WISCONSIN DEPARTMENT OF NATURAL RESOURCES

Eye of the Beholder: Perceptions of the Natural Beauty of Wisconsin Wetlands

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ANALYSIS SERVICES SECTION
BUREAU OF ENVIRONMENTAL ANALYSIS AND SUSTAINABILITY

WITH LOTS OF HELP FROM: JES REESE LOHR, AND ALL THE WETLANDS FIELD STAFF. FUNDING SUPPORT FROM EPA.

Introduction

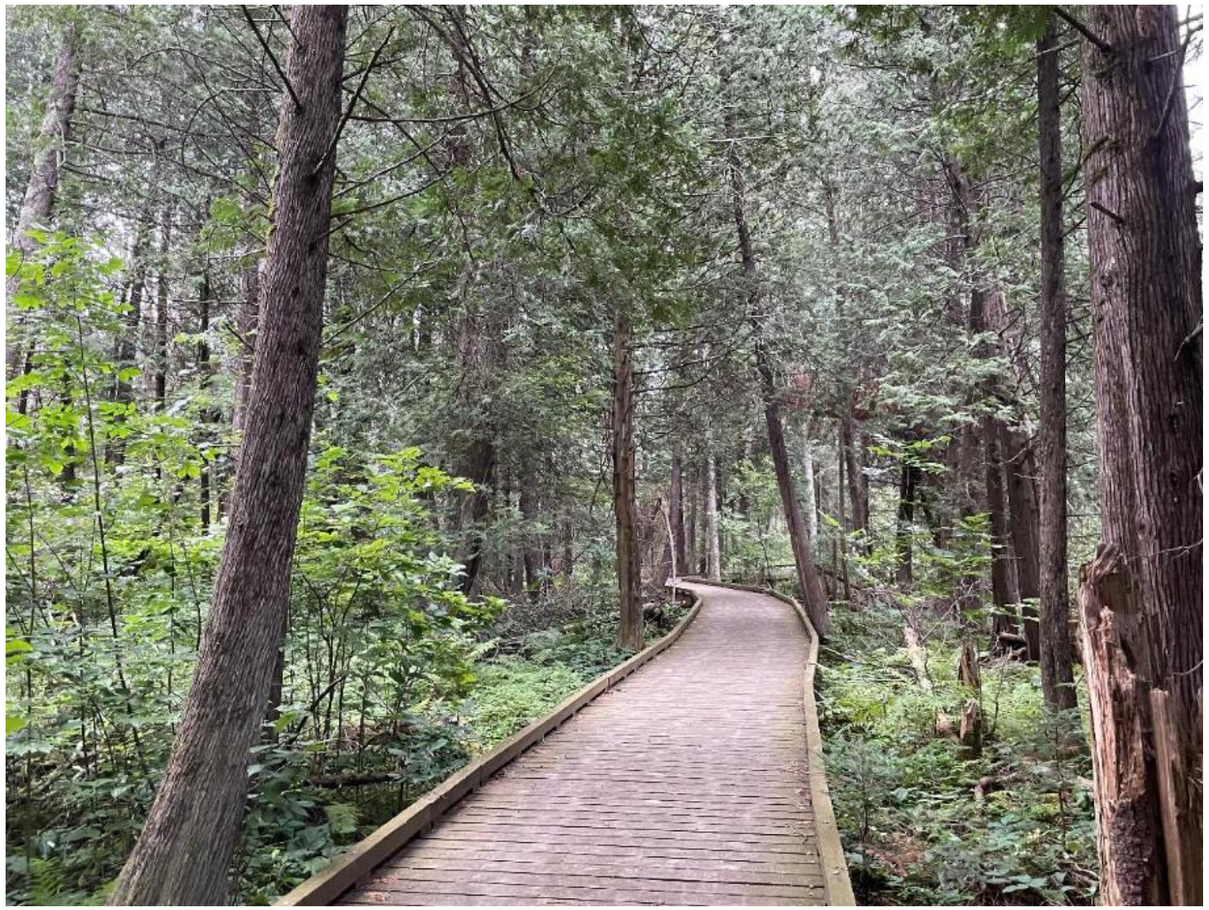
Background

- Natural Scenic Beauty (NSB) is a wetland functional value identified as a wetland water quality standard. (s. NR 103.02, Wis. Adm. Code)
- No calibrated tool to incorporate NSB into regulatory decisions.

Study purpose:

- To inform development of a decision support tool to facilitate consistency in assessing NSB.
- To assess the extent of diversity of perceptions within the public..

