



Las Ánimas

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The Las Ánimas seamount breaks the water surface as a small rocky islet crowded by seabirds. The effect of the Las Ánimas seamount on the local fertility of the sea is evident in the concentration of cormorants, pelicans, frigate birds, and petrels, and in the intense white color of the guano that covers the emerging rocks. Las Ánimas, the second seamount in our expedition, is about 10 nautical miles east of Punta Calabozo, the northernmost point of San José Island.

Geologically, Las Ánimas is very similar to San Marcial: the islet is formed by the remains of a submarine volcano, whose basalt column rises 20 m above the water's surface, and slopes underwater

along a pronounced incline down to a depth of 100 m. At that point, the slope changes to start descending gradually along an extensive sandy platform, approximately 7 kilometers (4 nautical miles) in diameter. At the margin, approximately 300 m deep, the eastern slope becomes pronounced once more and falls abruptly to the depths of Gulf of California.

We observed a great gathering of more than a thousand Pacific red snappers (*Lutjanus peru*), roaming around 40–80 m deep along the north side of the islet. A few small boats were fishing there, quickly filling their iceboxes with the fish that they captured every time they cast their lines. Among the Gulf's reef fishes,

Amabulacral tube-feet in the actinal part of the sea star *Tethyaster canaliculatus*, used for locomotion on the sea floor. In the arm at the center of the image a small polychaete, which defends itself from predators by taking the color of its host, can be seen. Photo © Vivianne Solís-Weiss.

the red snapper has the highest commercial value and is highly demanded in fresh fish markets because of the excellent quality of its meat. We purchased a few samples from fishermen and performed dissections to confirm that the fish were spawning.

Octavio and Brad went on another immersion at dawn and could observe and film many species spawning, including yellow snapper (*Lutjanus argentiventris*), giant hawkfish (*Cirrhites rivulatus*), pacific creolefish (*Paranthias colonus*), king angelfish (*Holocanthus passer*), and big-eye jacks (*Caranx sexfasciatus*).

Reviewing the video footage obtained here and the list of fish documented in this seamount, Las Ánimas seems to be very similar to the San Marcial seamount. A large part of the habitat was formed by rock debris and sandy slopes, inhabited by small garden eels and snake eels; as well as benthic fish like searobins, goosefishes, scorpionfishes, sand perch

(*Diplectrum* spp.), blackspot wrasse (*Decadon melasma*), and seabases (*Pronotogrammus multifasciatus*). In the rocky patches we observed California sheephead (*Semicossyphus pulcher*), sawtail groupers (*Mycteroperca prionura*), Mexican goatfish (*Mulloidichthys dentatus*), yellow snappers (*Lutjanus argentiventris*), rainbow basslets (*Liopropoma fasciatum*), and scythe-marked butterfly fish (*Prognathodes falcifer*).

Shallow zone

At this seamount we found a considerable cover of green algae, common in coralline environments, as well crustose red algae. The cup coral *Tubastrea coccinea* dominates the sessile fauna and is ubiquitous throughout the seamount. There was also a large amount of sea fans (gorgonians of the genus *Muricea*). A particular and unique trait of this seamount was the presence of very large specimens of the bivalve mollusk *Pinctada mazatlanica*. The

A Pacific mutton hamlet, or "guaseta", *Alphesthes immaculatus* finds refuge and camouflage in the colonies of the sea-fan *Muricea appressa*.
Photo © Octavio Aburto-Oropeza.







Above: Zebra moray *Gymnomuraena zebra* and orange cup-coral *Tubastraea coccinea* at Bajo Las Ánimas. Photo © Carlos Sánchez-Ortiz.

Left: A group of green morays *Gymnothorax castaneus* surrounded by soldier-fish *Myripristis leiognathus*. Photo © Octavio Aburto-Oropeza.



same crustose algal growth that covers the neighboring rocks is also found covering the shells of this mollusk, forming a hard substrate that shelters a great variety of small crustaceans and polychaetes. This helps the mollusk blend in with the surrounding landscape, with its covering substrate as a cryptic camouflage that possibly protects individuals from predators.

The shallow zones in Las Ánimas contain a rich and varied array of echinoderm species that prosper in the different microhabitats of the reef. Numerous species of starfish live on the rocks, predominantly *Nidorellia armata*, *Narcissia gracilis* and *Phataria unifascialis*. The small purple urchin (*Arbacia incisa*) is most abundant among the sea urchins. Several species of micro-ophiurans inhabit the soft coral branches, gripping them with their six arms. The rocky areas hide a small oasis of sand that houses species like the burrowing sea urchin (*Brissus obesus*) and the sand-bottom sea cucumber (*Holothuria impatiens*).

