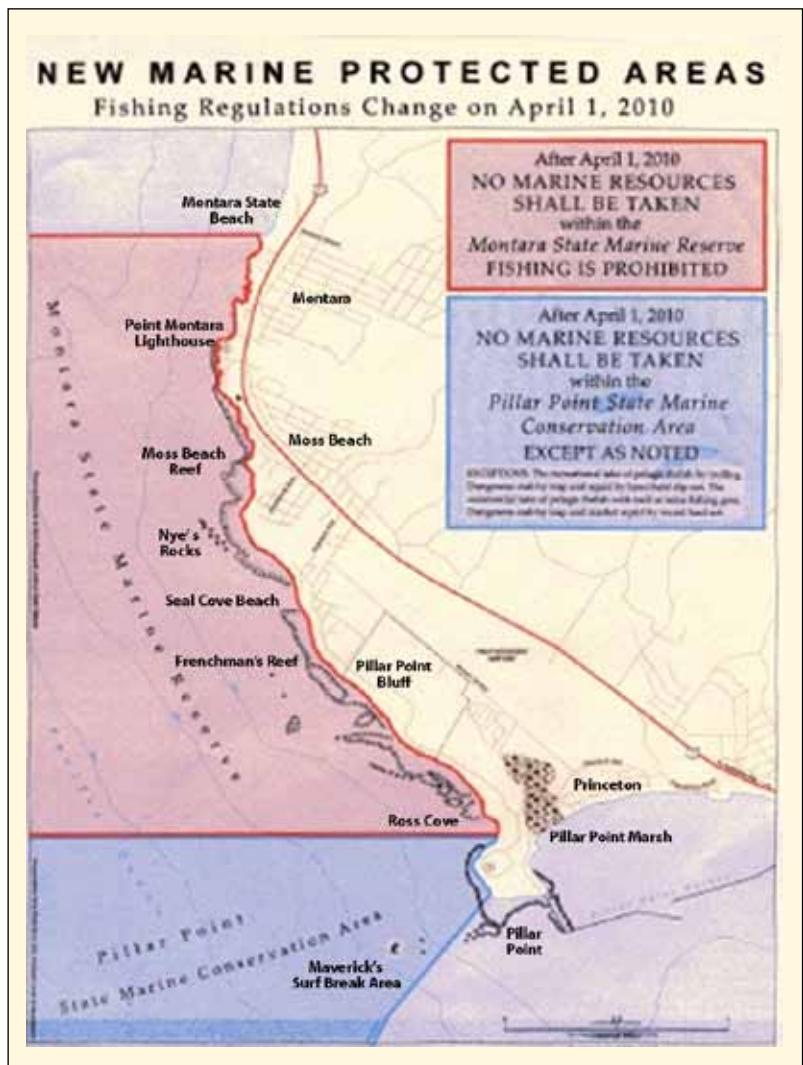
by Tom Ciotti

State Marine Reserves are given the highest level of protection by the MLPA, and no living, geological, or cultural marine resource may be taken from them

...implementing the goals, policies and regulations of the MLPA...falls to the California Department of Fish and Wildlife (DF&W), the lead managing agency for the MPAs.

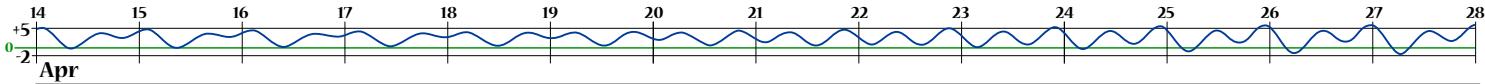
In 1999 California enacted the Marine Life Protection Act (MLPA). That Act contemplated the establishment of a network of Marine Protected Areas (MPAs) along the entire length of the California coast. San Mateo County lies in the North Central Coast section of MPAs and the MPAs along the San Mateo Coast became effective on May 1, 2010. The Fitzgerald Marine Reserve now lies wholly within the new Montara State Marine Reserve which extends from the south end of Montara State Beach to the south end of Ross' Cove adjacent to Pillar Point and seaward three nautical miles from the mean high tide line. State Marine Reserves are given the highest level of protection by the MLPA, and no living, geological, or cultural marine resource may be taken from them.

