



# The Historic Point Reyes Lighthouse

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Golden Gate NRA, Park Archives

Looking down at the busy wharves along San Francisco Bay from the city's famous hills in the mid-19<sup>th</sup> Century.



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A West Marin cowboy posed in front of his herd. By 1870, Marin County produced more than two million pounds of butter. Butter produced out on the Point Reyes Peninsula was considered of "gilt-edged" quality and commanded higher prices.

## A Challenging Place

*"Better to dwell in the midst of alarms than reign in this horrible place."*

~ attributed to a lighthouse keeper at Point Reyes

Virtually overnight, the California Gold Rush transformed the city of San Francisco from a sleepy bayside hamlet of about 1000 citizens to an international destination. The port hummed with activity. Would-be prospectors and ambitious merchants docked alongside cargo ships laden with mining and building materials, farm produce, and other supplies. People from all over the world boarded ships with the dream of striking it rich in the hills of California, and the main point of debarkation was San Francisco. But navigating the ferocious currents, foggy conditions, jagged cliffs, and off-shore rocks of the California coastline was a daunting proposition. In the newly-established state of California, navigational aids were virtually nonexistent. In 1853 the first California lighthouse was constructed on Alcatraz Island—then an army fort—and lit in 1854.

After the gold rush, Point Reyes became San Francisco's chief supplier of dairy products and hogs, carried by schooners which sailed from Tomales Bay and Drakes Estero to the city. As early as 1849, it was recognized that Point Reyes would play an important role in the protection of coastal traffic and in the economic prosperity of the western United States. However, land disputes and political intrigue delayed the establishment of a lighthouse for another twenty years. Over a fifteen-year period, about one million dollars of shipping losses were sustained in the waters offshore of Point Reyes before the lighthouse was built.

At a total cost of around \$100,000 for the building and equipment, well over the initial \$16,000 allocated for it, the Point Reyes Lighthouse began operation on December 1, 1870. The historic light remained in operation until it was decommissioned in 1975. Its navigational function has been replaced by an automated beacon located in a separate building below the lighthouse. The original lighthouse, including its remarkable lens and clockworks, is now preserved as an historic landmark.

## Why Build a Lighthouse at Point Reyes?

The treacherous currents and offshore rocks here have foundered many ships. In addition, Point Reyes is one of the windiest and foggiest places on the Pacific Coast. Powerful winter storms that often come howling in from the southwest dump volumes of water along the Inverness Ridge and continue across the Central Valley to blanket the Sierra Nevada with snow.

Springtime wind speeds can reach hurricane force, with winds exceeding 130 mph (210 kph) have been measured at the headlands. In summer, the temperature differential between the cool Pacific Ocean at around 52°F (11°C) and the warmer land causes dense fog to form along this coast. These hazardous conditions threaten the safety of the cargo and sailors that pass by the point. It is no wonder that the area now known as Point Reyes has seen over 73 major marine wrecks, 37 of them total losses.

On January 28, 1913, the *Samoa*, was en route to San Francisco from Caspar, CA, with a heavy cargo of lumber. In the deep fog off the Point Reyes Beach, she ran aground less than 600 yards from the U. S. Lifesaving Service station. The surfmen rushed to the beach, breeches buoy in tow. This rescue tool is employed using a small cannon that shoots a cable to the deck of the ship, then a buoy is attached and sent along the cable to the ship to bring the crew to shore. This is challenging work, especially as it is often being performed under extreme weather conditions. However, with the help of local ranchers, the crew of the *Samoa* were all hauled to safety.



Operating the breeches buoy during the rescue of the *Samoa*, 1913.

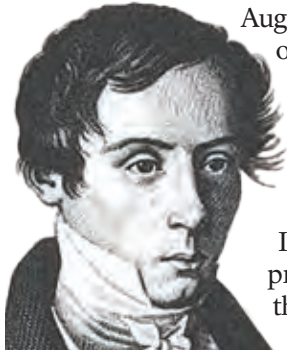


The steamer *Munleon* was bound from San Francisco to Astoria, WA carrying sugar, salt, and other general supplies. Due to a navigational error on the part of the Third Officer, she ran aground one mile east of the Point Reyes Lighthouse on November 7, 1931. The Coast Guard managed to launch a rescue boat from the newly-constructed Life Saving Station marine railway at Chimney Rock, and rescued all 29 hands. However, not all lifesaving attempts were so successful. In 1914, despite 18 hours of effort, rescuers were unable to save 23 of the 62 passengers and crew of the *Hanalei*, which ran aground on Duxbury Reef.



