

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 0

Fitzgerald Marine Reserve Projects Update

Editor's Note: As we reported in the April 2009 issue of Between the Tides, the San Mateo County Department of Parks has a number of projects going on at Fitzgerald Marine Reserve. Friends of Fitzgerald Marine Reserve Vice President Tom Ciotti got us this status update from Dave Holland, Director of the Department of Parks. — JK

Tidepool Sculpture

The County was considering having an outdoor sculpture representing the marine life in the high, mid- and low-tide zones constructed and placed near the access ramp from the parking lot. Following several public meetings, the County has decided to not move forward with the sculpture.

It was to be funded in part through a grant from the National Marine Sanctuary Foundation. Funds from that grant have been redirected to support the Seal Cove Stairway Replacement and Interpretive Signage projects (discussed below).

Seal Cove Stairway Replacement

The Seal Cove Stairway connects the bluff to Seal Cove Beach and is a very popular access point used by neighbors, visitors and docents leading groups of students. This approximately 160-foot trail access improvement project will reha-



The large sculpture being planned for the reserve has been canceled.

bilitate and replace an existing staircase that is in very poor condition. The top section of the stairway will have fifty-two 5-foot-wide redwood steps with 4'-10" stainless steel handrails. There will be a two-foot shoulder on the cut side and three-foot shoulder on the fill side. Landings will occur after each of two sections of nineteen stairs. A five-foot-wide gravel walkway will bring the visitor to another section of thirty-eight stairs. Midway along the gravel



The Seal Cove access trail will undergo improvements that include wider stairs, railings, landings, and interpretive signage.

Midway along the gravel walkway will be a ten-foot by ten-foot redwood viewing platform that will allow visitors to admire views of the beach

walkway will be a ten-foot by ten-foot redwood viewing platform that will allow visitors to admire views of the beach.

Construction documents have been prepared, permits have been secured, and the project has been bid and awarded. The bid award was for \$239,000 and construction began in January 2010. Needed funding to complete this project was secured from the National Marine Sanctuary Foundation grant originally intended for the Tidepool Sculpture.

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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:

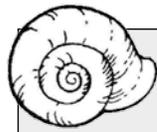
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Our Mission:

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 2/8/10 to 9/5/10. 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:

-0.81	2/26	2:53 pm
-0.76	4/1	6:58 am
-1.30	4/29	5:54 am
-1.37	5/16	7:01 am
-1.39	5/28	5:41 am
-1.62	6/13	6:03 am
-1.47	7/12	5:44 am
-1.01	8/9	4:38 am



Calendar of 2010 Events

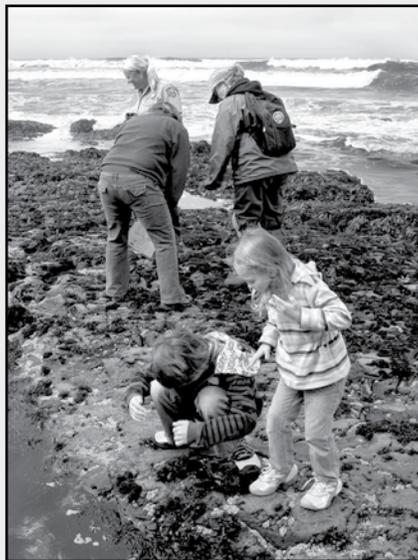
The following are FREE activities for the whole family. These events are open to the public, so encourage your friends and neighbors to come along. Check our web site or contact Ranger Sarah Lenz at (650)728-3584 or slenz@co.sanmateo.ca.us for more information. Some activities have a limited number of participants; be sure to register early!



Family Fun Days give parents and kids a chance to have fun together.



During a Family Fun Day in 2009, we learned All About Algae — we even tasted it!



In 2010, we'll learn about Marvelous Molluscs and then search for the animals we've learned about in the tidepools.

Saturday April 24th — 9 a.m. to Noon:

Join us for our annual Earth Day Beach Cleanup at Surfer's Beach in El Granada. Meet on the west side of the intersection of Coronado Street and Highway One. (Turn east at the traffic light and park on Obispo Rd.) All ages welcome.

Saturday May 16th — 7:30 a.m. to 10:30 a.m.:

Learn all about Marvelous Molluscs at this Family Fun Day. We'll explore mollusc anatomy and adaptations, learn how different animals feed, figure out where shells come from, and get insights into the amazing lives of octopus and squid, then search for molluscs in the tidepools. Open to kids 8 - 14 with accompanying adult(s). SPACE IS LIMITED and REGISTRATION REQUIRED by May 1 — email: slenz@co.sanmateo.ca.us and provide names and ages of your party members. Meet at the FMR ranger station.

Saturday June 5th — 8 a.m. to 11 a.m.:

Join us for our World Ocean Day Beach Cleanup at Surfer's Beach in El Granada. Meet on the ocean side of the intersection of Coronado Street and Highway One. (Turn east at the traffic light and park on Obispo Rd.) All ages welcome.

