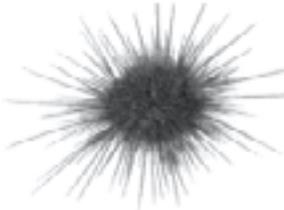


SEARCHING
FOR
SEA LIFE



Marine Mammals



Marine Mammal Field Notes.....122

Gray Whale Field Notes.....126

Sea Otter Field Notes.....129

Searching for More about Marine Mammals132

Explore Your Yard.....132

There's a Whale in Your Room!.....133

What's for Dinner?.....133

Take an Imaginary Trip.....134

Who Lives Here?.....135

An Oily Mess.....136

There Aren't Many Left!.....136

Get Involved!.....137

What Do You Think?.....137

Ollie Otter Lunch Bag Puppet.....138

Marine Mammal Field Guide.....140

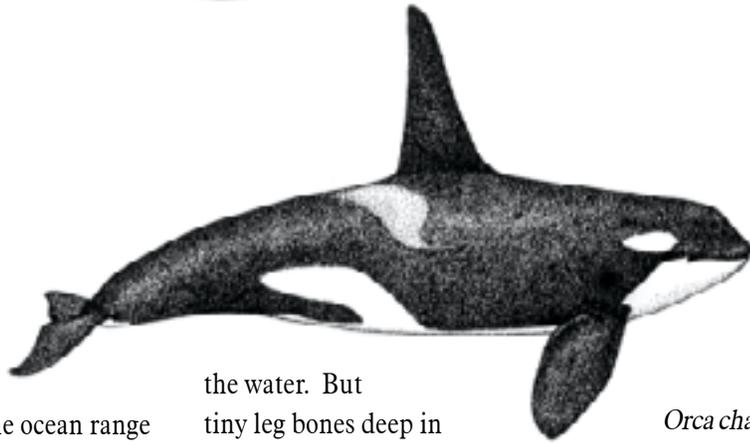


What Is a Marine Mammal?

Cold and dark as the sea is, some mammals have adapted to life there. Mammals that live in the ocean range in size from the furry, five-foot-long sea otter to the enormous blue whale, a hundred feet long. What do these creatures have in common? Like us, they are warm-blooded animals that breathe air, have hair and nurse their young.

More than 30 species of marine mammals live in or pass through Monterey Bay. Three major groups of marine mammals can be seen here: cetaceans (whales, dolphins and porpoises), pinnipeds (seals and sea lions) and sea otters. Each group evolved from different land mammals that moved back to the sea.

The cetaceans descended from a crowlike ancestor that returned to ocean life about 65 million years ago. The streamlined, fishlike whale doesn't resemble its four-legged ancestor. With one or two nostrils on the top of its head, a whale can easily breathe at the surface without lifting its head. Its tail is incredibly strong, forceful enough to push the whale through

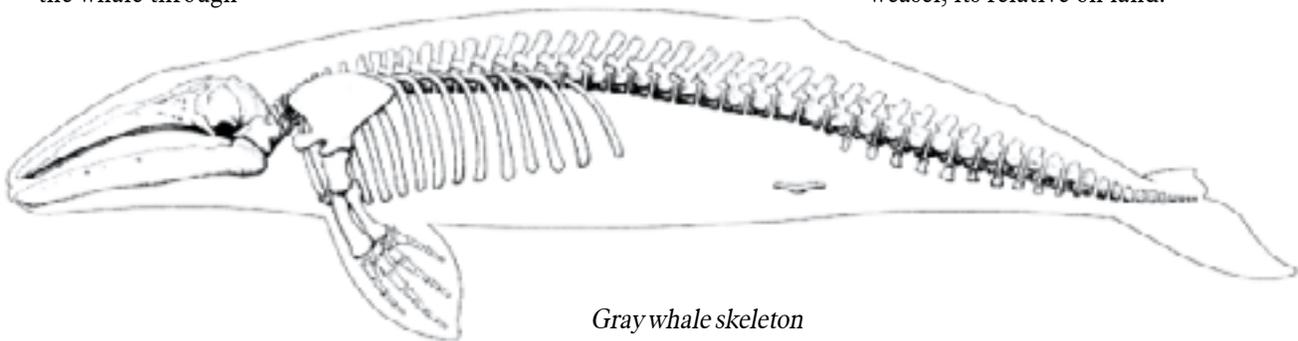


*Orca chasing
salmon*

the water. But tiny leg bones deep in the whale's body and handlike bones inside its flippers remind us of its land-dwelling ancestors.

The pinnipeds are graceful and agile swimmers with smooth, tapering bodies and strong flippers, but they still retain many ties to land. Most return to shore to mate and give birth, some more gracefully than others. "Eared" seals, like the California sea lion, have small external ears and versatile hind flippers they can turn under to "walk" on land. They evolved from bearlike mammals that returned to the sea about 30 million years ago. "Earless" seals, like the harbor seal, evolved from otterlike ancestors about 14 million years ago. These true seals don't have visible ears or walking flippers, on land, they wriggle awkwardly on their bellies.

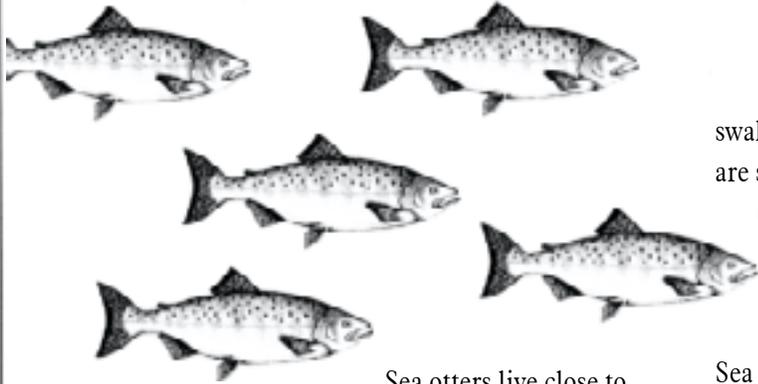
The sea otter, adapted to living in the ocean over the past four million years, still resembles the weasel, its relative on land.



Gray whale skeleton

MARINE MAMMALS

FIELD NOTES



Sea otters live close to shore; they're not as well equipped for the open ocean as the streamlined, deep-diving seals and whales.

Feeding

The largest Marine mammals eat the smallest food. Baleen whales, like the humpback and blue whales, strain millions of small, shrimplike crustaceans from the water with their sievelike baleen.

Baleen plates hang in rows from the whale's upper jaw. The baleen fibers, made of the same materials as fingernails and claws, fray toward the inside of the mouth and overlap to form a dense net. The whale swallows a great mouthful of food and water, then closes its jaws. With a thrust of its tongue, it expels the water through the baleen, leaving the prey trapped inside. The gray whale feeds on muddy bottoms, straining amphipod crustaceans from the sediments with its shorter, stubby baleen.

Toothed marine mammals use their teeth to grasp, rip or crush fishes and squids. With their strong jaws and doglike teeth, seals and sea lions tear at their prey. Dolphins and toothed whales make clicking sounds and use the echoes to find (echolocate) and possibly to stun their prey. With peglike teeth, these cetaceans grip a fish and

swallow it whole. Although many whales and seals are solitary feeders, orcas often feed in a group called a pod. Hunting together like a pack of wolves, a pod of orcas can surround a school of salmon or even overwhelm a larger whale.

Sea otters keep to shallow waters, eating whatever is readily available in kelp forests. They hunt while they dive, collecting crabs, clams and other shellfish with their agile front paws. Afloat on the surface, they use rock tools to smash the shells. With strong canine teeth for prying and powerful molars for crushing, sea otters break open and devour their prey.

Keeping warm

How do marine mammals generate enough body heat to keep warm in the cold ocean?

Their large appetites and fast digestion fuel the high metabolic rates that produce body heat. Other adaptations help maintain that heat in a marine mammals body.

