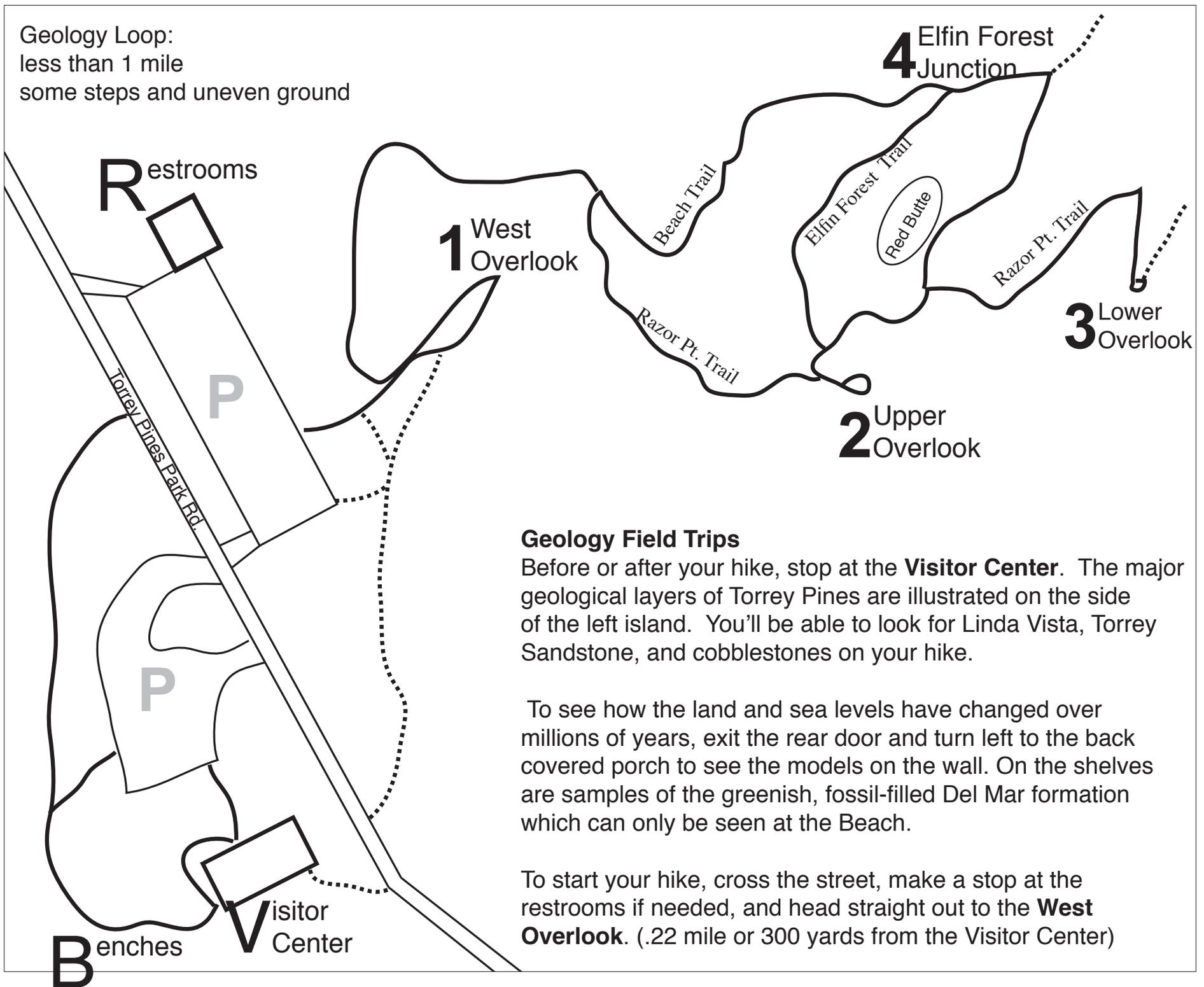


Geology Loop:  
less than 1 mile  
some steps and uneven ground



### Geology Field Trips

Before or after your hike, stop at the **Visitor Center**. The major geological layers of Torrey Pines are illustrated on the side of the left island. You'll be able to look for Linda Vista, Torrey Sandstone, and cobblestones on your hike.

To see how the land and sea levels have changed over millions of years, exit the rear door and turn left to the back covered porch to see the models on the wall. On the shelves are samples of the greenish, fossil-filled Del Mar formation which can only be seen at the Beach.

To start your hike, cross the street, make a stop at the restrooms if needed, and head straight out to the **West Overlook**. (.22 mile or 300 yards from the Visitor Center)

## 1. West Overlook

From here it's easy to see the red Linda Vista formation, once part of the ocean's floor: look out to Red Butte straight ahead. Between West Overlook and Red Butte were softer rocks that have eroded away.