While just establishing these MPAs was a Herculean effort in itself, taking years to accomplish, the next step, implementing the goals, policies and regulations of the MLPA within the MPAs, is an equally daunting task. That task falls to the California Department of Fish and Wildlife (DF&W), the lead managing agency for the MPAs. Given the magnitude and scope of the implementation program, DF&W realized it needed the help of local participants to make the program successful. Thus, DF&W, in collaboration with the California Natural Resources Agency (CNRA), conceived of establish-



Fitzgerald Marine Reserve now lies wholly within the new Montara State Marine Reserve. Map by Tom Reed, SIMoN/Gulf of the Farallones National Marine Sanctuary.

ing a series of regional MPA Councils composed of a diverse community of participants engaged in their local MPAs. The first of these Councils was formed in Orange County under the leadership of Calla Allison, who had been a regional stakeholder in the MPA process for the Orange County MPAs and was the Marine Protection Officer for the City of Laguna Beach. Information about the Orange County MPA Council can be found at www.ocmarineprotection.org. The mission of these Councils is summarized in the mission statement of the Orange County Council:



"Collaborating at a regional level to preserve and protect Orange County MPAs through ongoing monitoring, education, outreach and enforcement."

Calla Allison has now been tapped by DF&W and CNRA to establish additional regional MPA Councils along the California coast. Her title is Director of Community Partnerships Marine Life Protection Act Initiative. Her first priority is to establish a Council for the MPAs located in San Mateo County. To get things started she reached out to San Mateo County Parks (SMCP), the Friends of Fitzgerald Marine Reserve (FFMR), Neil Merrilees, San Mateo County Parks Commissioner, and Bob Breen, who had been a regional stakeholder in the North Central Coast MPA establishment process.

Calla, Bob, Neil and representatives from SMCP and FFMR had an initial meeting on November 21, 2012 to discuss the MLPA Community Partnership program and identify potential participants in the San Mateo County MPA Council. Those potential participants were: California Academy of Sciences; DF&W; California State Parks; FFMR; Gulf of the Farallones National Marine Sanctuary (GFNMS); GFNMS Advisory Council; Monterey Bay Sanctuary Foundation; Ocean Conservancy; Pillar Point Harbor District; Save Our Shores; SMCP; San Mateo County Parks Commission; and the San Mateo County Sheriff.

Calla contacted representatives from each of those organizations and invited them to attend a meeting on January 14, 2013. At that meeting Susan Ashcraft, DF&W Senior Environmental

Science Specialist MPA Outreach Coordinator, gave a presentation titled, "Managing the Statewide Network of Marine Protected Areas: Role of California Department of Fish and Wildlife and Local Partners," and she and Calla fielded questions from the attendees.

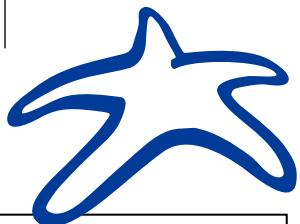
Each attendee organization was asked to identify its resources and activities relating to the San Mateo County MPAs. Following the meeting Calla compiled a list of those resources/activities and identified a list of gaps as potential items for the San Mateo MPA Council to work on initially. That list is:

1. Address displacement activities at Pillar Point
2. Outreach to recreational fisherman, "smart talks"
3. Insert multiple languages/universal symbols on signs and brochures
4. Add MPA signage
5. Develop local educational guidelines
6. Focus docent outreach/education on general public
7. Contact and educate colleges on MPAs/protocols
8. Develop local enforcement response plan
9. Conduct enforcement training
10. Interpretive kiosk.

FFMR representatives attending Council meetings are Tom Ciotti, FFMR President, and Marsha Cohen, FFMR Board member. As you can see, they have their work cut out for them!

Note: For further information on the establishment of the MLPA, see the June 2010 issue of *Between the Tides*. ♦

Note: The importance of protected marine reserves is discussed in the article on page 6, *Ocean Climate Change: The Rocky Intertidal Response*: "Fully protected marine reserves may be the most effective way and one of the few tools that local communities will have under future climate scenarios to combat the negative effects of climate change on marine ecosystems and livelihoods."



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

Membership Secretary, P.O. Box 669, Moss Beach, CA 94038, or through our website: <http://fitzgeraldreserve.org>

Contribution Levels:

- \$25 \$100 \$1000
 \$50 \$500 Other _____

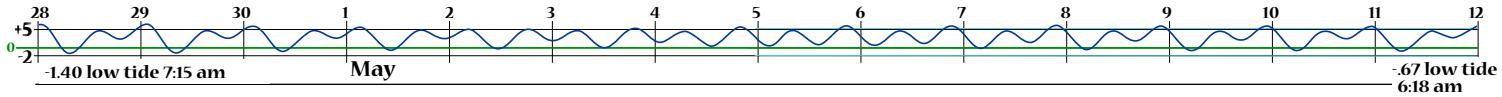
I want to double the value of my gift through my employer's matching gift program (please enclose the matching gift forms).