Assessment of Natural Scenic Beauty



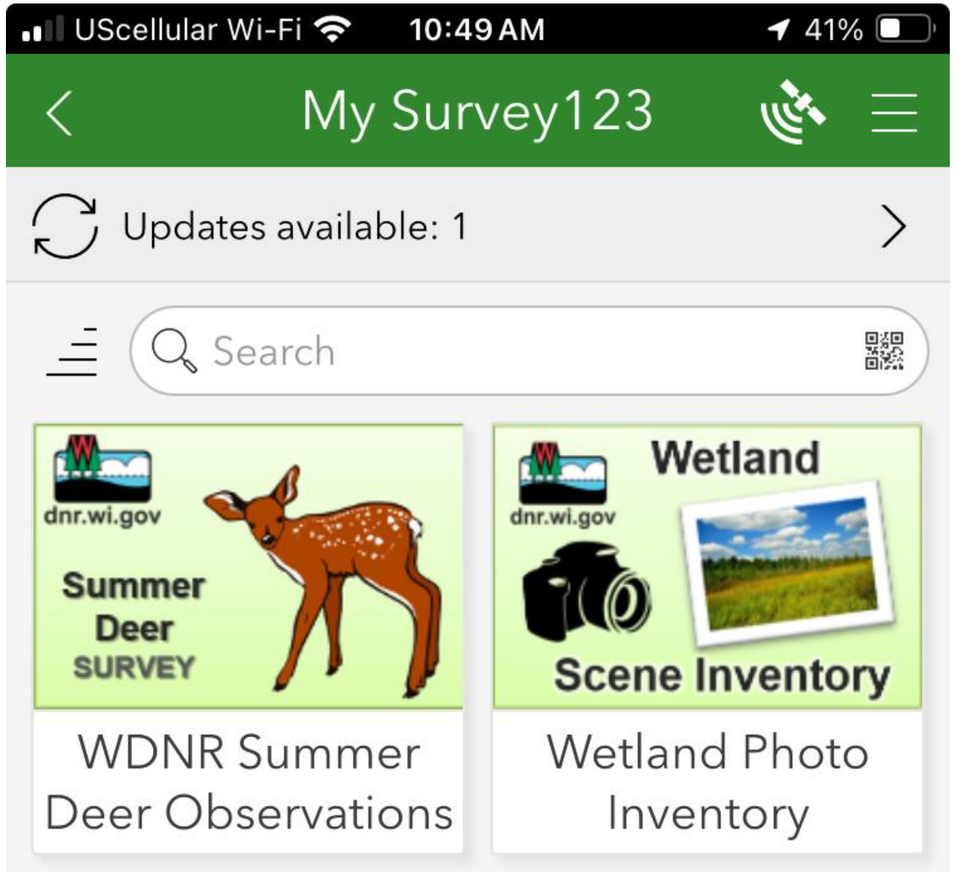
- Four main paradigms in landscape perception research:
  - Expert
    - Evaluation by skilled observers, trained in fields where sound management is assumed to lead to intrinsic aesthetic qualities.
  - Psychophysical
    - Evaluation by untrained observers and assumes that correlations exist between landscape properties and observers' ratings.
  - Cognitive
    - Search for meaning associated with landscapes, based on past experiences, future expectations, and socio-cultural conditioning.
  - Experiential
    - Considers the iterative process of human-landscape interaction to be the basis of landscape value.

Scenic Beauty Estimation

- Psychophysical approach
  - Developed in the 1970s by US Forest Service to address common rating problems:
    - Internal scale biases among respondents
    - Incomplete sets of stimuli
- Links observer rating to biophysical features of the landscape through regression analysis.
- Requires no special training for observers.
- Established validity
  - Near perfect linear relationship with willingness-to-pay (Daniel et al. 1989)
  - Strong correlation between in-person and photo-based ratings (Brown et al. 1988)

Step 1: Establishing a Photo Catalogue

- Wetland Program staff collected photos using a standardized protocol between July 1 and September 15, 2022.
- Photos uploaded in the field
  - Information captured onsite:
    - Date, time and location
    - Wetland Type(s)
    - Plant diversity at site (Low, Med, High)
    - Extent of Invasive vegetation
    - Presence or Absence of notable features:
      - Wildflowers in bloom
      - Areas of open water
      - Anthropogenic Structures including:
        Roads/Driveways, Buildings, Utilities, Berms
    - A brief written description
    - Aesthetic quality rating (1 to 10)



