

THE VIP VOICE

FALL 2001
THE NEWSLETTER OF
CABRILLO VOLUNTEERS

Dear Volunteers:

Upon our return from our "dream vacation," I was met with the May 2001 Edition of "The VIP Voice." I was so proud and pleased that I thought I would pop. "Proud" because Mike Nelson did such a superb job of putting this newsletter together – not that I didn't know he could and had more than enough talent and energy, but because he was willing to and DID compile and publish it even with his extremely busy work schedule. "Pleased" because something we had wanted to do for so long (provide pictures of almost all of our VIPs at work) had been accomplished so tastefully and well. Now, for example, when you read in this issue about Beth Gramoy or Kim Fahlen or Howard Burdett and you don't know who they are, you have only to check the last issue of the "Voice," and you will find a picture of them. Better still, you can offer a "Congratulations!" when you run into them should you wish to. So...thank you, Mike, for undertaking such a tremendous job and producing the best "VIP Voice" yet.

In This Issue....	Page
Notes & News...	2-3
Special VIP: Howard Burdett	4-5
Birds of Cabrillo	6
Musings from Mary Beth	7
Bird Count 2000	7
The gray fox	8
Proposed Marine Reserve	9
Termite of the Sea	10-11
Lighthouse Puzzle	12-13

The powers that be have decided to make the "VIP Voice" a quarterly newsletter with this being the fall issue and the next one coming in the winter. This will allow us to put more time into each one and not bankrupt the VIP bank account or ourselves. For the next issue, we already

have lots to look forward to if all goes as planned. Emily Lawlor has been working on a couple of articles and Mike Nelson has a couple of articles in progress. Kim Fahlen has been coerced into working on an article about the different orders of lighthouse lenses and the history of our third-order lens. We will also begin to feature information about some of the types of birds Claude Edwards has been kind enough to draw for this issue. We have other good things to offer and are always looking for more. Incidentally, this month's

I would rather be ashes than dust!
I would rather
that my spark should burn out in a brilliant blaze
than it should be stifled by dryrot.
I would rather be a superb meteor,
every atom of me in magnificent glow,
than a sleepy and permanent planet.
The proper function of man is to live, not to exist.
I shall not waste my days in trying to prolong them.
I shall use my time.

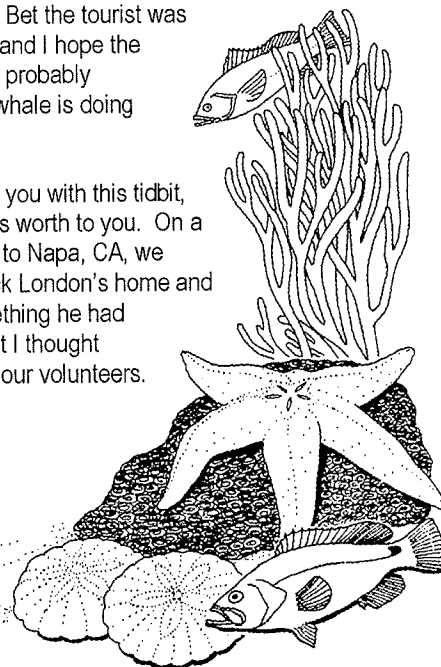
Jack London 1876 - 1916

contest is to see which VIP can supply the name for each bird illustrated in this month's Voice. Put your list in my blue folder in the library with a time and date or send it by e-mail to vipvoice@hotmail.com with your answers and a time and date. The volunteer with all the correct answers in the timeliest fashion will be contacted for a surprise. Obviously Claude Edwards and Susie Gardner (one of our VIP "bird counters" who has agreed to write a short bit about each of the birds) are not allowed to enter. All of the volunteers owe a debt of thanks to Claude for his willingness to produce some wonderful drawings of birds as well as an article for this VIP Voice. This busy man will, we hope, write more articles and share more information with us. Meanwhile, don't miss his bird walks and talks at 9:30 am on the 3rd Saturday of each month.

We are starting a new column in this issue called "Notes and News from All Over." We hope you will enjoy it. Our tremendous volunteers do other things that are worth sharing, and there are often tidbits of appropriate information from lots of other sources that can be included. We hope you will keep us supplied with newsworthy stuff or just stuff that you think is fun or interesting. The germ of the idea came to me when my husband showed me an article from the *Wall Street Journal* written on March 2, 2001. The article wrote of a 20-foot humpback whale that apparently breached off the coast of Hawaii and wound up flinging itself onto a whale-watching boat with its head landing in the lap of a tourist thereby breaking her knee. The boat owner indicated that humpback whale calves are very curious and are "like puppy dogs." I **needed** to share this with someone. Bet the tourist was surprised, and I hope the young and probably surprised whale is doing well too.

I will leave you with this tidbit, for what it's worth to you. On a recent trip to Napa, CA, we visited Jack London's home and read something he had written that I thought applied to our volunteers. Here 'tis!

Rock on!
Lynn



NOTES AND NEWS FROM ALL OVER
—Lynn Moss

Kim Fahlen, a "lighthouse lady," is developing special expertise in Fresnel lenses and is learning from Howard Burdett how to properly clean and care for our third-order lens. She was the first VIP Voice Puzzle winner and was awarded an imported box of Belgian chocolates for her fine efforts. Look for this month's challenge and see if you, too, can win a prize.



