Stated preferences for ecosystem services of new farmland conservation program

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- Iowa ranks high nationally in surface waters impairment by excessive use of nutrients, pathogens, pesticides, and soil sediment concentrations
- In terms of soil health, water quality, and erosion control, land management with strips of perennial vegetation with row crops (prairie strips) is beneficial (Schulte Moore et al. 2017)
- Public preferences for the ecosystem services of prairie strips and how the household attitudes and socio-economic characters affect that preference is not known
- Objective: To estimate the value of ecosystem services to the public of implementing prairie strips on private land

- Study area : Iowa
- Survey administration : Online survey
- Sample size : 1200
- Survey experiment : Choice based Stated Preference Design

Table: Ecosystem services attributes, definition and levels

Attributes	Definition	Unit	Levels
Decrease nutrient loss to water	Reduction in total phosphorus, total nitrogen, or nitrate-nitrogen concentrations	% less	50, 70, 90
Decrease sediment loss	Reduction in sediment loss (loss of topsoil with nutrients)	% less	55, 75, 95
Increase number of pollinators	Increase in pollinator abundance	times increase	2, 4, 6
Increase types of birds	Increase in bird species richness	% increase	50, 100,150
One time cost to you	Willingness to pay for ecosystem services by prairie strips [as one time tax]	$	25, 50, 100, 200

Table: Farm and conservation experience, and environmental attitude to explain the preferences

Index	Definition	Possible range	Parameter mean ± std dev)
Farm experience index	Respondents experiences with farm like living in farm, education, membership of farm related agency etc. Higher the experience higher the index	0 - 4	1.77 ± 0.87
Conservation experience index	Respondents' experience with conservation activities like participated in any conservation projects, education, gardening, hunting, fishing, birdwatching etc. Higher the experience higher the index	0 - 9	3.13 ± 2.02
Environmental attitude index	How positively respondent take the existing environment of Iowa. Higher the positive attitude toward existing environment higher the index	5 - 25	13.44 ± 3.69

	Mean		Std Dev	
	Estimate	Std. Error	Estimate	Std. Error
Decrease nutrient Loss to water (Nu)	3.24***	0.40	0.10***	0.09
Nu × FarmExpIndex	−0.05	0.12	0.05	0.05
Nu × ConsExpIndex	0.14*	0.05	0.17***	0.03
Nu × EnvtAttiIndex	−0.19***	0.02	0.01	0.01
Decrease sediment Loss (Se)	0.68***	0.16	0.14*	0.07
Se × FarmExpIndex	0.06	0.04	0.10**	0.03
Se × ConsExpIndex	0.01	0.02	0.06***	0.02
Se × EnvtAttiIndex	−0.05***	0.01	0.01	0.01
Increase number of pollinators (Po)	0.26***	0.04	0.03	0.01
Po × FarmExpIndex	−0.01	0.01	0.04***	0.01
Po × ConsExpIndex	0.01	0.01	0.00	0.01
Po × EnvtAttiIndex	−0.01***	0.00	0.00	0.00
Increase types of birds (Ph)	0.23	0.14	0.13*	0.06
Ph × FarmExpIndex	0.04	0.04	0.07*	0.04
Ph × ConsExpIndex	0.02	0.01	0.04*	0.02
Ph × EnvtAttiIndex	−0.03**	0.01	0.02***	0.00
Alternative specific constant (ASC)	66.10	43.75	133.40***	10.05
ASC × FarmExpIndex	29.37*	11.10	5.21	4.22
ASC × ConsExpIndex	−5.11	5.23	15.75***	2.00
ASC × EnvtAttiIndex	1.03	2.67	10.28***	0.67
Scale parameter (τ)	2.36***	0.13		
Weighting parameter (γ)	−0.03***	0.00		

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; FarmExpIndex = Farm Experience Index; ConsExpIndex = Conservation Experience Index; EnvtAttiIndex = Environmental Attitude Index

Thank You