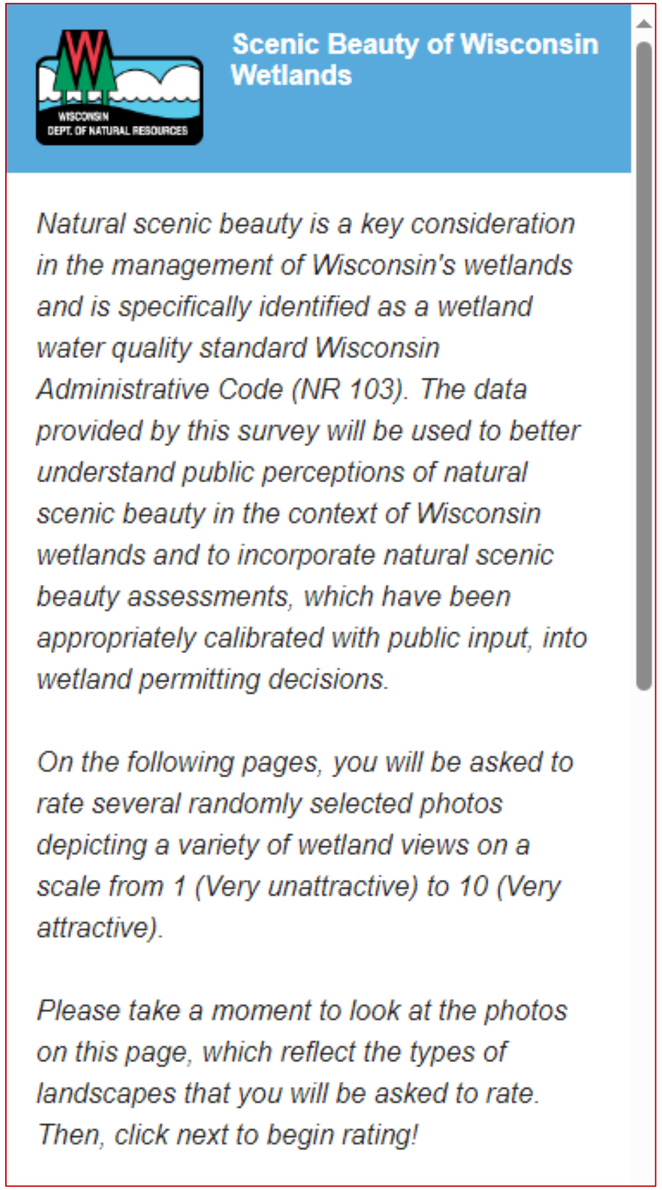
Step 1b: Establishing a photo catalogue

- During the field season:
  - Followed an iterative process to evaluate photos that were submitted and fill in gaps within the experimental space.

- After the field season:
  - Curation of the photo library.
  - Culling poor quality and repetitive photographs.
  - Coding of additional variables depicted.
    - Cloud cover, hills, etc.

Step 2: Photo Evaluation (Online Survey)

- Target Audience:
  - Wetland Program Staff
  - Online panel of 900 Wisconsin Residents
    - census matched to age, gender and income.
- Bank of 100 scenic photographs
  - Each respondent randomly assigned to rate 21 images.
  - All respondents rated an additional common set of 4 images.



Analysis

- Transform raw ratings into Standardized Scenic Beauty Estimates (SBE) (Daniel and Boster, 1976).
- Multiple Regression to predict SBE as a function of biophysical characteristics of landscape

Model 1: To what extent do differences in perceptions exist between the experts (Wetland Staff) and the nonexperts (Online Panel)?

Model 2: What differences exist in perceptions among the nonexperts?

- Latent class regression to identify groups of respondents to maximize differences in aesthetic preferences

Regression Model Staff vs Panel

		Staff		Panel			
	R^2	0.39		0.07			
	Class Size	3.4%		96.6%			
Attribute	**Level**	**Beta**	**s.e.**	**Beta**	**s.e.**	**p-value**	**p-value (=)**
Intercept		-114.66	11.85	-13.47	3.79	**<0.001**	**<0.001**
Anthropogenic Structures	**Absen**						
	Presen						
Dead Trees	**Absen**						
	Presen						
Dead Vegetation	**Absen**						
	Presen						
Flowers	Absen						
	Presen						
Open Water	Absen						
	Presen						
Bare Soil	**Absen**						
	Presen						
Hill	Absen						
	Presen						
Plant Diversity	Low						
	Mediu						
	High						
Invasive Vegetation Extent	Less tha						
	5 to 2						
	25 to 50	-21.73	7.52	-7.08	2.38		
	50 to 75	28.11	8.09	21.64	2.65		
	75 or more	10.68	7.08	-19.57	2.14		

