FACTORS INFLUENCING PARTICIPATION IN BIRDWATCHING ACTIVITIES, CITIZEN SCIENCE AND ENVIRONMENTAL ACTION AMONG BIRDWATCHERS IN ISRAEL

By

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Abstract

Birdwatching is one of the most popular pastimes in most developed countries with an estimated 55 million people in the USA participating in birdwatching activities. There are many studies that look at how gender and other factors influence birdwatching activities, motivation and identity. In Israel, birdwatching is growing in popularity and birding activities are well attended. However, not much is known about who these birders are or what factors influence their participation in birdwatching, citizen science or other pro-environmental behaviors related to birds. This study aimed to determine the demographics and characteristics of the birdwatching community in Israel and to determine what factors affect their participation in birdwatching. A snowball sampling method was used to gather survey data from 371 birdwatchers representing different age groups, genders, levels of expertise, and regions of Israel. Questions asked about birding skill levels, activities, motivation, commitment, influences, limitations, and equipment use. Analysis of results showed that there is marked difference in self-reported levels of expertise and skill between men and women in Israel, with age also playing a large role. Women and men are very similar in their level of commitment and motivations, yet differ in their style of birding and in which activities they conduct. Findings of this study will support birdwatching centers and educators in their efforts to offer services, programs and citizen science opportunities to the different groups of Israeli birdwatchers.

Key words: Birdwatching, birders, gender, Israel, recreational motivations, recreational specialization.

TABLE OF CONTENTS

Page Number

LIST OF TABLES

Page Number

LIST OF FIGURES

Page Number

Introduction

Statement of Problem

Although birdwatching is a growing pastime in Israel not much is known about the demographics of this population or about the extent to which these birdwatchers are involved in birdwatching activities, citizen science and environmental action.

Over the past decades there seems to have been an increase in the number of people involved in all levels of birdwatching. Activities offered by organizations such as the Society for the Protection of Nature in Israel (SPNI) are well attended. There is a yearly one-day conference that outgrew its initial venue and last year attracted over 1000 people of all ages. There is active participation on several social media sites including a rare bird alert on Telegram, groups on Facebook and an online forum. Last year the Israel Ornithological Society (IOC) started a bird club that offers monthly guided bird walks with expert birders and over 100 people have signed up so far. And at the Jerusalem Bird Observatory (JBO) there has been a steady increase in the number of people buying bird feeders, bird houses and field guides. In addition, in the last 5 years there has been an increase in the number of teens registered in youth bird clubs offered by the IOC. There is also a large mailing list for the IOC newsletter of around 10,000 people. Not all of these are birdwatchers, but it is possible that a large portion of them participate in some way in birdwatching activities. It is not really known how big the population is, how committed and active its members are or how to best serve this community. It is very possible that services offered by the IOC, JBO and SPNI as well

as other organizations are not serving a wide enough range of people – instead focusing more on either the very new to the hobby or those with some significant experience.

In addition, the IOC started a new online reporting system that is linked to eBird. Currently around 5164 number of people are registered on this website, although some of these are students and teachers and may not be birdwatchers. About 1225 have submitted less than 10 reports of their sightings to the website over the years and 180 have submitted 10 or more reports. However, it is known that many birders, including the top level birders, do not report on the site. Investigating the level of participation in a variety of different citizen science projects and other environmental action activates might shed some light on the reasons people get involved and what factors contribute to their involvement or non-involvement.

Goals and Objective of the Project

The goal of this research is to conduct an analysis of the birdwatching population in Israel in order to better understand the demographics of the community and to understand what factors are influencing their participation in birdwatching activities, citizen science and environmental action.

Research Questions

There were six main areas of questioning:

1. What are the demographics of birdwatchers in Israel?
2. What are the specialization levels of the birdwatchers in Israel?
3. What are the motivations of birdwatcher in Israel?

4. In what ways are birdwatchers in Israel involved in citizen science?

5. In what ways are birdwatchers in Israel involved in environmental action?

6. What is the level of pro-environmental behavior among birdwatchers in Israel?

7. What factors affect involvement in birdwatching activities, citizen science and environmental action among birdwatchers in Israel?

