

The EXPLORER

Vol. VII, No. 7
Winter 2003
2002

*Newsletter of
Cabrillo National Monument and
Cabrillo National Monument Foundation*

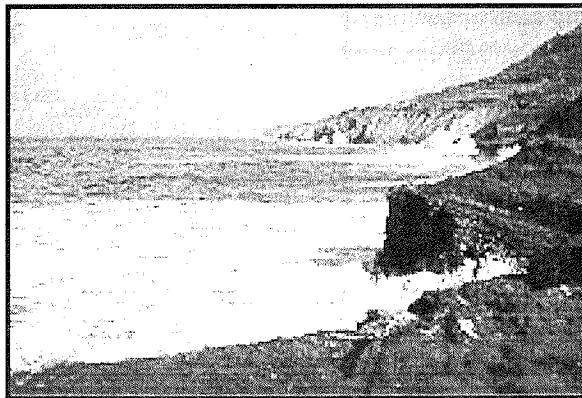
Humans and the sea

If there is one thing that is ever-present in the life of Cabrillo National Monument it is the sea. The ocean that almost surrounds us is an integral part of each of the park's themes: Cabrillo and his voyage of exploration, the Old Point Loma Lighthouse, the U.S. Army coast defense system, Pacific gray whales, the rocky intertidal, the sensitive coastal sage scrub and maritime chaparral habitats, and the constantly changing panorama of ocean and bay that attracts our attention. In this issue you will read a number of captivating articles about the relationship that we humans have with the sea. You will also read about some of the issues affecting the world's oceans and how we are caring for this life-sustaining resource. Despite its seemingly limitless appearance, the ocean is suffering and needs our attention.

According to James Watkins, a retired admiral and former chief of naval operations, and the chair of the new U.S. Commission on Ocean Policy, "The

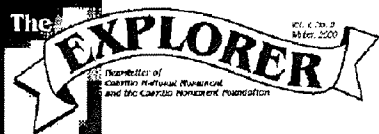
oceans are in trouble; the coasts are in trouble; our marine resources are in trouble." The commission has been studying the condition of our oceans and estuaries for about 12 months. Its interim report, released last September, contains several startling findings. Coastal wetlands, which are critical spawning, feeding, and nursery areas for the commercial fishery, are disappearing rapidly—at the rate of about

40,000 acres each year. Ocean pollution, largely from urban runoff and agriculture, along with development along the coast spurred by rapid population growth, is overwhelm-



ing management efforts. Forty percent of the fish stocks that have been fully assessed are either depleted or are being over-fished while the advice of scientists is too often ignored at the expense of the long-term sustainability of the fishing industry.

A growing number of scientists, commercial and recreational fishermen, policy makers, elected officials,



From the Editor

I read the articles for this edition of *The Explorer* and the theme "Humans and the Sea" came to life! As the writers researched and supported their varied interests—whales, the green flash, tidepools, submarines, bodysurfing—the passionate nature of these articles reminded me of my own personal connections to the sea. As I think about my childhood near the ocean, I remember looking for sand crabs and grunion, boogie boarding with my dad, MANY sunburns, beach-clean-up days with my Girl Scout troop, stepping on kelp to hear it pop, and discovering beautiful shells. I think about watching the sun set over the ocean with my grandmother and listening to the ocean's soothing sound when I needed a break from studying during college. I remember bringing Midwestern and East Coast relatives to Cabrillo National Monument to see the Pacific Ocean for the first time. They were impressed!

How fortunate we are to know the sea and its inhabitants! As you read these articles, we hope you'll be encouraged to reflect on your own connections to the sea, and that you'll be inspired to consider your role in caring for this treasure.

Patricia Heusner

and environmentalists are becoming concerned about the health of the oceans and the ability of these marine species to recover in order to feed us as a people and fulfill their roles in sustaining the health of the ocean. In addition to the U.S. Commission on Ocean Policy, the independent Pew Oceans Commission has been studying the condition of the seas and issued its report, "Marine Reserves: A Tool for Ecosystem Management and Conservation," on January 14, 2003. In 2000, President Clinton signed Executive Order 13158, "Marine Protected Areas." Its purpose is to "help protect the significant natural and cultural resources within the marine environment for the benefit of present and future generations by strengthening and expanding the Nation's system of marine protected areas (MPAs)."

Recognizing that the oceans need help, the State of California passed the Marine Life Protection Act in 1998. This law called for a review of the wide variety of marine protected areas that currently exist along our coast, and establishment of a viable system of several different types of protected areas that would protect representative habitats, helping to ensure the restoration of California's biologically diverse nearshore waters that belong to all of us. This system would contain different types of areas from state marine reserves—similar to national parks—where all species are protected and cannot be removed, to state conservation areas, where the managing agency may permit the commercial and recreational harvest of certain marine resources.

In June 2001 the California Department of Fish and Game (DFG) released its draft proposal for this system of marine protected areas. It proposed the creation of the Point Loma State Marine Reserve adjacent to the monument and extending from the southern tip of the peninsula north approximately 3.3 miles to about the boundary of the Federal reservation, and out three miles, which would encompass the kelp forest. We wrote a letter of support for this reserve because it would help preserve the rocky intertidal area, or tidepools, that we have administered

for over 30 years. Even though these tidepools have been protected, and are considered by many to be the best on the Southern California mainland, they are not as healthy as they should be. The information from the monitoring that we have been doing since the fall of 1990 indicates that the abundance of seven of 13 key indicator species has declined significantly over the years and remains below what it should be. A number of important ecological species, such as the predatory ochre seastar, economically important abalone and the habitat-forming California mussel, have experienced alarming declines or disappeared altogether. We believe creation of a state marine reserve would help the tidepools recover and contribute significantly to their long-term preservation.

There is a growing body of scientific evidence that suggests that the establishment of marine reserves can be a useful management tool if they are properly designed and enforced. The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) recently published a booklet, "The Science of Marine Reserves." In it, PISCO stated that "Marine reserves usually increase the biomass (weight of all animals and plants), density, size, and diversity of species living within their boundaries." If fish and other marine species are not removed and are left to reproduce naturally, within three to five years both their number and size increase rapidly. As these species grow and compete for space and food, they tend to spill over the boundaries of the reserve. People fishing and diving on the edge of reserves report catching more and larger fish than they did before creation of the reserve. Equally important, the fish migrate out of the reserves, repopulating the seas and helping to fulfill their role in maintaining the overall health of the ocean ecosystem.

The Department of Fish and Game is reviewing the comments it received from its 2001 draft master plan to create the system of marine protected areas. In response, it is using local groups of knowledgeable citizens to re-examine the location, size and classification of these MPAs. The

second draft of the master plan should be released later this year.

The creation of this system of marine protected areas will affect the ocean off the California coast for decades to come. It has the ability to help restore the health and vitality of the nearshore waters, ensure the livelihood of those who harvest its bounty to feed us and the enjoyment of those recreate upon and beneath it. It, along with E.O. 13158, the U.S. Commission on Ocean Policy, the Pew Oceans Commission, and the

other organizations and individuals working on behalf of the seas, can do even more. It can give everyone who loves the ocean the peace of mind that comes with knowing that we are doing something to restore, conserve and protect this life-sustaining gift.

We are watching these developments, and those that Bonnie mentions on pages 10 and 11 of this issue, closely. The sea is a vital part of the lives of millions of us who live near its shores and a vital part of the

life of Cabrillo National Monument. As Leon Panetta, former California congressman and chair of the Pew Oceans Commission said recently, "We need to treat our ocean as a national trust." To help ensure that we have a fully functioning marine ecosystem so necessary for our survival, we all need to become informed stewards of this gift that gives us life and so much pleasure.

*Terry DiMattio, Superintendent,
Cabrillo National Monument*

The "mascot" of Cabrillo

By Bonnie Becker, Marine Biologist

I nominate the Giant Owl Limpet to be the official mascot of Cabrillo National Monument.

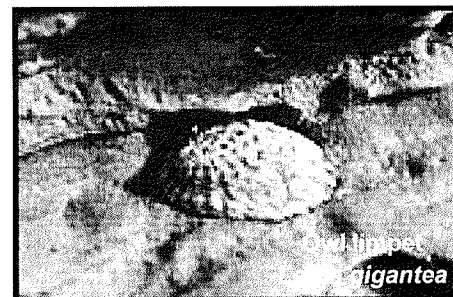
You might find this an odd choice. After all, it is a creature that many people mistake for a lump of rock. Once it is pointed out that these oval lumps that go unnoticed under our feet are actually animals, a common question that follows is, "What is it?" I find the most accurate answer is a simple one: Imagine a snail, untwist it, and flatten it out against the rocks. *Voilà!* A limpet!

Almost every visitor to the tidepools quickly becomes familiar with the shell of an owl limpet: a few inches in diameter and checkered with the telltale pattern of brown, tan, and white. Upon closer examination, the shell begins to tell a story: Divots and pits hint at a time in the history of the limpet when some other organism, such as a chiton, used the limpet as a place to grab on. Sections of shell with spaced-out concentric rings indicate a period of rapid growth, probably soon after the limpet had won a new territory. Parts of shell where the growth rings are close together were probably formed during leaner times, when perhaps the limpet was cornered into a less desirable territory. The same animal can have both types of markings, as its living situation can change quite a bit during its decade or so of life.

In fact, a limpet's existence is tightly tied to its territory. Despite their sessile appearance during low tide, limpets are quite mobile during high tide. They are grazers, feeding by scraping algae off of the rocks with a rasping organ called a radula. Ideally, a limpet will claim a territory, and graze it during high water by crawling along in repeating "figure eights." Once the tide goes out, the limpet returns to the same spot, called the "home scar," leaving a human observer to conclude that the animal has not moved.

Any other animal or plant that tries to settle into its space is quickly scraped off. A limpet will fight another limpet for its territory, using the front, blunt end of its shell as a bulldozer. The limpet only allows its preferred algal food to grow in its territory, and is therefore practicing a sort of "farming." Upon casual observation, it is not obvious that the bare space around a given limpet is being protected and managed by that limpet. However, if one were to remove it, the space would be quickly taken over by algae, barnacles, chitons, or other limpets.

If limpets tend to avoid each other, how do they reproduce? Interestingly, owl limpets are sequential hermaphrodites—they are male when they are small, but once they reach a certain size they become females. They spawn eggs or sperm



directly into the water, where they find and fertilize each other. The resulting embryos develop into free-floating larvae, called veligers, which float at the whim of water currents for some time before settling back in the intertidal region. The young shells on these larvae are twisted like a snail, indicating that limpets are a type of primitive, unraveled snail rather than a bivalve that has lost its other half. In fact, a young limpet settler is very difficult to discriminate from a young abalone.