		Staff		Panel			
Attribute	**Level**	**Beta**	**s.e.**	**Beta**	**s.e.**	**p-value**	**p-value (=)**
Type: Wet Prairie	**Absent**	17.64	3.77	5.06	1.19	**<0.001**	**0.002**
	Present	-17.64	3.77	-5.06	1.19		
Type: Marsh	**Absent**	4.81	3.81	3.09	1.19	**0.016**	0.670
	Present	-4.81	3.81	-3.09	1.19		
Type: Mature Forest	Absent	-13.87	4.28	-14.02	1.35	**<0.001**	0.970
	Present	13.87	4.28	14.02	1.35		
Type: Immature Forest	Absent	25.75	5.53	11.19	1.71	**<0.001**	**0.012**
					1.71		
					1.09	**<0.001**	**0.009**
					1.09		
					1.34	**<0.001**	**0.020**
					1.34		
					2.07	**<0.001**	**<0.001**
					2.07		

Several statistically significant differences in magnitude:

- Anthropogenic structures (Absent)
- Hills (Present)
- Invasive vegetation extent (50-75%; followed by 0-5%) – Largest single factor for Panelists
- Wet Prairie (Absent)
- Immature Forest (Present)
- Tall Shrub (Absent)
- Farmed (Absent) – Largest single factor for Staff

Few statistically significant differences in direction:

- Dead trees
- Plant diversity
- Sedge meadows

Green Cells indicate most preferred attribute value. Border indicates group with statistically significantly stronger preference.

Decision Support Tool

DNR Waterways Staff versus Online Panel of Wisconsin Residents

	Wetland Profile
Anthropogenic Structures	Absent
Dead Trees	Absent
Dead Vegetation	Absent
Flowers	Absent
Open Water	Absent
Bare Soil	Present
Hill	Present
Plant Diversity	Low
Invasive Vegetation Extent	5 to 25
Type : Wet Prairie	Absent
Type: Marsh	Present
Type: Mature Forest	Absent
Type: Immature Forest	Absent
Type: Sedge Meadow	Absent
Type: Tall Shrub	Absent
Type: Farmed	Absent

Predicted Scenic Beauty	Relative Score
Staff	53%
Panel	59%

Calculations	Staff	Panel
Intercept	-114.7	-13.5
Anthropogenic Structures	20.5	9.6
Dead Trees	-5.9	1.7
Dead Vegetation	17.8	20.7
Flowers	-3.2	-4.0
Open Water	-7.1	-5.6
Bare Soil	-1.0	4.8
Hill	25.2	15.4
Plant Diversity	-49.2	-2.0
Invasive Vegetation Extent	-33.8	-15.7
Type : Wet Prairie	17.6	5.1
Type: Marsh	-4.8	-3.1
Type: Mature Forest	-13.9	-14.0
Type: Immature Forest	-25.8	-11.2
Type: Sedge Meadow	-1.6	8.3
Type: Tall Shrub	17.5	7.3
Type: Farmed	52.9	10.8
Predicted SBE	-109.5	14.8
Max Possible Predicted SBE	157.9	132.3
Min Possible Predicted SBE	-412.5	-156.7
Range of Possible Predicted SBE	570.4	289.0
Relative Score:	**53%**	**59%**

Select Scenarios: DNR Staff vs Online Panel

	Most Scenic		Least Scenic		Biggest difference	
	Staff	Panel	Staff	Panel	Staff	Panel
Anthropogenic Structures	Absent	Absent	Present	Present	Absent	Present
Dead Trees	*Present*	*Absent*	*Absent*	*Present*	Present	Absent
Dead Vegetation	Absent	Absent	Present	Present	Present	Absent
Flowers	Present	Present	Absent	Absent	Absent	Present
Open Water	Present	Present	Absent	Absent	Present	Absent
Bare Soil	*Absent*	*Present*	*Present*	*Absent*	Absent	Present
Hill	Present	Present	Absent	Absent	Present	Absent
Plant Diversity	*High*	*Medium*	Low	Low	High	Low
Invasive Vegetation Extent	50 to 75	50 to 75	*5 to 25*	*75 or more*	75 or more	5 to 25
Type: Wet Prairie	Absent	Absent	Present	Present	Absent	Present
Type: Marsh	Absent	Absent	Present	Present	Absent	Present
Type: Mature Forest	Present	Present	Absent	Absent	Absent	Present
Type: Immature Forest	Present	Present	Absent	Absent	Present	Absent
Type: Sedge Meadow	*Present*	*Absent*	*Absent*	*Present*	Present	Absent
Type: Tall Shrub	Absent	Absent	Present	Present	Absent	Present
Type: Farmed	Absent	Absent	Present	Present	Absent	Present
Percentile: Staff	100%	95%	0%	11%	85%	12%
Percentile: Panel	89%	100%	12%	0%	48%	38%

