Baseline Characterization of Nearshore Fish Communities Associated with Rocky Reef Habitats

Methods and Sampling Metadata
We studied four MPA sites: Pyramid Point SMCA, South Cape Mendocino SMR, Sea Lion Gulch SMR, and Ten Mile SMR. These MPAs contained significant rocky reef habitat, and were distributed across the study region. We then selected a nearby reference site for each MPA with similar habitat characteristics and environmental conditions, so that the effects of MPA status could be evaluated in the future.

Each site was divided into 500m x 500m cells, and overlaid with high resolution bathymetric data obtained from the California Seafloor Mapping Project. Using GIS software, mean depth and percentage rough substrate were calculated for each cell. From a pool of cells with a mean depth of 10-50 meters, and with bottom composed of greater than 20% rough substrate, four cells were randomly selected for sampling within each MPA and reference site. Unlike the CCFRP project, the cells selected at each site were held constant through the course of the study. We visited each site five times, three in Summer 2014 and twice in Summer 2015.

Fishes were collected using hook-and-line gear designed to mimic methods used by local recreational fishermen. Each of the four cells in a sample site was sampled by four anglers each using a different category of standardized hook-and-line fishing gear, actively fishing for a total of 45 minutes during each sampling event. The four categories of standardized sampling gear used were: 1) two red or white size 4/0 shrimp-flies baited with a 1-2 inch strip of squid, 2) two un-baited red or white size 4/0 shrimp-flies, 3) a diamond or bar style metal jig paired with a single un-baited red or white size 4/0 shrimp-fly tied 2-4 feet above the jig, 4) a lead jig-head fitted with a scampi or swimbait style soft plastic jig paired with a single size 4/0 red or white un-baited shrimp-fly tied 2-4 feet above the jig.

Charter captains positioned the vessels to drift over as much rocky reef habitat as possible during the 45-minute sampling period within each grid cell. Specific drift locations within a grid cell were selected by the captain with the intent of targeting suitable habitat and dictated by the weather/ocean conditions of the day. Captains were directed to target at least three separate areas of suitable habitat within each cell for 15 minutes per area. If a single 15 minute drift was not possible due to strong currents or wind, the captain could choose to make several drifts in the same location for a combined total of 15 minutes.

Gear type, species, fork length (mm), and location of capture (sampling cell) was recorded for every fish landed. With few exceptions, all captured fish with a fork length of 240 millimeters or longer was tagged with an external T-bar anchor tag implanted through the dorsal pterygiophores and released at depth at the location of capture using a descending device (weighted inverted hook or customized weighted milk crate). The condition of all captured fish was evaluated, and those that were significantly injured (e.g. barotrauma, significant mouth injury, injuries from marine mammals or other predators while being reeled in) were assigned a
condition code and released without a tag. In order to reduce incidental mortality, care was taken when handling fishes and the duration of time that fish were aboard the vessel was minimized. If a high catch rate prevented rapid processing of the captured fishes, anglers were instructed to stop fishing so that the fish onboard could be processed before angling resumed.