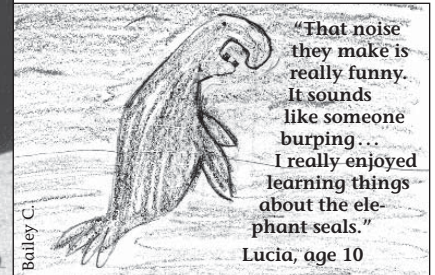


Elephant Seals

Point Reyes National Seashore

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Wild Wonders of the Deep

Point Reyes National Seashore is one of the few places in California where you can see North America's largest seal, the northern elephant seal. On shore for only a few months each year, these large but elusive creatures are often heard before they are seen. They are very social on land yet live a solitary existence at sea. This is the story of a remarkable species, living a life of extremes.

A Close Call with Extinction

While exploring the Pacific Coast in the 1800s, a British whale and seal hunter named Charles Scammon saw northern elephant seals from Baja California in Mexico, to Point Reyes, California, north of San Francisco. Elephant seals currently range from Mexico to Alaska and spend 80 percent of their life in the open sea. Sharing the fate of many of the oceans' great whales, they were hunted to the brink of extinction for their oil-rich blubber. One bull elephant seal would yield nearly 25 gallons of oil. Though we don't know exactly how many northern elephant seals were alive before the twentieth century, it has been estimated that fewer than 1,000 existed by 1910. The Mexican government banned elephant seal hunting in 1922, followed shortly by the United States government. Since then, the population of northern elephant seals has recovered at an average annual rate of 6 percent. Today, thanks to government protection and the seals' distant lives at sea, the worldwide population has grown to an estimated 150,000 animals.

Elephant seals exemplify the remarkable recovery of a near-extinct species.

After being absent for more than 150 years, elephant seals returned to Point Reyes Headlands in the early 1970s. In 1981, the first breeding pair was discovered near Chimney Rock. Since then, researchers have found that the colony is growing at a dramatic

annual average rate of 16 percent.

When severe storms occurred in 1992, 1994, and 1998, many pups were killed. During the El Niño winter of 1998, storms and high tides washed away approximately 85% of the 350 young pups before they had learned to swim. Nevertheless, the Point Reyes winter population of elephant seals is between 1,500 and 2,000. Fanning out from their initial secluded spot, the seals' expansion to popular beaches is causing concern for both their safety and that of their human visitors.

Proximity of People and Pets Raises Concern

A beach full of lumbering and slumbering seals is a rare and spectacular sight. Some people feel compelled to get "just a little closer". Unlike other seals and sea lions that react by stampeding into the water when disturbed, elephant seals do not always retreat from humans. Instead they may react by fighting with each other or moving to another section of beach. An ill-timed move could crush a pup or separate a female from her pup, creating a possible life-or-death situation for the young elephant seal. Human presence especially frightens pregnant females and new mothers, discouraging them from returning the next year. When surprised or approached too closely, elephant seals will also chase or bite people. Any change in elephant seal behavior caused by a person is, by definition, a violation of the Marine Mammal Protection Act. If you are less than 100 feet from an elephant seal, you are too close.

Dogs pose a safety concern to elephant seals. Predatory behavior and possible disease transmission (from dogs to seals, or vice versa!) could create serious problems for either animal. A dog's scent can frighten and disturb seals. Even on a leash, a dog may threaten seals by barking or cause injury by biting. Some beaches in the Park will temporarily be closed to dogs as the beaches become inhabited by breeding elephant seals.



Kim Linse
Leashed dogs are welcome on South Limantour, North, South, and Kehoe Beaches when wildlife restrictions are not in place. Please inquire at the Visitor Centers about pet restrictions and watch for closure signs.

Competition for Habitat

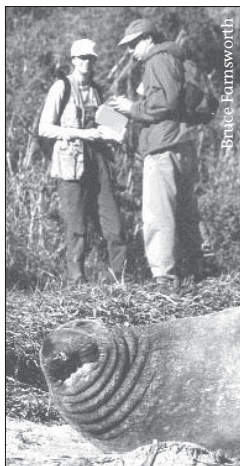
Sensitive resources such as birds and plants are also affected by elephant seals. The western snowy plover, a federally-threatened species under the Endangered Species Act, breeds on few California beaches. Loss of habitat to beachfront development and human recreation has forced elephant seals and plovers to compete for limited protected space. Also, rare plants native to coastal dunes are potentially at risk. Elephant seals and their curious

