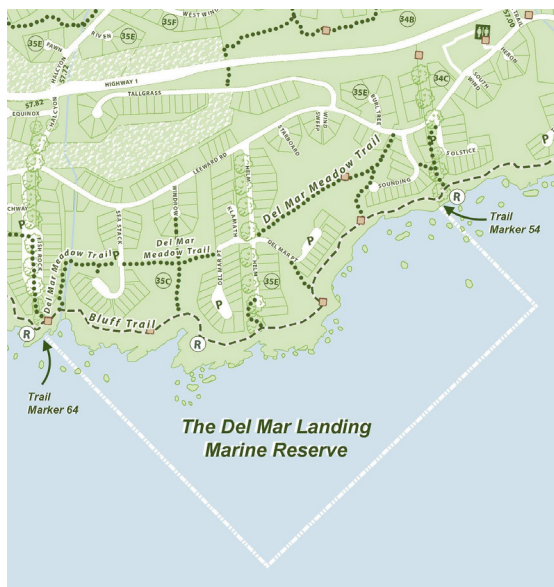


The Del Mar Landing Marine Reserve

The Sea Ranch Association Coastal Stewardship Task Force



The Del Mar Landing Marine Reserve stretches between Trail Markers 54 and 64 along the Sea Ranch Bluff Trail and extends seaward over 1000 feet offshore. It was established by the State of California in 2010 to protect and conserve the particularly rich diversity of habitat and marine life found along this section of the California coast. Along with 123 other Marine Protected Areas in California it helps to form a larger network of protected habitats that support thousands of species of invertebrates, algae, fish, marine mammals, and seabirds. To assure their protection, fishing, harvesting, or injuring any living marine organism within the Marine Reserve is strictly prohibited. For more details on the MPA network please visit californiampas.org. See QR link for more information.

Del Mar Landing Marine Preserve Area

A walk along Del Mar Landing between the Rest Log at Trail Marker 64 near Fish Rock and Trail Marker 54 near Sounding will reveal four distinct habitats that are characterized by fog, sea spray, wind, tides and currents:

- 1) Open ocean—subtidal to offshore, kelp beds to continental shelf
- 2) Intertidal beaches, sea stacks, rocks
- 3) Bluff top and cliffs
- 4) Marine terrace, meadows and hedgerows

As you are walking, it is easy to experience how one can live or visit here with deep honor and respect of the animals and plants in this powerful seascape. The Kashia Tribe of Pomo Indians demonstrated this respect in 4 night long ceremonies to give thanks and honor of the creation—From them we learn that “The Ocean Spirit is an Old Man. He is temperamental and he demands respect. Never turn your back on him or he will become angry and try to wash you off the rocks.” ref. As told to ***Eric Wilder on his first fishing trip by his Grandfather Sidney Parrish.***

Trail Marker 64 and Nearby Rest Log (north of Hedgerow at Fish Rock)

The well-developed cliffs along the Reserve’s coastline have been subject to constant erosion by waves and wind over time. Offshore islands and sea stacks (vertical columns of rock) are the remains of the earlier shoreline. The plants and animals making their home here are specially equipped to handle this environment. For example, the native plants will, in general, be grey/green to help stay cool, hairy to trap fog, long rooted to access water and low growing to handle the wind. Notice the angled rock beds as you look south along the coast.



Trail Marker 62A

From here you have an excellent view of tilted sandstone beds. Tectonic plate movement has caused the tilting of rock beds. Wind and waves erode the softer shale layers leaving the harder layers as ribs and ridges in these angled beds of weathered sandstone.

It is also a good spot to notice two types of Lupines found here: the native low lying blue flowered Lupine on the ocean side of the trail and the introduced larger yellow flowered Lupine on the opposite side of the trail. Yellow Bush Lupine, with yellow flowers and blue/green leaves, is native to Central California and has become established along the Sea Ranch bluff.