A whale has a thick, insulating layer of fat called blubber to help retain body heat. The layer of blubber also makes the whale buoyant and supplies energy when food is scarce. Seals have both a blubber layer and a coat of hair for insulation. Of all the



marine mammals, only sea otters lack blubber, depending instead on insulation from their dense fur coats. An otter must groom and clean itself constantly to keep the fur waterproof.

A whale also has a special circulatory system that helps maintain its core body temperature. In an overheated animal, the outer blood vessels dilate to allow warm blood to flow out to cooler fins and flippers. In a chilled animal, the outer blood vessels constrict to reduce blood flow to the extremities. Cool blood flowing from the outer body back to the heart recaptures heat from warm blood flowing away from the heart in a counter-current heat exchange.

Migrator or resident, a marine mammal spends a lot of time under water holding its breath. Sperm whales are the deepest divers, known to dive for an hour or more to at least 3,700 feet (1,100 meters). To prolong its underwater time, the animal's metabolism and heartbeat slow down and its lungs collapse. Because they breathe air, marine mammals must return to the surface at regular intervals.

Communication

On land, seals and sea lions communicate with barks and bellows. Some whales (like humpbacks) sing beautifully under water.



Sei whale

Migration and locomotion

Most marine mammals are social creatures. They may swim together, rubbing and playing in groups of two, three or more. Some, like sea otters and some pinnipeds, reside in coastal areas. Others, like baleen whales, are world travellers. Each year, baleen whales migrate between their polar feeding areas and the tropical areas where they breed and give birth. Passing Monterey Bay twice a year, the gray whales swim more than 10,000 miles (16,000 kilometers) from the Bering Sea to Baja California and back, the longest migration known of any mammal.

Blue whales call long distance with bursts of low-frequency sound (below the range of human hearing). Such sounds may travel hundreds of miles under water.

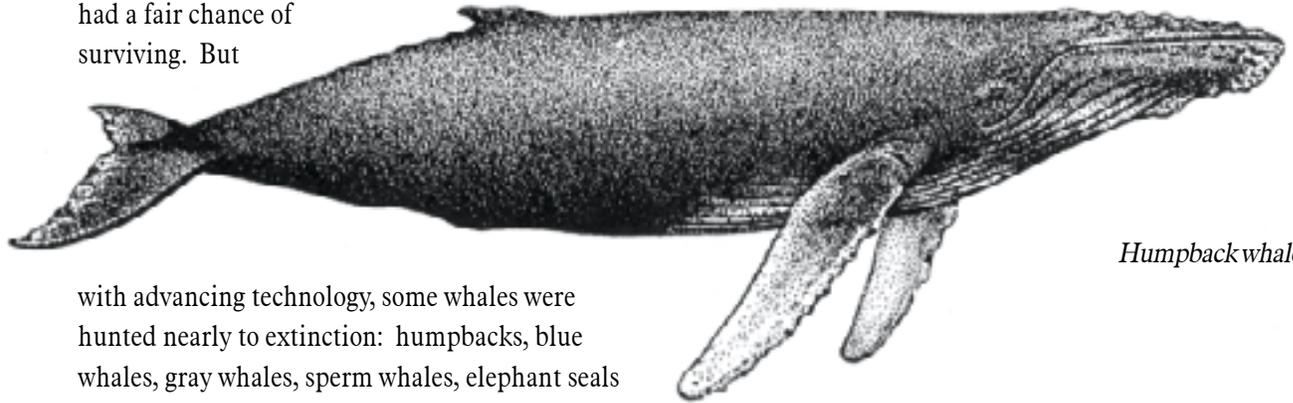
Others, like orcas, communicate with clicks. Each orca pod has its own dialect, its own catalog of clicks and squeaks. Neighboring pods share some calls; the more the pods interact, the more their dialects will overlap. Toothed whales and dolphins also use sound as a kind of sonar echolocation - to find out about objects they can't see. Sperm whales may even use blasts of sound to stun their prey.

Only otters and eared seals like sea lions have external ears. True seals and whales have hidden ears but they still can hear.

People and marine mammals

For thousands of years, people hunted marine mammals for food, oil, clothing and tools.

In Monterey Bay, whalers hunted mostly humpbacks and gray whales between 1854 and 1925. Long ago, when the shore whalers used small boats and limited weapons, whales had a fair chance of surviving. But



Humpback whale

with advancing technology, some whales were hunted nearly to extinction: humpbacks, blue whales, gray whales, sperm whales, elephant seals and sea otters.

Scientists and conservationists brought the plight of the marine mammals to public attention. As people have learned more about the lives of marine mammals, they have grown to respect and value them as an integral part of the ocean environment. Marine mammals are now protected by the Marine Mammal Protection Act in the United States. Since 1972, it's been illegal to kill or harass marine mammals or collect their bones, fur or other parts.

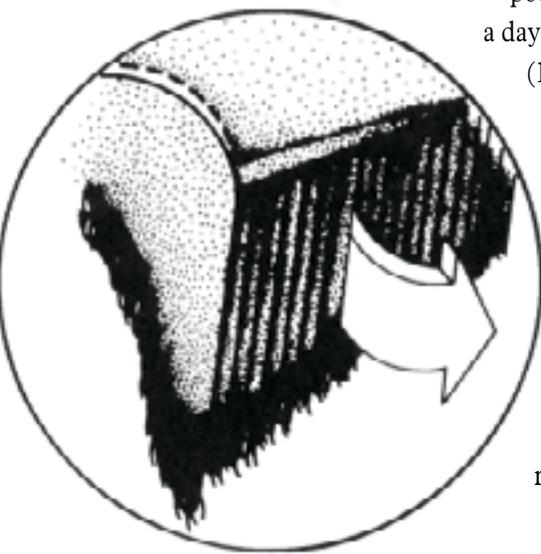
Now, scientists study marine mammals to learn how they interact with each other and with their environment. Researchers track them with radio tags and satellites, identify them individually with photographs, listen to them with underwater microphones and observe their group behavior. Such research has shown that these benign and probably intelligent animals form complex social groups and communicate with one another.

For many marine mammals, the future is still uncertain. With continued protection and research, perhaps these warm-blooded animals will find safety in their ocean home.

MARINE MAMMALS FIELD NOTES

What is a Gray Whale?

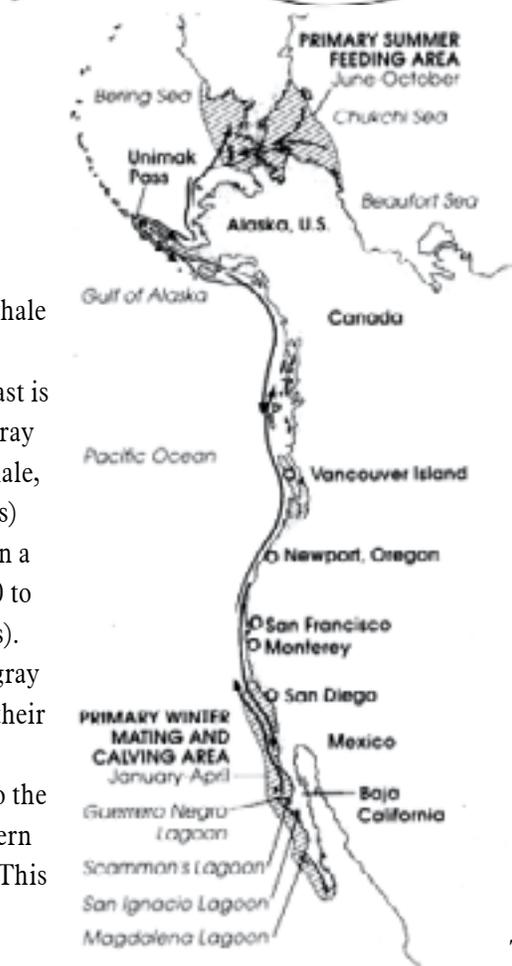
During winter, the baleen whale you'd most likely see along North America's Pacific Coast is the gray whale. The adult gray whale is a medium-sized whale, 36 to 50 feet (11 to 15 meters) in length (a little longer than a school bus) and weighing 20 to 45 tons (18 to 41 metric tons). Every winter, thousands of gray whales migrate south from their cold-water summer feeding grounds in the Arctic seas to the warm-water lagoons of western Baja California in Mexico. This journey is more than 10,000 miles (16,000 kilometers) round trip, the longest of all known mammal migrations.



