

# North American Birdwatching Survey: Summary Report Central Flyway 2018



A cooperative study completed by:

Minnesota Cooperative Fish and Wildlife Research Unit  
University of Minnesota

and

The Ohio State University

for the

National Flyway Council

# **North American Birdwatching Survey: Summary Report Central Flyway 2018**

Authored by:

Kristina Slagle, Ph.D.

Research Associate

Alia Dietsch, PhD.

Assistant Professor

School of Environment and Natural Resources

The Ohio State University

Technical Assistance provided by:

David C. Fulton, Ph.D.

U.S. Geological Survey

Assistant Unit Leader & Adj. Professor

Minnesota Cooperative Fish and Wildlife Research Unit

Department of Fisheries, Wildlife and Conservation Biology

University of Minnesota

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## Report Authors

This summary document was produced by Dr. Kristina Slagle and Dr. Alia Dietsch at The Ohio State University. Jason Spaeth, Graduate Research Assistant, Minnesota Cooperative Fish & Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology, University of Minnesota, Twin Cities, MN had lead responsibility for implementing and collecting data. Technical assistance in study design, implementation, and data analysis was provided by David C. Fulton, U.S. Geological Survey, Minnesota Cooperative Fish & Wildlife Research Unit, Department of Fisheries, Wildlife, and Conservation Biology, University of Minnesota, Twin Cities, MN.

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# Section 1. Introduction and Overview

## BACKGROUND

The National Flyway Council, in cooperation with the four Flyway Councils, the North American Waterfowl Management Plan (NAWMP) Committee, and non-governmental agencies initiated the formation of a Human Dimensions Working Group (HDWG) to obtain and incorporate human dimensions information and approaches into migratory bird conservation programs, policies and practices.

The 2012 NAWMP Revision *Vision Statement* provides a new vision of waterfowl management that emphasizes a growing and supportive core of waterfowl hunters and an engaged conservation community inspired by waterfowl and wetlands. The goal is to have a public supportive of waterfowl and wetlands conservation that have strong emotional and pragmatic ties to waterfowl and wetlands. To achieve this goal, NAWMP partners must engage both the traditional waterfowl hunting community and the broader nontraditional stakeholder groups who are interested in waterfowl and the conservation of waterfowl and wetlands. To facilitate this engagement, the NFC's HDWG and other NAWMP partners developed a research proposal for North American stakeholder and general public surveys that will inform: 1) NAWMP objectives; 2) harvest objectives and strategies; 3) habitat management; and 4) public engagement strategies.

## STUDY OBJECTIVES

The key objectives of the stakeholder and general public surveys were to:

- 1) Assess what hunters and other waterfowl conservationists (i.e., birders) most desire from their natural resource based management and social settings to inform NAWMP objectives and select habitat and population management alternatives.
- 2) Establish baseline measures that can be repeated to inform the development of a Public Engagement Strategy and monitor trends in achieving the NAWMP goal of "growing numbers of waterfowl hunters, other conservationists, and citizens who enjoy and actively support waterfowl and wetlands conservation."
- 3) Assess waterfowl hunters' and conservationists' knowledge, preferences, levels of use and support for waterfowl and wetlands conservation.
- 4) Assess the general public's participation in waterfowl-associated recreation and how much they support waterfowl and wetlands conservation.

5) Assess the general public's awareness and their perceptions regarding the importance of the benefits and values (i.e., Ecological Goods and Services - EGS) provided by waterfowl and wetlands conservation.

6) Assess waterfowl professionals' perspectives on the levels of waterfowl populations and habitats needed to support hunter and viewer use opportunities.

The expected outcomes of these studies were:

1) Quantified measures of stakeholder preferences;

2) A greater likelihood of developing NAWMP objectives and management actions that are informed by waterfowl and wetland stakeholders;

3) A focus on harvest management actions that will provide the greatest benefits in terms of stakeholder preferences within the context of what is biologically feasible.

The key research was completed by a collaborative research team at the U.S. Geological Survey's Fort Collins Science Center, the Minnesota Cooperative Research Unit located at the University of Minnesota, and the University of Alberta. Data analysis and report writing was completed by collaborators at The Ohio State University with review and technical assistance from the Minnesota Cooperative Research Unit.

## STUDY DESIGN AND METHODS

### *Survey Questionnaires*

The project included three surveys – a general public survey, a waterfowl hunter survey, a birdwatcher survey. The general public survey was mailed to 5000 individuals throughout the continental United States with a completed sample size target of 1200. A separate summary report is available for that effort (U.S. Geological Survey 2017). Throughout the rest of this report the waterfowl hunter survey is referred to as the National Survey of Waterfowl Hunters (NSWH) and the birdwatcher survey is referred to as the North American Birdwatching Survey (NABS).

The stakeholder studies involved multiple phases and research activities. A core portion of the waterfowl hunter and viewer surveys involved discrete stated choice experiments (DCE). The DCEs allow identification of key attributes and levels on those attributes that most influence hunter and viewer preferences for waterfowl hunting and viewing. The attributes used in the DCEs were identified through a series of workshops with stakeholders conducted by researchers from the U.S. Geological Survey Fort Collins Science Center.

Design and implementation of the U.S. stakeholder workshops began in November 2014 and was completed in June 2015. A total of 12 workshops with hunters and 12 with viewers were completed in key geographic locations across the Flyways in the U.S. to provide a diverse representation of important ecological characteristics and social traditions of the waterfowl hunting and viewing opportunities. A similar approach was taken in Canada. The primary outcome of the workshops was identification of key attributes of waterfowl hunting and bird viewing experiences. This information was used in the design of the DCEs in both the NSWH and NABS studies.

The NSWH and NABS surveys were designed between June 2015 and September 2016. In addition to the stakeholder workshops, the survey design involved multiple workshops, meetings, webinars, and reviews and comments from representatives of key partners including:

The core design team for the waterfowl hunter survey included Human Dimensions Working Group members from the Atlantic, Mississippi, Central and Pacific Flyways. These team held multiple meetings and webinars to identify appropriate sampling and questionnaire design. In addition to achieving the previously identified objects and implementing DCEs on hunting and viewing preferences, the hunter and viewer surveys also include questions targeting three areas identified by the HDWG as important:

- A. Decisions: Individual decisions to participate in viewing, hunting, and conservation are reflected in participation patterns. This series of questions would determine baseline participation levels in viewing, hunting, and conservation and offer the potential to identify stakeholder segments based on participation levels as well as types of participation.
- B. Identity: Measures of identity formation will focus on determining the degree to which hunters, viewers, and conservationists have developed personal identities associated with an activity or social role. (i.e., the individual's progression in formation of their identity as a hunter, viewer, etc.).
- C. Capacity: The NAWMP suggests the long-term sustainability of waterfowl and wetlands will depend on building support and relevancy. In essence, it is a matter of maintaining or increasing the capacity to grow waterfowl populations, protect and restore habitat, and the activities people enjoy that involve waterfowl and wetlands. Social science research suggests that institutional capacity can be thought of in terms of the social, political, economic, and human capital ("capital" can be defined as the available resources that can be used to effect action and outcomes). This survey will include questions to identify the levels of social, political, economic, and human capital that hunters, viewers, and the general public are providing to the institution of waterfowl and wetland conservation.

Additionally, the NABS study included questions concerning constraints to participating in birdwatching. The survey questionnaire items and wording were developing in close collaboration with a core design team representing the HDWG. A question-by-objective table is presented in Appendix A along with a copy of the waterfowl hunter survey. The table summarizes the objective addressed by each question and provides information concerning the source of the questions.

### *Sampling Design*

The target population for the NABS included all U.S. resident hunters 18 years of age who participate in birding and birdwatching. The research proposal for the study also directed data collection to occur using web-based surveys with e-mail contacts. Consideration was given to using commercial vendors for a listing of birdwatchers/birders but no large national lists were commercially available. Suggestions from the HDWG focused on using integrated membership lists from the national Audubon Society and The Cornell Lab of Ornithology's eBird membership list. Both organizations expressed interest in the study but we were only able to obtain permission to use the eBird membership list.

Developed and launched by the Cornell Lab of Ornithology in 2002, eBird is a real-time, online checklist program used by more than 100,000 birders in the United States and Canada. Individuals provide their e-mail address when they create an online account. They also have the option to provide a physical mailing address. The online tools available through eBird allow individuals to maintain information about their personal birding activities and keeps them engaged in using the site. The list of names, e-mails and physical addresses available through eBird represented a useful sampling frame for contacting potential respondents to the NABS throughout the United States and Canada.

The eBird sample can only be used to generalize back to eBird members and cannot be used to generalize back to the larger population of birdwatchers in the U.S. In subsequent reports, the data were weighted to reflect the distribution of eBird membership across the states. We applied the stratification scheme from the 2005 National Survey of Duck Hunters and the NSWH for regional and national reports (Table 1.1), and applied weights accordingly (weights for all states are available in the appendices of the regional reports for NABS).

We obtained the complete list of eBird members on October 24, 2016. We selected only respondents who indicated they lived within the United States, provided a seemingly valid e-mail address and who had logged into eBird no longer ago than January 1, 2012. After removing identifiably duplicate members, we obtained a final list of 134,111 eBird members living within the United States at the time of their last log in to eBird (Table 1.2). These individuals were distributed throughout the United States relatively proportional to the populations of the states, but California, Texas, and Florida were all under-represented in eBird relative to their population size.

## *Data Collection*

We adapted procedures outlined in Dillman, Smyth, and Christian (2014) for web and mobile surveys survey implementation using up to five e-mail contacts. The initial contact was made on November 16, 2017 using the University of Minnesota's mass e-mail program with an information banner from the, "College, of Food, Agricultural and Natural Resources Sciences." The initial e-mail contact had the subject of, "Birdwatching for eBird." It provided information about the purpose of the study and the entities conducting the study. We provided recipients with a clickable link to the survey labeled, "Birdwatcher Survey" and a unique 7-digit access code. Individuals were also provided an e-mail that they could contact to receive an automated reply e-mail with the web address included that they could click or enter into a web browser to connect to the survey. Of the 134, 111 e-mail addresses in the initial sample, a total of 126,083 (94.4%) could be delivered to the intended recipients. We completed up to 4 additional contacts to encourage response, removing the e-mail addresses for those who had already completed the survey each time we sent out a new e-mail invitation.

By January 6, 2017, a total of 32,818 respondents had at least partially completed the survey and we closed data collection. However, we had not yet reached the target of  $n = 400$  for Arkansas and re-opened the survey on February 13, 2017 and made 3 additional e-mail contacts only to eBird members residing in Arkansas on February 13, 15, and 21, 2017. In addition, we contacted all non-respondents in Arkansas the first week of March with a contact letter mailed through the U.S. Postal Service that indicated we had attempted to contact them through e-mail. We provided them with background information and the web address of the survey along with their 7-digit access code and a \$1 incentive. We made a second mailed contact to any remaining non-respondents the second week of March and we stopped data collection on March 23, 2017. A total of 33, 071 surveys were at least partially completed and recorded, providing a response rate of 24.7%. Individual state response rates are reported in Table 1.3, and the weights calculated and applied for the substrata and Flyway level estimates reported in this summary are in Table 1.4.

A web-based survey was used to reduce costs and to facilitate the implementation of the DCE portion of the survey. Discrete choice experiments can be cumbersome to implement in traditional paper-and-pencil surveys due to their complexity of design and the amount of space required to present questions. Data were collected using Sawtooth Software's Lighthouse Studio (<https://www.sawtoothsoftware.com>). Sawtooth Software was chosen for data collection because it allows for the design, hosting, implementation, data collection and analysis of DCE data using Choice Based Conjoint (CBC) software.

To conduct a non-response assessment, we drew a proportional random sample of 16,000 non-respondents left in the initial sample. These 16,000 individuals were sent a shortened survey questionnaire the second week of April 2017, and asked to respond by mail. Completed non-response surveys were collected through May 31, 2017. Data on key questions concerning birdwatching experiences, identity, and demographics were collected from non-respondents to assess if there are any substantive differences between people who completed the full-length

online survey and those who did not respond to it. A total of 3,730 (23.3%) individuals returned a completed non-response survey. Key questions concerning waterfowl hunting experiences, identity, and demographics were collected from non-respondents to assess if there are any substantive differences between people who completed the complete survey and those who did not respond to it. Summary results of the non-response survey are reported in a separate addendum to this report.

Where appropriate we report results of statistical tests in summary tables. We use the following convention when reporting statistical significance for these tests: \*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ , and \*\*\*  $p \leq 0.001$ .

Table 1.1 Stratification for North American Birdwatching Survey

Flyway	Sub-regions	States
Atlantic	Lower Atlantic	FL, GA, NC, SC
	Middle Atlantic	DE, MD, NJ, PA, VA, WV
	Upper Atlantic	CT, ME, MA, NH, NY, RI, VT
Mississippi	Lower Mississippi	AL, AR, LA, MS, TN
	Middle Mississippi	IL, IN, IA, KY, MO OH
	Upper Mississippi	MI, MN, WI
Central	Lower Central	NM, OK, TX
	Middle Central	CO, KS, NE, WY
	Upper Central	MT (ZIP 59000-59699), ND, SD
Pacific	Lower Pacific	AZ, NV, UT
	Middle Pacific	CA
	Upper Pacific	AK, ID, MT (ZIP 59700-599990), OR, WA

Figure 1.1 Flyway map





Table 1.2 Distribution of eBird membership across the United States

State	Initial Sample Size	State/ Sample	State/ USA	State	Initial Sample Size	State/ Sample	State/ USA
Alabama	1332	0.0099	0.0151	Montana	872	0.0065	0.0032
Alaska	860	0.0064	0.0023	Nebraska	679	0.0051	0.0059
Arizona	1948	0.0145	0.0215	Nevada	539	0.0040	0.0091
Arkansas	1312	0.0098	0.0093	New Hampshire	1577	0.0118	0.0041
California	11444	0.0853	0.1215	New Jersey	3631	0.0271	0.0277
Colorado	2892	0.0216	0.0172	New Mexico	1238	0.0092	0.0064
Connecticut	2226	0.0166	0.0111	New York	8691	0.0648	0.0611
Delaware	642	0.0048	0.003	North Carolina	4886	0.0364	0.0314
Florida	5602	0.0417	0.0638	North Dakota	247	0.0018	0.0024
Georgia	4030	0.0300	0.0319	Ohio	5380	0.0401	0.0359
Hawaii	155	0.0012	0.0044	Oklahoma	1078	0.0080	0.0121
Idaho	831	0.0062	0.0052	Oregon	3069	0.0229	0.0127
Illinois	3923	0.0293	0.0396	Pennsylvania	7387	0.0551	0.0396
Indiana	2307	0.0172	0.0205	Rhode Island	410	0.0031	0.0033
Iowa	1121	0.0084	0.0097	South Carolina	2282	0.0170	0.0154
Kansas	1244	0.0093	0.009	South Dakota	326	0.0024	0.0027
Kentucky	1155	0.0086	0.0137	Tennessee	2827	0.0211	0.0206
Louisiana	920	0.0069	0.0145	Texas	7057	0.0526	0.0862
Maine	1657	0.0124	0.0041	Utah	1024	0.0076	0.0094
Maryland/DC	3807	0.0284	0.0207	Vermont	1531	0.0114	0.0019
Massachusetts	4176	0.0311	0.0211	Virginia	4906	0.0366	0.026
Michigan	5128	0.0382	0.0307	Washington	4159	0.0310	0.0226
Minnesota	2924	0.0218	0.0171	West Virginia	775	0.0058	0.0057
Mississippi	710	0.0053	0.0093	Wisconsin	4627	0.0345	0.0179
Missouri	2162	0.0161	0.0189	Wyoming	405	0.0030	0.0018
<b>Total Sample</b>					<b>134111</b>		
<b>Without Hawaii</b>					<b>133956</b>		

*Table 1.3 Response rates for states in the Atlantic Flyway*

State	Flyway Stratum	eBird Sample	Number Returned	Response Rate
NM	CL	1238	372	30.0%
OK	CL	1078	196	18.2%
TX	CL	7057	1515	21.5%
TOTAL		9373	2083	22.2%
CO	CM	2892	774	26.8%
KS	CM	1244	274	22.0%
NE	CM	679	176	25.9%
WY	CM	405	96	23.7%
TOTAL		5220	1320	25.3%
ND	CU	247	72	29.1%
SD	CU	326	104	31.9%
MT East	CU	319	114	35.7%
TOTAL		892	290	32.5%
Central Total		15485	3693	23.8%
National Total		133956	33071	24.7%

Table 1.4 Response and weights applied to each state-level response

State	Flyway Stratum	eBird Sample	Substrata Proportion	Flyway Proportion	National Proportion	Number Returned	Substrata Weight	Flyway Weight	National Weight
NM	CL	1238	0.1321	0.0799	0.0092	372	0.7396	0.7937	0.8216
OK	CL	1078	0.1150	0.0696	0.0080	196	1.2223	1.3117	1.3578
TX	CL	7057	0.7529	0.4557	0.0527	1515	1.0352	1.1109	1.1500
TOTAL		9373	1.0000	0.6053	0.0700	2083			
CO	CM	2892	0.5540	0.1868	0.0216	774	0.9448	0.8911	0.9224
KS	CM	1244	0.2383	0.0803	0.0093	274	1.1481	1.0828	1.1209
NE	CM	679	0.1301	0.0438	0.0051	176	0.9756	0.9201	0.9525
WY	CM	405	0.0776	0.0262	0.0030	96	1.0668	1.0061	1.0415
TOTAL		5220	1.0000	0.3371	0.0390	1320			
ND	CU	247	0.2769	0.0160	0.0018	72	1.1153	0.8181	0.8469
SD	CU	326	0.3655	0.0211	0.0024	104	1.0191	0.7476	0.7739
MT East	CU	319	0.3576	0.0206	0.0024	114	0.9097	0.6674	0.6908
TOTAL		892	1.0000	0.0576	0.0067	290			
Central Total		15485		1.0000	0.1156	3693			
National Total		133956				33071			

## Section 2. Participation

### BIRDING

Nearly all respondents indicated participating in birdwatching or birding (Table 2.1). Respondents replying “no” skipped to a page thanking them for their time and they did not respond to any further questions.

