

Birdwatching in Monterey and the Carmel River



Packard Fellows Meeting, Sept. 8, 2007

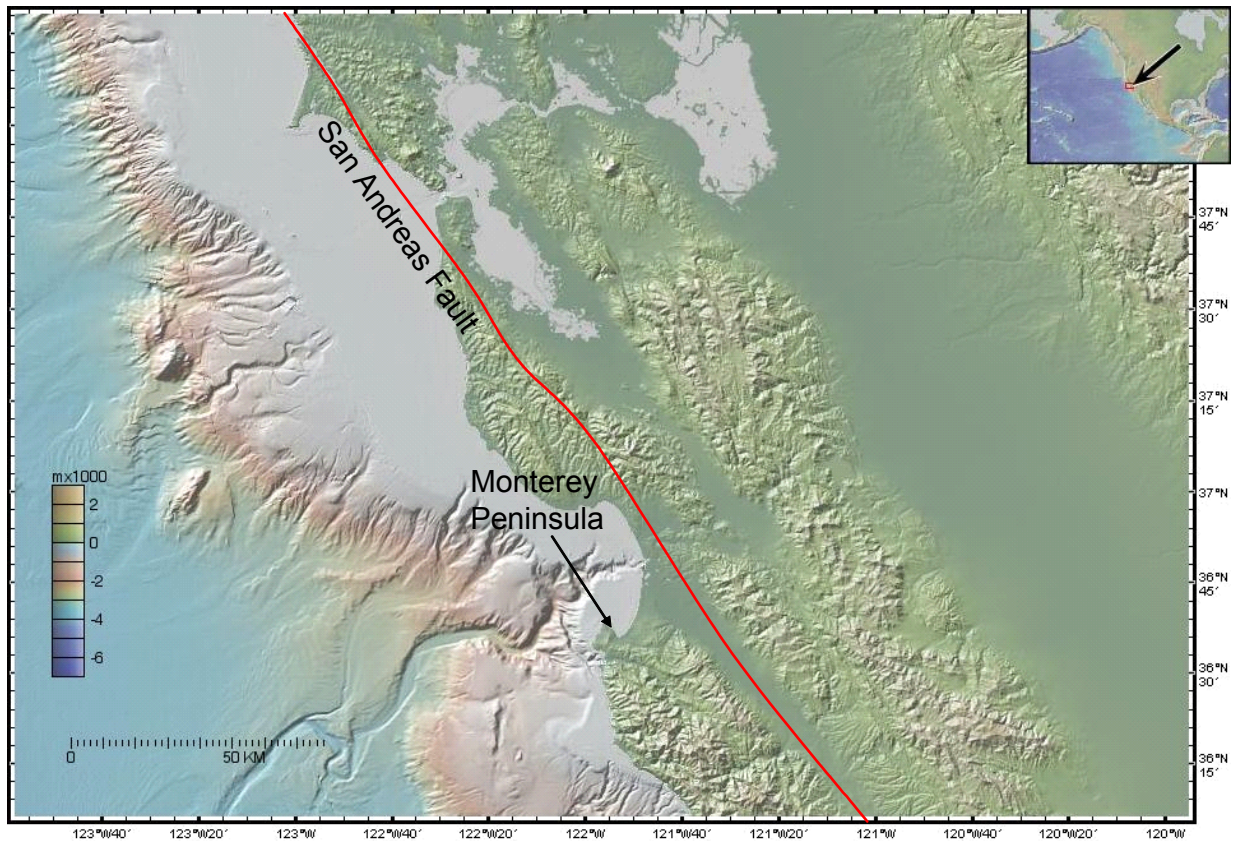
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Sanderling
(C Chow & E Thomas)

Many of California's estuaries have been destroyed by dredging, urbanization, or pollution, but we are lucky to have the Carmel estuary so close to us. The river mouth is an important stopover point for migrating waterbirds and shorebirds following the Pacific Coast flyway. Seabirds, such as gulls and pelicans, also come to the lagoon to drink freshwater and roost for the night. We will also take a short walk to Cross Hill, where there is a small stand of coastal sage scrub, a habitat limited primarily to the California (and northern Baja) coasts and harbors its own unique flora and fauna. From Cross Hill, we will have a beautiful view of the Pacific. Upwelling water from the submarine canyons provide nutrients to the surface waters, allowing for an abundant marine life in the area.