Beth Gramoy, our very own beachcomber (tidepool VIP) and Dr. Doolittle (she organizes the terrific puppet show during Whale Watch Weekend and she talks to the animals), has been awarded the SSC San Diego Executive Director's Award "... in recognition of her technical and programmatic leadership of multiple departmental teams in the area of software engineering process improvement for the Space and Naval Warfare Systems Center in San Diego." This information comes to us by way of Darrel Sims and the February SSC, San Diego newsletter, "Outlook." She was further cited for "... attaining a national reputation for the Center in implementing new processes and procedures and for leading" all their teams in upgrading software engineering performance. None of us who know Beth are surprised nor are we surprised that she gives every bit of credit for this tremendous achievement to everyone else in the program. Congratulations to Beth, another of our "treasures."

Ulla Kordel, one of our longer-term tidepool volunteers and a "lighthouse lady," and her husband, Bo, have returned to their lovely home in Redmond, WA (outside Seattle). Those of you wishing to keep in touch with Ulla can write her at 5308 218th Avenue NE, Redmond, WA 98053-2412. We all miss her. She promised to come visit in their brand new



fifth wheel trailer as they travel about celebrating Bo's new retirement.

Susan Dagwell, a tidepool and interpretive VIP at Cabrillo National Monument for about a year, has become a National Park Service Ranger in Hyde Park, NY. This area is Susan's original stomping ground and she actually volunteered at the Park there at one time, so her friends and family there are delighted. We, however, will miss seeing her in the tidepools and behind the desk at the Visitor's Center.



Darrel Sims, a long-time tidepool volunteer as well as a font of knowledge about the creatures of the seas, the history of San Diego, our tidepools and virtually anything else volunteers and staff choose to ask him, is spending some time volunteering at the San Diego Archaeological Center. You just can't keep a curious man down! In their Spring 2001 newsletter, "Breaking New Ground," they write, "A new volunteer, Darrel Sims, is a font of historic information about San Diego and a great storyteller!" He promises that he will still be found in Parking Lot #1 of the tidepools watching over Area 3 (the heavily protected area) and occasionally chatting with folks as they enter and leave Area 1. He further promises to keep giving us wonderful information to be relayed to you regarding things scientific. I have several on the back burner but will begin with only one.

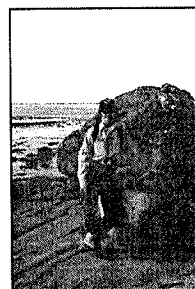
Darrel recently sent an article regarding squid in the Ocean Watch section which was written by Robert Shadwick, a professor of marine biology at UCSD's Scripps Institute, from the May 2, 2001, issue of the *San Diego Union-Tribune*. We have probably all read Jules Verne's classic, 20,000 Leagues Under the Sea. Few of us have forgotten the images of the giant sperm whale fighting a giant squid that he presented so clearly but most of us choose to think of squid as either the very shy and usually small invertebrate found in our tidepools or the

tasty food we love to eat, fried and dipped in cocktail sauce which we call calamari (*Loligo opalescens*). This Cephalopoda ("head-footed") class of invertebrates is amazing and highly advanced in terms of complex behaviors, sense organs and high intelligence. This *Union-Tribune* article reported that the Scripps Institution of Oceanography biologists collected a dead Pacific giant squid (*Moroteuthis robusta*) last summer on their beach. It was 10 feet in length and one of the "largest and most complete specimens of Pacific giant squid that has been found locally." Apparently the largest of this species that has ever been found was 22 feet long. Additionally and more thought provoking still, is that there is a larger giant squid known as *Architeuthis* that may grow upwards of 50 feet. I think perhaps the most fascinating part of this rather long article involves the squid's method of jet propulsion and jet stream. Learn how a creature (the *Architeuthis*) that "...should be able to swim around the world in 80 days" is able to do it. Check the internet for the Arts Section on 5-2-01 at the Tribune's website, www.uniontrib.com, and be rewarded for your efforts.

Tidepool volunteers are asked to think about the questions that are asked of them frequently when they are in the tidepools (FAQs). An example would be the question, "How high up the cliff does the water go at

high tide?" We do have some pictures, but perhaps we can give even more info on the bulletin board to help the public understand. Therefore we ask you to let the rangers know what questions you are asked that might be better explained with info on the bulletin board. Call Ranger Chris Anderson at (619) 523-4577 to let him know.

The training sessions for tidepool volunteers are going to be starting in late October. Rangers Mary Beth Vygrala and Chris Anderson need help putting the packets together, both for October and for the general VIP training sessions in January for all positions. If everyone pitches in, it won't take long to finish the task. Additionally, let people YOU know who might be interested in volunteering anywhere in the park (lighthouse, tidepools, visitor center desk, etc.) know about the many possibilities. Volunteers are asked to give 2-3 sessions a month to CNM which would be 8 hours per month minimum.



Late breaking news: Jeyan Therese was born to Ali and Victoria kirtay (one of our tidepool VIPs). Congratulations, and we wish them well.

