



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> Stefanie J. Lynch	<b>Project Number</b> <b>S1913</b>
<b>Project Title</b> <b>Shellfish Pursuits: Population Dynamics of the Olympia oyster, <i>Ostrea conchaphila</i>, in Richardson Bay, CA - Year 2</b>	
<b>Objectives/Goals</b> The Olympia oyster ( <i>Ostrea conchaphila</i> ) is the only native oyster on the Pacific Coast. Though once highly abundant, populations have been severely depleted. The purpose of this project is to continue a study of the natural population distribution and factors affecting growth and survival of Olympia oysters in the intertidal zones of Richardson Bay.	
<b>Abstract</b> <b>Methods/Materials</b> Seventy 10-minute ecological transects were performed during low tide at five sites around Richardson Bay, and at two other sites on main San Francisco (SF) Bay. Oyster size was measured, and water samples were collected measuring potential limiting factors including salinity, turbidity, pH, temperature, calcium, phosphate, silicate, and nitrate. Predators of the oysters were recorded, including oyster drills, shore crabs, and flatworms. Individual oysters were tracked for growth rate.	
<b>Results</b> Oyster counts were found to be as prevalent in Year 2 (1353) as in Year 1 (1438, $P = 0.54$ ). Abundance by location ranked in the same order as Year 1, with one exception, and predators were associated with decreased counts at two sites. Size-frequency distribution curves show variation and multi-modal peaks consistent with constant population renewal and turnover. Oyster counts correlated with phosphate ( $r = 0.73$ , $P < 0.05$ ) and with calcium levels ( $r = -0.80$ , $P < 0.005$ ). Individual oyster growth rate was highest (1.26 mm/wk) at the site adjacent to an ongoing oyster restoration project.	
<b>Conclusions/Discussion</b> The Olympia oyster once thrived in the healthy ecosystem of San Francisco Bay. The first step in successful restoration is acquiring detailed knowledge of the population distribution and factors limiting survival. In this study, population abundance and size composition were determined for seven sites in Richardson Bay and northern San Francisco Bay for two consecutive years. Total counts in the entire study remained statistically unchanged while size-distribution varied widely, probably reflecting constant renewal and change within the oyster populations due to waves of larval release and settlement at preferred sites. Providing even small amounts of preferred habitat could supply a viable niche for oyster survival.	
<b>Summary Statement</b> In this first detailed study of the natural population of Olympia oysters in Richardson Bay, CA, population abundance, size composition, and limiting factors have been determined at seven sites during two consecutive years.	
<b>Help Received</b> Parents drove me to transect sites. Dr. Michael McGowan, SFSU, offered advice on the transect process. Adria Lassiter and Al Marchi, Romberg Tiburon Center, gave assistance with lab analysis of water samples.	