Between the cracks in the rocks of Las Ánimas we also found numerous, large green moray eels (*Gymnothorax castaneus*); on one occasion there were seven of them in a single crevice. There were also zebra morays (*Gymnomuraena zebra*), although these were more rare. The density of reef fish species in this seamount was impressive, bearing witness to the high productivity of this site possibly aided in part by the nutrients derived from bird guano that runs-off from the emerged rocks into the surrounding waters. There was also a great diversity of small polychaetes and crustaceans in general, with dominance of species from the families Syllidae and Eunicidae.

During the first SCUBA dive we visited a cave where the walls were densely populated with the same encrusted life forms as in the exterior rocks, at least for the first few meters. Hidden deep in the bottom we found several large lobsters (*Panulirus inflatus*) and an enormous and

Aniculus elegans, the giant
Gulf of California hermit crab.
Photo © Octavio Aburto-Oropeza.

spectacularly beautiful hermit crab belonging to the species *Aniculus elegans*.

The large gorgonians often show basket starfish wrapped around them, differently colored and mimicking the coral branches. There were large tubular, yellow sponges, and others that form yellow carpets (*Aplysinia fistularis*), irregularly shaped and about a meter to 80 cm in diameter.

During the dive we observed that the bottom between 15 and 40 m deep was covered almost entirely with live coral (*Tubsatreia coccinea*), which was very hard to pull off. Dead coral was below the permissible depth with Nitrox, so we collected sandy substrate and large seashells, mainly mother-of-pearl (*Pinctada mazatlanica*). These substrates shelter cirratulid polychaetes of the family Phyllodocidae, easily distinguishable by their green color; and serpullidae polychaetes that stand out for their red color and their sensitive crests that retract when they feel any dis-

turbance. We also collected specimens from the families Polynoidae, Eunicidae, Terebellidae, Sabellidae (a *Megalomma* crown), and Amphinomidae (*Eurythoe complanata* and *Chloeia* sp.).

Deep zone

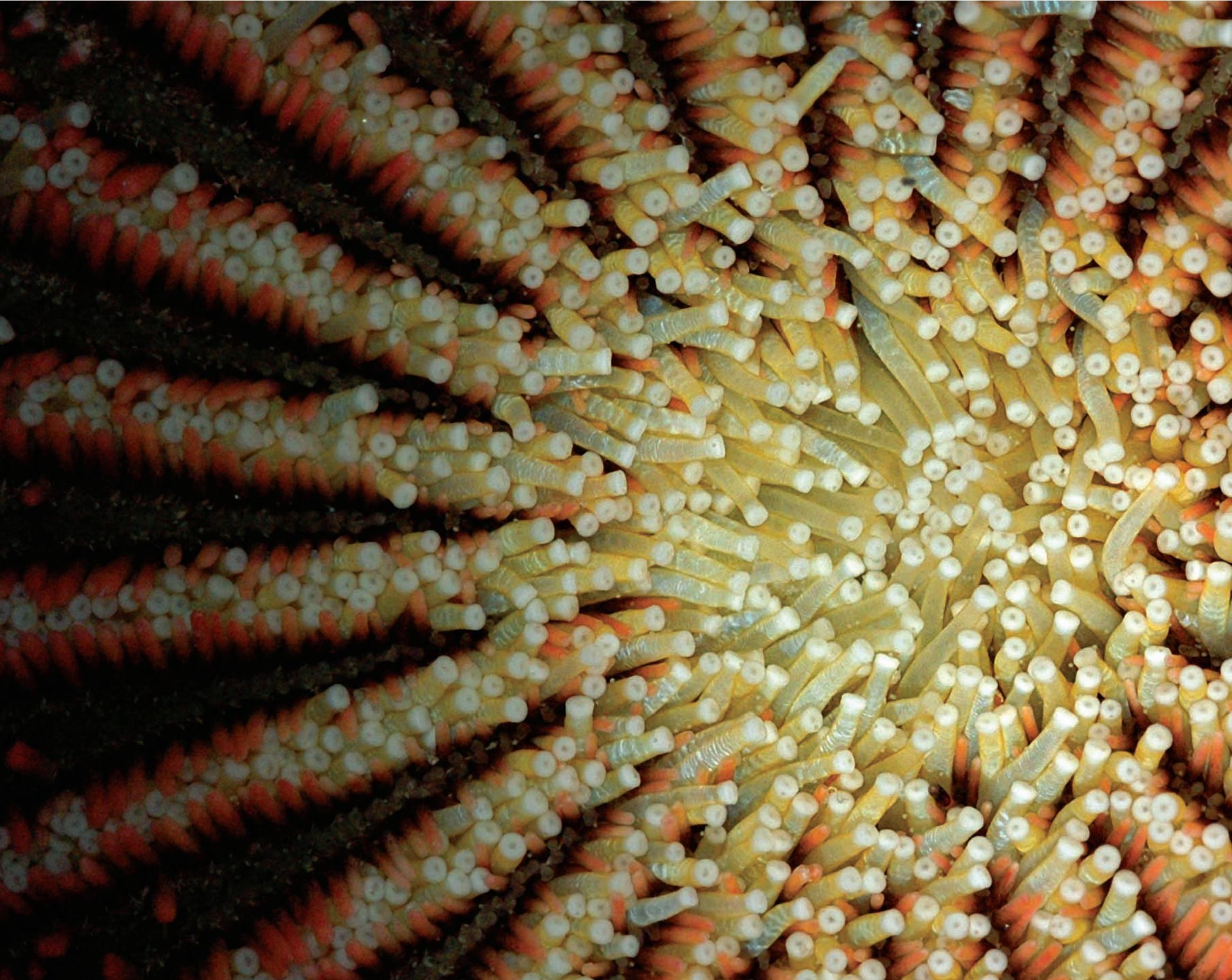
While exploring the seamount at 190 m, we stumbled upon an area with small, loose rocks. Among them, hiding from the submersible's light we found a small starfish (*Rathbunaster californicus*) with multiple arms. This fragile and seemingly harmless starfish is a terrible predator of other invertebrates. Its body is covered with thousands of pedicellariae or "tube-feet", small structures that act like tiny claws, biting everything in the sea star's path.

