LiMPETS Monitoring Site: Point Fermin

Directions

This site is located on the eastern portion of Cabrillo Beach Park in San Pedro, Los Angeles County. To get to the Park, take the Harbor Freeway 110 south from the 405. The 110 south ends at the Gaffey Street exit. Continue south on Gaffey Street to 22nd Street. Turn left on 22nd Street, then right on Pacific. Turn left on Stephen White Dr, then left into Cabrillo Beach Park. You will have to either pay for parking or park outside the gates on the street. The site is accessed from the Beach Park and Cabrillo Marine Aquarium parking lot. The study site is ahead and to the right about 300 m below the cliffs as you are standing in the parking lot facing south toward the ocean. Walk along the path across the grass until you access the boardwalk at the base of the cliffs. When the board walk ends, proceed along the intertidal to the concrete fundation on an old bunker (Figure 3). All of the monitoring will take place on a discrete raised reef south of the far corner of the concrete bunker foundation. The reef site is approximately 47 meters south (190) degrees) from this corner.

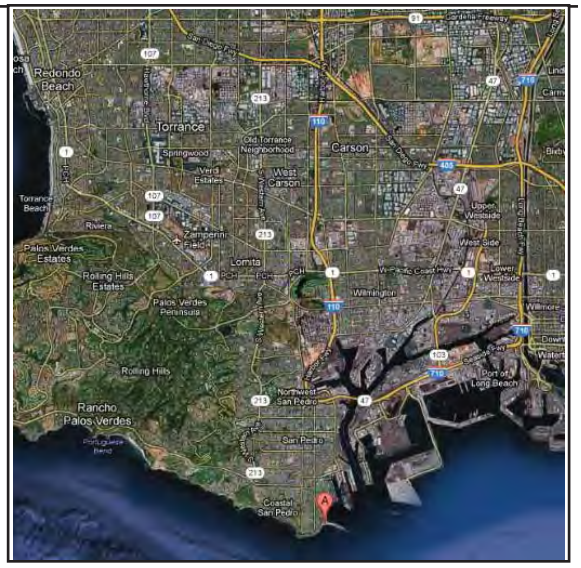

Figure 1: Location of Point Fermin.

Figure 2: Location of Point Fermin parking area and site.

Sampling procedures

Locations of sampling areas and procedures are outlined below. Three sampling methods are used at Point Fermin for monitoring:

1) Random quadrats
2) Size measurements (owl limpets)
3) Total organism counts (ochre sea stars)

1. Random Quadrats

The reef is raised about 0.75 meters above the surrounding bedrock. There are other raised reefs in this area so be sure that you are on the correct one (Figure 4). At the inshore edge of the reef there is a circular epoxy marker (inscribed UCLA T10). The transect starts at this point (Figure 5). Run the transect out for 25 meters at 150 degrees.

At 0 m, the GPS coordinates are 33 42.408 118 17.151

At 15m, the GPS coordinates are 33 42.400 118 17.148

At 25m , the GPS coordinates are 33 42.396 118 17.146

The permanent plot within which random quadrat counts are taken is located on this discrete raised reef and is approximately 200m2 in size. The plot is broken down into 2 zones, Barnacle and Mussel. Survey 10 random quadrats in each zone for 20 total.•

Lay a transect tape from the epoxy marker toward the ocean at 150 degrees to 25 m.

Figure 3. Looking back towards park from concrete bunker.