Limpets are closely related to the rare and prized abalone, a familial relation that has spelled nothing but trouble for the limpets. As abalone populations continue to suffer under the one-two punch of overharvesting and disease, some artisanal collectors have turned to the owl limpet as a substitute. The resulting aggressive harvesting, focused on larger individuals, has taken its toll on the limpet, which is getting rarer and smaller on the southern California mainland. Remember that small limpets tend to be male, and a population of smaller individuals will have a higher proportion of bachelors.

One important refuge from harvesting occurs here at Cabrillo Na-

tional Monument, where an aggressively enforced conservation plan is in effect. We have been monitoring the size distribution of our owl limpet population since 1990, and our results indicate what we have suspected all along—our owl limpets are HUGE. This becomes clear when compared to monitoring sites further north on Navy land where poaching is not regulated. For example, in the spring of 1995, the average size of owl limpets at Navy sites was 1.4 inches, with the largest recorded animal at 2.5 inches. That same season, the average at Cabrillo was 1.7 inches, with the largest at 3.3 inches. The largest individual recorded at Cabrillo is 3.6 inches, which is greater than the listed maximum size in the comprehensive book *Intertidal Invertebrates of California*.

The giant limpets within the park have attracted the attention of visiting scientists. In an article that has been accepted for publication in the journal *Ecology Letters*, Dr. Kaustav Roy of the University of California San Diego and co-authors Dr. Jack Engle of the University of California Santa Barbara and myself, compared owl limpets from pre-1960 museum collections with individuals measured in the field in 2002. Cabrillo specimens were larger than the individuals from both other sites last year, as well as the museum samples! The conclusion was that the protection afforded to Cabrillo limpets has led to a greater number of large individuals. Our protection was particularly noted in the following statement:

The data from Cabrillo National Monument show that existing conservation laws, if properly enforced, can help protect the intertidal biota from some of the anthropogenic changes.

I hope I have made the case for my bold suggestion to crown our remarkable limpets as our mascot. They have it all: action (territory wars), intrigue (hermaphroditism), and industry (practical strategies for food production). Most importantly, the health of our limpet populations is a living testament to the success of the management and protection of our tidepools.

Saving the sea

by Carol A. Martin

The people of Old Town San Diego did not worry too much about waste. If it was garbage or trash, folks just threw it in the back yard and the dogs, pigs, or other animals took care of it. As the town grew, a little waste was not a problem. You produce it—you take care of it. This meant digging a hole in your yard and simply covering it up. As the population moved into Alonzo Horton's "New Town," holes were dug into the soil to be used as outhouses. As more people came, trenches were dug along the city streets. The sludge was left to dry in the sun. One problem sprang up: When there was a high tide, the water backed up into the trenches, washing out their contents. People started digging bigger holes and dumping trash into canyons on the outskirts of town. Out of sight, out of mind.

With the current population of San Diego, trash, garbage, and waste are a huge problem. The city has dug bigger holes, filled in entire canyons, and put in miles of sewage pipes that have already become overloaded. Storm drains line our city streets and pour into the streams and rivers flowing into our beautiful ocean. This is where the abuse starts. But where does it end?

Who is going to protect our oceans? A few concerned citizens are trying, but it is a slow process. First, it must be determined that there is a problem. This takes years. Funding study after study to find the cause of the problem requires a lot of time and money. Members of the political organizations in charge change every

couple of years. Interests and funding change course. What is deemed most important for a particular time becomes the prominent pressing issue. So it becomes even more important that the National Park Service exists to protect and preserve the resources set aside for future generations, forever.

The intertidal area of Cabrillo National Monument, where the land meets the sea, falls under this protection policy. According to the Federal Water Pollution Control Act (Clean Water Act), the sea should be protected from human abuse. This

act firmly establishes federal regulation designed to "restore and maintain the chemical, physical and biological integrity of the Nation's waters." The act requires that states set and enforce water quality standards to meet

EPA minimum guidelines. It establishes effluent limitations for point sources of pollution, requires a permit for point source discharge of pollutants (through the National Pollution Discharge Elimination System), requires a permit for discharge of dredged or fill material, and authorizes a "National Wetlands Inventory." Changes brought about by the 1987 Federal Water Quality Act place greater emphasis on toxicological-based criteria and in-site biological monitoring.

More than 25 parks and monuments within the National Park Service supervise marine resources. These resources are important to global ecology and economy as a source of atmospheric moisture, oxygen, food, minerals, transportation, and recreation. The National Park Service



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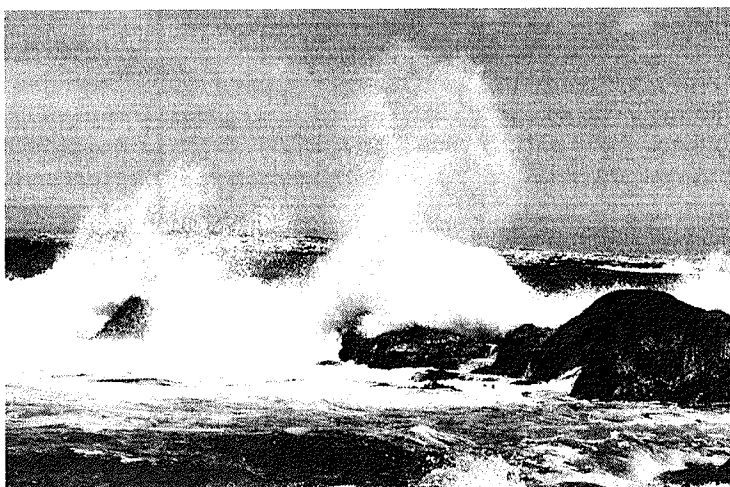
manages natural resources to maintain, rehabilitate, and perpetuate their inherent integrity. The objectives for marine resources management include:

- Inventory all ecosystem components
- Maintain and restore all components and processes of naturally evolving park marine ecosystems, recognizing that change caused by extreme natural events (e.g. storms, red tide, El Niño) is an integral part of functioning natural systems
- Maintain natural genetic diversity of marine ecosystems
 - Maintain or improve water quality affecting marine ecosystems
 - Maintain or improve air quality affecting marine ecosystems
 - Maintain the natural marine viewsheds
- Protect and restore threatened and endangered species and their critical habitat
- Regulate and mitigate human activities to minimize adverse impacts
- Determine limits of natural system variation (baseline conditions).
- Monitor system dynamics to detect abnormal changes in time to effect remedial actions
- Educate visitors about the importance and fragility of marine resources, threats to them, and mitigation to lessen impact

There are 22 other statutory laws that apply specifically to marine resources management and an additional 20 guidelines that contain pertinent material. As you can see, there are plenty of laws to protect our vast oceans. However, loopholes exist and human abuse of the oceans can slip through the cracks. Damage from human activities can add to destruction from natural causes. Limited areas where fishing, drilling for oil or gas, and other extractive activities are permitted, or where fishing quotas, seasons, and gear restrictions apply, tend to focus on a single species. It is more effective to protect the whole ecosystem because every species interacts with numerous

other species and the environment. Reserves can protect habitat and produce dramatic increases in populations living inside their borders, offering insurance against extinction and declines. Marine reserves affect areas beyond their borders by supplying larvae and mature organisms to adjacent waters.

Various forms of water pollution affect organisms on different levels. Oil, toxins, heavy metals, and suspended particulates are widespread problems that affect even the most remote areas. Non-lethal levels of toxins can build up in tissues of organisms. Fuel discharged from bilges and release of human wastes from boats add to the "unnatural" elements that organisms have to adapt to. Municipal sewage and storm drain



outfalls pose a variety of threats, including increased silt load, nutrient enrichments, freshwater influx, and increased bacterial levels. Recent studies have shown that cat feces have contaminated the waters of Monterey Bay.

The National Park Service is committed to protection of habitat, conservation of plants and animals that live in protected habitats, recovery of depleted populations of fish species, movement of animals from reserves to surrounding fished waters, insurance against environmental or management uncertainty, provision of ecosystem services, protection of places to provide baseline information, and provision of sites for enjoyment and inspiration. Quite a few visitors come to our intertidal area sim-

ply to enjoy the beauty of the ocean. It would be great to include a small part of the giant kelp forest within park boundaries for protection. Another reason to protect this environment is that most animals and plants move from habitat to habitat during their lives. They may float as larvae on the ocean surface, hide among the rocky shoreline or in kelp beds until they grow large enough to become an adult and swim freely to another area or return to the waters of their birth.

Outside influences, including pollution, invasive species, disease epidemics, and climate changes affect whole regions and require complementary solutions. An important reason to protect a variety of habitats is that different habitats often influence

each other. Estuaries serve as nursery habitats for some fishes of the open ocean. Organic matter produced in estuaries can flow into the ocean fertilizing coastal marine ecosystems. Fragments of kelp from rocky reefs wash up on beaches providing food and shelter for animals that live there. Some habitats such as estuaries trap sediments moving down rivers, preventing these sediments from entering the ocean. Without these, sediments could accumulate in

the coastal waters, smothering life on adjacent environments.

We are fortunate at Cabrillo National Monument to have a natural resources science department closely monitoring the tidepool area. Our waters also fall under the caring and ever-watchful eyes of our volunteer staff. To everyone who picks up a speck of discarded trash, no matter how small, thank you. Thank you for protecting those too small to protect themselves from the human abuse that lurks in their environment.

In the cradle of the deep

by Bob Munson, Historian, CNM



The other day CNM Volunteer Pierce Harris and I were talking, and he told me a story about surfers who had found a sunken submarine off the Silver Strand. This seemed highly unlikely, and I'd never heard anything about it. However, Pierce knows his onions and I thought I'd check up on the story, however dubious I thought it might be.

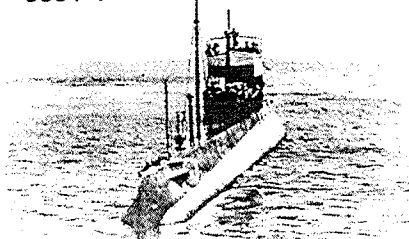
Well, after slogging through some very ancient and arcane records late into the night, I found out that Pierce was indeed wrong. There wasn't a submarine sunk off San Diego. There were two! I should have known better. When Pierce mentions something, believe it.

It turns out that two United States Navy submarines have ended their days off our smiling sunny sands—one by accident and one on purpose.

USS F-1 was a 142-foot "F" class launched by Miss J. Tynan at Union Iron Works, San Francisco, as USS CARP on 6 September 1911. The Navy decided that submarines shouldn't be named, so by the time the boat was commissioned in June 1912 she had been redesignated F-1.