Feeding and diet

Gray whales do most of their feeding from May to November in the cold northern seas. Unlike other baleen whales that filter food from the water, the gray whale usually eats from the bottom. Rolling on its side (usually the right side), the whale sucks up a mouthful of mud or sand. With a thrust of its tongue, the whale expels the mud through baleen plates that hang from its upper jaw. The baleen acts like a strainer, filtering shrimplike amphipods and other prey from the mud.

The gray whales gorge themselves during these months, eating about 1,000 pounds (455 kilograms) of food a day and gaining six to 12 inches (15 to 30) centimeters) of body fat. This fat provides the primary source of energy for the trip from the Arctic to Baja California and back. For a pregnant whale, these fat reserves not only get her to Mexico, but provide fuel for her and her calf on the return trip.

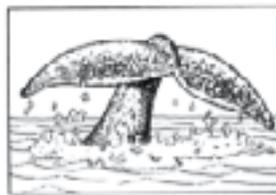
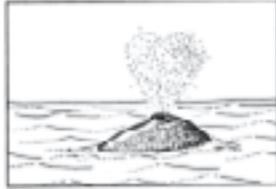


MARINE MAMMALS FIELD NOTES



Migration

In October, when the days begin to shorten and ice starts to form on the Bering Sea, pregnant females begin their migration south. They are soon followed by nonpregnant females, mature males and juveniles. Most of the 21,000 gray whales that live in the eastern Pacific migrate to the Mexican lagoons every year, passing through Monterey Bay from late November to mid-February.



which is 3.5 percent fat). A gray whale calf can gain 50 to 70 pounds (23 to 32 kilograms) a day. Calves are about 15 feet (five meters) long at birth, growing to 20 feet (six meters) long by the time they pass Monterey on the northward journey with their mothers. They are weaned at seven to nine months, reach maturity between five and 11 years and can live to be 50 years old.

Gray whales travel close to shore in small groups (pods) of two to 15 whales. The trip each way takes eight to 10 weeks. Males and nonpregnant mature females court and mate throughout the southward journey. If you see two or three gray whales thrashing and splashing about in the water, they are probably courting and possibly mating.

During their time in the Mexican lagoons, the other adults continue courting and mating. In February and March, newly impregnated females begin the return trip north. Mature males leave first, followed by juveniles. Females with new calves are the last to leave the lagoons. You can see the whales heading north past Monterey from mid-February to mid-May.

Reproduction

Most pregnant females give birth when they reach the warmer Mexican waters, usually in January and February. Some have their calves during their migration south. A female gray whale is pregnant for about 13 months and gives birth to a one-ton calf every other year.

Communication

Gray whales don't sing like humpback whales or click and whistle like dolphins, but they do make grunting sounds to communicate with one another. However, scientists aren't sure what the sounds mean or how these whales use them.

The whale's migration is timed so that the calves are born in warm water where they grow rapidly on their mother's rich milk. Gray whale milk is about 53 percent fat (compared to cow's milk

Like most whales, gray whales breach, rocketing nearly out of the water and falling back with a thunderous splash. Breaching and the slapping of flippers and flukes (tail fins) on the water may be forms of communication. Gray whales may also communicate by touch, especially females who often touch their calves.

Gray whales and people

Whether you watch gray whales from the shore or a boat, your first glimpse is usually its heart-shaped “blow” of misty vapor as it exhales at the surface. Look toward the horizon for the blow. A whale blows three to five times in a row, 10 to 20 seconds apart, before lifting its flukes out of the water as it starts, a three-to seven-minute dive. Sometimes you may see its mottled gray body with a row of six to 12 bumps, or knuckles, along the midline of its back. (Unlike many whales, the gray whale has no dorsal fin on its back.)

You can also recognize a gray whale by its parasites - the large whitish patches of barnacles attached to the skin. The barnacles don't harm the whale, they're just hitching a ride. Tan patches on the whale are large clusters of parasitic whale lice, amphipods that feed on the skin of the whale.

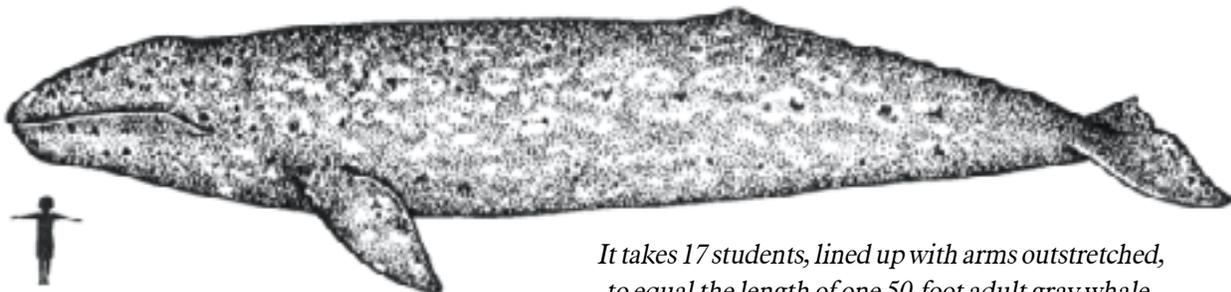
Over the years, people have had more of an interest in gray whales than just watching and studying them. Whalers made a living hunting them: first to make oil from their blubber (to light lamps and lubricate machinery), then later to make fertilizer from their meat and bone meal. Gray whales were easy to spot as they swam close to shore, and profits from whaling soared. Whaling

stations popped up along the migration route - the central coast of California at Point Lobos, Moss Landing and MacAbee Beach. With the discovery of the Mexican breeding lagoons in 1855, even greater numbers were hunted. By the 1880s, the gray whale population had plummeted to near-extinction.

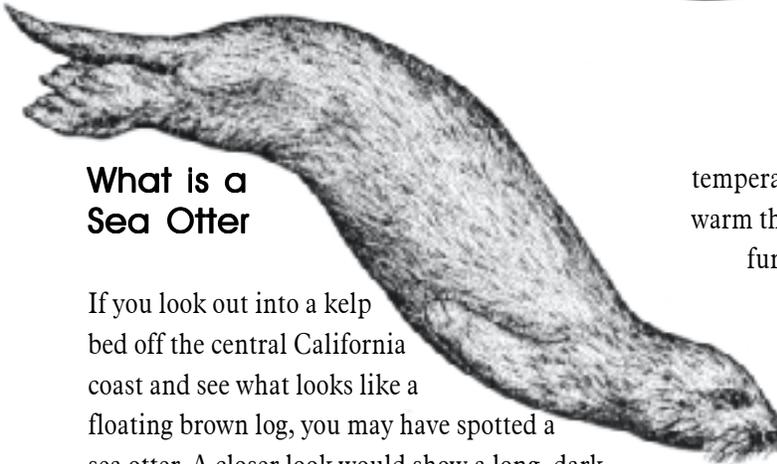
With fewer whales, profits fell. The gray whale population started to recover, until the next period of whaling occurred in the early 1900s. The introduction of floating factories and diesel-powered boats made hunting whales easier and more profitable.

Since the 1940s the gray whale population has been protected as an endangered species. The International Whaling Commission allows only Alaskan Eskimos and Soviet natives to harvest these whales for necessary food and supplies each year. Some scientists believe there may be as many gray whales now as there were before commercial whaling began.

Today, gray whales still deserve our protection. Pollution, boat traffic, industrial noise, offshore oil and natural gas exploration, fishing, whale watching and loss of habitat and food resources pose potential threats to these magnificent creatures of the sea. It's up to us to help protect them.



It takes 17 students, lined up with arms outstretched, to equal the length of one 50-foot adult gray whale.