SPECIAL VIP – HOWARD BURDETT
—Lynn Moss

I recently met Howard Burdett and, after talking with him for only a few minutes, it was clear that he is a man with a purpose—a man with a mission, so to speak. Ranger Mary Beth Vygrala said she felt him to be a particularly appropriate volunteer to feature because he has been at Cabrillo National Monument as

in various areas at CNM such as the lighthouse, the museum and other areas of concern for the furniture, books and all the artifacts that are under the care of the staff. This data, when Howard puts it together in graphs and charts, shows if the climatic conditions that have been recorded are within the tolerance of the museum limits.



a VIP since August of 1989, longer than any of the rest of us. Furthermore, he is a genuine jack-of-all-trades who has made all the rangers' lives easier for a considerable period of time.

On Howard's completed application to be a volunteer, he said, "I would like to assist in the preservation and operation of an historical resource I have enjoyed for many years." The opportunity to be a VIP just hit the spot for him when he read about it in the San Diego Tribune and he quickly applied. He was accepted and began his work by cleaning the lighthouse lens. Now he is responsible for many different areas. You will see him with what looks like a small hand calculator and a computer "dumping the data logs" in crucial areas of CNM. Essentially, he takes the data from a calculator-type device and puts it in the computer thereby emptying the log. At that point, he returns the device to its area and he transfers the information to a floppy disc that he can take home. The device registers temperature and relative humidity over time

After compiling the data, there is a report that takes 1–2 weeks to put together.

He also serves as the Curatorial Assistant for the Museum checking over everything that comes into CNM and making sure it is properly listed and identified.

His duties in the lighthouse have grown exponentially as well. Howard is responsible for the preservation and repairs of the furniture and all the furnishings and it is no small job. Many of the items in the lighthouse are original items that were used by the Israels and other lighthouse keepers. He continues to clean the lens and can tell you the complete history of the original lens due for the our lighthouse but was waylaid in Chicago for the World's Fair.

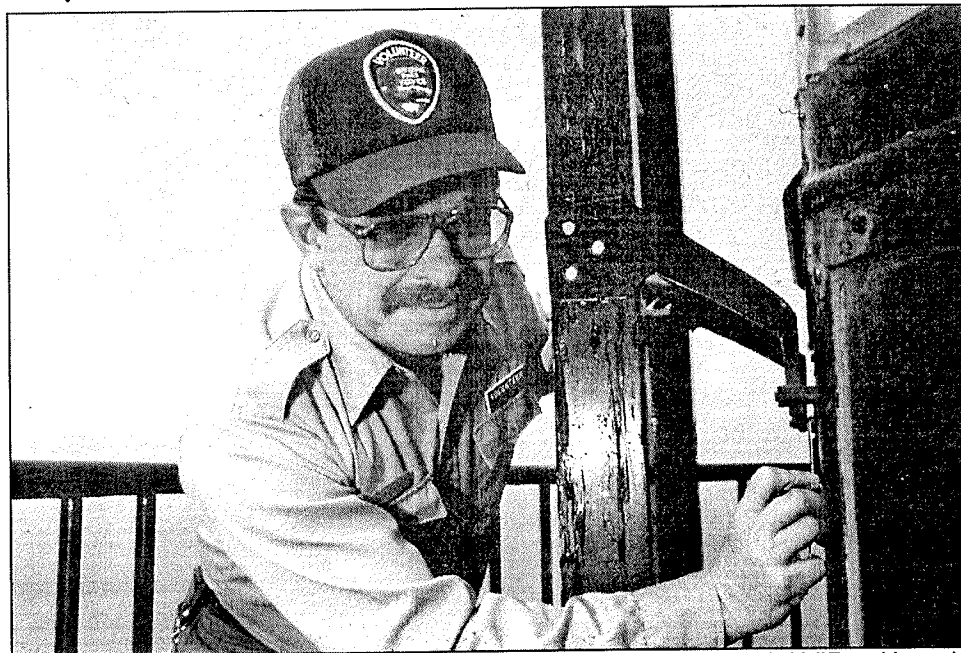
In the Visitor Center Bookstore, Howard catalogues books in the curatorial museum storage. In all, he puts in about 5–6 hours on Saturdays at the Monument as well as all

the time he spends at home. When I asked him what he would tell potential volunteers, he said he would tell them, "You get out of it what you put into it, but come ahead!"

Howard was born and raised with one sister in Providence, Rhode Island. Growing up, he preferred hiking and outdoor activities and still does. He lived in the same house in Providence until he left for the Navy. The first three years he served out of Newport,

weather there. On the other hand and quite understandably, Howard isn't even slightly interested in seeing "The Perfect Storm."

As I said, this man on a mission retired from the Navy after 22 years, then he worked in private industry doing command and control and technical writing for 15 years and then came back to the Navy as a civilian with SPAWAR in the Systems Center. He works with Mike Moser, another of our hard



RI, and he was sufficiently impressed that he reenlisted and became a radar operator in San Francisco. It was there that he met his wife, Ruth. After radar school, Howard transferred to a ship in San Diego and served on a succession of ships.