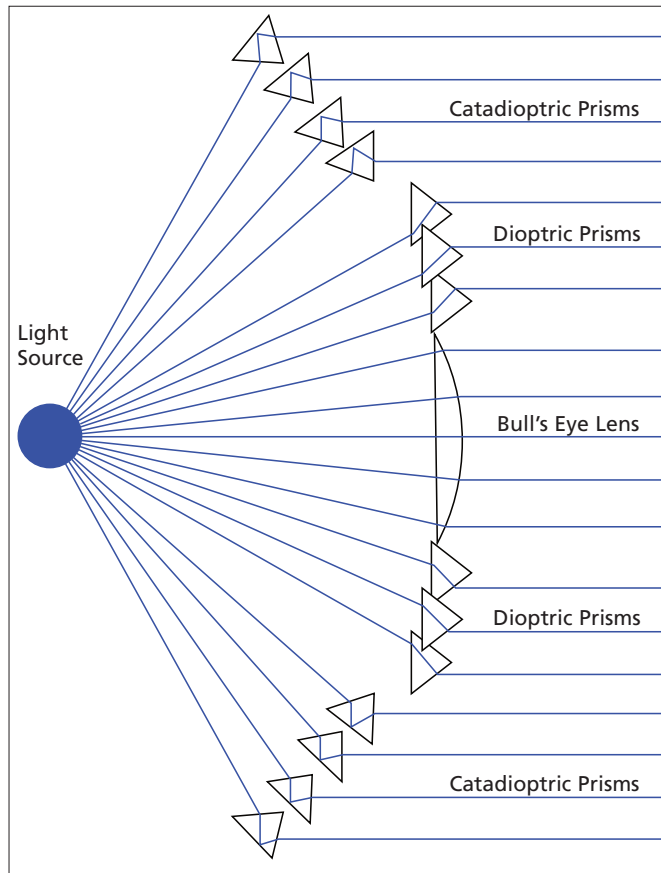
*Munleon* wrecked on the rocks near the Point Reyes Lighthouse, 1931.

# The Fresnel Lens



Augustine Jean Fresnel (1788-1827) of France wrote *Le Mémoire de Fresnel sur la diffraction de la lumière*, published in 1818, for which he received the 1819 Grand Prix from the Académie des sciences in Paris. In this article he documents the properties of light as it travels through prisms and lenses. He took his findings further by constructing the first

lighthouse lens in 1823, now called a Fresnel (*fray-nel*) lens, and went on to become a commissioner of lighthouses and member of the Académie and the Royal Society of London.

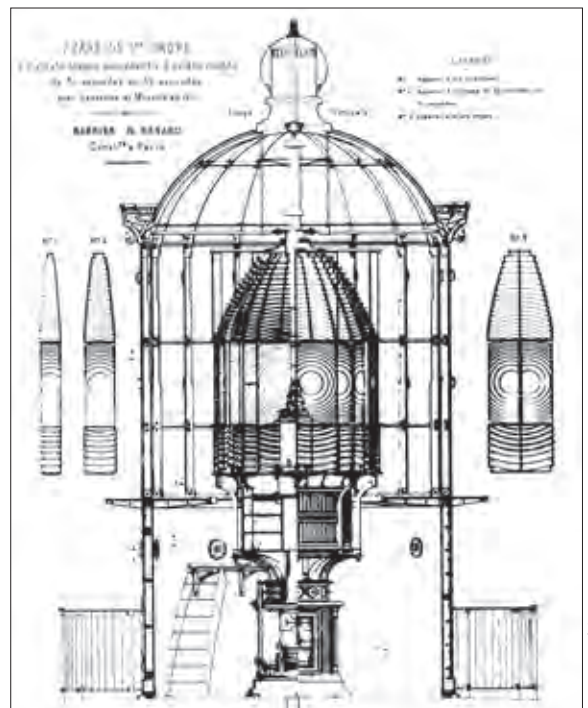


The Fresnel lens works through precise prism and lens alignment, so that the central source light, whether oil lamp or electric bulb, is bent or refracted and transmitted as concentrated parallel beams, making the light visible from farther away. Dioptric prisms bend the light once, while catadioptric prisms bend it twice.