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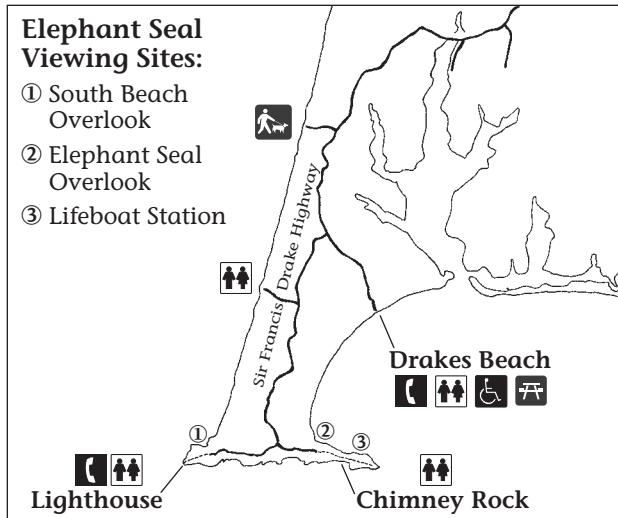
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human visitors may physically crush plants that are struggling to remain alive.

The Park's task is to balance the expansion of the elephant seal colony while providing for the health of other species. To manage this balance, the Park will continue its docent program, which provides visitors with on-site information and safety messages at the overlooks. To anticipate where the elephant seals might expand to next, researchers will attempt to discover why seals prefer to breed on some beaches and not others. This information will allow the Park to make informed choices about appropriate beach use by people, pets, and wildlife.



Biologists monitor seal behavior.



At Sea

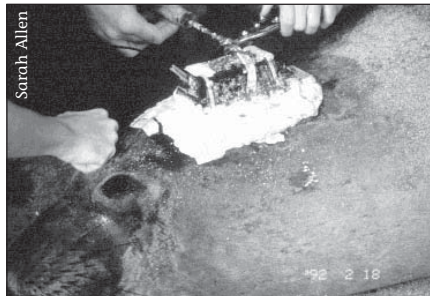
The Secret Lives of Elephant Seals

Northern elephant seals are mysterious and unique creatures. Not only do they spend most of their life in the ocean, but 90 percent of that time is spent underwater: eating, sleeping, digesting, and traveling. They are built to survive continuous dives to depths that would squeeze the life out of any other mammal. The average dive reaches 2,000 feet, lasts close to half an hour and is followed by only 3 to 5 minutes at the surface to breathe. Imagine being able to live in such extremes!

The deepest dive on record is over 5,000 feet and the longest dive is 2 hours!

Why do they dive so deep? The oceans are full of food for millions of animals, but relatively few feed at the depths elephant seals prefer. As a result, they face little competition for food. Feeding in almost total darkness, elephant seals use their large eyes and the bioluminescence of some prey, such as octopus and squid, to find food where other predators would not even be able to see. They may use their stiff yet sensitive 3- to 8-inch whiskers to "feel" some food, such as Pacific hake, skates, rays, shrimp, small sharks and crabs.

What allows such deep diving? Pressure increases as any object goes deeper into the ocean. As animals dive, the pressure on the outside compresses the air in their bodies. Elephant seals differ from humans in that when they dive, they carry all the oxygen they need in their blood rather than in their lungs. Before they dive, elephant seals exhale, collapsing their lungs so there is little air to be compressed. As they dive, the seals' fat is also compressed so that the



Electronic devices (time depth recorders) attached to elephant seals measure the depth and duration of dives, the amount of time spent resting at the surface between dives, and the sequential patterns of dives.

animals lose buoyancy and sink, allowing the seals to achieve great depth with little effort.

Elephant seals prolong their dives by reducing their heart rates. A seal resting on land has a heart rate of 55 to 120 beats per minute, but when diving, the heart slows to 4 to 15 beats per minute.

The seal maintains normal blood pressure by decreasing the blood supply to its extremities, allowing the blood to flow primarily to the vital organs and the brain. This also helps the seal conserve body heat when down in the cold ocean depths. During semiannual migrations, adult males and females not only travel thousands of miles apart, but also tend to have different feeding patterns. Males tend to return to the same feeding areas off the Aleutian Islands each year, while females tend to feed in the northeast Pacific and near Hawaii. To complete their two annual round-trips, females journey over 11,000 miles, males 13,000 miles. Males dive deeply and repeatedly for food. After about 3 weeks, they have eaten so

much that their dive pattern changes to a flat-bottom dive, following the bottom contours as they rest and digest. Females also dive deeply and repeatedly, but they go deeper during the daytime than at night.