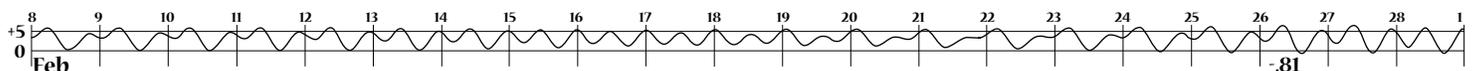
Thursday July 15th — 7:30 a.m. to 10:30 a.m.:

Breakfast at the Reserve. Enjoy coffee and muffins while you learn about the feeding strategies and anatomical adaptations of intertidal creatures. Then roam the tidepools during a great low tide to find the animals you've learned about.

Saturday September 25th — 9 a.m. to Noon:

Join us for our annual California Coastal Cleanup Day Beach Cleanup at Surfer's Beach in El Granada. Meet on the ocean side of the intersection of Coronado Street and Highway One. (Turn east at the traffic light and park on Obispo Rd.) All ages welcome.

Editor's Note: Due to uncooperative low tides, FFMR has cancelled Junior Rangers Day Camp for 2010.



One Enchanted Evening

by Richard Lau

On December 17, 2009, Friends of Fitzgerald Marine Reserve held its biggest-ever nighttime tidepool tour. Over sixty volunteers, docents, and members of the public shared this wonderful experience.

The evening weather turned out perfect for tidepooling: clear, not too chilly, and starting off with a beautiful sunset. Before folks headed down to the beach, we were treated to warm beverages, tasty snacks and pleasant conversation.

On our walk down to the tidepools, we passed several harbor seals who kept a watchful eye while we respectfully lowered our voices and gave them their space.

As regular tidepoolers know, the variety of life in the intertidal is incredible. We saw barnacles (volcano, buckshot, acorn, and gooseneck),

The sea stars in the tidepools rivaled those in the sky.

anemones (starburst, giant green, moonglow, and aggregated), mussels, chitons, limpets, and turban shell snails. Algae were well represented by sea palms, encrusting coralline algae, branching algae, sea lettuce, and surf grass.

The sea stars in the tidepools rivaled those in the sky. We saw a rainbow of bat stars and large ochre sea stars in orange and purple. Our sharp-eyed docent pointed out a tiny six-ray sea star, enabling us to spot several others during the night.

Kelp crabs and rock crabs were also in good attendance, and hermit crabs seemed particularly active.

We saw bright green and blue broken-back shrimps, purple sea urchins, numerous sculpin, and even a large white nudibranch! We also found a top snail shell and an abalone shell.

There was a strong feeling of community among the human participants. It was uplifting that so many people were interested in the natural surroundings and are striving to keep it protected. Plus many pairs of eyes can spot more

than one pair can. More than once, tidepoolers were almost led to their soggy doom with siren cries of, "Come look what I found!"

It's because of the sharp eyes of our fellow tidepoolers that we witnessed the real treats of the evening. One lady spotted a rock prickleback, an eel-like fish, that was nearly a foot long. Another found a little white tubeworm. A photographer displayed an enlarged view of a dwarf sea cucumber on the viewscreen of his camera.

However, what made the evening really special was the literal walk-on cameo of a reddish-orange octopus. It actually climbed out of the water and crawled across rocks and seaweed, showing off its stretchy sucker-studded tentacles and remarkably flexible body for several minutes. It was a truly spectacular sight!

More than three months have passed, but I'm certain I'm not the only one who retains vivid memories of our night tidepooling experience. A big thank you to co-organizers Ranger Sarah Lenz and Jenna Kinghorn, and all of the volunteer naturalists who made this event possible! ♦

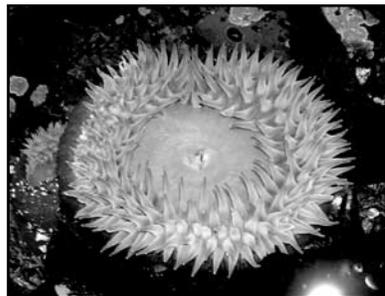


photo: Scott A. Snow

A highlight of the evening was this reddish-orange octopus which climbed out of the water and crawled across rock and seaweed, showing off its stretchy sucker-studded tentacles.



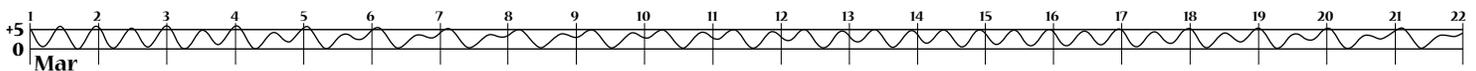
Purple sea urchins and pink coralline algae showed up well under our flashlight beams.



Sea anemones seemed to glow with an inner radiance under night tidepoolers' flashlight beams.



Night tidepoolers found many types of barnacles.



Interpretive Signs have been designed to help visitors learn about the natural history of the tidepools, marsh and bluff habitats and inhabitants, human history of early residents and those of recent times, geology, tides, and ocean processes.



Interpretive signs will be located throughout the reserve at strategic overlook points along the main trail.



New interpretive signs will go up throughout the reserve, including along the Pillar Point marsh trail, in spring of 2010.