Toward Trail Marker 62

As you proceed along the trail, notice that the sandstone bluffs here show some amazing shapes! As thick beds of sandstone are subjected to wind, waves, and salt spray over time, chemical and physical weathering processes create beautifully intricate honeycomb like patterns on the rock surface called “tafoni”. Directly opposite the rest log, the tafoni has been sculpted into a perfect 9 inch window-like hole!



Trail Marker 61

This cove and surrounding Northern California coastal scrub and grassy meadow is an excellent place to see and hear bird activity. Stop and have a listen! You may notice the small Song Sparrows, White-crowned Sparrows and Savannah Sparrows foraging among the lupine. Also evident are the yellow flowering California Poppies (the state flower of California) which bloom spring through summer. Native Douglas Iris (purple flowering) is abundant along this part of the bluff trail, blooming March to May.

As you observe the north facing cliffs of the cove, notice the sea caves forming at the base of the bluff. There is a large sandstone rock formation standing in the cove whose south face is usually covered with white patches of guano (the accumulated excrement of seabirds). This formation with its many alcoves and ledges serves as a roosting area for sea birds year-round.

Beginning in early Spring, the rocky outcropping in the cove acts as a nesting site for Pelagic Cormorants. Birds can be seen bringing in seaweed and plant material from the nearby cliffs to construct well-built nests anchored with guano onto the rock's narrow ledges. South facing walls are a favorite site. Young chicks remain in the nests for over a month and are fed by putting their entire head into their parent's throat to receive regurgitated food.



Along the bluff, large black birds are often seen: Common Ravens and larger Turkey Vultures soar on the wind. Both of these birds are the “clean-up crew” along the shore, removing dead fish and other animals.



Well-worn Side Path (ocean side of trail) to Northern-most Rest Log at Del Mar Point

At the rest log on the northwest side of Del Mar Point, we can see points far to the north and south and well out beyond the nearshore sea stacks and kelp beds—a great place to observe the offshore migration of sea birds and whales! Large flocks of sea birds migrate Spring and Fall in the flyway here.

The most common whale seen off our coastline is the Gray Whale. Adult males and females with their calves pass by in early Spring on their way to the rich cold waters of the Arctic sea before returning again in the Fall and Winter on their way south to the calving lagoons in Baja California. This is a yearly roundtrip migration of over 10,000 miles. Look offshore for their tell-tale spouts. When a whale comes to the surface after a dive, it breathes out the “old” air quickly, all in one breath. Because the whale empties its lungs with such force, the air travels 10, 20, even 40 feet. And because its blowhole (nostril) is on the top of its head, the air goes straight up. This air is usually warmer than the air just above the surface of the ocean, so the water vapor condenses. This condensed water vapor looks like steam—the same thing happens when you “see your breath” on a cold winter day. So the “spout” you see is not a fountain of water; rather, it’s a stream of warm air being forced out of the whale’s lungs—the whale’s breath. Some whale watch guides can tell you the kind of whale that has just come to the surface based on the height and shape of their spout.

California Brown Pelicans can be seen roosting on the rocks and islands off the coast, often flying in large V formations. The California Brown Pelican hunts for its food usually within five miles of land, making impressive dives from ten to thirty feet above the surface. The deeper the meal the higher the dive. When the bill touches the surface of the water the pelican will push its legs and wings back creating a bit more force, under the water the bill opens and the pouch stretches out wide allowing the pelican to scoop up fish. The pelicans hit the water with such force that even fish six feet below the surface are stunned. Their pouch can hold up to three gallons of water and fish. The pelican pops up to the surface, tips their head and bill forward letting the water drain out yet keeping the fish. Then they toss their head back to position the fish head first and swallow. Another way they feed is by sitting on the surface of the water, scanning the ocean for reflections off of the silvery scales of schooling fish. As abundant top predators, they are sensitive indicators of change in the marine environment, telling us a great deal about the impacts of climate change and pollution.