Initially assigned to the 1st Submarine Group out of San Francisco, she was transferred to Honolulu in July 1914. After a year and a half in Hawaiian waters she returned to the mainland at the end of 1915. F-1 was laid up, out of commission from March 1916 to 13 June 1917 when she was returned to full commission as World War I dragged everyone, even on the west coast of

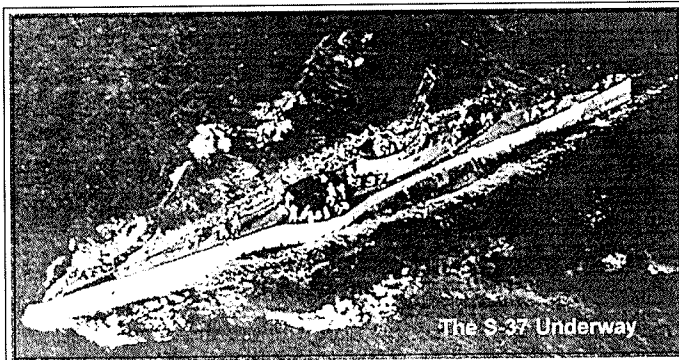
USS F-1



F-1 sank like a rock, taking nineteen of her 22-man crew down with her. F-3 picked up her three survivors.

America, into the fury. She was based at San Pedro under the command of Lt. Alfred E. Montgomery.

On 17 December 1917, while involved in training exercises off Point Loma, F-1 was rammed in the port side amidships by her sister ship F-3. Her control room was completely



The S-37 Underway

torn open and F-1 sank like a rock, taking nineteen of her 22 man crew down with her. F-3 picked up her three survivors.

There is no record of any salvage attempts on F-1, and the wreck is apparently still there.

The other submarine on the bottom off San Diego is USS S-37.

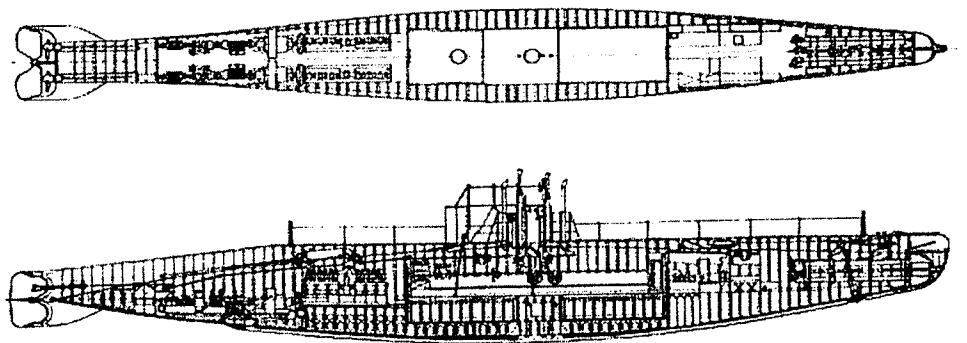
S-37 was launched at Union Iron Works, San Francisco on 20 June 1919 by Miss Mildred Bulger. Due to post-World War I defense cuts, it took awhile to get S-37 fitted out. She wasn't commissioned until 16 July 1923!

S-37 got off to a rough start. Transferred to San Pedro for shake-down, she suffered a battery explosion while in harbor that killed three men and sent her back to Mare Island for major repairs. After that she became an operational unit, involved in three major fleet exercises which took her to the Caribbean via the Panama Canal.

On 17 September 1925, S-37 with Sub Div 17 and the submarine tender Canopus (AS-9) departed San Francisco for duty in the Philippines. She would spend the next 16 years operating in the Philippines with spring and summer maneuvers off the China coast.

December 7, 1941 found her tied up in Manila Bay. Within twenty-four hours she had cleared Corregidor outward bound on her first war patrol. Her patrol encountered no Japanese, but revealed that she was an aging boat that had spent too many years in the tropics. On 1 January 1942 she suffered a fire in her starboard main motor panel. It took all night to repair the damage. Three days later she developed air leaks which were finally stopped by makeshift repairs.

On 7 January she was ordered to Darwin, Australia, but diverted the following day to the Dutch naval base at Soerabaya on the northeast coast Java. By the 11th she was on patrol off the Celebes and Borneo. She encountered none of the invading Japanese, but was constantly evading their prowling destroyers. Lacking



Deck, Profile and midship drawings of the S-37

proper codes, S-37 was unable to communicate with the Dutch navy which made her approach to Soerbaja very ticklish having to surface in front of some very wary Dutch patrol vessels. By the 24th she was safely tied up at the base.

By the end of January the Japanese juggernaut was rolling ever further through the Dutch East Indies and S-37 was once more at sea hoping to help stop them. On 8 February she evaded a Japanese destroyer and then spotted three more. Tired of avoiding the enemy cans, S-37 went after them—this at a time when it was considered suicidal for a submarine to engage a destroyer, much less four of them! Just as S-37 lined up for a full spread, another four destroyers and three transports were sighted. The transports were the crucial targets and S-37 broke off her attack to pursue them. It was after dark before firing position was achieved and it was a long shot. All four bow tubes were fired and one hit was obtained. Not on a transport, but S-37 had the satisfaction of hearing the destroyer *Natsushio* break in two and sink. The other Japanese destroyers did not take kindly to this and spent the next two hours working S-37 over as she went deep to escape.

S-37 remained on patrol for another eight days, but with all the Japanese destroyers around, she was able to manage only one attack. This was a complete bust as all her torpedoes sank after leaving the tubes! This did not stop the enemy destroyers from hammering her again. During these operations it was discovered she was trailing oil, which was a directional

sign for every enemy unit and aircraft in the area. S-37 finally managed to disappear in a choppy sea and returned to Soerbaja for repairs.

Unfortunately, the Japanese were closing in on the Dutch base and S-37 had to get out before it was over run. She put to sea jammed with spare parts and her engine room crew still reassembling her starboard engine. On 28 February she sighted two cruisers and three destroyers, but her depth control was lost during the approach which ruined the attack. At noon she spotted a 50-foot boat jammed with survivors from the Dutch cruiser *De Ruyter* which had been sunk in the Battle of the Java Sea the previous night. Unable to cram all the survivors on board, she gave the boat as much water and food as it could hold and radioed its position to the Dutch authorities.

From this point on, life became one series of bombings, depth chargings, and broken, worn-out equipment. Finally, on 6 March her engine room hatch sprung a leak and S-37 was ordered to head for Australia. She arrived at Fremantle without incident on 19 March. This heralded a long-overdue and extensive three-month overhaul.

She sailed on her fifth war patrol on 22 June 1942 in the New Britain area. Here she hit the freighter *Tenzan Maru* with three torpedoes and the ship promptly sank. On 14 July she began having mechanical difficulties again and limped back to Australia arriving in Brisbane on the 21st.

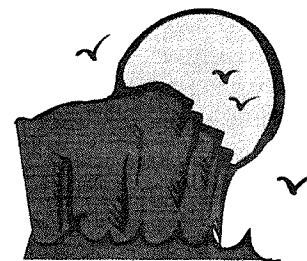
Her sixth, and last, war patrol was on a defensive line in the Savo area during the Guadalcanal campaign.

Once again this patrol ended with an increasing list of mechanical failures, and S-37 was ordered home to San Diego by way of Pearl Harbor.

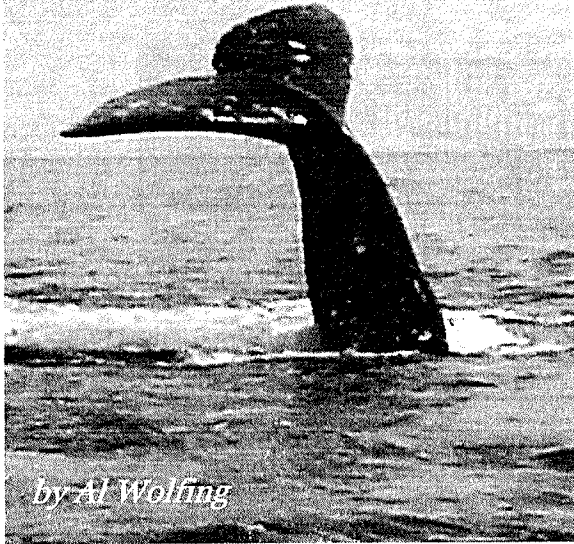
After a major overhaul in the winter of 1943, S-37 spent the remainder of her career on antisubmarine warfare training.

Decommissioned on 6 February 1945, S-37 was stripped of all useful equipment and sunk in shallow water to serve as an anti-submarine depth bomb target. Again, there is no record she was ever salvaged and scrapped, so presumably what is left of her is still there.

So, the only question remaining is, which of these two subs is the one located by Pierce's surfers? Considering that F-1 was officially lost exercising off Point Loma, while S-37 was scuttled off "Imperial Beach" in shallow water, it would appear Pierce's boat off the Silver Strand, which abuts Imperial Beach, is the S-37.



A whale of a tale



by Al Wolfing

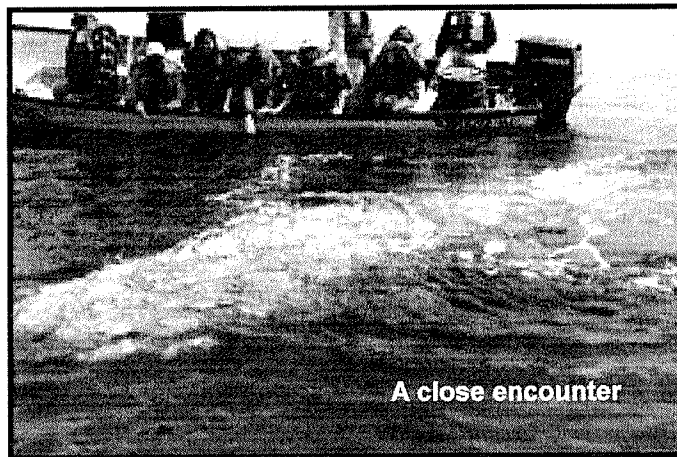
At the end of February 2002, my wife and I traveled to Scammon's Lagoon in Baja California with a tour group organized by San Diego State University. We were both eager to see the whales close up; not even the excellent whale movie we show at CNM prepared me for the fantastic adventure that trip would be.

Scammon's lagoon is about 450 miles south of San Diego on the Pacific coast. Although the road to it is quite good, it still took twelve hours in our two 15-passenger vans. Along the way are some of the most impressive parts of the Baja California desert. There were areas where the cactus grew so thick and in such variety that they rivaled any cactus garden I have ever seen.