Planning and permitting is underway for improvements to the access ramp at the main entrance.

bridge will be undertaken. Design, plans, and permitting have been initiated. Implementation of this project was placed on hold due to the State grant funding freeze, however those funds are now available. To date, concept plans are completed, public meeting on plans was conducted, and construction plans and specifications are being prepared. ➤

Interpretive Signage

The Interpretive Signs have been designed to help visitors learn about the natural history of the tidepools, marsh and bluff habitats and inhabitants, human history of early residents and those of recent times, geology, tides, and ocean processes. Welcome and regulatory signs offer information about the reserve's features, rules and regulations. The signs will be installed throughout the reserve at Pillar Point Marsh, Pillar Point Bluff, Seal Cove, Nye's Overlook, Moss Beach Reef pathway and at the reserve's parking lot in Moss Beach. The signs have received final review and are being fabricated. They will be placed at the reserve sometime in early spring 2010.

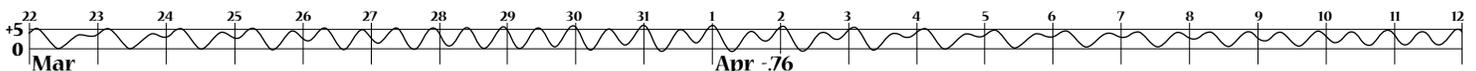
Access Ramp to Beach from North Lake Parking Lot

Design plans are being prepared to improve the coastal access ramp from the corner of North Lake Street and Nevada Avenue to the beach. The existing ramp and overlook are proposed to be reconstructed to improve safety and accessibility to the overlook and beach. Implementation of this project was placed on hold due to the State grant funding freeze, however those funds are now available. To date, concept plans are completed, public meeting on plans was conducted, and construction plans and specifications are being prepared. A total of \$175,000 in grant funding for design and permitting of this project, the San Vicente Bridge (discussed below), and the California Coastal Trail (discussed below) has been secured from the California Coastal Conservancy and State Parks Proposition 40. Funding for construction has not been secured.

San Vicente Creek Bridge

As part of the completion of the California Coastal Trail segment in Fitzgerald Marine Reserve, the replacement of the bridge across San Vicente Creek with an improved free span

As part of the completion of the California Coastal Trail segment in Fitzgerald Marine Reserve, the replacement of the bridge across San Vicente Creek with an improved free span bridge will be undertaken.



California Coastal Trail

San Mateo County Parks will complete the California Coastal Trail segment in Fitzgerald Marine Reserve from the Moss Beach main park entrance along the east side of the reserve to Cypress Avenue. Implementation of this project was placed on hold due to the State grant funding freeze, however those funds are now available. To date, concept plans are completed, public meeting on plans was conducted, and construction plans and specifications are being prepared.



In the future, the parking lot will undergo changes to improve water quality and be a green demonstration project.

Education Center

In December 2004 County Parks completed a Conceptual Plan for Interpretation at the Fitzgerald Marine Reserve. This plan identified the need for a 3,000 sq. ft. Education Center with interpretive exhibits. The proposed Education Center would be located in the western end of the existing parking lot at the reserve main entrance parking lot located at North Lake Street and Nevada Ave. The estimated cost for the Education Center project is \$4.3 million.

Following a number of public meetings during 2009, County Parks has determined the design for the Education Center needs to be scaled back to better align with the neighborhood, Department funding, and public needs. The Department will be reviewing green building plans for a modular style building that will have a reduced footprint from the original plan. Cost estimate for the structure will be in the \$500,000 or less range. No immediate timeframe has been established for implementation and no funding has been secured.

Parking Lot

The San Mateo County Department of Parks is implementing a stormwater and runoff treatment demonstration project for improving the existing parking lot. The project will include the placement of signs that explain the stormwater pollution prevention site design and treatment features and the protection of the reserve's water quality. Key design elements will include pervious paving, stormwater planters, vegetated and stormwater swales, and rain gardens. A conceptual plan and survey of the parking lot has been completed. Two grants for a total of \$450,000 are available for the project. Implementation of this project has been placed on hold due to the State grant funding freeze.

San Vicente Creek Restoration Project

The State funding award process for this project is on hold due to the State budget crisis. ♦

Key design elements will include pervious paving, stormwater planters, vegetated and stormwater swales, and rain gardens.

Friends of Fitzgerald Marine Reserve

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

Contribution Levels:

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

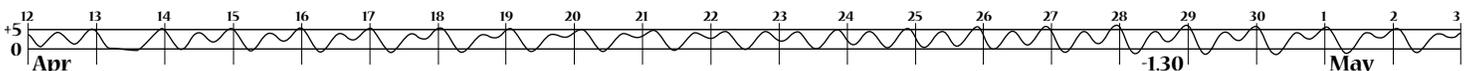
- I want to double the value of my gift through my employer's matching gift program (please enclose the matching gift forms).