8. Comparison of responses to questions about demographics, motivations, and behaviors will allow for further consideration of questions such as:

   a. Is age a factor affecting involvement in birdwatching activities, citizen science and environmental action?
   b. Is religious identity a factor affecting involvement in birdwatching activities, citizen science and environmental action?
   c. Is education level a factor affecting involvement in birdwatching activities, citizen science and environmental action?
   d. Is specialization a factor affecting involvement in birdwatching activities, citizen science and environmental action?
   e. Is gender a factor affecting involvement in birdwatching activities, citizen science and environmental action?

The Importance of the Study

The importance of the study was to (a) increase understanding of the community of birdwatchers in Israel; (b) to identify barriers preventing participation in birdwatching in Israel; (c) to identify ways to improve on the services of the IOC and other birdwatching sites around the country; (d) to understand how to increase the number of

birdwatchers participating in citizen science projects and other environmental action efforts around the country.

Definition of Terms

Citizen science: Scientific collection of data relating to the natural world, generally by amateur scientists in collaboration with professional scientists at universities or other centers of study.

Birdwatchers: Or Birders. People of all ages who watch birds and participate in other activities connected with birds.

ABA: American Birding Association – A non-profit association in the USA that caters to birdwatchers of all levels and conducts conservation and educational programs around the country.

Limitations

1. Although Arabic, English and Hebrew are the three main languages spoken in Israel, the online survey was offered in Hebrew and English only. It was too difficult to set up three different surveys on the web. This may have prevented some people from participating.

2. Due to the fact that the birdwatching population size was not known, it was difficult to do a random sample and determine percentage of responses. In order to get the largest possible number of responses, a snow-ball sampling method was used. This compromised our ability to calculate things like response rate.

3. As we did not know everyone who would be sampled it was not possible to use traditional follow through methods for sampling. It was therefore difficult to calculate non- response rate.

Assumptions

1. Birdwatchers would be willing to spend 10 minutes answering an online survey.
2. Participants would complete the study honestly and carefully.
3. Participants would be willing to send the survey link to other birdwatchers that they knew.
4. The sampling method would give us access to as many different people as possible across all demographic ranges.
5. Information gained from participating birdwatchers would be representative of the country as a whole.

Review of Literature

This chapter reviews peer-reviewed literature in the fields of leisure studies and recreation specialization as it relates to birdwatchers, citizen science and environmental action. The reviews will (1) describe ways that commitment, motivation and specialization have been measured using leisure studies techniques and (2) examine some of the research into what motivates people to participate in citizen science and environmental action. A survey carried out by the U.S. Department of the Interior (2007) showed that around 21% of the adult population participates in some form of birdwatching in the U.S. – approximately 47.7 million people. Later surveys reported by the U.S. Fish and Wildlife Service (2013) demonstrated that the number of people participating in some form of birdwatching has been stable over the last few decades. There have been some studies done on birdwatchers in the U.S. and in other countries around the world. These include Turkey (Cakici & Harman, 2007), Australia (Connell, 2009), China (Yuanyuan & Lei, 2014), Thailand (Hvenegaard, 2002) and the U.K. However, no such study has been carried out on the birdwatchers in Israel. Collins-Kreiner et al. (2013) estimated that 3,000 – 100,000 birdwatchers were active in Israel but did not specify the source of this figure. It is believed that birdwatching has increased in popularity but more exact numbers are not known at this moment.

Recreation Specialization

Recreation specialization is one way to study participation a leisure activity such as birdwatching. The theory assumes that participants in any leisure activity can be

arranged on a continuum ranging from casual or occasional involvement to very serious involvement. It also assumes that people the longer people have been participating in a hobby, the higher their level of involvement will be. Bryan (1977) defines recreation specialization as a process where a person moves from a general interest in a activity of hobby into a more focused set of behaviors around that activity or hobby. This more focused specialization involves acquisition of special equipment and learning new skills among other things.

According to Scott and Shafer (2001), specialization involves progression in three different areas – skill, behavior and commitment. Progression of skill involves fine tuning of knowledge and skills that make the participant more competent in the activity – such as identification skills for birders. Progression of behavior involves devoting more and more time to the activity often to the detriment of other activities. Progression of commitment refers to the level of investment and attachments that make it difficult to stop the chosen activity. This often manifests as a feeling that this activity is superior to all others, or the development of close friendships with other participants that could be lost if they stop the activity. Lee and Scott (2004) showed that although these three areas are connected they do not happen in "lock step" and that it is possible for someone to participate very regularly but still have a low level of skill and that someone with high skill and commitment could due to health or other reasons participate very little in actual birdwatching.