Relative Score

81 - 100%
61 - 80%
41 - 60%
21 - 40%
0 - 20%

Online Panel LC Model

		Class 1		Class 2		Class 3		Class 4		Class 5		Class 6			
	R^2	0.11		0.25		0.08		0.27		0.24		0.3			
	Class Size	29.80%		19.20%		18.50%		16.10%		8.20%		8.20%			
Attribute	Level	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.	Beta	s.e.	p-value	p-value
Intercept		48.47	6.69	-34.09	9.57	-20.79	12.12	-67.68	8.38	-135.65	11.42	97.37	11.12	<0.001	<0.001
Anthropogenic Structures	Absent	9.25	1.87	-6.62	2.32	24.67	2.16	19.76	2.84	-2.49	2.64	7.84	2.67	<0.001	<0.001
	Present	-9.25	1.87	6.62	2.32	-24.67	2.16	-19.76	2.84	2.49	2.64	-7.84	2.67		
Dead Trees	Absent	4.59	1.52	-2.93	2.12	2.71	2.05	1.99	2.02	-7.24	2.61	9.40	2.69	<0.001	<0.001
	Present	-4.59	1.52	2.93	2.12	-2.71	2.05	-1.99	2.02	7.24	2.61	-9.40	2.69		
Dead Vegetation	Absent	26.75	2.08	9.65	2.90	30.65	2.83	23.87	3.04	-0.61	3.38	28.54	3.51	<0.001	<0.001
	Present	-26.75	2.08	-9.65	2.90	-30.65	2.83	-23.87	3.04	0.61	3.38	-28.54	3.51		
Flowers	Absent	-7.42	1.49	4.64	2.08	-14.25	2.16	-5.02	2.79	14.59	2.60	-7.37	2.65	<0.001	<0.001
	Present	7.42	1.49	-4.64	2.08	14.25	2.16	5.02	2.79	-14.59	2.60	7.37	2.65		
Open Water	Absent	2.64	2.07	-9.95	2.92	-9.99	2.73	-17.15	2.88	-27.01	3.76	24.69	3.74	<0.001	<0.001
	Present	-2.64	2.07	9.95	2.92	9.99	2.73	17.15	2.88	27.01	3.76	-24.69	3.74		
Bare Soil	Absent	-6.13	1.60	-4.30	2.21	-10.84	2.14	-3.52	2.24	0.26	2.63	-2.40	2.87	<0.001	0.02
	Present	6.13	1.60	4.30	2.21	10.84	2.14	3.52	2.24	-0.26	2.63	2.40	2.87		
Hill	Absent	-5.04	1.93	-16.58	2.48	-20.11	2.28	-28.23	2.61	-31.44	3.10	7.25	3.33	<0.001	<0.001
	Present	5.04	1.93	16.58	2.48	20.11	2.28	28.23	2.61	31.44	3.10	-7.25	3.33		
Plant Diversity	Low	7.74	2.84	-2.77	4.05	-3.36	4.55	-12.82	3.92	-20.00	5.18	13.08	5.14	<0.001	<0.001
	Medium	-4.71	2.26	2.67	3.17	8.96	3.16	9.71	3.01	13.93	3.98	-3.70	3.99		
	High	-3.02	2.50	0.11	3.49	-5.61	3.54	3.11	3.59	6.07	4.42	-9.38	4.69		
Invasive Vegetation Extent	Less than 5	29.81	3.02	8.50	4.13	36.10	4.39	25.07	4.17	0.79	4.91	17.67	5.28	<0.001	<0.001
	5 to 25	-7.52	2.81	-13.91	3.83	-26.13	3.61	-28.94	3.44	-18.30	4.66	-7.46	4.97		
	25 to 50	-10.17	3.99	-7.07	5.34	-8.95	5.01	-7.66	5.14	-20.21	6.60	-0.23	6.82		
	50 to 75	27.75	4.43	12.55	6.58	22.75	6.10	9.69	5.60	13.39	7.58	46.20	7.92		
	75 or more	-39.87	3.73	-0.08	5.45	-23.77	7.19	1.83	4.82	24.33	6.05	-56.18	6.46		
Type: Wet Prairie	Absent	3.99	1.99	9.63	2.77	3.77	2.56	0.41	2.63	6.43	3.42	4.58	3.58	<0.001	0.34
	Present	-3.99	1.99	-9.63	2.77	-3.77	2.56	-0.41	2.63	-6.43	3.42	-4.58	3.58		
Type: Marsh	Absent	2.26	2.00	1.78	2.75	3.42	2.52	-1.02	2.57	5.30	3.34	9.63	3.74	0.031	0.28
	Present	-2.26	2.00	-1.78	2.75	-3.42	2.52	1.02	2.57	-5.30	3.34	-9.63	3.74		
Type: Mature Forest	Absent	-23.70	2.25	-10.82	3.20	-14.45	2.95	-9.33	2.94	-4.74	3.85	-17.87	4.03	<0.001	<0.001
	Present	23.70	2.25	10.82	3.20	14.45	2.95	9.33	2.94	4.74	3.85	17.87	4.03		
Type: Immature Forest	Absent	-11.96	2.95	-4.96	3.90	-17.15	3.74	-18.30	3.71	2.06	4.89	-7.37	4.83	<0.001	0.006
	Present	11.96	2.95	4.96	3.90	17.15	3.74	18.30	3.71	-2.06	4.89	7.37	4.83		
Type: Sedge Meadow	Absent	11.81	1.84	5.91	2.44	9.95	2.29	-2.83	2.56	-0.42	3.17	21.76	3.26	<0.001	<0.001
	Present	-11.81	1.84	-5.91	2.44	-9.95	2.29	2.83	2.56	0.42	3.17	-21.76	3.26		
Type: Tall Shrub	Absent	7.32	2.22	7.64	2.99	3.35	2.90	1.02	2.76	5.60	3.70	15.12	4.07	<0.001	0.082
	Present	-7.32	2.22	-7.64	2.99	-3.35	2.90	-1.02	2.76	-5.60	3.70	-15.12	4.07		
Type: Farmed	Absent	-11.28	3.54	7.54	4.85	18.74	5.39	31.19	4.82	42.86	5.84	-18.78	6.33	<0.001	<0.001
	Present	11.28	3.54	-7.54	4.85	-18.74	5.39	-31.19	4.82	-42.86	5.84	18.78	6.33		

