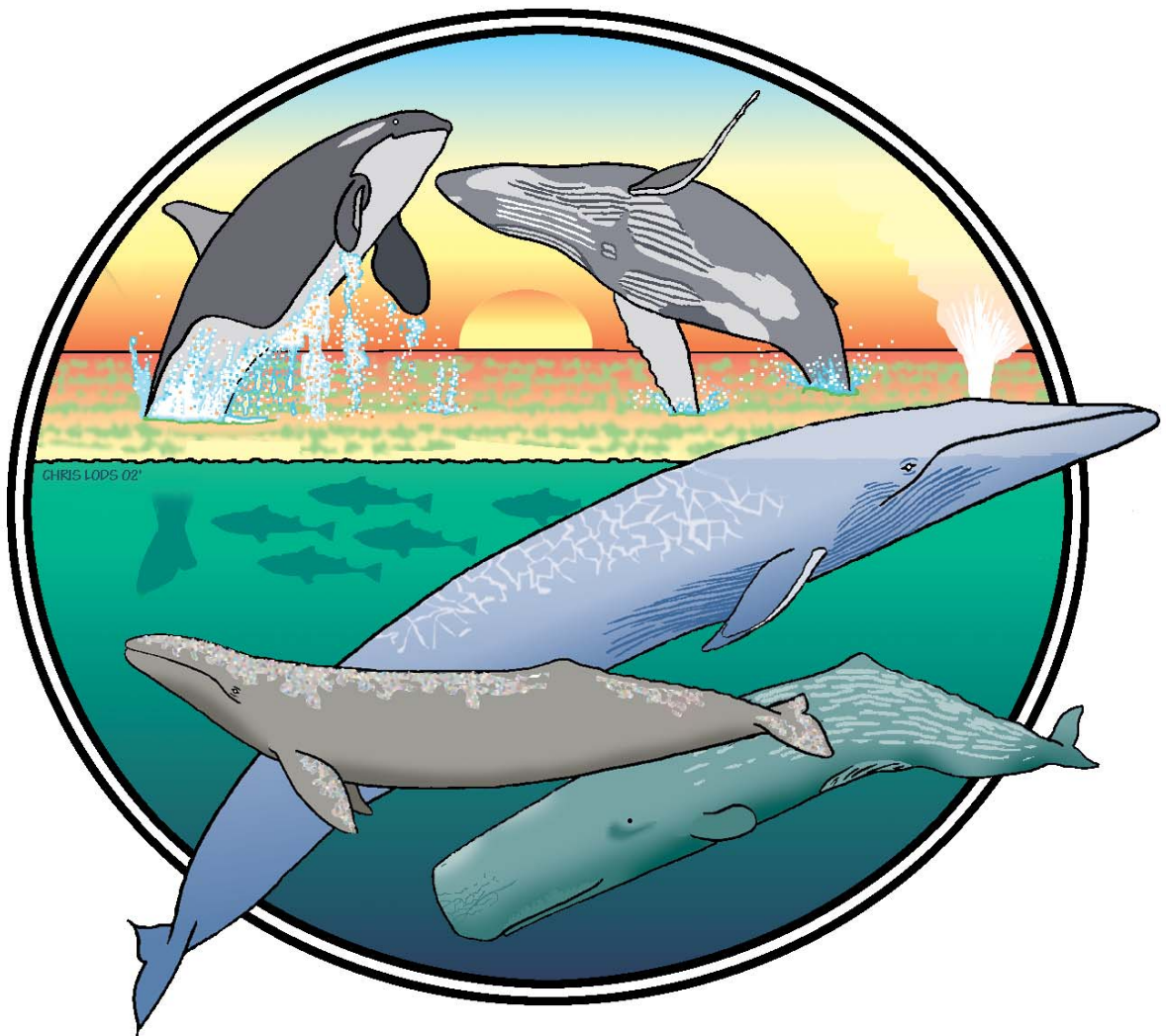


CALIFORNIA STATE PARKS



Whale Watch Sonoma Coast State Beach Docent Manual

Developed by Stewards of the Coast and Redwoods
Russian River District State Park Interpretive Association

Whale Watch

California State Parks/Russian River District

25381 Steelhead Blvd, PO Box 123, Duncans Mills, CA 95430
(707) 865-2391, (707) 865-2046 (FAX)



Stewards of the Coast and Redwoods (Stewards)

PO Box 2, Duncans Mills, CA 95430
(707) 869-9177, (707) 869-8252 (FAX)
stewards@mcn.org, www.stewardsofthecoastandredwoods.org



Program Coordinator:
Stewards Executive Director:

Bea Brunn
Michele Luna

State Parks Cooperating Association Liaison, CAL
Armstrong Redwoods Supervising Ranger

Andrea Mapes

Sonoma Coast State Park Staff:
Supervising Ranger
Volunteer Ranger

Damien Jones
Ben Vanden Heuvel
Ranger Tim Murphy
Ranger Trish Nealy
Ranger Greg Probst
Supervising Lifeguard Lexi Jones
Raul Escobar
Clark Hale
Aaron Pendergraft

Lifeguards

Cover Design:

Chris Lods

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Welcome to the Volunteers in Parks Program

As a volunteer, you are joining thousands of other trained individuals who are working with the California Department of Parks and Recreation's staff in meeting the educational, interpretive, and recreational needs of the visitors to our many parks and reserves. The donation of your time and talent is tremendously appreciated, and your unique contribution makes it possible to further enhance the experiences of countless visitors each year. We couldn't do it without you!

Thank You

**State of California
Department of Parks and Recreation
Russian River District
25381 Steelhead Blvd.
P.O. Box 123
Duncans Mills, CA 95430
(707) 865-2391**

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THE CALIFORNIA STATE PARK SYSTEM

The State Park concept is generally believed to have started in California in 1864 when President Abraham Lincoln signed an Act of Congress transferring the areas then known as the Yosemite Valley and Mariposa Grove of the Sierra Redwoods to California. In 1905, however, these lands were returned to the federal government.

Three years earlier, in 1902, the present California State Park System was begun with the establishment of the California Redwood Park at Big Basin in Santa Cruz County. It is only fitting that one of our state's proudest possessions -- the magnificent coast redwood (*sequoia sempervirens*) -- should have provided the inspiration for the creation of California's first permanent park.

Today, with nearly 300 units, California has one of the largest and most diversified park systems in the nation. Represented in those units are outstanding examples of the state's unique scenery, including redwoods, deserts, historical units, scenic reserves, recreation areas and mountain parks for the public to enjoy.

California State Parks acquires, designs, develops, operates, and maintains units of the State Park System. These activities are directed toward the accomplishment of eight principle objectives:

1. Secure and preserve elements of the state's outstanding landscape, cultural, and historical features.
2. Provide the facilities and resources that are required to fulfill the recreational demands of the people of California.
3. Provide a meaningful environment in which the people of California are given the opportunity to understand and appreciate the state's cultural, historical and natural heritage.
4. Maintain and improve the quality of California's environment.
5. Prepare and maintain a statewide recreational plan that includes an analysis of the continuing need for recreational areas and facilities and a determination of the levels of public and private responsibility required to meet those needs.
6. Encourage all levels of government and private enterprise throughout the state to participate in the planning, development and operation of recreational facilities.
7. Meet the recreational demands of a highly accelerated, urban-centered population, through the acquisition, development and operation of urban parks.
8. Encourage volunteer service in the State Park System.

STATE PARK RULES AND REGULATIONS

"THE BEST OF CALIFORNIA FOREVER" -- with your help and cooperation. It is very important that the park visitor is given this message. Parks are for people to use and enjoy, not abuse and destroy. Without protection, the highly perishable values of the areas preserved in the California Park System could soon be destroyed.

In many cases, park protection can be accomplished by interpretation of park philosophy, policies and rules and regulations. Enforcement becomes necessary if and when other means prove insufficient. Many people who misuse or abuse a park area or facility do so only through thoughtlessness or ignorance. It is usually sufficient to bring to their attention the permanent nature of the damage resulting from improper use.

Though some may resist compliance because of lack of understanding, it isn't often that a simple explanation of the reasons behind the rules will fail to obtain willing cooperation. However, there is a small percentage of visitors who, once they understand the "why," will continue to resent or resist the regulations. They will require special attention and probable enforcement action.

As a volunteer, you may encounter situations where you must decide whether a visitor's actions merit only an explanation of a rule or more formal action. If enforcement action is indicated, or a public relations problem seems imminent, remember that State Park rangers have peace officer authority. Do not threaten or try to bluff a visitor. Never hesitate to call upon a ranger or lifeguard for guidance or assistance in any situation that threatens to become a problem.

Every volunteer is charged with the responsibility of observing and recognizing any acts that may constitute potential hazards to the safety of people or property. Such acts should be reported promptly to a ranger, supervisor, or lifeguard. This will permit effective action to eliminate the hazard. It will also help forestall or minimize any liability in case of an accident.

It is important that each volunteer read and become familiar with rules and regulations of the State Park System, specifically those that apply to the Sonoma Coast State Beach. The following is a summary of some of the more commonly seen violations:

ANIMALS

No person is allowed to hunt, injure, or otherwise disturb any animal within the park's boundaries. State Fish and Game regulations govern all activities from the average (mean) high tide area and beyond. Within this authority, tide pool creatures are protected from molestation and injury. Marine mammals are further protected by federal statute from harassment.

BOAT SPEED LIMIT

No person shall operate any motorboat at a speed in excess of five miles per hour on the Russian River from its mouth to Duncans Mills (Sonoma County Ordinance No.3308).

CAMPING

Camping is allowed only in designated campgrounds, which include the four

state-operated campgrounds at Wright's Beach, Bodega Dunes, Pomo, and Willow Creek.

CLOSED AREAS

Because of the significant dangers to the public, certain areas may be closed to public access at the discretion of the District Superintendent. On the Sonoma Coast, two locations have specifically led to the deaths of a number of park visitors. Goat Rock proper is completely closed to any kind of hiking or climbing activity, and the rock outcropping at Duncans Landing, known as Death Rock, is restricted to any type of entry.

COLLECTING

Living and non living things are protected within state parks, including all plant life and drift wood. Permits must be obtained from the District Superintendent for any exception. Contact a local ranger for information on exceptions.

CRIMINAL ACTIVITIES

Any activity that is defined as criminal through the California Penal Code is illegal within a State Park unit. Other violations that also apply include all alcohol-related regulations.

CURFEW

Juveniles (under 18 years of age) may not be on the Sonoma Coast State Beaches after sunset unless accompanied by their parent or guardian.

FIREARMS AND WEAPONS

Regardless of the intention of their possession, it is illegal to possess or carry any weapon capable of causing injury.

FIRES

Fires are allowed on the beaches, as long as they are controlled. Fires amongst the dunes or dune grasses are prohibited, as well as fires in an area with any type of vegetation.

GEOLOGICAL AND ARCHAEOLOGICAL FEATURES

Such features are protected from activities including removal, disturbance, disfigurement, defacement, destruction or mutilation.

HORSES

Generally, horses may not be ridden on beaches. Certain areas are exceptions, including the beach south of the Bodega Dunes day use area.

LITTER

Disposal of any item, other than in a proper trash receptacle, is prohibited.

OFF-HIGHWAY VEHICLES

No vehicles are allowed off-road in a State Park, and all vehicles must be registered through DMV for use on roads.

PETS

Animals must be kept leashed and under control at all times within a State Park unit. **Dogs are not allowed on hiking trails or at the environmental campgrounds. Certain areas are closed to dogs on Sonoma Coast, including the bluffs on Bodega Head and Goat Rock beach. Dogs are allowed on a leash at Blind Beach.**

PUBLIC RESOURCES CODE

The Department shall protect the State Park System from damage and preserve the peace therein. Any person who violates the rules and regulations established by the Department is guilty of a misdemeanor and, upon conviction, shall be punished by imprisonment in the county jail for a time not to exceed 90 days, or by a fine not exceeding \$500, or by both such fine and imprisonment.

VEHICLE OPERATION

All rules of the road, as defined by the California Vehicle Code, apply in State Parks.

ROLE AND FUNCTION OF VOLUNTEERS IN THE STATE PARK SYSTEM

Volunteers are trained, but unpaid, employees of California State Parks who perform a valuable function by augmenting park staff in providing increased services for the visiting public. Volunteers perform a variety of tasks and assignments throughout the State Park System, including giving tours, assisting with fund raising, working in sales booths, and giving demonstrations.

Many of our volunteers are also members of the Stewards of the Coast and Redwoods, the cooperative association for the Russian River District. Membership in the Stewards is a personal choice and is not required in order to volunteer; however, many volunteers find a great deal of satisfaction in their involvement.

Occasionally there is some confusion between the division of the association and the State Parks' role. The Stewards of the Coast and Redwoods is a support group for Sonoma Coast State Beach. They do not operate the park nor "run" the interpretive programs; they support the mission of the State Park System by providing additional services to the parks. So, as a volunteer, you are not working for the association but for California State Parks.

VOLUNTEERISM...defined

1. You are an unpaid employee of the state, and will not receive pay or goods for work performed.
2. All of your service will be on a strictly voluntary basis, and you cannot be required by any of the park staff or anyone else to do any work which you do not wish to do.
3. You will be covered by Worker's Compensation Insurance in the event you are injured while working in the park. For this condition to be valid, you must first complete and submit to your district superintendent two forms: A Volunteer Record and Service Agreement (DPR 208), and an Oath of Allegiance (Form 689). You will be covered by the same policies as regular employees regarding liability.
4. A number of state and federal tax benefits are available for volunteers. You may be able to deduct some unreimbursed expenditures made while serving the departments. Such items include automobile mileage, bus and cab fare, parking and toll fees, cost of meals and lodging if away overnight, travel expenses above per diem allowance, and expenditures for special uniforms or costumes.

VOLUNTEER STANDARDS

State park volunteers are members of the park staff within the Russian River District. As a volunteer, you are expected to conduct yourself in a manner that reflects pride in yourself and in the State Park System. In order to operate the interpretive program efficiently, all volunteer staff members must adhere to certain rules, procedures, and standards. The following information is intended to give you some guidance along these lines. Volunteers who display an unwillingness to conform to these standards will be asked to leave the program.

1. PUNCTUALITY

Plan to arrive at your committed shift location on time.

2. DEPENDABILITY

You will be asked to make a voluntary commitment of time so a reliable schedule can be followed. If an unforeseen emergency arises, notify the volunteer coordinator at once. If you were committed to a shift requiring a replacement, attempt to find a replacement from the alternate list and notify the volunteer coordinator of any changes. Remember promptness and reliability are crucial! Teamwork and cooperation keep our volunteer program alive!

3. APPEARANCE

You must be neat and clean in appearance when acting in a public function. Wear the approved volunteer badge or vest when identifying yourself as a volunteer with the State Park System.

4. ATTITUDE

A pleasant and professional attitude is all-important. All visitors are guests, and it is a primary responsibility to see that their visit is pleasant, enjoyable, and safe. Sincere concern and friendly interest should characterize staff dealings with all visitors. The public expects and deserves always to be treated in a courteous and professional manner. If a visitor comes to you with a complaint, explain to her/him what action you can or cannot take and report the matter promptly to a ranger or lifeguard. If a visitor asks you to identify yourself, do so.

Above all, never give false or misleading information to the public. If you do not know the answer, do not be afraid to say so, but try to be well informed and helpful. Avoid any public criticism of the State Parks Department, staff, or policies when performing volunteer duties. If there is something you disagree with, discuss it with the volunteer coordinator or the supervising ranger.

When dealing with visitors to Sonoma Coast State Beach, please remember that:

- A park visitor is our guest, and should be treated as such.
- A park visitor is the most important person in any park.
- A park visitor is dependent on us for a better understanding of the philosophy of the Department of Parks and Recreation.
- A park visitor is not an interruption of our work, but one of the purposes of it.
- A park visitor does us a favor when visiting a park. Serving the visitor is the service we perform.
- A park visitor is not a cold statistic, but a flesh-and-blood human being with feelings and emotions like our own.
- A park visitor is someone who brings us his/her needs for the outdoors. It is our job to help satisfy those needs.
- A park visitor is deserving of the most courteous and attentive treatment we can give.
- A park visitor expects good manners from all park employees.

Your pleasant and professional attitude must also extend to your fellow volunteers. You must have a willingness to work as a team member with other volunteers, as well as the park staff. Special privileges or separatism should not be expected and will not be tolerated.

5. BEHAVIOR

Immoral conduct, the illegal use of drugs, reporting to work with alcohol on the breath, being drunk or drinking alcohol on duty, or commission of a serious crime are all expressly prohibited, and will result in your being asked to leave the program.

It is your responsibility to treat your co-workers and park staff with courtesy and respect; to obey all lawful orders; to report to the park on time and ready to work; and to remain alert while on duty. It is not proper to listen to radios or cassettes, play cards, or perform other such activities in view of the public. Keep private visiting to a minimum when the public is present. Do not use public contacts as a soapbox for your private views.

6. AUTHORITY

As a volunteer, you do not have peace officer authority. You should be familiar with park rules and regulations and, using your best judgment, you should caution park visitors if you witness a violation of these regulations. You are to report all violations of law or park rules that you witness to a ranger. You are, of course, expected to personally comply with all park rules and regulations.

7. CONFIDENTIALITY

Certain information of which you may become aware is confidential and must not be discussed outside the organization. Confidential information includes such things as crime and incidents, rescue and accident reports, disciplinary actions, employee grievances, budget proposals, and proposed policy changes. If you are questioned on these matters, politely but firmly refer the questioner to park staff.

8. INTERPRETATION

You are required to read this manual in order to become familiar with the basic information. It is important that all volunteers know and adhere to a certain "standardization of facts" for a consistent interpretive program. A fact, stated as a fact, must be a fact! A story, legend, or conjecture may be included in your presentation, but it must be clearly identified as such. Admit, "I don't know" rather than relate misinformation. Don't change from interpreting facts to personal showboating. Let your visitor be your guide to the direction of your interpreting.

A satisfactory speaking voice and the ability to communicate well are basic requirements for effective interpretation. Park staff will assist you in your interpretive efforts. It is important that you possess the ability to accept constructive criticism for reasons of self-improvement. All volunteers are encouraged to repeat training sessions as a refresher, and to assist in sharing information and experiences as a volunteer.

We encourage volunteers to make use of any resources available to them to enhance their experience, including staff members, veteran volunteers, written materials and library information. The District Office and unit offices each have a variety of materials to offer.

Further, to enhance interpretation in the District, we would like to encourage all volunteers to become members in the Stewards of Slavianka. Membership is not required, but it is desired in order to share information and keep updated in current activities in the Russian River District.

INTERPRETIVE PRINCIPLES

Interdependence: Emphasize the interdependence between people and nature, between any one bit of nature and all the other bits and pieces, and between historic facts and current interpretations thereof. John Muir said, "When we try to pick out anything by itself, we find it hitched to everything else in the universe." This is called ecology. Historical events did not happen in isolation, but were linked to other events which the visitor may know about and relate to.

Relate: The interpreter must relate the subject (ecology, a particular plant, an historic event) to the personality or experience of the visitor. Therefore, interpreter and audience must inter-relate (connect their personalities and experiences) as soon as possible.

Information: Volunteers must have at least as good a command of the facts they are explaining as the average visitor. Parenthetically, knowing the facts does not in itself insure good interpreting.

Sensory Awareness: Having visitors describe what they see, hear, taste, smell, sense, and feel emotionally about an item interprets better than just asking them to see it, hear it, or feel it. We absorb information about the environment through our senses. Determine sensory awareness by eliciting responses and participation.

Values Awareness: The values we hold influence how we treat the environment and each other. Why are trees important? What would happen if all the buildings along Sonoma Coast were allowed to decay away into oblivion? Searching for and discovering the answers promotes understanding.

Involvement: A Chinese proverb, quoted in the CSP Interpreter's Handbook says, "What I hear I forget, what I see I remember, what I do I understand." Get the visitor to join you in doing things, not just listening and looking.

Historical Perspective: Everything in the environment, including us, has come from somewhere and has changed over time. How do these changes relate to the visitor? History in proper chronological order has no perspective!

Stewardship: When we begin to understand the environment and its relationship to us, we develop a sense of proprietary caring and desire to take care of it. Stewardship is not for nature alone, but is equally applicable to interpreting history, i.e. humans taking care of or destroying humans.

Children: Interpretation addressed to children up to the age of twelve should not be a dilution of that appropriate for adults. It should follow a fundamentally different approach. To be at its best, it will require a separate program.

Enjoyment: Having fun facilitates learning. This is a scientifically established fact! Have fun and be sure the visitors do, too!

WHALE WATCH RESPONSIBILITIES

Whale Watch began as a response to the public's growing concern and awareness of our fragile relationship with the dwindling population of remaining whales, but also as a celebration to one of nature's grand events—the annual migration of the gray whale.

Whale Watch volunteers are stationed at Bodega Head on Saturday and Sunday afternoons to talk with the many visitors about whales, the ocean environment and the gray whale migration.

Being involved with Whale Watch is a very positive experience for volunteers and the public alike. A common bond or interest has brought you together, and you have the opportunity to share your knowledge and enthusiasm with a first-time whale observer or a watcher for many years. In either event, our goal is the same—to help guide the public in viewing the gray whale during their migration, and perhaps instilling a renewed awe, respect and appreciation for this magnificent species.

WHAT TO BRING...

A Whale Watch volunteer's day begins on Saturday or Sunday afternoon with an awareness of how the conditions at Bodega Head can change radically from one moment to the next. Having done Whale Watches while the wind is blowing 40 mph, I can ASSURE you that your comfort is imperative to a successful whale watch. You cannot be an effective interpreter if your teeth are chattering!

The following is a suggested list of personal items to bring with you on your Watch day. As you conduct more Whale Watches with greater frequency, you will be able to "fine tune" what is necessary and bring what will keep you comfortable. Remember that since your vehicle will be close by, you can "overpack" and not worry about carrying around a lot of excess baggage.

1. Layered clothing: sweaters, jackets, scarves
2. Wool cap
3. A Thermos with something hot to drink
4. Snacks
5. Chapstick or lip balm
6. Sunscreen
7. Your own binoculars if you wish
8. Field Guide favorites—birds, mammals, tidepools, etc.

Weather on Bodega Head is extremely variable, and difficult to gauge if you live inland. Generally, we do not expect you to conduct a Whale Watch in the rain; however, days that appear to threaten rain sometimes are the best Watch days because the spouting stands out in such bold relief against the flat gray sky. Use your own judgement, but feel free to call Bodega Dunes campground at (707) 875-3483 if you are in doubt about the conditions on the coast.

WHALE WATCH DUITES...

Your Whale Watch commitment is from 12 noon until 4:00 p.m. If you wish to come out earlier or stay longer, that is fine. I would encourage you to stay your full four hours even on blustery

days for two reasons: one, much of the public doesn't know what to expect in the way of whale viewing, and they will come out in the most outlandish weather to view whales. Your availability to answer questions and explain to them WHY they aren't seeing any whales leads to a broader base of knowledge amongst the population at large. Two, we publicize through the radio, newspaper and television of our involvement on Bodega Head during those hours. The public has expectations to have a volunteer available to answer questions and guide their viewing, and we want to honor those expectations.

Currently, all Whale Watch materials are kept in a box outside of the Salmon Creek Ranger Station and will be picked up by your day supervisor. Your Watch materials include the following:

1. A single rib bone of a gray whale, washed up on the Sonoma Coast a number of years ago.
The whale was guestimated at being two years old at the time of its death.
2. Several vertebrae from the same beached whale.
3. Two sections of baleen ("whalebone")
4. A glass jar of preserved whale lice
5. Green volunteer vests
6. Whale Watch log
7. A box of handout materials—fact sheets, SOS membership, State Park information, etc.
8. Marine Mammals of the World – (mounted poster).

Watch materials are returned to the Salmon Creek Ranger Station at the end of your shift. This is the most central location to keep everything, due to the bulky size. Make sure everything gets returned for the next Watchers.

During your Watch, please record in the Whale Watch log the number of visitors who came out to the Head (this is an approximation, but a hand-held counter is in the materials box to assist in your estimation). Also necessary is the name of the volunteer(s) in attendance that day, and the number of hours you worked that day. Observation details, such as conditions, number of spouts observed, unusual sightings or behavior, and direction of travel, all round out the information which is kept in the log.

INTERPRETATION...