Scott and Lee (2010) suggest that this progression is not always consistent and in fact many birdwatchers show that specialization can remain stable over time or even decline. There are many things that might interfere with this progression to serious

involvement such as competing interests, family commitment and changes in life situation, but they did identify two significant factors – retirement which often gave people more time for leisure activities and support of family members which could determine the amount of time and effort a person can put into their leisure activities.

Many studies have used specialization theory to understand the different ways that people are involved in birdwatching and how this specialization interacts with things such as motivation (McFarlane, 1994), effect of gender on specialization (Lee, McMahan & Scott, 2015), involvement in conservation activities (McFarlane & Boxall, 1996) and spending, use of national parks and tourism planning (Maple, Eagles & Rolfe, 2010); destination choices (Oh & Ditton, 2007) and setting preferences (Cole & Scott, 1999), types of information used to make trip decisions (Ditton et al., 1999), and environmental attitudes (Thapa, Graefe, & Meyer, 2006).

Bryan (1977) used specialization to divide birdwatchers into four different groups based on differences in frequency, preferences in setting and technique, choices in equipment, social unit of participation and natural resource management preferences. These groups were occasional, generalist, technique specialist, and technique and setting specialists. Hvenegaard (2002) identified three different groups – novice, advanced active and advanced experienced. In a study of participants in the Texas Hummer/Bird Celebration, Scott and Thigpen (2003) also identified four different groups – casual, involved, active and skilled. They noted differences in skill in identifying birds by sight and in the level of importance attached to birdwatching. McFarlane (1994) measured specialization in among birdwatchers in Alberta, Canada using 11 variables across three components- past experience (6 variables), centrality to lifestyle (3 variables) and

economic commitment (2 variables). Her results identified four birdwatcher types – casual (43%), novice (38%), intermediate (12%) and advanced (7%). The advanced group had the highest overall mean scores and the casual birders had the lowest. Intermediate birders had higher scores than novice on centrality to lifestyle and past experiences components

Scott et al. (2005) note that measuring specialization by asking questions about how far and frequently people travel to see birds or how much equipment they own does not take into account the socio-economic level of the participants. Lack of money and transportation may score people low in these categories of testing but not accurately show their level of commitment. Lee et al. (2015) also noted that men were more likely than women to travel and to purchase equipment suggesting that this might also skew the specialization scores. This could explain why most research studies report a higher percentage of men and those with high incomes in higher levels of specialization.

Motivation

McFarlane (1994) suggests that understanding the motivation of birdwatchers as well as the shifts that occur with increased experience can help managers of non-consumptive recreation programs to develop a variety of programs targeting specific audiences. Decker et al. (1987) suggested that participants in wildlife recreation would move through different stages of motivation as they progress from casual participants to more serious participants. They identified three main categories of motivation – affiliation-oriented, achievement-oriented and appreciation-oriented. Affiliation-oriented

participants get involved as a way to strengthen personal relationships with other people – maybe accompanying a family member or friend or to meet other people with similar interests. Achievement-oriented participants are more concerned with meeting goals or challenges such as keeping lists or seeing new species of wildlife. Appreciation-oriented participants are more interested in enjoying nature and getting outdoors. They suggested that there would be a shift from achievement-oriented or affiliation-oriented goals at the beginning of involvement to more appreciation-oriented goals over time. Kellert (1985) also found different reasons for birding between committed and casual participants suggesting that there is a change in goals and motivation with increased experience. In this study, 53% of committed birders indicated personal fascination with birds as their main reason for birding, whereas casual birders were more interested in the aesthetic qualities of birds.

