



## **Palos Verdes Peninsula Kelp Restoration - Frequently Asked Questions (FAQs) -**

### **Why is Giant Kelp important to restore?**

Kelp forests are like the rain forests of the sea—they are home to thousands of ocean animals who depend on them for food and shelter. Giant Kelp forests support hundreds of species of invertebrates, fish, and other algae, many of which are popular with sport and commercial fishermen and recreational divers. Giant Kelp grows on rocky reefs from the lower intertidal to depths of 85 ft. Restoring kelp to areas where it used to grow is good for marine life, divers, and fishermen.

### **We had a lot of kelp, what happened? And what is an 'urchin barren'?**

Over the past 100 years, giant kelp canopy has declined by approximately 75% along the Palos Verdes Peninsula. This decline is the result of numerous negative factors including El Niño events (1940, 1958, 1972, 1982, 1986, 1992, 1997) as well as sedimentation, urban runoff, pollution, and the reduction in natural sea urchin predators and competitors for resources.

Under these and similar circumstances, kelp forests can become "urchin barrens." Urchin barrens are rocky reefs where sea urchins have over-populated and effectively eliminate the kelp by overwhelming it. They eat any young kelp, and nearly everything else that pops up and tries to grow.

In the remaining kelp forests along the Palos Verdes peninsula—where there are approximately two (2) urchins per square meter—the kelp can grow to adulthood creating a stable kelp forest. In the urchin barrens, purple sea urchins—with densities of up to 70 urchins per square meter—endure. Urchin barrens like these are an "alternative steady state habitat" that, once established, can persist indefinitely and even expand. Unlike the life-giving kelp forests, very few organisms live in urchin barrens. Despite favorable kelp growing conditions (e.g., physical and chemical oceanographic attributes) the last few years, urchin barrens still persist in large areas off of Palos Verdes Peninsula.

### **Why is it necessary to cull the urchins to restore the kelp?**

Kelp forests stressed by urban runoff, sedimentation, and pollution tend to have high densities of purple urchins. These high densities of urchins can lead to destructive grazing leaving rocky reefs without any kelps. So, to limit destructive grazing and allow for the regeneration of the kelp forest, purple urchins are culled to two (2) per square meter (the target density for this restoration project), based on the success of prior projects.

## **Are all urchins bad?**

No! At densities of approximately two (2) per square meter, sea urchins are a critical component of a healthy kelp forest community; they eat drift kelp, provide cover for juvenile abalone, and are a food source of invertebrates and fish.

Urchins living in barrens behave differently than those in kelp forests. Barren urchins are undernourished and tiny, often diseased, and of no value to the ecosystem nor to fishermen. They do not hide in crevices; instead they are found on the open surfaces of the rocks and expand the barren area by invading the holdfasts of kelp plants on the edge of the barren.

## **How will the urchins be culled?**

Purple urchins will be culled one by one on the ocean floor by SCUBA divers using geology hammers. This coalition of divers is scientifically trained or are commercial sea urchin harvesters. All divers will be supervised by professional marine biologists.

## **Do urchins feel pain?**

While urchins do have a nervous system, they do not have a centralized brain or nervous system as humans do. Additionally, studies have shown that urchins in barrens are undernourished and likely to succumb to disease. Care will be taken to insure the purple urchins within the barrens are quickly and effectively eliminated, leaving behind fewer, but healthier, urchins.

## **Why don't commercial urchin fishermen just harvest the urchins?**

The barrens are made up primarily of purple urchins, for which there is a small commercial market. More importantly, the urchins in the barrens are starving and often diseased, do not have a large enough gonad (the edible part), and are of no economic value to the urchin fishery.

## **What is wrong with other methods of thinning?**

Past efforts have successfully restored giant kelp forests by quickly and systematically reducing sea urchin densities on the rocky reef. With the large kelp forest area needing to be restored, culling was determined to have the highest likelihood of success, and lessened the risks associated with relocating the urchins elsewhere. All other approaches to this project also required higher rates of greenhouse gas production by the extended use of boats and trucks. Last, keeping the sea urchins underwater means their nutrients will benefit the recovery of the kelp forest.

## **What species of urchins are you culling?**

Restoration only requires that purple urchins be culled. All red urchins will be left in place.

## **How long will it take to restore the kelp forests along the Palos Verdes Peninsula?**

This is a multi-year, multi-site project; each site is expected to be completed within four years. Information on the project can be found on the Montrose Settlements Restoration Program (MSRP) webpage at: <http://www.montroserestoration.gov/restoration/fish-habitat/>.

### **Will the barrens come back after the project is over?**

Restoration experience in other southern California sites has found that once a kelp forest is restored, the ecosystem is back in balance, and can thrive for many years.

### **How will you know if the restoration is working?**

Monitoring will be conducted at each restoration site for the life of the project. Further monitoring will be conducted annually at all sites along with control sites during restoration and for five years after restoration work is complete.

### **Will restoration work occur in the Marine Protected Areas (MPAs)?**

No! A barren off Long Point in the Point Vicente State Marine Conservation Area (SMCA) was restored before the MPAs were created. There is a large barren in the Abalone Cove SMCA, but the take of urchins is not permitted within that MPA. This project will monitor the barrens and the kelp forests all along the Peninsula, including those in the MPAs.

### **How is this project funded?**

This project is being funded by the Montrose Settlements Restoration Program (MSRP). The trustees for the MSRP included kelp restoration to help rehabilitate Palos Verdes shelf for mitigation purposes resulting from a loss of habitat due to the presence of nearby superfund site. Further information can be found on the MSRP webpage at: <http://www.montroserestoration.gov/restoration/fish-habitat/>.

### **Who is involved with this project?**

Santa Monica Bay Restoration Foundation  
Los Angeles Waterkeeper  
California Science Center  
California Sea Urchin Harvesters  
Vantuna Research Group  
National Oceanic and Atmospheric Administration  
Department of Fish and Wildlife  
Southern California Marine Institute

For more information, please contact SMBRF via the online contact form at <http://www.santamonicabay.org/>, or call 213-576-6645.

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