

Supplementary Material

Multi-Objective Wetland Design for Water Quality and Waterfowl Habitat

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The following supporting material is included: Table S1: Continuous distributions for k-C model variables with modeled vs. actual data statistic comparisons; Table S2: Vegetation species used in model with preferred water depths.

Table S1 Continuous distributions for k-C model variables with modeled vs. actual data statistic comparisons

Input Variable	Distribution	Param. 1	Param. 2	Param. 3	Domain shift	AIC	Data Min. (Fit Min.)	Data Max. (Fit Max.)	Data Avg. (Fit Avg.)	Data Med. (Fit Med.)	Data Std. Dev. (Fit Std. Dev.)
τ (month)	Inverse						0.008	1.94	0.44	0.25	0.44
	Gaussian	$\mu=0.48$	$\lambda=0.51$		-0.04	35	(-0.04)	(+Inf)	(0.44)	(0.29)	(0.47)
k (m/month)							-4.82	32.10	1.42	0.57	3.39
	Log-logistic	$\gamma=-5.59$	$\beta=6.38$	$\alpha=7.51$		982	(-5.59)	(+Inf)	(0.98)	(0.79)	(1.64)
C_{in} (mg-TP/L)	Pearson						0.016	89.29	2.78	0.14	10.01
	Type V	$\alpha=0.66$	$\beta=0.064$		-0.04	237	(0.005)	(+Inf)	(3.12)	(0.19)	(18.20)

Table S2 Vegetation species used in model with preferred water depths (MSU 2024)

Common Name	Scientific Name	Wetland Zonation	Preferred Depths (in)
Bluejoint Grass	<i>Calamagrostis canadensis</i>	Wet meadow	0 – 6
Marsh Bell Flower	<i>Campanula aparinoides</i>	Wet meadow	0 – 6
Sedges	<i>Carex aquatilis</i> , <i>C. lacustris</i> , <i>C. stricta</i>	Wet meadow	0 – 6
Water Hemlock	<i>Cicuta bulbifera</i>	Wet meadow	0 – 6
Jewelweed	<i>Impatiens capensis</i>	Wet meadow	0 – 6
Small Bedstraw	<i>Galium trifidum</i>	Wet meadow	0 – 6
Water Smartweed	<i>Persicaria amphibia</i>	Wet meadow	0 – 6
Marsh Cinquefoil	<i>Comarum palustre</i>	Wet meadow	0 – 6
Common Skullcap	<i>Scutellaria galericulata</i>	Wet meadow	0 – 6
Broad-leaved Cattail	<i>Typha latifolia</i>	Wet meadow	0 – 6
Common Arrowhead	<i>Sagittaria latifolia</i>	Wet meadow	0 – 6
Bulrushes	<i>Scirpus spp.</i> , <i>Schoenoplectus spp.</i>	Emergent marsh	6 – 18
Spike-rushes	<i>Eleocharis spp.</i>	Emergent marsh	6 – 18
Rushes	<i>Juncus spp.</i>	Emergent marsh	6 – 18
Cattails	<i>Typha spp.</i>	Emergent marsh	6 – 18
Pondweed	<i>Potamogeton natans</i>	Submergent marsh	18 – 36
Water Celery	<i>Vallisneria americana</i>	Submergent marsh	18 – 36
Common Waterweed	<i>Elodea canadensis</i>	Submergent marsh	18 – 36
Bladderwort	<i>Utricularia vulgaris</i>	Submergent marsh	18 – 36
Coontail	<i>Ceratophyllum demersum</i>	Submergent marsh	18 – 36
Slender Naiad	<i>Najas flexilis</i>	Submergent marsh	18 – 36
Sweet-scented Water-lily	<i>Nymphaea odorata</i>	Submergent marsh	18 – 36