

Marine Food Chain: Observations relating to the creation of a marine food chain around an underwater light to test the theory that a man-made food chain would attract game fish and that night fishing around that light activated food chain would be feasible and productive. Test location: Cabrillo Marina, San Pedro, California, November 2010.

California Fishery Scientists have noted that increasing numbers of coastal fish have been migrating into clean marinas and estuaries establishing permanent residence, Cabrillo Marina by virtue of a strong tidal flow and a deep main channel running from the Harbor entrance alongside the Marina to the 22nd Street Landing is (was) blessed with very clean water hosting a diverse and expanding healthy marine animal population. The Marina has become a nursery for anchovy's, [garibaldi](#), white croakers, opal eye, rays and [skates](#), a growing number of halibut, a [lone turtle](#), an abundance of juvenile red and black [rock crabs](#) as well as an diverse assortment of local in-shore shallow water fish such as perch, bass, mackerel, smelt, etc. that are common around Southern California Piers and Kelp beds. There is no official identification or count of what fish call Cabrillo Marina "Home" or the type of predators that regularly visit the area from the open ocean but it is well known that fish such as large adult pacific chub mackerel to about 24" are often present feeding on the anchovy's, that "keeper" sized halibut, white seabass and barracuda have been caught off moored pleasure boats and kayaks, large rays and skates are common and large [octopi](#) are present. (*Video clips were taken at various locations within the Marina in January/February 2010 as water visibility was declining)

Having said that all is not well, unfortunately as of this date due to recent Main Channel dredging and Basin fill operations the usually clear water has become cloudy with visibility limited to a few feet meaning poor observation conditions especially depth and the extended periphery areas where larger fish would be expected to gather, therefore this experiment was incomplete and the continuation of this program, which includes underwater video cameras, high and low power underwater lighting and an advanced chum formula have been delayed...

In this initial limited experiment a full spectrum 150 watt metal halide lamp was placed about 24 inches below the surface between the boat hull and the algae encrusted floating dock structure, almost immediately a cloud of plankton and small anchovy's engulfed the lamp mixed with what appeared to be tiny bubbles suggesting that the lamp housing was leaking.



Using an 10 power wide angle close focusing monoscope the activity of these small creatures could be clearly observed from the boat deck, the dense cloud was made-up of thousands of plankton too small to be individually identified, the tiny bubbles are believed to be Copepods, a zooplankton species that normally feed on smaller plankton, it was an interesting all-out micro feeding frenzy that went on for about 30 minutes. More juvenile anchovy's arrived closely surrounding the lamp voraciously feeding on the copepods.



Additional copepods continued to arrive joining those around the lamp however within about 30 minutes almost all the visible copepods were eaten. On two occasions about 5 minutes apart a large halibut, maybe 24 inches, rose from the 14 foot bottom and grabbed an anchovy, the second time up the excited halibut actually hit the lamp, we assumed that the halibut was resting on the bottom just under the boat and the circling overhead anchovies were too tempting to ignore, this incident suggests interesting possibilities for halibut night fishing.

Within about 30 minutes a school of large pacific chub mackerel (maybe 15" to 18") came on the scene, for a few seconds the mackerel stood-off about three feet from the lamp observing the anchovy's then one by one charged the anchovy school causing them to bunch even closer together and move very quickly as a group wildly going back and forth within an area of about 10 feet across but staying within the bright light area.



While most of the anchovy's hung close together many became disoriented by the mackerel assault and moved away from the school into the dark mid-channel wherein mackerel, smelt and other predators picked them off. It was too dark to see exactly what was going on in the channel but there was a lot of vigorous activity and surface splashing, a feeding frenzy that within a half-hour reduced the visible anchovy population by about half.

It was apparent that for the most part the mackerel (and probably other predators) were feeding in the darker waters out of the immediate light circle, this tends to confirm previous speculation and underwater ROV videos that larger fish will for the most part avoid the bright light and forage well below the light or on the periphery picking off well defined targets such as single baitfish, stragglers or baitfish disoriented or wounded in the on-going mackerel assault on the baitfish school.

It is well known that fish are attracted to light; most likely they are programmed to relate light to a potential food source the light being a beacon worth investigating but not in-itself a food target. These observations suggest that the best night fishing would be live bait or silver spoon casting into the darker waters outside the illuminated area and a baited

drop line below the light. For night fishing a small light may be better suited as it would draw the foraging night feeding game fish closer to the boat enabling easier short range casting and drop line fishing for bottom fish such as halibut. On a dark night with clear water a cool white high intensity 12 volt LED array may be safer, easier to use and work just as well as the 120 VAC metal halide lamp.

Update: November 2011 and March 2012. Two attempts were made to redo this experiment at the same location, the idea was to include video however the visibility was poor as the water was dense with suspended algae and debris. The light attracted local plankton and anchovies as before, after about 15 minutes a few juvenile mackerel and smelt came on the [scene](#) and mingled with the anchovy's. In this instance the mackerel/smelt were too small to feed upon the anchovy's. Although visibility was poor a few larger foraging mackerel and smelt can be seen darting thru and below the bait ball.

Poor water visibility now appears to be a permanent situation not expected to change anytime soon, it is caused by the Main Channel Deeping Program wherein the dredged material is dumped into the West Channel/Cabrillo Basin area churning up the bottom with fine debris that are kept in suspension by the twice daily tides. For addition information on water quality please return to the Home Page and click on the "Red Tide" Button.