



# Of Humans and Limpets: Size-Selective Harvesting and the future of *Lottia gigantea*



## Overview:

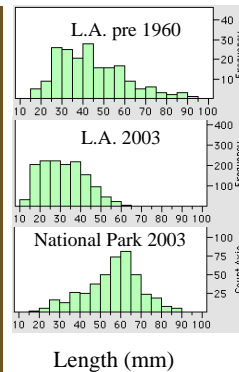
Humans have harvested marine animals from rocky shores since prehistoric times, but exploitation of these resources is far more intense and wide-ranging today compared to subsistence collecting in the past. Current harvesting and recreational activities are generally considered responsible for a serious decline in the biological diversity of California rocky shores. However, we still know little about the nature and extent of such declines. The aim of my project is to evaluate how human harvesting (mostly illegal) is affecting the ecology of rocky shore animals along the California coast.

## Sex Ratio

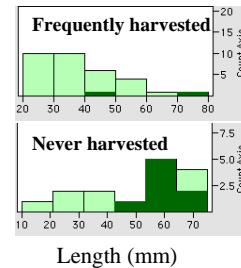
*L. gigantea* is a sequential hermaphrodite. All limpets are born male and change sex to become female as they grow older and larger. Thus, selective harvesting of the largest individuals preferentially removes the females from the population. The size distributions below demonstrate that sites that have limpets that are never harvested by humans have an equal ratio of females and males (8 females, 7 males). The frequently harvested site has a very skewed sex ratio (2 females, 29 males).

## Body Size - change through time

People preferentially remove the largest limpets from a population for consumption. This has led to a wide-spread decline in body-size of *L. gigantea* populations throughout southern California. My analyses of museum collected shells dating back to the mid-1800's from Los Angeles show a significant decline in body size of this species over the last century (see left). The only limpets not showing such declines are those from a National Park in southern California where they are protected from poaching. A decline in body size of this species will lead to negative impacts on ecological traits such as sex ratio, reproduction, age, and competitive interactions.



■ = female □ = males



**Genetics:** I am using genetic techniques to determine the relatedness between different populations of *L. gigantea* along the California coast. These data will help identify which populations are most vulnerable to local extinction due to size-selective harvesting.