McFarlane (1994) tested five components of motivation among birdwatchers – achievement, appreciative, affiliated, conservation and intellectual orientations. Intellectual orientation factors were dropped from the analysis due to lack of factor loading. Most respondents identified a primary motivation – 25% achievement, 33% appreciative and 42% conservation oriented with no respondents identifying affiliation affiliative as their primary motivation. She found that birdwatching involves a mix of multiple motivations. She also found that contrary to suggestions by Decker et al. (1987), appreciative motivation actually decreased from low levels of specialization (43%) to advanced levels (12%), and that achievement motivations increased from low levels of specialization (17%) to advanced levels (55%). Conservation motivations initially increased from casual (39%) to novice levels (47%) but then decreased at intermediate

levels (40%) and yet again at advanced levels (33%). She suggests that there is a shift in the primary motivations of birdwatchers from appreciative oriented to conservation oriented to achievement oriented motivations as one progresses through the specialization levels. This is supported by a study of New York birders by Sali et al. (2008) who noted that many individuals may be motivated by spiritual and enjoyment reasons but that as their involvement grows different motivations take precedence.

Scott et al. (1999) identified four main motivations for birders – competition, enjoyment and conservation, sociability and self-expression. Maple et al. (2010) divided birders in a study at Point Pelee National Park, Canada into three different groups – beginners, intermediate and expert. They found that there was a difference in motivation and activities among the different groups where beginners were more likely to participate in activities outside the park and in non-birding activities than intermediate or expert birders. They also stayed the least number of nights and spent less money. Ditter et al. (1992) also concluded that less specialized participants have a broader focus of interest and participation than more specialized participants. These differences in motivation, focus and participation can affect the different kinds of programs people will be attracted to. A study by Eubanks et al. (2004) also suggests that different types of birdwatching activities attract different levels of birders. Cole and Scott (1999) compared "serious birders" from the American Birding Association with "casual wildlife watchers" who hold Texas Conservation Passports. They also found that serious birders are less likely to want other activities such as culture or crafts, prefer less developed sites, and prefer sites with more bird variety than do casual wildlife watchers who are looking for more services, trails and interpretive activities. Scott and Thigpen (1999) also noted that casual

birders were more likely to be interested in non-birding things like history and culture, and placed more importance on scenic routes and visitor services. Specialized birdwatchers are more likely than casual birdwatchers to seek out new and rare birds when planning trips (Hvenegaard, 2002). Maple et al. (2010) suggest that managers need to offer more specialized bird identification and biology programs to the experts and a wider range of programs to beginners, such as those that focus more on introduction to the flora and fauna of the park and introduction to birding.

It is interesting to note that although birdwatchers are interested in meeting other birdwatchers and in the social aspect of the activity, this motivation was not found to be very important to the average birdwatcher (McFarlane, 1994; Hvenegaard, 2002: Sali et al., 2008).

Gender

The US Department of the Interior (2012) reported that there were almost equal numbers of men and women participating in some sort of birdwatching. However, many of the studies of birdwatchers show that men are more likely to achieve higher levels of specialization than women. 85% of participants in the great Texas Birding Classic competition were male (Scott et al. (1999). This fits the overall trend observed by McFarlane (1994) who reported that 60% of casual birders in her study were female, however only 37% of advanced birders were women. ABA members, more likely to be more advanced birders, also were 66% male (Scott, Stewart & Cole, 1997). In Turkey, in a study of 550 birdwatchers, 71% were male (Cakici & Harman, 2007).

In contrast, 74% of the Texas Hummer/Bird Festival participants were female and this was true across all specialization levels (Scott and Thigpen, 2003). No analysis was given to explain this higher than usual percentage of participation. Studies by Scott et al. (2005) and Lee et al. (2015) suggest that there is no difference between male and female birdwatchers in their level of serious commitment to birding but that men and women have different styles of birding. They noted that men were more likely to be serious listers, to own more specialized equipment and to be more concerned about developing their skills. Women on the other hand seemed more concerned about the personal enrichment and enjoyment aspects of the activity and to have a more emotional attachment. This seems to back up Henderson et al. (1989) who suggested that men and women give different meanings to leisure activities with men focusing more on achievement, competition and quantity, and women focusing more on relationships, sociability and quality of the experience. This difference can explain why more men attend competitions such as the Texas Birding Classic and why women are more likely to attend less competitive events such as the Hummer Bird Festival. However, Lee et al. (2015) also point out that their sample might not take into account generational differences and that the more egalitarian societal norms of the last few decades may mean that this gendered difference has less effect in younger generations.