Nearly all respondents in each flyway substrata reported watching birds at their home in the past 12 months (99-100%), watching birds away from home (97-99%), and only slightly fewer reported feeding birds at their home (87-89%; Table 2.2). Photographing or filming birds in the past 12 months was significantly less reported in the Middle Central (72%) than in either the Lower (77%) or Upper Central (80%), while installing nest boxes for birds was more frequently reported in the Upper Central (54%) than in either the Lower or Middle Central (46%; Table 2.2a), though effect sizes suggest these differences were small.

Nearly all respondents reported watching waterfowl (89-95%; Table 2.3), waterbirds (87-93%; Table 2.5), birds of prey (97-99%; Table 2.6), hummingbirds (81-96%; Table 2.7), songbirds (98-99%; Table 2.8), and other birds (80-83%; Table 2.9). Between about 40-60% of respondents reported photographing all birds except other game birds (29-39%; Table 2.4). There were significant but small differences between the substrata in watching other game birds (Upper: 92%, Middle: 73%, Lower: 64%, Tables 2.4a) and respondents claiming to have not done any activities related to other game birds (Upper: 8%, Middle: 26%, Lower: 34%). Additionally, hummingbird activities were significantly less frequently reported in the Upper Central and more frequently reported in the Lower Central (Table 2.7a); effect sizes suggest these differences were small. Other differences between the substrata were significant but small (2.3a-2.9a).

Most respondents (79-85%) indicated they took a trip in the previous 12 months further than 1 mile from their home in order to watch birds (Table 2.10). Respondents indicated the number of trips taken in the past 12 months, and the median across the substrata was between 12-13 trips. Data were heavily skewed with a small number of respondents reporting trips nearly every day, so the median is reported here. Analyses suggest significant differences between the substrata in the number of trips taken, but effect size suggests these were small.

Across the substrata, respondents indicated the highest agreement with the statement, “I typically use binoculars to view birds,” ( $\bar{x}$  = 4.1-4.2; Table 2.11, 2.11a), and the lowest

agreement was with the statement, “I tend to take photos of birds for the primary purpose of having someone help me identify them,” ( $\bar{x} = 2.3$ ). While there were a few significant differences between substrata, effect sizes suggest these differences were small (Table 2.11b).

## OTHER ACTIVITIES

Participation in consumptive recreation in the past 12 months was highest for fishing (88%-92%; Table 2.12) and lowest for other (8%-10%). Responses differed significantly between the substrata for all of the consumptive recreation activities (Table 2.12a). In particular, hunting other game birds was more significantly more frequently reported in the Upper Central than in the Middle or Lower Central (Upper: 49%, Middle: 23%, Lower: 27%; Table 2.12a).

Across substrata, over 90% of respondents reported in the past 12 months spending time in nature away from home, viewing wildlife, and participating in backyard/at-home nature activities, while over 80% reported participating in non-motorized outdoor recreation activities, learning about nature (Table 2.13). Analyses suggest significant but small differences between the substrata for participation in consumptive wildlife-based activities (Upper: 48%, Middle: 25%, Lower: 25%), and motorized outdoor recreation activities (Upper: 37%, Middle: 18%, Lower: 20%; Table 2.13a).

*Table 2.1 Birdwatching or birding participation*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Do you ever participate in birdwatching or birding?	Yes	99.8%	99.5%	99.3%	99.7%
	No	.2%	.5%	.7%	.3%
	Valid N	2066	1302	286	3656

*Table 2.2 Wild Bird Activities*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Wild bird activities	Watching birds at my home	99.3%	98.9%	99.6%	99.2%
	Feeding birds at my home	88.9%	89.6%	87.3%	89.0%
	Watching birds away from my home	97.1%	97.2%	98.9%	97.2%
	Photographing or filming birds	76.5%	72.1%	80.0%	75.2%
	Counting/monitoring birds	71.8%	75.6%	73.7%	73.2%
	Keeping track of the birds you see on a list	84.8%	82.7%	81.2%	83.9%
	Installing or maintaining nest boxes for birds	45.5%	46.3%	53.8%	46.2%
	Valid N	2066	1302	286	3656

Table 2.2a Wild bird activities significance tests

		Chi-Square	df	Cramer's V
Wild bird activities	Watching birds at my home	2.12	2	.02
	Feeding birds at my home	0.80	2	.02
	Watching birds away from my home	2.57	2	.03
	Photographing or filming birds	14.51*	2	.06*
	Counting/monitoring birds	5.40	2	.04
	Keeping track of the birds you see on a list	4.42	2	.04
	Installing or maintaining nest boxes for birds	8.36*	2	.05*

\*p < 0.05

Table 2.3 Waterfowl Activities

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Waterfowl activities	Waterfowl watching	88.7%	91.4%	95.2%	90.2%
	Waterfowl feeding	7.3%	4.1%	5.1%	6.1%
	Waterfowl photographing	48.1%	43.8%	52.6%	46.9%
	Waterfowl did not do any activities	10.3%	7.8%	4.0%	9.1%
	Valid N	2066	1302	286	3656

Table 2.3a Waterfowl Activities significance tests

		Chi-Square	df	Cramer's V
Waterfowl activities	Waterfowl watching	13.41*	2	.06*
	Waterfowl feeding	14.86*	2	.06*
	Waterfowl photographing	9.71*	2	.05*
	Waterfowl did not do any activities	16.06*	2	.07*

\*p < 0.05

Table 2.4 Other game bird activities

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Other game bird activities	Other game birds watching	64.4%	72.5%	91.9%	68.7%
	Other game birds feeding	6.4%	5.2%	9.3%	6.2%
	Other game birds photographing	30.1%	28.9%	39.0%	30.2%
	Other game birds did not do any activities	34.4%	26.3%	8.1%	30.1%
	Valid N	2066	1302	286	3656

Table 2.4a Other game bird activities significance tests

		Chi-Square	df	Cramer's V
Other game bird activities	Other game birds watching	103.75*	2	.17*
	Other game birds feeding	6.90*	2	.04*
	Other game birds photographing	12.37*	2	.06*
	Other game birds did not do any activities	87.38*	2	.16*

\*p < 0.05



*Table 2.5 Water Bird Activities*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Water bird activities	Water birds watching	89.8%	87.1%	92.7%	89.1%
	Water birds feeding	1.9%	1.0%	.4%	1.5%
	Water birds photographing	51.0%	44.0%	49.1%	48.5%
	Water birds did not do any activities	9.1%	12.0%	7.0%	9.9%
	Valid N	2066	1302	286	3656

*Table 2.5a Waterbird activities significance tests*

		Chi-Square	df	Cramer's V
Water bird activities	Water birds watching	9.54*	2	.05*
	Water birds feeding	7.09*	2	.04*
	Water birds photographing	16.46*	2	.07*
	Water birds did not do any activities	10.72*	2	.05*

\*p < 0.05

*Table 2.6 Bird of prey activities*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Bird of prey activities	Birds of prey watching	97.3%	97.4%	98.6%	97.4%
	Birds of prey feeding	2.2%	2.7%	1.0%	2.3%
	Birds of prey photographing	49.8%	45.9%	50.9%	48.6%
	Birds of prey did not do any activities	1.6%	1.8%	1.1%	1.7%
	Valid N	2066	1302	286	3656

*Table 2.6a Bird of prey activities significance tests*

		Chi-Square	df	Cramer's V
Bird of prey activities	Birds of prey watching	1.68	2	.02
	Birds of prey feeding	2.92	2	.03
	Birds of prey photographing	5.68	2	.04
	Birds of prey did not do any activities	0.98	2	.02

\*p < 0.05

*Table 2.7 Hummingbird activities*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Hummingbird activities	Hummingbirds watching	95.6%	92.2%	80.8%	93.6%
	Hummingbirds feeding	63.1%	55.8%	45.3%	59.6%
	Hummingbirds photographing	50.0%	39.3%	38.9%	45.4%
	Hummingbirds did not do any activities	2.7%	6.6%	17.5%	4.8%
	Valid N	2066	1302	286	3656

*Table 2.7a Hummingbird activities significance tests*

		Chi-Square	df	Cramer's V
Hummingbird activities	Hummingbirds watching	96.27*	2	.16*
	Hummingbirds feeding	44.28*	2	.11*
	Hummingbirds photographing	41.78*	2	.11*
	Hummingbirds did not do any activities	114.29*	2	.18*

\*p < 0.05

Table 2.8 Songbird activities

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Songbird activities	Song birds watching	98.4%	98.5%	98.6%	98.5%
	Song birds feeding	65.8%	67.4%	68.0%	66.5%
	Song birds photographing	57.5%	53.2%	61.9%	56.3%
	Song birds did not do any activities	.3%	.4%	0.0%	.3%
	Valid N	2066	1302	286	3656

Table 2.8a Songbirds activities significance tests

		Chi-Square	df	Cramer's V
Songbird activities	Song birds watching	0.09	2	.01
	Song birds feeding	1.21*	2	.02
	Song birds photographing	9.49*	2	.05*
	Song birds did not do any activities	1.07	2	.02

\*p < 0.05

Table 2.9 Other bird activities

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Other bird activities	Other birds watching	81.0%	82.8%	79.8%	81.5%
	Other birds feeding	26.8%	26.5%	22.5%	26.4%
	Other birds photographing	40.6%	37.6%	43.8%	39.8%
	Other birds did not do any activities	17.3%	16.4%	19.8%	17.2%
	Valid N	2066	1302	286	3656

Table 2.9a Other birds activities significance tests

		Chi-Square	df	Cramer's V
Other bird activities	Other birds watching	1.53	2	.02
	Other birds feeding	2.27	2	.03
	Other birds photographing	6.71*	2	.04*
	Other birds did not do any activities	2.23	2	.03

\*p < 0.05

*Table 2.10 Percent taking birding trips >1 mile from home and median number of trips taken in past year by flyway substrata*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
In past 12 months, did you take any trips at least 1 mile or more from your home primarily for birdwatching?	Yes	80.7%	79.1%	85.3%	80.4%
	No	19.3%	20.9%	14.7%	19.6%
In the past 12 months, about how many trips at least 1 mile from your home did you take primarily for birdwatching?		13.0	12.0	12.0	15.0
Valid N		2053	1297	286	3636
Trips taken Y/N significance:		$\chi^2 (2) = 5.89$		Cramer's V = .04	
# of trips significance:		F (2, 2900) = 3.72* $\eta^2 = .00$			

Table 2.11 Types of participation in birding

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N
I can identify most birds I see in the field	3.8	.89	1939	3.8	.85	1239	3.9	.82	278	3.8	.87	3456
I can readily identify many birds in the field by sound	3.1	1.16	1935	3.1	1.14	1239	3.3	1.16	278	3.1	1.16	3449
I tend to take photos of birds for the primary purpose of having someone help me identify them.	2.3	1.03	1934	2.3	1.03	1240	2.3	.96	278	2.3	1.02	3449
I tend to need to use a field guide (paper or electronic) to identify birds	3.5	1.03	1937	3.4	1.02	1241	3.4	1.08	278	3.5	1.03	3453
I often use websites, social media or ID apps such as Merlin to identify birds	3.3	1.19	1937	3.2	1.17	1240	3.2	1.15	278	3.3	1.18	3452
I photograph birds as a way to watch them.	3.1	1.28	1935	2.9	1.28	1236	3.2	1.16	278	3.1	1.28	3446

*Table 2.11 Types of participation in birding, cont.*

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N
I typically use binoculars to view birds.	4.2	1.00	1934	4.1	1.02	1238	4.1	.94	277	4.1	1.00	3446
I often use a camera instead of using binoculars	2.5	1.25	1938	2.4	1.19	1241	2.6	1.14	277	2.5	1.23	3454
I tend to just watch birds without using any special equipment.	2.7	1.17	1936	2.8	1.11	1237	2.8	1.09	278	2.7	1.15	3449
I use eBird to report my birdwatching experiences	3.4	1.27	1937	3.2	1.28	1236	3.2	1.28	276	3.3	1.28	3446

Scale from 1=Strongly Disagree to 5=Strongly Agree



*Table 2.11a Types of participation in birding response distribution*

Item	Response					Valid N
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
I tend to take photos of birds for the primary purpose of having someone help me identify them	1.0%	8.6%	17.0%	54.3%	19.1%	3454
I can readily identify many birds in the field by sound	8.6%	26.0%	21.8%	33.4%	10.2%	3449
I photograph birds as way to watch them	23.6%	40.4%	21.6%	12.3%	2.0%	3449
I typically use binoculars to view birds	2.7%	17.9%	24.9%	40.3%	14.2%	3453
I often use websites, social media or ID apps such as Merlin to identify birds	8.0%	21.2%	19.3%	37.3%	14.3%	3452
I tend to need to use a field guide (paper or electronic) to identify birds	14.2%	22.2%	19.4%	30.7%	13.6%	3446
I can identify most birds I see in the field	1.8%	7.2%	11.4%	33.4%	46.1%	3446
I tend to just watch birds without using any special equipment	24.0%	36.3%	17.0%	14.8%	7.9%	3454
I often use a camera instead of using binoculars	14.2%	33.6%	21.1%	25.7%	5.5%	3449
I use eBird to report my birdwatching experiences	9.4%	21.2%	20.2%	27.5%	21.7%	3446