What is a Sea Otter

If you look out into a kelp bed off the central California coast and see what looks like a floating brown log, you may have spotted a sea otter. A closer look would show a long, dark-brown, furry animal with stubby front paws, large, webbed hind flippers and a whiskered face.

Sea otters are the smallest marine mammals in North America. (Only the marine otter - an endangered species that lives off the coast of South America - is smaller.) An average adult California sea otter is about the size of a ten-year-old child - four feet (1.2 meters) long. Females weigh about 44 pounds (20 kilograms), males about 64 pounds (29 kilograms).

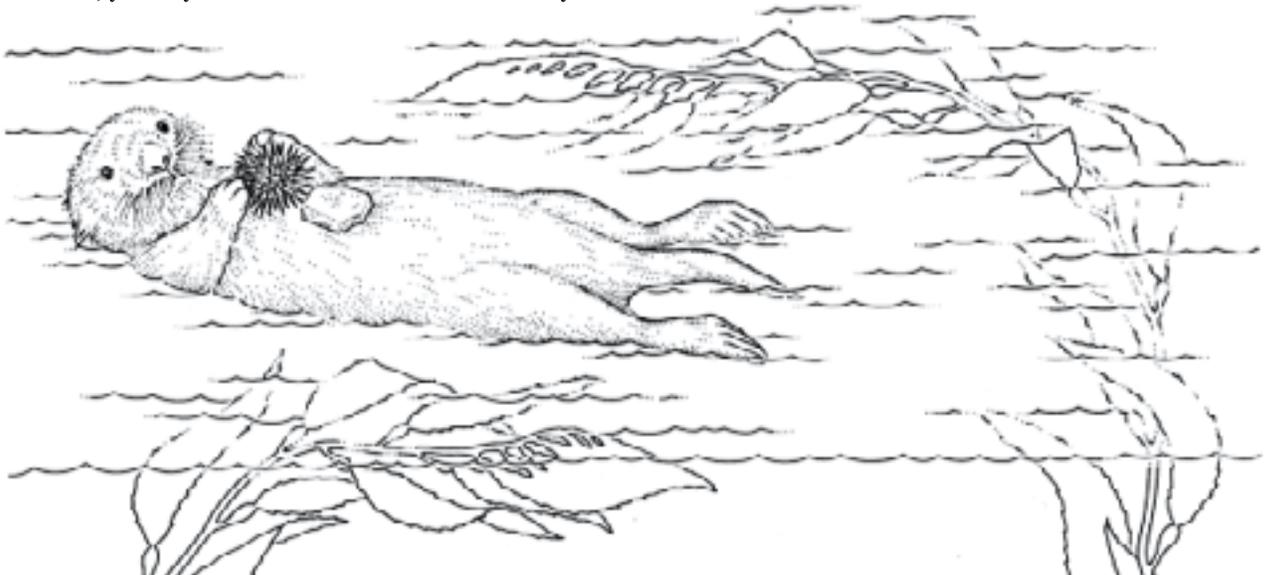
Keeping warm

Sea otters live in 30° to 60° F (0° to 15° C) sea water, yet they maintain a constant internal body

temperature of about 100° F (38° C). To keep warm they depend on their thick, water-resistant fur. Most other marine mammals have an insulating layer of fat, called blubber, to keep out the cold.

When you see a sea otter rubbing its body and rolling in the water, it's grooming its fur to keep it clean and waterproof. Depending on which part of a sea otter's body you look at, a square inch (6.5 square centimeters) of fur contains between 170,000 and one million hairs. (You have only about 100,000 hairs on your entire head.) As an otter grooms, it's coating each hair with natural oils from its skin and trapping tiny air bubbles in its fur.

The trapped air and oils make the fur water resistant and insulate the otter from the cold ocean water. If the fur becomes soiled, perhaps from oil or boat fuel, it gets matted, which destroys the protective bubble barrier. A soiled sea otter dies of exposure to the cold in just a few hours.

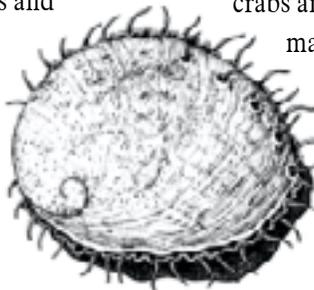
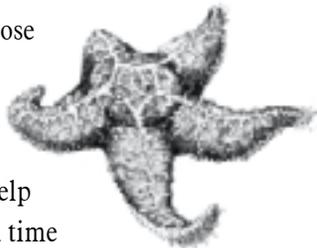


Sea otters also keep warm by burning calories from their food. A sea otter's metabolism (rate of heat production) is two to three times faster than similar-sized land mammals. Depending on the caloric content of its prey, an otter fuels its high metabolism by eating about 25 percent of its body weight in food every day. A 50-pound (23 kilograms) otter eats about 13 pounds (six kilograms) of seafood daily.

Habitat and locomotion

Sea otters live in the coastal waters of the northern Pacific Ocean from the Kuril Islands in Russia to Prince William Sound in Alaska. Smaller populations of sea otters live off the coasts of British Columbia, Washington State and California. In California, sea otters live along a 250-mile stretch of coast from point Año Nuevo in Santa Cruz County south to Purisima Point in Santa Barbara County.

California sea otter live close to shore, usually in or near kelp forests. They rest in the kelp, often wrapping themselves in kelp fronds. Some otters spend time along sandy beaches and in harbors and sloughs. Unlike Alaskan otters, California sea otters seldom come ashore. When they do, they usually haul out on low, algae-covered rocks along the water's edge.



Ochre star and abalone

An otter swims on its back at the surface, pumping its hind flippers in unison. But when it's in a hurry, an otter will swim on its stomach. Some otters, usually females, stay within a few miles of where they were born. Males tend to travel farther, often exploring new areas.

Feeding and diet

There are more than 50 kinds of marine invertebrates on a sea otter's menu, including mussels, clams, abalone and other snails, octopuses, crabs, sea urchins and sea stars. But from this variety, each individual usually specializes in only two to four kinds of prey. Sea otters frequently hunt in the kelp forest, usually in water less than 60 feet (18 meters) deep.

While sea otters hunt for food under water, they eat at the surface. An otter gathers its meal with its powerful forepaws or uses a rock to knock loose stubborn abalone and sea urchins. Back at the surface, the otter floats on its back and eats. It uses its powerful jaw muscles and blunt molars to crush its food. The otter may place a rock or other hard object on its chest to use as an anvil. Then the otter bashes its prey against the rock, breaking open hard-shelled animals like abalone, crabs and clams. Sea otters are the only marine mammals that use tools.

Reproduction

Sea otters mate year-round. A male and female bond together as a pair for a few days during mating activities.

MARINE MAMMALS FIELD NOTES



After mating with one female, the male goes on to bond and mate with other females.

A female otter is pregnant for about six months and usually gives birth to a single pup a little bigger than a kitten, weighing about four or five pounds (two kilograms).

Female sea otters are generally excellent mothers. Males don't take part in caring for pups. The mother nurses the young pup for four to eight months on milk that contains 20 to 25 percent fat. (Cow's milk contains only three to four percent fat.) After one or two months, the pup begins eating solid food that its mother collects. By about three months of age, the pup can dive and begins learning how to hunt. A pup can usually hunt on its own by the time it's six months old.

Sea otters and people

Living so close to the coast makes sea otters very vulnerable to humans. Coastal Indians and northern Aleuts hunted sea otters for many thousands of years. At that time there were probably 18,000 to 20,000 otters living off the California coast and hundreds of thousands throughout their Pacific range.

In 1741 Russian hunters found the otters, and the commercial otter fur trade began. There was a great demand for the otters' beautiful, warm pelts in Russia, Europe, Japan and especially China. In the late 1700s, the Americans and English joined the hunt. By the early 1900s, sea otters were nearly extinct. In 1911, the International Fur Seal Treaty brought protection to the sea otter and other marine mammals.

Otters were thought to be extinct off the California coast until a group of about 50 otters along the Big Sur coast became publicly known in 1938. All the sea otters currently living along the central California coast descended from these few survivors. Since the late 1930s this population has been growing in number and expanding north and south along the coast.

