

## Supplementary Material

Accola et al. 2021. Acoustic Characterization of Juvenile Pacific Salmon Distributions Along an Eco-Engineered Seawall

Equation S1: Negative Binomial Hurdle Model Equations

$$f_{negbin\ hurdle}(y; \pi, \mu, r) \left\{ \begin{array}{l} f(binomial)(y = 0; \pi) \\ [1 - f(binomial)(y = 0; \pi)] * \left( \frac{f_{negbin}(y = 0; \mu, r)}{1 - f_{negbin}(y = 0; \mu, r)} \right) \end{array} \right.$$

$\pi$  = probability of a positive count,  $\mu$  = mean of positive counts

$r$  = scale of positive counts

Probability of a zero count

$$z_i \sim Bernoulli(\pi_i)$$

$$\text{logit}(\pi) = X_d \beta_d$$

Counts

$$c_i \sim Negbin(\mu_i)$$

$$\text{log}(\mu) = X_c \beta_c$$

Table S1: Covariate testing for Nearshore Microhabitats and Pier Ends models.

Potential Covariates (with Julian day)	DF	AIC	$\Delta$ AIC	BIC	$\Delta$ BIC
<b>Nearshore Microhabitats Model</b>					
Microhabitat + light + depth + transect length	18	767.7	0.0	776.4	0.0
Microhabitat + light + depth + transect length + tide	20	771.4	3.7	781.1	4.7
Microhabitat + light + depth	16	774.1	6.4	781.9	5.5
Microhabitat + light + length	16	780.3	12.6	788.0	11.6
Microhabitat + light + trans length + tide	18	783.4	15.8	792.2	15.8
Microhabitat + light	14	785.2	17.5	791.9	15.6
Microhabitat + light + tide	16	788.3	20.6	796.0	19.6
Light	6	800.3	32.6	803.2	26.8
Microhabitat	12	895.1	127.4	902.8	126.4
Null	4	905.1	137.4	907.6	131.2
<b>Pier Ends Model</b>					
Site type + pier edge type + light	10	283.7	0.0	288.6	0.0
Light	6	294.0	10.3	297.0	8.4
Pier edge type	6	296.7	13.0	300.5	12.0
Site type + pier edge type	8	298.4	14.7	303.5	15.0
Null	4	309.8	26.1	312.3	23.8
Site type	6	311.7	28.0	315.6	27.0

Note: R package ‘GLMMadaptive’ is used to develop mixed models with potential covariates and a hurdle negative binomial distribution (Rizopoulos 2020). Models are ordered in the table by lowest AIC value. Specific sites are excluded from fixed covariates due to low numbers of sites.