Name _____

Address _____

City _____ State _____ Zip _____

Email _____



Ocean Climate Change: The Rocky Intertidal Response

by Bob Breen

*The greatest concern
is rising air and
sea temperatures
which could produce
mass mortalities of
intertidal organisms.*

Evidence is accumulating rapidly that ocean structure, both globally and locally, is changing at a rate faster now than was predicted even a few years ago. Physical and chemical changes, driven by increased carbon dioxide in the atmosphere, include sea level rise, ocean

acidification, and rising temperatures. These changes are resulting in biotic responses both worldwide and at Moss Beach. Biotic responses at Moss Beach are physiological responses of intertidal organisms, changes in population structure and range shifts.

Moss Beach, called one of the most biodiverse intertidal regions in the state, is being affected by complex combinations of sea and atmospheric conditions that are rapidly changing in geological terms.

The greatest concern is rising air and sea temperatures which could produce mass mortalities of intertidal organisms. Extreme heat waves have caused mass mortalities in the past at Moss Beach, when daytime temperatures have reached into the high seventies during afternoon low tides for several days in a row. In one particular instance this resulted in mass mortalities of rock crabs and sea urchins, many of them washing up onto the beach after three to four days of high temperatures. During low tide intertidal organisms can reach a body

species, the mussel and two species of porcelain crab, respond to elevated temperatures with increased heart rates, eventually leading to heart collapse and death. Heart collapse occurred in these species at body temperatures between 79 and 88 degrees F.

Many intertidal invertebrates at the reserve are already living on the edge of their thermal tolerances. For example, the thermal limits of the black turban snail have been found to be within 1 to 3 degrees of temperatures that are already experienced in the intertidal of Moss Beach. Because responding to these high temperatures requires energy to protect cellular function, the turban snail must reduce expenditures elsewhere. Potential trade-offs could be made by decreasing growth, activity or reproduction. Several researchers have studied the response of the ochre star to heat stress. The ochre star, a keystone species in the intertidal, was affected negatively when exposed to temperatures higher than 73 degrees F.

Researchers in general have found that intertidal invertebrates' ability to acclimatize to increasing temperatures seems to be greatest in moderately variable habitats, such as shallow subtidal areas. Conversely, those living in highly variable regions such as highest intertidal zones have limited abilities to adapt to changing conditions. They further found that organisms with the narrowest and the widest temperature ranges live closest to their thermal limits and have only limited ability to acclimate. These will be the species, both plant and animal, that will have to adapt, move away or risk death.

The other major affect on intertidal plants and animals is ocean acidification, which will affect the ability of marine species to produce ➤

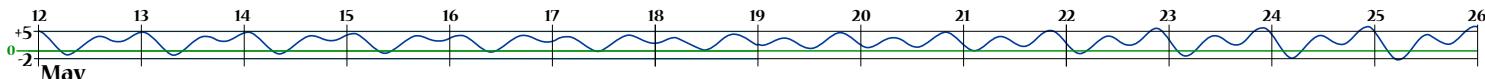


Above: Nail brush algae
Below: Rockweed algae



temperature as high as 104 degrees F and then at high tide down to 50 degrees F.

Studies have addressed these questions in the California intertidal where the temperature gradient is steep. Studies have found that three



calcium carbonate shells. A wide variety of marine organisms that could be impacted by ocean acidification include bivalves, snails, sea stars, sea urchins, crabs and calcareous seaweeds such as coralline algae. Of particular concern are larval stages of these organisms, which have been found to be more susceptible to ocean acidification. A review of the science literature found that 67.5% of all calcium carbonate producing organisms studied had a negative response to increased ocean acidity. One caveat should be mentioned when interpreting these results. Most of these studies were short term and under laboratory conditions. What is poorly understood is the long-term effect of gradual changes in ocean chemistry. This highlights the fact that ocean acidification responses are likely to be species specific.