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Paleontology Students Visit Fitzgerald Marine Reserve

Text and Photos by Scott A. Snow



Conch fossil



Pink bay star



Monterey doris



Six-ray star in palm of hand



Hermissenda on snail

FMR often hosts college biology classes which come to see the reef's diverse sea life, but on Saturday, November 14th, 2009 we hosted a paleontology class of 20 students from the City College of San Francisco. This group was as interested in learning about long-extinct sea life as the creatures of today. I jumped at the chance to be one of their volunteer naturalists, and it turned out to be as rewarding for me as for the students.

Professor Joyce Lucas-Clark led us north from the main entrance. I had never explored this area, which turned out to be as fascinating as any other part of FMR. We passed the kelp cove and continued 20 feet out onto a geological formation called a syncline. Under our feet were two- to four-foot tall, two- to five-foot wide, pointy, vertical rows of black and gray rock that extended from the sea cliff 50 or so yards out into the ocean, not unlike mini-mountain ranges.

Lucas-Clark explained that between four and six million years ago this unique geological formation wasn't rock at all. Rather, it was the ocean floor about 10-40 meters deep. According to the professor, whenever there were large rain storms the rivers would swell, rush out into the ocean,

and wash near shore and intertidal sea life deeper into the ocean until it settled on the ocean floor. This was happening while giant mastodons roamed the land and ferocious sharks longer than a school bus patrolled the seas.

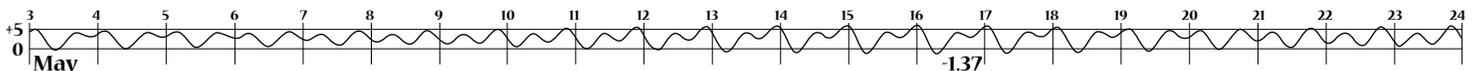
Over time the ocean floor sediment solidified into the soft dark sandy stone we were standing on. To my amazement, Lucas-Clark pointed out thousands of shell fossils embedded in the rock. I wondered how many people had walked across the syncline and never realized what was under their feet.

After giving us time to look at all the fossils around us, including a conch some six to eight inches long, Professor Lucas-Clark turned to point to a spot on the sea cliff where the rock face appeared crushed and cracked. It turns out this was a real live seismic fault called the Seal Cove Fault. This fault and other regional faults have generated many earthquakes over millions of years that at first buried the syncline deep under the sea floor, then twisted it vertically, and eventually pushed it upwards until with some erosion it became exposed as we see it today.

After this lesson in geology, paleontology, and seismology, the college students switched to tidepooling with as much excitement as any grade school students. They found a great variety of sea life including giant green, aggregating, starburst, brooding, and moon glow anemones; gorgeous neon blue and yellow striped hermissenda and bright yellow Monterey doris nudibranchs; baby eels; giant, pink, leather, ochre, and six-rayed stars; live clams; a gumboot chiton; kelp and hermit crabs; and lots of turban snails.

They got down on their stomachs to observe nudibranchs and tiny six-rayed stars hidden on the syncline walls. Some of us were fortunate to witness a hermit crab doing battle with a hermissenda. The crab lunged at the hermissenda several times, and the hermissenda whipped its poisonous cerata back in its face in response.

It was an altogether wonderful day of discovering FMR's creatures past and present. ♦



Reserve Marks 40th Birthday

Text by Kelly Huber · Photos by Kelly Huber, Mary DeLong, and Linda Theroff

On Sunday, November 1, 2009, dozens of people gathered to celebrate the fortieth anniversary of the establishment of Fitzgerald Marine Reserve (FMR). The party ran from 1 to 5 pm near the ranger station, where we had tables set up with coffee, tea and cookies. The weather cooperated by being spectacularly beautiful!

On display were photographs spanning the years from 1969–2009, including many recent ones by board member John Albers-Mead. People commented on how much they enjoyed seeing all the photos.

Many past and present volunteers attended; I saw many folks I hadn't seen in years!

Volunteers were photographed in a group and asked to remain standing as we counted down who had been leading tours for five years, ten years, fifteen years, and so on. Dorothy Baughman was the only volunteer who was still standing when we got to 30 years.

Several volunteers led groups down to the reserve to enjoy a –0.2 tide at 3:30 pm.

We heard from a number of speakers, including:

Mary DeLong, President of Friends of Fitzgerald Marine Reserve, discussed her love of the reserve, talked about some of the philosophies of the Friends, and made introductions.

Dave Holland, Director of the San Mateo County Department of Parks, discussed projects past and present.

Bern Smith of the Parks Commission shared some of his memories.

Tom Ciotti, a volunteer naturalist, talked about reviewing the staff's log books. He had looked through about 20 years worth starting in 1968. He started out by saying that his dream job had always been to be the ranger at Fitzgerald, until he reviewed the log books. His review of them made him realize that he wasn't qualified to be a ranger—that it required being a plumber, electrician, mechanic, carpenter, painter, arborist, teacher, lecturer, researcher, scientist, politician and garbage man, among other things! He also mentioned his surprise at the amount of

vandalism that occurred in the early years. The signs were regularly destroyed, the restrooms were regularly pillaged and fire bombed and the building was occasionally partially dismantled to provide firewood for beach bonfires. Some of the local boys also regularly bombarded visitors to the reserve with rocks thrown from the top of the bluff. Local kids also torched the Dolger house in 1970. He also mentioned that on the founding day of the reserve, November 1, 1969, there was no entry in the logbook—Ranger Bob Breen having been off that day!