He served in Viet Nam on and off from 1965 to 1973 and, while there, worked with drone reconnaissance as well as being an air intercept controller. This included fighters looking for MIGs, helping airborne tankers to refuel in the air and search and rescue. He also worked with Air Force fighters in Laos. He received credit for assisting on one MIG kill.

When asked about close calls, he mentioned being on a ship in truly heavy weather and actually looking up at the tops of waves in the Grand Banks area on a Navy ship. After seeing the movie and reading the book, The Perfect Storm, I can assure you that I wouldn't be interested in experiencing even a mild variety of heavy

working and very special VIPs. He enjoys what he does, both at work and as a volunteer at the Cabrillo National Monument. He likes to bring all kinds of things and ideas together and make sense out of it. Thus, as a history buff, he also likes to restore and save our past history. Perhaps he genuinely believes that "those who forget the mistakes of the past are doomed to repeat them." Another of his passions is the out-of-doors where he especially enjoys hiking.

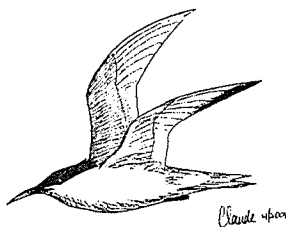
Howard lives with his wife, Ruth, who is a full-time billing clerk for a pharmacy. Their three children, all young men, are career Navy. Their oldest son is in England, the middle son serves on the USS Nimitz, and the youngest son is in Bremerton, WA, where he felt the recent 7-point earthquake, and serves on the USS Rainier. There is a proud tradition building here I think.

It's a genuine pleasure to learn about all the special volunteers, and you are all special in one way or another.

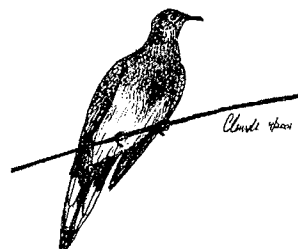
Birds of Cabrillo
—Claude Edwards



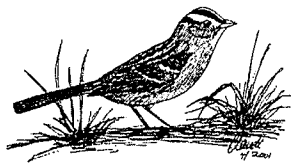
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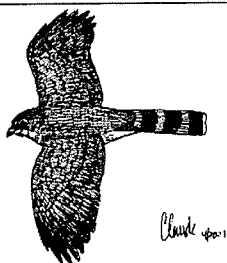
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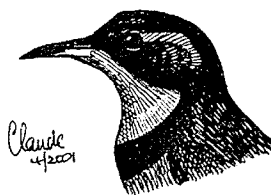
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7)



8)



9)

See if you can correctly identify each of Claude's drawings. If you are the first to submit a correct listing to Lynn, you will win a surprise.

Leave your list in her blue file in the library or send it by email to vipvoice@hotmail.com. Be sure to put your name and the date on your list!

Musings from Mary Beth
—Mary Beth Vygrala

A gentle reminder for checking out the volunteer radios: When you are checking out a radio, be sure to sign out on the appropriate sign-out sheet. Each individual radio has its very own check out sheet. For example, TP 1 has a sheet entitled "TP 1" as opposed to "TP 2," etc... The radios cost \$1000.00 to replace so I will sleep better at night knowing who has what radio. Also please make sure a red light goes on when you place them in the charger so they will be fully charged for the next volunteer.

We have gotten a replacement set for our volunteer keys. These keys are for volunteers only. Please do not just borrow

them for even just a minute. Always sign for the keys before you put them in your hands. Again, following these procedures will keep the red tape to a minimum.

We are now recruiting volunteers, especially for the tidepools. If you know anyone interested, please contact me ASAP. We are always understaffed for volunteers during the weekdays so retirees and students with flexible hours are a bonus.

I appreciate all the hard work volunteers do and look forward to a busy and fun fall season.

**Cabrillo Monument Staff And Volunteers
Aid In Annual Bird Count**
—Claude G. Edwards

The 46th-annual San Diego Christmas Bird Count (CUBIC) was an historic event on the basis of the role played by representatives of Cabrillo National Monument. For the first time, a group of Cabrillo Monument staff and volunteers participated in the wintertime event by searching for and performing a census of the birds they encountered during a 2-hour period on the morning of Saturday, December 16, 2000. They were among nine observers that surveyed portions of Point Loma as part of the overall annual event, sponsored by the National Audubon Society.

I have performed the task of coordinating the Point Loma Cabrillo Bird Count team, and contributing our unique data to the bird count for more than 20 years. In fact, I personally led and participated as part of the Point Loma team until December 1996 when my friend and colleague, Mike Klein, took over the responsibility. Since that time, I have been surveying the birds in and around Imperial Beach.

This time I was able to convince/coerce four individuals to invest some personal time to covering a small portion of Cabrillo National Monument as part of the overall birding team. These individuals were Fred Andrews, Samantha Weber, Susie Qashu, and Mike Barbie. They were asked to search for the birds inhabiting accessible areas of native brush and associated vegetation between the Coast Guard

Lighthouse and the San Diego Sewage Treatment Plant. This included available trails and paths through the vegetation, as well as accessible and visible portions of the Monument's Pacific coastal waters, shoreline, and tidepools. This latter area was exposed only during the low tide that occurred in the morning, but which could not be reached and surveyed by the two sub-teams assigned to areas "topside". They were only to be concerned with species they could recognize and not worry about things like sparrows and finches.