Finally, your role as a Whale Watch volunteer puts you in a position of “expertise”, but I don't want you to feel pressured to have to be an expert on gray whales, marine mammals, coastal ecology, etc. The level of knowledge you bring to your job as a volunteer will constantly be broadened by the questions the public brings to you. "I don't know" is an acceptable answer, but don't stop there. Seek out the answer to those difficult questions.

You will hear the same questions asked by visitors over and over again. In spite of your weariness of the repetition, remember this question is important to everyone who asks it – treat it like it is the first time you have heard it, every time. Those "dumb questions" have a basis of seeking knowledge, and asking might have been difficult to the visitor. Give each person the courtesy and attention you would like to receive in similar circumstances.

IN CASE OF EMERGENCIES...

A cell phone is provided for Whale Watch volunteers for emergency use only (medical, cliff rescue, criminal activities, etc.) A list of current Emergency Phone Numbers will be provided to volunteers at the beginning of each season. If you are making the phone call to report an emergency, have the following information ready:

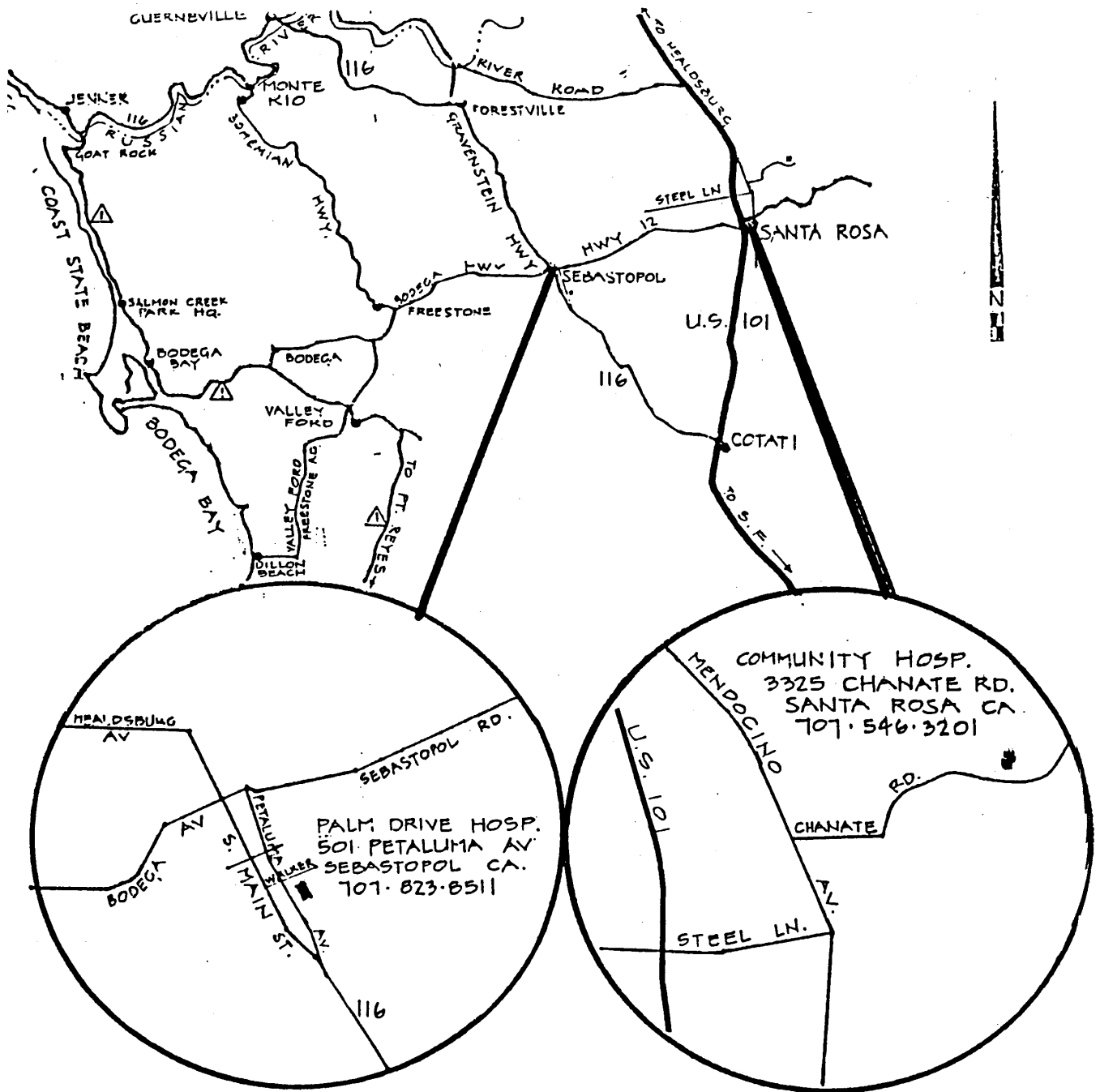
- What type of incident is it?
- Where is it located in relation to the Head parking lot?
- If medical, what is the victim's condition, age?
- If law enforcement, what was the crime? Suspect description? Suspect car? Location of the victim?
- When did the incident occur?

If you are staying with the victim or watching the incident, your duties are many-fold. DO NOT put yourself in any dangerous or compromising situation, whether to attempt a rescue or to stop a criminal. The rangers and local law enforcement officers are trained personnel for both eventualities. DO NOT become the next victim! For a medical situation, keep the victim calm, if possible. Keep the public away from the scene. Perform first aid ONLY if you have been trained through a Red Cross course and are current in your training. Do not attempt first aid that you are not familiar with or have not been trained.

If a rescue is necessary, keep the public from attempting to be heroes, whether in the water or on a cliff. We DO NOT want untrained people getting involved, and possibly being the next victim. (If a person ignores your request, then simply watch them. Rangers will deal with them when they arrive on the scene).

If the situation is law enforcement related, JUST WATCH THE SCENE! Note where the suspects go, what they look like, if you saw any weapons, but DON'T follow them! Your safety comes first. Your job is to be a pair of eyes until the rangers can take over.

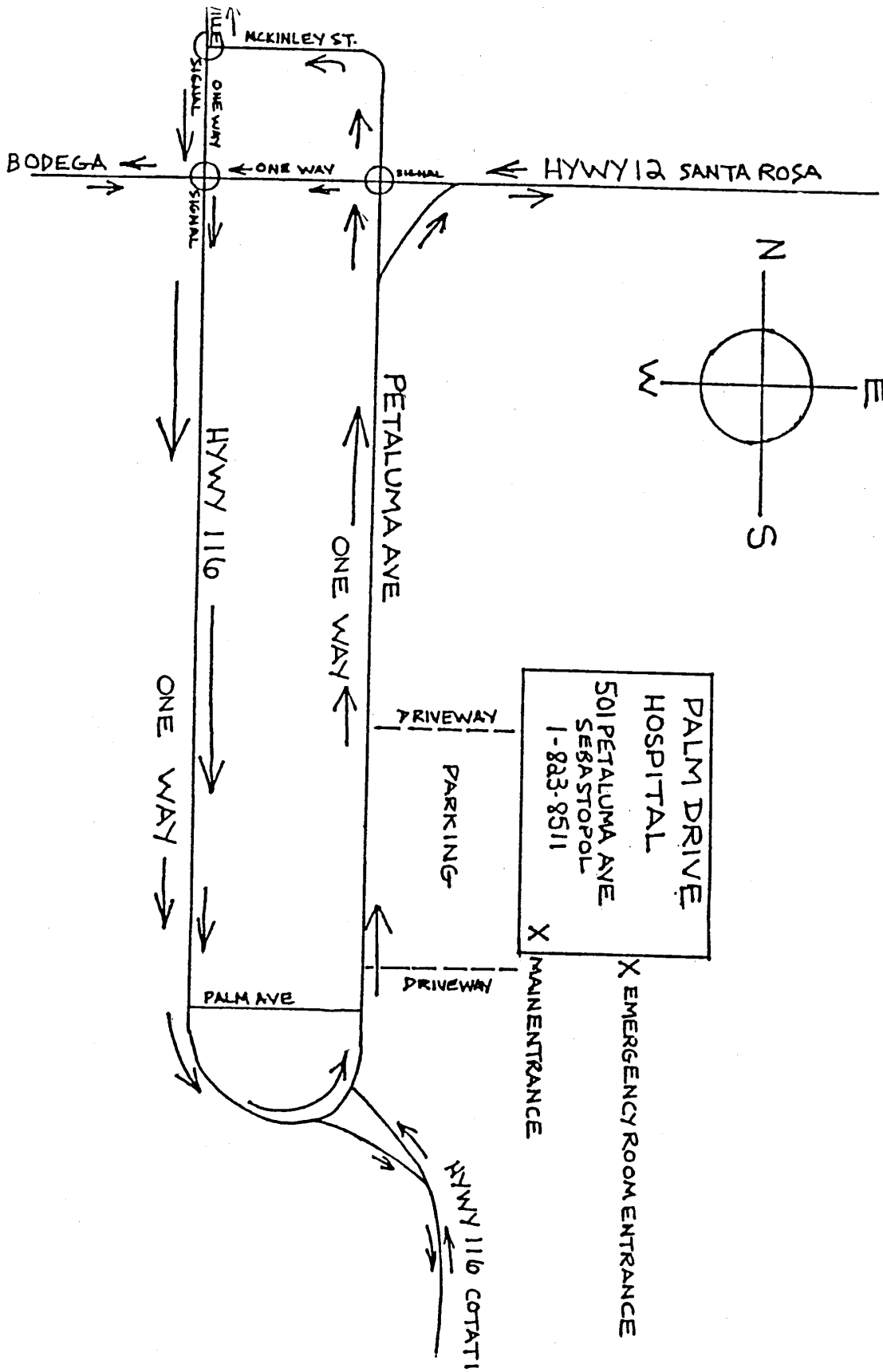
The Sonoma County Sheriff's Office is in direct communication with our office and will notify us of any emergencies you report.



SEBASTOPOL

SANTA ROSA

LOCAL HOSPITAL INFORMATION



Marine Mammals

Marine mammals include whales, dolphins, porpoises, seals, sea lions, walruses, and sea otters. Like land mammals, they are warm-blooded and nourish their young on the mother's milk.

The bodies of marine mammals are well adapted for life in the sea. Most are streamlined, making it easier for them to move through the water. Seal's limbs are modified to form flippers, while sea otters have flipper-like hind feet. Instead of vertical tails like fishes, whales have horizontal tails—an adaptation that enables them to dive and surface easily. Whales combat cold ocean waters by insulating their bodies with a thick layer of fat (blubber), which also provides buoyancy, padding, and a source of energy when food is scarce. Sea otters depend on long, fine, thick coats of hair for warmth. Seals have both a layer of fat and a coat of hair to keep them warm.

Young marine mammals are born well developed and with their eyes open. The high protein and fat content of the milk of marine mammals puts fat on the young quickly, giving them needed insulation from the cold and providing energy for metabolism. The young grow fast and can take care of themselves early in life, adaptations essential to survival in the hazardous marine environment.

Perhaps the most fascinating aspect of marine mammals, especially whales, is their ability to dive deep and stay down a long time. Although, proportionally, their lungs are not much larger in size than those of land mammals, sperm whales can dive to depths of 3,000 feet and stay down for as long as 90 minutes.

WHALES

Whales are mammals that live in the water.

Whales are mammals adapted to life in the water. Their bodies are very streamlined. They have a tail, known as tail flukes, for swimming. The tail flukes are moved in an up-and-down motion. Whales have a pectoral flipper on each side of their bodies just behind the head. These flippers are used for steering, turning and stopping. Some whales have a dorsal fin along their backs. This fin acts like the keel of a boat, it keeps the whale from rolling from side to side when the whale swims.

Whales can breathe only through their blowholes.

Whales have lungs and get the oxygen they need by breathing air. These mammals cannot breathe through their mouths like we can, because the trachea (windpipe) does not open into the throat; it is connected directly to the nasal passages. Whales breathe through their nostrils, which are located on top of their heads and are called blowholes. The blowhole is an adaptation for breathing while in the water. When a whale is in the water, swimming or resting at the surface, it does not have to lift its entire head out of the water to breathe. It just comes near the surface, thrusts the blowhole clear of the water and takes a breath.

Whales have a thick layer of blubber.

Since whales are warm-blooded they need a way of reducing the amount of body heat lost to the cooler surrounding waters. A thick layer of tissue similar to fat lies just under the skin. This layer is called blubber and acts as an insulator, streamliner and source of energy during the migration.

There are two groups of living whales.

All whales together belong to a group known as cetaceans. There are two groups of whales within this group. They are the mysticetes, or baleen whales, and the odontocetes, or toothed whales. Baleen and toothed whales differ in a number of ways, including physiology and behavior.

Today scientists study live whales.

The science that studies whales is called cetology and the scientists are called cetologists. Much of our past knowledge about whales has come from the study of dead animals on beaches and from whaling expeditions. Today, cetologists are studying live whales to learn more about how they live. Some whales are studied in the wild. This is very difficult, because all one usually sees of a whale is the blow, the back or the tail flukes. Some cetologists study whales under water and analyze underwater photographs of whales. A great deal of information has also come from the study of whales in the controlled environments of research facilities and oceanariums, like Sea World and the Hubbs/Sea World Research Institute, because it is easier to study an animal that you can see clearly. Even though there are many people studying whales, and even though we know a great deal about whales, we cannot answer all the questions. We still have a long way to go before we will fully understand these fascinating aquatic mammals.

BALEEN WHALES

Mysticetes have baleen plates instead of teeth.

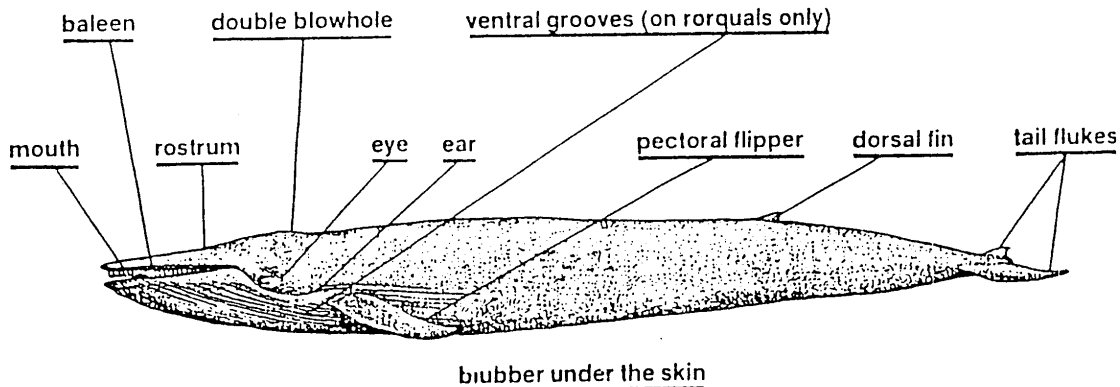
Mysticere means, "whale with moustache." This name refers to the baleen plates that hang from the roof of the whale's mouth. The baleen plates are somewhat triangular in shape and are located on both sides of the jaw. The inner edge is frayed and these fringes are intertwined on the inside of the mouth, forming a dense mat.

Baleen plates work like a strainer.

Mysticetes use the baleen to strain food from the water. Basically, they feed by opening their mouths and taking in huge amounts of water. The water is strained out through the baleen, and food gets trapped in the fringe mat. After all the water is gone, the whale can swallow its meal. Baleen whales, some of which are the largest animals to have ever lived on earth, eat some of the smallest, most abundant life in the oceans. They eat plankton—tiny plants and animals that drift through the seas.

What else makes a baleen whale a baleen whale?

Baleen whales tend to be solitary animals, traveling alone or in very small groups called pods. Female baleen whales are larger than male baleen whales. Most baleen whales migrate each year, from their cold-water feeding grounds to their warm-water breeding grounds, then back again. The blowhole of baleen whales has two openings. There are approximately ten species of baleen whales. In this packet, you will find descriptions of four baleen whales: the blue whale, humpback whale, gray whale and right whale.



BLUE WHALE
Balaenoptera musculus

GRAY WHALE FACT SHEET



| | |
|--|---|
| Class | <i>Mammalia</i> : mammals |
| Order | <i>Cetacea</i> : whale (from Latin "cetus") |
| Sub-order | <i>Mysticeti</i> : baleen whales (from Latin for mustache,) as opposed to <i>Odontoceti</i> : toothed whales. |
| Family | <i>Eschrichtidae</i> |
| Genus | <i>Eschrichtius</i> |
| Species | <i>robustus</i> |
| Gestation | 11-13 months. Complete female reproductive cycle believed to be two years. |
| Size | At birth: length 12 to 15 feet, weight 1500 to 2000 pounds. Maximum adult length: 50 feet, weight 40 tons. Females are slightly larger than males. |
| Speed | Average: 4 knots (about 5 mph) Maximum: 10 knots (about 11 mph) |
| Physical | Dark gray, with lighter gray and white markings; whitish barnacle clusters on body. Gold coloration sometimes present in barnacle clusters caused by presence of lice. Overall, heavily mottled gray and white appearance, unlike any other great whale. No dorsal fin; distinct ridge where dorsal fin would be, followed by 7 to 14 bumps or ridges composed of connective tissue. Two to four grooves on throat. Spout: heart-shaped, arches to both sides from blowholes. |
| Diet | Primarily gammarid amphipods (shrimp-like crustaceans), mollusks, tubeworms, some fish and squid. |
| Range | Northeast Pacific stock: Bering and Chukchi Seas, along coastal North America, to Baja California and Sea of Cortez. Korean stock: western Pacific, nearly extinct. Atlantic stock: extinct since 18th century. |
| Population | Present: 23,000 to 26,000 (estimated) Original: 15,000 to 20,000 (estimated) |
| Ectoparasites (those found on skin) | Barnacle: 1 species <i>Cryptolepas rhacianceti</i> , species specific (found only on gray whale) Whale lice: 3 species <i>Cyamus scammoni</i> : largest (up to ½" long) and most abundant parasite. Found around barnacle clusters and in fresh wounds. Species specific. <i>Cyamus ceti</i> : found in grooves and skin folds <i>Cyamus kessler</i> : least abundant; found around anus and genital grooves. Species specific. |
| Other names | Pacific gray whale (preferred), California gray whale, Mexican gray, gray back, mussel digger, devilfish, hard head, scamperdown, ripsack, California ranger, scrag whale, rock hopper. |

THE AMERICAN CETACEAN SOCIETY, 1983



WHALE CENTER FACT SHEET: THE GRAY WHALE

Eschrichtius robustus

*These are the whales which migrate along
the coast of California from December through May*

THE GRAY WHALE IS SO NAMED for the color (slate gray) of its skin, but often white barnacles, barnacle scars, and orange whale lice attached to the skin give these whales a very mottled appearance. The Latin name of *Eschrichtius robustus* refers to Eschricht (a Danish zoology professor) and the robust, powerful body shape of this coastal whale species. Early Yankee whalers called the gray whale "devil fish," primarily because of its fierce nature when it or its calves were harpooned. Today, gray whales are viewed by thousands of people annually during their migration from the summer feeding grounds in the Bering and Chukchi Seas off Alaska to their winter grounds in the shallow calving lagoons of Baja California. So popular is this large and interesting cetacean that in 1976, the California legislature designated the gray whale as the state marine mammal.

A MATURE GRAY WHALE will average 42 to 46 feet in length and weigh between 17 and 35 tons. Females are slightly larger than males (as is usually the case with baleen whales). A newborn calf averages 15 feet in length and 1,100 pounds in weight! Gestation lasts approximately 13 months. Gray whales are thought to live 70 years or longer.

THE ANNUAL MIGRATION of 12,000 to 14,000 miles round-trip of the gray whale begins when the first signs of winter occur in the northern waters in October. The migration begins with late-term pregnant females followed by mature males and nonpregnant females, and finally juveniles. The entire population of gray whales migrates in small groups or as individuals for some 2 ½ to 3 months, on the southward leg, passing quite close to shore along Canada, Washington, Oregon, California and Mexico, generally within the 50-fathom (300 foot) contour line. Gray whales are slow but steady swimmers; they swim about 2 to 7 knots (3-8 mph), averaging 50 to 100 miles per day, and will dive between 2 to 5 breaths on the surface on a regular basis. The southward migration occurs faster and more concentrated than the northward movements. In the relatively warm, sheltered lagoons of Baja, the pregnant females will give birth to half-ton calves while males usually concentrate close offshore. While courting takes place among gray whales all year long, most conceptions are thought to take place in the Gulf of Alaska in the first week of December. Most calves are born in the first two weeks of January. The northern migration begins in February as spring temperatures rise. The sequence of migration is reversed going north—first females, which became pregnant on the southward migration, followed later by males. The last whales to leave are females accompanied by their 3-month-old calves. This cycle of movement is a spectacular example of adaptations to the physical (temperature, ice conditions, and concentration of sunlight) and biological (food availability, vulnerability of newborn calves) environment of the gray whale.

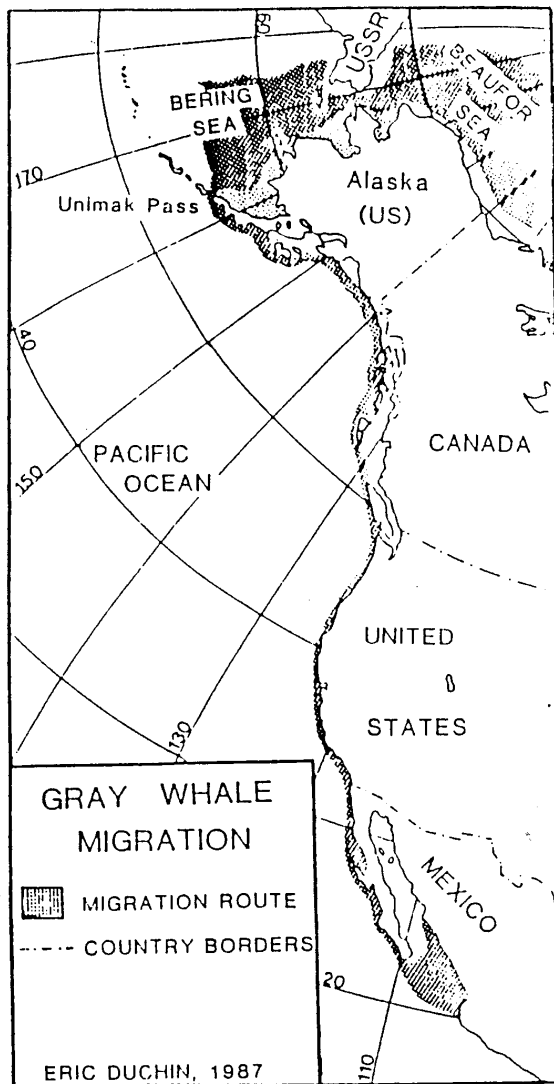
GRAY WHALES FEED primarily on bottom crustaceans called amphipods in the sandy mud of Arctic seas. A gray whale will typically dive to the shallow sea floor, roll onto its side and suck up the sediment. Mud and seawater will be filtered out through the whale's baleen plates, like a sieve, leaving behind the amphipods which are then swallowed. Gray whales will also feed opportunistically on schooling fish, swimming or floating crustaceans, and other bottom-dwelling invertebrates when on migration.

GRAY WHALES EXHIBIT MANY UNUSUAL CHARACTERISTICS which distinguish them from other whale species. Their marbled gray and white color set off by whale barnacles and yellow/orange lice is typical, and the snout (or rostrum) is very narrow and curved, surmounted by two blow holes typical of baleen whales. Instead of a dorsal fin they have a series of 10 to 12 knuckles along the dorsal ridge of their tail stock. The flukes are broad (approx. 12 feet wide) with irregular trailing edges. Biologists can photograph backs and flukes and recognize individual whales by characteristic coloration patterns, scars, and fluke contours.

THE HISTORY OF GRAY WHALE/HUMAN CONTACT began violent and bloody, but has now changed to an enlightened attitude emphasizing protection and benign research. Originally thought to be composed of three distinct populations, gray whale numbers were reduced in size by whalers in the Pacific to near extinction (the Korean/Japan population has yet to recover) and was wiped out entirely in the North Atlantic by the early 1700's, most likely by early European and American aboriginal and colonial whalers. Despite the slaughter of gray whales along the Pacific coast of North America at the turn of the century and again in the 1920's and 30's, this population of gray whales, under subsequent international protection, has increased to an estimated 17,000 whales.

The best estimate of the original gray whale population ranges from 15,000 to 30,000. The gray whale is one of the few whales to reach commercial extinction and yet recover to nearly its former population.