Most prefer presence of:

- Flowers- except Class 2,5 (presence); Class 4 (indifferent);
- Open water– except Class 1 (indifferent); Class 6 (absence)
- Hill – except Class 6 (absence)
- Medium Plant Diversity – except Class 1,6 (Low); Class 2 (indifferent)
- Less than 5% Invasive Vegetation – except Class 2,6 (50-75%); Class 5 (More than 75%)
- Mature forest – except Class 3,4,5 (indifferent)
- Immature forest – except Class 2,5,6 (indifferent)

Most prefer absence of:

- Anthropogenic Structures – except Class 2,5 (presence)
- Dead Trees - except Class 2,5 (presence);
- Dead Vegetation - except Class 5 (indifferent);
- Wet prairie – except Class 4 (indifferent) ***Not Sign. different***
- Sedge meadow – except Class 4,5 (indifferent)
- Tall Shrub – except Class 2,4,5 (indifferent) ***Not Sign. different***
- Farmed wetland – except Class 1,6 (presence)

Most indifferent to:

- Marsh – except Class 6 (absence) ***Not Sign. different***
- Bare soil – except Class 1,3 (presence)

Online Panel Latent Class Covariate Characteristics

Age:
- Class 5 is most likely to be older.
- Class 3 is most likely to be younger.

Hiking:
- Class 2 is more likely to participate.
- Class 6 is least likely to participate.

Birdwatching:
- Class 4 is most likely to participate.
- Class 6 is least likely to participate.

Trapping:
- Class 5 is most likely to participate.