Steve Durkin, former FMR Ranger, discussed his love of the reserve and recounted some history.

Bob Breen, former (and first) FMR Ranger, expressed a historical viewpoint, including the archeological excavation, and discussed some fond memories of the reserve. He discussed some of the rare plant and animal life discovered at the reserve, and discussed the new Marine Protected Area (MPA) designation and its significance.

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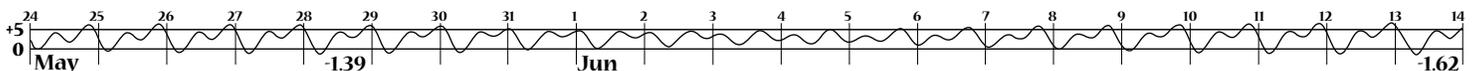
Mary DeLong reads a Declaration sent by Congresswoman Anna Eshoo along with a flag flown over the California state capitol building to commemorate our 40th anniversary.

Ranger Steve Durkin spoke of his many fond memories of the years when he worked at FMR.



Dorothy Baughman, an active volunteer at the reserve for 30 years, got special recognition for her long service.

Tom Ciotti realized that he wasn't qualified to be a ranger—that it required being a plumber, electrician, mechanic, carpenter, painter, arborist, teacher, lecturer, researcher, scientist, politician and garbage man, among other things!



Fond Memories of the Early Days

Editor's Note: Long-time FFMR volunteer Arpi Haleblian was prompted by the 40th anniversary celebration to share some of her memories with us. Thanks for the stories, Arpi, and for your many years as an enthusiastic volunteer naturalist! — JK



Long-time volunteer Arpi Haleblian and her husband John helped us celebrate FMR's 40th anniversary.

It was wonderful to celebrate our 40th yesterday, it was like a big family REUNION!

I did enjoy meeting friends and listening to the informative talks.

From the 21 years that I happily spent at the tidepools I have interesting memories that I would like to share with you.

First of all Bob was not only a handyman as mentioned, he also supervised the tidepools daily! We sometimes had 500 children running around wild! That is when I bought my whistle and did use it many times. I remember boys throwing sea stars up into the air! That is when I became a "police-woman," just to help Bob!

Secondly, leading tours was rewarding. During a tour as I was demonstrating how to put

back a bat star in the pool, I slipped and fell! Two fathers lifted me up! I told them gratefully that falling was part of our business.

Another time as I was going up the stairs after our tour, I heard a boy behind me saying, "If that old lady can go up, I can too!"

Thirdly, while I was the scheduler before the computer age, I used to spend many hours calling the docents on the phone. Linda Liebes of the Coyote Point Museum had given me a desk in the staff room to do my calling, this made me feel good!

Finally, I often substituted for the docents who could not make it at the last minute. Sometimes this meant going to the reserve twice a week — but then it did not matter, now that I hit 70!

I still enjoy the tidepools by being a roving volunteer naturalist.

Becoming Conservationists Under Bob Breen's Influence

Editor's Note: Long-time FFMR volunteer Jerry Maxwell was prompted by the 40th anniversary celebration to share how volunteering at the reserve with his wife Joan has influenced their lives. Thanks for the stories, Jerry and Joan, and for your years of conservation efforts at FMR and elsewhere! — JK



Former volunteers Joan and Jerry Maxwell recalled visiting the reef before it became a reserve, and how much Bob Breen taught them about conservation during their volunteer years.

Joan and I always felt this was a special place for us.

We started going there about 1960 when people were carrying buckets of sea stars home to rot. In those days before it was a park we used to build fires against the cliff and roast hot dogs with Joan's parents.

I was also diving there with an aqua lung in those days. There were times when my mother-in-law and I ate giant sea urchin eggs raw while on the beach.

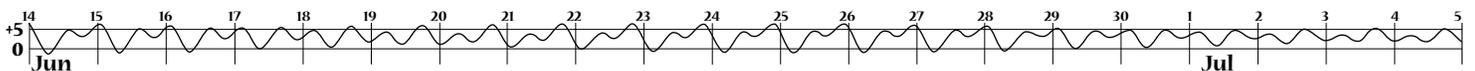
The good thing that happened was the effect of Fitzgerald on our knowledge about conservation. Bob Breen taught us to both pick up litter and always try to be seen by the public who would send their kids to us with litter thereby teaching the public.

This action by us went on for 25 years where we cleaned Bean Hollow beach and trail for ten years and also cleaned the Bay Trail getting South SF and Burlingame to finally clean up their messes with truckloads of litter.

Bob Breen had a great influence on both of us for which I am very grateful.

"There were times when my mother-in-law and I ate giant sea urchin eggs raw while on the beach."