What is the future of the intertidal at Moss Beach? Sea surface and air temperatures taken at Hopkins Marine Station since 1931 have shown a 1.4 and 3.4 degree F increase respectively. These temperature increases, arguably experienced at Moss Beach, have resulted in changes in the intertidal community at both at Hopkins and Moss Beach. For example, a massive decline in the cover of rockweed, *Pelvetia compressa*, has been documented both in Monterey and Moss Beach. This small rockweed has been replaced by turf building species such as the nail brush algae. In 1969 the cover of three species of rockweeds at Moss Beach near Cypress Point was heavy and dense. Of these three species, the two narrow bladed kinds, *Pelvetia* and *Pelvetiopsis*, are now sparse on rocks below this point, occurring mostly on the sides of rocks away from the direct glare of the sun. The larger, wide bladed, and more common rockweed, *Fucus*, while diminished, is now the most common seaweed in this location.

There have been significant changes in the composition of intertidal invertebrates at Moss Beach during the past 40 years. Most notable is the rapid increase in the populations of the sunburst anemone, a southern species; whereas the formerly common northern giant green anemone has been in recent years increasingly hard to find. Other northern species of tidepool invertebrates that were formerly common at Moss Beach have also declined. These are the six rayed star, flat limpet, and the porcelain crab. Conversely a southern

barnacle that has been moving north and increasing in number at Moss Beach is the southern red barnacle *Tetraclita rubescens*. Formerly rare at the Reserve the red barnacle is commonly seen in and near mussel beds.

Researchers who have studied range shifts such as those that are occurring at Moss Beach have predicted that first, southern species should colonize sites north of their present range, whereas northern species will become locally extinct near their southern boundary. And second, the abundance of southern species should increase and the abundance of northern species decrease.

Until recently there has been little evidence that local protection in the form of marine reserves do anything to mitigate climate change. Last year Fiorenza Micheli and six other authors found evidence that marine protected areas enhance resilience to climate impacts.

They found that the establishment of marine reserves seems to be “one of the few management tools available to local communities to combat the harmful effects of large scale environmental impacts.” Here they found that marine reserves increase the resilience of marine populations to withstand mass mortality events. Experimenting with the pink abalone from Baja California they found that “abalone populations remained stable because of the large body size and high viable egg production found in protected adults. Thus local protection provided resilience through greater resistance and faster recovery of protected populations.” Further, “this resilience extended to adjacent unprotected area through larval spillover.” Fully protected marine reserves may be the most effective way and one of the few tools that local communities will have under future climate scenarios to combat the negative effects of climate change on marine ecosystems and livelihoods. ♦



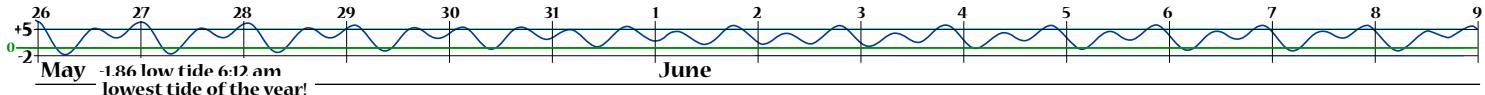
Above: Sunburst anemone

Below: Red barnacles



The other major affect on intertidal plants and animals is ocean acidification, which will affect the ability of marine species to produce calcium carbonate shells.

Last year Fiorenza Micheli and six other authors found evidence that marine protected areas enhance resilience to climate impacts.



Nudibranch Survey

Nudibranchs are soft-bodied, carnivorous mollusks with no shells. The word “nudibranch” comes from the Latin nudus, naked, and the Greek brankhia, gills. They are very small, ranging from under one inch to 6 inches, making them difficult to spot.

The fourth nudibranch survey of 2012 was held in January 2013 due to inclement weather that occurred on the planned December date. Seven participants (Tom Ciotti, Susan Evans, Sasha Greenawalt, Karen Madsen, Sandy Meyers, Jan Pelinka and Mary Ellen Hannibal) joined coordinator Julie Walters on the reef at

Mavericks. Although there was a very low tide (-1.5) the rough surf made the water very cloudy. The poor visibility caused the numbers to be low. Julie thanks everyone for their enthusiasm and for coming out on a very cold day. Following are the survey results:

Acanthodoris nanaimoensis (2)
Cadlina modesta (2)
Dendronotus subramosus (1)
Diaulula sandiegensis (1)
Doriopsilla albopunctatus (1)
Doris montereyensis (1)
Geitodoris heathi (8)
Hallaxa chani (2)