By 1992, the sea otter population off the California coast had grown to about 2,100. However, they're still threatened by oil spills, gill nets and other human disturbances.

MARINE MAMMALS

SEARCHING FOR MORE

Explore Your Yard



MATERIALS

- Plastic milk jug
- Magnifying lens
 - Magazines
 - Scissors
- Crayons, colored pencils or colored markers
- Large sheets of plain paper

Take a walk through your backyard or school yard and look for insects, birds and other animals. If you'd like to look at them more closely, bring along a tray and magnifying lens to hold the plants and animals that you find.



To make a tray for observing the plants and animals you find, cut off the bottom of a plastic milk jug. Recycle the top half and use the bottom piece as a tray to hold plants and animals. When you're done observing, be sure to return any animals you collect back to their homes.

Compare how one kind of animal is different from and similar to another kind of animal. What makes a bird a bird? An insect and insect? A mammal a mammal? What kind of animal is a person? (A person is a mammal.) How are marine mammals different from land mammals? Back inside, use pictures from magazines and ones that you draw to make several collages with each collage illustrating a different kind of animal.



There's a Whale in Your Room!



MATERIALS

- Your favorite drawing or painting materials
- Construction paper in different colors
- Large sheet of butcher paper
- Marine Mammal Field Guide (pages 140-144)

animal eats (sea otters eat sea urchins and crabs) and to create each animal's habitat (sea otters live in kelp forests). Take a friend on a walk-through your oceany room.



The sizes of different marine mammals are in the Field Guide.

Create a mural of mammals that live in the sea. Draw or paint a life-sized harbor seal, sea lion, sea otter, dolphin or other favorite marine mammal. If whales and orcas are too big to fit on your mural, just include the head or tail flukes coming onto or going off of the mural's edges. Use construction paper to cut out food that each

What's for Dinner?



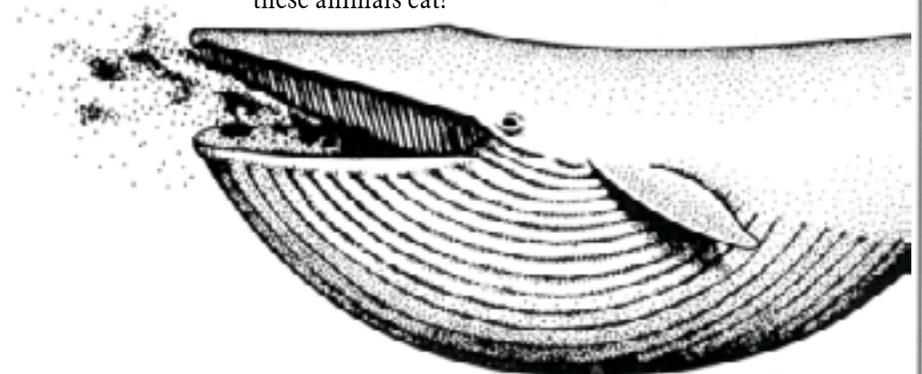
MATERIALS

- Scale to weigh yourself
- Paper
- Pencil
- A variety of utensils from your own and other cultures

Use a scale to compare your weight with that of a 60-pound (27 kilograms) sea otter and a 160-ton (45 metric tons) blue whale. Otters eat a quarter of their body weight each day; this otter would eat about 15 pounds (7 kilograms). Add up the weight of your lunch or dinner to see how many lunches or dinners this otter would eat in a day.

A blue whale eats four tons of krill a day to get three million calories. Calculate how many burgers, pizzas or milk shakes would satisfy that huge appetite.

Now collect a variety of utensils that you use to prepare and eat your food. What kinds of utensils do people from different cultures use? Compare the ways we eat food with the way an otter catches and eats its food. How does a blue whale eat? What kinds of body parts and behaviors help these animals eat?



MARINE MAMMALS

SEARCHING FOR MORE

Take an Imaginary Trip

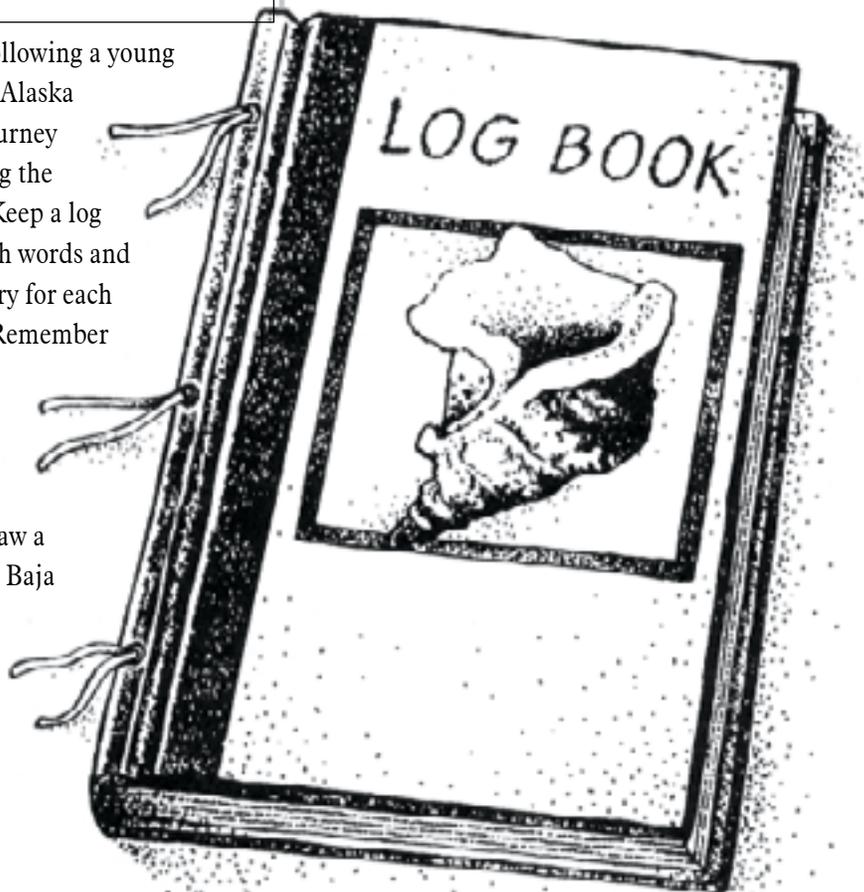


MATERIALS

- 4-5 sheets of white paper to make a log book
 - Decorative paper for cover
 - Heavy-duty needle and thread
 - 12 inches of yarn
 - Pencil and drawing materials
- Map of the west coast of North America, from Alaska to Baja California

TO MAKE YOUR LOG ,
fold the sheets of white paper in half. Unfold
them and cut along
the crease. Stock the papers together and
fold the decorative paper around them.
Stitch the pages and cover together along
the center fold.

Imagine you're on a boat following a young gray whale migrating from Alaska to Baja California. The journey takes about 12 weeks during the late fall and early winter. Keep a log of the whale's activities with words and pictures, recording one entry for each week of the long journey. Remember to write about the fishes and people the whale encounters and the adventures that take place during the trip. Find or draw a map that shows Alaska and Baja California to chart the course of your journey.



MARINE MAMMALS

SEARCHING FOR MORE

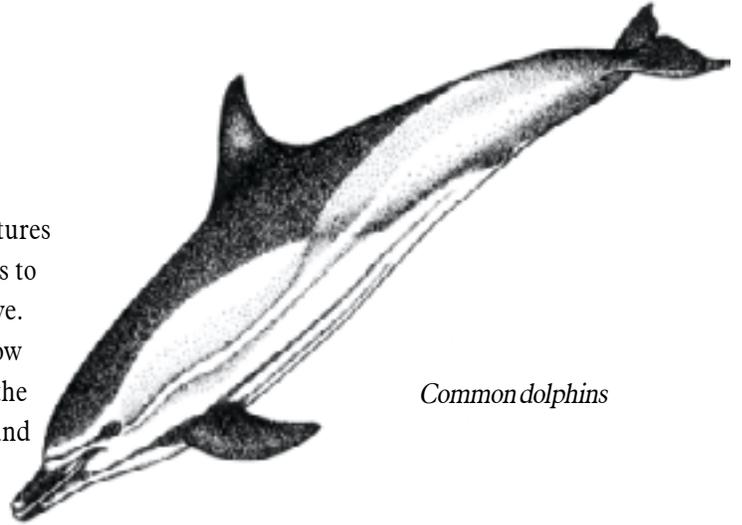
Who Lives Here?