— Jerry Maxwell



New Kids on the Block

*Editor's Note: Every year, the Friends of Fitzgerald Marine Reserve are blessed with a few new members and a class of new volunteers. **Linda Theroff** became a volunteer naturalist shortly after moving in near the reserve just over a year ago. She was prompted by the 40th anniversary celebration to share with us her new-found enthusiasm. Thanks for joining us, Linda! — JK*

I moved to the coast a year ago and became a docent and love the enthusiasm of the docents when they find nudibranchs and the children when they find a sea star and the thrill to see an octopus.

The beauty and treasures of the reserve abound: the sunsets and moon rises, harbor seals swim and look at you, the heron that lands to fish, the pelicans that fly overhead, the calls of the oystercatchers, the thousands of purple urchins that are exposed at a low tide, the counting of the legs of the sunflower star, watching a crab eat and the different patterns in the anemone.

The crowds rise and fall, children play, people are taking pictures, making discoveries or relaxing in the sun and sand surrounded by the blue ocean, sky and land the cypress rise out of. The protection, education and preservation are important.

I rarely go to Mavericks' beach but I went a few weeks ago at a low tide and saw two guys each with two ten gallon buckets nearly full of urchins, hermit crabs and sea stars. They said they use them for aquariums. I remember what a treasure it is for the people who come to make discoveries at Fitzgerald Marine Reserve. ♦

"I... love the enthusiasm of the docents when they find nudibranchs and the children when they find a sea star and the thrill to see an octopus."

— Linda Theroff



Carol Ferguson and Ranger Sarah Lenz.



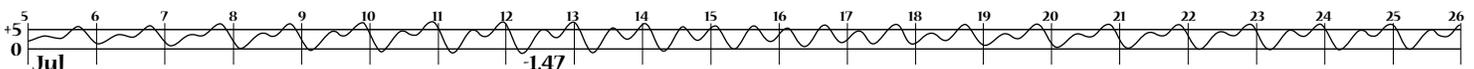
Long-time volunteers Janine Miller (L) and Mary DeWolf Ryan (R).



Jan McFarland-Brown, Mary DeLong, and Kelly Huber

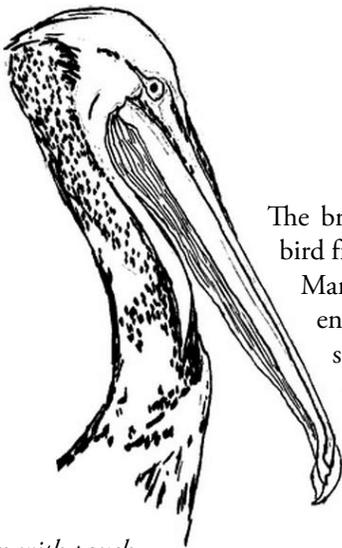


Long-time and brand-new volunteers joined in the celebration.



Creature Feature: The Brown Pelican

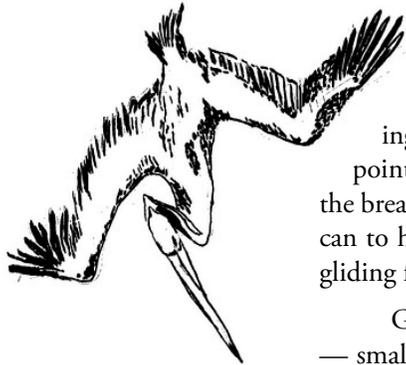
Text by Jenna Kinghorn · Drawings by Kelly Huber



Pelican with pouch collapsed

The brown pelican (*Pelecanus occidentalis*) is a bird frequently spotted by visitors to Fitzgerald Marine Reserve. You may see a flock of dozens of members of this gregarious species soaring in v-formation riding the updrafts of wind high above the bluff's edge, or a line of two or three skimming like daredevils just above the reach of a curling wave. Weighing up to nine pounds, these prehistoric-looking birds have wingspans that reach 90 inches.

In birds, the furcula or wishbone, a v-shaped ossification formed by fused clavicles, helps power wingbeats. The tips of the v are fused to a bird's shoulder bones; and in most birds, the point of the v is suspended just above the breastbone. The wishbone flexes with each flap of the wing, stretching out on the down-stroke and springing back on the upstroke. In pelicans, the point of the v is actually fused to the top of the breastbone. This adaptation enables the pelican to hold its wings steady for long periods of gliding flight.



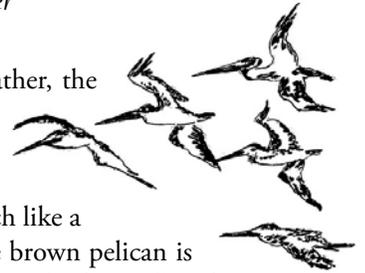
When fishing, the brown pelican plummet dives from the air at up to 40 mph!

Gliding allows a pelican to spot its prey — small and medium-sized fish swimming just below the surface of the ocean — without using too much energy. From 25 or so feet in the air, a pelican can spot sardines, anchovies, menhaden, herring, mullet, sheepshead, or silversides. It then folds its wing and plunges beak-first into the water at up to 40 mph, hard enough to stun the fish it hopes to catch. Air sacs beneath the pelican's skin cushion its landing and keep it from submerging far.