Hermisenda crassicornis (3)
Peltodoris nobilis (5)
Phidiana hiltoni (5)
Rostanga pulchra (1)
Triopha catalinae (4)
Triopha maculata (6)



Survey participant in deep channel at Mavericks



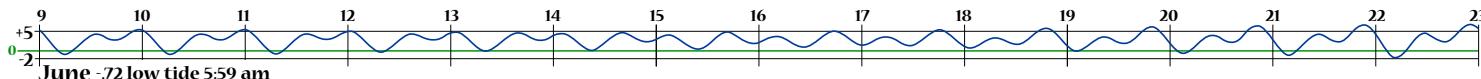
Dendronotus subramosus



Survey participants



Survey participants



Volunteer Spotlight

Susan Evans, Nudibranch Afficionado

She came in with a bang, born in New York City on the 4th of July. Susan Evans was raised and educated in Connecticut. On her third visit to California she landed a teaching job in special education in the Palo Alto School District, where she taught learning handicapped students at all levels, elementary, middle school and high school.

Susan's love of the ocean began at early age. She has fond memories of exploring the east coast beaches from Nantucket to Hilton Head. She became interested in the docent program at Fitzgerald Marine Reserve when she saw a flyer posted at Pillar Point. She took the training class in 2007 and has been very involved with work at the Reserve since then. Susan's background in education has been beneficial to the program. She loves teaching children about tidepools and mentoring new docents on the reef. She has been instrumental in developing the docent training program for the past two years. ♦

Susan always participates in the quarterly nudibranch surveys. Indeed her keen eye and knowledge of nudibranchs has enriched the experience of all who participate. She has identified numerous species both at Fitzgerald and Mavericks, her favorite being *Cadlina luteomarginata*.

Susan's travels with her husband have taken her to all seven continents. She swam with dolphins in New Zealand and with sea lions in the Galapagos Islands. Besides travelling, her hobbies include bicycling along the coast, raising vegetables in her yard, visiting with family and friends, and exploring other tidepools along the California coast. ♦

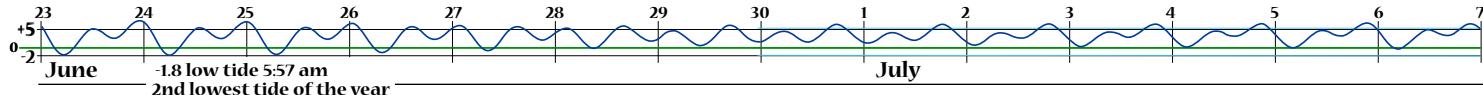


Susan's favorite nudibranch, *Cadlina luteomarginata*

Susan's travels with her husband have taken her to all seven continents. She swam with dolphins in New Zealand and with sea lions in the Galapagos Islands.



Susan with her 2013 Training Class



Renovated Trail Opens At The Reserve

by Diann Chethik



Side view of new bridge



San Mateo County Supervisor Don Horsley delivers his address.



Commissioners Marico Enriques and Neil Merrilees cut the ribbon as Supervisor Horsley supervises.

The morning of February 13, dignitaries and locals gathered at the new trailhead behind the reserve parking lot to celebrate the opening of a new and better bridge and beautifully groomed trail which is now part of the California Coastal Trail.

County Supervisor and former County Sheriff Don Horsley delivered the opening remarks. He acknowledged the hard work of several cooperating organizations including the San Mateo County Parks and Recreation Commission, the Commission on Disabilities, the Mid-Coast Advisory Council and the Coastal Conservancy. He thanked the members of the Dardanelle family present at the festivities for their generous donation of the land. He praised the attending owners of the Half Moon Bay Grading Company for their excellent work.

The bridge is higher and wider than its predecessor and is reinforced with a fiberglass structure that looks like steel. The walking surface is made of a gravel composite that is porous and more durable than the previous surface. The bridge and the trail are disability accessible.