MATERIALS

- Map of the area you're interested in studying
- Marine Mammal Field Guide (on pages 140-144) or pictures from magazines
 - Paper
- Marking pens
 - Guide

On a map, glue pictures of marine mammals to show where they live. Make a chart to show which ones live in the same area year-round and which ones migrate. (Pacific white-sided dolphins, porpoises, seals and sea otters live in Monterey Bay; sea lions, large whales and common dolphins visit during their migrations.)



Common dolphins

Monterey Bay Marine Mammals

Animal	YEAR-ROUND RESIDENT	VISITOR
Sea Otter	X	
Seal	X	
Porpoise	X	
Gray Whale		X
Common Dolphin		X

An Oily Mess

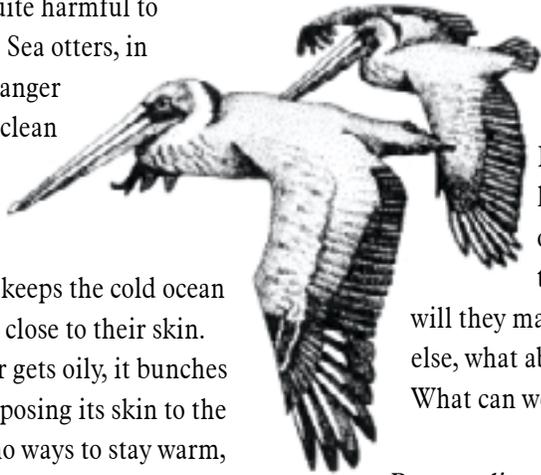


MATERIALS

- Vegetable oil
- Old bowl
- Variety of materials to drop in oil (feathers, fake fur, fabric)
- Variety of materials to clean up oil (soap, cotton balls)

Oil spills can be quite harmful to marine mammals. Sea otters, in particular, are in danger because they need clean fur to stay warm.

Their thick, well-groomed fur makes a layer that keeps the cold ocean water from getting close to their skin. But if an otter's fur gets oily, it bunches up into clumps, exposing its skin to the cold water. With no ways to stay warm, the otter may get sick and die. Pour some vegetable oil into an old bowl. Dip different kinds of materials, like feathers and fake fur, into the oil to see what happens. How would you clean the oil from these materials? How can people minimize the occurrence of oil spills?



Brown pelicans

There Aren't Many Left!



MATERIALS

- Magazines
- Scissors

Collect pictures of threatened animals, like the sea otter and grizzly bear. Are there threatened plants, too? Discuss why these plants and animals are threatened and how they're important to the environment. Plan a way you'd like to help threatened plants or animals. (You may wish to tell a friend, keep the plant or animal's home clean, buy products that don't harm the plant or animals or write letters to key decision makers.)

Do you think people should build houses on farm land where endangered or threatened animals live? If not, then where will people live and how will they make a living? If they build somewhere else, what about the animals that live there? What can we do?



MARINE MAMMALS

SEARCHING FOR MORE

Get Involved!



MATERIALS

- Paper
- Pencil

Write letters to organizations listed on Join A Group Working to Protect the Sea (page 221) to find out how you can help protect whales and other marine mammals. Use this information to make posters for your school or community, paint T-shirts and do other projects that share with people what you've learned about marine mammals, their loss of habitat and why they need protection.

What Do You Think?



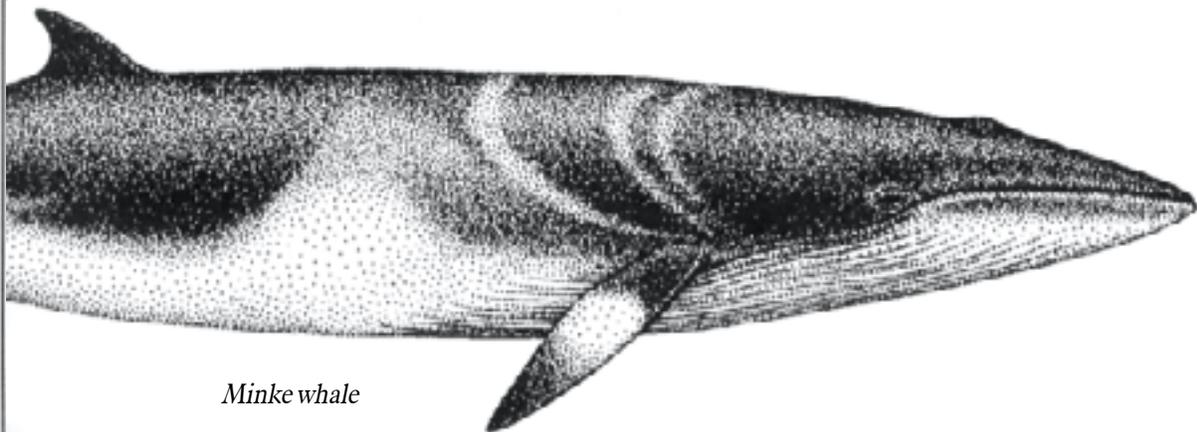
MATERIALS

- Books or other information about federal laws that protect marine mammals

At the library, learn about the different federal laws that protect marine mammals. Do you think protected otter populations should be established on uninhabited islands if this practice threatens the local abalone fishing industry? Is traditional subsistence whaling by native groups justified? Should marine mammals be kept in captivity for educational and entertainment purposes?



Harbor seal



Minke whale

Ollie Otter Lunch Bag Puppet



MATERIALS

- Paper lunch bags
- Copy of the otter's body parts
 - Scissors
 - Glue
 - Crayons
- Yarn or pipe cleaners

the clam in a fold of skin under its arm.

The otter swims back to the surface and float on its back. Setting the rock on its chest as if it's a table, the otter holds the clam and bangs it against the rock to crack open the clam's hard shell. The otter tears at the soft clam body inside the shell with its sharp teeth in front, then chews the clam with its strong jaws and flat teeth that are in back.

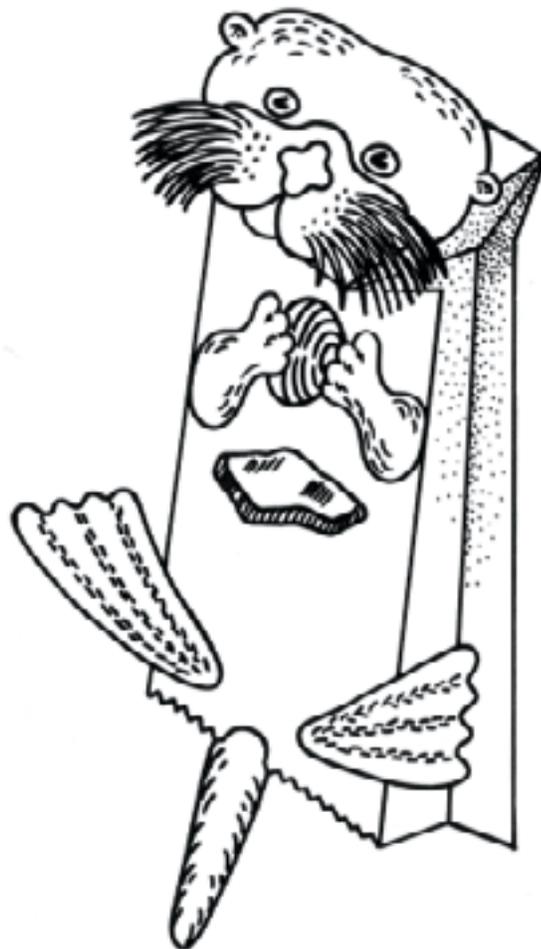
Feeling full, the otter rubs its face and chest with its paws, cleaning its fur from any leftovers. Then the otter rests, floating on its back in the warm sun.