The pelican then wields its foot-long beak, which has a hooked tip and a lower mandible that spreads wide to form a hoop, to scoop stunned fish into its gular sac or deep throat pouch. This pouch can hold up to three gallons — two more than the bird's stomach can! The pelican floats on the surface of the water with its catch, tilting its head to drain the water from its pouch. Then it throws its head back and swallows the wriggling fish whole.



In hot weather, the pelican flutters the gular sac to cool itself by evaporation, much like a panting dog. The brown pelican is one of seven species of pelicans found around the world. It's also related to cormorants, boobies, and frigate birds, most of which have smaller gular sacs.



When not flying or feeding, the brown pelican spends a lot of time preening, or caring for its feathers. Standing on dry land or a dock, the pelican combs its feathers with its beak, spreading oil through them from a special gland near its tail. Clean, well-oiled feathers shed water easily and keep the pelican warm and dry and light enough to fly.

Plunge-diving is a difficult way to make a living; only about one-third of the young who fledge are able to master the skill well enough to survive their first year of independence. Some pelicans hang around near fishing piers and harbors to steal catches off fishing lines and cadge hand-outs. On shore and on docks, pelicans lose their gracefulness, waddling comically on their short webbed feet while trying to balance their long heavy beaks and ungainly wings. Unfortunately many of these avian clowns become entangled in fishing line or are snared on hooks.

As its common name implies, the brown pelican has a dark brown body and wings, but the plumage of its head and neck varies according to its breeding status. An immature pelican has a brown head and neck, but the feathers on the front of its neck turn white as it becomes an adult, some time between two and five years of age. When courting in late winter, they develop golden feathers on top of the head and pale blue eyes surrounded by pink skin. When nesting in late winter or early spring, the feathers on the back of the neck turn chestnut. During the 30-day incubation period, the feathers on top of the head and the eyes whiten. While caring for their hatched chicks, the parents develop white head and neck feathers, their eyes turn brown, and the skin surrounding the eyes becomes gray. ➤



When the chicks have fledged, the adults' necks turn blackish or mottled gray.

Brown pelicans are seen all along the Pacific coast of North America, but they nest only on isolated islands off the coast of southern California and Mexico where few predators can bother them. The female lays two to three eggs in a ground nest of twigs and reeds, and both parents incubate them. The eggs hatch a few days apart; depending on the abundance of fish, often only the oldest chick survives, competing so successfully for food that its weaker siblings starve.

The chicks emerge from the shell completely naked. Both parents not only provide food through regurgitation, but also shelter their young from the sun, the cold, and predators with outspread wings. The chicks soon grow white down and often outweigh their parents before their brown feathers grow in. They fledge at about 10 weeks of age, and there is no parental care after that.

Pelicans in the wild live 15 to 25 years, and this long lifespan was key to the survival of the species. From the 1940s through the 1970s, the pesticide DDT made pelican eggs so thin-shelled that parents broke them simply by sitting on them during incubation, and the brown pelican was nearly driven into extinction. Fortunately the pesticide did not sicken the adult birds. As DDT fell into disfavor — its use was banned in the United States in 1972, although it is still in limited use for malaria control in parts of the world — and became

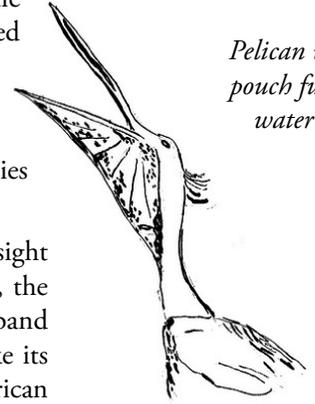
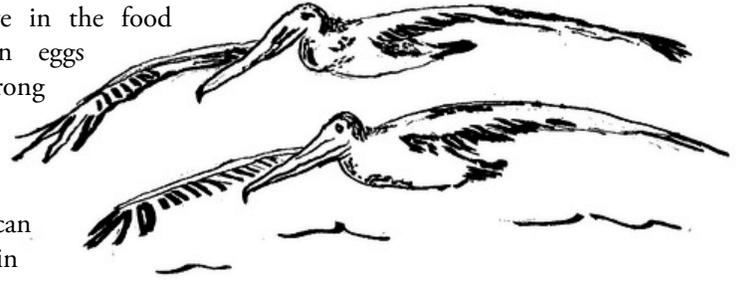
less pervasive in the food web, pelican eggs became strong enough to fully develop. The brown pelican population in Alabama, Georgia,

Florida, and northward along the Atlantic coast was removed from the list of endangered species in 1985. With a North American population now topping 650,000, the remaining brown pelican population was removed from the federal Endangered Species List in November of 2009.