*Table 2.11b Types of participation in birding ANOVA tests*

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
I can identify most birds I see in the field.	Between Groups	4.73	2.00	2.37	3.12	0.04	
	Within Groups	2622.71	3453.18	0.76			
	Total	2627.44	3455.18				.00
I can readily identify many birds in the field by sound	Between Groups	17.59	2.00	8.79	6.61	0.00	
	Within Groups	4590.38	3448.85	1.33			
	Total	4607.97	3450.85				.00
I tend to take photos of birds for the primary purpose of having someone help me identify them	Between Groups	0.77	2.00	0.39	0.37	0.69	
	Within Groups	3601.73	3449.38	1.04			
	Total	3602.50	3451.38				.00
I tend to need to use a field guide (paper or electronic) to identify birds.	Between Groups	0.14	2.00	0.07	0.06	0.94	
	Within Groups	3648.03	3452.54	1.06			
	Total	3648.16	3454.54				.00
I often use websites, social media or ID apps such as Merlin to identify birds	Between Groups	12.01	2.00	6.00	4.33	0.01	
	Within Groups	4785.83	3451.38	1.39			
	Total	4797.84	3453.38				.00
I photograph birds as way to watch them	Between Groups	36.50	2.00	18.25	11.28	0.00	
	Within Groups	5577.07	3445.84	1.62			
	Total	5613.57	3447.84				.01
I typically use binoculars to view birds	Between Groups	6.41	2.00	3.21	3.19	0.04	
	Within Groups	3465.17	3445.23	1.01			
	Total	3471.58	3447.23				.00
I often use a camera instead of using binoculars.	Between Groups	23.38	2.00	11.69	7.85	0.00	
	Within Groups	5138.30	3453.15	1.49			
	Total	5161.68	3455.15				.00
I tend to just watch birds without using any special equipment	Between Groups	18.98	2.00	9.49	7.27	0.00	
	Within Groups	4501.14	3448.30	1.31			
	Total	4520.11	3450.30				.00
I use eBird to report my birdwatching experiences	Between Groups	23.30	2.00	11.65	7.14	0.00	
	Within Groups	5620.89	3445.37	1.63			
	Total	5644.19	3447.37				.00

*Table 2.12 Participation in consumptive recreation*

	Flyway substrata			Flyway
	Lower Central	Middle Central	Upper Central	Central
Fishing (last 12 months)	89.9%	91.6%	88.0%	90.3%
Hunting waterfowl (last 12 months)	8.0%	10.4%	25.2%	10.5%
Hunting other migratory birds (last 12 months)	20.2%	8.5%	14.8%	15.7%
Hunting other game birds (last 12 months)	14.5%	17.9%	47.2%	18.9%
Hunting any other game animals (last 12 months)	27.2%	22.9%	48.9%	27.9%
Other	7.9%	8.2%	9.8%	8.2%
Valid N	2066	1302	286	3656

*Table 2.12a Participation in consumptive recreation significance tests*

		Chi-Square	df	Cramer's V
Activity	Fishing (last 12 months)	46.80*	2	.12*
	Hunting waterfowl (last 12 months)	82.60*	2	.16*
	Hunting other migratory birds (last 12 months)	20.85*	2	.08*
	Hunting other game birds (last 12 months)	169.94*	2	.23*
	Hunting any other game animals (last 12 months)	98.08*	2	.17*
	Other	10.58*	2	.08*

\*p < 0.05

*Table 2.13 Nature Based Recreation*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Activity	Spending time in nature away from home	94.3%	95.6%	95.3%	94.8%
	Non-motorized outdoor recreation activities	85.3%	88.9%	88.9%	86.7%
	Motorized outdoor recreation activities	19.8%	17.6%	37.0%	20.0%
	Viewing wildlife	99.2%	99.2%	99.3%	99.2%
	Consumptive wildlife-based activities	24.9%	25.1%	47.9%	26.3%
	Learning about nature	84.2%	81.1%	81.2%	83.0%
	Backyard/at-home nature activities	92.7%	93.6%	91.2%	92.9%
	Other	19.9%	20.5%	21.7%	20.3%
	Valid N	2066	1302	286	3656

*Table 2.13a Nature Based Recreation significance tests*

		Chi-Square	df	Cramer's V
Activity	Spending time in nature away from home	2.72	2	.03
	Non-motorized outdoor recreation activities	9.11*	2	.05*
	Motorized outdoor recreation activities	55.91*	2	.13*
	Viewing wildlife	0.06	2	.00
	Consumptive wildlife-based activities	69.71*	2	.14*
	Learning about nature	6.32*	2	.04*
	Backyard/at-home nature activities	2.07	2	.02
	Other	2.21	2	.04

\*p < 0.05

## Section 3. Avidity and Constraints

### AVIDITY

Avidity can refer to several aspects of a recreational experience (Scott & Shafer 2001)—here, it was assessed via the centrality or importance it holds for the individual, in addition to the equipment they use and their self-assessed expertise as a birdwatcher. Respondents reported strong agreement with the following statements: “Birdwatching is one of the most enjoyable activities I do,” “Developing my skills and abilities in birdwatching is important to me,” “Being in nature is an important part of birdwatching,” “The sights and sounds of nature are important to birdwatching,” “Getting to enjoy the natural environment through birdwatching is important,” ( $\bar{x}$  = 4.1-4.6; Table 3.1, 3.1a). Agreement was weakest for the following statements: “If I couldn't go birdwatching I am not sure what I would do instead”, “Most of my friends are in some way connected with birdwatching,” ( $\bar{x}$  = 2.5-2.7). Though there were significant differences between the substrata on a few items (Table 3.1b), effect sizes suggest these differences were small.

A small number of respondents reported not owning any equipment for birdwatching (4-7%, Table 3.2), while most reported owning binoculars (93-95%). There were significant but small differences between the substrata in ownership of cameras and spotting scopes for birdwatching (Table 3.2a).

Respondents were asked to rate their ability to observe and identify birds on a scale from 1 = Novice to 7 = Expert, and averaged around a rating of 4.5 across the substrata (Table 3.3). While differences were significant, effect size suggests the differences were small.

### CONSTRAINTS

Constraints are any barriers that might impede birdwatching participation. Respondents were asked to rate series of barriers to participation on a scale of 1 = Not at all to 4 = Large barrier. With one exception, respondents' average rating across substrata for all of the barriers fell below 2 (“slight barrier”), suggesting overall, barriers to participation are either not serious for eBird participants, or they have found ways to navigate these barriers already and they no longer impede participation (Table 3.4, 3.4a). “Don't have time to go,” had the highest average among the items ( $\bar{x}$  = 1.8-2.0). While analyses revealed significant differences between the substrata on several items, effect sizes suggest these were small (Table 3.4b).

*Table 3.1 Importance of birdwatching*

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N
	Birdwatching is one of the most enjoyable activities I do	4.3	.78	1950	4.2	.82	1245	4.2	.82	276	4.2	.80
Most of my friends are in some way connected with birdwatching	2.6	1.04	1947	2.5	1.01	1243	2.7	.96	277	2.6	1.02	3465
Birdwatching has central role in my life	3.5	1.08	1947	3.6	1.09	1246	3.6	1.05	277	3.5	1.08	3468
A lot of my life is organized around birdwatching	3.0	1.15	1948	3.0	1.14	1243	3.1	1.18	276	3.0	1.15	3465
If I couldn't go birdwatching I am not sure what I would do instead	2.6	1.11	1948	2.5	1.09	1243	2.6	1.06	274	2.5	1.10	3463
Developing my skills and abilities in birdwatching is important to me	4.1	.76	1951	4.1	.78	1246	4.1	.74	277	4.1	.77	3471

*Table 3.1 Importance of birdwatching, cont.*

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N
Getting a chance to add a new bird to my life list is important to me	3.8	.94	1951	3.7	.96	1246	3.8	.98	277	3.8	.95	3471
Using new techniques, technology and equipment to help me identify more birds is important to me	3.5	.95	1952	3.4	.95	1244	3.4	.94	277	3.4	.95	3471
Challenging my birdwatching skills is important	3.7	.93	1948	3.7	.93	1246	3.7	.92	277	3.7	.93	34768
Being in nature is an important part of birdwatching	4.6	.64	1950	4.5	.69	1245	4.5	.65	277	4.6	.66	3470
The sights and sounds of nature are important to birdwatching	4.5	.63	1948	4.5	.63	1247	4.5	.55	277	4.5	.63	3472
Getting to enjoy the natural environment through birdwatching is important	4.5	.65	1953	4.5	.65	1245	4.5	.61	277	4.5	.65	3473

Scale from 1=Strongly Disagree to 5=Strongly Agree

*Table 3.1a Importance of birdwatching response distribution*

Item	Response					Valid N
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Developing my skills and abilities in birdwatching is important to me	0.6%	2.6%	11.2%	42.8%	42.8%	3469
If I couldn't go birdwatching I am not sure what I would do instead	13.4%	39.2%	27.3%	16.7%	3.3%	3465
Birdwatching has central role in my life	3.6%	15.0%	25.1%	35.8%	20.4%	3468
Birdwatching is one of the most enjoyable activities I do	8.5%	27.9%	26.5%	26.3%	10.8%	3465
Challenging my birdwatching skills is important	17.4%	37.8%	24.8%	14.4%	5.6%	3463
Most of my friends are in some way connected with birdwatching	0.6%	2.4%	14.4%	52.0%	30.7%	3471
Using new techniques, technology and equipment to help me identify more birds is important to me	2.5%	6.7%	22.3%	45.6%	23.0%	3471
The sights and sounds of nature are important to birdwatching	2.7%	12.9%	33.3%	39.3%	11.7%	3471
Getting to enjoy the natural environment through birdwatching is important	1.8%	8.3%	27.9%	43.2%	18.8%	3468
Getting a chance to add a new bird to my life list is important to me	0.4%	1.0%	4.1%	32.3%	62.2%	3470
A lot of my life is organized around birdwatching	0.5%	0.2%	3.5%	36.9%	58.9%	3470
Being in nature is an important part of birdwatching	0.5%	0.6%	3.6%	37.1%	58.2%	3473



Table 3.1b Importance of birdwatching ANOVA tests

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
Birdwatching is one of the most enjoyable activities I do	Between Groups	2.90	2	1.45	2.27	0.10	
	Within Groups	2214.20	3467	0.64			
	Total	2217.11	3469				
Most of my friends are in some way connected with birdwatching	Between Groups	8.01	2	4.00	3.85	0.02	
	Within Groups	3607.18	3464	1.04			
	Total	3615.18	3466				
Birdwatching has central role in my life	Between Groups	2.15	2	1.08	0.92	0.40	
	Within Groups	4072.18	3467	1.17			
	Total	4074.33	3469				
A lot of my life is organized around birdwatching	Between Groups	5.83	2	2.92	2.22	0.11	
	Within Groups	4547.73	3463	1.31			
	Total	4553.56	3465				
If I couldn't go birdwatching I am not sure what I would do instead	Between Groups	6.43	2	3.21	2.65	0.07	
	Within Groups	4205.29	3461	1.21			
	Total	4211.72	3463				
Developing my skills and abilities in birdwatching is important to me	Between Groups	0.89	2	0.44	0.75	0.47	
	Within Groups	2040.11	3470	0.59			
	Total	2041.00	3472				
Getting a chance to add a new bird to my life list is important to me	Between Groups	5.49	2	2.75	3.04	0.05	
	Within Groups	3135.79	3470	0.90			
	Total	3141.28	3472				
Using new techniques, technology and equipment to help me identify more birds is important to me	Between Groups	10.31	2	5.16	5.73	0.00	
	Within Groups	3124.59	3469	0.90			
	Total	3134.91	3471				
Challenging my birdwatching skills is important.	Between Groups	1.64	2	0.82	0.95	0.39	
	Within Groups	2998.10	3467	0.86			
	Total	2999.74	3469				
Being in nature is an important part of birdwatching	Between Groups	1.38	2.00	0.69	1.59	0.20	
	Within Groups	1507.11	3468	0.43			
	Total	1508.49	3470				
The sights and sounds of nature are important to birdwatching.	Between Groups	0.05	2.00	0.03	0.07	0.94	
	Within Groups	1349.59	3468	0.39			
	Total	1349.64	3470				
Getting to enjoy the natural environment through birdwatching is important	Between Groups	0.81	2	0.41	0.97	0.38	
	Within Groups	1450.10	3471	0.42			
	Total	1450.91	3473				

*Table 3.2 Equipment Owned*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Equipment owned	Own binoculars for birdwatching	94.6%	93.4%	93.0%	94.1%
	Own cameras for birdwatching	55.6%	48.2%	55.6%	53.1%
	Own spotting scopes for birdwatching	43.3%	47.0%	51.8%	45.0%
	Do not own any special equipment for birdwatching	4.2%	4.2%	6.6%	4.3%
Valid N		1948	1240	277	3463

*Table 3.2a Equipment owned significance tests*

		Chi-Square	df	Cramer's V
Equipment owned	Own binoculars for birdwatching	3.09	2	.03
	Own cameras for birdwatching	17.93*	2	.07*
	Own spotting scopes for birdwatching	9.08*	2	.05*
	Do not own any special equipment for birdwatching	3.37	2	.03

\*p < 0.05

*Table 3.3 Personal rating of ability to observe and identify birds on scale from 1=Novice to 7=Expert*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
How would you rate your own ability to observe and identify birds?	Mean	4.5	4.6	4.8	4.5
	SD	1.35	1.31	1.25	1.33
	Valid N	1945	1243	278	3463
Significance:		F (2, 3464) = 5.602*		$\eta^2=.00$	

Table 3.4 Barriers to participation

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid
			N			N			N			N
Don't feel welcome in bird viewing areas	1.3	.67	1918	1.3	.63	1232	1.3	.61	274	1.3	.66	3421
Areas are too crowded	1.8	.91	1908	1.7	.88	1227	1.6	.89	273	1.8	.90	3405
Lack of birds in my area	1.5	.75	1909	1.5	.74	1231	1.4	.73	274	1.5	.75	3411
Poor quality of the natural habitat in my area	1.5	.79	1908	1.4	.70	1230	1.4	.73	273	1.5	.76	3407
Poor quality of facilities in my area	1.4	.69	1909	1.3	.56	1226	1.4	.69	274	1.4	.65	3406
Don't have the skills	1.4	.64	1913	1.4	.68	1230	1.3	.59	274	1.4	.65	3414
Don't have the companions/people to go with	1.5	.77	1916	1.5	.80	1233	1.5	.71	273	1.5	.78	3420
Public areas to go to are too far away	1.5	.71	1913	1.4	.71	1228	1.3	.65	274	1.4	.71	3413
It costs too much to do	1.3	.60	1912	1.3	.60	1230	1.2	.58	273	1.3	.60	3412
Don't have time to go	2.0	1.03	1914	2.0	.99	1233	1.8	.87	274	2.0	1.01	3418
Don't feel safe in bird viewing areas	1.3	.58	1914	1.2	.48	1231	1.1	.39	274	1.2	.54	3417

Table 3.4 Barriers to participation (cont.)

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid
			N			N			N			N
Restrictions on public lands due to hunting	1.6	.84	1911	1.6	.78	1226	1.4	.70	274	1.6	.81	3409
Access is too difficult (no auto tour options, walking trails, open gates, etc.)	1.5	.78	1914	1.4	.71	1225	1.4	.75	273	1.5	.76	3410
Expense of access fees/permits	1.3	.61	1913	1.3	.63	1228	1.2	.56	274	1.3	.61	3412

Scale of 1=Not at all to 4=Large barrier

*Table 3.4a Barriers to participation response distribution*

Item	Response				Valid N
	Not at all a barrier	Slight barrier	Moderate barrier	Large barrier	
Don't feel welcome in bird viewing areas	81.0%	12.3%	4.2%	2.4%	3421
Areas are too crowded	49.2%	31.0%	14.2%	5.7%	3405
Lack of birds in my area	65.6%	23.7%	8.4%	2.3%	3411
Poor quality of the natural habitat in my area	65.5%	23.5%	8.5%	2.5%	3407
Poor quality of facilities in my area	70.6%	22.0%	6.4%	1.1%	3406
Don't have the skills	71.9%	21.0%	6.0%	1.1%	3414
Don't have the companions/people to go with	63.6%	24.3%	9.3%	2.8%	3420
Public areas to go to are too far away	67.2%	23.2%	8.1%	1.5%	3413
It costs too much to do	79.1%	15.2%	4.6%	1.2%	3412
Don't have time to go	41.3%	29.0%	19.3%	10.4%	3418
Don't feel safe in bird viewing areas	83.1%	12.9%	3.1%	0.9%	3417
Restrictions on public lands due to hunting	59.5%	27.9%	8.6%	4.0%	3409
Access is too difficult (no auto tour options, walking trails, open gates, etc.)	66.0%	23.1%	8.3%	2.6%	3410
Expense of access fees/permits	75.1%	19.1%	4.7%	1.1%	3412

*Table 3.4b Barriers to participation ANOVA tests*

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
Don't feel welcome in bird viewing areas	Between Groups	1.28	2.00	0.64	1.49	0.22	0.00
	Within Groups	1461.10	3420.80	0.43			
	Total	1462.37	3422.80				
Areas are too crowded	Between Groups	7.56	2.00	3.78	4.72	0.01	0.00
	Within Groups	2730.45	3405.42	0.80			
	Total	2738.01	3407.42				
Lack of birds in my area	Between Groups	1.36	2.00	0.68	1.22	0.30	0.00
	Within Groups	2778.73	1900.42	3411.91	0.56		
	Total	2781.75	1901.78	3413.91			
Poor quality of the natural habitat in my area	Between Groups	9.35	2.00	4.67	8.26	0.00	0.01
	Within Groups	2953.88	1928.71	3407.45	0.57		
	Total	2972.27	1938.06	3409.45			
Poor quality of facilities in my area	Between Groups	11.64	2.00	5.82	13.80	0.00	0.00
	Within Groups	1961.53	1436.95	3406.34	0.42		
	Total	1966.64	1448.60	3408.34			
Don't have the skills	Between Groups	1.69	2.00	0.84	2.01	0.13	0.00
	Within Groups	2232.74	1434.49	3414.29	0.42		
	Total	2233.23	1436.17	3416.29			
Don't have the companions/people to go with	Between Groups	0.52	2.00	0.26	0.43	0.65	0.00
	Within Groups	3355.33	2064.74	3419.47	0.60		
	Total	3356.07	2065.26	3421.47			
Public areas to go to are too far away	Between Groups	3.66	2.00	1.83	3.68	0.03	0.00
	Within Groups	2450.87	1694.61	3412.73	0.50		
	Total	2451.31	1698.27	3414.73			

Table 3.4b Barriers to participation ANOVA tests, cont.