In a study by Moore et al. (2008), the authors noted that there were two big differences in the factors affecting initial involvement in birdwatching between men and women. Women were more likely to have started out by maintaining birdfeeders or nest boxes and were more likely to get involved after life changes allowed them more time to participate. The authors suggest that women's involvement is impacted by an "ethic of

care." This ethic of care involves women putting the needs of others in front of their own needs. This affects their involvement in two ways. First of all, taking care of birds helped to get them involved and secondly, because caring for families etc. often affected the amount of time and energy women could give to their leisure activities. Gender can also affect the level of support people might get to participate in a leisure activity at a more specialized level with women tending to get less support from family and society (Scott & Shafer, 2001). Sali et al. (2008) noted higher participation in birdwatching for women who had never married than among widowed or married women, possibly due to fewer family obligations. This also seemed to be reflected in the age of the female birdwatchers with highest participation in women over 55, with lowest participation was with women less than 44 years old. This could also reflect fewer family obligations at this stage of life.

Conservation activities

Birdwatchers have been important volunteers in many citizen science projects. In North America, in the last 50 years, 1459 observers running Breeding Bird Surveys in Canada and 7998 in the US, provided valuable data for species and habitat conservation (Downes et al., 2016). Since 1900, the annual Christmas Bird Count draws thousands of participants all over the Americas. The number of birders submitting records to eBird has dramatically increased with over 1.7 million entries from 210 countries being recorded by 2011 (Wood et al., 2011). This trend has been building all over the world and yet many organizations are still questioning how they can increase conservation action and citizen science participation among birdwatchers.

Experiences in the outdoors and appreciating nature are often thought to be important factors that promote pro-environmental behaviors (PEB). This would suggest that birdwatchers should therefore be very involved in actions that promote environmental health and quality and that they would be very involved in conservation issues. Bryan (1977) and Kellert (1985) both suggest that more specialized and experienced individuals are more likely to be involved in natural resources conservation activities. More participation and experience increases knowledge, awareness and understanding of the environment and the issues facing the natural world, which in turn leads to more involvement. Specialized birdwatchers seem to be more likely to be involved with conservation and leadership activities (Lee & Scott, 2006; McFarlane & Boxall, 1996). More experienced birders are more likely to belong to conservation organizations or to take part in bird census activities (Boxall & McFarlane, 1993). Birders also contribute to conservation in a more indirect way through the economic impact of the money they spend on equipment, trips and accommodations (Hvenegaard et al., 1989; Kerlinger & Weidner, 1991; Lingle, 1991; Kerlinger, 1993; Kim et al., 1998). When birdwatchers contribute to the economy of a particular community, they build awareness about the natural resource and encourage the local community to be concerned about its conservation.

Boxall and McFarlane (1993) noted that traditional Christmas Bird Counts attracted more specialized birdwatchers, often more males and generally an older group of people. They contrasted this with a count in Edmonton, Canada which advertises the count to the general public and attracts more casual birders, more women and a younger group of people. Most participants indicated that enjoyment of nature and being outdoors

were their main motivations with “helping to collect bird population data” being important to only 7%.

McFarlane and Boxall (1996) studied four conservation related activities to see if more experienced birdwatchers were more likely to participate in conservation activities and to examine what factors encourage participation. These activities include indirect participation such as number of memberships in conservation organizations and amount donated to conservation organizations, and direct participation such as number of hours volunteered in conservation activities and personal expenditures in maintaining or improving wildlife habitat. They found that the more experience and committed birdwatchers were more likely to be involved with conservation activities: belonging to more organizations, contributing an average of 157 hours in volunteering, donating more money to organizations and spending more money on habitat improvement. Older individuals were also more likely to volunteer as they had more available free time.

Memberships in organizations increased with increased levels of education and amount donated to organizations increased among people with higher incomes. They did note, however, that those with higher incomes spent less hours volunteering. They did not see a significant difference in participation according to gender. The authors suggest that innovative programs could be developed to involve birdwatchers of all levels – from collecting data at bird feeders, to monitoring bird population changes, to becoming stewards of protected areas, to teaching landowners about wildlife conservation on their land.