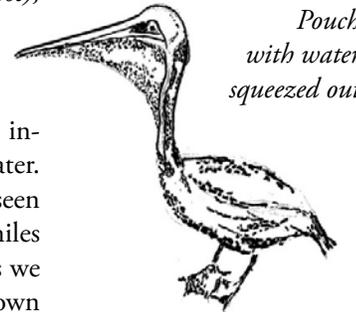
Although it has become a common sight along the Atlantic, Gulf, and Pacific coasts, the brown pelican lives in a very narrow habitat band about 25 miles wide along the coast. Unlike its

relative the American white pelican (*Pelecanus erythrorhynchos*), the brown pelican cannot feed on freshwater fish, so is not found on inland bodies of water. It is also rarely seen more than 20 miles out to sea. Even as we celebrate the brown pelican's recovery, we

must continue protecting it from a variety of human impacts, including habitat destruction, pollution, entanglement in abandoned fishing gear, flying into overhead wires, disturbance of nesting colonies, and overfishing. ♦



Pelican with pouch full of water and fish



Pouch with water squeezed out



Webbed feet

A wonderful bird is the pelican.

His bill will hold more than his belican,

He can take in his beak

Enough food for a week

But I'm damned if I see how the helican!

— 1910 limerick attributed to

Dixon Lanier Merritt (1879 – 1972)

Park Aide Earns Marine Biology Degree

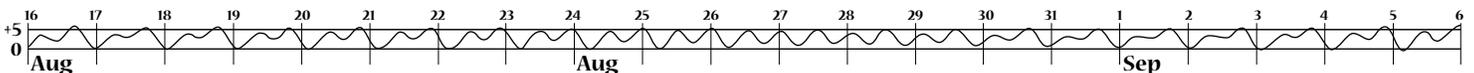
Text and Photo by Ranger Sarah Lenz

Jessica Donald graduated from San Francisco State University with a B.S. in Marine Biology in May 2009. While there she spent two years as a National Science Foundation fellow in Dr. C. Sarah Cohen's lab conducting an independent research project on invasive colonial tunicates. In the future she plans on attending graduate school at San Francisco State to get her masters in

Marine Biology. Jessica has worked as a Park Aide for the Fitzgerald Marine Reserve (FMR) on and off for the last five years. She is currently attending the FFMR volunteer naturalist training program and looks forward to sharing her knowledge of the local marine environment with school kids. ♦



Park Aide Jessica Donald graduated from San Francisco State University in May 2009 with a degree in Marine Biology.



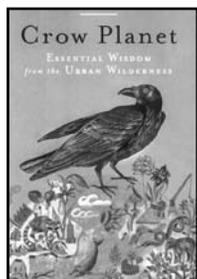


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Crow Planet: Essential Wisdom from the Urban Wilderness

by Lyanda Lynn Haupt • Little Brown • Reviewed by Mary DeLong

Most visitors to Fitzgerald Marine Reserve love trips here because it's a place where they can experience nature deeply. As docents we want to show people the many miraculous happenings of the intertidal and to instill a sense of stewardship that will last a lifetime. In *Crow Planet — Essential Wisdom from the Urban Wilderness*, Lyanda Lynn Haupt asks readers to think not of nature as somewhere “Out There,” not as someplace to go, but surrounding us all the time. “Such sojourns are nourishing and necessary, but it remains our daily lives, in the places we live that make us ecosystemic creatures; these are the seat of our most meaningful interactions with, and impact upon, the wider, wilder earth.”

Living in Seattle and suffering from depression, Haupt becomes fascinated with the crow outside her window. Already an ornithologist and writer, she decides to become an urban naturalist with a specific interest in crows.

Crows are over-abundant in most urban areas, an indicator that our world is out of balance. They do not want to live close to humans but most of their natural habitat has been destroyed. The crow is the most common wild animal most people encounter. “Here, after all, is a bird very much like us—at home, yet not entirely at home in the urban habitat, gleaning what’s here while remaining wild, showing us what’s beautiful, what’s ugly and what’s missing. Crows remind us that we make our home not in a vacuum, but in a zoopolis, a place where human and wild geographies meet and mingle.”

Haupt weaves an incredible story of crows, the philosophy of nature, and what it is to be a naturalist. How are people connected to the earth? How will we deal with the changing earth? Although she is no Pollyanna, she believes it is easy to be cynical. “My on-going education in the close-to-home wild has reinforced my sense that we are living in a graced moment, a rare earthly time in which our present, everyday actions are meaningfully entwined with a broader destiny.”

Haupt discusses the importance of amateur naturalists who become passionate about conserving a place for the wild. “We can take responsibility for our own biological education, and the earth-sustaining work it entails need not wait for anointing from either academia or politicians.”

Wonder. It is what we aspire to instill in our visitors at the reserve. Haupt believes, “Wonder feeds our best intelligence and is perhaps its source... Wonder is not a given: it is contingent on the habit of being that allows it to arise in the face of the wondrous.”

Haupt wants to “co-create and inhabit a nation of watchers, of naturalists-in-progress, none of us perfect, all sharing in the effort of watching, knowing, understanding, protecting and living well alongside the wildlife with whom we share our cities, our neighborhoods, our households, our yards, our ecosystems, our earth.”

“...we are living in a graced moment, a rare earthly time in which our present, everyday actions are meaningfully entwined with a broader destiny.”