TODAY GRAY WHALES ARE PROTECTED by a number of treaties and national laws. The International Whaling Commission does not allow commercial whaling of the gray whale at the present time; however, a quota of 179 has been established for aboriginal subsistence (10 for United States Eskimos and 169 for the Soviet Union for Siberian natives). The United States protects the gray whale through the Endangered Species Act and the Marine Mammal Protection Act. Habitat threats, such as offshore oil production, toxic wastes dumped at sea, and other exploitation of marine resources, may harm gray whales unless care is taken to avoid conflicts. Some gray whales have been drowned in fishing nets; recent restrictions on such fishing methods will help avoid future drownings. The United States government has proposed changing the gray whales' status from "Endangered" to "Threatened"—conservationists, including the Whale Center, are concerned that such a change in status may weaken gray whale protection.



Pacific Gray Whales

Seasonally mature 5-11 yrs, mean 8 yrs. Come into estrous during 3 week period late November/early December. Most conceive at this time but if fails may undergo another estrous cycle about 40 days later.

Whales in general (During Dives)

80-95% of air exchanged (man only about 20%)

Lungs collapse completely beyond 330 ft.

Most ribs are “floating ribs”, not attached to a rigid breastbone

Heart beat slows down 50%

Oxygen stored in muscles and in blood.

Whales have 56 vertebrae

Blowholes close tighter with pressure. (Whales have to forcefully open blowholes whereas humans have to forcefully close nostrils)

As much as 50% of total body weight is blubber

Baleen:

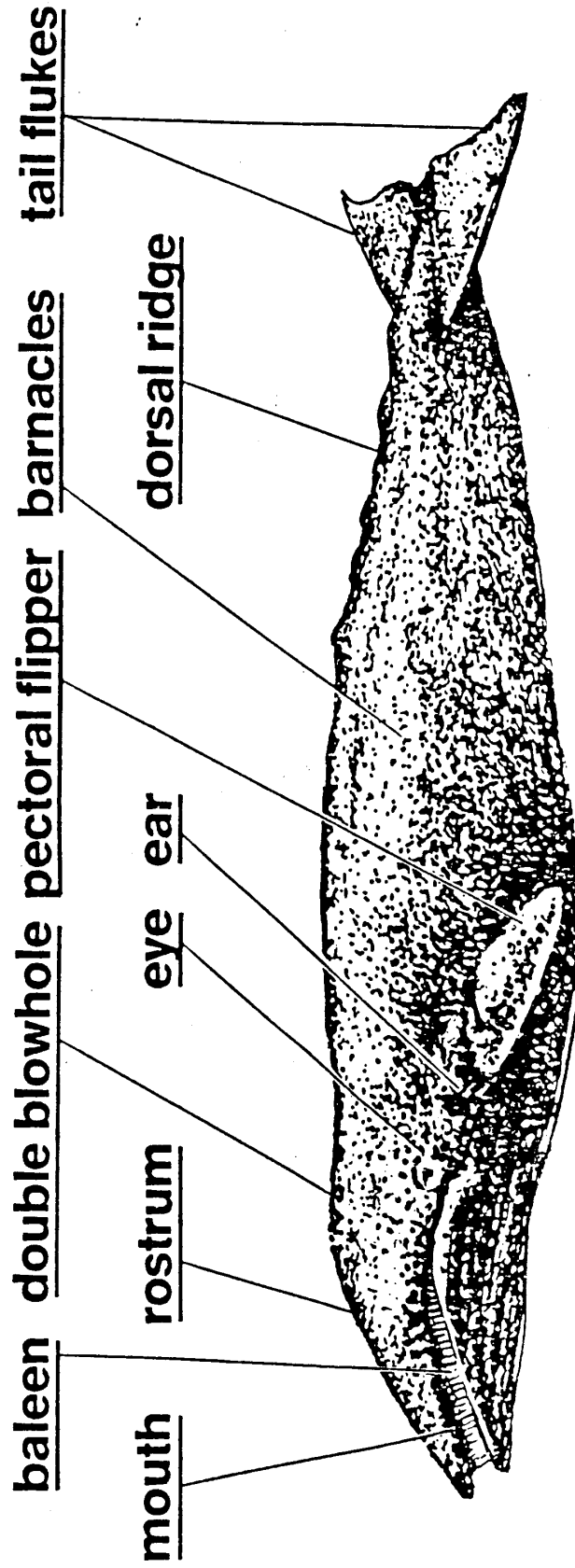
Gray Whale – 140 – 180 plates each side, longest 16 inches

Blue Whale – 270 – 395 plates each side, longest 39 inches

Humpback – 270 – 400 plates each side, longest 39 inches

GRAY WHALE

Eschrichtius robustus



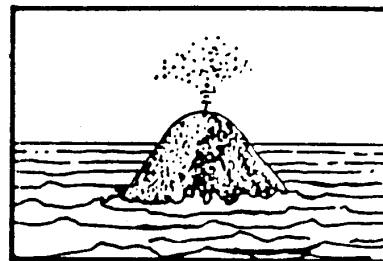
blubber under the skin

WHAT TO WATCH FOR IN A WHALE'S WORLD

Welcome to a whale's world. Although whales spend their entire lives in the water, they are not fish. They are mammals—warm-blooded air-breathers that feed milk to their young.

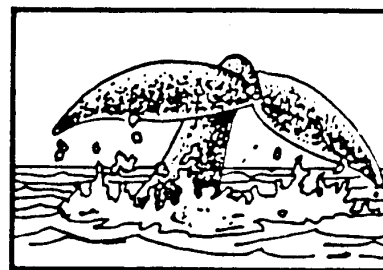
Look for the "blow."

Whales must come to the surface regularly to breathe, and it is because of this need to breathe that we can follow them during their migration. Whales breathe through their nostrils, which are located on top of their heads. Their nostrils are called blowholes. To breathe, a whale just comes near the surface, thrusts the blowhole clear of the water, exhales, and then takes a breath. When the whale exhales a mist or spray may be seen. This spray is called a spout or blow. Look along the horizon for a white spray a few feet above the surface of the water.



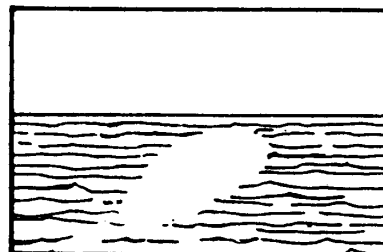
A flip of the flukes means a deep dive.

Normally a gray whale makes three to five shallow dives before making a deep dive. Deep dives last about five minutes. A gray whale making a deep dive will show you its tail flukes. Lifting the tail flukes out of the water helps the whale dive deep.



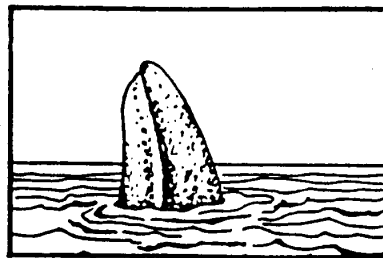
Gray whales leave "footprints."

After a gray whale takes a breath, it usually makes a shallow dive, swimming just under the surface of the water for about one minute. You probably won't be able to see the whale under water, but you will be able to tell where the whale is. Each time the whale moves its tail, it creates a "footprint" on the surface of the water. This footprint looks like an oil slick. You can follow a whale that is swimming just under the surface by following its "footprints".



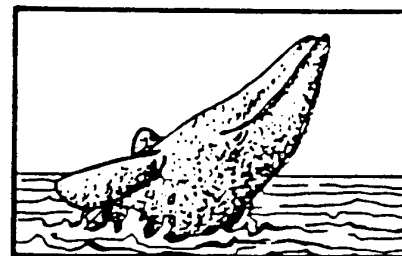
Watch for whales watching you.

Whales don't spend all their time swimming and breathing. While you are watching the whales, a whale may stop to watch you. Gray whales probably have fairly good eyesight. Sometimes they poke their heads out of the water exposing their eyes. This is called "spyhopping."



Whales take great leaps.

The head is not the only part of a gray whale that you may see out of the water. The whales can also bring their entire bodies out of the water. This incredible leap is called a breach. When the whale lands back in the water it creates a huge splash. No one knows for sure why whales breach.



MORE WHALE FUN FACTS

Lung capacity of large whales relative to their body weight is only about one half that of terrestrial mammals.

Whales replace 80-90% of air in their lungs compared to 10-20% for land mammals.

Cetacean blood contains twice as many red blood cells as terrestrial mammals, and thus can carry twice as much oxygen.

Cetaceans' body temperature 36-37°C.

Oil in bones may account for 50% of body total.

Smell seems to be of little importance.

Touch is an important sense,

Vision is good above and under water.

Hearing is the most important sense.

How long do whales live?

| | |
|----------|-----|
| Gray | 70 |
| Blue | 110 |
| Humpback | 77 |
| Fin | 114 |
| Sei | 74 |
| Bryde's | 72 |
| Minke | 47 |
| Sperm | 77 |
| Killer | 50+ |

Gray whales lose 20-30% of body weight in winter.

Sexual maturity 5-11 years.

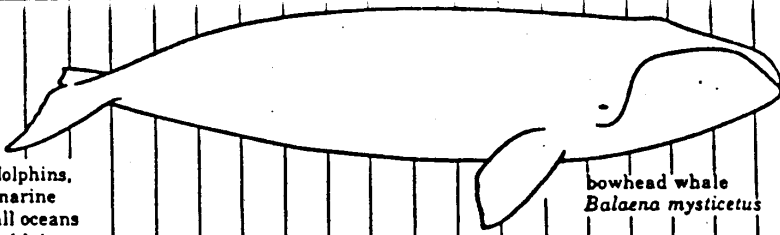
Internal parasites not common.

WHALE SHAPES AND SIZES COMPARED

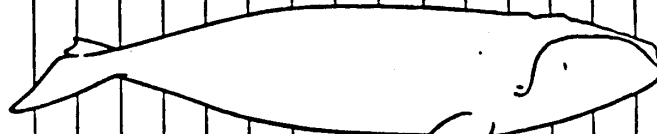
Larry Foster

There are 80 or so species of cetacea, i.e., whales, dolphins, and porpoises. They are intelligent warm-blooded marine mammals with terrestrial ancestors. They inhabit all oceans of the world with several species living in rivers and lakes. The cetacea give live birth, nurse their young and show tenderness. And they breathe air, the nostrils having evolved to the top of the head. However, little is known about whale life styles. The creatures have always been valued primarily as a raw material rather than an object of natural science.

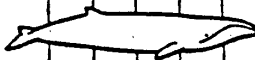
AMERICAN CETACEAN SOCIETY
 NATIONAL HEADQUARTERS P.O. BOX 2639 SAN PEDRO, CALIFORNIA 90731 (213) 548-8279



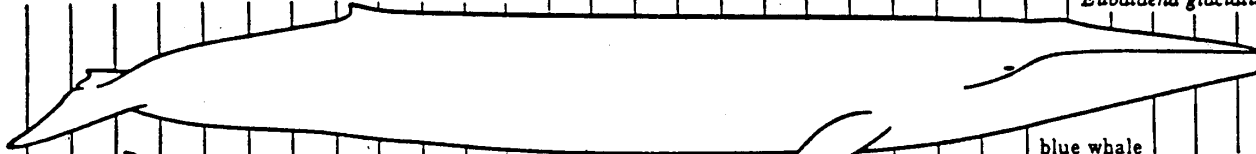
bowhead whale
Balaena mysticetus



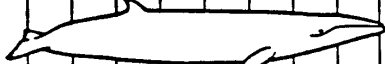
right whale
Eubalaena glacialis



pygmy right whale
Caperea marginata



blue whale
Balaenoptera musculus



minke whale
Balaenoptera acutorostrata



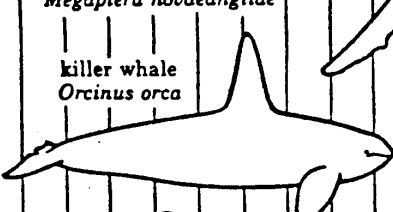
fin whale
Balaenoptera physalus



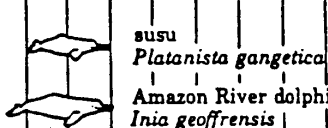
humpback whale
Megaptera novaeangliae



gray whale
Eschrichtius robustus



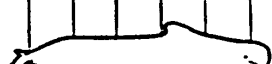
killer whale
Orcinus orca



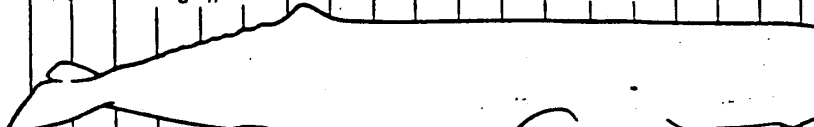
susu
Platanista gangetica
 Amazon River dolphin
Inia geoffrensis



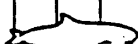
narwhal
Monodon monoceros



pilot whale
Globicephala melaena



sperm whale
Physeter catodon



pygmy sperm whale
Kogia breviceps



humans
Homo sapiens



harbor porpoise
Phocoena phocoena



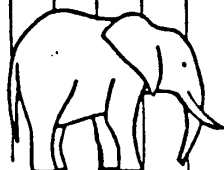
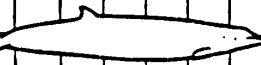
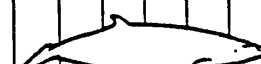
common dolphin
Delphinus delphis



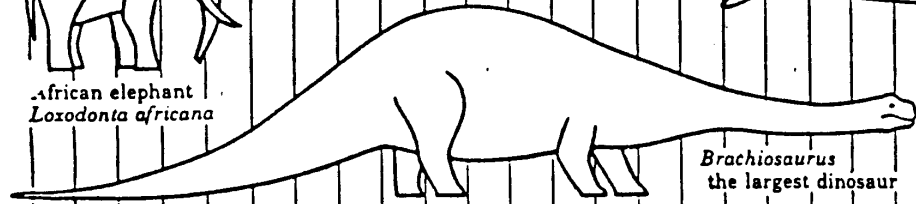
bottlenosed dolphin
Tursiops truncatus

dense-beaked whale
Mesoplodon densirostris

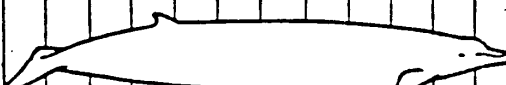
strap-toothed whale
Mesoplodon layardi



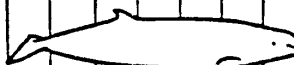
African elephant
Loxodonta africana



Brachiosaurus
the largest dinosaur



giant bottlenose whale
Berardius bairdi



Cuvier's beaked whale
Ziphius cavirostris

LF

METERS

5

10

15

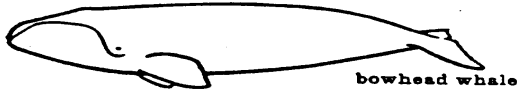
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25

WHALES IN GENERAL

Cetology (se-tol'o-ji) is the study of whales, dolphins and porpoises. Cetos is Greek for whale. Cetologists divide all cetaceans into two groups; those with teeth (odontoceti) and those without (mysticeti). MYSTICETI (mustache-whale, referring to the baleen, which may have resembled a mustache to the ancient Greeks).

There are 10 species of baleen whales. These whales feed by sieving water through their baleen, which is a biologically ingenious arrangement of flexible blades that are smooth on the outside edge but fibrous on the inside and are positioned around the outer edge of the whale's upper jaw. The baleen makes it possible to gather tons of the minute food creatures upon which these whales, the largest of all animals feed. Water will pass through the baleen but whale food will not.



bowhead whale

The bowhead whale lives only around Greenland and Alaska. It was hunted so relentlessly that the last ship to sail to the arctic in search of bowhead whales stayed out two years and came back empty. Today the magnificent bowhead whale is not extinct, but rare.



right whale

The right whale has also been greatly reduced in numbers and is nearly extinct in the Northern Hemisphere. In the Southern Hemisphere, in Patagonia, there is a small group of right whales that spend part of the year in certain bays, in shallow water close to the beach. There they have been carefully studied and much information on natural behavior has been recorded ("At Home with Right Whales" National Geographic, March 1976) This is significant in that so little is actually known about the lives and capabilities of the largest creatures on earth.



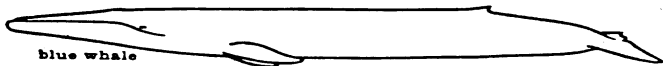
humpback whale

The humpback whale's songs, some 20 minutes long and then repeated, are astonishing and hard to believe at first. The sounds range from clicks and grunts to beautiful ethereal squeals. The humpie is distinguished by being the only animal to have two hit records—Songs of the Humpback Whale and Deep Voices, both on Capitol Records.



gray whale

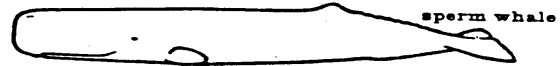
Another unique whale, with a genus all to itself, is the gray whale. They swim from Alaska, where they feed during the summer months, to Baja California, where they calve and mate during the winter: This distance is over 15 000 kilometers (8,000 miles) round trip. It is one of the longest migrations of any mammal. In some places they swim quite close to land, in fact, just beyond the surfline. This whale is easier to see than most and much information on its biology and behavior is now being gathered. It remains true, however, that whales are extremely difficult, rare, and expensive subjects to study.



blue whale

Among the mysticeti there is a special group of long, thin streamlined whales known as rorquals. They are beautiful and graceful animals, the fastest of which can swim over 30 kilometers (19 miles) an hour. In water this is very fast. Rorqual's food gathers in swarms, like the five-centimeter (two-inch) shrimp-like animals called krill and small schooling fish. Krill is the favorite food of the largest of all whales, the blue whale. The thin, sleek torquel whale approaches the food and takes a giant mouthful that blows its throat and chest out like the world's largest beach ball! The mouth is then closed and the water "squashed" through the baleen. What is left is whale food.

ODONTOCETI (These whales have teeth. All porpoises and dolphins are in this group.) The largest toothed whale is the sperm whale.



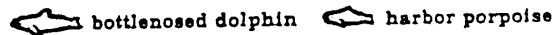
sperm whale

Sperm whales can stay submerged for over an hour and the large males, feeding on deep-sea squid, may dive to over 915 meters (3,000 feet) straight down! Sperm whales have the largest brain ever evolved. Moby Dick was a sperm whale.



killer whale

Orcas or killer whales are among the largest odontocetes. As do sperm whales, some orcas roam the seas in close family groups with a large male (presumably) as the leader. Orcas feed mainly on fish but also catch seals, sea lions, dolphins, and small whales and even attack large whales. Orcas have been kept in aquariums where it was discovered that the mighty orca is gentle, cooperative, curious, and intelligent. Many believe they are the smartest of cetacea. There is no dependable record of orcas attacking humans, although they certainly have had ample opportunity.



bottlenosed dolphin

harbor porpoise

The bottlenose dolphin is well known from aquariums. These dolphins do well in captivity and many successive captive-born generations are now in progress.

Porpoises, as do dolphins, enjoy a diet of fish and squid. The body differences of the porpoises compared to the typical dolphin can be described. First, the porpoise does not have a beak, it has a more blunt face. Porpoises do not have a large, sharply hooked dorsal fin, as most dolphins do. There are teeth and skeletal differences too.



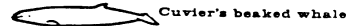
susu

One of the smallest dolphins, the susu, is only 1.5 meters (five feet) long, and lives in India's Ganges River. The water is obscure but the dolphins' hearing is so advanced they can "see with their ears" and catch all the fish they need.



giant bottlenose whale

One more group of whales must be mentioned—the beaked whales. They are a separate group of odontocetes that are strange in appearance and little known in nature. The largest is the 13 meter (40-foot) bottlenose whale, or berardius. The males have two rather strange, obtuse teeth at the tip of the lower jaw. These teeth are presumably used in adjusting berardius mating or territorial disputes, as the males are covered with long shallow scratches that match berardius teeth.



Cuvier's beaked whale

Cuvier's beaked whale is another interesting looking whale of the ziphid group. It has very small flippers, and, as in other .beaked whales, has little or no notch in the tail. Practically nothing is known about the living habits of these strange little whales.



strap-toothed whale

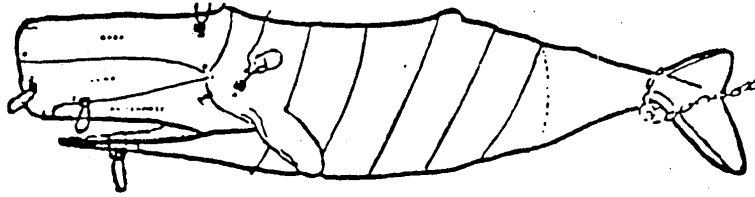
There are several species of mesoplodons which are the strangest and least known of all cetacea. Many mesoplodons species have not even been seen alive, and are known only from strandings or fortuitously discovered bone fragments.

WHALE PRODUCT SUBSTITUTES

Each year thousands of whales are killed because of their high commercial value. Whales provide hundreds of products, from teeth for souvenirs to high grade machine oils. Today all whale products can be synthetically produced or other products substituted for their use. It is no longer necessary to kill the great whales, but the tragic destruction of these magnificent animals continues. Today, Jojoba oil is being used as a Sperm Whale oil substitute, almost a Sperm Whale oil duplicate. Jojoba oil like many other products will help Save the Whales. Listed below are whale products and their substitutes.

| Product | From | Processing | Alternatives |
|--|--------------------------------------|--|---|
| ANIMAL FEEDS | Whale meat | Meal | Residual seed meal of jojoba, sugarbeets, seaweed, cereals |
| HIGH QUALITY CANDLES | Whale Oil Sperm Oil Spermaceti | Hydrogenation | Beeswax, paraffin, jojoba, tallow |
| CRAYONS AND PENCILS | Sperm oil Whale oil Spermaceti | Hydrogenation | Jojoba |
| FERTILIZERS | Whale bone | Grinding | Seaweed, various organic and composted materials |
| FLOOR COVERINGS (Linoleum and Whale oil) | Sperm oil Whale oil | Polymerization | Linseed oil: jojoba oil |
| GLYCERINE | Whale oil | Saponification | Any saponified oil or fat: palm oil, ground nut oil |
| GELATINE | Skin bones, tendons | Boiling | Skin, bones, tendons and hooves of domestic cattle |
| INDUSTRIAL OILS Cutting oils Textile oils High speed machine oils Watch and clock oil Leather dressings | Sperm oil | Hydrolization Sulphurization | Linseed oil, castor bean oil, tung, rapeseed oil jojoba |
| MARGARINE | Whale Oil | Filtering Mixed with mineral oil Hydrogenation | Various available oils Vegetable oils: soya, sesame, corn, safflower |
| PHARMECEUTICALS | Spermaceti | Refining and Filtering | Domestic animal sources |

"NOTHING IS WASTED BUT THE WHALE ITSELF"



| Product | From | Processing | Alternatives |
|---|-------------|---|---|
| Vitamin A | Whale liver | Extraction | Natural carotenese from carrots and alfalfa: cod liver oil, synthesized Vitamin A from lemongrass oil or turpentine |
| PLYWOOD GLUE | Whale blood | Dehydration | Fish bone |
| PRINTING INKS | Sperm oil | Sulphurization | Jojoba oil, rapeseed oil |
| SOAP | Whale oil | Polymerization | |
| | Whale oil | Saponification | Jojoba, palm oil, others |
| WAXES (Polishes and Textile Industry) | Sperm oil | | Jojoba |
| COSMETICS (Lipsticks, cold creams, etc.) | Sperm oil | Saponification | Lemon, orange, jojoba oils, cactus cream, avocado, cucumbers |
| | Spermaceti | | |
| TRANSMISSION FLUID | Sperm oil | Refining | Jojoba, rapeseed |
| PERFUMES | Ambergris | None | "Fixateur 404" and others based on oak moss, clary labadanum, agat wood oils, etc. |
| PET FOODS | Whale meat | Very little processing, if any | Fungal protein, slaughterhouse wastes, cereal protein, soya bean meal |
| SHAMPOO | Whale oil | Cetyl alcohol derived from saponification | Jojoba, fatty acid alcohol's from coconut, palm, kernel oils, etc. |
| SUNTAN OILS | Whale oil | As above | Jojoba, other oils |
| SOUVENIRS | Teeth | Polish and cut | Postcards, photographs, records and tapes, carvings on ivory nut, domestic animal bone |
| | Baleen | | |

THE AMERICAN CETACEAN SOCIETY

HUMPBACK WHALE

Megaptera novaeangliae

Sportive but gentle, and a singer of songs

In the days when ships were quietly powered by wind and sails, sailors would sometimes hear the ghostly sounds of whale songs reverberating through the wooden hulls. In recent years, with the development of hydrophones and other sophisticated electronics, man has been able to record the sounds of whales.