Distribution within Class		Class1	Class2	Class3	Class4	Class5	Class6
	Class Size	29.8%	19.2%	18.5%	16.1%	8.2%	8.2%
Age	18 to 34	31.2%	18.3%	**45.1%**	17.4%	14.9%	31.0%
	35 to 64	43.4%	46.0%	46.7%	48.0%	45.9%	33.0%
	65 and older	25.4%	35.7%	8.3%	34.5%	**39.2%**	36.0%
Hike	No	45.3%	26.8%	43.2%	31.5%	44.6%	**59.9%**
	Yes	54.8%	**73.2%**	56.8%	68.6%	55.4%	40.1%
Birdwatch	No	62.3%	61.3%	71.1%	45.5%	73.8%	**76.9%**
	Yes	37.7%	38.7%	29.0%	**54.5%**	26.2%	23.1%
Trap	No	97.8%	97.8%	91.4%	95.1%	90.9%	**98.4%**
	Yes	2.2%	2.2%	8.6%	4.9%	**9.1%**	1.6%

Select Scenarios: Latent Classes within Online Panel

	Most Scenic						Least Scenic					
	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
Anthropogenic Structures	Absent	*Present*	Absent	Absent	*Present*	Absent	Present	*Absent*	Present	Present	*Absent*	Present
Dead Trees	Absent	*Present*	Absent	Absent	*Present*	Absent	Present	*Absent*	Present	Present	*Absent*	Present
Dead Vegetation	Absent	Absent	Absent	Absent	*Present*	Absent	Present	Present	Present	Present	*Absent*	Present
Flowers	Present	*Absent*	Present	Present	*Absent*	Present	Absent	*Present*	Absent	Absent	*Present*	Absent
Open Water	*Absent*	Present	Present	Present	Present	*Absent*	*Present*	Absent	Absent	Absent	Absent	*Present*
Bare Soil	Present	Present	Present	Present	*Absent*	Present	Absent	Absent	Absent	Absent	*Present*	Absent
Hill	Present	Present	Present	Present	Present	*Absent*	Absent	Absent	Absent	Absent	Absent	Present
Plant Diversity	*Low*	Medium	Medium	Medium	Medium	*Low*	*Medium*	Low	*High*	Low	Low	High
Invasive Vegetation Extent	Less than 5	*50 to 75*	Less than 5	Less than 5	*75 or more*	*50 to 75*	*75 or more*	5 to 25	5 to 25	5 to 25	*25 to 50*	*75 or more*
Type: Wet Prairie	**Absent**	**Absent**	**Absent**	**Absent**	**Absent**	**Absent**	**Present**	**Present**	**Present**	**Present**	**Present**	**Present**
Type: Marsh	Absent	Absent	Absent	*Present*	Absent	Absent	Present	Present	Present	*Absent*	Present	Present
Type: Mature Forest	**Present**	**Present**	**Present**	**Present**	**Present**	**Present**	**Absent**	**Absent**	**Absent**	**Absent**	**Absent**	**Absent**
Type: Immature Forest	Present	Present	Present	Present	*Absent*	Present	Absent	Absent	Absent	Absent	*Present*	Absent
Type: Sedge Meadow	Absent	Absent	Absent	*Present*	*Present*	Absent	Present	Present	Present	*Absent*	*Absent*	Present
Type: Tall Shrub	**Absent**	**Absent**	**Absent**	**Absent**	**Absent**	**Absent**	**Present**	**Present**	**Present**	**Present**	**Present**	**Present**
Type: Farmed	*Present*	Absent	Absent	Absent	Absent	*Present*	*Absent*	Present	Present	Present	Present	*Absent*
Percentile: Class 1	**100%**	**76%**	**89%**	**80%**	**24%**	**97%**	**0%**	**33%**	**18%**	**29%**	**64%**	**3%**
Percentile: Class 2	**69%**	**100%**	**86%**	**80%**	**74%**	**57%**	**35%**	**0%**	**13%**	**18%**	**24%**	**48%**
Percentile: Class 3	**84%**	**78%**	**100%**	**94%**	**37%**	**72%**	**17%**	**19%**	**0%**	**7%**	**54%**	**22%**
Percentile: Class 4	**69%**	**81%**	**98%**	**100%**	**58%**	**51%**	**39%**	**15%**	**6%**	**0%**	**42%**	**51%**
Percentile: Class 5	**34%**	**95%**	**79%**	**77%**	**100%**	**20%**	**72%**	**2%**	**22%**	**18%**	**0%**	**86%**
Percentile: Class 6	**91%**	**66%**	**70%**	**57%**	**20%**	**100%**	**4%**	**45%**	**31%**	**48%**	**71%**	**0%**
Weighted total	**84%**	**85%**	**90%**	**84%**	**46%**	**75%**	**18%**	**18%**	**12%**	**19%**	**47%**	**26%**

Relative Score

81 - 100%
61 - 80%
41 - 60%
21 - 40%
0 - 20%

Key Takeaways

- More diverse perceptions of NSB within the public than between the public as a whole and DNR Staff.
- SBE models offer a consistent and transparent starting point to consider NSB in wetland management.