To make Ollie Otter

Cut out the otter's body parts. Glue the otter's head to the bottom of the lunch bag. Use yarn or pipe cleaners to make whiskers. Then glue the tail to the inside edge of the bag and the rest of the parts to the outside. Color your otter with crayons: sea otters are brown-colored with a black nose; clams are yellow or tan. Have children use their puppets to act out the story below while you read it to them.

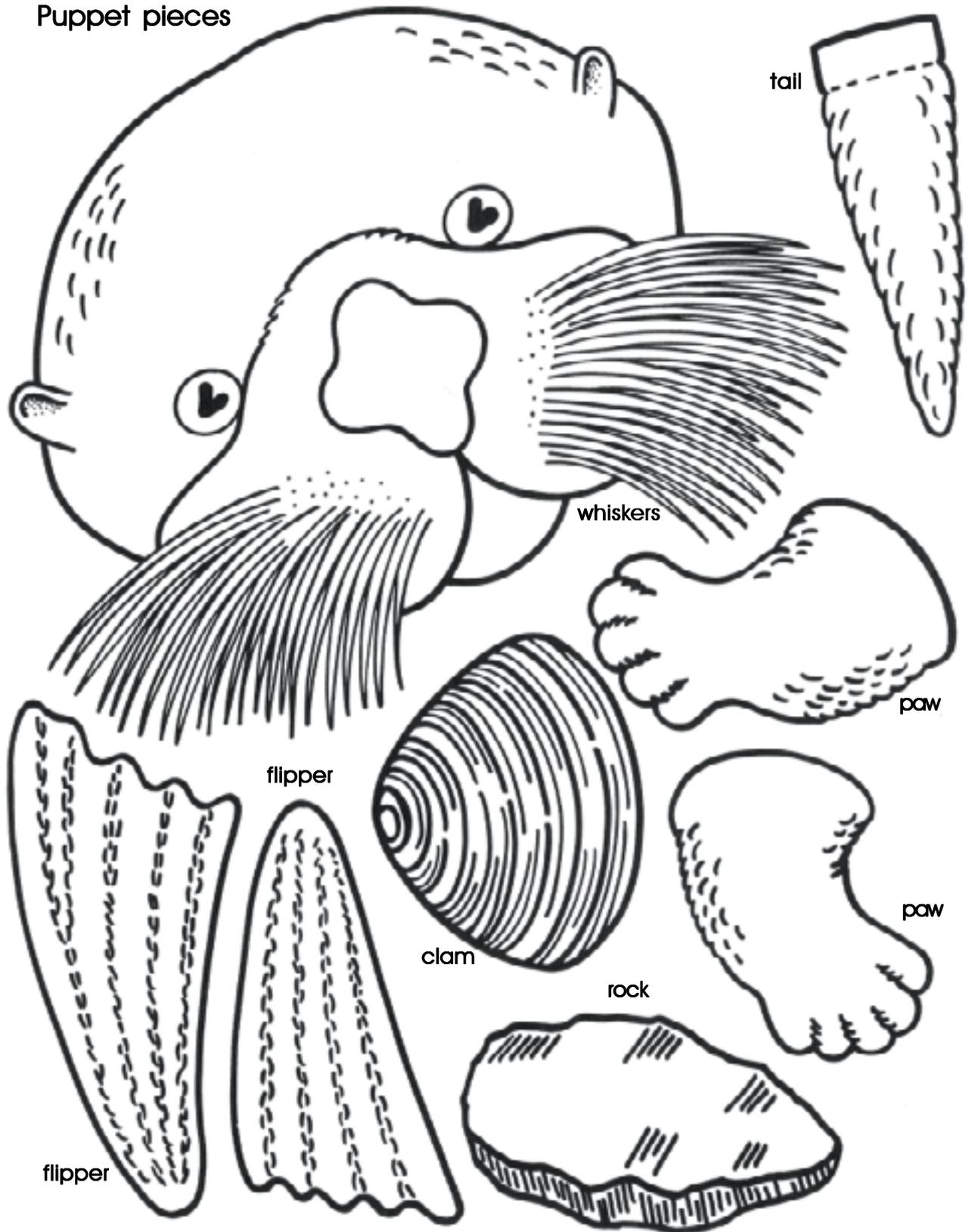
A sea otter's meal

A sea otter dives to the seafloor, searching for something to eat. Steering with its tail, the otter uses its rear flippers, which are webbed like a duck's feet, to paddle itself along. It spots a clam hidden just under the sand and quickly swims over to it. Wriggling its whiskers, the otter feels for the clam, then grabs it with its padded paws. The otter also picks up a small rock, then tucks the rock and

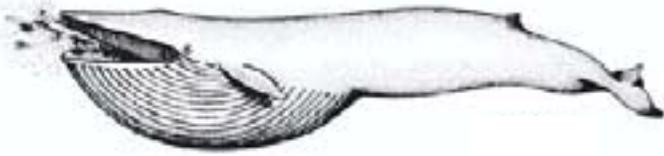


MARINE MAMMALS
SEARCHING FOR MORE

Puppet pieces



Critter Cards - Marine Mammals



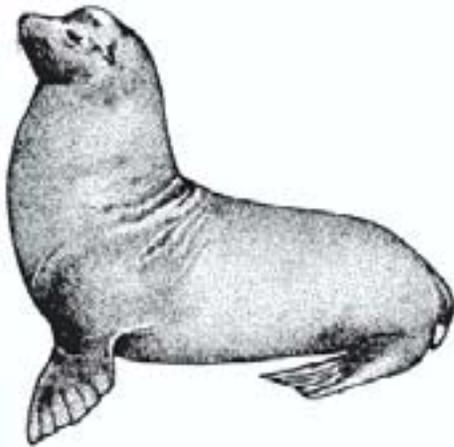
Blue whale

Blue whale

Balaenoptera musculus [size: to 100 ft. (30.5 m)]

Largest of all living animals, the 160-ton blue whale consumes some fairly-small prey. Lunging open-mouthed at schools of shrimplike krill, this baleen whale can engulf and strain four tons of food daily.

The 24-foot long newborn blue whale is an impressive eater, too. Drinking 130 gallons of milk a day, the calf can double its weight in one week.



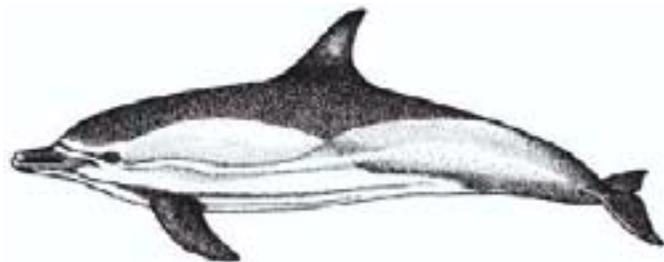
California sea lion

California sea lion

Zalophus californianus [size: to 7.5 ft. (2.3 m)]

Diving 800 feet deep, the sea lion paddles with its strong front limbs and steers with its rear flippers. On land, it rotates the hind flippers forward to walk on all fours.

At mating time, the male sea lion barks and bellows to establish his territory and gather a harem of females. Never giving ground, not even to eat, the bull defends his turf from male intruders.



Common dolphin

Common dolphin

Delphinus delphis [size: to 8.5 ft. (2.6 m)]

These slender dolphins live and travel in huge groups that can cover several square miles. Even in pods of a hundred or more, the dolphins protect each other. When one is injured, the others take turns supporting it so it doesn't drown.

In some countries, people still hunt and eat dolphins. Thousands more die each year, accidentally caught in fish nets.