The topside teams were done with the areas that they had been checking since the pre-dawn hours when they were confirming the occurrence of owls onsite. After they were done, the participants convened by midday in specified survey areas along the Pacific coast. This is where the Cabrillo Monument's team gave their specific contribution. Their data was incorporated into the overall team totals and submitted as part of the final Point Loma team results.

I am very grateful for and excited about the efforts given by Fred, Samantha, Susie, and Mike on behalf of Cabrillo National Monument and the San Diego Christmas Bird Count. I look forward to them, and others, participating in next December's CBC investigating areas of the Monument as part of the Point Loma birding team. Good job!

The gray fox —Emily Lawlor

After spending countless hours among the living things of the intertidal, it is easy to forget that Cabrillo is also home to a great variety of terrestrial animals. One of these animals is the gray fox (*Urocyon cinereo-argenteus*). It seems that the more I delve into the vast amount of information pertaining to the Cabrillo National Monument, the more I discover there is to learn.

The gray fox can be found from southern Canada to as far south as Venezuela. It inhabits chaparral, wooded areas, shrublands, and is always found near a water source. The gray measures about 15 inches from ground to shoulder, and usually 32-45 inches from nose to tail. It has salt-and-pepper gray coloration with white extending to beneath the throat. Hints of reddish-orange are also found on areas such as the sides of the legs, under the tail, and on the neck. They have a black line extending from the outside corner of their eyes and down the neck as well as on the upper side of the tail.

The gray fox is the only member of the dog family that can climb trees. This aids in quick escape and pursuit of prey. In order to climb tree trunks, they grip the tree with their forepaws and force themselves higher with the long claws on their hind feet. This allows them to more readily catch prey such as squirrels, birds, rats, mice, and insects. They are omnivores, thus eating cherries, grapes, or other berries as well as meat.

The gray fox lives in a den that may be made of a hollow tree, a cliff, a rock pile, under buildings or even in other animals' abandoned homes as well as in underground dens that may be 75 feet long with as many as 10 openings. The grays are generally solitary, but immediate family groups (or skulks) can sometimes be found together. Mating season occurs in February and March, with a gestation period of about 65 days. A litter usually contains 3 - 5 blind, black or dark brown pups. They remain blind for about 10 days. While they are young, the father fox (renard) provides food. At about 10 weeks, the mother (vixen) will begin teaching them how to hunt. By late

summer and early fall, the pups will begin to venture out on their own.

The gray fox is generally nocturnal, which is why it is rarely seen at Cabrillo. However, they ARE present, so it is nice to have a general knowledge of them. A study was conducted at Point Loma Natural Reserve (with Cabrillo included) in 1996-1997 to determine the number of carnivores present. Using track transects, scat analysis, and camera surveys, presence of foxes on the Monument grounds was affirmed. During the first year, 52 fox scats were found on Point Loma. It is interesting to note that grays were numerous in the Cabrillo area



and coyotes were rare while foxes were rare and coyotes were numerous outside the Monument. Also in the first year, 59 fox tracks were found in Point Loma. For the camera survey, foxes were photographed in Cabrillo National Monument, and coyotes were photographed elsewhere. According to data collected on the survey, most tracks are seen in the fall with a progressive decline culminating during the summer.

It is incredible to fathom how much there is to learn and then pass it on to the visitors! The next time

someone asks you about foxes, you can tell them they really are here. It might be fun to challenge the visitors to look for scat or tracks. Gray fox tracks can be a nearly straight line of neat prints with 3-4 inches between from left to right. The heel pad looks like an upside-down V, and sometimes all four claws will be visible. Who knows? You may even discover the remnants of a fox's presence down in the tide pools.

References:

- California Mammals; Stephens, Frank
- California Mammals; Jameson, E.W. & Peeters, Hans J.
- The Wild Canines; Fox, M.W.
- Wild Dogs of the World; Bueler, Lois E.
- The Effect of Mammalian Carnivores on the Structure and Diversity of Ecological Communities; Dr. Michael Soule' and Kevin Crooks

Photos:

<http://www.nps.gov/brca/nagrayfox.htm>

Marine Reserve Proposed Off of Point Loma

—Bonnie Becker

I'm sure that many of you have noticed that Point Loma has been in the news quite a bit lately. In accordance with the Marine Life Protection Act, the California Department of Fish and Game has proposed a network of marine reserves and parks along the coast of the state. One of those proposed sites is the Point Loma Kelp Forest, including area within the boundaries of Cabrillo. Other San Diego County designated sites include La Jolla and Camp Pendleton. As proposed, the new reserves would completely limit extractive uses (fishing, hunting, harvesting), although access would probably remain open.

There are numerous benefits of marine reserves, many of which I have told you about in the past. At the same time, there are a number of users that rely on these waters for their livelihoods, and they will likely experience short-term economic losses from the plan. Consequently, this proposal is somewhat controversial.