The vocalizations produced by humpback whales are different from those made by any other animal—they extend over a wide frequency range, and possess a variety of expressions greater than those of a songbird. These "songs" are produced in complete and complex sequences, and are repeated at intervals. Their meaning, if any, is not known, but it is thought that different "songs" could be used to convey different kinds of information, such as identity, mood and location.

This species belongs to a group of whales known as rorquals, a term which indicates the presence of grooves on the ventral surface. On the humpback, the grooves reach from the throat to the navel, distinguishing it from all other rorquals.

Another feature which distinguishes the humpback are the two rows of bumps, each of which has a single tactile hair, on both sides of the upper jaw.

Their scalloped pectoral flippers, colored white on the underside, are extraordinarily long in comparison to those of other cetaceans; in humpbacks, the flipper length is more than one-fourth the body length, and provides these whales with additional underwater maneuverability.

These powerful, acrobatic whales are often sighted in coastal waters. The humpback whale often leaps clear of the water, creating a thunderous crash and an explosive eruption of spray when it reenters the water. This behavior, called breaching, is common to all whales and dolphins, but the humpback's display is quite impressive in that it will often breach as many as 20 times in a row. These intense and graceful displays are often seen from land, as the humpback's migration to its inshore breeding grounds usually follows routes close to the continental coasts.

The humpback is a middle-sized member (50 ft/15m) of the rorqual family of "toothless" baleen whales, and although they are the most vocal, they are not the only sound producing whale. The larger rorquals (the blue and fin whales) were once thought to be silent, but have also recently been recorded producing very low frequency sounds which, when traveling over long distances in the sea, may allow communication between distant whales.

MINKE WHALE

Balaenoptera acutorostrata

More than 300 pairs of pale-yellow, white-fringed baleen plates hang from the minke's upper jaw

The minke whale, a slender, spindle-shaped relative of the giant blue whale, can be distinguished by its sharply pointed snout and a white band or patch on the outer surface of the pectoral flippers.

The minke is also commonly called the "little piked whale" or the "little finner". This species is often observed off the coasts of the British Isles, the northwestern U.S. and Canada. It frequently follows ships, entertaining travelers with magnificent breaches and tremendous splashes.

Widely distributed in both the northern and southern hemispheres, the minke, like other whales, is most often observed in small groups consisting of either adults or adolescents.

The minke's throat and ventral surface has sixty long, pleat-like grooves which expand and contract as the whale feeds. As do most other baleen whales, the minke feeds primarily on krill, a small shrimp-like animal, but squid and schooling fishes such as herring and anchovies are also consumed.

In breadth, the minke's tail flukes equal almost one-fourth of its total body length. With powerful up and down motions of these broad tail flukes, the minke and all other cetaceans are propelled through the water.

Though the minke generally cruises around 7 mph (11 km/h), if necessary it can attain speeds up to 17 mph (21 km/h). The spray from the "blow" exhaled through the paired blowholes can be easily seen from a distance, as it reaches a height over six feet (2m).

During the spring and summer, populations in the Northern Hemisphere migrate along the coasts to their feeding grounds in the Arctic. In the North Pacific, breeding occurs from January through May. After a gestation period of approximately 11 months, the calves are born weighing almost 500 Pounds (227 kg) at birth. They then nurse for six to eight months.

This species has a relatively high reproduction rate; mature females generally give birth to a single calf each year or year and a half.

BLUE WHALE

Balaenoptera musculus

The blue whale - largest animal ever to have lived on earth

More than three times heavier than the largest dinosaurs, the giant blue whale may weigh over 130 tons (118 MT) and may exceed 100 feet (30m) in length. The huge heart alone weighs half a ton, and pumps nearly 4,000 gallons (15,140 liters) of blood through the body.

Traveling alone or in pairs, the blue whale migrates each year to Antarctic waters to feed on the abundant krill—a tiny, two-inch long, shrimp-like crustacean. In order to consume the four tons of krill and other foods it needs each day, the blue whale must filter hundreds of thousands of gallons of water through the baleen plates hanging from its upper jaw. Part of this enormous quantity of food is converted to blubber which provides energy for the eight month journey to and from the equatorial breeding grounds.

In the warm waters of these breeding grounds, the three-ton calves are born during the austral winter, which corresponds to summer in the Northern Hemisphere. Nourished by their mother's rich milk, at a rate of 50 gallons (189 liters) daily, the calves gain about 209 pounds (91 kg) a day. By the end of seven months of nursing, the calves weigh over 20 tons (18 MT) and will start south with their mothers for the Antarctic feeding grounds.

Now protected worldwide, populations of blue whales are increasing.

SOUTHERN RIGHT WHALE

Eubalaena australis

An endangered gentle giant

The timid and gentle southern right whale swims slowly in the waters of its breeding grounds off the coast of South America. Once abundant, the several species of right whales were almost hunted to extinction. Their large size and slow speed along with the thick oil-rich layer of blubber made them the "right" whale to hunt in the early days of sailing ships. Today under international protection their numbers are increasing.

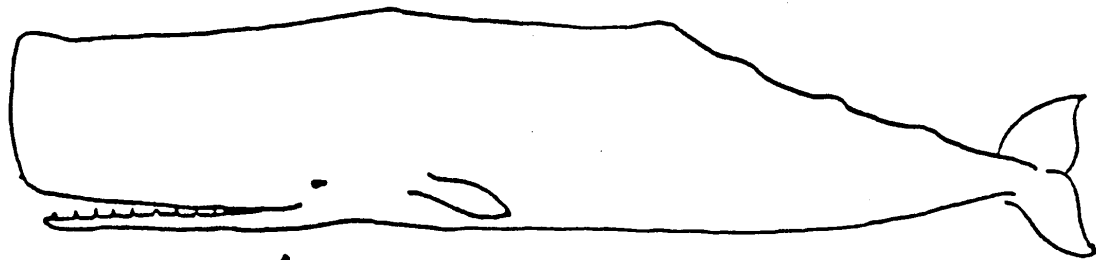
The right whale has a thick, blunt shape and no dorsal fin. The huge lower jaw is sharply arched, and unlike the rorquals, is not grooved on the undersurface. The upper jaw holds the ponderous 12-foot long plates of fringed, comblike baleen, which are used to strain food from the water. At the turn of the century, baleen provided the "whalebone" stays for fashionable ladies' corsets.

The head of the southern right whale is covered with callous-like growths, which are heavily encrusted with hitchhiking whale lice. The shape and position of these bumps varies with each whale, making it possible for observers to identify individual animals when studying their movements and behavior.

TOOTHED WHALES

Odontoceti

- Have teeth for capturing food
- Have a single blowhole
- Are social animals --- generally travel in family groups called pods
- Are thought to communicate through both a variety of high and low frequency sounds and physical displays



SPERM WHALE

60 ft.



KILLER WHALE

30 ft.



BELUGA WHALE

18 ft.



BOTTLENOSE DOLPHIN

12ft.



PACIFIC WHITE-SIDED DOLPHIN

7 ft.

KILLER WHALE

Orcinus orca

Undisputed monarch of the sea

Distributed in all oceans of the world, the strikingly marked black and white killer whale has no natural enemies, and is capable of swimming at speeds up to 30 mph (48 km/h). The killer whale, like most large cetaceans, generally travels in relatively small herds or pods, ranging from a few individuals to forty, fifty or more whales.

Groups of killer whales have frequently been compared to wolf packs, as they hunt in a cooperative effort. Though the main part of the killer whale's diet is fish, these magnificent predators will also prey upon other marine mammals, such as seals and sea lions, and are occasionally seen attacking the larger species of whales, including the massive blue whale. As with all predators, the killer whale plays an important role in its environment by ensuring only the survival of the fittest.

While killer whales and other predators display the intelligence needed to be efficient hunters, they are also highly communicative through both physical displays and vocalizations. Clicks, squeaks, whistles, grunts and other sounds audible to the human ear are emitted by the killer whale through the melon or forehead and convey such things as identity, moods and location. The high frequency clicks are used primarily in echolocation, a process used to locate objects by means of sound waves which are reflected back to the whale from the objects.

PACIFIC WHITE-SIDED DOLPHIN

Lagenorhynchus obliquidens

Streamlined acrobats, the Pacific white-sided dolphins can easily leap 15 feet into the air

Shorter beaked than the common dolphin, the Pacific white-sided dolphins have distinct, striking markings and display acrobatic abilities. Leaping high into the air, they land on their sides or back with a loud smack. They even somersault in mid-air, as do several other species in the wild.

Found in offshore waters along the Pacific coast, from the tip of Baja California to Alaska, they frequently travel with the common dolphin in huge combined herds.

Like other pelagic or open ocean dolphins, white-sided dolphins are vigorous swimmers, streaking along through the water using a powerful up-and-down undulating motion of the tail fluke. This mode of swimming, shared with all the other dolphins and whales, brings the nostril (or blowhole) located at the top of the head to the surface for breathing without interrupting the forward motion of the animal—a useful adaptation when pursuing the fast swimming fish and squid on which they feed. Their speed is also used when escaping predators.

Though they are not large animals, the Pacific white-sided dolphins must consume large quantities of food, for they have a very rapid metabolic rate.

COMMON DOLPHIN

Delphinus delphis

Dolphins establish strong social bonds within a family group or pod

The dolphin's graceful form has been depicted in murals, on pottery, sculpture, jewelry and carvings for thousands of years. Fascinated by these playful and social creatures, man has long made them the subject of his legends. Their use of echolocation to navigate and find food, intelligence and ability to communicate continue to be subjects of intensive scientific inquiry.

There are over 60 different species of dolphins inhabiting the world's waters. A few species inhabit only large freshwater lakes and rivers, such as the Ganges and Amazon. Some are found only within specific geographical areas and still other species undertake long migrations and are pelagic in behavior.

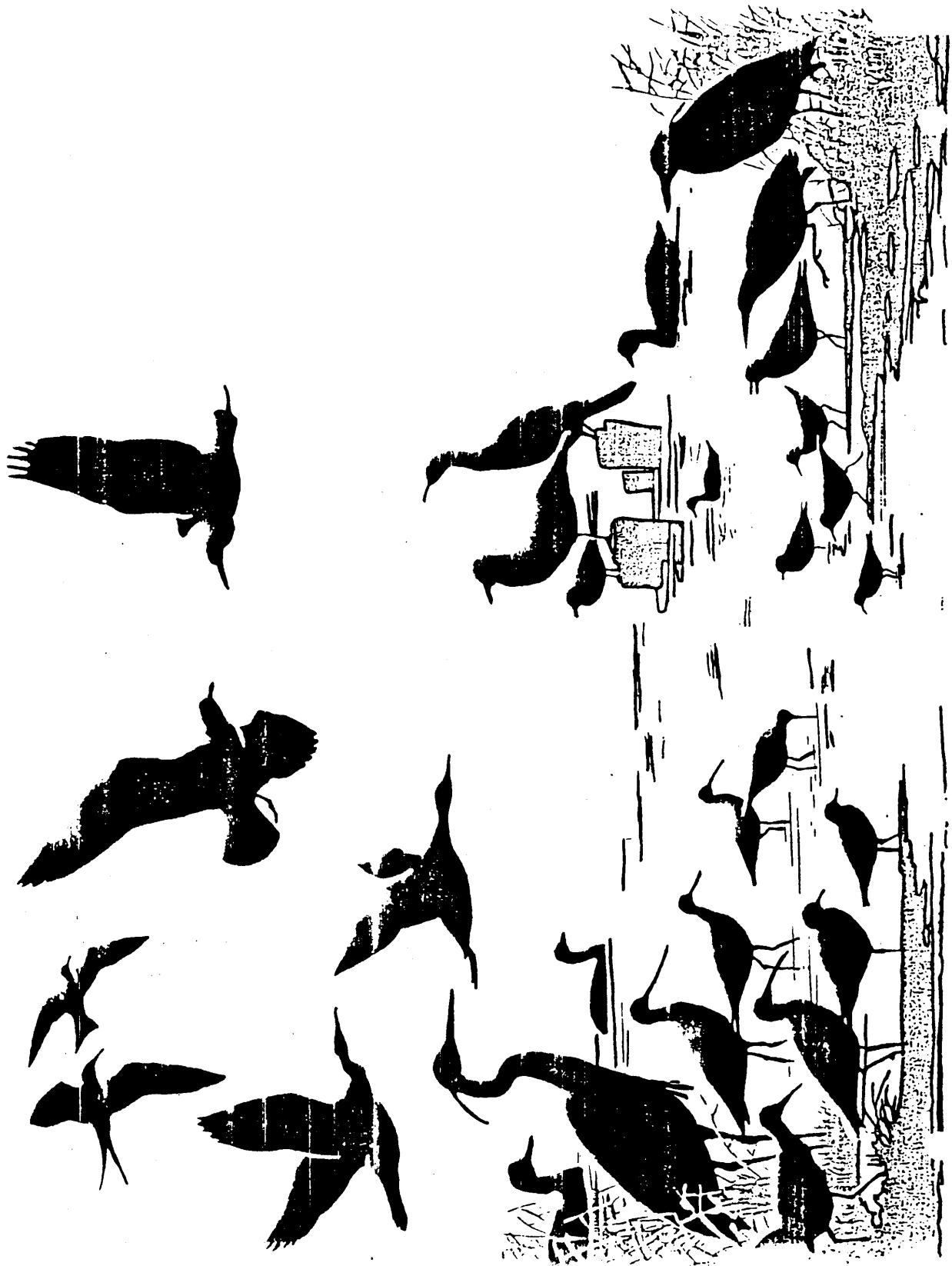
At present, the terms "dolphin" and "porpoise" are often used interchangeably to describe these small, toothed cetaceans. The taxonomic difference between the two terms lies in the skeletal structure and in the formation of the teeth.

Common dolphins are essentially a "pelagic" or open ocean species, with the largest numbers found in the Atlantic Ocean and its adjacent seas. Their total world population is estimated in the millions.

Plentiful in the Atlantic, Pacific and Mediterranean Oceans, common dolphins are social animals, usually traveling in herds made up of several hundred individuals. These herds contain smaller family units or pods. The older individuals carefully tend the young while the bolder, stronger animals patrol the perimeter of the pod—"protecting" the group and guiding its movement.

While feeding, dolphins cooperate in a mutual effort to herd and encircle schools of fish. Since dolphins frequently leap clear of the water, and reenter with a splash, their herds can be easily spotted from a distance. Fishermen often take advantage of these sightings to help locate schools of fish.

The common dolphin is strikingly and beautifully marked. These playful, active mammals are generally colored black on the dorsal surface, yellowish-white on the ventral surface, with gently shaded ochre or gray regions on the sides. Stripes of slate gray, ochre, black or ivory form distinct patterns which decorate the rostrum eye regions and body sides.



BIRDS OF BODEGA BAY

This list is meant to be a general birding guide for the immediate Bodega Bay and harbor area. It is by no means an all-inclusive accounting of every bird possible to see nor is it an enumeration of rarities which have occurred. (An excellent source of information as to the status and frequency of birds in the county is to be found in Birds of Sonoma County by Gordon L. Bolander and Benjamin D. Parmeter.)

The sequence in which species are listed follows the order adopted by the American Ornithologists' Union in 1983. It also reflects the common name changes. Former names, when significantly different, appear in parentheses below the new name.

Bird population and density are at their highest in the Bodega Bay area during migration. Many landbirds (hawks, hummingbirds, swallows) are migrant, fluctuating in abundance seasonally. Shorebirds, ducks, and loons move north, many to the Arctic, to have their young as soon as the weather begins to warm in late winter / early spring. Bodega Bay is an important stop on their journey for both feeding and rest.

In the fall many of the same water birds again pass through the area on their way to warmer winter homes. The young they have produced also migrate south at this time and pour through Bodega Bay in great numbers. Many of these migrants remain here over the winter.

Some visible residents are noticeably absent during the breeding season. Egrets, herons, kingfishers, phoebes, for example, become less conspicuous as they tend nests either away from this area or choose to remain quiet for the safety of their young.

This list was compiled in 1984 by Nancy T. Conzett for Sonoma County Regional Parks. Recognition also goes to Kurt F. Campbell, Betty Burrige, Peter Connors, Hal Corey, Benjamin D. Parmeter and Chris Tarp for their involvement in the project.

Abundance Categories

A – Abundant. Possible to see 100+ / day.

C – Common. Possible to see 25+ / day.

FC – Fairly Common. Should be seen, but not in great number. Also included are birds which are conspicuous but numerically few, i.e. osprey, great blue heron, etc.

U – Uncommon. Occur either irregularly or in small numbers.

R – Rare. Not regular.

Status Categories

RES – Resident. Abundance can fluctuate through the year. Local breeders usually.

M – Migrant. Present in fall and/or spring. Some may and/or spring. Some may over winter or summer.

M* – Fall migrant only.

WR – Winter resident. Arrives late summer or fall, leaves in spring.

SR – Summer resident. Arrives in spring, leaves late summer or fall.

*When a status is parenthesized, it indicates it's less common.

Habitat Categories

A – Aerial

BB – Bodega Bay (seewared of Doran)

Be – Beach (Doran or S. Salmon)

BH – Bodega Harbor (its waters, shoreline & tidal flats)

D – Dunes

E – Everywhere

G – Grassland. Open areas of annual grass & cover, such as lupine, coyote bush, etc.

Msh – Marsh. Tidal areas where salt / fresh water joins land. Reedy.

O – Ocean. Open sea.

RS – Rocky shoreline.

T – Trees; especially willow, cypress, eucalyptus.

Ur – Urban. Houses, gardens, lines, fences.

*When a habitat is parenthesized, it indicates it's less common.

| <u>GULLS</u> | <u>Abundance</u> | <u>Status</u> | <u>Habitat</u> |
|--------------------------|-------------------------|----------------------|-----------------------|
| Bonaparte's | FC | M | BB, BH, O |
| Heerman's | C | SR, M* | Be, BH, O, RS |
| Mew | FC | WR | Be, BH, O, RS |
| Ring-Billed | C | WR, M | Be, BH (O, RS) |
| California | C | WR, M | Be, BH, O, RS |
| Herring | FC | WR | Be, BH, O, RS |
| Thayer's | U | WR | Be, BH, O, RS |
| Western | A | Res | Be, BH, O, RS |
| Glaucos-winged | C | WR | Be, BH, O, RS |
| <u>TERNs</u> | | | |
| Caspian | C | M, SR | A, BH, O |
| Elegant | C | M* | A, BH, O |
| Common | R | M | A, BH |
| Forster's | C | WR | A, BH |
| <u>LOONS</u> | | | |
| Red-throated | U | M, (WR) | O, BB, BH |
| Arctic | C | M, (WR) | O, BB, (BH) |
| Common | C | M, (WR) | O, BB, BH |
| <u>GREBES</u> | | | |
| Pied-Billed | FC | M, (WR) | BH |
| Horned | C | M, (WR) | BH |
| Red-Necked | | M, (WR) | BH, O |
| Earred | | M, (WR) | BH |
| Western | | M, (WR) | BH, BB, O |
| <u>PELICANS</u> | | | |
| American White | FC | M* | BH |
| Brown | C | SR, M* | BH, BB, O |
| <u>CORMORANTS</u> | | | |
| Double-crested | C | Res | BH |
| Brandt's | C | Res | O, RS, BB, BH |
| Pelagic | U | Res | O, RS, BB, (BH) |
| <u>JAEGERS</u> | | | |
| Pomarine | R | M | O, (BH) |
| Parasitic | U | M | Be, BH, O |
| <u>SWANS</u> | | | |
| Tundra (Whistling) | R | M* | BH |
| <u>GEESE</u> | | | |
| Greater White Fronted | R | M | BH |
| Snow | R | M | BH |
| Ross' | R | M | BH |
| Canada | R | M | BH, A |

| <u>HERONS & EGRETS</u> | <u>Abundance</u> | <u>Status</u> | <u>Habitat</u> |
|--|-------------------------|----------------------|-----------------------|
| Great Blue Heron | FC | Res | BH, D, G, Msh, T |
| Great Egret | U | Res | BH, Msh |
| Snowy Egret | FC | Res | BH, Msh, T |
| Black-Crowned Night Heron | U | Res | BH, Msh, T |
| <u>TUBE-NOSES</u> | | | |
| Northern Fulmar | U | M*, WR | O |
| Scoty Shearwater | A | M | O |
| <u>ALCIDS</u> | | | |
| Common Murre | U | Res | O, (BH) |
| Pigeon Guillemot | FC | SR | O, RS, (BH) |
| Marbled Murrelet | R | Res | O |
| Ancient Murrelet | R | WR | O |
| Cassin's Auklet | U | Res | O |
| Rhinoceros Auklet | U | WR | O |
| Tufted Puffin | R | Res | O |
| <u>SHOREBIRDS</u> | | | |
| Black-bellied Plover | FC | WR | Be, BH, Msh |
| Lesser Golden Plover (American Golden Plover) | R | M | BH |
| Snowy Plover | U | WR | Be, BH |
| Semipalmated Plover | FC | WR, M | Be, BH, Msh |
| Killdeer | FC | Res | Be, BH, Msh |
| Black Oystercatcher | U | Res | RS |
| American Avocet | U | M* | Msh |
| Greater Yellowlegs | U | M, WR | Msh |
| Lesser Yellowlegs | R | M | Msh |
| Willet | C | WR | BH, Be, Msh |
| Wandering Tattler | U | WR | RS |
| Spotted Sandpiper | R | M | RS |
| Whimbrel | U | M | Be, BH, G, RS, Msh |
| Long-billed Curlew | R | M | BH, Msh |
| Marbled Godwit | A | WR (Res) | Be, BH, Msh |
| Ruddy Turnstone | FC | WR, M | BH, RS, Msh |
| Black Turnstone | C | WR, M | BH, RS, Msh |
| Surfbird | FC | WR, M | RS |
| Red Knot | U | M | BH |
| Sanderling | C | WR | Be, BH, RS |
| Semipalmated Sandpiper | R | M* | BH, Msh |
| Western Sandpiper | A | WR, M | Be, BH, Msh |
| Least Sandpiper | A | WR, M | Be, BH, Msh |
| Baird's Sandpiper | R | M* | BH, Msh |
| Pectoral Sandpiper | U | M* | BH, Msh |
| Rock Sandpiper | R | WR | RS |
| Dunlin | A | WR, M | Be, BH, Msh |
| Short-billed Dowitcher | C | M | BH, Msh |
| Long-billed Dowitcher | U | M | BH, Msh |

| <u>SHOREBIRDS</u> | <u>Abundance</u> | <u>Status</u> | <u>Habitat</u> |
|--|-------------------------|----------------------|-----------------------|
| Common Snipe | U | M | Msh |
| Wilson's Phalarope | R | M | Msh, O |
| Red-Necked Phalarope (Northern Phalarope) | FC, (C) | M | Msh, O |
| Red Phalarope | U | M | O, (BH) |
| <u>RAIL</u> | | | |
| Virginia Rail | U | Res | Msh |
| Sora | U | WR | Msh |
| American Coot | A | WR | BH, Msh |
| <u>KINGFISHER</u> | | | |
| Belted Kingfisher | FC | WR, M | BH |
| <u>WATERFOWL</u> | | | |
| Green-winged Teal | U | M | Msh, BH |
| Mallard | C | M, Res | Msh, BH |
| Northern Pintail | FC | M | Msh, BH |
| Cinnamon Teal | FC | M (Res) | Msh |
| Northern Shoveler | U | M (WR) | Msh |
| Gadwall | U | M | O, (BH) |
| American Wigeon | FC | M,WR | Msh, BH |
| Canvasback | U | M | BH |
| Greater Scaup | C | M, WR | BH |
| Lesser Scaup | FC | M | BH |
| Oldsquaw | R | WR | O, BH |
| Black Scoter (Common Scoter) | U | M | O, (BH) |
| Surf Scoter | C | WR | BH, O |
| White-winged Scoter | C | WR | BH, O |
| Common Goldeneye | FC | WR | BH |
| Bufflehead | C | WR | BH |
| Red-Breasted Merganser | U | WR | BH |
| Ruddy Duck | C | WR | BH |
| <u>DOVES</u> | | | |
| Rock Dove | U | Res | T, Ur |
| Band-tailed Pigeon | U | WR, (Res) | T, Ur |
| Mourning Dove | FC | Res | T, Ur |
| <u>SWIFTS</u> | | | |
| Vaux's Swift | U | M | A |
| <u>HUMMINGBIRDS</u> | | | |
| Anna's Hummingbird | FC | Res | T, U |
| Rufous Hummingbird | U | M | T, U |
| Allen's Hummingbird | FC | SR, M | T, U |
| <u>WOODPECKERS</u> | | | |
| Downy Woodpecker | U | Res | T |
| Hairy Woodpecker | R | Res (M) | T |
| <u>WOODPECKERS</u> | | | |
| Nuttall's Woodpecker | R | M | T |
| Northern Flicker | FC | WR | T |