From the Northern Rest Log at Del Mar Point, you can see huge slabs of sandstone with rounded rocks on top called concretions. These concretions form as sediment builds up in successive layers around a nucleus such as a shell or pebble in an area rich in calcium carbonate, an ingredient in cement. These layers are better cemented than surrounding areas, giving them more resistance to erosion.

Continue along the Side Path to Southern-most Rest Log at Del Mar Point (rejoins Bluff Trail near round geological marker)

Shorebirds, including Black Oystercatchers, Black Turnstones, Surfbirds and Wandering Tattlers, are all probing for mussels, limpets, and other invertebrate prey, jumping out of the way of high surf. Some of these shorebirds travel long distances between their breeding and wintering grounds. You may see people recording nesting activity of the shorebirds and gulls in order to track long term trends in our preserve.

Pacific Harbor Seals often sprawl along nearshore rocks and reefs, resting and conserving energy for their foraging activities. Pups are born between April and May, are able to swim and dive within hours, and are nursed for 4 to 6 weeks. Never approach marine mammals on the rocks or sandy beaches. Quiet observation from the blufftop is best.

If disturbed from their rest, they will dive into the water to escape their pursuer, losing a chance to recover from their hunt for food. They may abandon their haul-out sites or their pups if disturbed too often.



Proceeding to Trail Marker 60 Along the Bluff Trail



The intertidal zone—the area between high and low tides—is a harsh and unforgiving habitat, subject to the rigors of both the sea and the land. The harsh conditions in the intertidal zone cut down on competition for food and for space by excluding many animals. The shallow water transmits sunlight necessary for the bottom-dwelling plants' photosynthesis. Looking out from the trail, if the tide is low enough, you may be able to observe various plants and animals in the intertidal area.

In a deeper tidepool, Giant Green Anemones may be visible from the bluff. Binoculars will give you a better look! This green plant-like creature is actually an animal with algae plants living inside it. In this symbiotic relationship, the algae gain protection from snails and other grazers and don't have to compete for living space, while the anemones gain extra nourishment from the simple sugars produced by the algae in their tissues.

At low tide, you may see large black beds of California Mussels along the upper margins of the rocky reefs. Their predators, the Ochre Sea Stars, feed on both mussels and barnacles. Sea Star population was decimated in 2015 by a virus that causes "Sea Star wasting disease". This allowed some of their prey, especially Purple Sea Urchins, to flourish. The increase in population of urchins led to overgrazing of kelp beds in many areas of the coast, especially shallow coves. Two years later, Sea Stars and kelp beds are seen to be recovering in some areas. However, many coves still remain barren of kelp due to urchin overgrazing.



Leaf Barnacles, shown here protruding in the background, form "hummocks" near and among the California Mussels, like the one shown in foreground. Mussels and barnacles live firmly attached to a single spot. Both species filter food from seawater. Limpets, snails with shield-shaped shells, will move about to graze, scraping microscopic plants off rock surfaces.

Acorn Barnacles are also shown here looking like raised circles attached to a mussel and rocky substrate. In competition for space among predators, these small barnacles can multiply rapidly, their larvae settling over any bare surface available in the high intertidal zone.

At low tide, we see the exposed rocky reef, with pools and channels filled with sea life. A variety of algae and bright green beds of seagrass, the only flowering plant in our tidepools, grow here. Their narrow blades often harbor egg masses deposited by sea slugs.

Trail Marker 59

Look for the Sea Palm kelp clinging to the rocks on the outer intertidal area. Well adapted to the heavy surf of the areas it inhabits, its strong stalk is tough and flexible, allowing it to bend with the motion of the powerful waves. It is the one kelp that can stand erect at low tide without the support of water.

Trail Marker 58

As a part of Greater Farallones National Marine Sanctuary, the history of landing sites and ports along this coast are being studied in detail. There are few archaeological remains along this stretch of coastline due to its exposed location and coastal bluff erosion. Between trail markers 58 and 59, seaward of the Bluff Trail, a large wooden timber protrudes from the bluff. Bracketing this timber are several iron eye bolts and rings set into the rocks. Operating between 1898 and 1910, these artifacts once secured a wire chute for transferring

heavy timbers from land to ship. Unlike other doghole ports in the area, the natural topography offered no protection for vessels loading at Del Mar.