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
It costs too much to do	Between Groups	0.58	2.00	0.29	0.80	0.45	0.00
	Within Groups	1232.15	3412.39	0.36			
	Total	1232.73	3414.39				
Don't have time to go	Between Groups	7.34	2.00	3.67	3.62	0.03	0.00
	Within Groups	3462.50	3418.33	1.01			
	Total	3469.85	3420.33				
Don't feel safe in bird viewing areas	Between Groups	8.21	2.00	4.11	14.61	0.00	0.01
	Within Groups	959.97	3416.92	0.28			
	Total	968.18	3418.92				
Restrictions on public lands due to hunting	Between Groups	5.36	2.00	2.68	4.13	0.02	0.00
	Within Groups	2214.03	3408.67	0.65			
	Total	2219.39	3410.67				
Access is too difficult (no auto tour options, walking trails, open gates, etc.)	Between Groups	7.93	2.00	3.97	7.00	0.00	0.00
	Within Groups	1931.43	3409.69	0.57			
	Total	1939.36	3411.69				
Expense of access fees/permits	Between Groups	2.52	2.00	1.26	3.37	0.03	0.00
	Within Groups	1277.33	3412.57	0.37			
	Total	1279.85	3414.57				



## Section 4. Place

### PREFERENCES

Most respondents did their birdwatching within the flyway substrata in which they resided, with a plurality of the flyway birdwatching in Texas (44%; Table 4.1).

Most respondents knew of wetlands nearby (88-95%; Table X), and had visited wetlands in the past 12 months (85-93%). Analyses suggested significant but small differences between the flyways.

### ECOSYSTEM SERVICES

Overall ratings were lowest for loss of hunting opportunities ( $\bar{x} = 1.7-2.4$ ; Table 4.3, 4.3a), and highest for providing home for wildlife ( $\bar{x} = 3.7-3.8$ ) and providing a home for animals such as butterflies and bees that pollinate plants and crops ( $\bar{x} = 3.7-3.8$ ). While analyses revealed significant differences between the substrata on several items, effect sizes suggest these were small (Table 4.3b). Respondents chose “Hunting opportunities,” most frequently as their benefit of least concern, particularly in the Middle and Lower Central (67%), but less so in the Upper Central (48%; Table 4.4). Respondents most frequently reported being most concerned with losing benefits of providing a home for wildlife (41-43%; Table 4.5). Analyses revealed small but significant differences in which benefits respondents were most and least concerned with losing.

*Table 4.1 State where most of respondent birdwatching occurred*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
In which state do you go birdwatching most often?	CO	.5%	54.1%	0.0%	18.5%
	KS	0.0%	20.4%	0.0%	6.9%
	MT	.1%	.2%	34.8%	2.2%
	ND	.1%	0.0%	23.4%	1.4%
	NE	0.0%	11.3%	.4%	3.8%
	NM	13.2%	.2%	.4%	8.1%
	OK	10.3%	0.0%	0.0%	6.2%
	SD	0.0%	.1%	32.3%	1.9%
	TX	72.3%	.7%	1.5%	44.0%
	WY	.1%	7.8%	0.0%	2.7%
	Valid N	1841	1166	262	3267

Table 4.2 Knowledge and visitation of wetlands

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Do you know of any wetlands in your local area or community?	Yes	88.2%	92.4%	94.8%	90.0%
	No	11.8%	7.6%	5.2%	10.0%
	Valid N	1870	1200	269	3336
Have you visited any wetlands in the last 12 months?	Yes	85.0%	88.1%	93.1%	86.5%
	No	15.0%	11.9%	6.9%	13.5%
	Valid N	1869	1201	270	3336
Knowledge significance:		$\chi^2 = 21.38^*$		Cramer's V=.08*	
Visit significance:		$\chi^2 = 15.84^*$		Cramer's V=.07*	

Table 4.3 Level of concern for ecological benefits

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid
			N			N			N			N
Flooding Protection	3.4	.85	1844	3.3	.87	1196	3.3	.89	269	3.3	.86	3304
Erosion Protection	3.4	.78	1837	3.4	.76	1193	3.3	.75	270	3.4	.77	3295
Wildlife viewing and birdwatching	3.7	.59	1838	3.7	.60	1195	3.6	.65	270	3.7	.59	3297
Hunting opportunities	1.7	.96	1833	1.8	.99	1195	2.4	1.21	265	1.8	1.00	3290
Storage of greenhouse gases, such as carbon	3.0	1.05	1832	3.2	.99	1192	3.1	1.02	265	3.1	1.03	3284
Clean water	3.7	.66	1843	3.7	.62	1197	3.7	.60	267	3.7	.64	3303
Clean air	3.6	.73	1838	3.6	.71	1195	3.6	.68	267	3.6	.72	3296
Providing home for wildlife	3.8	.50	1840	3.8	.49	1198	3.7	.52	266	3.8	.50	3300
Providing a home for animals such as butterflies and bees that pollinate plants and crops	3.8	.52	1841	3.8	.53	1196	3.7	.51	269	3.8	.52	3300
Scenic places for inspiration or spiritual renewal	3.3	.87	1836	3.4	.88	1194	3.3	.87	266	3.3	.87	3292

Scale from 1=Not at all concerned to 4=Very concerned

*Table 4.3a Level of concern for ecological benefits response distribution*

Item	Response				Valid N
	Not at all concerned	Slightly concerned	Somewhat concerned	Very concerned	
Flooding Protection	4.7%	11.6%	28.8%	54.9%	3304
Erosion Protection	2.7%	9.6%	31.4%	56.3%	3295
Wildlife viewing and birdwatching	0.9%	3.9%	23.5%	71.8%	3297
Hunting opportunities	52.0%	24.0%	14.9%	9.1%	3290
Storage of greenhouse gases, such as carbon	10.8%	16.8%	25.7%	46.8%	3284
Clean water	1.5%	5.2%	17.5%	75.8%	3303
Clean air	2.3%	7.0%	19.4%	71.3%	3296
Providing home for wildlife	0.6%	2.1%	16.0%	81.3%	3300
Providing a home for animals such as butterflies and bees that pollinate plants and crops	0.8%	2.5%	15.4%	81.3%	3300
Scenic places for inspiration or spiritual renewal	5.1%	12.0%	29.1%	53.8%	3292

*Table 4.3b Level of concern for ecological benefits ANOVA tests*

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
Flooding Protection	Between Groups	5.41	2.00	2.71	3.66	0.03	
	Within Groups	2443.21	3306.08	0.74			
	Total	2448.62	3308.08				0.00
Erosion Protection	Between Groups	1.75	2.00	0.87	1.47	0.23	
	Within Groups	1956.10	3297.31	0.59			
	Total	1957.84	3299.31				0.00
Wildlife viewing and birdwatching	Between Groups	2.55	2.00	1.28	3.60	0.03	
	Within Groups	1170.00	3299.24	0.35			
	Total	1172.55	3301.24				0.00
Hunting opportunities	Between Groups	105.91	2.00	52.95	53.67	0.00	
	Within Groups	3247.51	3291.18	0.99			
	Total	3353.42	3293.18				0.03
Storage of greenhouse gases, such as carbon	Between Groups	9.88	2.00	4.94	4.69	0.01	
	Within Groups	3460.80	3285.98	1.05			
	Total	3470.68	3287.98				0.00
Clean water	Between Groups	0.68	2.00	0.34	0.83	0.44	
	Within Groups	1351.03	3304.76	0.41			
	Total	1351.71	3306.76				0.00
Clean air	Between Groups	0.71	2.00	0.35	0.68	0.50	
	Within Groups	1703.83	3297.80	0.52			
	Total	1704.53	3299.80				0.00
Providing home for wildlife	Between Groups	0.53	2.00	0.26	1.06	0.35	
	Within Groups	821.72	3301.54	0.25			
	Total	822.25	3303.54				0.00
Providing a home for animals such as butterflies and bees that pollinate plants and crops	Between Groups	0.37	2.00	0.19	0.68	0.51	
	Within Groups	897.37	3302.03	0.27			
	Total	897.74	3304.03				0.00
Scenic places for inspiration or spiritual renewal	Between Groups	3.43	2.00	1.72	2.25	0.11	
	Within Groups	2516.43	3293.94	0.76			
	Total	2519.86	3295.94				0.00

*Table 4.4 Ecological services least concerned about losing*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Least concerned about losing	Flooding Protection	5.2%	5.6%	8.5%	5.5%
	Erosion Protection	2.8%	3.8%	4.6%	3.2%
	Wildlife viewing and birdwatching	.7%	.4%	.9%	.6%
	Hunting opportunities	67.4%	66.8%	48.0%	66.1%
	Storage of greenhouse gases	13.1%	12.7%	22.2%	13.5%
	Clean water	.6%	.2%	0.0%	.4%
	Clean air	1.7%	1.8%	4.2%	1.9%
	Providing a home for wildlife	.2%	.4%	.4%	.3%
	Providing a home for butterflies and bees (pollinators)	.3%	.3%	.4%	.3%
	Scenic places for inspiration and spiritual renewal	8.1%	7.9%	10.8%	8.2%
	Valid N	1805	1171	258	3231
	Significance:	$\chi^2 = 52.93^*$		Cramer's V=.09*	

*Table 4.5 Ecological services most concerned about losing*

	Flyway substrata			Flyway
	Lower Central	Middle Central	Upper Central	Central
Most concerned about losing				
Flooding Protection	12.2%	6.8%	8.6%	10.1%
Erosion Protection	2.2%	1.7%	3.5%	2.1%
Wildlife viewing and birdwatching	17.1%	19.6%	14.8%	17.8%
Hunting opportunities	.6%	.8%	2.3%	.8%
Storage of greenhouse gases	1.3%	1.8%	.8%	1.5%
Clean water	15.6%	16.2%	22.4%	16.2%
Clean air	1.8%	1.9%	1.1%	1.8%
Providing a home for wildlife	42.3%	42.9%	41.4%	42.4%
Providing a home for butterflies and bees (pollinators)	4.8%	6.4%	4.7%	5.4%
Scenic places for inspiration and spiritual renewal	2.2%	1.8%	.4%	1.9%
Valid N	1809	1175	260	3240
Significance:	$\chi^2 = 56.15^*$		Cramer's V=.09*	



## Section 5. Discrete Choice Models for Preferred Trips

This study included a discrete choice experiment (DCE) examining the preferences of birdwatchers concerning different potential combinations of birdwatching experiences. Choice models present hypothetical scenarios to respondents to derive individuals' preferences for alternatives composed of multiple resource and management attributes (Adamowicz, Louviere & Williams 1994; Louviere, Hensher & Swait 2000; Oh et al. 2005). The approach depends on the imperfect relationship between behavioral intention and behavior (Ajzen & Fishbein 1980), yet allows estimation of the effects of all parameters of interest independently. Individuals are assumed to be utility maximizers, and respondents' choices reflect the perceived utility of the alternatives presented (McFadden 1981). Individual respondent choices reflect the personal utility of attributes and attribute levels, and are aggregated to estimate the utility of attributes and attribute levels in a population (McFadden 1981). In an economic sense, utility is simply a measure of the perceived usefulness of something to an individual. The degree to which someone chooses one circumstance over another provides the ability to measure its perceived usefulness, or utility, to that person. In general, the utility of an attribute level may be considered a reflection of relative desirability (Orme 2014).

Alternatives presented in this season choice experiment consisted of seven attributes:

- 1) Diversity:** How many kind or species of birds you see
- 2) Rarity:** Whether there are rare or unusual species of birds
- 3) Number of birds:** The total number of birds you see
- 4) Ease of access:** How difficult it is to get into and around an area
- 5) Wetlands:** Whether the area contains wetland habitat (shallow ponds or marshes) and wetland species
- 6) Naturalness:** The degree to which the area is in a natural condition or has been developed
- 7) Travel distance:** Total distance from home to the location (one-way).

Response levels varied from 2 to 5 for each attribute (Table 5.1). In order to have adequate power to conduct this experiment, we developed 10 survey versions. In each, respondents were presented with 10 different hypothetical comparisons of birdwatching experiences and asked to choose one option. Each scenario included two viewing option choices plus a "none" (i.e., I would not go if these were my only choices). The background explanation of the DCE and an example of the choice scenarios are presented in Figures 5.1 and 5.2.

Results for the hierarchical Bayes model (Tables 5.2 and 5.3 ), including average utilities, or usefulness, for each attribute level, summarize the preference among birdwatchers. The attribute importances (Table 5.2) provide a summary of how important each of the 7 attributes were in respondents' choices.

The utilities of each level for each attribute are summarized in Table 5.3. The larger the range in the part-worth utilities (i.e. the average utilities across levels within that attribute) for an attribute, the more influential that attribute is on respondents' choices and the greater the importance of that attribute. The set of part-worth utilities for each attribute is scaled to sum to zero, so some part-worth utilities are necessarily negative numbers for some levels. A negative part-worth utility does not mean that the level has a negative utility; but the larger the number, the higher the utility. This means that a large positive number has higher utility than a large negative number.

The most important attributes in the choice of birdwatching trips were: 1) travel distance; 2) chance to see rare or unusual bird species; and 3) the naturalness of the area. The levels with the highest utility included: 1) travel distances of 2 miles or less 2) chance to see rare/unusual species; 3) travel distance of less than 25 miles; 4) natural setting; and 5) wetlands with waterfowl/wetland birds.