We encourage you to wear comfortable shoes and a light jacket for this scenic 1.5 mile walk. If you have binoculars, feel free to bring them. Please let us know if you and your guest plan to join us on Saturday afternoon (3-6pm).



Shaded relief map of the central California coast and the Monterey Peninsula. Map made with Geomapapp.

Introduction

One of the most accessible and interesting regions in California for natural history is the Monterey Peninsula. What makes up the peninsula is a large block of granitic basement, known to geologists as the Salinia terrane. These granitic rocks are the extinct roots of large volcanoes that were active 110 to 80 million years ago and were once contiguous with the southern end of the Sierra Nevada, which are familiar to us as California's physiographic "backbone". Salinia, itself, has since been displaced hundreds of kilometers northwards by the San Andreas Fault, whose trace in this region is manifested by the Salinas Valley. Compared to the soft mud- and sandstones that crop out along the California coast, granitic rocks are more resistant to physical and chemical breakdown, which is why the Salinia block juts out into Monterey Bay, forming a peninsula.

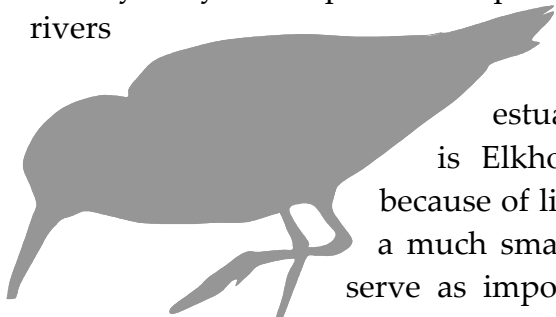
Although volcanism is now absent along the central California coast, the region is still tectonically active, as evidenced by the San Andreas fault, its associated fault splays, and the rapidly uplifting and eroding Coast Ranges. The rapid uplift and



erosion, particularly in the region of Santa Cruz and Monterey, has resulted in the incision of deep submarine canyons into the continental shelf by rivers and debris flows (such as underwater landslides). As a result, the continental shelf has been deeply embayed so that the edge to the shelf is now closer to land here than anywhere else along California's coast.

The combination of an embayed continental shelf and rivers entering the ocean make for a very diverse fauna, which is what we will try to sample on this field trip. The Monterey submarine canyon (and smaller canyons like the Carmel) focuses the upwelling of deep, nutrient-laden Pacific waters towards the surface. These nutrients, in turn, act as fertilizers, increasing the production of algae, phytoplankton and zooplankton, which themselves support a rich and diverse assemblage of macrofauna, such as birds, fishes, and mammals. Pelagic seabirds, which normally feed much farther offshore and are thus seldom seen, can often be seen in huge flocks from any of the promontories around Monterey County. Not too far off the rocky coasts, sea lions and sea otters, the latter once highly endangered, can often be seen frolicking in the kelp (brown algae) beds. A little further out, but still visible from land, one may even chance upon the spout of a whale!

And where the rivers meet the ocean, the intermingling of freshwaters and saltwaters give forth to estuaries. Although most estuaries have been disturbed or destroyed by development and pollution on the beaches and in the watersheds of the rivers



feeding the upper estuaries, Monterey County is lucky to have a few relatively undisturbed estuaries. The largest and most important in Monterey is Elkhorn Slough to the north of the peninsula, but because of limited time, we will visit the Carmel River Mouth, a much smaller but more accessible estuary. These estuaries serve as important migratory stopovers for birds. Shorebirds nesting in the Alaskan arctic pass Carmel twice each year, once in the spring on their way to Alaska, and once in the fall on their way to their wintering grounds, which for some, may be as far south as the southern hemisphere.

The goal of this field trip is to give you a taste of the richness of the birdlife here in Monterey, just one window into the unique natural history of the Monterey Peninsula.