Trail Marker 57

From here, depending on the tide, you may see resident harbor seals diving for food near the shore. Some beaches on Sea Ranch are closed in April and May to allow a peaceful start for the new Harbor Seal pups born here. You may also see the more playful and vocal California Sea Lions. A visit to The Marine Mammal Center in Sausalito is a great way to learn more about these animals!

Look for the floating beds of bull kelp. Be sure to distinguish between kelp heads and seal heads! This large brown alga provides food and



habitat for a host of wildlife species. The long leaf-like greenish-brown fronds are supported by a balloon-like floating bladder that allows them to reach the upper water layer and the sunlight necessary for photosynthesis. Its root-like holdfast has many fingerlike projections securing it to rocks below. Winter storm surf rips kelp away from their holdfast attachments, tossing the plants adrift in the sea and from there to great piles along shore. The plant spores grow on the ocean floor to start its cycle again each year. See Monterey Bay Aquarium QR link below for more information.

In the waters, a “soup” of small plants and animals float about, known as plankton and forming the basis of the ocean’s food web. Freshly hatched fish larvae are considered plankton until they grow large enough to swim against currents. While plankton are most abundant in surface waters, they live throughout the water depths. Large schools of small fish, such as sardines and juvenile rockfish, and even the occasional grey whale, gobble up swarms of planktonic tiny shrimp-like mysids.

Trail Marker 55

There are many holes or burrows as you walk along the trail. These are made by California Voles as they make pathways to the plants they feed on. Voles are also part of the diet of birds that hunt over the land.

Trail Marker 54

The Monterey Cypress, seen here in its hedgerow form, is tolerant of wind and salt spray making its home on the rugged coast of California. One can usually see the original footprint of the hedgerow of Monterey Cypress. Look for two rows of larger trees. The smaller trees on either side of this “alley” are volunteers. If not managed, hedgerows continue to widen, as new plants germinate from seeds dropped by the original trees. The original hedgerows, planted by ranchers in the 1920s at intervals of about one mile, formed windbreaks and served to delineate various grazing fields. The hedgerows are one of the signature landscape design elements of the Sea Ranch community.

Marine Preserve Boundary just beyond Trail Marker 54

The Del Mar Landing Marine Preserve waters are included in the 3,295-square-mile Greater Farallones National Marine Sanctuary. National Marine Sanctuaries shield significant waters and cultural resources from various potentially destructive human activities, such as alterations of the seabed through mining and drilling activity.

Looking out over the sea we notice the waves forming up nearshore to crash down upon the rocky reefs and sandy coves. You may notice organisms that are exposed to air or only slightly submerged during times of low tide. Exposure to the drying effect of the wind, or quick changes in salinity from freshwater in-floods of rain, the cold of winter or the heat of summer sun all create physiological challenges for sea life on the edge. In addition, these animals become subject to predators from above the tide line—birds and land mammals (including humans). You may be able to spot the mussels, barnacles, small crabs and snails attached to the rocks. These intertidal species provide food for animals above and below the water.

To learn more about the annual intertidal surveys being done to track changes in sea life along the Sea Ranch coast, ref.

<https://www.eeb.ucsc.edu/pacificrockyintertidal/sitepages/searanch.html> or see QR code below. To learn more about the plants and animals of the Marine Preserve, please see QR links below.

Photo credits: Delmar Marine Reserve: Sea Ranch Association; Tilted beds, Algae and Seagrass: Chris Wall; All other photos: Craig Tooley



UCSC Pacific Rocky intertidal, Sea Ranch MARINE site



Greater Farallones National Marine Sanctuary, Doghole Port: Del Mar Landing



Monterey Bay Aquarium, Bull Kelp



SSU Center for Environmental Inquiry, California's Coastal Prairies



California Marine Protected Areas