His lens revolutionized lighthouse optics. When Fresnel developed this lens, lighthouses were using mirrors to reflect light out to sea, a method not too different from that believed to have been used in the ancient lighthouse at Alexandria, Egypt. In the early 19<sup>th</sup> Century, the most effective lighthouses could be seen eight to twelve miles away.

The Fresnel lens intensifies the light by refracting (bending) and magnifying the light source through crystal prisms into concentrated beams. On clear nights, the largest lenses, called first-order lenses, such as the one in Point Reyes' historic lighthouse, are visible all the way to the horizon, almost twenty-four miles away.

The Point Reyes Fresnel lens, which resembles a giant beehive, is divided into 24 vertical panels each with identical arrangements of prisms and one bull's eye lens (see graphic below). Each of these panels transmits an individual beam of concentrated light. The 6,000-pound lens sits on a clockworks mechanism that rotates the lens using gears and a counterweight. One complete rotation takes two minutes. As the lens rotates the beams sweep over the ocean like spokes on a wagon wheel, creating the Point Reyes Lighthouse light signature pattern of one flash every five seconds.



Design for the Point Reyes Lighthouse Fresnel lens and clockworks. This equipment is in the Point Reyes Lighthouse today, although it is no longer in operation.

## A Day in the Life

Keeping the lighthouse in working condition was a twenty-four hour job. The light was lit between sunset and sunrise, but there was work to do all day long. The head keeper and three assistants shared the load in four six-hour shifts.

The work combined mind-numbing routine with back-breaking toil. Some days were spent washing, scraping, and whitewashing buildings, or hauling coal and pushing it down a chute to the fog signal building, another 150 feet below the lighthouse. Other duties included cleaning the lens, polishing brass, and making necessary repairs. Days were followed by sleepless nights, watching the lamp and, when it was foggy, shoveling coal for the steam-driven fog whistle.

Every evening, a half-hour before sunset, a keeper walked down the wooden stairs to light the oil lamp in the center of the lens. Once the lamp was lit, the keeper wound the clockwork every two hours and twenty minutes to rotate the lens and create the flash. Throughout the night, he kept the lamp wicks trimmed so that the light would burn efficiently.

It must have been a lonely vigil on evenings when the wind howled and storms broke against the lighthouse and foghorn buildings. It's hard to imagine spending the



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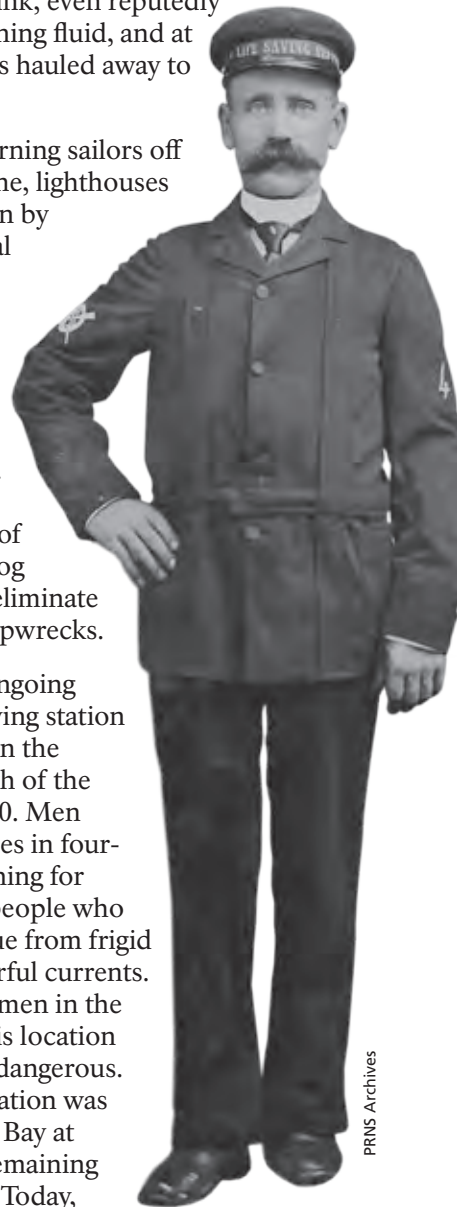
Building the stairs down to the original foghorn building, another 150 feet below the lighthouse level.

dark night watch by the light of an oil lamp, or on foggy nights, shoveling 140 pounds of coal an hour to keep the foghorn blaring for several miles out to sea.