STOP 1. Monterey Bay Sea Aquarium Lookout

We will begin our trip at the Aquarium, where we can look out into the open bay and get up close to the seaweed covered rocks and crags. The first birds you will probably notice, if you haven't already, are the really noisy "seagulls". Most of these will be Western Gulls. These are actually not real "seagulls" as they actually spend most of their time along the immediate coast rather than out in the open ocean. If you look carefully at these gulls, you might encounter a smaller one with dark gray body and an red bill. This is the Heermann's Gull, a bird largely confined to the California coast.

If you can concentrate over the raucous of gulls, scan the open bay. Cormorants, with long necks adapted for catching fish, will likely be flying back and forth. Interestingly, cormorant feathers are not perfectly water-proof, which means that they often have to spend their time sunning their wings to dry them off. You might see sunning cormorants sitting on rocky crags or even on the buildings of the Aquarium. Another bird that we should see on the bay is the Brown Pelican, one of the largest birds in North America. The Brown Pelican's lower bill is shaped like a pouch, which it uses to store fish, its main staple. The Brown Pelican feeds by hovering high above the



Brown Pelican Chow & Thomas

water and then, when it spots a fish, it plunges straight into the water, often from heights above 50 feet. The Brown Pelican holds a place in environmental history as its populations in California and eastern United States were nearly decimated by the rampant misuse of pesticides, such as DDT.

After your eyes get tired from scanning the bay, take a closer look at the



seaweed covered rocks and kelp forests. There are likely to be little tiny shorebirds walking on the rocks. These might include the Black and Ruddy Turnstone, both of which have slightly upturned bills, as their name suggests. These bills are used to flip over stones in search of secretive invertebrates overlooked by other shorebirds, which go for more obvious prey. As for the nearshore waters, you might see a tiny bird, which is distinctive not so much for its plumage, but for its behavior. This shorebird, called a Red-necked Phalarope, actually floats like a little boat on the water, and even more peculiar, it spins around like a top. Fluid dynamicists have shown that this spinning motion causes turbulence in the water, agitating tiny zooplankton so that they are more easily detected and preyed upon by the phalarope.



