

Murray, S.N., T.G. Denis, J.S. Kido, and J.R. Smith. 1999. Human visitation and frequency and potential impacts of human collecting in rocky intertidal habitats in southern California marine reserves. *CalCOFI Rep.* 40:100-106.

Abstract: Humans intensely use southern California rocky shores for recreational activities such as fishing, exploration, walking, enjoyment of the out-of-doors, and educational field trips. People also collect intertidal organisms for consumption, fish bait, home aquariums, and other purposes. In Orange County, visitors concentrate their activities on a few rocky headlands and reefs. Many of these shores have been designated as California Marine Life Refuges (CMLRs) or State Ecological Reserves (SERs), where the removal of most intertidal organisms, except for scientific purposes, has been unlawful for 30 years. In a yearlong study of eight Orange County shores, unlawful collecting of organisms was often observed. In addition, lifeguards have frequently observed unlawful collecting on these and other shores. The CMLR or SER designation did not deter collecting. Mussels, trochid snails, limpets, urchins, and octopuses were the most commonly collected organisms, primarily for food or fish bait. Several of the gastropod species targeted by human collectors had low population densities and population structures dominated by smaller and less fecund individuals, characteristics that often occur in populations exploited by humans. Most collected invertebrates were broadcast spawners that require high densities of fertile individuals to optimize reproduction. The cascading effects of collecting on community structure and the reproductive success of exploited populations are unknown. Except for state park rangers at one site, no state enforcement personnel were seen during 768 hours of low-tide observations throughout the year. Without effective enforcement, adequate signage, and educational programs to increase public awareness, CMLRs and SERs are not protecting rocky intertidal populations on heavily visited southern California shores. Improved management practices are needed if CMLRs and SERs are to protect rocky intertidal populations and to serve as benchmark sites where changes in populations due to regional climatic events or chronic human disturbances can be measured and evaluated in the absence of exploitation.