FLYCATCHERS

| | | | |
|------------------------|----|-----|-------------|
| Olive-sided Flycatcher | U | M | T |
| Western Wood Pewee | FC | M | T |
| Willow Flycatcher | R | M | T |
| Western Flycatcher | FC | M | T |
| Black Phoebe | FC | Res | BH, Msh, Ur |
| Say's Phoebe | U | M* | G |

SONGBIRDS

| | | | |
|--|----|--------|--------------|
| Tree Swallow | FC | M | A |
| Violet-green swallow | FC | SR | A |
| Northern rough-winged swallow | FC | SR | A |
| Cliff Swallow | C | SR | A |
| Barn Swallow | C | SR | A, Ur |
| Scrub Jay | FC | R | G, T, Ur |
| Common Raven | FC | Res | E |
| Chestnut-backed Chickadee | U | Res | T |
| Bushtit | FC | Res | G, T, Ur |
| Red-breasted Nuthatch | U | M | T |
| Brown Creeper | FC | WR | T |
| Bewick's Wren | FC | Res | G, T, Ur |
| House Wren | R | M | G, T, Ur |
| Winter Wren | U | WR | T |
| Marsh Wren | FC | Res | Msh |
| Golden-crowned Kinglet | U | WR | T |
| Ruby-crowned Kinglet | FC | WR | G, T |
| Western Bluebird | U | Res | A, G |
| Swainson's Thrush | FC | SR, M | T |
| Hermit Thrush | U | WR | T |
| American Robin | C | M, ReS | G, T, Ur |
| Varied Thrush | U | WR | T |
| Wrenit | U | Res | G |
| Northern Mockingbird | R | Res | Ur |
| Water Pipit | U | WR | Be, BH |
| Cedar Waxwing | U | WR, M | A, T, Ur |
| European Starling | C | Res | E |
| Hutton's Vireo | FC | Res | T |
| Warbling Vireo | FC | M* | T |
| Orange-crowned Warbler | FC | SR, M | G, T |
| Yellow Warbler | U | M* | T |
| Yellow-rumped Warbler (Audubon's /Myrtle) | C | M, WR | BH, G, T, Ur |
| Black-throated gray Warbler | U | M* | T |
| Townsend's Warbler | U | M | T |
| Hermit Warbler | U | M* | T |
| Northern Waterthrush | R | M | BH, Msh |
| MacGillivray's Warbler | R | M | T |
| Common Yellowthroat | U | M (WR) | Msh |
| Wilson's Warbler | FC | SR, M | T |

SONGBIRDS

| | <u>Abundance</u> | <u>Status</u> | <u>Habitat</u> |
|-----------------------|-------------------------|----------------------|-----------------------|
| Western Tanager | U | M | T |
| Black-headed Grosbeak | U | SR, M | T |
| Rufous-sided Towhee | R | WR | T, Ur |

| | | | |
|---------------------------------------|----|-----------|-------------------|
| Brown Towhee | FC | Res | G, T, Ur |
| Savannah Sparrow | C | Res | BH, D, G, Msh |
| Fox Sparrow | FC | WR | G, T, Ur |
| Song Sparrow | C | Res | E |
| Lincoln's Sparrow | R | M, (WR) | Msh |
| Golden-crowned sparrow | FC | WR | G, T, Ur |
| White-crowned sparrow | C | Res | D, G, Msh, T, Ur |
| Dark-eyed Junco (Oregon Junco) | U | WR, (Res) | G, T, Ur |
| Red-winged Blackbird | C | Res | BH, Msh, G, T, Ur |
| Tricolored Blackbird | R | M | Msh, G |
| Western Meadowlark | FC | WR, M | G |
| Brewer's Blackbird | A | Res | E |
| Brown-headed cowbird | FC | M, SR | E |
| Northern Oriole (Bullock's Oriole) | FC | M, SR | T |
| Purple Finch | FC | Res | T, Ur |
| House Finch | C | Res | E |
| Pine Finch | FC | Res | T |
| Lesser Goldfinch | R | M | G, T |
| American Goldfinch | C | SR | G, T, Ur |
| House Sparrow | FC | Res | Ur |

QUAILS AND PHEASANTS

| | | | |
|----------------------|---|-----|-------------|
| Ring-necked Pheasant | R | Res | G |
| California Quail | C | Res | D, G, T, Ur |

OWLS

| | | | |
|------------------|---|---------|---------|
| Barn owl | U | Res | A, T |
| Great-Horned Owl | U | Res | A, T |
| Burrowing Owl | R | WR, (M) | G |
| Short-eared owl | R | M | A, D, G |

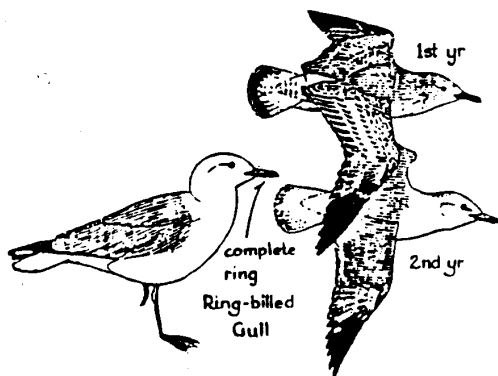
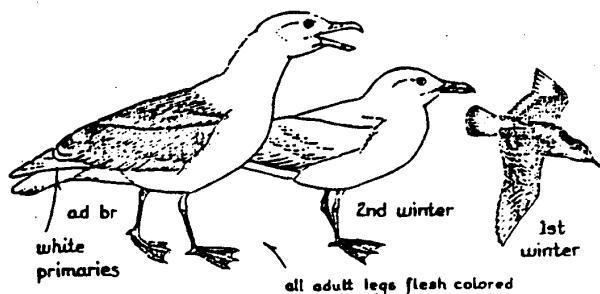
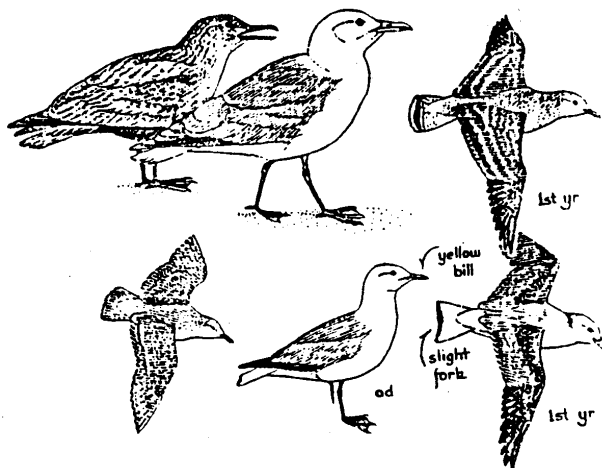
RAPTORS

| | | | |
|-----------------------|----|----------|------------------|
| Turkey Vulture | FC | M, (Res) | A, BH |
| Osprey | FC | M, SR | A, BH |
| Black-shouldered Kite | U | M | A, BH, Msh |
| Northern Harrier | FC | Res | A, BH, D, G, Msh |
| Sharp-shinned Hawk | U | M, WR | A |
| Cooper's Hawk | U | M, WR | A, G |
| Red-shouldered Hawk | U | M, WR | A, T, Ur |
| Red-tailed Hawk | FC | Res, (M) | A, D, T, Ur |
| Ferruginous Hawk | R | WR | A, G |
| Rough-legged Hawk | R | WR | A |
| American Kestrel | FC | M, WR | A, G, T, Ur |
| Merlin | R | M*, WR | A, BH, T |
| Peregrine Falcon | R | M*, WR | A, BH, E |

From the bird list of the bodega bay area alone, it is clear that the opportunity for bird sightings is vast and nearly limitless. The following highlights a few of our more notable residents which you have a likelihood of seeing while on a watch. Remember to take advantage of nature's cues!

GULLS...

Gulls are sturdy robust birds with webbed feet, long pointed wings, a stout hooked bill, and generally a square tail. Fish were their primary source of food historically, but the opportunistic gull has shown itself to be an accomplished scavenger. Scavenging makes up the majority of its food gathering. Gulls are commonly egg and nest robbers. Swallowing young birds whole or attacking the older fledglings. They will also chip and crack eggs of more retiring birds that do not defend the nest site; gulls have raided nesting colonies of cormorants or murrens and wreaked havoc on the eggs laid. Gulls have also learned the trick of breaking bi-valves or urchins open by flying up and dropping the shell from a great height. They will repeat the sequence until the shell breaks open, then the animal inside is ingested. Gulls rarely dive from the air, but will alight on the water to seize food. Their flight is deliberate and powerful. Some species soar frequently. The sexes are alike; immature birds of the larger species take several years to acquire adult plumage. Their color phase is a more indistinct brown compared to the adult markings. Nest sites for many of the gull species are amongst rock outcroppings, often in a hollow but occasionally in the open. Dry weeds and grasses make up the bulky nest, with three eggs making up the typical compliment to the nest. Eggs are a light brown with darker speckling for many of the gulls species.



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CORMORANTS...

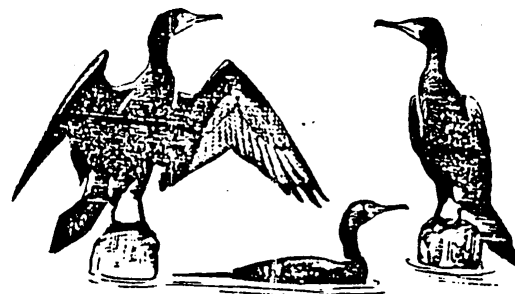
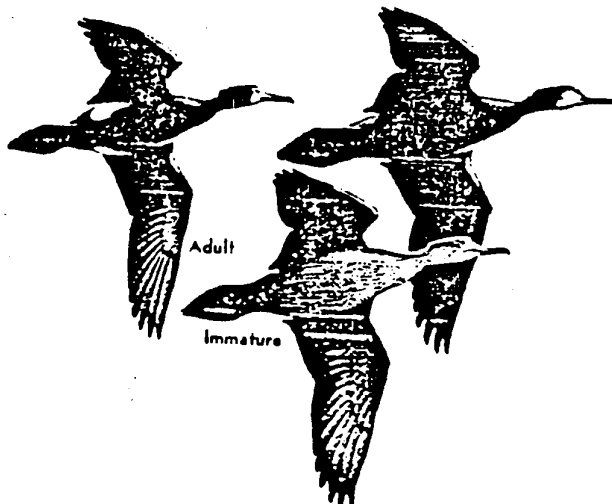
Cormorants are fish eaters that swim with their bill lifted upward, their bodies sitting low in the water. They often dive from the surface and swim underwater in search of prey. Because they do not have the same oil-releasing system common in ducks to keep from becoming "waterlogged", cormorants will stand erect in a "spread eagle" pose, drying their feathers in the air. Cormorants are distinctive looking birds, from their hooked bill to their rapid flight. They belong to the same family as pelicans, and also have an expanding throat pouch of skin which they utilize in hunting, as well as in breeding displays.



Some species of cormorants have been trained by commercial fishermen to catch fish--light lines are tied around the bird's neck and the bird is sent out diving. When the cormorant catches a fish it is prevented from swallowing the fish by the restricting line. The fisherman retrieves the fish, and the cycle is repeated. Since cormorants are excellent fishers this is a lucrative business!

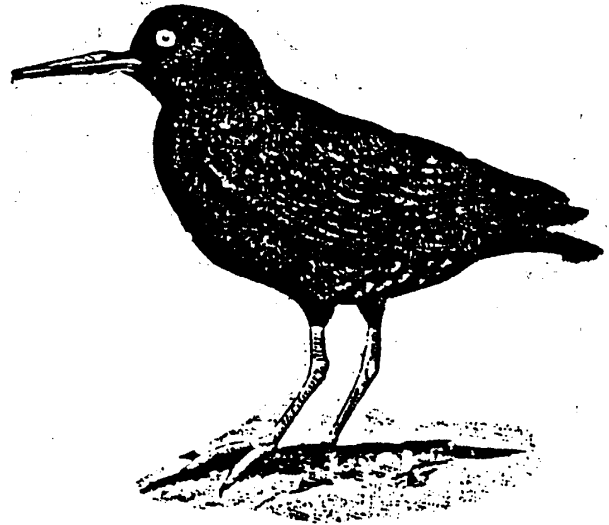


Cormorants are social and colonial birds. They will generally nest on ledges, and they will range far inland to freshwater lakes and streams, seeking fish. They are not aggressive birds and will not go to great lengths to defend their nest site.



BLACK OYSTERCATCHERS...

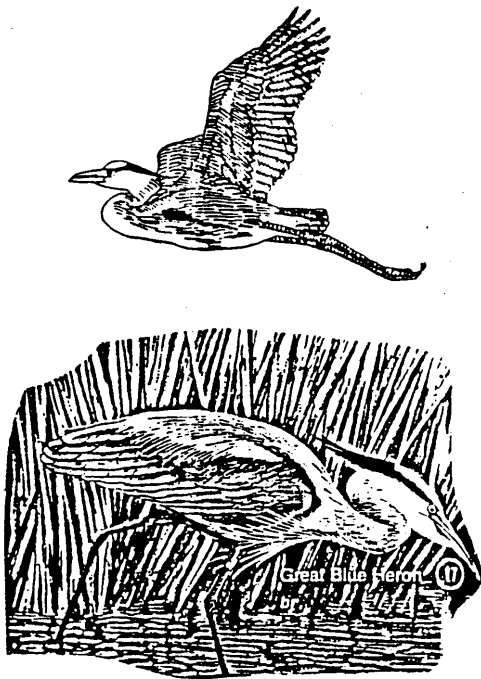
The black oystercatcher is a large shorebird, black with long, stout, red bill and flesh-colored legs and feet. The flat strong bill is instrumental in feeding. Oystercatchers' main diet is of marine worms, crustaceans, barnacles, limpets, and mussels. The bill is used to pry animals from rocks, or to force an entrance into the shell and sever the adductor muscle which keeps bivalve shells together. The oystercatcher then extracts the animal from the shell. Hunting is usually limited to the barnacle-covered rocks and high-lying mussel beds of the rocky shore. If necessary, oystercatchers are good swimmers and divers. Their call is a low peculiar whistle which sounds like "whee-up". The sexes look alike.



GREAT BLUE HERONS...

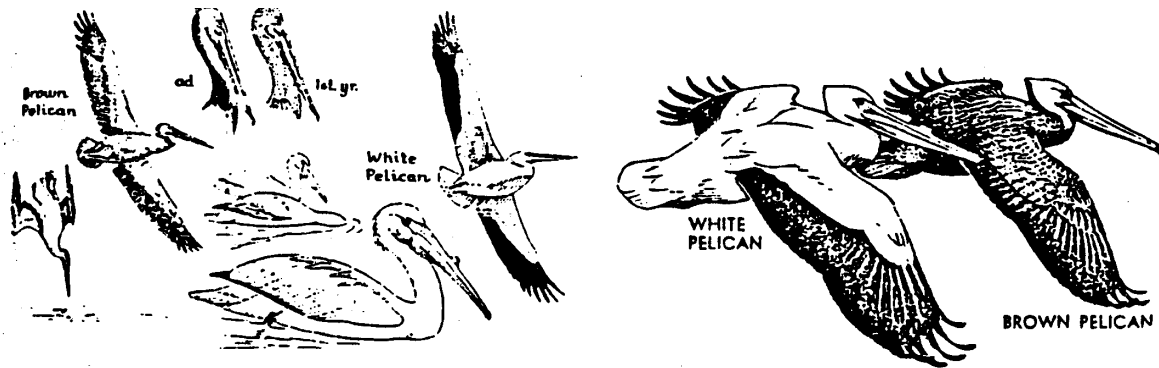
Herons live along coastal cliffs, brackish lagoons, and freshwater lakes. They prefer to nest in congested communities, varying from a few pairs to hundreds in the rookery. They will often choose tall trees as nest sites to maintain security for the young. Four pale green eggs are commonly laid per nesting. Although herons have few natural enemies as adults, the young suffer from a high mortality rate from egg-robbing from predators and scavengers.

Herons fly with their neck folded back on their shoulders, extending it only when about to alight or under attack. Herons stand in water on a bank with head hunched on shoulders or walking slowly through shallow waters. Their call is a loud "grak" or "kraak" uttered when startled or alarmed. Fish is its main diet.



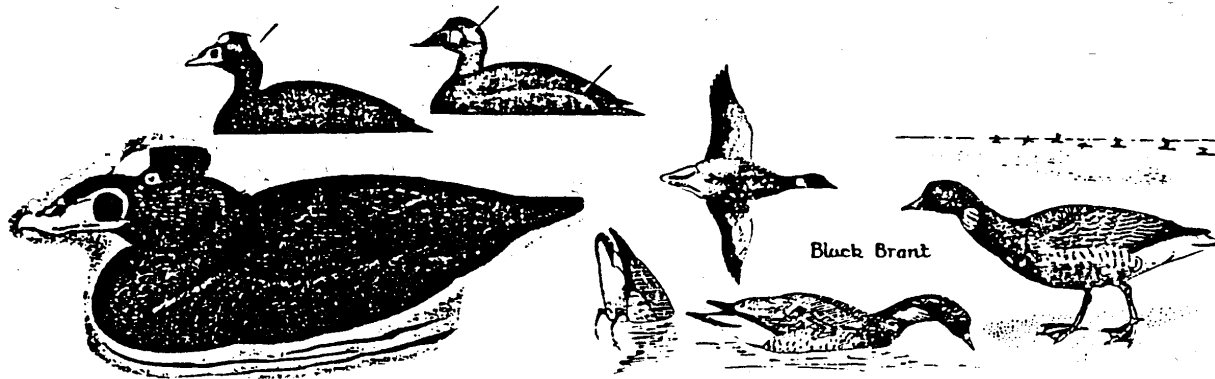
WHITE AND BROWN PELICANS...

These social, colonial birds fly low over the water searching for prey. Their flight is easily recognizable by the alternate 'glide and flap' of powerful wings. Pelicans have short tails, S-shaped necks, and the distinctive skin pouch that expands when used while hunting. On sighting prey pelicans will plunge from heights of up to 30 feet, but surface to swallow the fish. They can also use their pouch, which expands under the water, to suck in small fish. Pelicans have a history of at least 30 million years but were threatened with extinction recently because of sensitivity to chemical pollutants which they absorbed through the fish they ate. The pollutants affected their calcium metabolism, resulting in thin-shelled eggs that broke when moved. Since the banning of DDT, pelicans are making a healthy comeback.



SURF SCOTER...

The commonest scoter of the Pacific Coast in winter, these scoters stay some distance from shore, taking shellfish, especially mussels from diving. In deeper water the colorful male and dark brown female dive with their wings partially open, and swim underwater with feet and wings, using a "false wing" as a stabilizer. It seldom flies in a line formation.

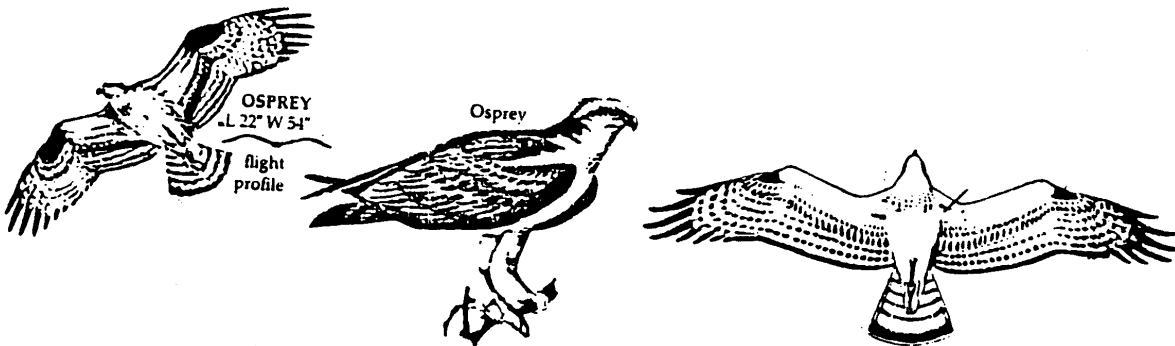


BRANT...

The small size of these geese and their black and white appearance make them unique. Hunters shoot many each year, but a greater danger to the species is the steady loss of winter habitats to encroaching civilization. The brant's flight is rapid and usually low over the water, often in flocks strung out in a long line. Primary food is aquatic plants, such as eel grass.

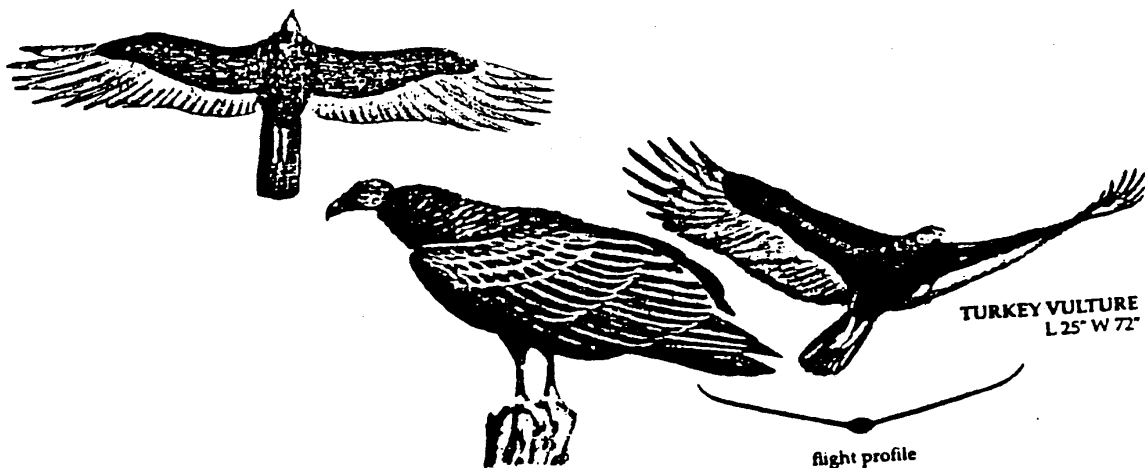
OSPREY...

Ospreys are sometimes called "fish eagles". Fish are their only prey, and are taken at or just below the surface. The birds will hover, often 50 to 150 feet high. Then suddenly plunge, sometimes going completely under the water. They will often nest on artificial platforms. Ospreys are seen along the seacoast and along rivers and lakes. They have a conspicuous crook in their long wings and black wrist marks which confirm identification of adults and young at great distances. Plumage is dark above, and white below. Ospreys are more prone to flapping than sailing, with wingbeats slow and deep. Their call is a series of loud, clear whistles.



TURKEY VULTURES...

Turkey vultures are common carrion eaters, scavenging in fields and along roadsides. They soar in wide circles, holding their two-tone wings in a broad "V" and tilting quickly from side to side. Immature vultures have a black head, while adults have a bald red head. Feeding vultures are soon joined by others flying in from beyond human vision. They are common sights along the coast, especially in rural farm country.



PACIFIC INTERTIDAL LIFE

INTERTIDAL ECOLOGY

Rocky reefs along the Pacific coast have some of the world's richest intertidal life. The secret behind its abundance lies with winds and currents which drive surface water away from shore, causing colder water to rise from below. The upwelling water is rich in the nutrients plants need. So plant life—from microscopic diatoms suspended in the water to giant attached seaweeds—flourishes. There is plenty to eat and an incredible variety of eaters. Animals subsisting on the vegetation support, in turn, a horde of predators, parasites, and scavengers.

Intertidal organisms use each other for much more than food. Some attach themselves to, hide in, or ride about upon others. Scaleworms may live harmlessly on the undersides of sea stars and urchins, or in the shells of hermit crabs. A dozen or more different species may live on or under an abalone's shell. Some species are experts at mimicking and use particular animals or plants for camouflage. Tidepool sculpins alter their color to match the algae where they rest. Interaction among the species is complex.