Black Oystercatcher
Chow & Thomas



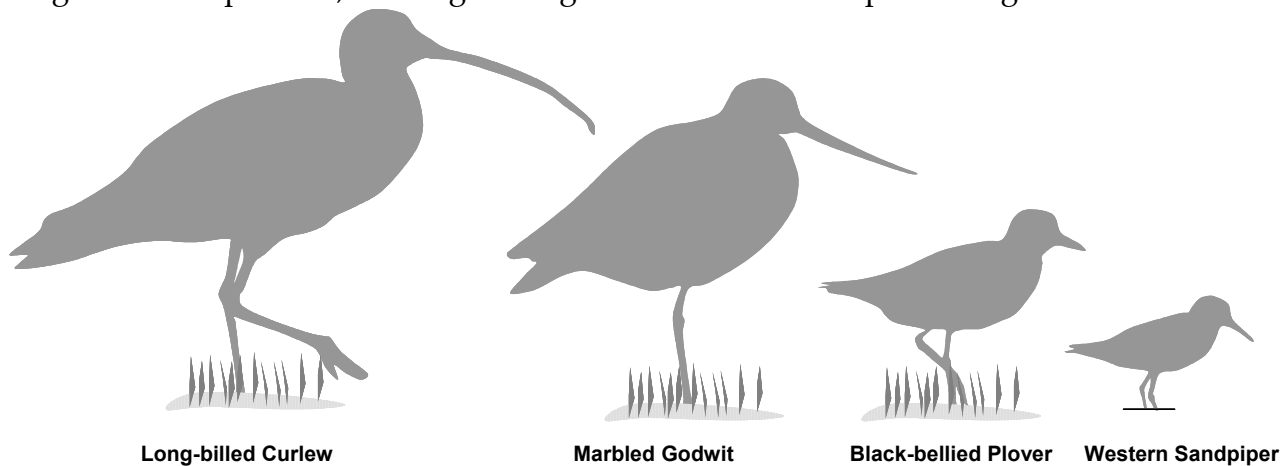
Ruddy Turnstone
Chow & Thomas

STOP 2. Carmel River Mouth Lagoon and Estuary

After a short bus ride, we will find ourselves at the mouth of the Carmel River. The Carmel River drains the Santa Lucia Mountains, which are the NW-SE trending mountains in the distance. Because the watershed area is relatively small compared to larger rivers, such as the Sacramento, Mississippi, Columbia, etc., the total riverine flow is small and exhibits very large seasonal variations. In the dry summer months, the flow of water is small enough that its erosive power cannot compete with the rate at which beach sands are deposited by the waves coming off of the Pacific Ocean. Thus, in the summer, the river often does not make it out to the ocean. The result is the formation of a lagoon just behind the dunes. Because it is isolated from the ocean, the lagoon will consist mainly of freshwater in these conditions. But in the rainy season (winter and early spring), the combination of storm-driven wave action and enhanced riverine flow will breach the sand dune barrier. Once breached, seawater and freshwater will intermingle with the rising and ebbing of tides, resulting in a dynamic chemical gradient in the estuary from saline seawater to fresh riverine water. An estuary can thus be broken down into a series of zones, each characterized by a given salinity and, in turn, by distinct floral and faunal communities.

Because rivers, estuaries, and coastlines are always evolving, it is hard to predict exactly what we will see as the birds are often very finicky about their environment. Nevertheless, the fresh waters serve as the drinking waters for Western and Heermann's Gulls, Brown Pelicans, and Elegant Terns, the latter a gull-like bird with long, dagger-shaped bill used for catching fish on the dive. Chances are that we will see a huge flock of these birds, perhaps numbering well into the hundreds, congregating and loafing on the lagoon as they return from their daily forays for food out in the ocean.

At the edge of the lagoon, we may also see a few shorebirds. Instead of the rocky crags at the Aquarium, the edge of lagoon will be made up of fine-grained mudflats.





Elegant Terns
Chow & Thomas

Thus, instead of turnstones, we are likely to see shorebirds with longer bills used for probing into the mud. The largest shorebird we might see is the Long-billed Curlew, which is almost the size of a turkey. This bird's bill exceeds 1.5 feet, is distinctly down-curved, and is used to probe deep into wet mud searching for worms. The next largest shorebird to be encountered is the Marbled Godwit, which also has a long-bill, but in contrast to the curlew, is distinctly upturned. The godwit searches for food by inserting its bill into the mud and lifting the mud up.

Seemingly running between the legs of the curlews and godwits will be little tiny shorebirds. These birds are so small that to the untrained eye, they may go unnoticed. These shorebirds include Sanderlings and Western Sandpipers. While the two species look very similar in plumage during the fall, they have different feeding behaviors. Sanderlings like to run like hyperactive mice along the shoreline, picking off invertebrates from the top of the sand. We will see them running around the edge of the lagoon, but we are even more likely to see them running along the immediate beach. The quintessential behavior of Sanderlings is that they like to follow the waves. They run back and forth as the waves come up and go back down. Each time the wave passes, new invertebrates are exposed at the surface. We, as humans, probably never notice these invertebrates, but watch the birds and take a closer look, and you'll see.

The Western Sandpiper, on the other hand, has slightly longer legs than the Sanderling. The legs are just long enough so that they are clumsy runners compared to the Sanderling. However, they make up for this "inadequacy" by taking advantage of the shallow water near the edge of the lagoon. They use these slightly longer legs to wade elegantly through the water, searching for submerged invertebrates. As such, Western Sandpipers and Sanderlings rarely compete for the same food.

A word on shorebird migrations

Most of the shorebirds that we will encounter on this trip do not reside here all year round. In fact, most of them breed in the arctic tundra of Alaska or Canada and winter

either along the California coast or even further south in Central America or South America. Thus, some of the birds we will be seeing represent individuals that have arrived to stay the winter while others will simply be in transit to more southerly wintering grounds. Based on subtle plumage differences, some field ornithologists can even tell you which bird is staying and which bird is just resting before continuing its long journey.