It is still in draft form and public comments are being accepted through public hearings (we just had one a few weeks ago, I believe that there will be more) and letters. Over the next year, we will be hearing a lot more about local reserves. There will be many media reports. Visitors will probably be asking you about it during the tidepool season. If you would like to learn more about this proposal, you can find information at <http://www.dfg.ca.gov/mrd/mlpa>. If there is sufficient interest, I can give a presentation about it at the next tidepool VIP training. I will also be writing a more detailed article about it in the next edition of The Explorer. As usual, feel free to ask me any questions...

Here is a map of proposed marine reserves for Orange and San Diego Counties:

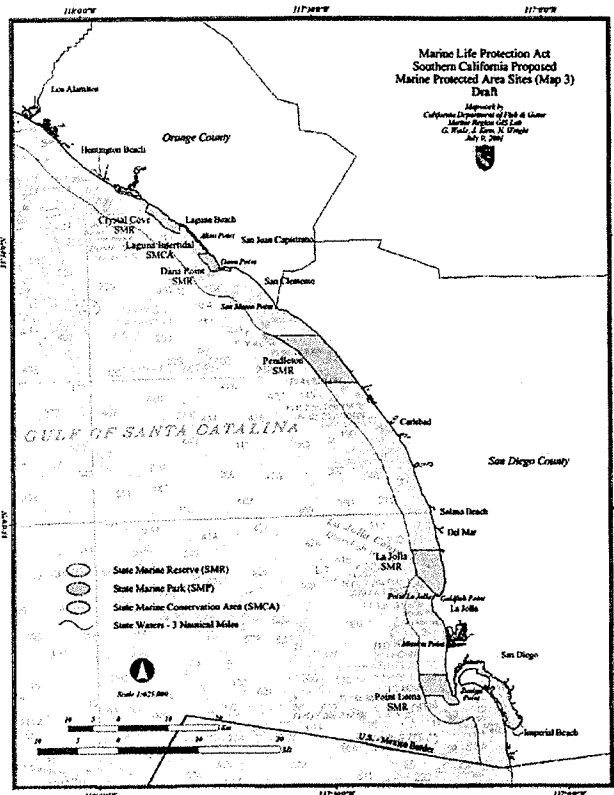
As summer winds down, our thoughts are turning to the new tidepool season. I hope you are all looking forward to spending some time out in the tidepools, talking to people and seeing how

our little habitat has subtly changed over the over the summer.

If you are interested, there are a number of volunteer positions within the science division. We have gotten our invertebrate settler monitoring program up and running, and we are in need of more volunteers to help out, in the field but especially on the lab team. Bird counts will be coming up soon and we will need to start training some new people to help us monitor our feathered friends. Tidepool sampling has been scheduled for the week of October 15—maybe this year you would like to join us?

Feel free to contact me at bonnie_becker@nps.gov or 619-557-7308 to learn more about these and other tidepool volunteer opportunities. Enjoy the daytime low tides!

Cheers,
Bonnie



Termites of the Sea—Shipworms —Lynn Moss

For many years, my husband and I sailed the west coast of California and Baja and to Hawaii.

Some of our boating friends occasionally mentioned shipworms and the fact that they wreak havoc on wooden boats and docks and pilings – essentially any wet wood in saltwater.

One day, Darrel Sims showed me the calcareous coating of a shipworm in our tide pools, and it is not a thing of beauty. It is, however, a thing of wonder. At that point I decided to find out more about this creature that has been the bane of shipping for at least 2000 years. The Greeks and Romans certainly knew of them in an unfavorable way. It has been conjectured that the early Mediterranean custom of hauling boats ashore when they were not being used was partially due to the knowledge that drying out the wood of the ship tended to protect it from attack by shipworms. Additionally, since shipworms need saltwater, sailors tried to anchor as close to the mouth of a freshwater river feeding into the sea when they came into a harbor.

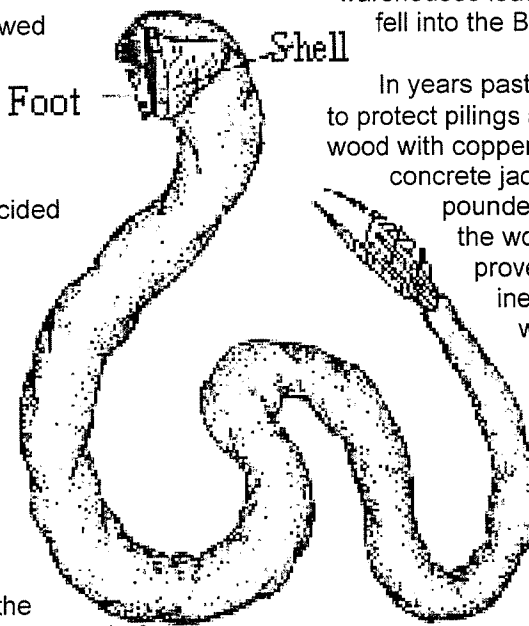
During the first century, Pliny the Elder believed that shipworms bored with their shells and he was eventually found to be correct although there were centuries when many other theories were put forth. There are several references to shipworms in historical literature. During Columbus' 4th voyage in 1502, his four ships withstood virtually everything including lightening, a hurricane, a waterspout and rocky reefs, but two ships had to be abandoned due to shipworm rot. In 1519, Fernando Cortes decided to burn his ships saying they had shipworm rot. This was to prevent his crews from turning back from their march into Mexico to conquer the Aztecs. Even though his story wasn't true, he knew this lie would be accepted because shipworm rot was so prevalent.