Getting to the lagoon from our motel in Guerrero Negro involved a thirty-minute drive that emphasized how the economy of this region revolves around the topographical realities that have made it so barren. The entire area was once at the sea bottom and today is barely above sea level. It is also as flat as a table top

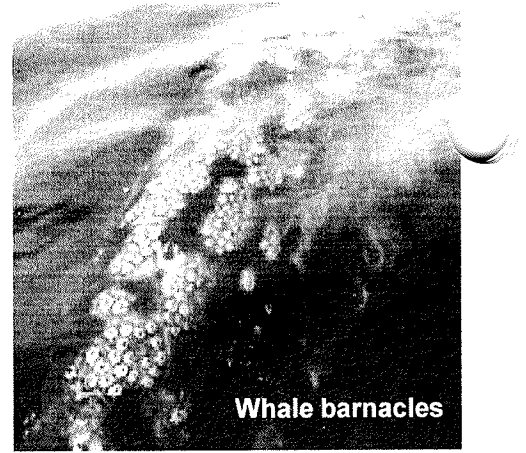
for as far as the eye can see. Over many years the area has been covered in sea water any number of times. As a result, only a few sparse weeds can grow in the salty soil. Today, to obtain salt for export, salt beds about three feet deep and two hundred yards square have been bulldozed in the earth. Each is flooded with seawater and, after the water has evaporated, flooded again until nothing but a solid mass of salt is left. These salt beds extended to the horizon in all directions. The salt is then trucked to the water's edge and sent by ship to Isla Cedros to be processed and packaged. At the edges of the lagoon, virtual mountains of salt are piled up awaiting shipment. Bulldozers on top of these salt piles resemble Tonka Toys.

By 9:30 we were at the center of the lagoon, the shores on either side just barely visible. The boat operator throttled back the outboard motor to a slow idle as we waited for a whale to appear in the deep green, slightly choppy water. Even before the boat came to a halt, a whale surfaced some hundred or more yards to star-



A close encounter

board. Although only its back and head were out of the water, it seemed enormous. It turned and headed directly for the side of our launch like a bus-sized torpedo. Beside her, we could now see a calf, more than twelve feet long but ridiculously tiny



Whale barnacles

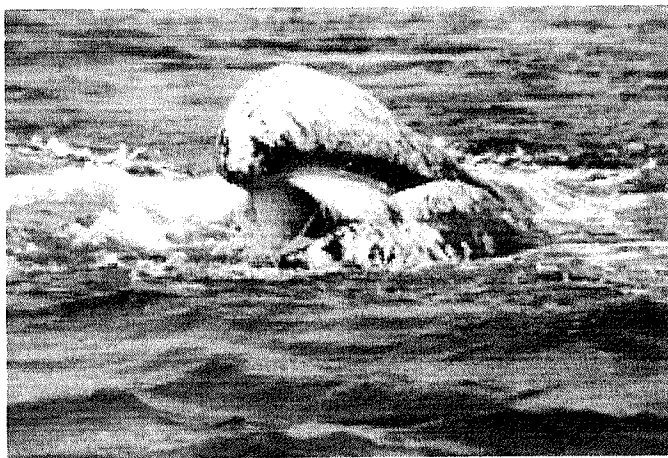
beside its huge mother. On they came, a little faster now. In the days of whaling the gray whale had picked up the nickname "devilfish" because it was one of the few species known to attack boats like ours, probably in defense of a calf. I had not shared that particular tidbit of information with the others on the tour, but I couldn't help but recall it, given the circumstances. With less than ten feet between us, the whales dove just enough to clear the keel of our boat, only to appear on the surface again, moments later.

Those of us on the port side continued to stare as the pair slipped off to the south. Our attention was pulled back from them within moments by the exclamations of the folks on the starboard side who were now almost within touching distance of a whale that had just surfaced, parallel to our boat. It lay quietly on the surface with its left eye about at the center of our 25-foot launch and the majority of its 60-foot body extending beyond our bow. Long moments passed as we two species inspected each other. This was no newborn and its mottled white and gray back displayed a carpet of barnacles, whale lice, and white scar tissue left by prior generations of such parasites. Its eyeball, the size of an orange, moved back and forth taking our measure. On top of its head, its nostrils quivered with each breath and resemble nothing so much as a horse's nose—black around the outside rim, pink on the inside; had it

been close enough to touch I am sure it would have been as soft. (Since our trip can't bring myself to use the word "blowhole" because "nostril" is so much more descriptive of what was there in front of us.)

After what seemed like several minutes, but was probably no more than twenty seconds, the enormous creature sank as quietly as it appeared and passed behind us, just below the surface. I had expected to see some dramatic motion of its tail or an undulation of its powerful body but the movement that propelled its 30-ton bulk in this shallow lagoon was so subtle as to be almost imperceptible.

At the far end of the lagoon, more than two miles away, we could now see whales breaching. Our two boats headed off in that direction, but before we were halfway there another scene from our whale movie played out before us at a distance of no more



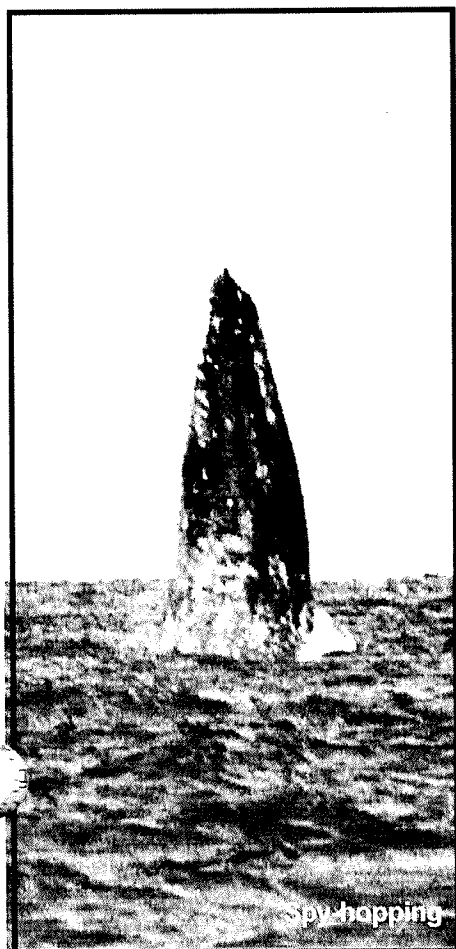
Mouth of a gray whale, showing the left baleen plate. What a lucky shot!

than 150 yards. A trio of courting whales surfaced and it became evident that, contrary to good manners, the female was clearly being vigorously courted by two suitors who seemed oblivious to the calf at her side. Just as we have seen on film, the males were twisting and diving, entwining themselves about the female's body even as she rolled and bucked trying to dislodge them. Before us, one hundred tons of whales rolled and convulsed, beating the wa-

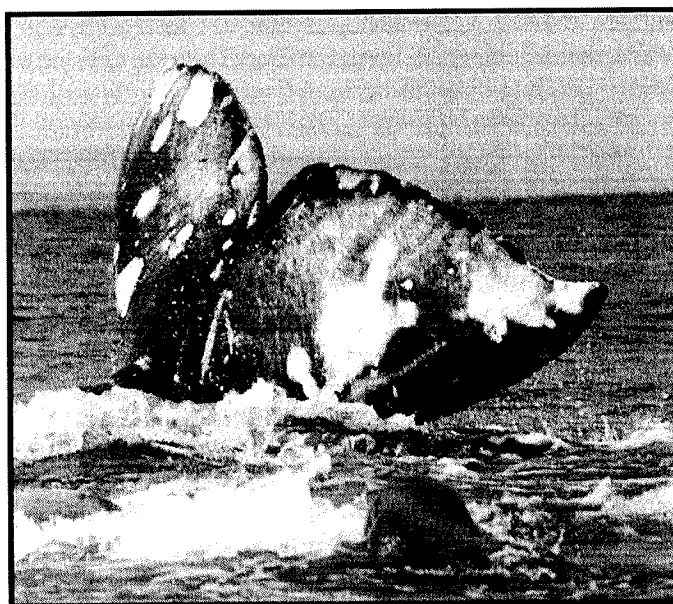
ter about them to froth. For one brief moment the calf came entirely out of the water, pinned between its mother and one of her suitors as they rolled over and over. Unlike our film at CNM, I cannot report the outcome. The guide continued toward the lagoon entrance, perhaps to spare us what might have been an unhappy ending to this episode.

For the rest of the day and most of the next we continued to have truly fantastic luck. Hardly a half hour went by that some curious whale or calf didn't try to "climb into the boat." Between those encounters we could almost always see two to a dozen whales in the distance—breaching, spy hopping, or courting. Almost everyone had touched a whale in the course of those two days.

We found out later that few tour groups are half as lucky as we had been in encountering friendly whales, but in retrospect, the expenses and time would have been well worth it if we had only that first morning's adventures to remember.



spy hopping



**Photograph showing baleen plates by Renee Bonner
Other photographs by Nancy Richards-Wolfing**

Marine reserves

By: Bonnie Becker, Marine Biologist

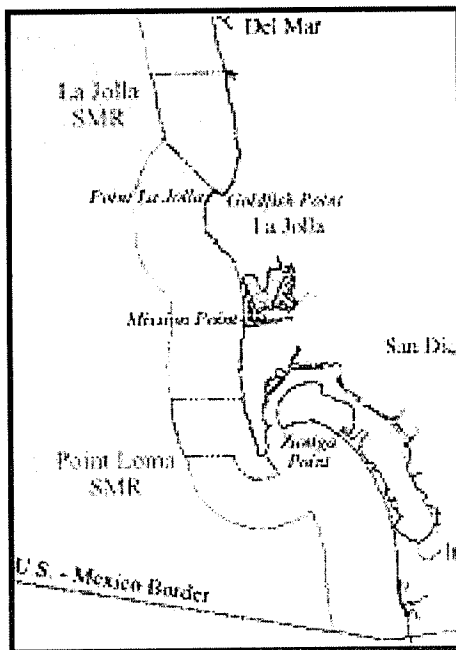
In the past four years, you might have noticed a number of news reports about proposed marine reserves in our area. Here is a summary of the current situation:

What is a marine reserve?

Since the beginning of human culture, and especially over the past century, humans have had to face their ability to exploit their resources until they are gone. The realization that marine resources are not limitless has come more slowly than our terrestrial awareness, but the risk of overexploitation has proven to be quite high. Traditionally, we have tried to manage our actions by limiting our use, either in time (e.g. closed seasons, size limits) or through technology (e.g. gear restrictions, by-catch reduction devices).

Over the past two decades, many scientists and managers have suggested that a very powerful tool for management is limiting use in space, closing off areas from exploitation. Although the details and labels vary (marine reserves, marine protected areas (MPAs), marine parks, etc.), the idea is the same—protecting populations to allow them to replenish themselves. One important distinction is that some marine reserves allow complete or partial access to fishing. In the rest of this discussion I will use the term “reserve” to imply “no-take” areas where exploitation of any organism is prohibited.

