

Appendix A: The Latent Class Membership Function and Additional Robustness Results

Table A1 – Factor Analysis of Psychometric Questions

Statement	Factor Loadings			
	Factor 1 (Amenity Preferences)	Factor 2 (Recreational Fishing Quality)	Factor 3 (Shoreline Amenities)	Factor 4 (Aesthetic Amenities)
Presence of boat ramp	0.23	0.59	0.13	-0.09
Fishing opportunity available	0.22	0.62	0.06	-0.01
Convenient facilities nearby	0.35	-0.11	0.34	-0.13
Nature area nearby	0.33	-0.03	-0.07	0.63
Not crowded	0.27	-0.04	0.32	0.33
Sandy (rather than rocky) beach	0.21	-0.20	0.47	-0.30
Convenient parking available	0.26	-0.18	0.39	-0.01
The health of aquatic life	0.35	0.18	-0.36	0.09
The odor of the water	0.35	-0.14	-0.34	-0.40
The water clarity of the water	0.39	-0.13	-0.30	-0.35
Scenic beauty or nice view	0.29	-0.33	-0.30	0.30

Table A2 – Membership Function of Latent Class Model

	Beach-Goers	Anglers
Factor 1 - Amenity Preferences	0	0.1108 (0.0896)
Factor 2 - Recreational Fishing Quality	0	0.3377*** (0.1112)
Factor 3 - Shoreline Amenities	0	0.0052 (0.1087)
Factor 4 - Aesthetic Amenities	0	-0.1958 (0.1364)
Income (2016 Dollars)	0	0.1516*** (0.0443)
Boat License (0/1)	0	0.6559* (0.3444)
Kid (0/1)	0	0.1978 (0.2673)
College (0/1)	0	-0.4090 (0.2985)
Intercept	0	-1.2543*** (0.3669)

Notes: *, **, *** represent significance at the 10%, 5% and 1% level respectively.
Robust standard errors have been clustered at the blockgroup level.

Table A3 – Summary Statistics for the Latent Class Subsample and for the Full Survey

	Full Survey (N=738)	Latent Class Model (N=524)
Male (%)	0.68	0.70
White (%)	0.93	0.94
Live in urban or suburban area (%)	0.80	0.81
Married (%)	0.72	0.72
Mean household size	3.05	3.09
Employed (%)	0.69	0.71
Boat License (%)	0.23	0.24
Fish License (%)	0.37	0.40
Mean household income (in 2016 dollars)	77,888	79,747
Some high school (%)	0.01	0.01
High school graduate (%)	0.10	0.08
Some college (or associate degree) (%)	0.27	0.27
College graduate (%)	0.36	0.36
Graduate or professional degree (%)	0.27	0.29

Education attainment status does not always sum to one due to rounding.

Table A4 – Latent Class Model Based on Alternative Gasoline Cost (\$0.25 per mile)

	Latent Class	
	Beach-Goers	Anglers
E. coli (1,000 cfu/100mL)	-0.55 [-1.00, -0.10]	-0.81 [-1.83, 0.21]
Algae (10,000 cells/mL)	-0.03 [-0.11, 0.05]	-0.16 [-0.32, 0.00]
Trail (0/1)	0.53 [-1.25, 2.31]	-4.06 [-8.20, 0.08]
Picnic shelter (0/1)	2.53 [0.16, 4.90]	-5.77 [-12.41, 0.87]
Food (0/1)	2.56 [0.87, 4.25]	3.24 [-2.23, 8.71]
Shower (0/1)	0.40 [-0.54, 1.18]	5.98 [0.53, 11.43]
Boat ramp (0/1)	-2.16 [-3.65, -0.67]	6.17 [0.68, 11.66]
Restrooms (0/1)	-1.26 [-3.38, 0.86]	13.97 [7.40, 20.54]
Beach (0/1)	2.70 [0.72, 4.68]	-3.37 [-8.82, 2.08]

Note: All estimates are measured in 2016 dollars. The bracketed terms are 95% confidence intervals.