*Table 5.1 Possible trip choice characteristics in discrete choice experiment*

<b>Attribute</b>	<b>Possible levels</b>
<b>Diversity:</b> How many kind or species of birds you see	<ul style="list-style-type: none"> <li>- Observe 10 or fewer species</li> <li>- Observe 20 species</li> <li>- Observe 30 species</li> <li>- Observe 40 or more species</li> </ul>
<b>Rarity:</b> Whether there are rare or unusual species of birds	<ul style="list-style-type: none"> <li>- No rare or unusual species</li> <li>- Chance to see rare or unusual species</li> </ul>
<b>Number of birds:</b> The total number of birds you see	<ul style="list-style-type: none"> <li>- Less than 100 birds</li> <li>- Hundreds of birds</li> <li>- Thousands of birds</li> </ul>
<b>Ease of access:</b> How difficult it is to get into and around an area	<ul style="list-style-type: none"> <li>- Easy access with paved trails and roads</li> <li>- Moderate access with some paved trails</li> <li>- Difficult access with unpaved trails and paths</li> </ul>
<b>Wetlands:</b> Whether the area contains wetland habitat (shallow ponds or marshes) and wetland species	<ul style="list-style-type: none"> <li>-No wetland habitats</li> <li>-Wetlands but NO waterfowl/wetland birds</li> <li>-Wetlands with waterfowl/wetland birds</li> </ul>
<b>Naturalness:</b> The degree to which the area is in a natural condition or has been developed	<ul style="list-style-type: none"> <li>- Area is developed</li> <li>- Natural habitat and setting</li> </ul>
<b>Travel distance:</b> Total distance from home to the location (one-way)	<ul style="list-style-type: none"> <li>- 2 miles or less</li> <li>- 25 miles</li> <li>- 50 miles</li> <li>- 100 miles</li> <li>- 200 miles</li> </ul>

Figure 5.1 Background for Discrete Choice Experiment for birdwatching

introCBCq12

## BIRDWATCHING CHOICES

Birdwatching experiences can vary across many different areas and situations. We are interested in knowing what experiences and conditions influence where you decide to watch birds on a given trip. On the next few pages, we present 10 different hypothetical comparisons of birdwatching experiences you could choose to have.

These experiences vary on 7 conditions:

- 1) Diversity: How many kinds or species of birds you see**
- 2) Rarity: Whether there are rare or unusual species of birds**
- 3) Number of birds: The total number of birds you see**
- 4) Ease of access: How difficult it is to get into and around the area**
- 5) Wetlands: Whether the area contains wetland habitat (shallow ponds or marshes) and wetland species**
- 6) Naturalness: The degree to which the area is in a natural condition or has been developed**
- 7) Travel distance: Total distance from home to the location (one-way)**

Some of these scenarios might seem unlikely to you, or neither option matches to what you would want to do, but we are still interested in understanding which described experiences you would choose. Your opinions about these comparisons will help managers better understand birdwatching preferences.

*For each scenario, select the one choice you would make if these were your only options.*




Figure 5.2 Example of choice scenario for birdwatching DCE

BirdviewChoice\_Random1

If these were your only options, which would you choose?  
Choose by clicking one of the buttons below:

(1 of 10)

	Option 1	Option 2	Would not go
<b>Diversity:</b> How many kinds or species of birds you see	Observe 10 or fewer species	Observe 40 or more species	NONE: I would not go if these were my only choices.
<b>Rarity:</b> Whether there are rare or unusual species of birds	Chance to see rare or unusual species	No rare or unusual species	
<b>Number of birds:</b> The total number of birds you see	Hundreds of birds	Less than 100 birds	
<b>Ease of access:</b> How difficult it is to get into and around the area	Difficult access with unpaved trails and paths	Easy access with paved trails and roads	
<b>Wetlands:</b> Whether the area contains wetland habitat (shallow ponds or marshes) and wetland species	No wetland habitats	Wetlands but NO waterfowl/wetland birds	
<b>Naturalness:</b> The degree to which the area is in a natural condition or has been developed	Area is developed	Natural habitat and setting	
<b>Travel distance:</b> Total distance from home to the location (one-way)	200 miles	25 miles	
<b>Choose one option</b>	BirdviewChoice_Random1=1 <input type="radio"/>	BirdviewChoice_Random1=2 <input type="radio"/>	BirdviewChoice_Random1=3 <input type="radio"/>

*Table 5.2 Relative attribute importance derived from hierarchical Bayes estimation*

<b>Season choice attribute</b>	<b>Importances</b>	<b>SD</b>
Diversity	10.68	4.53
Rarity	18.25	9.83
Number of birds	5.95	3.07
Ease of access	8.83	6.62
Wetlands	11.26	5.00
Naturalness	14.42	8.36
Travel Distance	30.60	14.48

Notes: n = 2,901

*Table 5.3 Results of the hierarchical Bayes model for trip choice for birdwatching*

<b>Choice attribute</b> - level	<b>Average utilities</b>	<b>SD</b>
<b>Diversity</b>		
- Observe 10 or fewer species	-35.42	23.63
- Observe 20 species	-4.28	10.82
- Observe 30 species	10.50	14.52
- Observe 40 or more species	29.20	23.75
<b>Rarity</b>		
- No rare or unusual species	-62.91	36.12
- Chance to see rare or unusual species	62.91	36.12
<b>Number of birds</b>		
- Less than 100	-16.20	13.80
- Hundreds	-0.37	12.19
- Thousands	16.57	18.01
<b>Ease of Access</b>		
- Easy access with paved trails and roads	2.07	28.18
- Moderate access with some paved trails	15.27	19.68
- Difficult access with unpaved trails and paths	-17.35	40.91
<b>Wetlands</b>		
- No wetland habitats	-25.99	17.46
- Wetlands but NO waterfowl/wetland birds	-19.51	16.41
- Wetlands with waterfowl/wetland birds	45.50	23.03
<b>Naturalness</b>		
- Area is developed	-50.13	29.84
- Natural habitat and setting	50.13	29.84
<b>Travel Distance</b>		
- 2 miles or less	70.62	67.38
- 25 miles	59.07	40.50
- 50 miles	28.06	19.67
- 100 miles	-42.35	36.93
- 200 miles	-115.41	71.79
<b>None</b>	-224.89	157.80

**Notes:** n = 2,901

## Section 6. Engagement

### COMMUNITY

The highest average identification among several different social groups (birdwatcher, waterfowl hunter, other type of hunter, conservationist) was as a birdwatcher ( $\bar{x} = 4.0-4.1$ ; Table 6.1, 6.1a) or a conservationist ( $\bar{x} = 4.0$ ). Identification as any type of hunter was relatively low overall, but highest in the Upper Central ( $\bar{x} = 1.5-1.9$ ). While analyses revealed significant differences between the substrata on several items, effect sizes suggest none of the differences are substantive (Table 6.1b).

Around 40% of respondents across the substrata reported membership National Audubon Society (Table 6.2); analyses revealed no significant differences between the substrata.

Highest reported levels of involvement in bird-related organizations were with bird conservation groups ( $\bar{x} = 2.3-2.4$ ; Table 6.3, 6.3a) and lowest levels are with ornithological societies ( $\bar{x} = 1.5-1.7$ ). While analyses revealed significant differences between the substrata on two items, effect sizes suggest none of the differences are small (Table 6.3b).

Across the substrata, few respondents reported that participating in eBird was not at all important (10%, Table 6.4); analyses suggest significant but small differences.

Respondents reported the frequency of conservation activities, and reported most often making their yard more desirable to wildlife ( $\bar{x} = 4.0-4.1$ ; Table 6.5, 6.5a), and least often volunteering to improve wildlife habitat in my community ( $\bar{x} = 2.3-2.5$ ). While analyses revealed significant differences between the substrata on several items, effect sizes suggest these were small (Table 6.5b). Respondents reported wetland conservation activities within the past year, and reported most often voting for candidates or ballot issues to support wetlands or waterfowl conservation ( $\bar{x} = 2.6-2.9$ ; Table 6.6, 6.6a), and least often working on land improvement project related to wetlands or waterfowl conservation, volunteering my personal time and effort to conserve wetlands and waterfowl, attending meetings about wetlands or waterfowl conservation, contacting elected officials or government agencies about wetlands and waterfowl conservation ( $\bar{x} = 1.5-1.7$ ). While analyses revealed significant differences between the substrata on several items, effect sizes suggest these were small (Table 6.6b).



We used a social network approach to understand the diversity of relationships and connections that individuals have in their personal networks (Harshaw and Tindall 2005; Lin, Fu & Hsung 2001). Respondents were presented with a list of 24 avocational, occupational, and organizational structural positions and asked what relationship if any they had associated with the position through an acquaintance, close friend, relative, or self. The percentage of respondents reporting ties to the positions at each level of relationship are summarized in Tables 6.7a through 6.7f.

## TRUST

Respondents indicated highest levels of trust in birding/birdwatching organizations ( $\bar{x}$  = 3.9-4.1; Table 6.8, 6.8a), similar for university researchers and scientists ( $\bar{x}$  = 3.6-3.7) and other conservation organizations ( $\bar{x}$  = 3.4-3.5), and lowest for elected officials ( $\bar{x}$  = 1.7-1.8). While analyses revealed significant differences between the substrata on several items, effect sizes suggest these differences were small (Table 6.8b).

## CONSERVATION SUPPORT

Monetary support for conservation can take the form of donations, permit purchases, and fees. Respondents were asked about their previous support in the past year to wetland or waterfowl conservation, conservation of other birds, birdwatching and related issues, and waterfowl hunting. Possible responses to this item were \$0, less than \$250, \$250-\$999, \$1000-\$2499, \$2500-\$4999, \$5000-\$9999, and \$10,000 or more. Because of the non-normal distribution of donations (see Tables 6.9b-6.9e), responses were dichotomized as \$0 donation or more than \$0. Most respondents reported having donated to birdwatching and related issues (78-85%; Table 6.9), as well as conservation of other birds (68-75%). Fewer reported donating to causes related to waterfowl hunting, and analyses revealed significant but small differences between the substrata (Lower and Middle: 13%, Upper: 31%; Table 6.9a).

Most respondents indicated having paid a State Park access permit or fee (86-90%; Table 6.10), while relatively fewer respondents reported purchasing a Federal Migratory Bird Hunting and Conservation Stamp (17-31%). Analyses revealed significant but small differences in purchasing

behavior between substrata (Table 6.10a), notably in National Wildlife Refuge access fee (Upper: 31%, Middle: 43%, Lower: 54%), access fees for land owned by non-governmental conservation organizations (Upper: 10%, Middle: 17%, Lower: 24%), Federal Migratory Bird Hunting and Conservation Stamp (Upper: 31%, Middle: 17%, Lower: 17%), and National Park pass (Upper: 63%, Middle: 67%, Lower: 53%).

A majority of respondents indicated a willingness to pay all permits and fees in the next 12 months except for the Federal Migratory Bird Hunting and Conservation Stamp (Upper: 51%, Middle: 44%, Lower: 38%; Table 6.11). Analyses revealed significant but small differences in willingness to pay between substrata (Table 6.11a), most notably for access fees for land owned by non-governmental conservation organizations (Upper: 56%, Middle: 65%, Lower: 71%).

Table 6.1 Level of social identification with group types

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid
			N			N			N			
Identify yourself as a birdwatcher	4.1	.97	1910	4.1	.94	1224	4.0	.91	275	4.1	.95	3406
Identify yourself as a waterfowl hunter	1.1	.52	1829	1.1	.56	1182	1.5	1.05	269	1.2	.59	3274
Identify yourself as other type of hunter	1.3	.88	1836	1.3	.85	1185	1.9	1.40	268	1.4	.92	3285
Identify yourself as a conservationist	4.0	1.00	1902	4.0	1.05	1221	4.0	.97	274	4.0	1.02	3394

Scale of 1=Not at all to 5=Very strongly

*Table 6.1a Level of social identification with group types response distribution*

Item	Response					Valid N
	Not at all	Slightly	Moderately	Strongly	Very strongly	
Identify yourself as a birdwatcher	0.4%	5.8%	22.7%	29.6%	41.5%	3406
Identify yourself as a waterfowl hunter	91.1%	4.9%	2.1%	0.8%	1.0%	3274
Identify yourself as other type of hunter	82.7%	7.3%	4.0%	3.2%	2.9%	3285
Identify yourself as a conservationist	1.3%	7.9%	21.0%	30.4%	39.4%	3394

*Table 6.1b Level of social identification with group types ANOVA Table*

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
Identify yourself as a birdwatcher	Between Groups	0.39	2.00	0.20	0.22	0.81	
	Within Groups	3082.30	3406.19	0.90			
	Total	3082.69	3408.19				0.00
Identify yourself as a waterfowl hunter	Between Groups	34.51	2.00	17.26	48.19	0.00	
	Within Groups	1173.20	3276.55	0.36			
	Total	1207.71	3278.55				0.03
Identify yourself as other type of hunter	Between Groups	96.06	2.00	48.03	56.42	0.00	
	Within Groups	2798.42	3286.90	0.85			
	Total	2894.48	3288.90				0.03
Identify yourself as a conservationist	Between Groups	0.84	2.00	0.42	0.41	0.67	
	Within Groups	3511.73	3394.35	1.03			
	Total	3512.58	3396.35				0.00

*Table 6.2 National Audubon Society Member*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Are you a member of the National Audubon Society?	Yes	41.5%	44.4%	38.2%	42.3%
	No	58.5%	55.6%	61.8%	57.7%
	Valid N	1859	1193	268	3316
Significance:		$\chi^2 = 1.43$		Cramer's V=.04	

Table 6.3 Level of involvement in bird groups

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid	Mean	SD	Valid
			N			N			N			N
Involvement with birding and birdwatching groups	1.9	.92	1804	1.9	.95	1161	1.9	.95	262	1.9	.93	3222
Involvement with bird conservation groups	2.3	.91	1856	2.4	.92	1194	2.3	.93	265	2.3	.91	3313
Involvement with ornithological societies	1.6	.84	1660	1.7	.91	1090	1.5	.83	247	1.6	.87	2990
Involvement with local naturalist orgs	2.1	1.09	1738	1.9	.99	1110	1.7	.94	247	2.0	1.05	3094

Scale of 1=No involvement to 4=High involvement

*Table 6.3a Level of involvement in bird groups response distribution*

Item	Response				Valid N
	No involvement	Slight involvement	Moderate Involvement	High involvement	
Involvement with birding and birdwatching groups	43.4%	32.4%	17.3%	7.0%	3222
Involvement with bird conservation groups	18.2%	44.3%	24.8%	12.6%	3313
Involvement with ornithological societies	62.5%	21.4%	11.3%	4.7%	2990
Involvement with local naturalist orgs	43.1%	28.1%	15.8%	13.0%	3094

*Table 6.3b Level of involvement in bird groups ANOVA tests*

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
Involvement with birding and birdwatching groups	Between Groups	.136	2	.07	.08	.93	
	Within Groups	2820.89	3223	.88			
	Total	2821.02	3225				0.00
Involvement with bird conservation groups	Between Groups	2.42	2	1.21	1.45	.24	
	Within Groups	2767.33	3313	.84			
	Total	2769.76	3315				0.00
Involvement with ornithological societies	Between Groups	9.58	2	4.79	6.38	.00	
	Within Groups	2248.90	2994	.75			
	Total	2258.48	2996				0.00
Involvement with local naturalist orgs	Between Groups	39.80	2	19.90	18.29	.00	
	Within Groups	3364.72	3093	1.09			
	Total	3404.52	3095				0.01

*Table 6.4 Importance of eBird*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
How important is participating in eBird to you?	Not at all important	9.2%	11.4%	14.7%	10.3%
	Slightly important	32.1%	35.3%	33.1%	33.2%
	Moderately important	33.2%	31.2%	28.2%	32.2%
	Very important	25.6%	22.1%	23.9%	24.3%
	Valid N	1857	1198	268	3320
Significance:		$\chi^2 = 16.43^*$		Cramer's V=.05*	



*Table 6.5 Participation in conservation activities in past year*

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N
Made my yard or land more desirable to wildlife	4.1	1.04	1874	4.0	1.04	1201	4.0	.98	269	4.1	1.04	3342
Volunteered to improve wildlife habitat in my community	2.5	1.37	1856	2.3	1.24	1190	2.4	1.25	265	2.4	1.32	3309
Talked to others in my community about conservation issues	3.1	1.30	1867	3.0	1.24	1200	3.1	1.21	265	3.0	1.27	3330
Participated as an active member in a nature, outdoor, or conservation group	2.9	1.51	1866	2.8	1.46	1197	2.8	1.49	266	2.8	1.49	3326
Donated money to support wildlife/habitat conservation	2.9	1.27	1868	2.9	1.27	1197	2.9	1.24	268	2.9	1.27	3331