Many potential advantages, both to fisheries and to the general public, of marine reserves have been identified. Marine populations both within and outside the proposed area could increase with well-designed and enforced marine reserves. There are a number of studies that indicate animals in reserves are larger and more abundant than those in nearby areas. These larger, protected animals can contribute to populations in neighboring regions in two ways—they can migrate or their offspring can be transported to new areas. Many



marine organisms reproduce by bearing microscopic larvae that disperse in the currents for periods ranging from hours to months. With luck, these larvae eventually arrive at suitable habitat and develop into the larger animals with which we are familiar. Therefore, if a protected population is upstream of suitable habitat, the larvae produced in the reserve can seed other regions with new juveniles. In most species, larger animals produce many times more larvae than small ones, so the protected animals can serve as a source of a large proportion of new fish and invertebrates for nearby, unprotected areas. Closed areas are also easier to enforce than other management techniques, such as size limits or partial closures.

In addition, reserves have advantages unrelated to fisheries—tourism, recreation, education, and scientific research all benefit from protected areas. Cabrillo National Monument is a marine reserve with non-fishery goals. Harvesting is limited within the park; consequently, a healthy and diverse ecosystem allows for increased biodiversity as well as tourism and educational opportunities.

Our closed area, called Zone III, allows for replenishment of marine organisms that potentially seed the rest of the park and the local area. Preservation of biodiversity and of representative habitat are strong arguments in favor of reserves.

Marine reserves have been applied abroad for decades, but the United States has been more conservative in their application. One percent of the global ocean is closed to fishing; less than 0.02% of California's waters are fully protected. In the past four years, three major proposals have been introduced in California to create large, no-harvest reserves. All have been in the media quite a bit, but it might not be clear how they differ and what their current status are. Following is brief synopsis and update on each.

Channel Island Marine Reserve Network (State and National)

Currently, protection of the northern Channel Islands falls under a number of jurisdictions, including the Channel Islands National Park (National Park Service) and the Channel Islands Marine Sanctuary (National Oceanic and Atmospheric Administration). Although the area is included in a number of overlapping management units, the only existing no-take reserve around the Channel Islands is a 37-acre spot off of Anacapa Island.

Beginning in 1998, a working group of scientists, fishermen, concerned citizens, and other stakeholders met to discuss alternative plans for establishing a reserve network in the Channel Islands area. A separate scientific panel recommended that 30 to 50% of the surrounding waters be protected, although the fishermen wanted 13% or less. When negotiations for consensus failed two years later, the California Department of Fish and Game (DFG) and the Channel Islands National Marine Sanctuary developed a compromise plan.

On October 23, 2002, the California Fish and Game Commission approved a proposal to close 17 square miles of marine habitat around the five northern Channel Islands from fishing activities. The network comprises 13 reserves. Eleven of these are completely closed to all

harvesting, while the other two allow limited recreational and commercial water fishing.

Beyond three miles offshore, state jurisdiction ends and federal begins. Therefore, the reserve created by the state this year only includes the area near the islands. The federal government (National Marine Fisheries Service and the Marine Sanctuary Program) is considering extending the Channel Islands Reserve beyond its borders to create a 426 square mile complex, which would be a combined federal and state entity. This reserve would protect about 25% of the water around the islands, and would be the largest in the continental US. They are expected to make their decision within the next year or two.

The state regulations were scheduled to go into effect on January 1, although due to the fact that the plan was passed towards the end of the year, they will probably not be finalized until mid February. In addition, a coalition of fishing groups sued the Fish and Game Commission in November, hoping to block the creation of the reserves.

Marine Life Protection Act (State)

Although many of the players are the same, the movement to create a large network of marine reserves spanning the whole coast of California is a different process than the one described above in the Channel Islands. In 1998, the state legislature passed the Marine Life Protection Act (MLPA), which required the California DFG lead in the development of a plan to create a network of marine protected areas. The purpose was to improve and consolidate the existing disparate reserves on the coast to a well-planned and executed network that would protect representative habitats and sustain marine populations.

In June 2001, the DFG, with assistance of a planning team, introduced a draft plan to meet these requirements. One of sites they proposed for a new reserve is the Point Loma Kelp Forest, including the area adjacent to Cabrillo NM. Other San Diego County designated sites include La Jolla and Camp Pendleton. As proposed, the new reserves would completely limit extractive uses (fish-

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ing, hunting, harvesting), although access would probably remain open.

The DFG began a series of ten public workshops in July 2001. One major comment to come from these controversial meetings was that the public had not been included in the initial process. In response, the DFG began a series of smaller meetings with constituent groups, and set up seven smaller local panels (Regional Working Groups) with approximately fifteen chosen representatives from a wide range of constituent types. Our local representatives encompass interests from Point Dume to the Mexican border, and include friends of the park: Dr. Paul Dayton (who has two students doing research at Cabrillo, including myself), Dr. Kathy Ann Miller (a member of MARINE, our partner monitoring network), and John Moore (a local diver who has volunteered in the Natural Resource Science Division). The groups began meeting in July 2002.

Each group is charged with creating a local siting map for its area. These will be combined into a second draft of alternative networks. These drafts will go through economic and scientific review processes. Once again, the plan will be open to public meetings. The final product will be a master plan, compiled by the Department and Fish and Game. Although in the original MLPA a master plan was to be presented to the Fish and Game Commission by January 1, 2003, the process has been postponed. The new deadline for a master plan is December 1, 2003.

Rockfish Closure (National)

On June 20, 2002, the Pacific Fishery Management Council (federal body in charge of federal waters on the West Coast) declared an emergency closure of the West Coast deep water rockfish fishery. The fishing ban includes the bottom fishing for rockfish, ocean whitefish, sculpin and lingcod deeper than 120 feet and south of Humboldt County. Some of these species can still be fished in shallower waters.

A number of reports had indicated that many of these species were dwindling due to intense fishing pressure. Bocaccio, in particular, had been harvested to its annual limit after only six months in 2002, and is believed to be at about 5% of their initial abundance. The council declared it "overfished" under the Magnuson-Stevens fisheries Act. All other fisheries not mentioned in this action are still open, such as salmon, striped bass, halibut, tuna, and barracuda. In October, the state DFG adopted a similar closure.

On the surface, this move seems quite similar to the creation of a large marine reserve. However, the ban only includes certain targeted fish, without protecting the rest of the ecosystem. It is a different type of management that is being applied to a slightly different issue. A marine reserve, as I've explained it, is designed to protect smaller area of habitat and include a range of species. This action is a more traditional fisheries closure.

Marine Reserves in Action

These three different scenarios demonstrate how complicated marine reserve applications can be. They include many governmental bodies (state and federal) and constituent groups addressing various goals ranging from protection of representative habitat to protecting specific species from extinction. Armed with this information, I suggest you pay attention to the news to follow these stories as they develop. I will write another update in a few months to keep you current.

References supplied on request

As far as the eye can sea

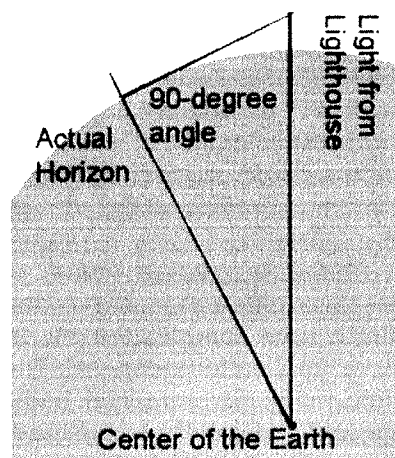
by Mike Nelson, Volunteer, CNM

Back in the 1970's, I lived up at the top of Mount Laguna. During a Santa Ana, I could see incredible views of San Diego. The Point Loma peninsula stood out in bold relief before the ocean slid off the horizon. I often wondered how many miles away the horizon actually was.

Today, through the wizardry of computers and the internet, I can get instant gratification. The answer is about 97 statute miles (84.3 nautical miles) from a height of 5200 feet.

One would think the computation would be pretty straight forward—simply a matter of geometry. And it is—sort of.

The Greek mathematician, Pythagoras, gave us the formula for



calculating the distance to the horizon in the 6th century B.C. His theorem says that the square of the hypotenuse of a right triangle is equal to the sum of the squares of the other two sides. (The drawing shows the radii to the center of the earth with tangent to the shorter radius). Since it's been more than 35 years since I took plane geometry in high school, I found the derived formula a lot

easier to use: Distance in nautical miles is equal to the square root of 1.17 times height in feet ($\text{n miles} = \sqrt{1.17 \times h}$).

Joseph E. Brown in his book *Ca-brillo National Monument*, writes that the height of the light in the Old Point Loma Lighthouse (OPLL) is 462 feet. Using his figure, the formula computes the horizon to be about 28.9 statute miles from the tower.

Let's consider a ship coming to San Diego with the crow's nest 90 feet high. The ship's horizon would be about 12.77 statute miles away. Theoretically, under ideal weather conditions, the crew might see the light from the tower over 41 statute miles (36.2 nautical miles) away. In reality, it would be extremely difficult to actually see the light at that distance unless it were perfectly clear and you knew exactly where to look.

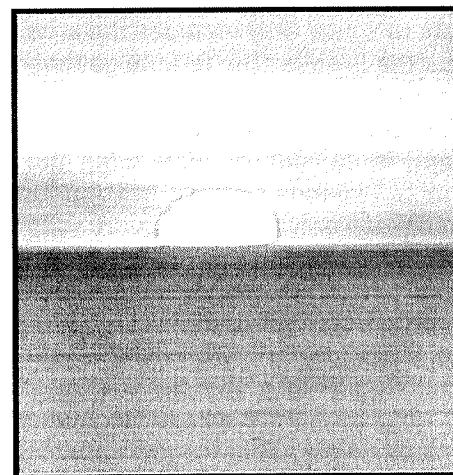
Moisture in the atmosphere bends light slightly. As a result, you can actually see a bit behind the horizon. Depending upon the air temperature and the moisture content of the atmosphere at the surface of the ocean, the apparent horizon may be up to 4 degrees below the actual horizon. Carol Ann Vallee's article on the elusive green flash at sunset—on the following page—has an excellent illustration of actual versus apparent horizon. When the refraction affects the appearance of celestial objects like the sun, it is called astronomical refraction. Objects like ships or land masses are subject to terrestrial refraction.

There are ways to calculate the effect of refraction by using geometry and physics but they are beyond my mathematical skills. In fact, as I reviewed them, I got a headache! I think that Lloyd Morris on his website summed it up best: "It only takes about 2 months of concentrated studies to understand it all, and after leaving the service (Navy), you don't have much need for all the stuff you learned. That (is) why you end up giving people long-winded answers to short questions, like I just did."

One more thing: Refraction also manifests one other interesting effect. Objects tend to compress vertically as they approach the horizon. You can often see this as the sun sets

like in this picture I took on November 15, 2002, near the lighthouse.

If we need high precision (like targeting a ship on the horizon), we can always use a 20th or 21st cent



technology like radar, lasers or geopositioning satellites.

When push comes to shove, I learned that "approximately" is close enough when it comes to figuring out how far away the horizon actually is. The perfectionist in me quickly conceded to pragmatism when faced the maze of calculations that would be involved to determine the exact distance. I will simply access the web and refer to one of the calculation pages if I really need to know the distance to the horizon!