The San Francisco Bay Marine Piling Committee discovered the true European Teredo (a type of shipworm) on this coast in 1910. How it gained a foothold isn't known; however, in 1914, the pilings at Mare Island in northern San Francisco Bay were badly compromised, and in 1917 the attack was repeated and ferry slips collapsed and warehouses loaded with freight cars fell into the Bay.

In years past, people have tried to protect pilings and other damp wood with copper sheathing, concrete jackets and even nails pounded side by side into the wood, but the methods proved too expensive or ineffective. Today, wood is pressure-treated and hulls of ships are made of fiberglass or steel, but the shipworm remains a formidable pest.

Our tidepools aren't troubled with shipworm because we have no wood there; however, if you can find a piece of wood that has floated in on the tide, you may examine it and find crumbling wood and the calcareous shell remaining from the shipworm. It's worth checking out. In this case, even though the shipworm isn't a native part of our very special tidepools, it is a creature that can be found there.

Shipworms are from Phylum: *Mollusca*. There are hundreds of Genera. The San Diego area, however, is concerned with two Genera in particular: *Teredo* and *Bankia*. The shipworm has a small bivalve shell and a foot at the larger end and siphons and pallets at the smaller end. The small foot attaches to the wood by a hidden thread, allowing the "worm" to travel and rasp away the wood making a longer and longer channel. A shipworm has a long fleshy body that can reach one foot in length. (A few individuals have been found to be up to 4 feet long and an inch in diameter.) The body is not covered with a shell but surrounded by a thin calcareous layer that lines the tunnel. The "worm" rasps or scrapes the wood with its toothed shell by



holding on with its foot and alternately contracting the anterior and posterior adductor muscles of the shell. This rocks the valves in a motion that is repeated 8 to 12 times a minute, and it rotates on its foot in a way that cuts a perfectly cylindrical burrow in the wood. Interestingly, there are two different rasping surfaces on the shell of the shipworm, and its intestines are found to contain two different sizes of wood particles as a result.

All the wood that is removed during the burrowing passes quickly through the animal's stomach into its intestine and is finally removed via a siphon that excretes all wastewater. It extracts virtually no nourishment from the wood in route, but like all bivalves, consumes plankton filtered from the respiratory stream by the other siphon or ctenidia. Respiration occurs when water flows through the incurrent siphon or inhalant current into the mantle cavity across the gills and out through the excurrent siphon or exhalant current by means of cilia. Outside the two siphons are two pallets, or caplike structures, that can close the posterior end of the shipworm if it is threatened.

While most shipworms breed during the summer and early fall, they tend to breed year-round in San Diego. Although the sexes are separate, the same individual is first male then eventually female. Eggs remain in the gill cavity until fertilized by sperm from the incoming water. There is a brood pouch that forms in the gills to store the eggs until they are ready to be expelled through the parent's siphons as free-swimming bi-valves known as veliger larvae. Since the breeding period is continuous for several weeks, the brood pouch contains larvae in all various stages of development. The life cycle of the shipworm is a fascinating one just as the creature itself is most unusual to most of our ways of

thinking. The case of the shipworm has, in many ways, changed the course of history. Perhaps Cortes' men would have turned back and sailed for home. What would have happened to the Aztec Indians then? How many people have lost their lives or had them changed by this small mollusk? There is no way to know the answers to these questions with accuracy but it's important that we think about them in the context of our future as well as our past.

The tidepools and our Cabrillo National Monument offer so many wonders to explore. Here we are blessed with historians, biologists, geologists, herpetologists, naturalists and ornithologists to mention only a few. We are all here to learn and to protect the precious things nature has given us. It is a pleasure to see these dedicated individuals and wonderful groups such as the Cabrillo National Monument Foundation work together to see that we save for the future what we, ourselves, have been able to enjoy.

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Drawing:

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Old Point Loma Lighthouse Puzzle

—Mike Nelson

F S B B A D E G N I N A E L C N I B A C
R E A R L E N A O M R T C O R O N A D O
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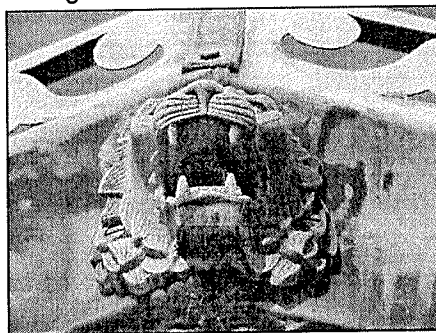
On **November 15, 1855**, the light in the **Old Point Loma Lighthouse** was lit for the very first time. Since that time, she has stood as a silent **sentinel** looking over a **vista** that spans all the way from Mt. Palomar to the north, Mt. Cuyamaca and the Laguna mountains to the east, from Mexico to the **Coronado Islands** and westward to the Pacific.