Scale of 1=Never to 5=Very often

*Table 6.5a Participation in conservation activities response distribution*

Item	Response					Valid N
	Never	Rarely	Sometimes	Often	Very often	
Made my yard or land more desirable to wildlife	3.5%	3.7%	17.5%	31.1%	44.2%	3342
Volunteered to improve wildlife habitat in my community	34.1%	21.0%	24.4%	10.2%	10.3%	3309
Talked to others in my community about conservation issues	15.8%	15.5%	33.1%	19.7%	15.9%	3330
Participated as an active member in a nature, outdoor, or conservation group	28.0%	17.4%	18.9%	15.6%	20.2%	3326
Donated money to support wildlife/habitat conservation	18.1%	18.5%	34.5%	14.7%	14.2%	3331

*Table 6.5b Participation in conservation activities ANOVA tests*

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
Made my yard or land more desirable to wildlife	Between Groups	6.386	2	3.19	2.99	.05	
	Within Groups	3571.31	3342	1.07			
	Total	3577.70	3344				0.00
Volunteered to improve wildlife habitat in my community	Between Groups	39.77	2	19.89	11.53	.00	
	Within Groups	5704.07	3308	1.72			
	Total	5743.84	3310				0.00
Talked to others in my community about conservation issues	Between Groups	3.10	2	1.55	.96	.38	
	Within Groups	5360.93	3329	1.61			
	Total	5364.03	3331				0.00
Participated as an active member in a nature, outdoor, or conservation group	Between Groups	6.10	2	3.05	1.37	.25	
	Within Groups	7387.22	3326	2.22			
	Total	7393.32	3328				0.00
Donated money to support wildlife/habitat conservation	Between Groups	3.96	2	1.98	1.23	.29	
	Within Groups	5360.44	3331	1.61			
	Total	5364.40	3333				0.00

*Table 6.6 Participation in wetland conservation activities in past year*

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N
Worked on land improvement project related to wetlands or waterfowl conservation	1.5	.94	1854	1.5	.93	1195	1.7	1.16	261	1.5	.95	3309
Attended meetings about wetlands or waterfowl conservation	1.6	.93	1854	1.6	.92	1195	1.8	1.11	262	1.6	.94	3309
Volunteered my personal time and effort to conserve wetlands and waterfowl	1.5	.91	1850	1.5	.89	1194	1.7	1.07	262	1.5	.91	3304
Contacted elected officials or government agencies about wetlands and waterfowl conservation	1.4	.85	1848	1.6	.96	1193	1.6	1.01	262	1.5	.90	3301
Voted for candidates or ballot issues to support wetlands or waterfowl conservation	2.3	1.43	1843	2.6	1.48	1192	2.6	1.46	264	2.4	1.46	3296
Advocated for political action to conserve wetlands and waterfowl	2.0	1.29	1844	2.1	1.31	1193	2.2	1.33	263	2.0	1.30	3298

Scale of 1=Never to 5=Very often

*Table 6.6a Participation in wetland conservation activities response distribution*

Item	Response				Valid often	Valid N
	Never	Rarely	Sometimes	Often		
Worked on land improvement project related to wetlands or waterfowl conservation	71.9%	13.1%	9.7%	2.9%	2.4%	3309
Attended meetings about wetlands or waterfowl conservation	66.4%	15.8%	13.1%	3.0%	1.6%	3309
Volunteered my personal time and effort to conserve wetlands and waterfowl	71.2%	14.5%	9.5%	3.0%	1.8%	3304
Contacted elected officials or government agencies about wetlands and waterfowl conservation	72.0%	12.2%	11.6%	2.7%	1.4%	3301
Voted for candidates or ballot issues to support wetlands or waterfowl conservation	43.9%	8.9%	19.7%	16.3%	11.1%	3296
Advocated for political action to conserve wetlands and waterfowl	53.0%	12.6%	18.1%	9.9%	6.5%	3298

*Table 6.6b Participation in wetland conservation activities ANOVA tests*

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
Worked on land improvement project related to wetlands or waterfowl conservation	Between Groups	11.260	2	5.630	6.180	.002	.004
	Within Groups		3013.275	3308	.911		
	Total		3024.535	3310			
Attended meetings about wetlands or waterfowl conservation	Between Groups	10.018	2	5.009	5.647	.004	.003
	Within Groups		2934.762	3309	.887		
	Total		2944.780	3311			
Volunteered my personal time and effort to conserve wetlands and waterfowl	Between Groups	7.612	2	3.806	4.531	.011	.003
	Within Groups		2774.915	3304	.840		
	Total		2782.527	3306			
Contacted elected officials or government agencies about wetlands and waterfowl conservation	Between Groups	13.619	2	6.809	8.320	.000	.005
	Within Groups		2701.581	3301	.818		
	Total		2715.200	3303			
Voted for candidates or ballot issues to support wetlands or waterfowl conservation	Between Groups	85.752	2	42.876	20.425	.000	.012
	Within Groups		6919.964	3296	2.099		
	Total		7005.716	3298			
Advocated for political action to conserve wetlands and waterfowl	Between Groups	18.025	2	9.013	5.328	.005	.003
	Within Groups		5578.036	3298	1.691		
	Total		5596.061	3300			

*Table 6.7a Personal community: Recreation*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Personal Community: Birdwatcher	Acquaintance	52.3%	51.4%	60.8%	52.5%
	Close Friend	57.5%	55.4%	62.3%	57.1%
	Relative	46.8%	50.8%	50.9%	48.4%
	Myself	87.4%	87.1%	86.0%	87.2%
	Valid N	1880	1209	274	3360
Personal Community: Angler	Acquaintance	55.0%	56.2%	57.4%	55.6%
	Close Friend	45.0%	46.9%	58.0%	46.5%
	Relative	57.0%	58.2%	67.6%	58.2%
	Myself	28.4%	29.4%	45.5%	29.9%
	Valid N	1513	1008	260	2765
Personal Community: Waterfowl Hunter	Acquaintance	67.4%	68.5%	70.0%	68.0%
	Close Friend	33.0%	35.8%	56.7%	36.0%
	Relative	35.0%	34.3%	47.1%	35.8%
	Myself	6.4%	8.6%	20.7%	8.4%
	Valid N	1032	704	223	1936
Personal Community: Other hunter	Acquaintance	62.5%	66.1%	67.1%	64.0%
	Close Friend	41.0%	42.1%	63.1%	42.9%
	Relative	51.0%	47.9%	64.6%	51.0%
	Myself	13.1%	11.4%	33.1%	13.9%
	Valid N	1403	875	245	2511

*Table 6.7b Personal community: Agencies*

		Flyway substrata			Flyway	
		Lower Central	Middle Central	Upper Central	Central	
Personal Community: State/provincial park manager/employee	Acquaintance		86.3%	83.4%	86.1%	85.3%
	Close Friend	22.8%	23.4%	26.8%		23.3%
	Relative	4.4%	7.7%	5.1%		5.5%
	Myself	3.6%	5.1%	6.6%		4.3%
	Valid N	809	480	138		1422
Personal Community: National Park Manager/Employee	Acquaintance	81.9%	79.7%	85.3%		81.4%
	Close Friend	25.0%	29.9%	29.0%		27.0%
	Relative	6.3%	9.7%	8.4%		7.6%
	Myself	2.9%	5.2%	6.9%		4.0%
	Valid N	725	489	142		1343
Personal Community: Federal wildlife agency manager/employee	Acquaintance	85.8%	88.1%	80.7%		86.1%
	Close Friend	24.4%	26.0%	42.4%		26.7%
	Relative	3.8%	8.6%	11.7%		6.3%
	Myself	4.1%	6.6%	13.3%		5.8%
	Valid N	585	412	148		1125
Personal Community: State/provincial wildlife agency manager/employee	Acquaintance	87.6%	87.9%	87.4%		87.7%
	Close Friend	23.0%	27.1%	37.7%		25.6%
	Relative	5.2%	4.9%	8.4%		5.4%
	Myself	2.4%	4.9%	7.6%		3.7%
	Valid N	733	486	158		1362

*Table 6.7c Personal community: Environmental Occupations*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Personal Community: Farmer/Rancher	Acquaintance	64.3%	68.4%	76.2%	66.9%
	Close Friend	31.9%	30.7%	42.7%	32.3%
	Relative	36.6%	37.4%	39.8%	37.1%
	Myself	12.4%	11.0%	12.3%	11.9%
	Valid N	1280	833	235	2332
Personal Community: Outdoor Educator	Acquaintance	76.2%	75.3%	75.7%	75.9%
	Close Friend	37.3%	39.8%	36.4%	38.1%
	Relative	9.4%	11.4%	9.4%	10.1%
	Myself	23.7%	21.3%	24.3%	22.9%
	Valid N	1171	752	182	2099
Personal Community: Wildlife artist	Acquaintance	71.9%	72.3%	75.6%	72.3%
	Close Friend	25.7%	27.8%	30.8%	26.8%
	Relative	11.6%	12.0%	12.4%	11.8%
	Myself	14.5%	14.3%	18.5%	14.7%
	Valid N	832	572	134	1531
Personal Community: Wildlife biologist	Acquaintance	76.2%	74.3%	81.6%	75.9%
	Close Friend	36.5%	37.1%	45.4%	37.4%
	Relative	8.5%	12.9%	12.4%	10.3%
	Myself	16.1%	20.1%	26.3%	18.3%
	Valid N	1055	701	194	1936
Personal Community: Wildlife photographer	Acquaintance	64.0%	62.0%	73.1%	63.9%
	Close Friend	40.7%	42.7%	41.9%	41.4%
	Relative	19.3%	23.2%	18.4%	20.5%
	Myself	46.9%	43.5%	50.5%	46.0%
	Valid N	1457	915	227	2593



Table 6.7d Personal community: Conservation organizations

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Personal Community: Member of fishing/conservation organizations	Acquaintance	65.1%	70.3%	74.5%	67.7%
	Close Friend	33.1%	35.9%	46.2%	35.2%
	Relative	28.3%	29.0%	38.8%	29.4%
	Myself	25.7%	24.9%	29.4%	25.7%
	Valid N	690	531	145	1348
Personal Community: Member of national conservation organization	Acquaintance	57.7%	53.6%	65.1%	56.7%
	Close Friend	42.9%	42.5%	43.6%	42.8%
	Relative	29.1%	34.7%	28.6%	31.0%
	Myself	62.2%	66.3%	60.9%	63.6%
	Valid N	1176	803	174	2147
Personal Community: Member of local conservation organization	Acquaintance	67.4%	64.2%	74.8%	66.8%
	Close Friend	44.1%	43.7%	53.0%	44.6%
	Relative	21.5%	24.9%	28.3%	23.1%
	Myself	57.4%	56.3%	52.0%	56.6%
	Valid N	890	600	149	1631
Personal Community: Member of local naturalist organization	Acquaintance	70.4%	69.8%	78.4%	70.6%
	Close Friend	49.7%	43.1%	50.1%	47.7%
	Relative	18.8%	15.4%	16.4%	17.6%
	Myself	55.2%	53.2%	39.4%	53.8%
	Valid N	993	534	109	1650

*Table 6.7e Personal community: Hunting organizations*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Personal Community: Member of Ducks Unlimited	Acquaintance	66.2%	68.6%	75.0%	67.8%
	Close Friend	29.2%	28.9%	41.5%	30.2%
	Relative	25.3%	24.2%	24.7%	24.8%
	Myself	13.5%	8.7%	19.9%	12.4%
	Valid N	641	434	146	1205
Personal Community: Member of Delta Waterfowl	Acquaintance	85.9%	83.3%	85.5%	85.1%
	Close Friend	19.3%	24.6%	37.6%	24.0%
	Relative	8.9%	11.1%	14.0%	10.4%
	Myself	5.8%	3.7%	12.2%	6.4%
	Valid N	95	51	44	183
Personal Community: Member of state waterfowl association	Acquaintance	73.9%	78.0%	88.7%	77.1%
	Close Friend	25.9%	23.0%	33.1%	25.8%
	Relative	13.7%	17.0%	11.3%	14.5%
	Myself	4.6%	4.3%	16.0%	5.9%
	Valid N	202	141	69	400
Personal Community: Member of non-waterfowl hunting organization	Acquaintance	69.3%	71.3%	79.5%	71.3%
	Close Friend	32.9%	33.1%	45.2%	34.5%
	Relative	21.3%	27.5%	27.2%	24.4%
	Myself	14.7%	14.0%	23.0%	15.4%
	Valid N	385	352	140	847

*Table 6.7f Personal community: Bird groups*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Personal Community: Member of birding group	Acquaintance	67.1%	65.6%	74.8%	67.0%
	Close Friend	53.6%	55.4%	52.8%	54.1%
	Relative	21.9%	24.0%	21.9%	22.6%
	Myself	62.0%	60.7%	52.2%	61.0%
	Valid N	1310	822	193	2322
Personal Community: Member of bird conservation group	Acquaintance	58.9%	56.1%	66.3%	58.4%
	Close Friend	48.6%	48.2%	46.9%	48.3%
	Relative	26.1%	27.1%	25.0%	26.4%
	Myself	74.2%	78.2%	73.1%	75.5%
	Valid N	1566	1010	223	2797
Personal Communication: Member of ornithological group	Acquaintance	69.1%	71.5%	81.9%	70.6%
	Close Friend	48.2%	47.4%	51.6%	48.1%
	Relative	15.1%	15.0%	11.1%	14.9%
	Myself	49.2%	53.1%	48.7%	50.6%
	Valid N	946	630	127	1702

*Table 6.8 Trust in various institutions*

	Lower Central			Flyway substrata Middle Central			Upper Central			Flyway Central		
	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N	Mean	SD	Valid N
State wildlife agencies	3.3	.93	1866	3.2	.91	1200	3.3	.92	267	3.3	.92	3331
Federal wildlife and land management agencies	3.2	.93	1863	3.2	.95	1199	3.3	.91	264	3.2	.93	3324
Elected officials	1.7	.80	1865	1.7	.79	1203	1.8	.83	265	1.7	.80	3331
Waterfowl hunting/conservation organizations	2.9	1.00	1831	3.0	.97	1191	3.1	.91	262	3.0	.98	3281
Birding/bird conservation organizations	4.0	.75	1870	4.1	.72	1204	3.9	.70	268	4.0	.74	3338
Other conservation organizations	3.5	.82	1822	3.5	.85	1172	3.4	.84	264	3.5	.83	3255
University researchers/scientists	3.6	.92	1853	3.7	.92	1195	3.6	.87	267	3.6	.92	3311

Scale of 1=Do not trust at all to 5=Trust completely

*Table 6.8a Trust in various institutions response distribution*

Item	Response					Valid N
	Do not trust at all	Trust a little	Trust somewhat	Trust a lot	Trust completely	
State wildlife agencies	4.4%	14.2%	38.8%	36.9%	5.8%	3331
Federal wildlife and land management agencies	4.5%	15.5%	39.5%	34.5%	6.1%	3324
Elected officials	47.9%	34.6%	15.6%	1.7%	0.2%	3331
Waterfowl hunting/conservation organizations	7.5%	24.9%	36.1%	28.0%	3.5%	3281
Birding/bird conservation organizations	0.4%	2.8%	14.6%	57.3%	24.9%	3338
Other conservation organizations	1.6%	7.6%	35.8%	45.2%	9.7%	3255
University researchers/scientists	2.1%	8.7%	28.4%	45.2%	15.6%	3311

Table 6.8b Trust in various institutions ANOVA tests

		Sum of Squares	df	Mean Square	F	Sig.	$\eta^2$
State wildlife agencies	Between Groups	2.04	2	1.02	1.20	.30	
	Within Groups	2831.40	3331	.85			
	Total	2833.44	3333				0.00
Federal wildlife and land management agencies	Between Groups	9.44	2	4.72	5.42	.00	
	Within Groups	2893.50	3323	.87			
	Total	2902.95	3325				0.00
Elected officials	Between Groups	4.33	2	2.17	3.39	.03	
	Within Groups	2129.43	3330	.64			
	Total	2133.76	3332				0.00
Waterfowl hunting/conservation organizations	Between Groups	4.43	2	2.21	2.30	.10	
	Within Groups	3155.93	3282	.96			
	Total	3160.36	3284				0.00
Birding/bird conservation organizations	Between Groups	3.96	2	1.98	3.68	.03	
	Within Groups	1797.36	3339	.54			
	Total	1801.32	3341				0.00
Other conservation organizations	Between Groups	5.04	2	2.52	3.63	.03	
	Within Groups	2258.92	3256	.69			
	Total	2263.96	3258				0.00
University researchers/scientists	Between Groups	4.80	2	2.40	2.86	.06	
	Within Groups	2782.58	3312	.84			
	Total	2787.38	3314				0.00