The lives of intertidal creatures are further complicated each time an outgoing tide exposes them to radically different environment: pounding waves, drying wind, heat and ultraviolet radiation from the sun, rain that dilutes salinity, and a whole new set of predators. It is a hard life. The reef dwellers you find are the tough survivors—shaped by ages of evolutionary change which has gradually adapted them to these kinds of adversity.

Although the natural environment may be harsh, the greatest present dangers to intertidal life are man-made. No species has had time to evolve a defense against oil spills or chemical pollution. Nor can intertidal animals resist either the unintended damage done by careless visitors or the deliberate killing done by inconsiderate collectors.

You can help preserve reef life. If you look under rocks, return them to their exact original positions. Make sure that people with you do the same and know why it is important: sponges, hydroids, anemones, and other animals attached to the undersides of rocks will die if you leave them exposed to air, sun, and predators. You can use a jar to observe free-swimming animals, but put them back. Above all, don't try to remove permanently attached animals, and don't take any animals home with you. They will soon die. Within State Parks, it is illegal to collect tidepool life; another incentive to leave tidepools intact is the law! Be a careful visitor so that others can see the intricate variety of life that exists on rocky reefs.

INTERTIDAL ZONATION

The intertidal zone extends from the highest wave-splashed rocks down to levels which are uncovered only by infrequent, extreme low tides. Within this zone are many different kinds of places to live. That's why you'll find different plants and animals as you move from one level to another. Species with the least tolerance to atmospheric exposure are found at the lowest part of the zone or closest to the sea. More tolerant ones live near the tops of rocks or higher up the reef. Species that can't take heavy wave action occupy protected crevices or the lee sides of rocks.

On flat reefs, these changes in the kinds of plants and animals present are subtle. But where there are large, deep pools, or rock walls and overhangs, the changes are more abrupt and dramatic. You can often find sponges and tunicates at the lowest levels of a rock wall which has mussels and goose barnacles at the top. The diagram below shows three tide zones used as a guide to where you're most likely to find the species described.

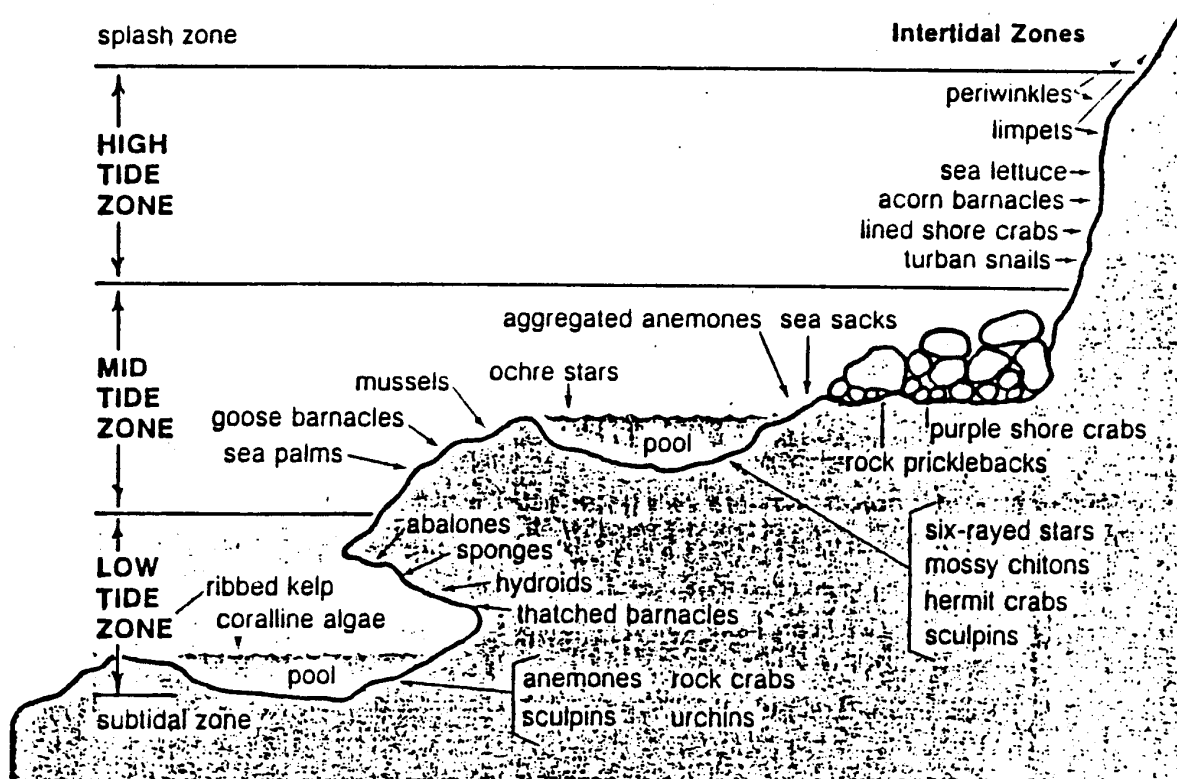
ABOUT TIDES

The highest and lowest tides, called spring tides, occur every two weeks near the times of either full moon or new moon (dark of the moon). Between periods of spring tides there are less extreme tides called neap tides.

The low spring tides are usually the best times for exploring, especially in the lower part of the intertidal zone. To determine the tides for a given date, consult the daily tide information in the newspaper. Yearly tide tables are available through the Russian River District at all Park offices, or commercial guides are available where fishing supplies are sold.

CAUTION

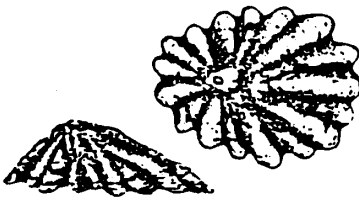
When exploring a reef at low tide never let the incoming tide flood your route back to shore.



LIMPETS

Limpets are molluscs with flat or conical, one-piece shells. Some live high in the intertidal zone on rocks; others live in tidal pools on algae and kelp. When the tide rises, they creep about within a range of up to two meters grazing—scraping tiny algae from rocks with rasping tongues called radulae. As the tide falls they usually feel their way back to habitual resting spots, often in crevices protected from the full force of the waves, where their shells have worn snug depressions in the rock. A limpet may use the same resting spot for its entire life of perhaps ten to fifteen years. An alarmed limpet contracts its foot muscles to grip the surface. It's like a suction cup without a handle, because its streamlined form offers a low profile to both surf and predators. Dislodged limpets can't right themselves, and are soon eaten or tumbled helplessly in the surf. Most species have separate sexes and release eggs or sperm into open water.

Rough Limpet - 3 cm long with pronounced light-colored, radiating ribs, strongly scalloped or jagged margin. Abundant with barnacles, high tide zone.



Shield Limpet - Shell 3-4 cm long, with fine, irregular, radial ribbing; some with scattered white dots and rays. Flexible Sea Palm provides limpet with food and protection from waves. High tide zone.



Ribbed Limpet - Shell 2 cm long, often with broad ribs, apex near front edge, mixed large and fine white dots, often pitted by parasitic fungus, tops often eroded. High tide zone.



Owl Limpet - Shell to 10 cm long, light brown and white, top often eroded, apex far forward. Defends home territory by bulldozing intruders off. On undersides of rocks, high to mid tide zones.



Plate Limpet - Shell 6 cm long, flat; apex off center; color variable, frequently green. Has irregular white spotting from edge to apex. Mid tide zone.



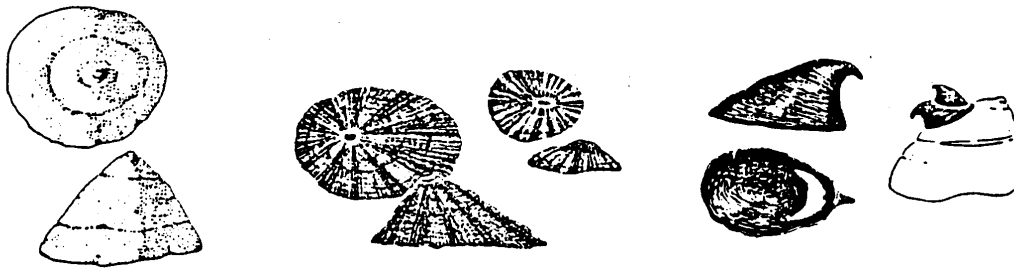
Kelp Limpet - Shell 2 cm long, oval-elongated, nearly as high as long, chestnut-brown and smooth. Always on blades of feather boa kelp, low tide zone.



Dunce Cap Limpet - Shell 3.5 cm long, with high cone shape, entirely white, smooth or covered with pink coralline algae. Low tide zone in pools.

Keyhole Limpet - Shell to 6 cm long, gray-brown and white with light and dark radiating ribs, and small opening at apex. Small scale worms live between foot and shell. Wastes escape via hole without contaminating breathing apparatus. Under rocks, low tide zone. Also has pink and red ribs.

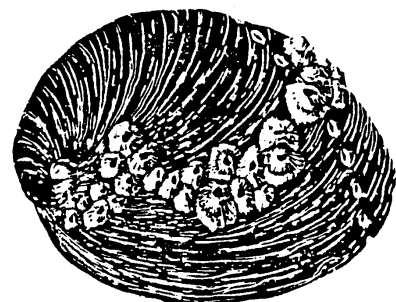
Horned Slipper Shell - Shell 1-2 cm long, dark brown. Apex is hooked, with pocket on inside of shell. Actually a limpet-like shell. Almost always on turban snail shells and stacked on each other. Feed on detritus trapped with mucus nets. Males of some species become females with age. High to mid tide zone.



ABALONES

Abalones are molluscs closely related to limpets, but larger. In 13 years an abalone will grow to be about 18 cm long and have a muscular foot able to exert a grip of about 180 kg. With its rasping tongue (radula) it scrapes and eats seaweed which it finds by smell with the sensitive black tentacles protruding from under its shell. Water passing under the shell supplies oxygen to well hidden gills, and carries off wastes (also eggs or sperm in late spring and summer) through holes near the shelled edge. Abalone blood contains properties useful against penicillin-resistant bacteria, but it lacks a blood-clotting mechanism and abalones may bleed to death when cut by a careless diver or other enemy. Abalones require and thrive in water well oxygenated by strong waves and currents. They're often in deep crevices or under ledges. Once an abalone population declines, algae-eating urchins, who graze more efficiently, tend to crowd out abalones and prevent their reestablishment. Abalones are regularly eaten by cabezon fish, moray eels, crabs, octopi, sea stars, and sea otters. The current abalone scarcity is caused, however, by pollution, competition for food with urchins, and human collectors; not by natural predators. Harvesting should be controlled by temporarily closing off sections of the coast to divers to allow for recovery.

Black Abalone - Shell to 20 cm wide, dark blue-black, smooth, rarely covered with seaweed or other growth. Found in well protected, deep crevices, mainly intertidally. Feeds on diatoms and thin films of algae on rocks and shells of other abalones. Mid to low tide zones.



MUSSELS

Mussels are related to other two-shelled molluscs: clams, oysters, and scallops. Most mussels attach themselves to rocks by secreting a viscous liquid which quickly hardens in sea water to form fibrous threads called byssus. A mussel lives upside down in its shell with the head nearest the point of attachment. To eat, it opens the shell and with tiny hairs called cilia, makes a water current which brings oxygen to the gills and microscopic plankton to be trapped in a layer of mucus and passed to the mouth by other cilia. Pea crabs often live inside mussel shells subsisting on organic debris drawn in by the current. Other animals live between clustered mussel shells. One study showed 22 different species living amongst mussels in an area of 30 square centimeters. Mussels release eggs and sperm into open water. Their natural enemies are primarily sea stars and people.

CAUTION: From late May through October, mussels feed on microorganisms that make them poisonous to human consumption.

California Mussel - To 20 cm long and often eroded at tip showing bands of white, blue and black. In dense colonies on exposed outer rocks where waves break. Mid to high tide zone.



SNAILS

Most snails bear little resemblance to their more squat, sure-footed relatives: limpets, abalone and chiton. Snails have less streamlined-shells, and are easily dislodged, but because they can right themselves faster, snails are less likely to be eaten for having lost their footing. Besides, a snail can withdraw completely into its shell behind a trapdoor-like, horny plate called an operculum, which protects it from predators and water loss. A snail has a distinct head, displays plume-like gills and eyes on tentacles which can be withdrawn in case of a threat. It can extract calcium carbonate from sea water and deposit it through a membranous mantle onto the edge of the shell's opening so that the shell grows larger. The deposit is made unevenly so that the shell grows into a compact spiral rather than a long, cumbersome tube. Thick muscle tissue forms the boneless snail foot. Its adhesive ability comes from thin, elongated depressions in the sole, which act as suckers. Snails travel by advancing a portion of the foot, then pulling the remainder after it in a looping motion. Most intertidal snails scrape a thin film of algae from rocks or from the shells of other animals. Snail enemies include shorebirds, fish, lobsters, crabs, other snails, people.

Black Turban Snail - Broad, thick, purple to black, top often eroded. Feeds on algae on rocks. May live to 25 years. High to mid tidal zone.

Leafy Hornmouth - Marked with spiral ridges and at least 3 prominent, winglike erect extensions of shell. Brown to creamy white. Low tide zone.

Dogwinkle - Rough, frilly or smooth and thick. Uniform brown, gray or white. Rough water wears ridges smooth. Low tide zone.

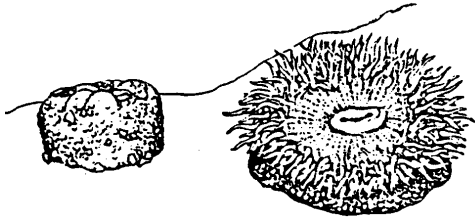


Scaled Worm Shell - Prominent linear ribs, scaly with noticeable breakage scars, white. Occurs singly or in twisted masses of several individuals. Shell is straight or coiled on sides of rocks or on others. The only

sedentary snail. Feeds by secreting a mucous net to trap plankton and small creatures. Pulls net in to feed. Resembles giant serpulid worm. Low tide zone.

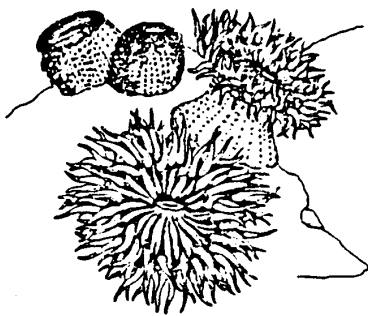
ANEMONES

Anemones are flower-like coelenterates. Most attach to rocks, pilings and even kelp. Some species burrow into sand or mud. They occur intertidally and at depths to 10,000 meters. When disturbed, or when feeding, they force water out of the body column and fold inwardly, pulling their tentacles-and food with them. Unwanted materials are cast out through a central mouth opening. Needle-like stinging cells on the tentacles inject paralyzing compounds into their prey. These stinging cells feel sticky but are usually harmless to humans. Certain fish and shrimp live among the tentacles unharmed by the cells and protected from predators. Anemones have special muscles which can pinch off tentacles at their bases, in a defensive maneuver. Tentacles can be regenerated and their number increases with age. Anemones move slowly by gliding, snail-like on the basal discs. Some let go at the base and pull themselves forward by tentacles. Others release their hold, swell their bodies with water, and ride free on currents, or thrash back and forth in apparent swimming motion. Anemones eat fish, shrimp, isopods, amphipods, and plankton. Enemies include nudibranchs, snails, fish, sea stars. Some of the green color in anemones is due to single-celled plants in their tissues which serve anemones by consuming waste carbon dioxide and providing them with oxygen.

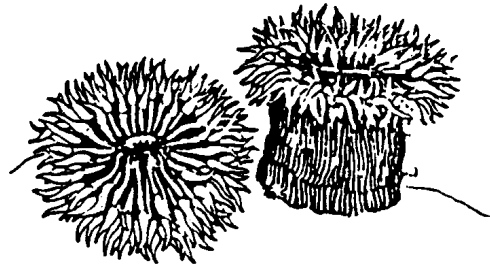


Giant Green Anemone - Column olive-green to brown, tentacles and disc an emerald green. Column has irregular bumps. Sand and shell fragments may stick to column, but seldom produce solid coating. Does not tolerate polluted water. Low tide pools, rocks.

Aggregated Anemone - Olive-green; tentacles often banded and tipped with white, pink or purple. Tubercles sticky, round. Column is almost always covered with sand and shell pieces, which may conserve moisture and prevent sun damage during exposure. Mid tide zone.



Brooding Anemone - Brown to greenish-brown. Some specimens red, pink or dull green. White lines radiate near base and on the oral disc. Tentacles same color as body. Low to mid tide zones on sheltered sides of rocks.



BARNACLES

Barnacles are crustaceans, with jointed legs and shells of connected overlapping plates. Instead of crawling after food, they glue themselves to rocks, ships, pilings, abalones, even whales, and wait for food to wash by. When under water or even when a wave washes over, they reach out with feathery barbed legs to strain out plankton and absorb oxygen. Most individuals have both sexes (hermaphrodites). Fertilized eggs hatch into larvae, then leave the parents' shells and spend their youth swimming. After several molts, they settle down to a sedentary adulthood, held permanently by one of the strongest known natural adhesives. Enemies include worms, snails, sea stars, fish like sheephead, certain shorebirds and oil spills.

Acorn Barnacle - White, volcano-shaped (although those growing in crowded conditions are columnar, reaching 2 cm high). Habitats vary from exposed shoreline to protected bays. Inner hinged plates seal off the animal when exposed by low tides. In colonies, high to mid tide zone.

Brown Buckshot Barnacle - about 8 mm wide and half as high, brownish. When inner plates close a cross-shaped form appears. Found in the highest part of high tide zone. Our smallest barnacle.

Thatched Barnacle - Shell to about 5 cm wide at base, dirty pink. Plates have strong ridges and furrows. Usually solitary under ledges and rocks, but occasionally in tight groups where shape is more columnar. Low tide zone.

Goose Barnacle - Body to 10 cm high including fleshy neck. Plates small, white, many, on top of grey-green scaly or wrinkled neck. In tight clusters with necks hidden. Protruding barbed feet turn to face incoming wave, then turn around to strain again as wave recedes. Once believed to hatch into the geese associated with mussel beds. Mid tide zone and outer exposed rocks.



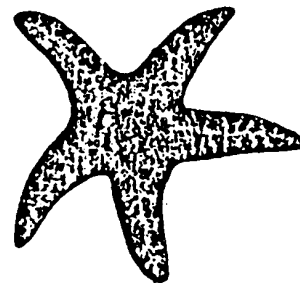
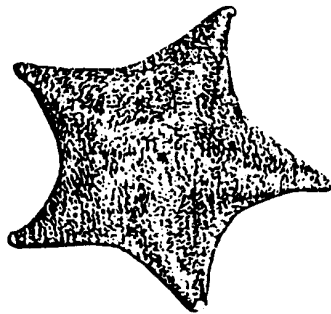
SEA STARS

Sea stars are echinoderms with knobby spines on their backs. Their skin also has soft fuzzy clumps of oxygen-absorbing tissue, and tiny pincers which preserve the breathing ability of the skin and prevent suffocation by routinely cutting up the larvae of barnacles, sponges, and hydroids seeking attachment there. Hold an Ochre Star gently against your arm. When you remove it you'll feel pincers tugging at your hair. Just off center on the star's back is a small strainer for taking water into its internal hydraulic system which operates hundreds of flexible, elastic tubes on its underside, called tube feet.

Each foot is tipped with a tiny suction cup, which helps a star to hang on tight when a wave hits. Whichever way stars go is "forward". Having neither heads nor tails, they change direction without turning around. Tube feet can pry open clams or mussels just far enough for the star to insert its inside-out stomach into the shell and digest the victim. When finished, a star retracts its stomach and moves on. Some species have free swimming larvae; others brood eggs until they hatch into little stars. Stars can usually regenerate lost arms. In some species severed arm tips can regenerate whole new animals. Sea stars' greatest enemies are human curio collectors.

Bat Star - To 10 cm across, webbed between arms, scaly. Color variable: solid or mottled red, orange, brown, yellow, green or purple. Eats sea stars, tunicates and algae. Worm lives in arm grooves. Low tide zone, but more often subtidal.

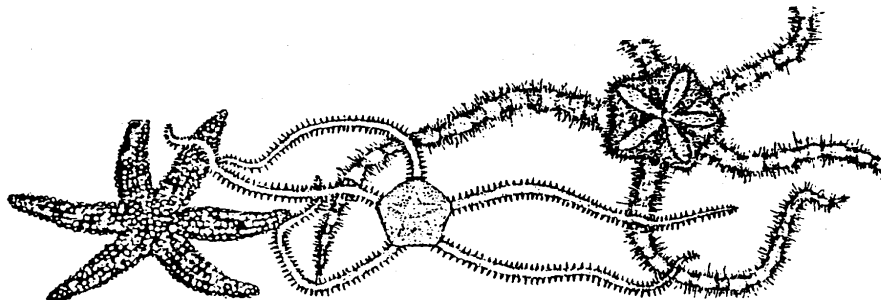
Ochre Star - To 30 cm across. Rows of white-tipped spines resemble pentagons near center. Harsh to touch. Purple or orange. Arm tips have light sensors. Slow growing. Needs only a 0.1 mm opening to insert stomach into mussel shell. Also eats barnacles, limpets, certain snails. Mid to low tide zone.



Six Rayed Star - Body to 8 cm across, usually smaller. Lead-gray, olivegreen, blackish or orange with pink tones. Eats barnacles, chitons, snails, small sea cucumbers. Low tide zone.

Brittle Star - Body to 2 cm across. Black and white, often nearly all white. Does not drop arms easily. Often found in large groups under rocks for protection and to avoid-suffocation. Fast moving. Cannot extrude stomach. Feeds on detritus. Smallest brittle star on coast. Mid to high tide zone.

Brittle Star - Body to 2 cm across. Arms have tiny, fuzzy spines. Color variable, orange margins on arm bands. Drops arms easily. Eats detritus and small animals. Usually solitary in algal hold-fasts and under rocks. Low tide zone.

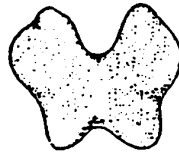


CHITONS

Chitons or sea cradles are sluggish molluscs that creep along the underside of rocks on broad feet. Most have eight exposed, overlapping plates on their backs. However, two species have plates that are partially or completely covered by a thick, fleshy layer called a mantle or girdle. The flexibility of these plates allows a chiton to fit snugly into a crevice or depression, where its low profile helps it hang on. When dislodged, it rolls into a ball or "sea cradle" to protect its soft undersides from predators. Tufts of gills are hidden in a groove between the body tissues and the plates.

Although generally eyeless, some chitons have light-sensitive receptors that penetrate the plates. Like other molluscs, chitons generally use their scraping tongues or radulae to graze on thin films of algae and diatoms that coat the rocks. Some feed on seaweed debris and dead animals. One species eats small worms and crustaceans. Like limpets, chitons frequently have homing spots where they rest when not feeding. Fertilized eggs are attached to rocks and seaweed. About 100 species occur on the Pacific coast. The backs of some chitons are exquisitely camouflaged with as many as 26 species of hydroids, bryozoans and algae. Enemies include crabs, fish, and anemones. Remnant plates, known as butterfly shells, wash up on beaches.

Black Chiton - 12 cm long, black. Thick girdle covers white plates except for exposed sections on the upper back. Mid tide zone.



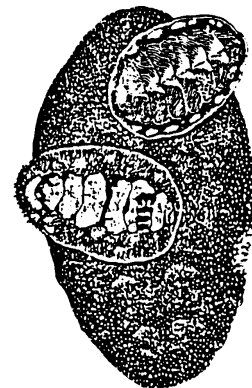
Mossy Chiton - 3-6 cm long. Scattered, branching bristles on dark girdle. Greenish overall. Most of each plate is exposed. Prominent notch at end of girdle. Mid to low tide zone.



Lined Chiton - 2-5 cm long. Pink to lavender with red, white and blue wavy lines on plates. Girdle is smooth, leathery. Colorful. Usually of coralline algae, in pools or exposed on rocks. Mid to low tide zones.



Rough Chiton - To 5 cm long with brown and white spines scattered on the girdle. Plates are dull brown, streaked with white, often eroded. More sedentary than other chitons. Some individuals may stay in permanent homing spots that trap seaweed debris. May live to 25 years. Mid to high tide zone.



Gumboot - To 33 cm long, world's largest chiton. Plates completely covered with brick-red gritty girdle. Often found with pea crab and scale worm living harmlessly on underside. Mid to low tide zone.