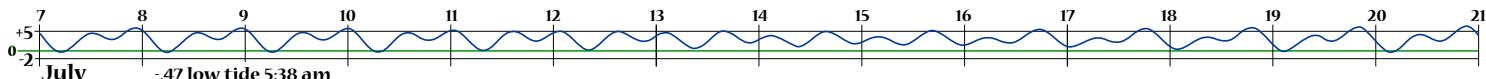
Nicole Fernandez, representing State Senator Jerry Hill, presented a certificate of recognition to the County for its fine work. Janet Deal of the State Coastal Conservancy spoke about the Conservancy's involvement in this project and also of plans for future projects, the next being the building of restrooms on the portion of the Coastal Trail that will be created on the closed section of Devil's Slide. ➤



Our new sign



Susie Castoria (seated) and Lucy Williams (far right) represent the Commission on Disabilities, Ben McMullan (left) from the Center for Independent Living in Berkeley.



Pupping Season is Here

During the spring at FMR Rangers and Naturalists keep an eye out for harbor seal pups. Some of the pups can arrive early in the year but peak pupping season is late April to early May. By the end of January this year we already had 2 newborns.

This is a vulnerable time for harbor seals who are nursing their young. Recently there have been reports of flushing (return of seals to the water due to disturbance) both at Nye's Rocks and at the haulout area at Cypress Point. Too few orange cones (indicating areas to stay away from) have been put out and it is sometimes difficult for visitors to understand which areas are designated as restricted. And seals blend in so well with the rocky reefs and beaches that some visitors have not noticed they are approaching a seal until they are too close.

Please do your utmost to aid these creatures who faithfully honor our Reserve with their presence. We can all act as good stewards by helping to educate the public about safe distances from which to observe the seals in all seasons. By doing our part we can keep Fitzgerald a safe place where seals can thrive and use the protected coves as nurseries for their young.

Please report any disturbance of harbor seals to Park Rangers. Above all, don't attempt to rescue a seemingly abandoned pup. The mother



Tinsel

may be out foraging for food. To report sick or abandoned pups please contact:

Park Rangers: 650-728-3594

Marine Mammal Center: 415-289-7350 ♦

Trail *continued from page 10*

Supervisor Horsey invited San Mateo County Parks and Recreation Commissioners Marico Enrique and Neil Merrilees to cut the ceremonial ribbon spanning the bridge. A crowd

of some 50 plus people attending followed Supervisor Horsey and Commissioner Merrilees for a pleasant walk up the length of the trail ending near Cypress Point. ♦



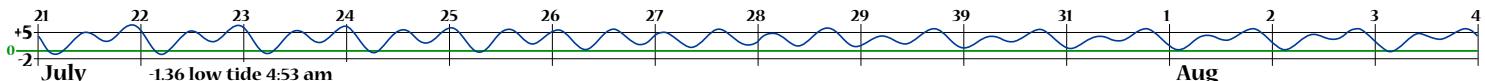
Janet Deal, State Coastal Conservancy



Dardanelle trail



New kiosk at trail entrance near Cypress Avenue



Please report any disturbance of harbor seals to Park Rangers. Above all, don't attempt to rescue a seemingly abandoned pup. The mother may be out foraging for food.

LiMPETS Study Field Guide

The LiMPETS program has published its Rocky Intertidal Field Guide 2012 funded by the Friends of Fitzgerald Marine Reserve. The new guide is available for viewing at http://limpetsmonitoring.org/docs/LiMPETS_Field%20Guide_2012.pdf

The photos in the guide are accompanied by notes to help the students and others who are participating in the study identify the marine life being counted.

In case you missed our previous article explaining this program, this acronym stands for: Long-term Monitoring Program and Experiential Training for Students. About 4000 carefully trained students throughout the state are participating in LiMPETS.

(Fitzgerald Marine Reserve has been a LiMPETS partner since 2006.) This hands-on program was developed to monitor the coastal ecosystems of California's national marine sanctuaries to increase awareness and stewardship of these important areas.

Two distinct programs make up the core of the LiMPETS network: the Rocky Intertidal Monitoring Program and the Sandy Beach Monitoring Program. From the Channel Islands to the Gulf of the Farallones and beyond, students are using the same LiMPETS protocols to monitor their local intertidal areas. This is truly a collaborative program that is managed locally by the Farallones Marine Sanctuary Association (FMSA) in partnership with NOAA's Gulf of the Farallones National Marine Sanctuary. ♦



Students from Lighthouse Community Charter School use reference charts to identify species.

Pink Acorn Barnacle (*Tetraclita rubescens*)



- Large barnacle, up to 2 inches (5 cm) wide.



- Shell is reddish-pink, appearing thatched.



- Do NOT count the above barnacle; similar in size but whitish-brown in color.

One set of photos with notes from the Field Guide.