

Culturing the giant red sea cucumber for U.S. export

Main Goals: Develop and describe all of the methods involved in successfully growing *P. californicus* in co-culture under existing aquaculture farms at commercial scale.

Background: The native giant red sea cucumber (*Parastichopus californicus*) ranges from southern California to the Gulf of Alaska. It feeds on decaying organic matter, bacteria and benthic diatoms that occur in or on the seabed. The wild fishery for *P. californicus* is declining in Alaska and Washington, with a first ever closure in Puget Sound in 2014, and the initiation of a license buy-back program in 1999 to reduce harvest. This species of sea cucumber is in high demand in China due to its similar characteristics to the native Chinese species, presenting an opportunity to culture the species in the U.S. for export and reduce harvest pressure on wild populations.



Giant red sea cucumber native to the Pacific coast, grazes along the seafloor extracting nutrients from fallen detritus and small marine algae.



Vassili, our professional sea cucumber diver, about to take the plunge in search of more broodstock for our hatchery.

Project Summary: This research will develop methods to co-culture *P. californicus* underneath currently farmed species (e.g. salmonids, sable fish, mussels, oysters) in Alaska (Ketchikan area) and Washington (Totten Inlet and Rich Passage), utilizing the sea cucumbers as nutrient recyclers, feeding on the waste products from the co-cultured organisms growing above them. Research will begin with the collection of wild *P. californicus* specimens living subtidally and among shellfish aquaculture gear in Washington, Alaska and California for population genetic analysis and for grow-out experiments in the first year. Genetic analyses will be used to determine whether spatially distinct populations of *P. californicus* exist prior to out-planting activities. Additional specimens will be collected as broodstock from Puget Sound and transferred to the Kenneth Chew Center for Shellfish Research and Restoration in Port Orchard, WA for the development of culture techniques by staff at the Puget Sound Restoration Fund and the Alutiiq Pride Shellfish Hatchery in Seward, AK.

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