What is amazing is that these little shorebirds travel thousands of kilometers twice a year (once going north and once going south). These migrations have been going on for millions of years, illustrating how resilient these shorebirds are. However, large environmental changes associated with industrialization and human population growth have occurred in the last century. Their arctic breeding grounds are threatened by global warming, their South American wintering grounds are being threatened by extensive grazing, and their stop-over points, such as the estuaries along the Pacific coast, have been severely reduced in numbers or quality. These changes may be occurring too fast for the birds to respond. Indeed, the global populations of some of shorebirds now number only in the few thousands. Thus, what we will experience at the Carmel River Mouth is only a tiny insight into what shorebird migration might have been in the past.

STOP 3. Cross Hill and Coastal Sage Scrub

From the lagoon, we will take a short walk across the beach to Cross Hill, which forms the bluffs on the south side of the lagoon. The tops of the bluffs are covered with a floral community called “coastal sage scrub”, a plant community that extends from Oregon south into Baja California. Most of the human population in California lives in what was once “coastal sage scrub”. Coastal sage scrub plants are characterized by dense foliage, small leaves, slightly hairy leaves, or wax-coated leaves, all adaptations for preventing moisture loss in the generally arid Mediterranean climate of coastal



Rufous-sided Towhee
(C Chow & E Thomas)

California. Examples of such plants, which we will see on our trip, include Coyote Brush (*Baccharis pilularis*), California Sagebrush (*Artemisia californica*), and Ceanothus. Most of these plants appear like dull green or gray bushes, hence often look nondescript or even ugly to the average person.

However, this gray-green foliage is a haven for many animal species, particularly birds. Most of the birds

will skulk in the dense undergrowth and are easy to overlook, but their secretive behaviors are often compensated by their loud and musical songs. We are likely to hear the echoing marble-dropping song of the Wrentit, the trills of the Spotted and California Towhees, and the raspy songs of the Bewick's Wren. Some of these birds, like the Wrentit and the California Towhee, are found only in coastal sage scrub habitats and nowhere else. We will spend a few minutes trying to kick up a Wrentit or a towhee for everyone to see.

In any case, before returning to our cars, don't forget to look back down at the Carmel River as we will have a very good view from the top of Cross Hill. If you let your eye follow the river upwards, you will see that the river is bordered by a very green grove of trees and shrubs. These trees are dominated by mulefats, willows, and cottonwoods and make-up what biologists call a riparian habitat, that is, a community that serves as the transition between the river and its surroundings. Riparian habitats are important nesting and migratory stopover sites for songbirds. Unfortunately, we will have no time to visit this area, so you will just have to enjoy the view!

Credits – photographs by Cindy Chow and Edward Thomas. Illustrations by Cin-Ty Lee.

Useful references

Geology

- Atwater, T., 1970, Implications of plate tectonics for the Cenozoic tectonic evolution of western North America: Geological Society of America Bulletin, v. 81, p. 3513-3536.
- Clifton, H.E., 2006, Reconstructing physical and biological processes in an ancient submarine canyon: the Carmelo Formation at Point Lobos: unpublished field guide. (the source of much of the information presented in this guide)
- Tikoff, B., 2006, A rough geological field guide to Point Lobos State reserve, California, Packard Meeting 2006.

Ornithology

- Roberson, D., 2002, Monterey Birds, 2nd ed., Monterey Peninsula Audubon Society, ISBN 0-96157798-2-X
- Stallcup, R. W., 1976, Pelagic birds of Monterey Bay, California, *Western Birds*, 7(4):113-136.
- Stallcup, R., 1990, Ocean birds of the Nearshore Pacific, Point Reyes Bird Observatory Publications

Other reading

- Ricketts, E. F., 1986, *Between Pacific Tides*, 5th edition, Stanford University Press, 652 pg.
- Steinbeck, J., 1945, Cannery Row, Viking Press.

Directions from Monterey Bay Sea Aquarium

1. Take Lighthouse Road south from the Aquarium
2. Veer right on Pacific St.
3. Get on HWY 1 – Pacific Coast Highway and go south (right)
4. Continue south into Carmel Valley. Turn RIGHT on Rio Road.
5. Turn left on Santa Lucia
6. Turn left on Carmelo St.
7. Continue to the parking area for Carmel River State Beach