At the end of each shift, the keeper trudged back up the wooden staircase, sometimes in winds so strong that he had to crawl on his hands and knees to keep from being blown off the cliff. Men of fortitude lasted several years, while others barely stayed a month. Some men succumbed to drink, even reputedly drinking the cleaning fluid, and at least one man was hauled away to an asylum.

In addition to warning sailors off the rocky shoreline, lighthouses also aid navigation by identifying coastal location by their unique flash patterns. When it is too foggy to see the lighthouse, a fog signal is essential. However, even the combination of lighthouses and fog signals does not eliminate the tragedy of shipwrecks.

Because of this ongoing problem, a lifesaving station was established on the Great Beach north of the lighthouse in 1890. Men walked the beaches in four-hour shifts, watching for shipwrecks and people who would need rescue from frigid waters and powerful currents. After losing four men in the first five years, this location was deemed too dangerous. In 1927, the operation was moved to Drakes Bay at Chimney Rock remaining active until 1968. Today, the building is a National Historic Landmark.



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Life Saving Service members assisted in 35 ship rescues, saving hundreds of lives.

## A Look Inside the Lens

When the Point Reyes Lighthouse is open for tours, it provides a glimpse into the 19<sup>th</sup> Century, when machines were king. Enormous metal structures were created on a colossal scale for art, science, and industry. The first-order lens—with 1032 pieces of hand-ground crystal—and the clockworks that drove it are in good condition and look almost as if they had just arrived.

The brass nameplate proudly announces its origins in Paris and the date of manufacture (1867). The curving stairs up to the lens level (not accessible to visitors) provided the keepers access to the oil lamp for lighting and wick trimming. This stairway was also the path to the backbreaking chore of cleaning the glass of soot accumulated from smoke caused by the oil lamp.

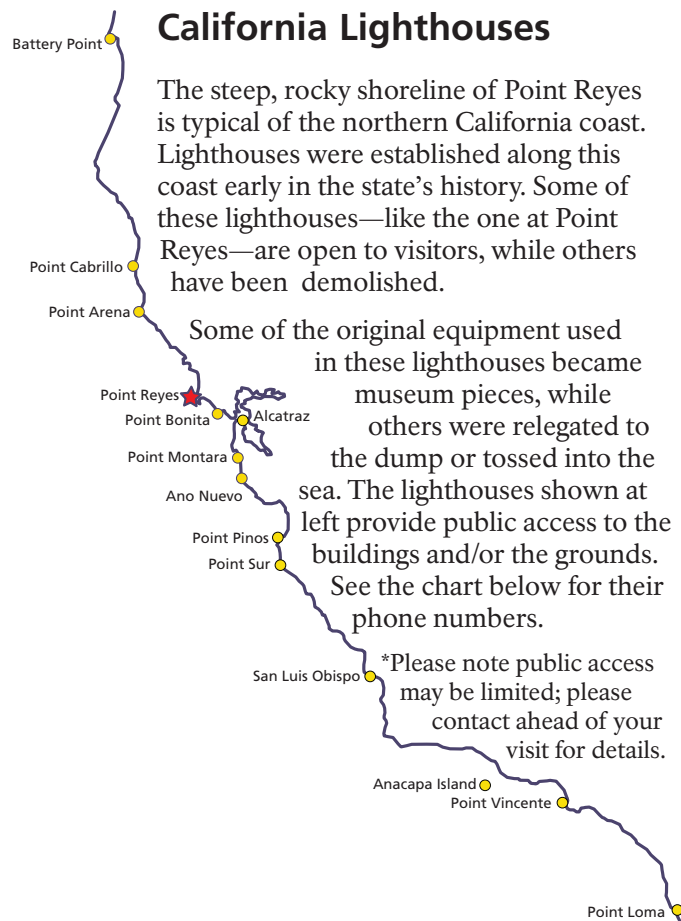
Take a walk back in time, visit the headland with its compelling beauty and distinctive lighthouse. Come explore the historic and natural world of Point Reyes!



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The original equipment, manufactured in 1867 in Paris, is still housed in the historic lighthouse lensroom. Tours are usually available during days of operation, Thursday-Monday, in the afternoons.

## California Lighthouses



The steep, rocky shoreline of Point Reyes is typical of the northern California coast. Lighthouses were established along this coast early in the state's history. Some of these lighthouses—like the one at Point Reyes—are open to visitors, while others have been demolished.

Some of the original equipment used in these lighthouses became museum pieces, while others were relegated to the dump or tossed into the sea. The lighthouses shown at left provide public access to the buildings and/or the grounds. See the chart below for their phone numbers.