Table A5 – Welfare Estimates from an Opt-Out and Kuhn-Tucker Recreational Demand Model

		Kuhn-Tucker	Opt-out
Algae Bloom (sample maximum 99.41)	Western sites	-3.77 [-5.08, -2.46]	-2.35 [-3.86, -0.84]
Site Closures	Western sites	-4.97 [-5.50, -4.44]	-3.79 [-5.20, -2.38]
No Algae	Western sites	1.54 [0.46, 2.62]	1.96 [0.39, 3.53]
40% Reduction in Spring Phosphorous Loadings	Lakewide	0.62 [0.21, 1.03]	0.81 [0.30, 1.32]
Ecoli Reduction to 410 CFU/100mL if Exceeding	Lakewide	2.72 [1.66, 3.78]	1.35 [0.23, 2.47]

Note: All estimates are measured in 2016 dollars. The bracketed terms are 95% confidence intervals.

Figure A1: Importance of Site Characteristics

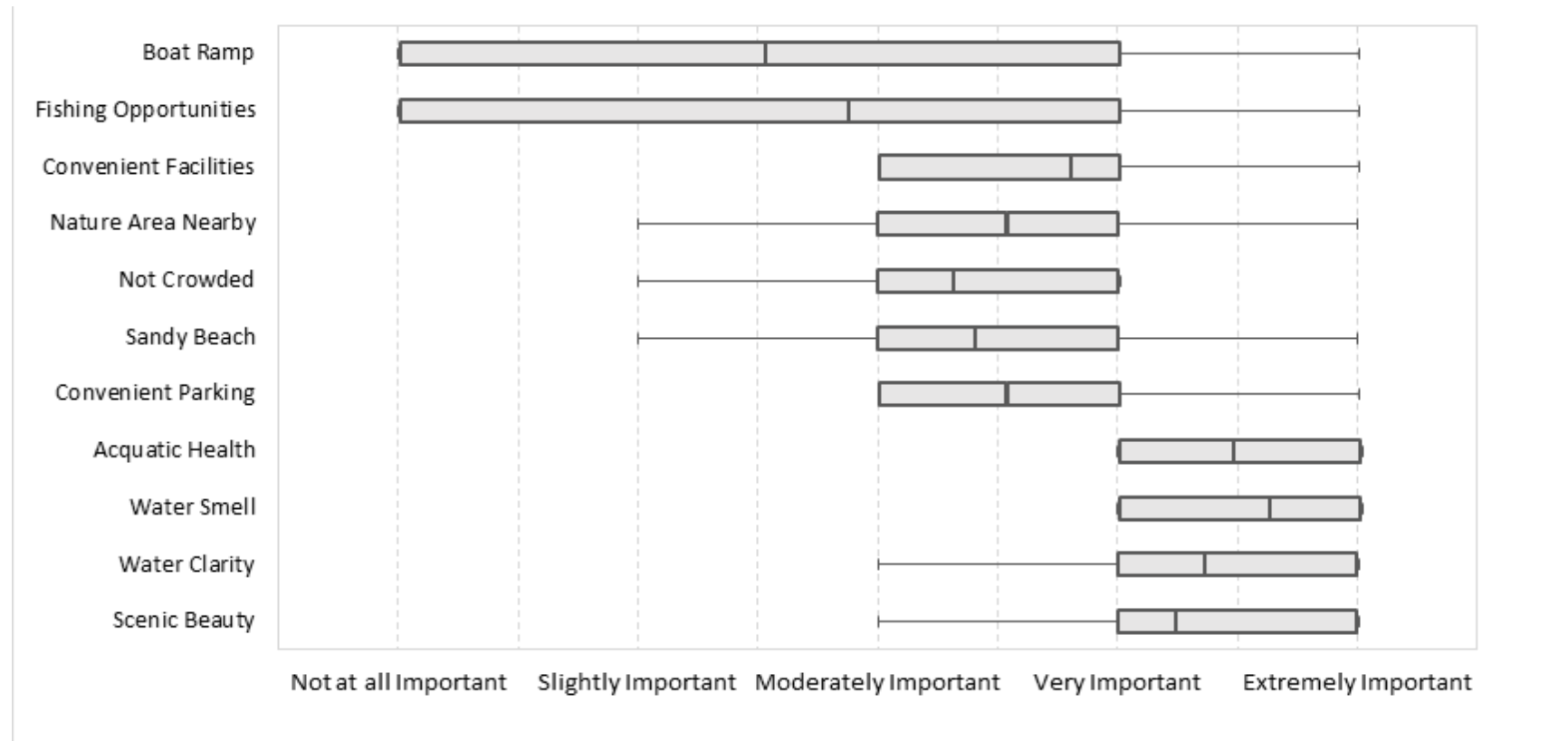


Figure A2: Absolute Change in Algae Concentrations Due to a 40% Reduction in Phosphorous Loadings