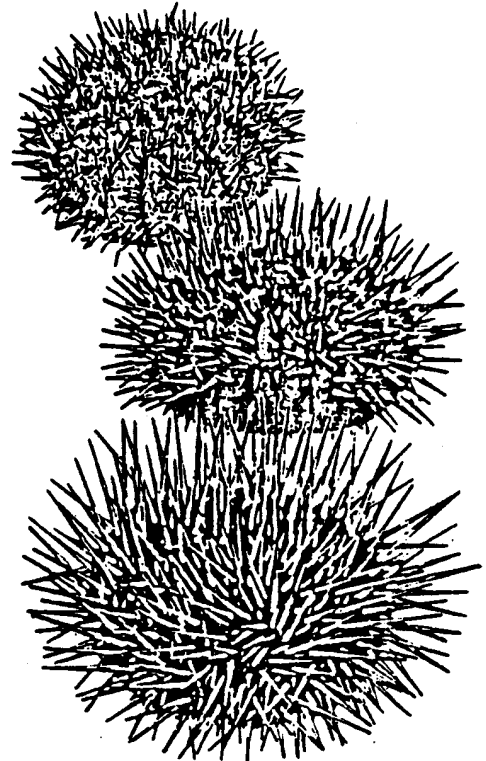
SEA URCHINS

Sea urchins are echinoderms with roundish fragile calcium carbonate shells. They're covered with hundreds of formidable-looking spines capable of wounding careless handlers. The spines rotate on ball-and-socket joints which are seen as round knobs on old shell fragments after the spines have broken off. The spines are used for defense and for trapping bits of seaweed. In between them there are many long tube feet like those of sea stars. Besides gripping the surface, these tube feet can also absorb oxygen and pass bits of food around to the urchin's mouth, a white bony organ on the underside which can scrape algae from rocks and pilings. Like sea stars, urchins have tiny pincers nestled among the spines which keep their bodies clear of barnacles, sponges, tunicates, etc. by destroying their larvae. Feet and pincers can be regenerated. Minor shell cracks may be healed-over, but major shell repairs are impossible. Urchins grow by depositing new calcium on the outer shell surface while absorbing it on the inside. They are efficient grazers, sometimes leaving insufficient algae behind for abalone, limpets, snails and other grazers. They often burrow into reef rock, apparently by a combination of rubbing spines, plucking tube feet and water erosion. The burrows become chambers which protect urchins from wave action and enemies, and trap edible bits of seaweed. They may grow too big to leave these burrows. Urchin enemies include sea stars, otters, crabs, sheephead fish, people and pollution.

Green Urchin - Body to 8 cm not including short, crowded green spines. Greenish overall with some red and brown tones near top. Abundant in low tide zone.

Purple Urchin - Body to 10 cm across, red to purple. Spines short in intertidal specimens but to 6 cm in subtidal specimens. Often burrows into reef rocks by hundreds. Greenish young often confused with the Green Urchin. Often harbors isopods and worms on undersides. Primary enemies are sun stars and sea otters. Thrives amid strong wave action; less in sheltered places. Low tide zone.

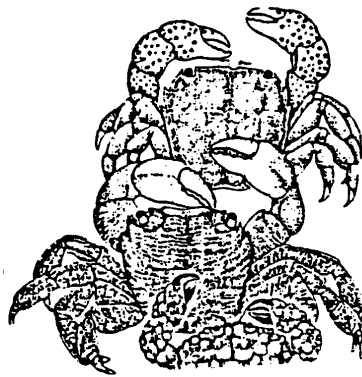
Giant Red Urchin - Body to 12 cm, spines to 5 cm long. Usually wine-red; young also have red spines. Does not burrow. Pincers have three jaws, each with a poison gland. Flatworms inhabit stomach. Abundant intertidally in quiet areas as well as rough water in the north. Mostly subtidal in the south. Low tide zone pools.



CRABS

Crabs have claws and four other pairs of legs. Sizes range from about 1 cm to nearly 2 m. To accommodate growth, a crab periodically sheds its rigid shell, usually exiting through a slit in the back. New skin soon hardens with calcium carbonate which the crab extracts from sea water or gets by eating the old shell. To escape enemies, crabs can shed legs or claws by contracting special muscles at predetermined breakage points. Lost appendages are regenerated through successive molts. Except for hermit and porcelain crabs, the crab abdomen has evolved into a simple ventral flap, which is broader and more rounded for carrying eggs on females. Most crabs are scavengers; some are predators; some eat plankton. Flat bodies allow crabs to hide in crevices. Some, like the pea crab, hide instead in the bodies shells or burrows of other living animals where they wait for plankton and edible debris. Fish, birds, octopi and sea otters eat crabs.

Lined Shore Crab – Body to 6 cm wide, two teeth along outer margin of shell near eyes. Reddish-purple with black-green lines. Joints have bright green connecting tissue. Often out of water. Dominant crab of high tide zone.

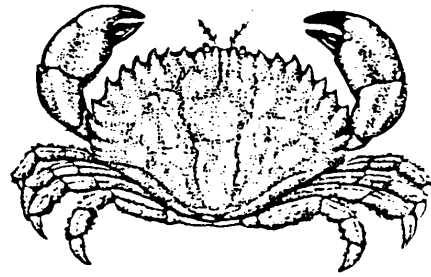
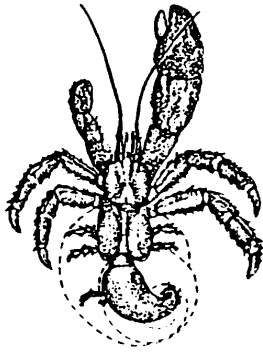
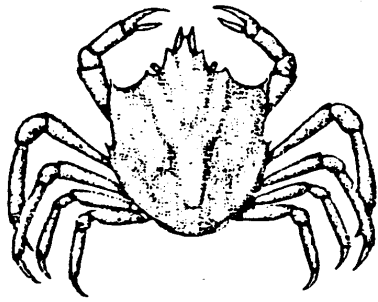


Purple Shore Crab - Body to 5 cm wide, uniform dark wine-purple with purple spots on claws, no leg hairs, eyes protected by spines along shell edge. In coarse sand, gravel, with overlying rocks. Uses camouflage and unturned claws for defense. Dominant crab of mid tide zone.

Kelp Crab - to 12 cm wide, rich, dark chestnut above, reddish below, smooth-looking. Beware of powerful claws. Body and leg spines are for grasping kelp and seaweeds. Adults often bear barnacles, hydroids. Low tide zone.

Hermit Crab - Body to 2 cm, red antennae, blue and white bands on legs. Somewhat hairy. Often is in turban snail shells. Most common hermit in upper tide pools. They fight amongst themselves for food and shells. Mid to high tide zone.

Rock Crab - Body to 15 cm wide. Heavy looking, lavender-red shell has red spots under-neath. Claws have black tips. Has parasitic worms in gills and barnacles in body cavity. In crevices, pools, or buried in sand. Eats limpets and other tidepool creatures. Low tide zone.



MARINE ALGAE

Pacific coast waters are rich in mineral nutrients brought from the depths by upwelling currents. They support a rich assemblage of marine algae, including the world's most elaborate submarine forests of kelp. Algae are simpler in structure than familiar land plants. Instead of root systems they use simple anchoring devices called holdfasts. They have no use for complex vascular systems for storing, transporting and conserving water. Since waves would soon dismember any rigid intertidal plant, they generally lack supporting tissues, rely instead on tough elasticity, and often use floats to hold themselves up toward surface light for photosynthesis. Reproduction is without seeds, but instead by way of microscopic gametes. Some algae pass the winter in different, less conspicuous forms.

The main botanical groups are: the green algae, the brown algae (the most abundant group which includes large, fast growing kelps used commercially for products like ice cream, medicines, toothpaste, gelatin), and the red algae (some of which look brown) whose redness adapts them to using the weak light on deeper water. Some red algae are pink, and fix calcium carbonate from sea water to form hard exterior, wing-like plates. They occur in either branched form or as encrusting sheets on rocks and shells, and usually in tidepools. They lose the bright pink color and bleach white when they die. Green chlorophyll occurs in all groups, but its color may be masked by other pigments. Algae supply food, oxygen, shelter and hiding places to intertidal animals.

GREEN ALGAE



Sponge Weed - To 30 cm, deep green, low tide zone.

Sea Lettuce - To 15 cm or more, green, mid tide zone (also in bays and harbors).



Moss Weed - To 7 cm, green clumps, mid to low tide zone.



Surf Grass - 3 mm by 30 cm, bright green, mid to low tide zones. Not an alga, but a seed-bearing plant whose remote ancestors, like the whale's, lived on land.



BROWN ALGAE



← **Wing Kelp** - To 3 m, greenish brown, low tide zone.



Rock Weed - To 8 cm, light brown, high tide zone.

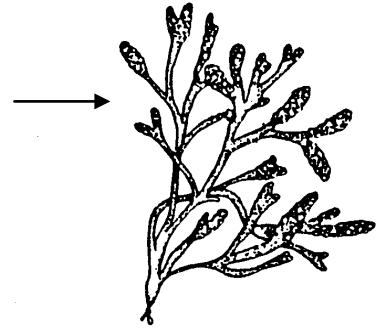
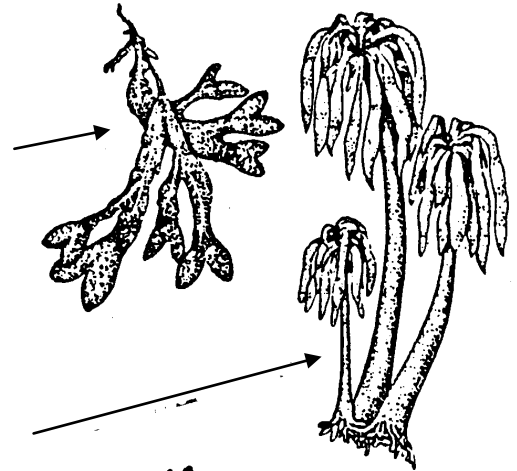
← **Ribbed Kelp** - To 1 m, brown, low tide zone.



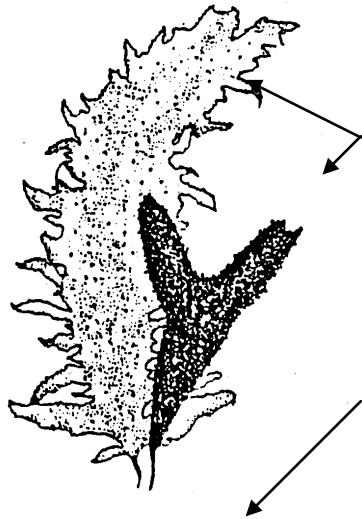
Sea Palm - 60 cm, dark brown, low tide, surf zone.

← **Rock Weed** - To 8 cm, greenish-brown, mid to high tide zone.

← **Feather Boa Kelp** - To 8 cm, dark brown, low tide zone.



RED ALGAE

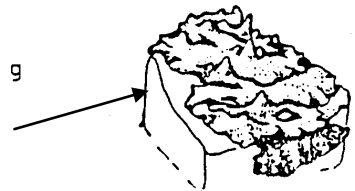
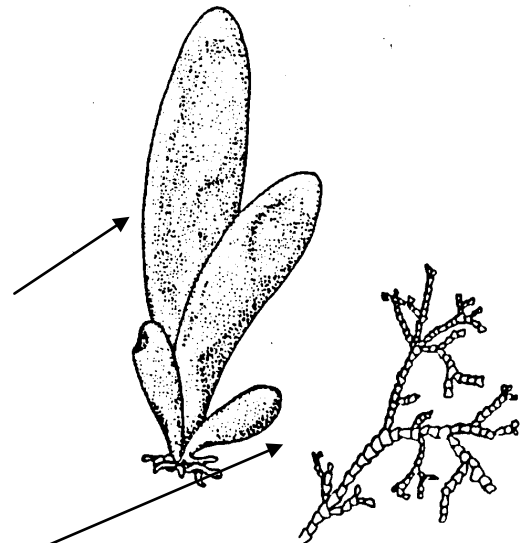


← **Sea Alga** - To 1 m, brownish purple, many bumps, mid to low tide zones.

← **Sea Sacks** - To 25 cm, yellow-green, mid tide zone.

← **Film Alga** - 4 mm thick to 1 m wide, greenish black, mid to high tide zones.

← **Coralline Alga** - To 8 cm, pink-lavender, low tide pools.



← **Coralline Alga** - Encrusting, pink-lavender, mid to low tide zone pools, rocks.

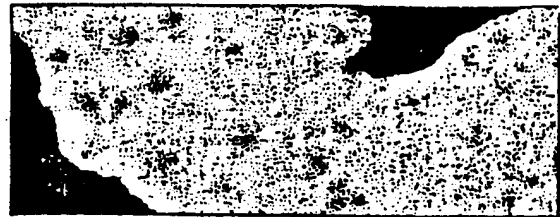
SPONGES

Sponges are found from the intertidal zone to deep water in all oceans. One family occurs in freshwater. Most intertidal sponges form thin, encrusting sheets up to 1 m wide. Most erect species are subtidal. Only shallow-water species are brilliantly colored; deep-water species are paler. Sponges lack both nervous systems and digestive tracts. They digest plankton in individual cells. Nourishment spreads through the body by diffusion from cell to cell. Sponges' shapes result from skeletons of intricate, interlaced microscopic fibers called spicules. Plankton and oxygen-laden water enters through small pores; filtered water passes out via larger holes. Many sponges harbour commensal worms, brittle stars, barnacles, shrimp, crabs, copepods, and amphipods in their large openings. Over 13,000 animals representing 19 species were found in a single Caribbean sponge. Almost all sponges are both male and female with eggs fertilized in the body. Tiny larvae flow out through large holes. Some sponges reproduce by budding. They live from several months to over 50 years, and have few enemies. Many have disagreeable odors that may ward off predators. However, sponges are regularly eaten by certain snails and sea stars and many nudibranchs. On the Pacific coast a yellow boring sponge weakens shells of abalone, clams and barnacles by dissolving hundreds of tiny holes, usually killing them.

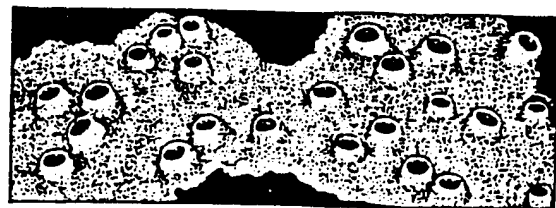
Red Sponge - Forms encrusting sheets to 2.5 cm thick, bright-red to salmon to orange, firm and woody. Surface smooth. Large holes are about 2 mm in diameter, scattered and far apart. Under rocks, ledges, in crevices. Mid to low tide zone.



Red Sponge – Forms encrusting sheets to about 1 cm thick, red, deep salmon, terra cotta, yellow-tan, or mustard. Surface velvety. Large holes about 1 mm, irregularly placed, far apart. On sides of rocks, under ledges, in crevices. A small red nudibranch often lives on this sponge. Mid to low tide zones, often higher than other sponges.



Purple Sponge - Forms encrusting sheet to 4 cm thick, lavender to purple. Regularly spaced, raised, volcano-like holes. Soft but not slimy. Large holes to 4 mm wide. Tolerates light but normally on sides of rocks and under ledges. Mid to low tide zone.



SONOMA COAST STATE BEACH A QUICK REFERENCE GUIDE

**If asked a question you don't know the answer to, admit it.
Offer to take the visitor's name and phone number for follow-up contact.**

State Park in 1934; over 5000 acres, 18 miles of coast
4th most popular of 266 parks; est. 2-2.8 million visitors this year

Animals: no person is allowed to hunt, injure, or otherwise disturb any animals.

Living and non-living things are protected, including all plant life and driftwood.

Geological and archaeological features are also protected from removal, disturbance, injury, disfigurement, defacement, destruction, or mutilation.

Beach Safety See "Swimming" in this section and "Sonoma Coast Beach Safety"

**On beaches, visitors should stay above the high water line
(look for debris line); cliffs consist of decomposing sandstone
and are unstable and unsafe.**

Bicycles Paved and fire roads only; Willow Creek Road and Bay Flat Road.
California state law requires bicyclists under 18 years old to wear helmets.

Birds 300 species

Boats Speed limit is 5 mph from Duncans Mills to mouth of river
(Sonoma County Ordinance 3308).
Not permitted within 100 yards of haulout area
Rentals at Cassini (right on Moscow Road);
Kayak rental from Lotus or Gold Coast Coffee in Duncans Mills.
300 ft./parallel approach to seals.
Bodega Bay Sport Fishing Center 875.3344
Wil's Whale Watching/Harbor Cruises 875.2323

Camping State sites: Wright's Beach, Bodega Dunes; for state
campground reservations call 1.800.444.7275 (8 am - 5 pm);
some \$1 hiker/biker sites at Bodega Dunes.
Environmental campgrounds at Pomo Canyon, Willow Creek: no
reservations, pay at campground. Environmental campground
users may shower at Bodega Dunes with receipt.
Refer to white campground sheet for private campgrounds
including Bridgehaven and Cassini.

| | |
|--------------------------|---|
| Closed Areas | Goat Rock proper and Death Rock (Duncan's Landing). |
| Dogs | Six foot leash - Only allowed on paved roads and Blind Beach. No access to Bodega Head bluffs and Goat Rock Beach; not allowed in environmental campgrounds or Austin Creek back country camps. Must be in tent or vehicle at night. |
| Fires/Firewood | Controlled on beaches; prohibited in all areas with any type of vegetation. Wood available at Bodega Dunes & Wright's Campgrounds \$5 |
| Fishing | License issued for day or year, required at age 16. Visitor is responsible for checking current regulations. Available at Casini or in Bodega Bay. Clamming is year-round. Crab season is mid-November through June. Ocean: salmon, ling cod, rockfish, perch, bottom-fish, red abalone, mussels, cockles River: Salmon (Sept. - Nov.) steelhead (Nov. - Mar.) shad (mid-spring - early summer) bass, bluefin, catfish. (Refer to blue leaflet from King's) Abalone requires ticket and punch card. Season is April - June and then August through November. Must use legal size abalone iron. Limit three in your possession; size 7 inches. |
| Gasoline | Jenner, Bodega Bay (11 mi), Stewarts Point (27 mi), Guerneville (14 mi). |
| Horses | Salmon Creek from the boardwalk south to Bodega Head Trailer Parking off Bay Flat Road For hire at Chanslor Ranch just south of Salmon Creek and Hwy 1 phone 875.3333. Armstrong Pack Station 887.2939. |
| Laundromat | Pelican Plaza, Bodega Bay or in Guerneville |
| Marine Lab | (UC Davis) The lab is open to the public on Fridays between 2 and 4 p.m. The Bodega Marine Reserve is off-limits to the public. |
| Mushrooms | After first fall rains - 5 pound limit per person per day. Collection is allowed only at Salt Point State Park. |
| Off-Road Vehicles | Not allowed in a State Park. All vehicles must be registered through the DMV. |
| Penny Island | No access limitations as long as visitors are in compliance with all state park rules and regulations. |
| Picnic Supplies | Jenner, Bodega Bay, Duncans Mills, Guerneville |

- Rhododendrons** Late April through May at Kruse Rhododendron State Reserve north of Salt Point.
- Seal Watching** **.8 mile to overlook to see seals**; pullouts at m 22.04 and 22.08. "Pupping season" is typically April-May; Seal Watch operates late February through August at Goat Rock Beach. Stay 50 yards away on beach; boats and kayaks, 300 ft./parallel approach.
- Swimming** Not recommended on Sonoma Coast. Suggest Doran Beach South of Bodega Bay.
- State Parks** Fort Ross Historic Park - 12 mi
Salt Point State Park/Kruse Rhododendron State Reserve - 17 mi.
Armstrong/Austin Creek - 16 mi
- Tidepools** Check tides in tide book:
Shell Beach 2 mi. south at m 18.22
Schoolhouse Beach at m 14.40
Marshall Gulch m 14.05
- Seaweeds, barnacles, anemones, sponges, jellyfish, worms, snails, sea slugs, clams, oysters, scallops, chitons, squid, octopus, abalone, periwinkles, limpets, mussels, cockles, shrimps, crabs, starfish, sand dollars, sea urchins.

Swimming and wading in the ocean is not recommended anywhere at Sonoma Coast State Beach. Coastal conditions are very rough and treacherous, especially during "sleeper wave" season, from September to March. Suggest Doran Regional Park, just south of Bodega Bay.

Many people have drowned along the Sonoma Coast State Beach from Bodega Head to Russian Gulch. At Duncans Landing, about five miles north of Bodega Dunes, more people are killed than on any other stretch of coastline in California.

There are several hazards that make the water unsafe even for strong swimmers.

Water temperature The water is always cold, varying from 48° to 52° F, so the hazard of hypothermia, a condition that robs its victims of upper body strength, is great.

Sleeper waves These waves hit an unsuspecting person and pull them into the sea. "Sleeper" refers not to the wave, but to the unsuspecting visitor it snatches from the beach. These waves are giants, formed randomly by the sudden alignment of different sets of waves born of the Pacific's storms.

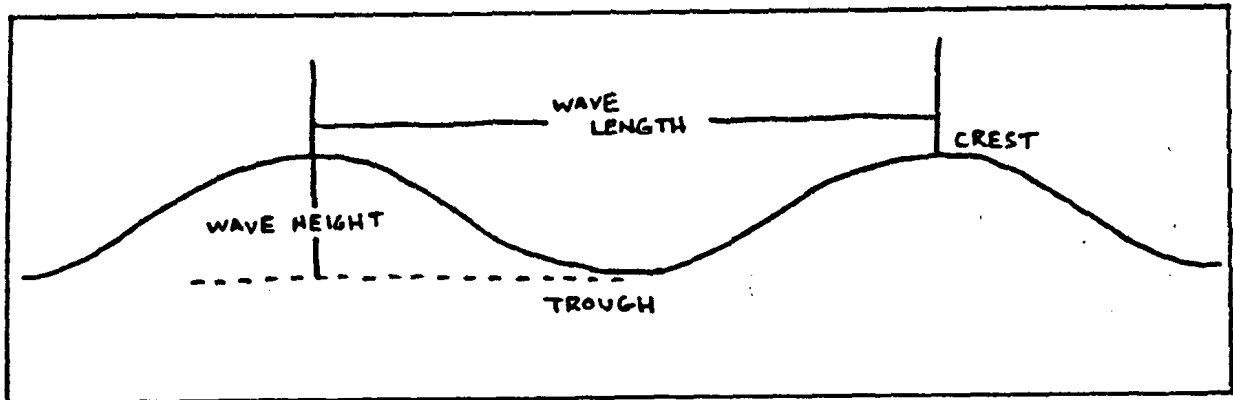
When the waves are out of phase, the trough of one set meets the peak of another, and they tend to cancel out one another, making the ocean appear calm. But because they are traveling at different rates of speed, at any moment they can become in phase, pitching peak atop peak, trough in trough, a giant sleeper wave is formed.

Character of sand The Russian River spills geologically "new" large grained sand out of its mouth at Jenner, and a southerly current piles it on beaches along the Sonoma Coast shore. This large grained sand is like popcorn and is, therefore, easily moved by the ocean. It piles up all summer long until the beaches are very steep. When a person is awash in a wave against a steep beach, this sand erodes like a trapdoor from under their feet.

Drop-offs/trenches These run underwater parallel to the beach. They are formed by waves breaking against the beach face. If a person is swept past a drop-off where they cannot touch the ocean floor, they often panic and drown.

Rip currents These ocean currents are caused by a build up of water near the shore. They are strongest during a lull in the crashing waves. Usually a rip current will result in a channel 25 to 100 feet wide resulting in a powerful current running offshore. Rip currents are usually sandy brown in coloration and are choppy in appearance. *To get out of a rip current, one should swim parallel to the shore until the pull stops. Then swim or tread water until a rescuer can come to assist.*

WAVES



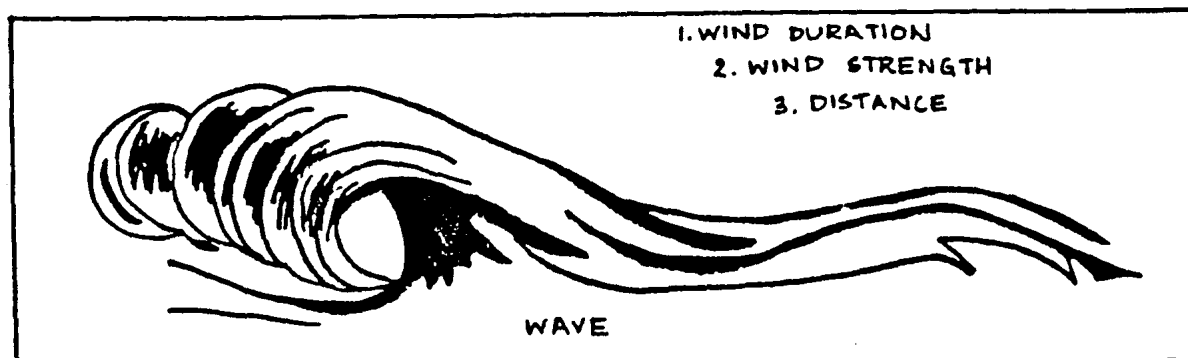
Waves are swells of water that eventually end their journey on some beach where they become breakers. Waves have a crest and a trough. The crest is the highest part, the trough is the lowest part, and the vertical distance between the crest and the trough is the wave height.