\*Please note public access may be limited; please contact ahead of your visit for details.

Alcatraz Island:  
415-561-4700  
[www.nps.gov/alca](http://www.nps.gov/alca)

Alcatraz Ferry:  
415-981-7625  
[www.alcatrazcruises.com](http://www.alcatrazcruises.com)

Anacapa Island:  
805-658-5700  
[www.nps.gov/chis](http://www.nps.gov/chis)

Battery Point:  
707-464-3089  
[www.lighthousefriends.com](http://www.lighthousefriends.com)

Pigeon Point:  
650-879-2120  
[www.parks.ca.gov/](http://www.parks.ca.gov/)

Point Arena:  
707-882-2777  
[www.pointarenlighthouse.com](http://www.pointarenlighthouse.com)

Point Bonita:  
415-331-1540  
[www.nps.gov/goga/pobo](http://www.nps.gov/goga/pobo)

Point Cabrillo:  
707-937-0816  
[www.pointcabrillo.org](http://www.pointcabrillo.org)

Point Loma:  
619-557-5450  
[www.nps.gov/cabr](http://www.nps.gov/cabr)

Point Montara:  
415-728-7177  
[www.parks.ca.gov](http://www.parks.ca.gov)

Point Pinos:  
831-648-5716  
[pointpinos.org](http://pointpinos.org)

Point Reyes:  
415-669-1534  
[www.nps.gov/pore](http://www.nps.gov/pore)

Point Sur:  
831-625-4419  
[pointsur.org](http://pointsur.org)

San Luis Obispo:  
805-541-8735  
[www.lighthousefriends.com](http://www.lighthousefriends.com)

## Natural History at the Lighthouse

The Point Reyes Lighthouse is a cultural treasure enjoyed by thousand of visitors each year, but it isn't solely the lighthouse that people come to see. The Point Reyes headland is a destination for nature lovers, too.

The complex geologic formations draw rock enthusiasts. They are eager to see the rock uplifted from the ocean floor, especially the unique Point Reyes Conglomerate—contorted sandstone embedded with cobbles that washed out from mighty rivers millions of years ago. Granitic outcroppings give glimpses of the southern bedrock on which the peninsula is carried.

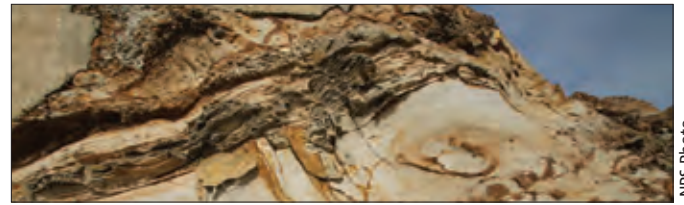
In fall, birders armed with enormous spotting scopes turn out to search the Monterey cypress trees for vagrants blown off course or resting from the exhaustion of their migration south. Point Reyes is in the Pacific Flyway and is a birder's dream.

In winter, Pacific gray whales swim past on their annual migration south to Baja California where they have their calves in the warm protected bays. On their return to the cold water feeding grounds off Alaska, mother and calf pairs swim within a quarter mile of the coast! The lighthouse observation deck provides an excellent platform for viewing these majestic travelers as they surface, spout, and dive on their journey.

In spring and summer, thousands of common murrens struggle to protect their incubating eggs while perched on the surf-pounded rocks below the lighthouse. Nesting peregrine falcons chase marauding ravens from their territory with raucous defense calls stooping overhead and zooming by.

The stairs leading down to the lighthouse are graced with a great diversity of flowers in spring. Douglas iris, checkerbloom, seaside daisy, Indian paintbrush, a profusion of yellow bush lupine, and many other species add color to the rocky slopes. A bright orange-colored algae, often mistaken for lichen, grows on the rock outcroppings

Black-tailed deer graze peacefully on the precariously steep hillsides. Long-tailed weasels dart about, fierce predators of the pocket gophers, field mice, and brush rabbits. In the waters below, California sea lions swim, hunt, and haul out for a rest. The natural world is remarkably diverse in this austere and sometimes challenging place.



Point Reyes conglomerate contains rounded pebbles of chert and volcanic rock separated by beds of graded sandstones.



*Trentepohlia* is a blue-green algae seen growing on the rocks along the stairs down to the lighthouse. The algae has a strong orange color due to large quantities of carotenoid pigments which mask the green of the chlorophyll.