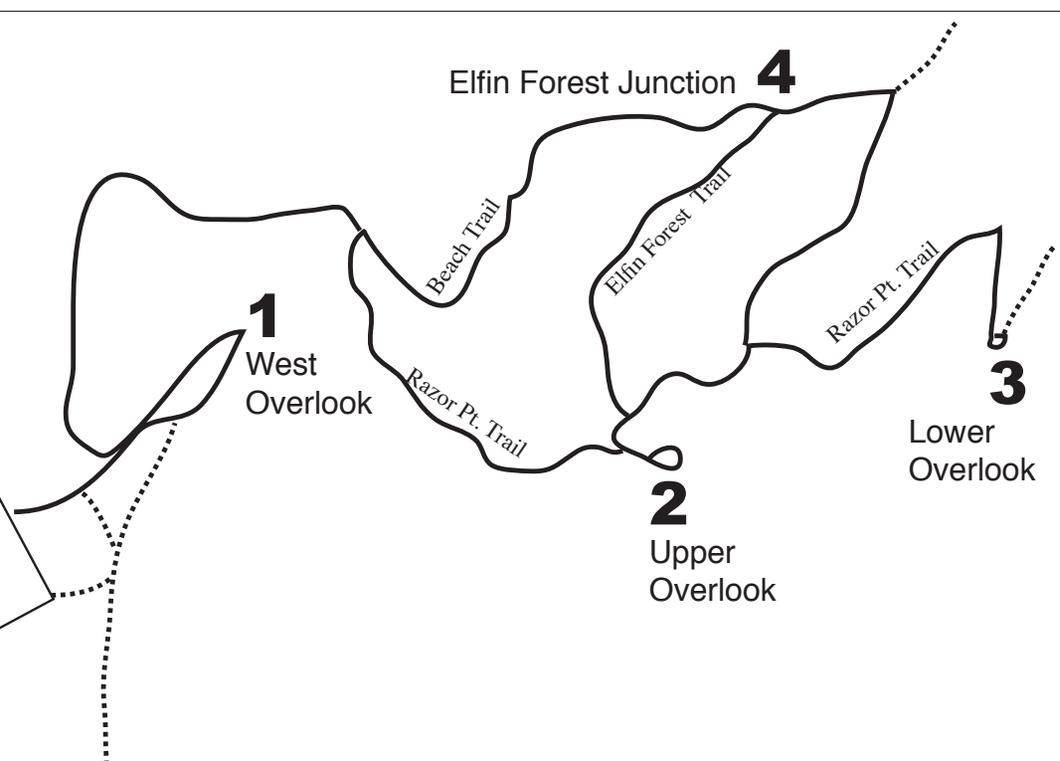
Activity: give everyone a magnet and an index card. Put a small amount of sand on top of the index card, and put the magnet underneath. Draw the magnet slowly across the back of the card--do grains of sand move? These grains are magnetite, one of the minerals that makes up the rocks around us. *Turn back towards the parking lot and keep right to the main trail into the Reserve. Take the right fork at the junction. (.19 mile or 333 yards to Upper Overlook)*

## 2. Upper Overlook of the Canyon of the Swifts

Here the primary rock is the beige-yellow Torrey Sandstone. Look for darker red, round deposits in the cliffs opposite: these are concretions. Concretions are formed during the rainy season, when rain flowing through the rocks dissolves some of the minerals, which are then re-deposited around a core, like the pearl in an oyster. The concretions are harder than the surrounding rocks, and eventually fall out as the softer sandstone erodes. Where the concretions have fallen out are small caves, sometimes called "wind caves." See if you can spot any nests in the wind caves. *Go back to the trail, turn right and go up the steps. Continue straight down the trail to the next overlook. (.11 mi or 192 yd)*

## 3. Lower Overlook of the Canyon of the Swifts

From here you can see the youngest geologic formation in TPSNR, the Bay Point soils of Razor and Yucca Points. Winter rains constantly erode these soft soils, creating dramatic fissured cliffs. Look out at the ocean and imagine the sea floor: the same canyons and mesas you see around you continue under water.



*Retrace your steps up to the trail and turn right at the base of Red Butte. Turn left at the bottom. (.13 mi or 248 yds to junction)*

## 4 Elfin Forest Junction

The trail here resembles beach sand, because the areas of that are now Torrey Sandstone were once beaches, millions of years ago. Try the magnetite experiment here--you probably won't find much. *You can go straight back to the parking areas (.19 or 333 yds to Parking Lot), or take the left fork to go through the Elfin Forest, a magical chaparral tunnel. At the end of the forest, turn right to head back (.24mi or 419 yards to Parking Lot)*

***Please return borrowed Trail Packs to the Visitor Center!***