Although their locations and diving patterns differ, both sexes dive repeatedly for 4 to 5 months during summer



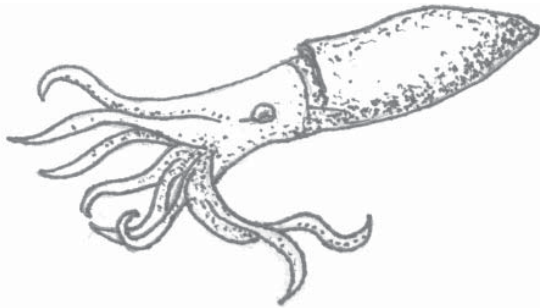
Northern elephant seals journey between their feeding grounds and land twice each year. They return to land in winter to breed and in spring/summer to molt (shed).

and fall. Research suggests that elephant seals forage continuously during their migrations and, furthermore, they don't sleep! They may take underwater "catnaps" when they dive, as their heart rate slows, making only brief, infrequent surface appearances. This pattern, and the incredible amount of time spent below the surface, explains why so few of them have been seen in the open ocean despite their rapidly growing population.

Point Reyes National Seashore is one of the few places on the Pacific Coast where northern elephant seals can be observed and studied on shore. Their semiannual sojourns to the shores of Point Reyes provide a unique opportunity to glimpse the lives and behaviors of these elusive ocean giants. Visit the Elephant Seal Overlook near Chimney Rock and discover for yourself the secrets of these wild wonders of the deep!

What Do Elephant Seals Eat?

While elephant seals are at sea, they need to store enough energy to sustain themselves when they haul out to give birth and mate in the winter and again in the summer when they molt. But how do you find out what an elephant seal eats at sea when it dives to depths of up to 5,000 feet? By looking at the stomach contents of elephant seals that have died, scientists have found that seals have a varied food source with their favorite or most common food being squid that can be up to 6 feet long.



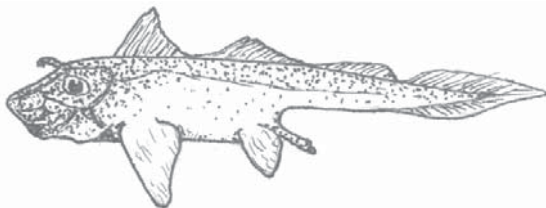
1 to 6 feet

Squid are the most frequently consumed prey of the northern elephant seal. They live far offshore in deep water and are found in large groups. This grouping occurs during the breeding cycle and also when following large schools of prey.



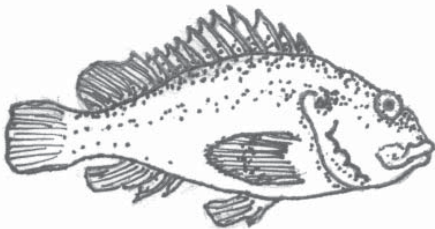
3 feet

Pacific hake range from northern Alaska to Magdalena Bay in California, and are found at depths of 183 to 914 meters. They are schooling fish migrating vertically each day (feeding nearer to the surface as night approaches), and offshore in the winter. It feeds mainly on fishes, but also on squid and crustaceans.



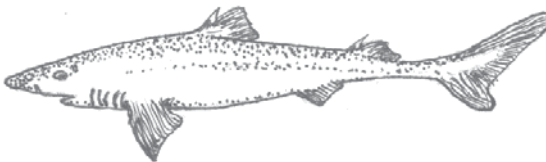
4 feet

Ratfish are found mainly in the cooler regions of the Atlantic, Pacific and Indian Oceans. They are long-bodied fish, sharklike in many respects, with a long dorsal spine that is connected to a venom gland. They are very abundant and are found at depths of 92 to 913 meters.



18 inches

Rockfish belong to the family of redfishes and scorpion fishes, and are found worldwide, except in the Antarctic region. They are abundant fish living at depths of 73 to 640 meters, and are important commercial species, as well as an important prey of halibut and albacore. Average length is 18 inches.



4 feet

Dogfish have a sharp spine in front of the dorsal fin which can inflict serious wounds made worse by the venom that is injected. These sharks are found worldwide in inshore waters at depths up to 950 meters.