There are a number of resources on the web which address as far as the eye can sea. I recommend starting with these:

- <http://www-istp.gsfc.nasa.gov/stargaze/Shorizon.htm>
- <http://www.warships1.com/WTech/tech-011.htm>
- <http://www.rossmack.com/aRPG/travelerAstroHorizonDistance.asp>
- <http://www.iol.ie/~geniet/engrefract.htm>
- <http://www.boatsafe.com/nauticalknowhow/distance.htm>

There are also a number of sites that calculate the distance to the horizon in both nautical and statute miles based upon altitude in feet or meters. I used this one for this title:

- <http://www.boatsafe.com/tools/horizon.htm>

The green flash: fact or fiction?

by Carol Ann Vallee

The cold wind bit at my red nose and numb fingers as I struggled to keep my ranger hat atop my head. This blustery December evening wasn't about to stop me—I just *knew* this was going to be the night I finally witnessed it. It was my third year working at Cabrillo National Monument and I felt destined to observe this phenomenon that had been so elusive to me in the past. The conditions were perfect: The horizon was crystal clear, not a cloud or smog bank in sight. I stood behind

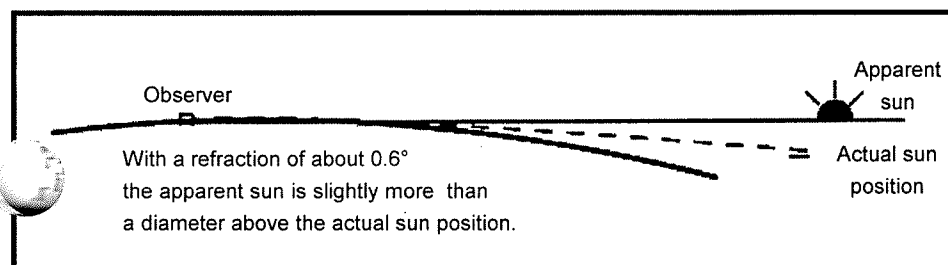
fore I die" list and set out determined to witness this rare luminary event. After countless futile attempts and a set of chapped lips, I decided that the flash must either be a figment of the weary sailor's imagination or perhaps another whale tale to pass time on an endless voyage. But then again, night after night, I heard other rangers comment, "Did you see the flash? It was a good one tonight!" I was now determined to find out what caused the flash and why I hadn't seen it yet.

The earliest accounts of the green flash are from the 19th century. Most

see it will be the first.

Alas, seeing the green flash at sunrise is even more difficult than witnessing it at sunset. In addition to having a clear and distant horizon, you must have a good idea of where the sun will first appear since you only have a couple of seconds to see the flash. Whether sunrise or sunset, your chances of observing this phenomenon increase with altitude. You may want to try standing on a mountain top or tall building, or even try taking an evening flight on an airplane.

As for myself, I head up to the lighthouse to watch and wait. The western sky fills with red and yellow hues. A cool breeze blows and rattles the pods of the locoweed. I watch, once again, as the radiant sun slips slowly into the blue deep. And as the final fiery ray disappears....I see a large emerald flash of light before my eyes. I turn to the family standing next to me. "Did you see THAT?" I ask in disbelief.



the Old Point Loma Lighthouse looking toward the setting sun eager with anticipation. Slowly at first, and then more quickly, the brilliant orange sun melted into the sapphire sea. And then, at long last, the final fiery ray sank below the horizon and...NOTHING! I trudged back down the hill, foiled once again.

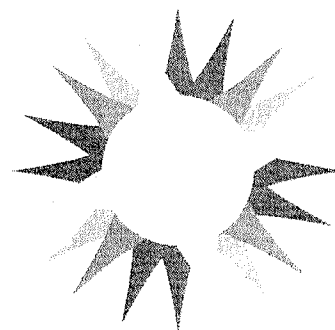
A year earlier I had read the following passage written by Jules Verne in his 1882 novel, *Le Rayon-Vert* (The Green Ray), in which he describes his observations of the green flash:

"...a green which no artist could ever obtain on his palette, a green of which neither the varied tints of vegetation nor the shades of the most limpid sea could ever produce the...! If there is a green in Paradise, it must be but of this shade, which most surely is the true green of Hope."

WOW! I immediately added this green flash to my "things to see be-

fore I die" list and set out determined to witness this rare luminary event. After countless futile attempts and a set of chapped lips, I decided that the flash must either be a figment of the weary sailor's imagination or perhaps another whale tale to pass time on an endless voyage. But then again, night after night, I heard other rangers comment, "Did you see the flash? It was a good one tonight!" I was now determined to find out what caused the flash and why I hadn't seen it yet.

The earliest accounts of the green flash are from the 19th century. Most reports were from observers at sea, so it was speculated that the flash of green was sunlight shining through crests of distant waves. There have been several other theories regarding its cause, however, and modern explanations seem much more plausible. Astronomers have discovered that the atmosphere acts as a prism, separating colors of visible light. Each wavelength represents an individual color of light being refracted or bent, at a different angle. When we are watching the last sliver of sun dip below the horizon, the sun is actually already below the horizon. (See figure 1.) All we are seeing is the light rays bent by the atmosphere. Blue light is bent more than other colors but is scattered by air molecules and aerosol particles. That is why the sky is blue. The scattering of blue light leaves green as the last wavelength to be seen as the sun sets. This effect can also occur at sunrise but instead of green being the last ray you



References supplied on request.

Diagram used with permission from Dr. Rod Nave, Department of Physics and Astronomy, Georgia State University



Protecting our coastline *by Carol Knipper*

The approximately twenty-five percent of this planet that is dry land emerges out of more than 138 million square miles of water. The almost chance encounter of land and water creates a diverse coastline whose edges draw up water and turn back waves and create an irresistible habitat for animals and humans. Worldwide there are 223,359 miles of coastline. The United States has 12,383 miles of seacoast (more than half of this in Alaska); the National Park Service is fortunate enough to preserve and protect several hundred miles of this. Cabrillo National Monument is responsible for a mere 1.2 miles—a fraction of a fraction—but when it comes to protecting vital resources we all must do the best with what we have, improve it and multiply our successes.

The National Park Service is committed to doing just that—from Bering Land Bridge National Park and Preserve in Alaska to Haleakala National Park in Hawaii, and from such recreation destinations as Padre Islands National Seashore in Texas, and Gulf Islands National Seashore in Mississippi to the designated International Biosphere Reserve: Florida's Everglades National Park. Many coastal parks are primarily historic fortifications holding strategic locations along the coast—Fort Jefferson in Florida and Fort Sumter in South Carolina, for example. From rocky intertidal areas to sandy beaches, coral reefs, and calving glaciers, each park harbors diverse animal and plant populations and even sunken cultural resources. Fifty-one park units are responsible for providing protection to marine and coastal resources. The challenges are many. According to Rebecca Beavers, coastal geologist with the National Park Service, "Citizen demands regarding the coastlines of the United States are both extensive and contradictory. Americans

want miles of undeveloped shoreline for walking, bird watching, and spiritual renewal, in addition to wide beaches to protect coastal homes and cities from hurricanes and the rising sea.... Yet citizens also want the benefits of engineered coastlines, such as reliable navigation channels, fiber-optic cables, and oceanside roads." When you consider that half of the US population lives within 50 miles of a coastline, the issues and potential negative impacts are enor-

Although Cabrillo National Monument may be an infinitesimal part of the global coastal issue, this park plays no small part in being an inspiring and enjoyable place for thousands of children and adults as well as being a favorite locale for researchers.

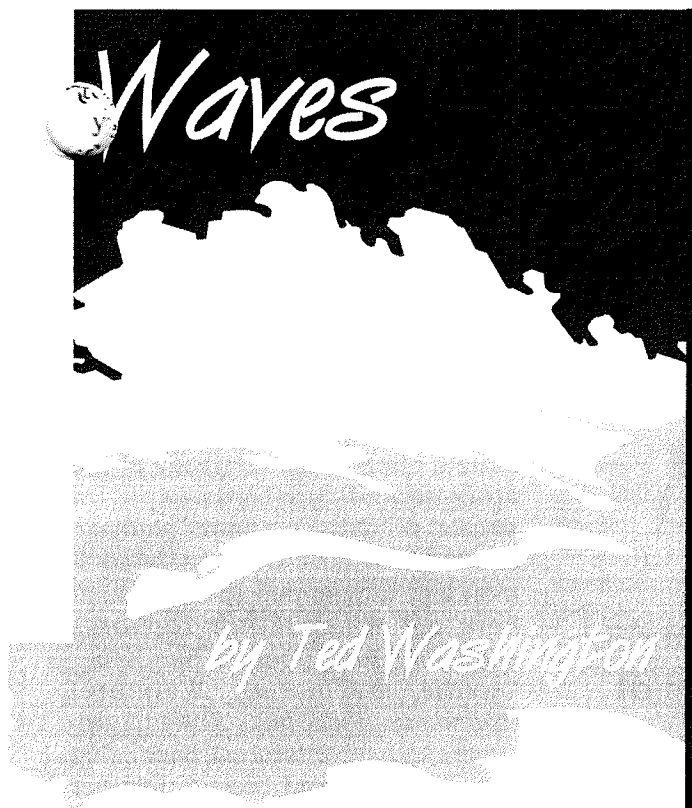
mous. In the 2001 Natural Resource Year-in-Review Report, the National Park System Advisory Board stated, "The marine world may be degrading faster than our terrestrial one as pollutants pour into it from the land and sky, and stock of many species decline from overfishing." The National Park Service encourages scientific studies in parks so that managers can make decisions based on science. The studies have included general biological surveys, fisheries, marine invertebrates, water quality, and marine algae and flora. Clearly there is a need to be vigilant and persistent in protecting and pursuing scientific study of coastal resources.

The National Park Service has embraced this resource challenge. Standardized monitoring methods and



mapping using global positioning systems are raising the mark on inventorying our resources. Importantly, the national parks serve as laboratories for the study of flora and fauna and natural processes in a relatively unaltered natural setting. Equally important, visitors can come and enthuse over the beauty and wonderment of the diverse and seductive coastal environs. The influence of a positive experience can not be underestimated. We can only hope that our chance to educate visitors about the best that the park service has to offer will help them to decide how to vote on environmental issues, and, in the younger generation, encourage future career choices that support park service mission. The better our research methods and tools, along with a consistent message of protection and education, the better managers will be able to set policy and guide the protection of our coastal resources for the present and future.

The National Park Service can be a positive influence in the understanding of coastal dynamics by being a place for scientific study. Based on research, policies and partnerships can be forged to further our understanding and enhance the protection of threatened coastal resources locally, regionally and even internationally. Although Cabrillo National Monument may be an infinitesimal part of the global coastal issue, this park plays no small part in being an inspiring and enjoyable place for thousands of children and adults as well as being a favorite locale for researchers. And we'd like to think that we can help change the world.