In the 19th century, the United States expanded under the doctrine of **Manifest Destiny**. Our **lighthouse** was one of the direct results of that doctrine. Congress appropriated \$15,000 to build the lighthouse. However, the final tab was \$30,000—a slight **cost overrun**, to say the least! Why did it end up costing twice as much as planned? There were a number of reasons.

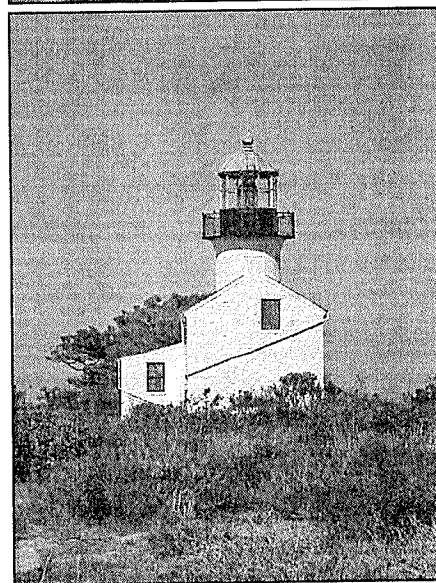
First of all, the lighthouse was originally designed to use a **parabolic reflector lens**. However, between the time she was designed and when she was built, the Lighthouse Board elected to use **Fresnel lenses**.

Unfortunately, the patents were held by the inventor in **France** and were built only under license in Paris—which meant that the lens was more costly up front than planned. To add insult to injury, a **first order** lens was originally shipped to San Diego. It was so big that it wouldn't fit in the tower. Finally, a

third order lens was brought in. It fit perfectly and was ideal for visibility. Additional costs were also incurred because the contractors had to build a road from **Ballast Point** to the top of the hill.



In spite of the limited budget, a number of niceties were included in the design. One is the spiral **stairwell**. Another is that each corner of the roof over the tower has a **gargoyle** in the shape of a **lion's head**. (To be honest, I had never seen them until a visitor pointed them out to me a couple of years ago.)



By the time our lighthouse was built, sperm oil was no longer being used because it had become very expensive. The most common **oil** came from **rapeseed** and was called **colza oil**. Unfortunately, there wasn't enough being produced to meet the Lighthouse Board's needs. **Lard oil** was tested but **kerosene** became the oil of choice

for next few decades.

Duty at the lighthouse would have been quite a challenge. To be sure, your primary work would be **cleaning**, cleaning and, yes, more cleaning. Being a **keeper** was not really a glorious job. During the first 18 years, 10 keepers and 12 **assistant** keepers

were appointed. During the 18 years that Robert **Israel** was keeper, the lighthouse went through 10 more assistant keepers—the first being his wife, Maria. Of all the keepers and assistants, official records show that 14 resigned. In addition to the hardship of repetitive and neverending cleaning, there was also a real shortage of fresh **water** because of limited rain and storage facilities.

Before the lighthouse location was selected, it was noted that Point Loma was often surrounded by **fog** and **haze** and, at an **altitude** of 422

feet, there may be problems with the lighthouse being effective. However, plans went forward to build the lighthouse in its current location so that it could serve as both as a billboard toward the sea and as a harbor lighthouse. In 1891, she was closed and the New Point Loma Lighthouse was opened at the bottom of the hill and is still in operation today.

By the turn of the 20th century, the lighthouse was in a terrible state of repair. In 1913, the Order of Panama petitioned the President to declare her immediate location as a national monument. The plan was to tear her down and erect a 150-foot statue to honor Juan Rodriguez Cabrillo. They got

their monument but, fortunately for us, the lighthouse was never torn down and the statue was never built.

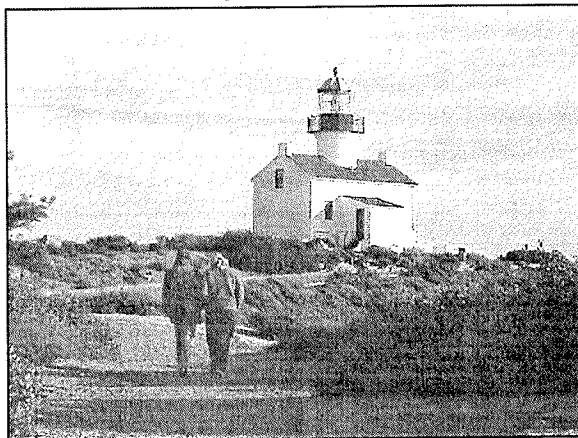
During the mid-1980s, the whole lighthouse was refurbished inside and outside. Today, the interior looks much the way it may have during the 1880s when the Israels lived in and operated the lighthouse. In fact, if you look at the south wall in the parlor, you will see a couple of **seashell** picture frames that Maria had made.

Over the years, the lighthouse has seen massive changes in San Diego. In 1887, the Hotel Del Coronado opened.

Today, high-rise office buildings dominate the **downtown** skyline. The **bridge** from San Diego to Coronado spans the **bay**. NAS North Island now covers most of the west end of Coronado. And above it all, the Old Point Loma Lighthouse stands as a crown jewel fulfilling her role as an integral part of the **view** and as a link to the past, the present and the future.

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