

# Water Intake Studies



Tenera has established itself as one of the leading experts on environmental issues related to intake systems including power plant cooling water intake systems (CWIS), desalination plant intakes, and intakes for delivery and management of water resources. Over the past 15 years Tenera has been involved in CWIS studies at most of the coastal power plants in California and Hawaii, and intake studies for proposed desalination plants throughout California. The methods of sampling and analysis developed by Tenera in cooperation with other scientist have been adopted by the California Energy Commission (CEC) in considering applications for repowering projects requiring water withdrawals.

Tenera has over 30 years experience in conducting biological monitoring and assessments. Recognized as one of the leading groups of marine and coastal ecosystem scientists on the Pacific coast, we provide our clients with experienced field teams, including diving scientists, for resource inventories, impact assessment, and monitoring programs. Since 1996 we have completed CWIS 316(b) Impingement Mortality and Entrainment studies at fifteen power plants in California and Hawaii, at two locations for a company specializing in permitting and siting desalination facilities, and at pilot desalination projects in northern and southern California. Tenera is also on a team that will be assessing the possible impact to aquatic organisms caused by the operation of the intake for a proposed Ocean Thermal Energy Conversion (OTEC) facility in Hawaii. We also



completed projects designed to assess the impacts to local fishes due to water withdrawals into LNG (Liquefied Natural Gas) tankers while they are off loading their cargo. We have provided testimony on behalf of our clients before the CEC, California State Water Resources Control Board, the San Francisco Bay Conservation and Development Commission, and several California Regional Water Quality Control Boards.

Based on TENERA's experience we have been able to develop and implement innovative and cost effective sampling programs that have satisfied the regulatory requirements of our clients. We have a wide variety of sampling equipment to allow us to collect samples in challenging environments. We are the only firm conducting field tests in the marine environment on the performance of wedgewire screen intake modules on reducing impingement and entrainment.

We have the largest reference collection of fish eggs and larvae from California and Hawaii outside of government and academic institutions. Many of the identifications have been confirmed by ichthyoplankton identification experts or by comparison of the larval DNA in relation to a set of reference sequences. We have also determined the larval growth rate for a number of species based on observing the growth increments on the otoliths.



*Atule mate* – 3.5 mm long



*Encrasicholina* otolith  
diameter 140 micron