Waves lapping lapping, licking licking
Timeless is your presence
Life giving a world away

and they dance
weightless giants
and they sing

Waves ebbing ebbing, rising rising
Movement is your presence
Airy spires a world away

and they dance
graceful giants
and they sing

Waves slapping slapping, kicking kicking
Sunset is your presence
Beneath the surface a world away

and they dance
diving giants
and they sing

Waves rolling rolling, crashing crashing
Thunder is your presence
Clouds gathered a world away

and they dance
trekking giants
and they sing

Seized by the sea

by Joe Wilson

How often has that been said, and what does it mean? What dreams does the sea inspire? What stories does it hold? Mysteries, journals, heroics, epic dramas, history, photography, art— all are inspired by the sea.

Visitors travel to Cabrillo National Monument, to the tidepools, to the cliffs, to sit on benches of sandstone and ponder the sea. Like me, they think about what they see: the waves. Waves rising, manes of spray flowing behind, curling into white and blue-green cascades as they crash into the sea and rocky shore. As an artist and photographer I am captured—seized by the surging sea.

"The surf is up!" I'm in California. I'm at Cabrillo. The dolphin tanks, Ralph's. "Cool, Man!" "Hey, Dude! Let's go!" The grace, the action, the quiet, the freedom on a board; feelings I ride as the surf falls below my feet. The offering of the sea has engulfed me in its power and beauty. As I fall I am seized by the sea.

Artist and surfer, two surprises. Surprises not promoted by the park, but there, brought by the sea. When you visit, stop and talk to one of these. Listen to a story. See pictures. Be touched by the sea. Artists are visitors on the land; surfers are visitors in the water. Surfers arrive by boat, artists travel across the land and walk to their place by the sea. Hundreds of years ago man came here to Cabrillo by sea. Native Americans, Europeans: Who were they and why did they come? Some came by land. Some stayed—were they seized by the sea?

Interpreters at Cabrillo National Monument can answer the questions. Ask one of them when you visit the park. You will hear a story, be introduced to journals, heroics, actions, history, and perhaps, perhaps be seized by the sea.



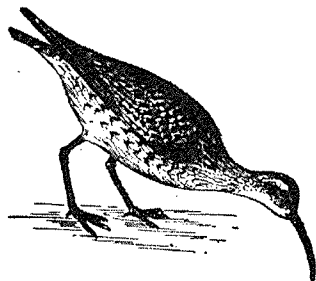
“Living on the edges”—our winter shorebirds

by Claude Edwards, CNM Volunteer

Much of the time and attention given by knowledgeable and enthusiastic bird watchers visiting Point Loma is spent looking for, chasing, and checking off the proverbial LBJs (a commonly used abbreviation for those “Little Brown Jobs”) or even LGJs (otherwise known as “Little Gray Jobs” or “Little Green Jobs”), . . . and yes, OK . . . we can’t overlook the LYJ’s (those “Little Yellow Jobs”), of course . . . gasp! However, the majority of our human visitors do not descend to the wave-washed coastlines around the edges of the Point. Here, several different and distinct families of birds prefer to occupy and utilize the ocean-tempered and wind-beaten environment where the land meets the sea.

Among these bird families are the loons (Gaviidae), grebes (Podicepsidae), pelicans and cormorants (Pelecanidae), herons and egrets (Ardeidae), waterfowl (Anatidae), and gulls and terns (Laridae). Most of these groups are more abundant during the winter months, between November and March. Updated information on the varied species in these families that have been observed and recorded can be found on the recently published list, “The Birds of Cabrillo National Monument and Point Loma.”

Another well-known, but sometimes challenging, group of birds that frequent and thrive along the rocky coasts of Point Loma are the shorebirds, which are mostly comprised of two families: plovers (Charadriidae) and sandpipers (Scolopacidae). For helpful illustrations and identification tips on these and the previously mentioned birds, you can check one or more of the field guides listed below. Two of our more distinctive species of shorebirds are the Black-bellied Plover (*Pluvialis squatarola*) and Semipalmated Plover (*Charadrius semipalmatus*). They have rather



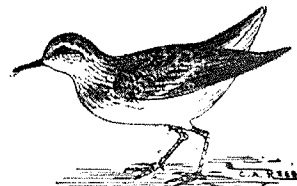
...several different and distinct families of birds prefer to occupy and utilize the ocean-tempered and wind-beaten environment where the land meets the sea.

short and stubby bills and move about with a deliberate and repeated “walk-bend-and-stand” cadence while hunting for food. Plovers are easy to overlook because of their subtle colors and patterns. Although rather nondescript in winter plumage, black-bellied plovers give a loud, somber, whistled note, “PLEE-ooee” (from Sibley).

The other family group of shorebirds includes the sandpipers, which vary in size from 6 to more than 20 inches in length and sport varied shaped and colored bills befitting their varied uses. We are fortunate to support several interesting species along our rocky coastline which are not found in other coastal habitats. The Cabrillo National Monument tidepools are home to sandpipers like the (American) Black Oystercatcher (*Haematopus bachmani*), sporting a flaming-red knife-like bill, but its dark plumage renders it invisible on the

rocks. The Wandering Tattler (*Heteroscelus incanus*) is dull-gray all-over, even in flight. Black Turnstones (*Arenaria melanocephala*) are busy and talkative, gathering around wracks of kelp in search of invertebrates, often in the company of the aptly-named Surfbirds (*Aphriza virgata*) which have a grayer plumage and stubbier bills. Other more common and widespread species found here are Willet (*Catoptrophorus semipalmatus*), Spotted Sandpiper (*Actitis macularia*), Whimbrel (*Numenius phaeopus*), Ruddy Turnstone (*Arenaria interpres*), Sanderling (*Calidris alba*), and Least Sandpiper (*Calidris minutilla*).

The following popular birding guides provide useful information for identification of shorebirds that visit Point Loma: *An Introduction Southern California Birds* (1995) by Herbert Clarke; *Western Birds* (1990 and earlier versions) by Roger Tory Peterson; *Golden Guide To The Birds Of North America* (1966 and other editions) by Chandler Robbins et al.; *National Geographic Society Guide To Birds Of North America* (1983, etc); and the *National Audubon Society Guide To Birds (Of North America)* (2000) by David Allen Sibley. Most, if not all, of these are available in the Cabrillo National Monument Foundation bookstore. Go birding, and Happy New Year in 2003.



Thirteen years of shorebird monitoring in the rocky intertidal zone

By Andrea Compton and Bonnie Becker

As you explore Cabrillo National Monument's rocky intertidal area, you might notice NPS staff or volunteers steadily working their way north to south, from Zones I to II (open to the public) and through Zone III (closed for research and protection purposes), peering through binoculars with clipboard in hand. The Natural Resource Science (NRS) Division is tracking the wading birds, shorebirds, and gulls that are potentially feeding within the rocky intertidal area. In addition, the number of people using each zone is also counted. Each winter and spring when the low tides fall to zero or below during the day, the staff and volunteers conduct this research to detect changes in species over time and to evaluate the relationships between human use and foraging bird species. An hour of survey effort is centered around the low tide.

This research was first initiated in 1990 by Dr. Gary Davis (NPS) and Dr. Jack Engle (UC Santa Barbara) and is associated with the broader tidepool monitoring efforts that occur each fall and spring. In 1996, the responsibilities for this research were transferred to the NRS Division, which continues with this now. Shorebird sampling for this winter and

spring began in November 2002 and will continue through May 2003.

After 13 years of reporting, the data are showing some interesting results. There are 21 species or groups (e.g., terns) that regularly use the rocky intertidal areas. These species are listed in the attached table. Forty-three bird species (27,309 total individuals) have been recorded. The most common species is the Western Gull (*Larus occidentalis*). When considering the possible influence of people, 29,629 people have been recorded in Zone I, 8,570 people have been recorded in Zone II, and 2487 (361 after the closure in 1996) people have been recorded in Zone III on a total of 706 days of survey efforts. The relationship between the number of people and the number of birds can be seen in the associated graph that shows a trend of fewer birds using the rocky intertidal area when more people are present.

If you would like to join us in this research effort or to learn more about shorebird monitoring, please give us a call (619-557-7308) or send us an e-mail:

(Tiffany_Luas@nps.gov,
Bonnie_Becker@nps.gov,
Andrea_Compton@nps.gov).

We look forward to speaking with you and having you join this effort! Happy birding.

Some Common Winter Shorebirds at Cabrillo National Monument

WADING BIRDS

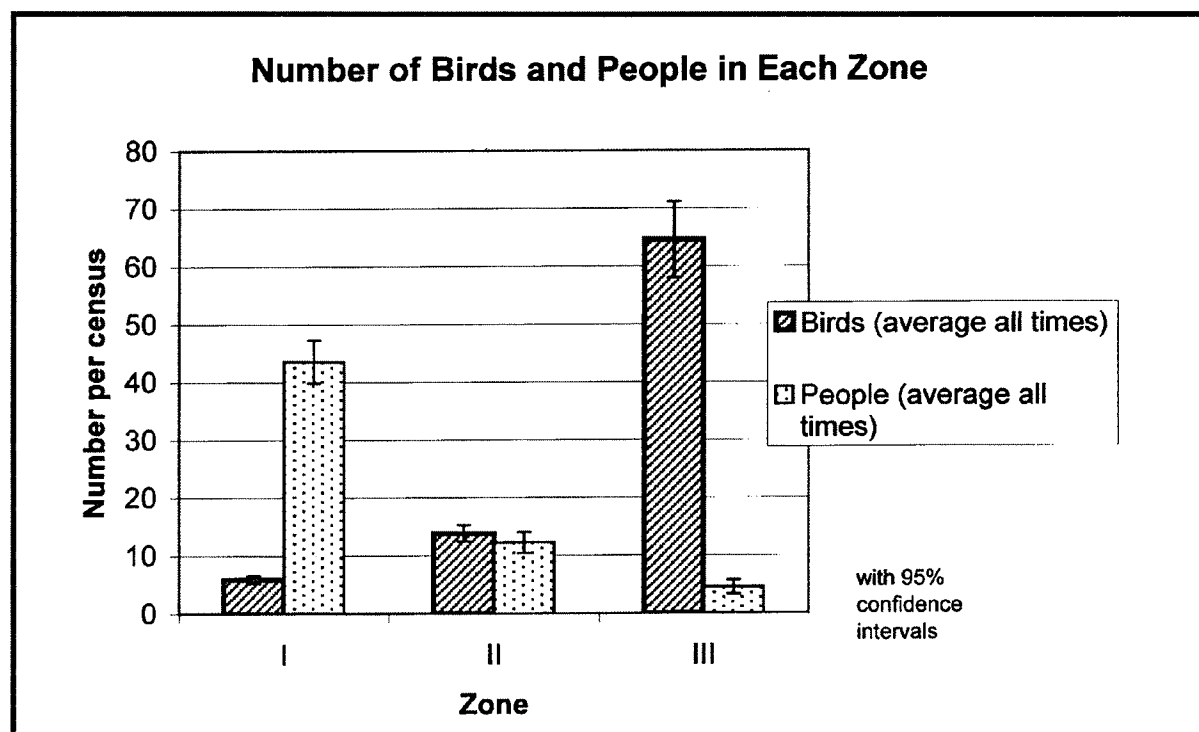
Great Blue Heron
Great Egret
Snowy Egret
Brown Pelican

SHORE BIRDS

Black-bellied Plover
Willet
Wandering Tattler
Spotted Sandpiper
Marbled Godwit
Whimbrel
Ruddy Turnstone
Black Turnstone
Surfbird
Sanderling

GULLS

Western Gull
Herring Gull
California Gull
Heerman's Gull
Ring-billed Gull
Mew Gull





Marcy's morsels

by Marcy Marquez

How many of you have heard or read the acronym TPREP? TPREP stands for Tidepool Protection & Restoration Education Program. We have over 30 volunteers who have dedicated their precious time to getting their feet wet!