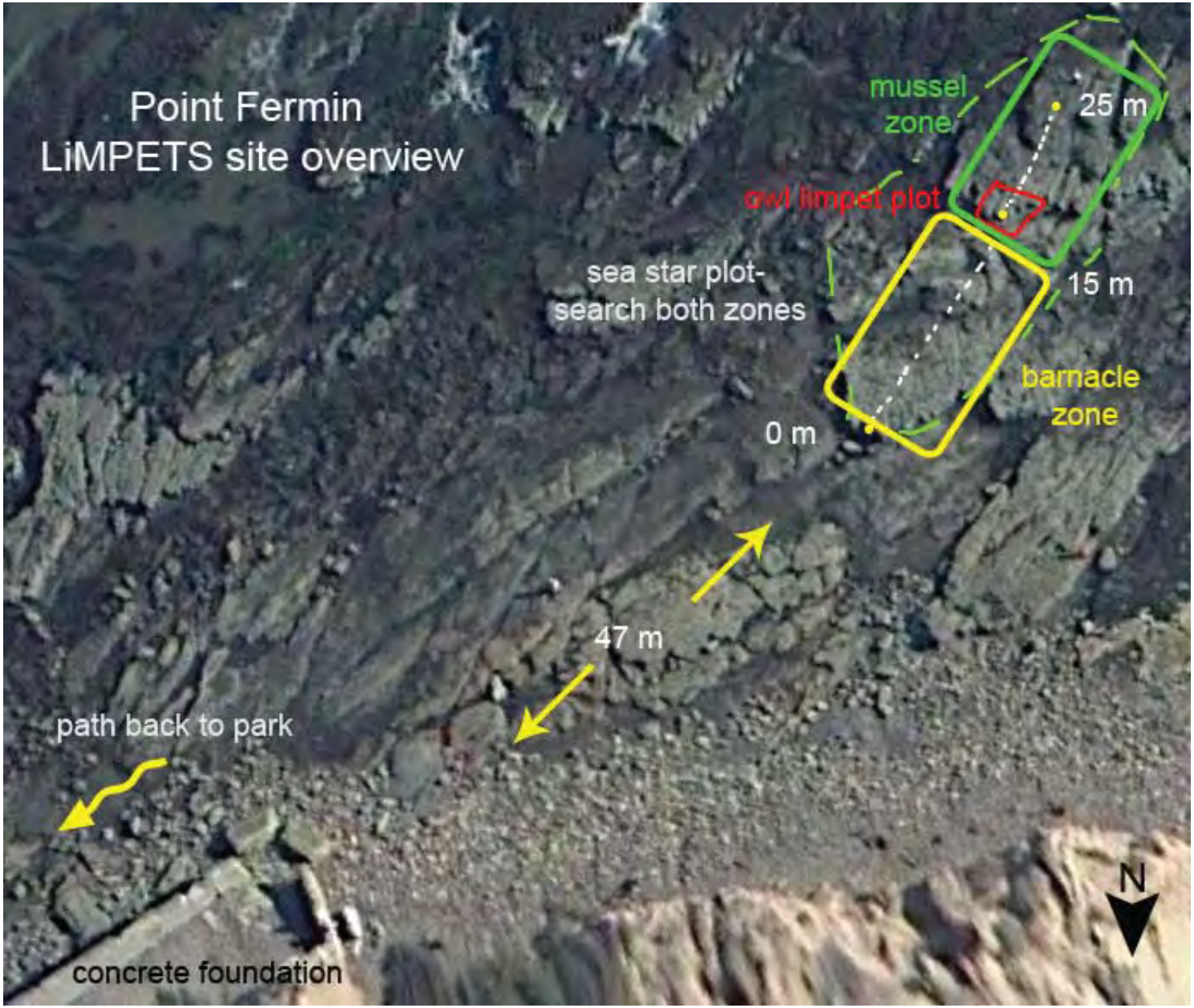

Figure 6: Schematic showing the location of the transect and permanent areas (for counting sea stars and owl limpets) at Point Fermin.

The site is set-up as diagrammed in Figure 6.

- Using the random number table, choose a number between 00.0 and 10.0 for the Barnacle zone or 15.0 to 25.0 for the Mussel zone. Locate this number along tape.

- Choose a second random number between 0.0 and 3.5. This number indicates how far from the base transect line you will place your quadrat. Use the third random number table to decide whether your location will be east or west of the base transect. Lay down a second transect tape, perpendicular to the first, to find this location. If the location is off the edge of the reef, try the opposing side of the tape.

- Center the quadrat over the meter tape.
- Record species abundance within the quadrats as directed on the "Random Quadrat Data Sheet."
- Count only live organisms and algae attached within the quadrat.

- Complete 10 quadrats for each of the two permanent areas.

Note: In some cases, the random numbers will place the quadrat in a deep pool or drop-off. When this happens, place the quadrat on a level area as close to the designated coordinates as possible.

2. Size Measurements

Owl limpets: Owl limpets are surveyed in a permanent area centered on the transect tape on the rocky reef at the beginning of the mussel zone. (Figure 6). Locate this area. This area is approximately 9m^2.

- Once the transect tape has been laid out, use another tape to make a square plot centered on the transect between 15 and 18 meters, as shown in Figs 6 and 8. The plot should be 3 meters on a side. In teams of 2 or 3, systematically search the whole area, both the top and all sides of the rocky outcrop.

- Designate one person as the recorder. This person is responsible for completing the data sheet. The others should be searching for limpets and should tell the recorder what they see as they see it.

- Use the rulers (or if in a crack, the paper clips) to measure the length of each limpet (Figure 7). Round up to the nearest 0.5 cm. Do not count limpets that are smaller than 2.5 cm.

- Look carefully in cracks, crevices and under ledgdes

Figure 4: View of reef and transect line from corner of concrete bunker. Note edge of concrete in forground.

Figure 5. Close-up of epoxy marker and start of transect

- Of course, some individuals will be missed, so counts are just estimates of the true abundance. If 5-10 teams count owl limpets in the same area, the average number counted provides a reasonable estimate that can be compared over time.

Figure 7: Measure owl limpets lengthwise using a ruler. Round up to the nearest 0.5 cm. The limpet above should be recorded as “5 cm” in length.

3. Total Organism Counts

Ochre sea stars

Ochre sea stars are surveyed on the reef within both plots, although the best habitiat is within the mussel zone. This large rectangular area begins at the 0 meter mark on the transect tape and extends seaward past the 25 meter mark as far as you can go depending on the tide. Tidal channels on either side of the reef mark the sides of the plot (Figure 6). Lay out the tape seaward across the reef. Next, locate the tidal channels that surround the reef. These channels serve as the boundaries for the total sea star count. The total area to be searched is approximately 250m2.

- Use a meter tape to measure and mark the boundaries of the area (see Figure 6).
- Systematically search the whole area in teams of 2 or 3, moving back and forth in successive swaths about the width of your outstretched arms.
- Record what you see, as you go.
- Record ochre sea stars as “orange” or “purple/ brown” (See Figure 9).
- When counts are finished, record the length of the count, in minutes, on the data sheet. Each count should last approximately 20 minutes.

Figure 8: The owl limpet plot is shown outlined, centered on the transect line between meter 15 and meter 18 at the beginning of the mussel plot. The concrete bunker can be seen in the background.

Figure 9: Count all ochre sea stars found within the permanent area. Record individuals as “orange” or “purple/brown”.