Critter Cards - Marine Mammals



Dall's porpoise

Dall's porpoise

Phocoenoides dalli [size: to 7 ft. (2.1 m)]

This stocky porpoise has a small dorsal fin and tiny flippers, but it's a spectacular swimmer. Moving like a hydroplane, it races through the water, leaving behind a "rooster tail" of spray when it surfaces for air.

For food, the Dall's porpoise favors deep sea fishing. It roams out beyond the continental shelf to hunt for squids, crustaceans and fishes.



Fin whale

Fin whale

Balaenoptera physalis [size: to 88 ft. (27 m)]

The world's second largest animal, the fin whale can cruise the open ocean at speeds of 35 miles an hour. Most other whales can't swim so fast for extended periods.

Uneven coloring makes the fin whale unique among all whales; its lower jaw is white on the right and black on the left. Dark and light patterns on its body may disguise the fin whale as it hunts fishes.



Gray whale

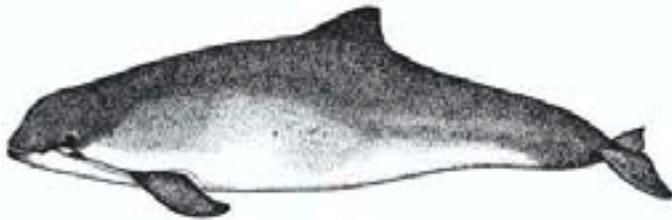
Gray whale

Eschrichtius robustus [size: to 50 ft. (15 m)]

Gray whales make the longest migration of any mammal, swimming 12,000 miles each year. In fall, they head south to their breeding lagoons in Baja California; in spring, they return north to feed in the Bering Sea.

Unlike other baleen whales, the gray whale eats bottom-living crustaceans. The whale sucks in a mouthful of mud and strains it through the baleen to remove the prey.

Critter Cards - Marine Mammals



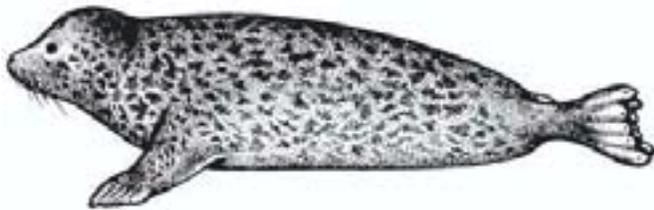
Harbor porpoise

Harbor porpoise

Phocoena phocoena [size: to 6 ft. (1.8 m)]

The stocky harbor porpoise lives near shore in harbors, bays and river mouths. Wary of boats, it won't cruise alongside them, preferring to swim quietly on the surface.

Harbor porpoises work cooperatively to hunt squids and fishes. The porpoises herd a school of fish into a tight ball, then each porpoise grabs a fish head-first and swallows it whole.



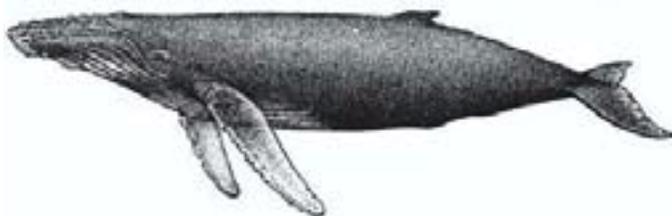
Harbor seal

Harbor seal

Phoca vitulina [size: to 5 ft. (1.5 m)]

A harbor seal can't "walk" on land the way a sea lion can. On shore, the harbor seal has to inch along awkwardly on its belly, but in water, it's a graceful swimmer, powered by its webbed hind flippers.

Harbor seals don't migrate far from home. They hunt fishes, squids and octopuses near shore, using their large eyes and sensitive whiskers to help them locate prey.



Humpback whale

Humpback whale

Megaptera novaeangliae [size: to 51 ft. (15.6 m)]

Humpback whales travel between their Arctic feeding grounds and tropical breeding grounds. Some migrate to Hawaii and some to Mexico; a few visit both sites in different years.

In the breeding areas, the males display their great vocal range with songs that may warn off other males or attract females. As they sing, the whales gradually alter their song, so each year it's a different melody.

Critter Cards - Marine Mammals



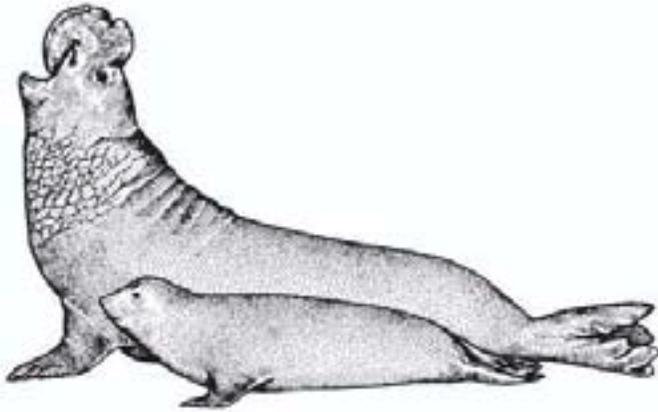
Minke Whale

Minke whale

Balaenoptera acutorostrata [size: to 35 ft. (10.7 m)]

Although it's as long as a bus, the minke whale is the smallest of the baleen whales. As agile as a porpoise, it can leap from the water in a graceful arc or ride the bow wave of a passing ship.

Alone or with a companion, the minke whale hunts squids, fishes and krill. The whale jumps and splashes to gather its prey in a ball, then lunges in to scoop up the cluster.



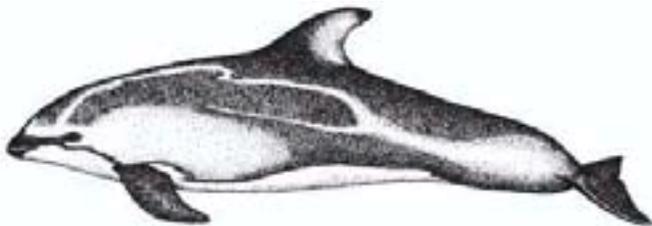
Northern elephant seal

Northern elephant seal

Mirounga angustirostris [size: to 19.5 ft. (5.9 m)]

Once hunted to near-extinction, elephant seals are now breeding successfully again. At mating time, they move ashore, the males battling for position. With snorts of warning, the dominant bulls defend their females against rival males.

After breeding, the elephant seals return to the sea to feed. Diving deeper than 2,700 feet, they hunt deep water fishes and squids.



Pacific white-sided dolphin

Pacific white-sided dolphin

Lagenorhynchus obliquidens [size: to 7 ft. (2.1 m)]

Resident pods of hundreds of white-sided dolphins streak through Monterey Bay. They swim in formation with other dolphins and sea lions, sometimes leaping from the water in spirited somersaults.

Each dolphin is unique, from the patterns on its body to the noises it makes. High-pitched squeaks, clicks and whistles help it communicate with its family pod.

Critter Cards - Marine Mammals



Sea Otter

Sea otter

Enhydra lutris [size: to 5.5 ft. (1.7 m)]

For warmth, the sea otter relies on its thick fur coat with 600,000 hairs per square inch. The otter spends nearly half its waking hours grooming its fur coat to keep it waterproof.

The otter dives for shellfish, then eats lying on its back at the surface. Because it consumes abalones and crabs, the otter sometimes competes with people for food.



Sei whale

Sei whale

Balaenoptera borealis [size: to 60 ft. (18.5 m)]

Sei whales cruise the oceans from polar regions to the tropics. Unlike other baleen whales, they don't have predictable migration routes but seem to follow their prey, trailing the northward fish migrations.

Swimming near the surface, the whale skims small invertebrates from the sea. As it feeds, the whale's throat pleats expand like an accordion to hold tons of water and prey.



Sperm whale

Sperm whale

Physeter macrocephalus [size: to 62 ft. (18.9 m)]

Diving a mile or more below the surface, the sperm whale makes clicking noises to echolocate for prey. When it finds a shark or giant squid, the whale stuns it with a blast of sound and swallows it whole.

For years, whalers hunted this whale for the milk-colored oil that fills its huge square head. No one knows what the oil is for; perhaps it helps the whale focus sounds.