These volunteers are under the Division of the Natural Resources and Visitor Protection (RMVP); Chris Anderson is their current Supervisor (you may call him Chief TPREP). Chris and his gang reach thousands of visitors down at the Rocky Intertidal Area, a.k.a. tidepools. They play a key role in connecting the visitors to

the many splendors one can find at the tidepools. TPREPs are out in sunny weather when the sky is a brilliant hue of blue; they also are protecting the sea's treasures when the sky turns grayish-blue, frigid winds surround one like an icy coat, and drops of water are felt on close-to-numb cheeks. What fascinates me about these dedicated volunteers is that whatever the elements may bring, they always return with a bright smile on their faces.

Tidepool volunteers truly have their work cut out for them. They need to be efficient, alert, safe, talkative, and friendly—just name a few requirements. They protect the resources not by slapping a visitor's hand for poking at an octopus, but by interpreting what one can see in the octopus's natural environment—how it loves to live in a shady area of a rock, undisturbed by the furious rays of the shining sun, for example.

A visitor may state, "I can't see a

darned thing here in the tidepools!" I am certain that volunteers have heard this statement a thousand times. They are then able to point out the different zones of the intertidal region, where visitors find gooseneck barnacles living in a close community, or where they can observe the awe-inspiring sea anemones seeking shelter out of the ocean's water. TPREPS can demonstrate how if you are careful, patient, and quiet you just may find a natural fountain flowing peacefully through the crevices of rocks!

TPREPS love what they do. I join the rest of the staff at CNM and our visitors in thanking them for their hard work. Many of the knobby sea stars, wooly sculpins, bat stars, and their intertidal neighbors would be forever lost without the commitment of these dedicated volunteers.

Random rantings from December: excerpts from a bodysurfing group

Compiled by Mares Northrop

Editor's note: Mary Northrop, known to us as Mares, spends much of her free time with world-class bodysurfers. Here, Mares captures the thoughts of three bodysurfers to give us a look into the intense ties between people and the sea. (Words in italics are definitions for bodysurfing terms.)

Takin' a Beatin', December 15, 2002

Beautiful waves—hollow and glassy, the light offshore turning to still air. Glass, glass, glass, and clear, clean water. Well-organized waves. Two main peaks broke into four as the tide rolled out. Thirty surfers sharing the feast and all getting their fill.

Highlights: Slammed hard; taking off late on the largest peak I could find, I freefall about ten feet and lose control as I hit the surface. Not keeping the wave and yet not penetrating very deep, I get sucked back up and over to freefall again. I slam so hard I am not sure if I hit the bottom but I am sure I lost my air, the center of my visual field, and any idea of the concept "up." The zipper of my wetsuit is torn away at the neck. (Get out the glue!) Looking like the Michelin Man, I try to swim out through the rest of the

set, dragging an extra fifty pounds of water.

State Park Punishing, December 15, 2002

The swim out was with backwash sweeping us outside pretty fast. There were a few small groups of spectators watching, no doubt thinking we were mental. David immediately gets a screaming right as I swim outside...then this bomb peak heads my way—a beauty left, sucking with the lip feathering; I scratch (*stroke in an attempt to catch a wave*) and hear HOOTS (*people cheering from shore*) as I feel this thing accelerate. It was powerful and fast; I had a hard time getting down the face but it held up—what a view from the tube! The exhilaration was off the scale!

One wave sucked me off the bottom and annihilated me with force I couldn't believe, nearly sucking me out of my wetsuit. One outside bomb forced us to dive so deep we heard the sand shifting; the next one was like a depth charge, nearly sucking my fins off....I love it!

Boomer This Weekend, December 16, 2002

I'm also experimenting with new techniques. Every ride, I'm starting to catalog. Like other practices in life, surfing offers me the ability to develop with every experience. To see where my limits are and to try to push them back. My attitude is no longer one of "charging the waves"; it's one of learning to channel an energy that I have found that will almost propagate itself through my body as if I were a conduit to the force behind the movement of the wave. If I could just grow gills.



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Cabrillo National Monument Foundation



Make a Lasting Legacy

In 2001, charitable giving in the United States amounted to \$212 billion. The ever-increasing generosity of Americans places last year's figure at a record amount. Yes, some of this giving was motivated by the tragedy of September 11th and the outpouring of charity resulting from the attacks on America. However, according to the American Association of Fundraising Council Trust for Philanthropy, an organization that tracks charitable giving, the donations for the September 11th events do not account entirely for the statistical boom for the year.

Charitable giving in the USA is enormous. To put the \$212 billion in perspective, compare it to the \$100 billion California state budget or the City of San Diego's total budget of almost \$2 billion. The amount of money freely given away in 2001 is enough to fund the operations of the State of California for more than 2 years! This is indeed remarkable when you consider that the California economy is equal to the world's seventh largest nation. No other country comes near the American experience measured by the amount given, percentage of Gross National Product, percentage of disposable income, or any other measurement. This uniquely American phenomenon pours billions of dollars each year, year after year, into our churches, schools, museums, health programs, social welfare, and

parks and recreation. It is our country's legacy of charitable giving that provides our society structural strength and distinguishes us from other nations.

The same report tells us that individuals, not corporations or foundations, donated the major portion of the \$212 billion. Eighty-three percent of the total was donated by individuals, including 7.7%, or \$16.33 billion, in the form of bequests.

It is this last figure regarding bequests that the Trustees of the Cabrillo National Monument Foundation wish to draw to your attention. Charitable bequests are usually made to deserving organizations whose purpose is noble, whose structure and leadership are sound, and whose goal is to meet challenges spanning generations.

The Cabrillo National Monument Foundation is a non-profit organization, dedicated, in cooperation with the National Park Service, to aid and support the natural, cultural, historical, and educational activities of Cabrillo National Monument. The Trustees of the Foundation, knowing that \$16 billion is directed to charitable trusts in the form of bequests each year, and fully aware that Cabrillo National Monument has been declared a National Park in perpetuity, decided to take advantage of these two conditions by establishing an endowment fund with the San Diego Foundation. By doing so, we hope that people will be encouraged

CALENDAR

February 22, 2003
Bird walk for members with
Claude Edwards

March 2, 2003
Tidepool talk for members

Invitations will be mailed at a later date for both events.

to increase the principal especially by way of bequests.

The Trustees of the Foundation want you to consider making provisions in your estate plan to direct a portion of your generosity to the Cabrillo National Monument Foundation Endowment Fund at the San Diego Foundation. By doing so, you will join the thousands of Americans who seek to improve our society in a very special way.

Your inquiries are invited. Please call Karen Eccles, CNMF Executive Director, at (619) 222-4747.

New Members

CNMF welcomes the following new members joining since October 15, 2002:

**Albert Fern
Tiffany Luas
James Miller
Sonnenberg & Company, CPAs
Carol Stachwick, CPA**

We appreciate your support.



Published quarterly by Cabrillo
National Monument, funded by the
Cabrillo National Monument Foundation.

Patricia Heusner, Editor
Jim Nauman, Production

1800 Cabrillo Memorial Drive
San Diego, California 92106
(619) 222-4747
www.CNMFKaren@aol.com



Cabrillo people

by Chris Anderson



The tide of change has ebbed and flowed once again, this time taking with it four of Cabrillo National Monument's dedicated employees. In this issue we say goodbye to Chief of Resource Management and Visitor Protection Carol Knipper, Chief of Maintenance Ed Caudillo and maintenance employees Jim Kerby and Russ Williams.

Carol Knipper arrived at Cabrillo NM in May of 1995. Her career has crisscrossed the country. Thus far, she has worked at Crater Lake NP, John Day Fossil Beds NM, Independence Hall NHP, Badlands NP, Washington Monument and Bryce Canyon NP. While at Cabrillo, Carol has worked vigorously to protect Cabrillo's visitors and natural resources, as well as reestablish the native coastal sage scrub community. She was the driving force behind the approval and even-

tual building of the park's greenhouse. In mid February, Carol will be leaving Cabrillo NM and heading northeast to Yosemite National Park. There she will oversee the park's Integrated Pest Management and Hazardous Materials Program.

Ed Caudillo began his career at Cabrillo NM in May of 1964. After a mere 39 years, he has decided to retire. During his tenure, Ed has seen his staff grow from two to six permanent employees; he has contributed to the development, care, and maintenance of CNM's historic and contemporary structures and has assisted in the creation of the park's historic preservation program. Ed was on hand in the mid 1960s, to participate in the landscaping of the newly built visitor center and installation of a parkwide irrigation system. In the 1990s, he assisted with the development of the park's veg-

etation management plan, which called for the removal of non-native vegetation. This management plan has not only established the native coastal sage scrub community, but also has saved the park over one million gallons of water per year. Throughout his time here, Ed has also overseen the rehabilitation of the Old Point Loma House and annual preparations for the Cabrillo Festival. His retirement will be effective February of 2003.

Jim Kerby came to work at Cabrillo in August of 1992. He departs Cabrillo, heading east to Ohio, where he will take care of his mother. His last day at Cabrillo NM was January 11. Jim leaves with us two messages: 1) always ask bicyclists if they have a receipt or pass and 2) take care of the lighthouse.

Russell Williams started his career at Cabrillo in February of 1993 in the Interpretation Division, later transferring to Maintenance. Like Jim, Russ has also returned to his roots, leaving San Diego for Arkansas, where he is currently attending truck driving school.

We wish these friends and coworkers safe travels and prosperity in their future endeavors.



Cabrillo National
Monument Foundation
1800 Cabrillo Memorial Drive
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