In a study by Cooper et al. (2015), birdwatchers expressed higher levels of environmental concern and showed higher levels of environmental efficacy – the belief that one's own personal actions can make a difference. Interestingly, they were less likely to believe that their community valued environmental protection. Birdwatchers also were more likely to participate in PEB in a variety of ways. They noted that women and people with higher education were more likely to donate to conservation organizations and causes, and that males were more likely to join in environmental groups.

Pro-environmental behavior can also reflect how birdwatchers behave in the field: how close they come to nesting sites, how well they obey laws, how frequently the report unethical behavior and whether they submit records of sightings to organizations such as eBird. In a study of birders in mainland China and in Hong Kong (Yuanyuan & Lei, 2014) used the Wildlife Value Orientations Scale (WVO) to measure the PEB of the two groups. They found that overall Hong Kong birders scored higher in PEB than those on mainland China. However, it was found that the affiliation and conservation motivation was higher for birders in mainland China than in Hong Kong and that the appreciative motivation was higher for Hong Kong birders. These results would suggest that those motivated by appreciation might be more likely to engage in PEB in the field. The study did not attempt to identify specialization levels of participants.

Summary

Factors such as gender, age and level of expertise have been shown to have an affect on how people participate in birdwatching, what kind of activities they engage in, what motivates them and how committed they become. However, since most of the studies have taken place in North America, it is unclear whether these factors will act the same way in Israel. Although it is possible that many of the same processes are in play in Israel, differences in religious practices and culture could influence participation in different ways. In order to serve the growing population of birdwatchers, a better understanding of who they are and what influences them is called for. This need is what drives the need for this study.

Methods

Sampling

The Israeli birdwatching community appears to be growing every year. However, the existing email and social media lists seem to mostly attract highly involved individuals – often the same small number again and again. In an attempt to reach out to a wider group of birders – casual to expert – a snowball sampling method was used. The first people to be contacted were the professional birders, bird club leaders and ringers. They were asked to fill in the survey and then to send to all their contacts with a personal invitation to do the same. Invitations were also sent to many birding related WhatsApp, Telegram and Facebook groups within Israel. Visitors to the Jerusalem Bird Observatory (JBO) were also asked to complete the survey. The survey was available online through Qualtrics and could be accessed by computer or smart phone. Some paper copies of the survey were also available at the JBO.

Questionnaire Development

A survey consisting of 26 questions was developed using Qualtrics. The survey was pre- tested on 10 individuals of various ages, gender and skill levels. Feedback was used to revise the survey and make it easier to follow and understand. The revised version was then pre-tested on 10 more individuals. The response time was recorded to ensure that it was kept to an average of 10 minutes or less. The survey was then translated and edited into two language options – Hebrew and English, and a choice of language offered at the beginning of each survey. Institutional Review Board approval was applied for and

received from the University of Wisconsin – Stevens Point, on 13 December 2017 (#17-18.025).

Survey questions included:

1. **Level of interest in birdwatching** – Four choices were offered: not interested; slightly interested; moderately interested; and very interested
2. **Age started birding** – Six age group options were given.
3. **Level of expertise** – Participants were asked identify their level of expertise on a 5-point scale – casual, novice, intermediate, advanced and expert.
4. **Birds identified by sight** – Participants were asked how many birds they could identify by sight without the help of a field guide. Nine categories were offered in increments of 25 from 1 to 200 or more.
5. **Birds identified by sound**– Participants were asked how many birds they could identify by sound without the help of a field guide. Nine categories were offered in increments of 25 from 1 to 200 or more.
6. **Life list** – This was a yes/no question on whether participants keep a life list of birds seen.
7. **Types of list kept** – Participants were asked to indicate all other lists that they keep. There was a list of choices including a write-in option.
8. **Use of social media and internet** – Participants were asked if they had ever posted their bird reports or photographs on the internet or social media. This was a yes/no question.
9. **Types of internet and social media sites used** – Participants were asked to indicate all sites where they had posted reports or photographs. Seven options

were given. An option was given to write in any other social media or internet sites used. The choices represent the main sites used by Israeli birders as identified by the researcher before the survey.

