

Ordinary Least Squares Single Regression Landings CPUE Models

Discussion OLS regression models using all lifestages from all surveys with a 1- and 2-yr lag to predict Charleston Harbor watershed (Ashley River, Cooper River, Wando River and Charleston Harbor) landings CPUEs were constructed to find all explanatory relationships. All significant relationships are displayed in the following tables. The CRMS Creek Trawl is the most consistently responsive of the surveys when used in regression modeling. Nine significant relationships exist between mean annual Landings CPUE and several 1- and 2-yr.lagged lifestage variables from the CRMS Harbor and Creek Trawl surveys (Table 5). The CRMS Harbor Trawl survey's mature males 1-yr. lag and the CRMS Creek Trawl survey's immature male 1-yr. lag are the only variables with a coefficient of determination (r-squared) > 0.40 .

Only two fisheries independent life stage abundance CPUEs have significant relationships with Landings with no fishing effort factor (Table 6). The effects from these models have very small explanatory power over total landings.

The next step in this chapter is to put all variables for the Harbor and Creek Trawl surveys into an exploratory dredge predicting mean annual landings CPUE. This exploratory dredge will suggest combinations of variables to populate multiple regression models. Multiple regression OLS models will be constucted using the suggestions of the dredge.

Table 5: Significant OLS regression relationships of Landings CPUE by all lifestages from all surveys.

Dependent Variable	Explanatory Variable	Summary Statistics			
		p-value	r2	F-statistic	Degrees of Freedom
Harbor Trawl (explanatory variable)					
Mean Landings CPUE	Mature Male (1-yr. lag)	0.007659	0.4330	9.928	13
Mean Landings CPUE	Subadult (1-yr. lag)	0.016680	0.3670	7.538	13
Mean Landings CPUE	Total CPUE (1-yr. lag)	0.027710	0.3208	6.140	13
Creek Trawl (explanatory variable)					
Mean Landings CPUE	Immature Male (1-yr. lag)	0.010420	0.4076	8.946	13
Mean Landings CPUE	Sublegal (1-yr. lag)	0.014850	0.3772	7.875	13
Mean Landings CPUE	Subadult (1-yr. lag)	0.019470	0.3532	7.100	13
Mean Landings CPUE	Total CPUE (1-yr. lag)	0.023880	0.3346	6.538	13
Mean Landings CPUE	Juvenile (1-yr. lag)	0.030140	0.3129	5.921	13
Mean Landings CPUE	Immature Female (1-yr. lag)	0.033210	0.3038	5.672	13

Table 6: Significant OLS regression of all non-Creek Trawl survey Total Landings by all lifestages from all surveys.

Dependent Variable	Explanatory Variable	Summary Statistics			
		p-value	r2	F-statistic	Degrees of Freedom
Ashley Potting Survey (explanatory variable)					
Total Landings	Legal (2-yr. lag)	0.04050	0.1464	4.631	27
Harbor Trawl (explanatory variable)					
Total Landings	Mature Male (1-yr. lag)	0.04897	0.1034	4.153	36