Study Limitations

- The “most preferred” wetland scene may not exist in Wisconsin (or anywhere!)
  - Solution: integrate SBE models in GIS to map wetland scenic beauty values
- Photographs were collected opportunistically in one summer field season.
  - Limits precision with which characteristics can be coded and effects estimated.
  - Solution: Additional resources for field data collection
- Response quality and representation issues associated with the use of online panels.
  - Solution: Additional resources to use a mixed mode probability sample.

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OFF THE RECORD"

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ANALYSIS SERVICES
BUREAU OF ENVIRONMENTAL ANALYSIS AND SUSTAINABILITY

Model Selection and Summary Statistics

Supplemental Information

Selection Criteria:

- Minimize Bayesian Information Criterion among candidate models

Selection Process:

- Step 1: Select most informative number of Latent Classes
  - 6 Class solution identified
- Step 2: Stepwise removal of potential Covariates predicting class membership
  - Final model retained Age, Hiking, Birdwatching, Trapping.

Sample	Model	LL	BIC(LL)	AIC(LL)	Npar	Class.Err.	R^2
Staff	1-Class Regression	-7340.4	14756.3	14724.8	22	0.0%	0.386
Panel	1-Class Regression	-141519.0	283187.6	283082.0	22	0.0%	0.070
Staff vs Panel	**Known Class Regression**	**-148995.3**	**298298.2**	**298080.6**	**45**	**0.0%**	**0.102**
Panel - No Covariates	2-Class Regression	-138983.5	278273.0	278056.9	45	2.2%	0.303
	3-Class Regression	-138363.2	277188.8	276862.3	68	5.4%	0.362
	4-Class Regression	-137998.5	276616.0	276179.1	91	6.0%	0.388
	5-Class Regression	-137882.7	276540.8	275993.5	114	9.6%	0.406
	6-Class Regression	**-137788.3**	**276508.4**	**275850.6**	**137**	**13.0%**	**0.417**
	7-Class Regression	-137722.2	276532.6	275764.4	160	13.8%	0.427
	8-Class Regression	-137660.9	276566.5	275687.9	183	16.4%	0.434
	9-Class Regression	-137614.9	276630.9	275641.8	206	17.6%	0.442
	10-Class Regression	-137563.5	276684.5	275585.0	229	18.0%	0.447
Panel 6-class	All Covariates	-137698.7	277077.3	275891.3	247	11.5%	0.415
Panel 6-class	Stepwise remove Urban/Rural	-137773.2	277124.2	276010.3	232	8.7%	0.407
Panel 6-class	Stepwise remove Income	-137703.7	276951.2	275861.4	227	11.6%	0.414
Panel 6-class	Stepwise remove Gender	-137708.2	276892.3	275850.4	217	10.7%	0.414
Panel 6-class	Stepwise remove Region	-137718.6	276743.1	275821.2	192	10.8%	0.414
Panel 6-class	Stepwise remove Motorboat	-137718.8	276709.4	275811.5	187	10.8%	0.414
Panel 6-class	Stepwise remove fish	-137720.8	276679.4	275805.6	182	11.1%	0.415
Panel 6-class	Stepwise remove hunt	-137724.9	276653.6	275803.8	177	11.3%	0.415
Panel 6-class	Stepwise remove canoe	-137730.6	276631.1	275805.2	172	11.4%	0.415
Panel 6-class	**Stepwise remove forage**	**-137735.2**	**276518.5**	**275804.3**	**167**	**11.4%**	**0.415**
Panel 6-class	Stepwise remove trap	-137741.8	276537.4	275807.7	162	11.6%	0.416
Panel 6-class	Stepwise remove age	-137768.8	276585.5	275831.6	147	11.7%	0.416
Panel 6-class	Stepwise remove birdwatch	-137776.4	276606.1	275836.7	142	12.9%	0.416
Panel 6-class	Stepwise remove hike (No Covariates)	-137788.3	276508.4	275850.6	137	13.0%	0.417