*Table 6.9 Percent making donation greater than \$0 in past year*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Percent making donation greater than \$0 in past year	Wetland or Waterfowl conservation	44.1%	41.9%	48.5%	43.6%
	Conservation of other birds	74.6%	75.2%	67.8%	74.4%
	Birdwatching and related issues	84.7%	80.9%	77.7%	82.9%
	Waterfowl hunting	12.9%	13.3%	30.6%	14.1%
	Valid N	1323	886	208	2408

*Table 6.9a Percent making donation greater than \$0 in past year significance tests*

		Chi-Square	df	Cramer's V
Percent making donation greater than \$0 in past year	Wetland or Waterfowl conservation	5.05	2	.04
	Conservation of other birds	1.56	2	.02
	Birdwatching and related issues	.21	2	.01
	Waterfowl hunting	55.77*	2	.14*

\*p < 0.05

*Table 6.9b Donations to wetland or waterfowl conservation*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Wetland or waterfowl conservation	\$0	67.0%	67.3%	60.4%	66.7%
	Less than \$250	30.0%	28.9%	35.7%	30.0%
	\$250 to \$999	1.8%	3.2%	3.2%	2.4%
	\$1000 to \$2499	0.7%	0.4%	0.8%	0.6%
	\$2500 to \$4999	0.3%	0.1%	0.0%	0.2%
	\$5000 to \$9999	0.0%	0.0%	0.0%	0.0%
	\$10,000 or more	0.2%	0.1%	0.0%	0.1%
	Valid N	1773	1136	254	3160

*Table 6.9c Donations to conservation of other bird species*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Conservation of other bird species	\$0	45.1%	42.8%	44.5%	44.3%
	Less than \$250	45.0%	47.0%	48.3%	45.9%
	\$250 to \$999	6.8%	7.5%	5.4%	7.0%
	\$1000 to \$2499	2.1%	1.7%	1.6%	1.9%
	\$2500 to \$4999	0.6%	0.6%	0.0%	0.5%
	\$5000 to \$9999	0.1%	0.2%	0.0%	0.1%
	\$10,000 or more	0.3%	0.3%	0.4%	0.3%
	Valid N	1799	1164	254	3215



*Table 6.9d Donations to birdwatching and related issues*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Birdwatching and relating issues	\$0	38.0%	38.7%	37.3%	38.2%
	Less than \$250	51.1%	50.8%	52.6%	51.1%
	\$250 to \$999	8.2%	7.3%	7.6%	7.8%
	\$1000 to \$2499	1.6%	2.5%	1.9%	1.9%
	\$2500 to \$4999	0.7%	0.5%	0.0%	0.6%
	\$5000 to \$9999	0.2%	0.2%	0.4%	0.2%
	\$10,000 or more	0.2%	0.1%	0.0%	0.2%
	Valid N	1807	1168	259	3231

*Table 6.9e Donations to waterfowl hunting and hunting related issues*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Waterfowl hunting and hunting related issues	\$0	90.1%	89.4%	74.2%	88.9%
	Less than \$250	9.2%	9.9%	22.6%	10.2%
	\$250 to \$999	0.5%	0.5%	2.9%	0.7%
	\$1000 to \$2499	0.0%	0.1%	0.4%	0.1%
	\$2500 to \$4999	0.1%	0.0%	0.0%	0.0%
	\$5000 to \$9999	0.1%	0.0%	0.0%	0.0%
	\$10,000 or more	0.1%	0.1%	0.0%	0.1%
	Valid N	1719	1108	247	3071

Table 6.10 Permits purchased and fees paid in the past 12 months

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Fees/Permits paid for in past 12 months	Federal Migratory Bird Hunting and Conservation Stamp	16.8%	16.7%	30.9%	17.7%
	National Wildlife Refuge access fees	54.0%	43.0%	30.9%	48.9%
	State Park access permit or fee	88.1%	86.4%	89.7%	87.6%
	State Wildlife Management Area access permit or fee	41.3%	37.6%	32.8%	39.5%
	County/local Conservation Land access fees	22.4%	21.5%	13.7%	21.6%
	Access fees for land owned by non-governmental conservation organizations	24.1%	17.4%	10.1%	21.0%
	National Park pass	53.4%	66.8%	63.2%	58.5%
	Valid N	2066	1302	286	3656

Table 6.10a Permits purchased and fees paid significance tests

		Chi-Square	df	Cramer's V
Fees/Permits paid for in past 12 months	Federal Migratory Bird Hunting and Conservation Stamp	32.19*	2	.10*
	National Wildlife Refuge access fees	54.39*	2	.13*
	State Park access permit or fee	5.52	2	.04
	State Wildlife Management Area access permit or fee	7.47*	2	.05*
	County/local Conservation Land access fees	7.69*	2	.05*
	Access fees for land owned by non-governmental conservation organizations	33.02*	2	.10*
	National Park pass	33.06*	2	.10*

\*p < 0.05

*Table 6.11 Willingness to pay for permits and fees in the next 12 months*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Fees/Permits willing to pay for in next 12 months	Federal Migratory Bird Hunting and conservation Stamp	37.9%	43.9%	51.1%	40.7%
	National Wildlife Refuge access fees	85.0%	81.3%	78.2%	83.4%
	State Park access permit or fee	94.9%	93.7%	94.8%	94.5%
	State Wildlife Management Area access permit or fee	81.9%	77.7%	68.4%	79.7%
	County/local Conservation Land access fees	71.8%	67.6%	57.0%	69.5%
	Access fees for land owned by non-governmental conservation organizations	71.3%	64.6%	55.6%	68.1%
	National Park pass	83.7%	86.4%	88.1%	84.9%
	Valid N	2066	1302	286	3656

*Table 6.11a Willingness to pay for permits and fees significance tests*

		Chi-Square	df	Cramer's V
Fees/Permits willing to pay for in next 12 months	Federal Migratory Bird Hunting and conservation Stamp	19.92*	2	.08*
	National Wildlife Refuge access fees	7.25*	2	.05*
	State Park access permit or fee	0.53	2	.01
	State Wildlife Management Area access permit or fee	19.29*	2	.08*
	County/local Conservation Land access fees	19.86*	2	.08*
	Access fees for land owned by non-governmental conservation organizations	27.63*	2	.09*
	National Park pass	6.72*	2	.05*

\*p < 0.05

## Section 7. Respondent characteristics

Respondents answered a series of sociodemographic questions regarding race, ethnicity, gender, age, education, profession, rural land ownership, urban/rural residence, urban/rural upbringing, income, and state of residence. Respondents were largely white (98-99%; Tables 7.1,7.1a), and non-Hispanic (97-99%; Table 7.2). Respondents were slightly more likely to be female in the Lower (53%) and Middle Central (55%; Table 7.3) than in the Upper Central (47%), but this difference is small.

After removing any respondents under the age of 18, the average age of respondents was 60 years old, with no differences between the substrata (Table 7.4). Almost half of respondents reported graduate or professional-level education (42-48%; Table 7.5), and another third reported holding a Bachelor's degree (32-36%). Analyses showed no differences in education between the substrata. Most respondents indicated that a nature related profession was not their primary source of personal income across substrata (69-86%), with significant but small differences between substrata (Upper reporting nature-related profession: 31% vs. Lower reporting nature-related profession: 15%; Table 7.6). Across substrata, 56-64% made less than \$75,000 per year in personal income, while 5-12% made more than \$150,000 (Table 7.7). Analyses indicate significant but small differences between the substrata, with overall slightly higher incomes in the Lower Central.

A majority of respondents did not own rural land (60-66%), and those that did owned an average of 325 acres to 928 acres (Table 7.8). There were no significant differences in rural land ownership between the substrata, as well as no significant difference between substrata in the number of acres owned. In the Lower and Middle Central substrata, about half of respondents reported living in a medium or large urban area, and about a quarter reported the same in the Upper Central (Table 7.9). Respondents from the Upper Central were overall significantly more rural than the rest of the flyway (Upper reporting residence in rural area: 38%, Middle: 19%, Lower: 17%); analyses suggest these differences were small. Respondents also reported the population size of the area where they grew up, and again, respondents in the Upper Central were significantly more likely to report a rural upbringing (Upper: 32%, Middle: 21%, Lower 16%; Table 7.10), but analyses suggest these differences were small.

Table 7.1 Percent reporting race

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Race	American Indian/Native American	4.3%	2.3%	2.4%	3.4%
	Asian	1.4%	.9%	.8%	1.2%
	Black or African American	.7%	.3%	.4%	.6%
	Native Hawaiian or Pacific Islander	.2%	.2%	.4%	.2%
	White	97.9%	98.9%	98.8%	98.3%
	Valid N	1780	1155	263	3191

Table 7.1a Race significance tests

		Chi-Square	df	Cramer's V
Race	American Indian/Native American	9.64*	2	.05*
	Asian	2.13	2	.03
	Black or African American	1.53	2	.02
	Native Hawaiian or Pacific Islander	0.63	2	.01
	White	3.69	2	.03

\*p < 0.05

Table 7.2 Ethnicity

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Hispanic or Latino	Yes	3.5%	1.4%	.8%	2.6%
	No	96.5%	98.6%	99.2%	97.4%
	Valid N	1791	1165	265	3215
Significance:		$\chi^2 = 15.79^*$		Cramer's V=.07*	

Table 7.3 Gender

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Gender	Male	47.4%	44.8%	52.9%	46.8%
	Female	52.6%	55.2%	47.1%	53.2%
	Valid N	1827	1188	264	3274
Significance:		$\chi^2 = 6.35^*$		Cramer's V=.04*	

Table 7.4 Age

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
	Mean	60	60	58	60
Age	SD	13.89	13.55	14.45	13.81
	Range	77	72	66	77
	Valid N	1805	1170	259	3230
Significance:		F (2,3233)= 2.18		$\eta^2=.00$	

Table 7.5 Education

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Level of education	Some high school or less	.8%	.8%	.8%	.8%
	High school diploma or GED	3.1%	2.8%	3.6%	3.0%
	Some college (no degree)	11.5%	10.0%	11.2%	11.0%
	Associate's degree (2 years)	5.1%	5.7%	6.2%	5.4%
	Bachelors degree (4 years)	32.7%	32.3%	36.4%	32.8%
	Graduate or professional school	46.9%	48.4%	41.7%	47.1%
	Valid N	1828	1189	263	3276
Significance:		$\chi^2 = 6.51$		Cramer's V=.03	

Table 7.6 Nature-related profession

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Is a nature-related profession primary source of personal income?	Yes	14.5%	20.2%	31.0%	17.4%
	No	85.5%	79.8%	69.0%	82.6%
	Valid N	1844	1189	266	3296
Significance:		$\chi^2 = 49.67^*$		Cramer's V=.12*	

Table 7.7 Income

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Personal income	Less than \$24,999	13.8%	13.9%	12.4%	13.8%
	\$25,000 to \$49,999	19.7%	23.4%	26.2%	21.4%
	\$50,000 to \$74,999	22.3%	22.9%	25.5%	22.7%
	\$75,000 to \$99,999	16.3%	17.0%	17.6%	16.6%
	\$100,000 to \$124,999	10.7%	9.6%	9.1%	10.2%
	\$125,000 to \$149,999	5.3%	5.2%	4.2%	5.2%
	\$150,000 to \$199,999	5.5%	3.8%	2.0%	4.7%
	\$200,000 to \$249,999	3.0%	1.4%	1.7%	2.3%
	\$250,000 to \$299,999	.9%	1.6%	0.0%	1.1%
	\$300,000 or more	2.6%	1.1%	1.2%	2.0%
Valid N		1613	1046	247	2899
Significance:		$\chi^2 = 38.90^*$		Cramer's V=.08*	



*Table 7.8 Rural land ownership*

			Flyway substrata			Flyway
			Lower Central	Middle Central	Upper Central	Central
Do you own land in a rural area	Yes	Column Valid N %	34.1%	34.3%	40.2%	34.5%
	No	Column Valid N %	65.9%	65.7%	59.8%	65.5%
How many acres of rural land?	Mean		352	908	325	538
	SD		3,224.19	5,614.77	1,159.73	4,120.58
	Range		42,737	43,041	10,000	43,041
	Valid N		1846	1193	265	3301
Own land Y/N significance:			$\chi^2 = 3.82$		Cramer's V=.03	
Acreage owned significance:			F (2,1061)= 2.23		$\eta^2=.00$	

*Table 7.9 Urban vs Rural Residence*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Where you live now	Large Urban area (500,000 or more)	34.5%	23.0%	.8%	28.6%
	Medium Urban area (50,000 to 499,999)	23.5%	29.0%	23.8%	25.4%
	Small city (10,000 to 49,999)	15.4%	15.7%	21.2%	15.9%
	Small town (2,000 to 9,999)	10.1%	13.1%	16.2%	11.5%
	Rural area (less than 2,000)	16.5%	19.4%	38.0%	18.8%
	Valid N	1832	1188	265	3280
Significance:		$\chi^2 = 188.12^*$		Cramer's V=.17*	

*Table 7.10 Urban vs Rural Upbringing*

		Flyway substrata			Flyway
		Lower Central	Middle Central	Upper Central	Central
Where you grew up	Large Urban area (500,000 or more)	24.2%	18.4%	11.3%	21.4%
	Medium Urban area (50,000 to 499,999)	25.5%	25.8%	17.7%	25.1%
	Small city (10,000 to 49,999)	19.5%	18.2%	21.4%	19.1%
	Small town (2,000 to 9,999)	15.3%	16.9%	17.5%	16.0%
	Rural area (less than 2,000)	15.6%	20.7%	32.1%	18.3%
	Valid N	1801	1171	260	3228
Significance:		$\chi^2 = 69.74^*$		Cramer's V=.10*	

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# Appendices

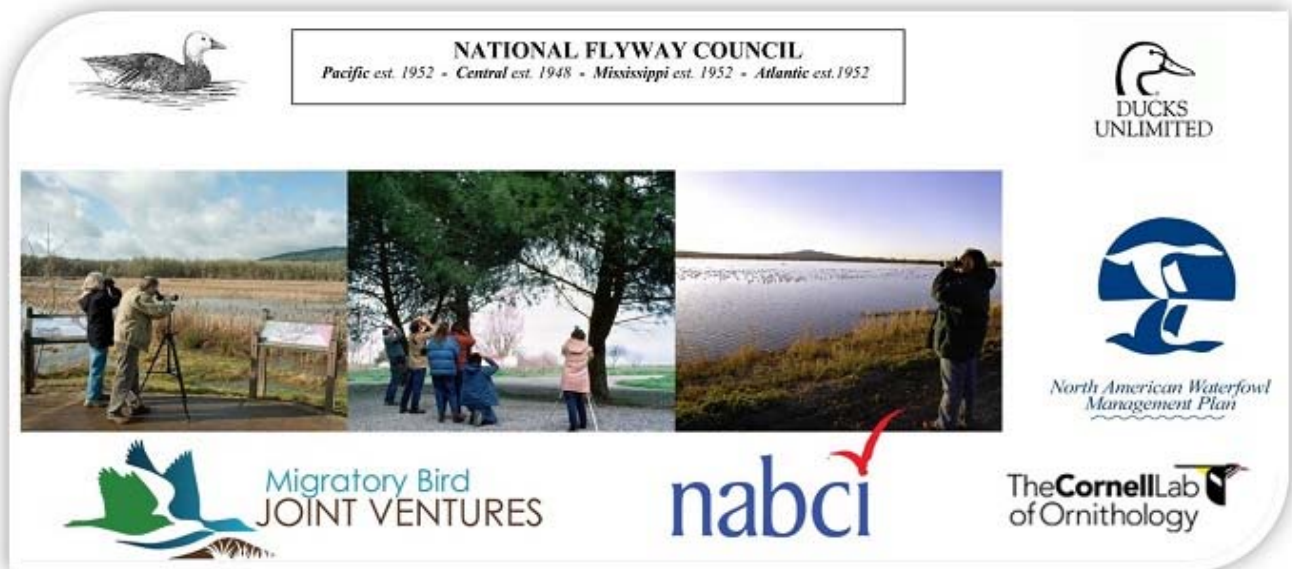
## Appendix A: Survey Instrument

Please refer to separate Appendix for a copy of the North American Birdwatching Survey.

