The following supplement accompanies the article

Mangrove expansion into temperate marshes alters habitat quality for recruiting *Callinectes* spp.

Cora A. Johnston*, Olivia N. Caretti

*Corresponding author: coraann.johnston@gmail.com

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Analyzing habitat use and quality based on structural complexity

Using the vegetation measures collected to parameterize experimental units, we found that *Rhizophora*, *Spartina*, and *Avicennia* structures differ in several potentially important attributes (Bartholomew et al. 2000). To further examine how structural attributes may influence differences in habitat provided by mangrove and marsh species, we analyzed preference and survival based on structural groupings of the three vegetation types (Table S1). We found a compelling pattern that both preference and survival are higher for vegetation with a branched architecture (*Spartina* and *Rhizophora*) – the only vegetation types that hosted recruitment pulses in the field. Although these results should be interpreted cautiously because we did not directly test response to modified architecture during our study, outcomes were unrelated to any other vegetation attribute examined (Table S1), lending support to the potential influence of branching architecture to patterns of habitat use and quality.

Results

Preference

When vegetation was grouped by structural attributes (with an expected distribution of 2/3 branching: 1/3 simple; Table S1), there were no differences in habitat preference without risk. But, with risk, recruits significantly preferred branching habitat (*Rhizophora* prop roots and *Spartina* shoots) over simple *Avicennia* pneumatophores across seasons (individual G-test: $G = 3.69$, $df = 1$, $p = 0.05$; Figure S1).

Survival

Compared to controls, survival improved significantly in vegetation with branching architecture (0.50 ± 0.05, residual $df = 57$, $p = 0.02$), while survival in simple vegetation (0.36 ± 0.07) was not significantly different from survival in sand (0.23 ± 0.06; residual $df = 57$, $p = 0.43$; Figure S2). *Spartina* appears to drive the higher survival in branched vegetation structures, as *Spartina* shoots were the only vegetation type that provided a probability of survival that was significantly higher than the unvegetated treatment (0.54 ± 0.07; residual $df = 56$, $p = 0.028$; Figure 6).

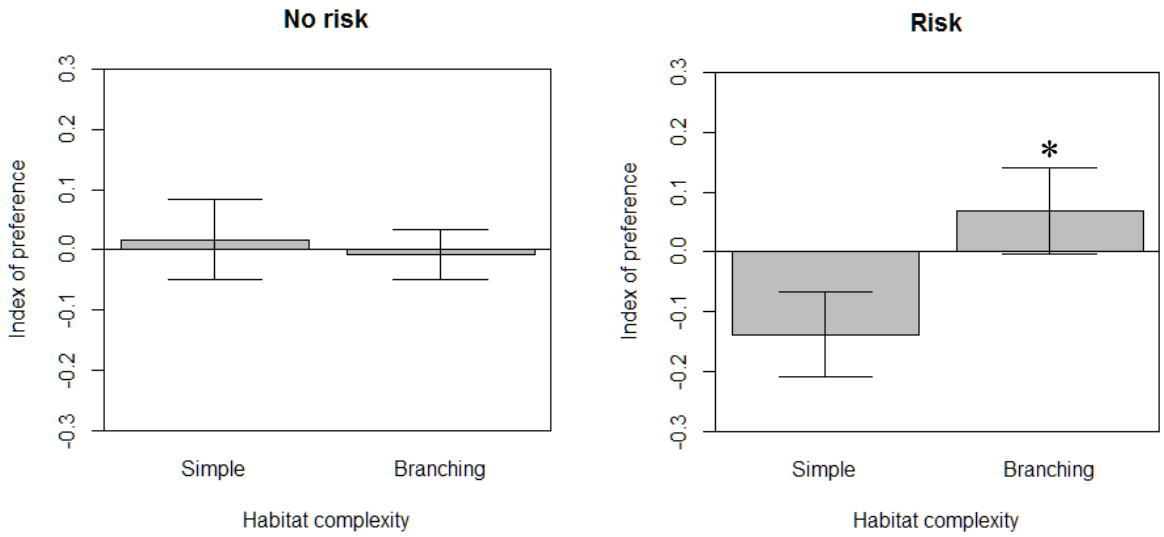

Figure S1. *Callinectes* preference among habitats with simple (*Avicennia* pneumatophores) or complex branched architecture (*Spartina* shoots and *Rhizophora* prop roots) across all studies (regardless of season). Values >0 indicate preference; values <0 indicate avoidance. Asterisks indicate significant differences at $p<0.05$.

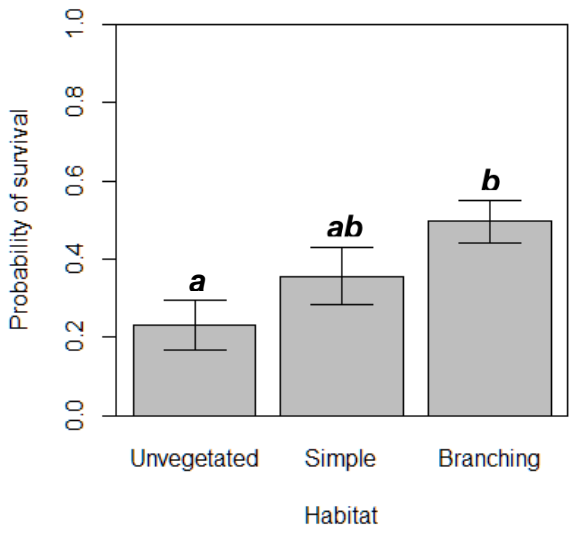

Figure S2. *Callinectes* survival among simple and complex branching vegetation architectures (as in Fig S1). Lettering indicates significant differences at $p<0.05$.

Table S1. Categorization of attributes of each microhabitat – the growth form of each vegetation type that occupies the intertidal water column. Assignments are based on analysis of data from vegetation plots in the field. Result refers to differences in survival across a given attribute.

	Categorization by habitat type			Analysis	
Attribute	***Spartina***	***Avicennia***	***Rhizophora***	**Test grouping**	**Result**
Element type	shoots	pneumatophores	prop roots	vegetation type	NS*
Density (m^{-2})	150 ± 11SE	227 ± 44SE	86 ± 9SE	vegetation type	NS*
Spacing	-	equivalent (NS)	-	n/a	n/a
Tissue	herbaceous	woody	woody	*Spartina* vs. *(Rhizophora + Avicennia)*	NS
Diameter	<10cm, low variance	<10cm, low variance	>10cm, high variance	*Rhizophora* vs. *(Spartina + Avicennia)*	NS
Arrangement	branching	simple	branching	*Avicennia* vs. (*Rhizophora + Spartina)*	P = 0.008

* $p > 0.05$ when compared between vegetation types; $p < 0.05$ for *Spartina* when each vegetation was compared to unvegetated sand substrate