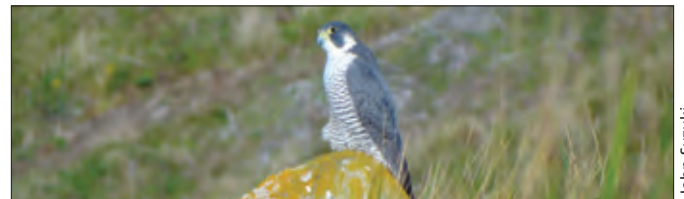
Gray whales spout as they pass the lighthouse on their journey south for the calving bays of Baja.



Common murrens crowd the offshore rocks below the lighthouse during their nesting season in late spring and summer.



In April and May a profusion of bush lupines covers the hillsides of Point Reyes headlands.



Peregrine falcons nest in the rocky cliffs near the lighthouse.

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John Suzuki

NPS Photo

NPS Photo

John Suzuki

## Places to Visit En Route

It is a 45-minute drive from the Bear Valley area to the Lighthouse parking lot, and there are wonderful sights to see along the way.

### Mount Vision Road

Take a drive up this narrow road to near the top where you can see the western side of the park laid out beneath you. Drakes Estero and the Point Reyes headland are visible on clear days, as are dense stands of bishop pine that sprung back following the 1995 Mount Vision fire.

### Estero Trail

Wander the open grasslands to sample the delights of Drakes and Limantour Esteros. Harriers and hawks hover over the grasses, while leopard sharks and bat rays seem to fly through the eel grass in the blue-green estuarine water.

### Life Saving Service Cemetery

From 1890 to 1914, the United States Life-Saving Service braved the treacherous surf and sea to rescue distressed mariners. Four of those brave men are buried here in the cemetery near G Ranch.

### Drakes Beach

One of the most visually stunning beaches at Point Reyes, the Drakes Beach cliffs are the result of millions of years of compression and uplift. These light-colored cliffs are reminiscent of the white chalk cliffs of Dover, England and are likely the features seen by Francis Drake in 1579 on his circumnavigation of the globe.

### Historic Ranches

Franciscan missionaries and Mexican land grantees introduced ranching to this peninsula. By the end of the 19<sup>th</sup> Century, Point Reyes was home to the largest dairy operation in California. The historic ranches, operated under federal leases by descendants of the original families, are part of the living fabric of the area's headlands.

### Chimney Rock & Historic Life Saving Station

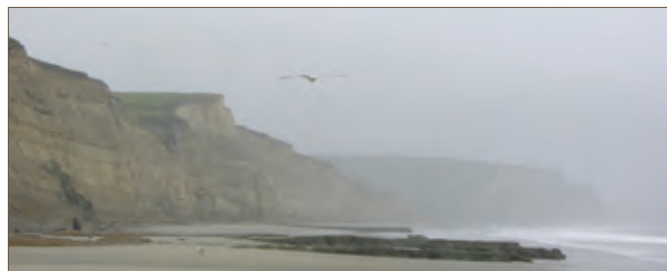
Chimney Rock is especially appealing in winter and spring. The northern elephant seals arrive for their breeding season in late December and can be seen crowding the beaches from the clifftop trails. In spring wildflowers including poppies, iris, and paintbrush adorn the trailside.



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NPS Photo



NPS Photo



Craig Stocks

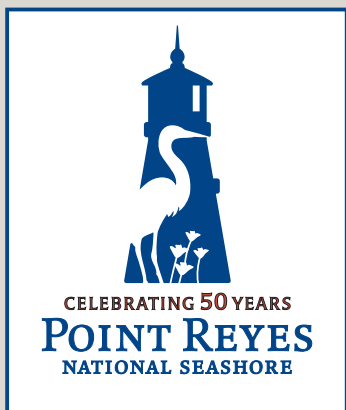


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National Park Service  
U.S. Department of the Interior

Lighthouse Visitor Center  
27000 Sir Francis Drake Blvd.  
Inverness, CA 94937  
Open Thursday-Monday  
Lensroom Tours 2:30-4:00 pm  
415-669-1534

**NOTE:** When wind speeds exceed  
40 mph, the stairs to the  
lighthouse close.

Point Reyes National Seashore  
Bear Valley Visitor Center  
1 Bear Valley Rd.  
Point Reyes Station, CA 94956  
Closed December 25th

415-464-5100 phone  
415-663-8132 FAX



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