In a steep, sandy slope, we observed an echinoderm fauna associated to these types of seafloors, including a purple sea cucumber, *Holothuria (Vaneyothuria) zaca*, which is very common here but previously poorly documented; the starfish

Testa (skeleton) of the heart urchin *Brissus obessus*. Photo © Lorenzo Rosenzweig.

Pages 58–59:
Ambulacral tube-feet, or podia, in the ray arms and feeding orifice area of the carnivorous sea star *Heliaster kubiniji*.
Photo © Lorenzo Rosenzweig.









Astropecten ornatissimus and *Narcissia gracilis*, that singly patrol the seafloors in search for food; the armored urchin *Hesperocidaris asteriscos*, which we found in small populations, sparsely scattered in the sandy areas, an unexpected encounter being that they usually prefer rocky areas. We also found scattered at the bottom some skeletons of *Metalia espatagus* and in some cases we could observe spiny starfish, *Amphiaster insignis*, feeding on the remains of these sea urchins, a behavior never before seen.

On a rocky slope located on the seamount wall at 200 m deep, we found an extensive population of *Ophiothrix galapagensis*, an ophiuran with lively orange and red colors that cropped-up right before our eyes as the submersible's light shined upon the specimens. They live under the rocks, only showing their arms capturing fine particles of food falling from the distant surface in the form of organic detritus.

The crustose red algae were always present, even in small rocks. Several stingrays and a couple of guitarfish swam close to the seafloor, and in the sandy parts we saw black-spotted brown sea cucumbers (*Brandthoturia impatiens*) scattered on the seafloor. Finally, we were able to collect a sample of *Conus*, a gastropod whose shell can reach a high commercial value.

In our second immersion at this seamount, at a depth of 180 m, we found a dense community of bottom-dwelling invertebrates, mainly hermit crabs that congregate densely in some patches of sand (20 individuals or more per m²). As we travelled deeper the abundance of urchins and sea pens increased. A few oval flounders (*Syacium ovale*) swam among these invertebrates, as well as scorpion fish (*Pontinus clemensi* and *P. furcirhinus*). Octopuses, the most active species, dragged themselves over the seafloor and abruptly changed color when the

Colony of orange cup-corals
Tubastraea coccinea.
Photo © Lorenzo Beltrán.

submersible illuminated the seascape. On two occasions we were able to observe the octopuses feed, using their tentacles to dig in the sand and bring the food to their mouths.

The marine community here is typical of subtidal communities with soft bottoms and no vegetation. The patchy distribution is an important aspect, driven by predation and natural disturbances that are provoked by excavating species (possibly sea cucumbers and oysters). Although we did not observe a high density of sea pens (pennatulaceans), they are the principal structural components of the habitat, acting as fixers of the bottom substrate. In other latitudes, these beds of sea pens are the habitat of specific marine communities, where nudibranchs and starfish are the main predators. In the sandy bottom, two small rocks (1 m²) formed an oasis in the monotonous sand plane, sheltering a large amount of brittle stars, hermit crabs, and sand crabs.

We were able to observe an extremely interesting species of jawfish (Opistognathidae) in the sandy seafloor, about 100 m below the surface. It was a little less than half a meter long and had streaks of vibrant green color through the length of its body. We managed to film it and turn the images over to Richard Rosenblatt, a Scripps expert in jawfishes (Opistognathidae) from the eastern Pacific. He informed us that surely this was a new species, and that he had never seen a specimen like it before.

Ambulacral tube-feet and feeding orifice
of the sea star *Coronaster marchenus*.
Photo © Lorenzo Rosenzweig.

Pages 64–65:
Barber-fish *Johnrandallia nigrirostris*
and hogfish *Bodianus diplotaenia* swimming
in Bajo Las Ánimas among seafan colonies of
ochre-colored *Muricea appressa* and white
Muricea austera. Photo © Octavio Aburto-Oropeza.