On Land

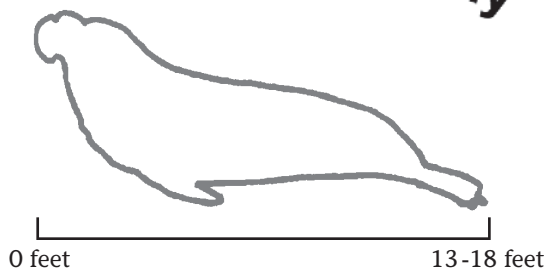
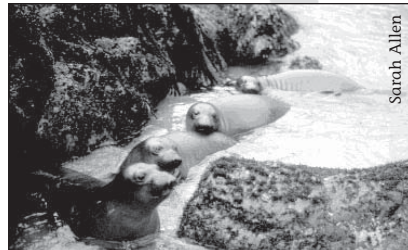
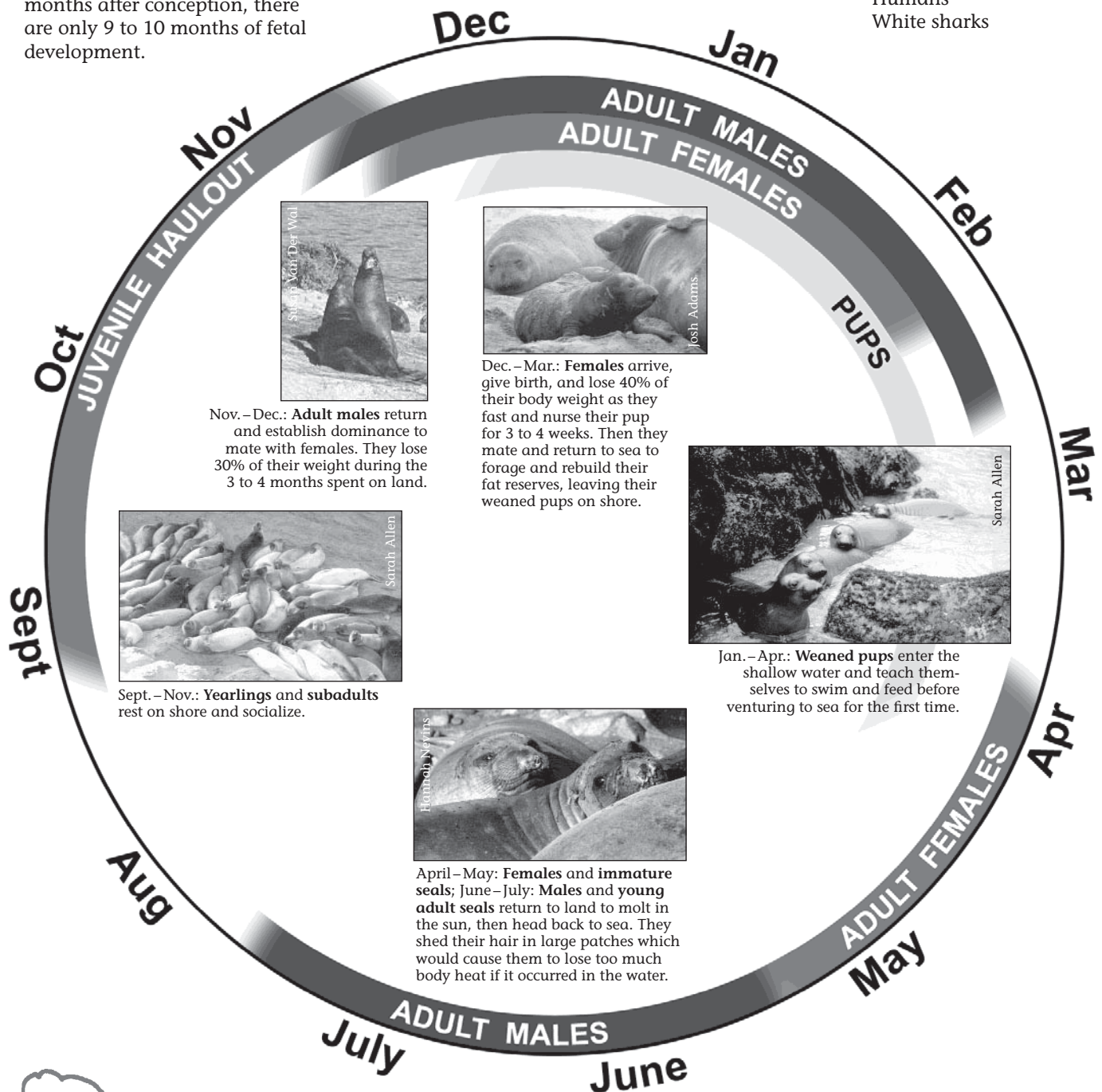
Northern elephant seals can be seen on land at Point Reyes National Seashore for a few months each year. During the rest of the year, elephant seals live only in the ocean.

Delayed Implantation

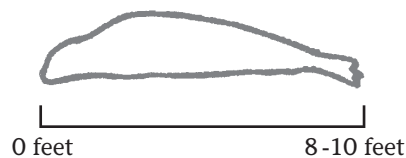
Although pups are born 12 months after conception, there are only 9 to 10 months of fetal development.