The waves you commonly see at the seashore are wind waves. They are caused by the friction of the wind blowing across the water. The size of wind waves depends on three factors: the distance over which the wind blows, the strength of the wind, and the length of time the wind blows. If all three factors are large, the waves are large.

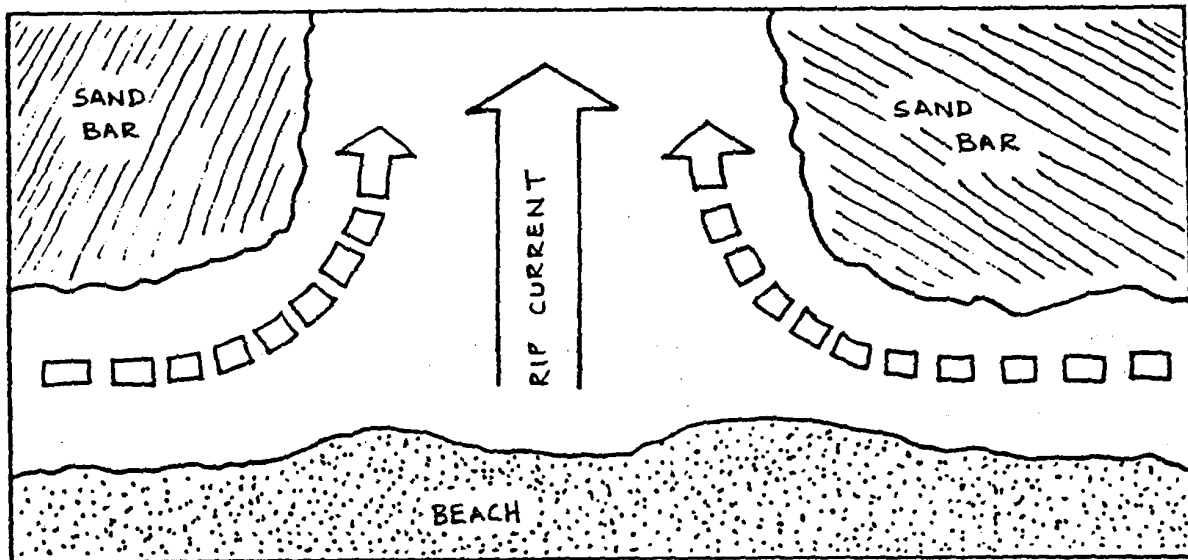
The most spectacular kind of wave is the seismic wave, commonly called a tidal wave. Seismic waves are caused by earthquakes, usually underwater but sometimes on land. In fact, the word *seism* means earthquake in Greek. The scientific name for a seismic wave is *tsunami* (pronounced soo-nah'-mee), the Japanese word for seismic wave.

People on a ship at sea would hardly notice a tsunami because the crest and the trough are so far apart. But the situation alters radically in shallower water where the waves may become breakers as high as 100 feet. The 1964 Good Friday earthquake in Alaska produced a tsunami that destroyed large sections of Crescent City in northern California. Even marinas inside San Francisco Bay were badly damaged by the tsunami caused by that earthquake.

Now there is a tidal wave warning system around the Pacific Ocean, the region where earthquakes commonly occur. When a seismograph station detects an earthquake, a warning is sent to all areas that might be hit by a tsunami.



RIP CURRENT



The onshore-offshore movement of the waves is responsible for moving sand. This back-and-forth movement can result in the development of long mounds of sand, called sand bars. A week or two of high breakers causes sand bars to build up offshore and parallel to the beach. Then, when the waves are small for a time, they gradually push the sand bar toward the shore and spread out the sand.

Sand bars are often the cause of rip currents, currents that go straight out to sea. The force of many waves breaking over a sand bar traps water between the bar and the beach. But, if there is a break in the sand bar, the water rushes back to the ocean through the gap, creating a rip current.

Rip currents are dangerous for swimmers. While it is possible to use rips to get through the surf rapidly, coming back through a rip current is extremely difficult. If you are ever caught in a rip, swim parallel to the shore until you are out of the current. With a little practice, you can learn to spot rip currents while standing on the beach.

THE NATURE OF SEA WATER

Sea water contains a mixture of minerals, mostly salts. If you were to evaporate sea water, you would end up with most elements known to man. Yet only six of these elements—chlorine, sodium, magnesium, sulfur, calcium, and potassium—make up more than 99% of the sea salts. These salts are the fertilizers of the sea; they are necessary for animal and plant growth.

The normal salinity (total amount of dissolved salts) of sea water is 35 parts per thousand (written as $S = 35 \text{ ‰}$), which means that there are 35 grams of dissolved salts per 1,000 grams (1 kilogram) of sea water. But the saltiness of sea water can vary slightly, especially in such areas as estuaries and bays that are supplied with fresh water from rivers, streams, or runoff.

SLEEPER WAVE SEASON

Fall, with its clear skies, mild winds and warm days, is the best season to visit the beautiful Sonoma Coast. Unfortunately, it is also the season for multiple drownings and sleeper waves. Since October is the month when the phenomenon called sleeper waves begins to occur, it is best to understand how these waves are created.

Waves are created by storm systems thousands of miles out in the Pacific Ocean. As these waves head toward shore they are in the same medium—the sea. When the peak of one wave coincides with the trough of another wave, we look out at the ocean and see a flat surface. It is during these out of phase periods that novice ocean visitors are lulled into walking down the beaches into easy range of the next phase shift of the waves.

Periodically the waves line up, peak upon peak followed by a double size trough and a "set" of large waves is created. When these large waves or "sleeper waves" slam onto the steep sloping beaches of the Sonoma coastline a tremendous surge of water rushes up the beach, often surprising beachcombers, waders, and children playing tag with the water. These victims are inundated as they attempt to run up the beach. The sand is quickly eroded from under their feet and they are swept back into the ocean by the receding surge. Once in the surf zone these victims are subjected to the tremendous pounding of the large surf and the debilitating effects of the cold ocean water. Few survive.

If you are a witness to such a situation, **DO NOT** attempt to rescue the victim or victims. Anyone attempting a water rescue under these conditions will find it nearly impossible to control the victim and return to shore safely. Thirteen people have lost their lives attempting ocean rescues along one beach alone.

Please heed the warning during sleeper wave season:

STAY BACK AND WATCH THAT WAVE!

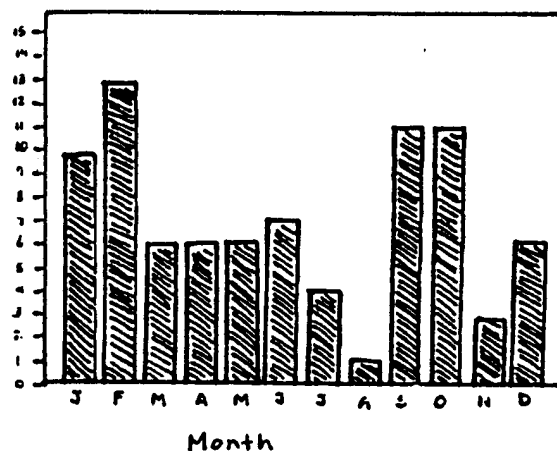
PORTRAIT OF A DROWNING VICTIM

The Sonoma Coast has long been an area known for its dangers. People who are attracted to the coast by its beauty often end up its victims. Since 1951 there have been 88 deaths on the coast. The majority of these deaths are attributed to drowning. This is not intended to be melodramatic, but instead to emphasize the need for safety along the coast, especially during the fall and winter months.

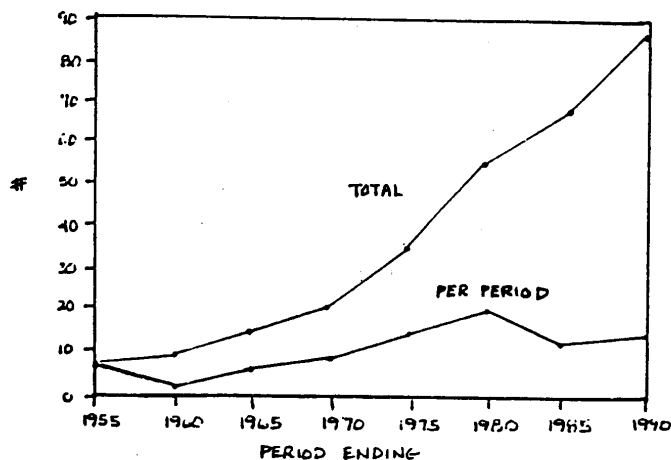
The majority of deaths occur during the period from September to February. Visitation in parks is usually light during this time, but at no time is the ocean more dangerous. Storms from the Gulf of Alaska generate large unpredictable surf. People, unaware of the ocean dangers, venture close to the water's edge often to become victims.

The typical drowning victim is a young male, although men and women of all ages have been Sonoma Coast drowning victims. With visitation increasing in our parks, more and more people are drowning. The trend will continue until people realize that if they don't use caution they could become a drowning victim. Playing in the surf, fishing, and beach-combing are the three activities that accounted for the largest number of drownings. When people visit the coast, they should remember a few simple rules:

Deaths Along the Sonoma Coast



NUMBER OF DEATHS ON THE SONOMA COAST - IN FIVE YEAR PERIODS



1. Pay attention to the ocean. Never turn your back to it.
2. Never venture into the surf zone. This is the area where the waves break. Avoid the beach area between the surf and the high water mark.
3. Always have an avenue of escape.
4. Don't be the next statistic!

These are a few simple safety rules that visitors should be made aware of:

- **Do not allow children to play tag with the waves or wander on cliffs.**
- Stay back from cliff edges.
Coastal rocks are extremely unstable and unsuitable for climbing.
- Never climb cliffs or on slippery, wet rocks.
- Stay off of cliff areas that suspend you over the ocean.
- Always watch the ocean; do not turn your back on the ocean.
Sleeper waves are both large and unpredictable.
- Look at the lines of driftwood and foam on the beach. No one should go between the highest line and the ocean.
- Always have an escape plan.
- When fishing lines snag, do not go into the surf zone to free the line.

IN AN EMERGENCY, CALL 911
Lifeguards will be dispatched

SONOMA COAST BEACH ACTIVITIES

TIDEPOOLING

The first thing needed is a low tide, preferably a minus or near minus tide. Check the SOS tide book for this information.

The following beaches are recommended for tide pooling:

| | | |
|-------------------|----------------|---------------------------------|
| Shell Beach | milepost 18.22 | approx. 2 miles south of Jenner |
| Schoolhouse Beach | milepost 14.40 | approx. 6 miles south of Jenner |
| Marshall Gulch | milepost 14.05 | |

The tide pools, rocky pockets that retain water when the tide goes out, and the intertidal zone, that area between high and low tides, host an extremely rich and diverse marine community. Making their home here are several species of plants and animals, including seaweeds, barnacles, anemones, sponges, jellyfish, worms, snails, sea slugs, clams, oysters, scallops, chitons, squid, octopuses, abalones, periwinkles, limpets, mussels, cockles, shrimps, crabs, starfish, sand dollars, sea urchins, fish, and many others.

The ecology of the intertidal zone is very fragile and, therefore, easily disturbed. Such a simple act as turning over a rock can expose certain immobile marine animals to the fatal rays of the sun. As a result, tidal invertebrates may not be taken in any tide pool or other area between the high tide mark and 1,000 feet beyond, except as follows. Abalones, chitons, clams, cockles, crabs, lobsters, scallops, ghost shrimp, and sea urchin may be taken, always in accordance with current fishing regulations.

FISHING

Anyone over 16 years of age must have a fishing license to take any kind of fish, mollusk, invertebrate, amphibian, or crustacean in California. Licenses can be purchased for either the year or the day. Regulations vary from fresh to salt water. **Visitor is responsible for checking current regulations.** Fish and Game Regulation booklets are available at any sporting goods or marine equipment store where fishing licenses are sold (Casini Campgrounds in Duncans Mills, 6 miles inland on Highway 116, or in Bodega Bay).

Clamming is year-round.

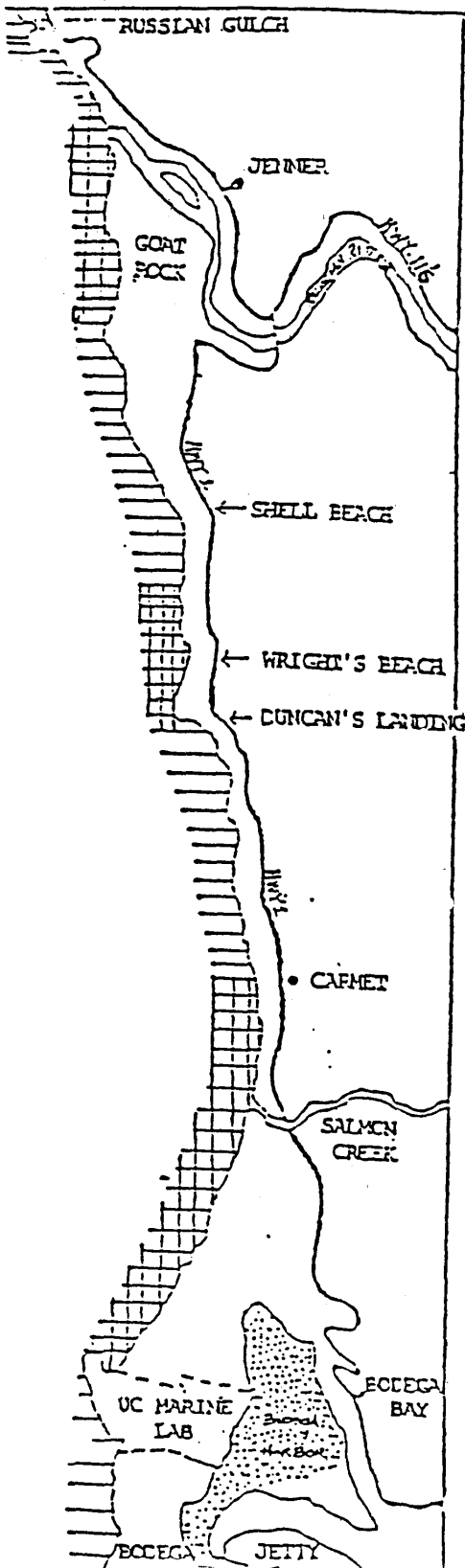
Crab season is mid-November through June.

Ocean: salmon, ling cod, rockfish, perch, bottom-fish,
red abalone, mussels, cockles

River: Salmon (Sept. - Nov.) steelhead (Nov. - Mar.)
shad (mid-spring - early summer) bass, bluefin, catfish.
(Refer to blue leaflet from King's)

Abalone requires ticket and punch card. Season is April - June and then August through November. Must use legal size abalone iron. Limit three; size 7 inches.

SONOMA COAST FISHING GUIDE



| | |
|----------|--|
| FISH: | Rockfish (Rock Cod, Lingcod, Cabezone, Sculpin, etc.) |
| BAIT: | Squid, shrimp, mussel, smelt, abalone guts. Most baits may be purchased locally in Jenner and in Bodega Bay. |
| SEASON: | Year round. OCEAN IS USUALLY ROUGH. BE CAREFUL! |
| ABOLONE: | Caught by diving or shore picking. |
| SEASON: | April thru November, except for July. |

| | |
|---------|--|
| FISH: | Perch, smelt, flatfishes, (halibut, sanddab, flounder, etc.) |
| BAIT: | Sand Crab, mussel, squid, anchovi |
| SEASON: | Year round. OCEAN IS USUALLY ROUGH AND UNPREDICTABLE. BE CAREFUL! |

| | |
|------------|--|
| CLAMS: | Horseneck, cockle, littleneck, & Washington |
| EQUIPMENT: | Shovel and bucket |
| SEASON: | Normally November thru April during minus tide conditions, subject to shellfish quarantines. |

Crabs (Rock, Red Rock, Dungeness) are limited to Bodega Bay harbor & jetty area. Equipment (crabnets) and bait (fish carcasses) may be purchased locally at Bodega Bay.

Party boats for rockfishing available at Bodega Bay. Must provide your own gear & bait. Equipment rental available.

Streamfishing (trout, salmon, steelhead, bass, etc.) is limited to the Russian River and Salmon Creek.

Refer to Fish & Game Regulations for specific information regarding minimum size and catch restrictions on specific species.

SONOMA COAST DIVING

The Sonoma and Mendocino coastlines provide divers with some of the most beautiful and varied sea life in the world. The diverse and plentiful sea life is due in part to the coastal upwelling of nutrient rich water from deep, near-shore waters. The steep coastline, accompanied by the absence of any land masses for nearly 10,000 miles can also cause some very rough conditions. Large swells from storms 2-3,000 miles away, "sleeper" waves (two different sets of waves doubling up to form one huge wave), rip currents, longshore ocean currents and the rough coastline can make the unwary divers' experience unpleasant.

To make your dive safer, follow the steps below:

- Before leaving for the coast, call the dive phone at Salt Point State Park (707) 847-3222 to get current ocean swell, visibility, wind and water temperatures. The weather is recorded between 8:00-9:00 a.m. daily with major changes in weather recorded as they occur.
- Upon arrival at the coast, check with local park staff, businesses, or divers to find a good, safe diving area.
- Watch the prospective dive area, for at least 20 minutes prior to entering the water to check for large swells, waves, rip currents, easy water entry and exits, etc.
- Plan for alternate water exits if it becomes rough.
- Always take a float (inner tube, dive mat, dive board or boat) with you when you dive.
- Let someone know where you will be diving in case of emergencies.
- Never dive (skin or scuba) alone – check campgrounds, dive areas, etc. for a partner if necessary.
- If you plan to take anything from the ocean, make sure you have a current fishing license, proper gear, open seasons and know limits. Your local ranger staff will help answer any questions you have about Fish & Game Regulations.

REMEMBER -Diving is a strenuous sport, be in good physical shape before diving, check your gear to make sure it is in good condition, check the water—if it's too rough do not go in—your life may depend on this decision. Do not take over your limit, the result can be expensive. Call the dive phone (707) 847-3222 before coming to the coast. If it is too rough, plan on doing something besides water activity.

SAFE HORSEBACK RIDING

Horses can be rented at the Chanslor Ranch, located south of Salmon Creek (north of Bodega Bay) on the east side of Highway 1.

In order to protect the natural environment and insure the safety of all park visitors, riders should be informed of the following rules:

- No horses are allowed north of the Bodega Dunes day use boardwalk. Horses are allowed on the trails or beach south of the boardwalk only.
- Load and unload horse trailers only at the horse assembly area located behind Bodega Dunes Campground (off Bay Flat Road).
- Horses are not permitted in the campground at any time.
- Overnight horse camping is not permitted at Bodega Dunes.
- Horseback riders should travel at a safe speed and slow to a walk when passing other trail users, announcing their presence prior to passing.
- Riders should stay on approved trails. Riding off trails damages the environment, causes erosion and threatens other park users and wildlife.
- Riders should carry identification on their person as well as on their horse.

HIKING

There are several hiking trails through the dunes and along the Sonoma Coast; it is a good idea to purchase a park map with the trails marked on it. Dogs and mountain bikes are not allowed on these trails (Section 4312 of the California Code of Regulations).

Visitors should be advised to:

- Obey all warning signs
- Be aware of wind and blowing sand
- Always carry water; walking in beach sand and loose dunes is strenuous
- Stay back from steep, unstable cliffs
- Watch for poison oak
- Check tide table; stay above tide line and do not turn your back to the ocean
- Stay on trails and off adjacent private property

Vista Trail m 26.3 (4 mi. north)

Picnic tables and outhouse; disability access; spur trail to observation deck

Russian Gulch m 24.55 (2 mi. north)

Not well-marked; immediate left after Russian Gulch bridge
Isolated beach sheltered by tall cliffs

North Jenner Headlands m 23.83

Descend rolling, grassy headlands to bluff's edge

Descent to North side of Russian River Mouth m 23.21

Steep descent from bluff to beach

Coastal Access m 22.24

Small dirt parking lot just north of milepost
80 ft. down moderately steep trail to long sandy beach

Coastal Access m 22.53

Two dirt pull-outs near milepost; not good on a windy day
Steep overgrown trail to exposed granite promontory with spectacular views

Dr. David Joseph Memorial Pomo Canyon Trail

Pomo Canyon Environmental Campground to Shell Beach (m 18.22)

On a clear day, views include: Jenner and mouth of Russian River, Northwest Cape at Fort Ross, Point Reyes, ancient sea stacks lifted 600 ft. by motion of San Andreas Fault.

Kortum Trail -- Blind Beach (m 19.15 Goat Rock Road) to Wrights Beach

Over ridge of Peaked Hill, grass-covered marine terrace, creek crossings, descend to black sand beach.

South Salmon Creek Trail

Access from Bodega Dunes (m 11.70) day-use parking lot

Bodega Dunes Loop (m 11.70)

900 acres; home to many mammals (deer, jackrabbits, mice, voles, foxes, raccoons, weasels, badgers), birds (red-tailed hawks, northern harriers, short-eared owls, California quail, ring-necked pheasants), seabirds, monarch butterflies.

Bodega Head Trails m 11.05 Bay Flat Road

Good trails for whale watching, December - April

Bodega Head Loop

Views of harbor, Campbell Cove, Hole-in-the-Head; wildflowers.
Summit offers 360 degree view of Sonoma and Marin coasts.

Overlook Trail

Bodega Head to South Salmon Beach

STATE PARK INFORMATION

RUSSIAN RIVER DISTRICT

The Russian River district is comprised of six separate units in the State Park System. You are volunteering through Sonoma Coast State Beach. Farther north on Highway 1 is Fort Ross State Historic Park, Salt Point State Park, and Kruse Rhododendron State Reserve. Inland, off Highway 116 are Armstrong Redwoods State Reserve and Austin Creek State Recreation Area. Each park has uniquely different features which we would encourage you to explore. Whether your interest is in redwood groves, wild coastline, watershed and drainages or California's history, there is something for everybody in Russian River's park units. Campgrounds are located along the coastal parks, scenic hiking trails abound, and all offer various interpretive activities or events throughout the year.

For more information, you can call Russian River District at (707) 865-2391, or the specific units at the following numbers:

| | |
|-----------------------------|----------|
| Sonoma Coast SB | 875-3483 |
| Fort Ross SHP..... | 847-3286 |
| Salt Point SP | 847-3221 |
| Kruse Rhododendron SR | 847-3221 |
| Armstrong Redwoods SR | 869-2015 |
| Austin Creek SRA | 869-2015 |

SONOMA COAST INFORMATION

Sonoma Coast State Beach has its local unit office on State Highway 1 at Salmon Creek Ranger Station in Bodega Bay. The District Office is located in Duncans Mills. Both are viable contacts for you should you need to notify the staff of any information that arises while on your watch, or should you need information in the meanwhile.

RUSSIAN RIVER DISTRICT
P.O. Box 123
Duncans Mills, CA 95430
(707) 865-2391

SONOMA COAST STATE BEACH
Salmon Creek Ranger Station
Highway One
Bodega Bay, CA 94923
(707) 875-3483

OCEAN, WEATHER, AND DIVING CONDITIONS (707) 847-3222

In case of an emergency, don't forget that 9-1-1 is always a choice, especially if you are at a pay phone and need to get through quickly. County operators will quickly assess what the nature of the emergency is and connect you with the most appropriate agency to handle the problem. The Sonoma County Sheriff's office is in direct communication with the Russian River Dispatch, also, so any information reported to them can easily be passed to Ranger or Lifeguard staff.

IN CASE OF EMERGENCY: DIAL 9-1-1

| | |
|-----------------------------|--------------------------------|
| State Park Dispatch | 1-916-358-1300 |
| Salmon Creek Ranger Station | 875-2603 (Private Line) |
| Bodega Dunes Kiosk | 875-3483 |