# Appendix B: Non-response Survey Instrument

<IDNUM>

## North American Birdwatching Survey



1. Do you ever participate in birdwatching or birding? (*Check only one*)

YES

NO → **GO TO QUESTION 7**

2. **In the past 12 months**, did you take any trips at least 1 mile or more from your home primarily for birdwatching?

YES

NO → **GO TO QUESTION 4**

3. **In the past 12 months**, about how many trips at least 1 mile from your home did you take primarily for birdwatching?

\_\_\_\_\_ (write in number)

4. How would you rate your own ability to observe and identify birds? Please respond on a scale where 1= novice to 7 = expert. (*Please circle one number*).

**Novice**

**1**

**2**

**3**

**4**

**5**

**6**

**Expert**

**7**

5. Other than at your home, where do most of your birdwatching activities occur? (*Please select only one*).

Privately-owned lands with no general public access

Publicly-accessible lands

I only watch birds at my home

I'm not sure



6. We are interested in knowing how much birdwatching means to you. Please indicate how much you disagree or agree with the following statements about your involvement in birdwatching. (Check one for each)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Developing my skills and abilities in birdwatching is important to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I couldn't go birdwatching I am not sure what I would do instead.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Birdwatching has a central role in my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Birdwatching is one of the most enjoyable activities I do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Challenging my birdwatching skills is important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most of my friends are in some way connected with birdwatching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using new techniques, technology and equipment to help me identify more birds is important to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The sights and sounds of nature are important to birdwatching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Getting to enjoy the natural environment through birdwatching is important.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Getting a chance to add a new bird to my life list is important to me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A lot of my life is organized around birdwatching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being in nature is an important part of birdwatching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. In the last 12 months, have you participated in the following nature-based activities? Please check Yes or No for each.

<input type="checkbox"/> Yes <input type="checkbox"/> No	Spending time in nature away from home (e.g., picnicking, relaxing in nature, camping, hiking, climbing)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Viewing wildlife (e.g., wildlife watching, bird watching, bird feeding, wildlife photography)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Learning about nature (e.g., attending festivals or lectures, visiting a nature center)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Backyard/at-home nature activities (e.g., gardening, landscaping)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Fishing
<input type="checkbox"/> Yes <input type="checkbox"/> No	Hunting other migratory birds (doves, woodcock, rail, etc.)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Hunting other game birds (grouse, pheasants)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Hunting all other game animals (deer, elk, rabbit, etc.)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Watching birds at my home
<input type="checkbox"/> Yes <input type="checkbox"/> No	Feeding birds at my home
<input type="checkbox"/> Yes <input type="checkbox"/> No	Watching birds away from my home
<input type="checkbox"/> Yes <input type="checkbox"/> No	Photographing or filming birds
<input type="checkbox"/> Yes <input type="checkbox"/> No	Counting/monitoring birds (e.g., Christmas or Backyard Bird Count)
<input type="checkbox"/> Yes <input type="checkbox"/> No	Recording the birds you see on a list, online or on paper
<input type="checkbox"/> Yes <input type="checkbox"/> No	Installing or maintaining nest boxes for birds

8. A person can think of themselves in a variety of ways. On a scale of “1” to “7”, where “1” is “not at all” and “7” is “completely”, how much would you identify yourself as the following? (Please circle one number for each)

	Not at all		Moderately			Completely	
	1	2	3	4	5	6	7
Birdwatcher	1	2	3	4	5	6	7
Duck Hunter	1	2	3	4	5	6	7
Goose Hunter	1	2	3	4	5	6	7
Other hunter	1	2	3	4	5	6	7
Conservationist	1	2	3	4	5	6	7

9. How important is participating in eBird to you? (*Check one*)

- Not at all important
- Slightly Important
- Moderately Important
- Very Important

10. Are you a member of the National Audubon Society? (*Check one*)

- YES
- NO

**About You** To help us compare your responses to those of others, we have some questions about you. Please be assured that all of your answers will remain completely confidential.

11. In what year were you born? 19\_\_\_\_\_

12. Are you...?  Male  Female

13. What is the highest level of education you have completed? (*Check one*).

- Some high school or less
- High school diploma or GED
- Some college (no degree)
- Associate’s degree (2 years)
- Bachelor’s degree (4 years)
- Graduate or professional school

14. Do you own land in a rural area (outside of an urban or suburban area)?

No  Yes → **If YES how many acres do you own in total** \_\_\_\_\_ **ACRES**

15. Which of these categories best describes the place where you live now? (*Check one*)

- Large urban area (population of 500,000 or more)
- Medium urban area (population between 50,000 and 499,999)
- Small city (population between 10,000 and 49,999)
- Small town (population between 2,000 and 9,999)
- Rural area (population less than 2,000)

16. Please indicate which of the following categories applies to your personal income for the last 12 months? (*Check one*).

- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Less than \$24,999 | <input type="checkbox"/> \$75,000-\$99,999   | <input type="checkbox"/> \$200,000-\$249,999 |
| <input type="checkbox"/> \$25,000-\$49,999  | <input type="checkbox"/> \$100,000-\$149,999 | <input type="checkbox"/> \$250,000-\$299,999 |
| <input type="checkbox"/> \$50,000-\$74,999  | <input type="checkbox"/> \$150,000-\$199,999 | <input type="checkbox"/> \$300,000 or more   |

17. What ethnicity do you consider yourself? (*Check one*).

- Hispanic or Latino
- Not Hispanic or Latino

18. From what racial origin(s) do you consider yourself? (*Please check all that apply*).

- American Indian or Alaskan Native
- Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White

19. Please let us know why you chose not to complete the survey online earlier? (*Check all that apply*)

- I didn't receive or notice the e-mail invitation
- I seldom or do not use the e-mail address provided to eBird
- I couldn't open the website even though I have internet access
- I didn't have time to complete the study earlier
- I was concerned that the invitation was a phishing scam
- I don't watch birds
- I didn't think the survey applied to me

# Appendix C: Contact E-mails

Participate in the birdwatcher survey.

November 16, 2016

Is this email not displaying correctly?

[View it in your browser.](#)



UNIVERSITY OF MINNESOTA  
Driven to Discover<sup>SM</sup>

College of Food, Agricultural and Natural Resource Sciences

Dear ,

We are contacting you to ask for your help in a national study of birding and birdwatching. The University of Minnesota and eBird at the Cornell Lab of Ornithology are working closely with the National Flyway Council (NFC), the North American Bird Conservation Initiative (NABCI), and your state wildlife agency to complete this study. We are contacting you because you participate in birding or birdwatching, and we believe you have an important point-of-view to share about bird conservation.

The survey will only take about 15 minutes to complete. To begin the survey, please click on this link:

### **[Birdwatcher Survey](#)**

**And then type in the following Access Code: JSY5526**

This survey is confidential. Your participation is voluntary, and if you come to any question you prefer not to answer please skip it and go on to the next.

If you should have any questions please e-mail us at [umn.birdwatcher@gmail.com](mailto:umn.birdwatcher@gmail.com) or call [612-625-3718](tel:612-625-3718) and leave a detailed message.

Your participation is very important to the study and will help improve bird management and conservation across North America. We greatly appreciate your help with this study!

---

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**This message was sent from:**

CFANS Research  
1420 Eckles Avenue  
St. Paul, MN, 55108  
USA

Participate in the birdwatcher survey.

November 21, 2016

Is this email not displaying correctly?  
[View it in your browser.](#)



## College of Food, Agricultural and Natural Resource Sciences

Dear ,

Recently, we sent you an e-mail asking you to complete an online survey about your experiences birding or birdwatching. We are collaborating with the folks at eBird at the Cornell Lab of Ornithology on the study. If you have completed this survey, we would like to thank you very much. We truly appreciate your help.

If you have not answered the questionnaire yet, we'd like to urge you to do so. It should only take about 15 minutes to complete. Simply click on the link below and use your access code to begin answering questions:

### [Birdwatcher Survey](#)

**Access Code: NPJUB33**

This first of its kind nationwide study is important to anyone concerned with bird management and conservation. Results will be used in planning to help improve bird management and conservation across North America.

If you should have any questions please e-mail the study director at [umn.birdwatcher@gmail.com](mailto:umn.birdwatcher@gmail.com) or call [612-625-3718](tel:612-625-3718) and leave a detailed message.

Your response is voluntary, and we greatly appreciate your help on this study!

---

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**This message was sent from:**

CFANS Research  
1420 Eckles Avenue  
St. Paul, MN, 55108  
USA

Participate in the birdwatcher survey.

November 30, 2016

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correctly?  
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College of Food, Agricultural and Natural Resource Sciences

Dear ,

A few days ago we sent an e-mail to you asking for your participation in a study of birding and birdwatching. If you completed it, thank you! If not we hope you can now.

We hope that providing the link to the survey makes it easier for you to respond. To begin the survey, simply click on this link:

### **[Birdwatcher Survey](#)**

**And then type in the following Access Code: 6HDW3G2**

We had reports that some folks could not complete the survey due to the volume of response at the server. If you encounter a server error while taking the survey, you can return later and complete it from where you left off.

Your participation is very important to the study and will help improve bird management and conservation across North America.

Your response is voluntary, and we greatly appreciate your help on this study!

---

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**This message was sent from:**

CFANS Research  
1420 Eckles Avenue  
St. Paul, MN, 55108  
USA

Participate in the birdwatcher survey.

December 7, 2016

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correctly?  
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## College of Food, Agricultural and Natural Resource Sciences

Dear ,

In November we contacted you asking for your help with the North American Birdwatching Survey. We are writing to you again because our ability to better understand birdwatching depends on hearing back from those people who have not yet responded. We need your help to ensure the results are as representative as possible.

If you have not answered the questionnaire yet, we ask that you do so now. To complete the study, click on the secure web address link below and use your access code to begin answering questions:

**<http://birdwatcher-survey.org/login.html>**

**Access Code: GH5TAYG**

The survey is hosted at our vendor's (Sawtooth Software) server and does not have an [UMN.EDU](http://UMN.EDU) address for that reason.

Responses to this survey are confidential and will not be connected to you in any reports of the data. If you should have any questions please e-mail the study director, Jason Spaeth, at [birdsurvey@umn.edu](mailto:birdsurvey@umn.edu) or call [612-625-3718](tel:612-625-3718) and leave a detailed message.

Thank you so much for considering this request, we greatly appreciate your help on this study!

---

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1420 Eckles Avenue  
St. Paul, MN, 55108  
USA



Participate in the birdwatcher survey.

December 15, 2017

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UNIVERSITY OF MINNESOTA  
Driven to Discover<sup>SM</sup>

College of Food, Agricultural and Natural Resource Sciences

Dear ,

We are writing to follow up on the message we sent last week asking you to participate in the North American Birdwatching Survey. This study is drawing to a close, and we really would like to hear from you before we run out of time.

The URL link and your personal access code are included below to provide an easy link to the survey website:

**<http://birdwatcher-survey.org/login.html>**

**Access Code: 427WK86**

We truly hope you will be able to share your opinions with us!

---

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**This message was sent from:**

CFANS Research  
1420 Eckles Avenue  
St. Paul, MN, 55108  
USA


## Appendix D: Institutional Review Board Determination

**DETERMINATION OF HUMAN SUBJECT RESEARCH**

Version 1.2

Updated June 2014, check <http://www.irb.umn.edu> for the latest version

<b>Route this form to:</b> See instructions below.	<b>U Wide Form:</b> June 2014
---	----------------------------------

<p>This form is used to help researchers determine if a project requires IRB review. It also provided documentation that the IRB has reviewed the project description and issued a determination.</p> <p>Additional information that may assist you in determining whether or not to submit an application can be found on the IRB website. See <a href="#">Does My Research Need IRB Review?</a> and Guidance and FAQs <a href="#">IRB Review of Exempt Research</a>.</p> <p>Please allow up to five (5) business days for review and response.</p> <p>Email completed form to <a href="mailto:irb@umn.edu">irb@umn.edu</a></p>	<p><b>Based on the information provided, this project does not meet the regulatory definition of human subjects research. Additional IRB review is NOT required.</b></p> <div style="text-align: right; border: 1px solid black; padding: 5px;">  </div>
--	---

**Project Title**

Provide the grant title below if the project is funded.

Assessing the preferences of stakeholders and waterfowl management professionals to inform the implementation of the North American Waterfowl Management Plan

**Section 1 Contact Information**

<b>Name (last name, First name MI)</b> Fulton, David C.		<b>Highest Earned Degree:</b> PhD
<b>Preferred contact information:</b> <input type="checkbox"/> dcfulton@umn.edu <input type="checkbox"/> Preferred email at which you may be contacted by IRB staff.		
<b>Affiliation and contact information</b> <input checked="" type="checkbox"/> University of Minnesota      Fairview      Gillette		
<b>U of M Required Contact information</b>	<b>U of M Internet ID (x.500):</b>	dcfulton
	<b>University Department:</b>	FWCB

**Section 2 Summary of Activities**

**2.1 Provide a brief description of your project. Include a description of what any participants will be asked to do and a description of the data accessed and/or collected (1,000 character limit).**

Individuals will be asked to complete an online survey focused on waterfowl hunting regulations, conditions that influence the choice of waterfowl hunting or bird viewing recreational trips, importance of hunting and viewing, beliefs about wetland conservation, and some demographics including income within broad categories. We are targeting 10,000 completed surveys nationwide. The data will be aggregated at the regional and national levels and market analysis will be conducted to better understand the preferences for hunting and viewing experiences among different segments of the study population. This information will be used to help set objectives for national level management plans of waterfowl, wetlands, and other bird species related to wetlands.

**2.2 Are all of the data used in this project publicly available, e.g. blog, aggregate data, etc.?**

Yes  No

**Section 3 Is this Project Human Subjects Research as Defined by Federal Regulations?**

Research is defined in the [Code of Federal Regulations, 45CFR46.102\(d\)](#), as *a systematic investigation designed to develop or contribute to generalizable knowledge*

*The Belmont report states* "...the term 'research' designates an activity designed to test a hypothesis or answer a research question(s) [and] permit conclusions to be drawn... Research is usually described in a formal protocol that sets forth an objective and a set of procedures to reach that objective."

**Research** generally does **not** include operational activities such as routine outbreak investigations and disease monitoring and studies for internal management purposes such as program evaluation, quality assurance, quality improvement, fiscal or program audits, marketing studies or contracted-for services.

**Generalizable knowledge** is information where the intended use of the research findings can be applied to populations or situations beyond that studied. Note that publishing the results of a project does not automatically meet the definition of generalizable knowledge.

**3.1 Do you have a specific research question or hypothesis?**

Yes  No

**3.2 Is your primary intent to generate knowledge that can be applied broadly to the group/condition under study?**

Yes  No

**Human subject is defined in the Code of Federal Regulations, 45CFR46.102(f)(1or2), as a living individual *about whom* an investigator obtains data through intervention or interaction or identifiable private information.**

The specimen(s)/data/information must be collected from or be **about** live subjects. Research on cadavers, autopsy specimens or specimens/information from subjects now deceased is not human subjects research.

**3.3 Does this project involve intervention or interaction with a living individual or group of individuals? (e.g. confidential surveys, interviews, medical or educational testing)**

Yes      No

**3.4 Does this project involve access to identifiable private data or specimens from living individuals?**

Yes       No

**3.5 Does this project consist exclusively of interviewing or surveying subjects about his/her area of expertise, with a focus on policies, practices, and/or procedures (e.g. the collected data does not focus on personal opinion or private information)?**

Yes      No

**3.6 Is the project meant to record the stories, knowledge or experiences of individuals? Oral histories typically do not intend to answer a research question or hypothesis.**

Yes       No

If a protocol exists for this project it must be submitted for review. Submit this request along with any supplemental documents that may aid in review of your project to the University of Minnesota IRB at [irb@umn.edu](mailto:irb@umn.edu).