Predators

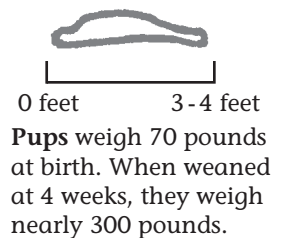
- Orcas
- Humans
- White sharks



Bulls weigh 3,000-5,000 pounds.



Cows weigh 800-1,200 pounds.



Elephant Seal Monitoring

Have you ever wondered how scientists learn about animals as unusual as elephant seals? By monitoring elephant seals at Point Reyes researchers and scientists determine trends in seal populations, migration, and reproductive success. This data is used as a baseline to determine trends, quantify annual reproductive success, and learn about their biology.

When Does the Monitoring Happen?

Elephant seals arrive at Point Reyes in December through March during the breeding season and again during May through July, as seals return to Point Reyes to molt (shed and regrow their entire fur coat).

Where Does the Monitoring Happen?

The monitoring occurs in all the elephant seal colonies found on the Point Reyes Headlands including the colony that you will visit at Chimney Rock.

What Are the Methods?

Researchers visit elephant seal colonies regularly during the pupping and mating season. They count seal numbers, births, deaths, and document unusual behavior. Listed below are other methods that researchers use to determine biology and to track individual animals.

Flipper Tags

These tags are made of colored plastic. The color of tags used by researchers can let you know the geographic location where the animal was tagged. Marine mammal rehabilitation hospitals, like The Marine Mammal Center, tag their rehabilitated patients that are released back to the wild with orange tags only. Sea lions are tagged on their front flippers. Seals are tagged in the webbing between digits on their hind flippers.

Brands

Researchers will tag and permanently brand numbers on the animal's back or side in an effort to track the animal during its entire life. Tags are not as reliable as a brand. Tags may fall off, or the numbers may rub off. Tags are harder to see. The continued observation of branded individuals can provide a wealth of information about range, behavior, and life history of not only that individual but the entire species. The numbers are put on with either a hot brand or a cold brand. A hot brand is done with a heated metal number. The cold brand is a copper number chilled with liquid nitrogen. With both procedures the animal must be held still—not an easy task. The hot brand takes seconds to leave a mark, while the cold brand may take a minute or more. Hot brands are easier to apply, but they kill the fur follicles and cause deep damage if done carelessly. Cold brands are not as damaging. The fur grows back white in color, so the number is visible.

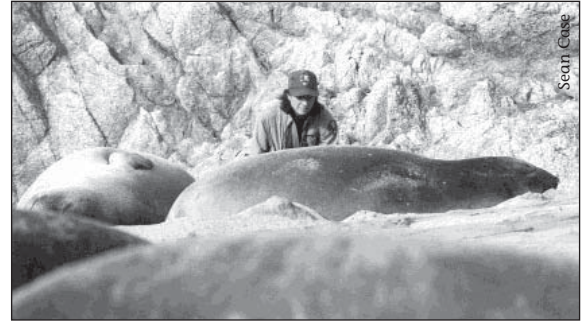
Dye Marks

Numbers, names, or identifying marks are sometimes dyed into the fur of seals and sea lions. Regular hair dye, donated by a company or by Lady Clairol™, is used. Dye marks are only temporary as they disappear when the animal molts.

Time Depth Recorders, Radio Tags and Satellite Tags

Time depth recorders (TDRs) are set in a white plasterlike base and are glued with epoxy to the seal's back. These are convenient to use with elephant seals that return to the same location on land when they molt, so the TDR can be easily retrieved. The information gathered by a TDR is transferred to a computer for analysis. TDRs are activated by sensing light and dark. TDR data enable scientists to see how often the animal dives, and the depth and duration of the dive. Researchers have also used TDRs with harbor seals.

Radio tags and satellite tags have a small transmitter and battery encased in epoxy. The antenna can be internal or protrude. The tags may be attached to a flipper or glued to the head or back with super glue. Each radio tag has a specific radio frequency. The signal is detected using a handheld receiver.



Sean Cause



Seal Viewing Tips

- For your own safety, always observe elephant seals from a distance. Use binoculars and spotting scopes. If a seal becomes alert or nervous and begins to move away, you are too close.
- Stay at least 100 feet from any marine mammal.
- Do not come between a cow and pup, a bull and a group of cows, or two bulls challenging each other.
- Watch quietly; whisper. Move slowly.
- Bring your pets only where they are allowed.
- Observe beach closures and restrictions.



Susan Van Der Wal

Special Thanks

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Point Reyes National Seashore Association
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