10. **Birding activities in the last 12 months** – Participants were given a list of 34 different kinds of birding activities and asked to indicate all that they had done in the last 12 months. (See Appendix for list of activities).
11. **Number of days spent birding in last 12 months** – Participants were asked to indicate how many days they had spent on nine specific types of birding activities in the last 12 months. (See Appendix for list of categories).
12. **Number of equipment items owned** – Participants were asked to indicate how many items of birding equipment they owned. These were write-in questions. (See Appendix for list of equipment).
13. **Percentage of equipment purchased overseas** – This question asked participants to indicate what percentage of their equipment was purchased overseas or purchased online. Six choices were given from 0% to 100%.
14. **Motivation** – Participants were asked to indicate how much they agreed with a series of 24 statements about motivation, using a 5-point Likert Scale (Strongly disagree – Strongly agree). These statements represented four different types of motivations as identified by McFarlane (1994). The motivations types were Affiliation, Conservation, Achievement and Appreciation. (See Appendix A, Question 14 for list of motivation statements).
15. **Commitment** – Participants were asked to indicate how much they agreed with a series of four statements about their level of commitment to birding, using a 7-point Likert Scale (Strongly disagree – Strongly agree). These statements are

based on similar statements asked by Scott, et al. (1999). (See Appendix A, Question 15 for list of commitment questions).

16. **Influences** – This question asked participants to indicate the people or things that had helped them to become interested in birds and birdwatching. Twelve options were given. An option was given to write in other types of influences. (See Appendix A, Question 16 for list of influences).
17. **Limitations** – Participants were asked to indicate all issues that might affect their ability to participate in birding the way they would like to. Fifteen choices were given. An option was given to write in other issues and limitations. (See Appendix A, Question 17 for list of limitations).
18. **Age** – This was an open ended question. For analysis purposes, this was re-coded into age categories starting at age 18 and increasing by increments of 10 years.
19. **Gender** – Three choices were given.
20. **Education** – Seven choices were given.
21. **Household gross monthly income level (Shekels)** – Nine choices were given.
22. **Employment Status** – Eight options were given.
23. **Religious identification** – Eight options given. In Israel religious identity is used as the main indicator of diversity.
24. **District** – Participants were asked to identify which district they lived in. Eight categories were used.
25. **Membership in conservation organizations** – This was a yes/no question and asked whether participants belonged to any local, national or international bird or nature conservation organizations.

26. **Membership in Israel Bird Club** – This was a yes/no question and asked whether participants were members of the Israel Bird Club run by SPNI.
27. **Threats to birds** – This was an open ended question that asked participants what they believe is the biggest threat to birds in Israel today.
28. **Services and activities** – This was an open ended question that asked participants what services or activities would they like to see offered that could help them become more involved with birds and birdwatching.

Survey Implementation

Invitations to participate in the survey were sent out to around 75 people on 28 December 2017. The following week the invitation was posted on five different bird related Facebook groups and on the Israeli birding Telegram group. The survey was kept open until the end of March when it was closed to new responses on Qualtrics. Reminders were sent to all the Facebook and Telegram groups twice over this period as well as to key bird club leaders and bird observatory managers. Paper copies of the survey were also available at the JBO for ultra-orthodox and older birders who did not have access to smart phones or computers. The survey targeted anyone participating in birdwatching activities that lives in Israel and is over 18 years old.

Data Analysis

Descriptive and inferential statistics were computed using IBM SPSS software. Chi-squared, two-tailed t-tests, one-way ANOVA tests and Pearson's tests of correlation were all used where relevant to test for significant relationships between variables. $P<.05$ was used as the significance threshold for all tests performed. All variables were tested according to age, age started birding, gender and level of expertise. Some variables were also tested to explore relationships with motivation, commitment, limitations and membership in conservation organizations.

Results

The results of the survey will be presented in two sections. The first section will report on responses to the survey and will highlight some of the top responses to the questions asked. The second section will report on the statistical analysis that was performed on the results.

Response Rate

A total of 373 people responded to the survey. Two of the surveys were rejected as the participants were less than 18 years old. A non-response rate cannot be calculated due to the type sampling method used. As the sample size is also unknown, a response rate also cannot be calculated.

Survey Results

Demographics. (see Appendix A, Questions 18 – 24 for detailed breakdown).

The question about gender revealed that 56% of respondents were male and 44% were female. The mean age of respondents was 46.84 and the median age was 46.50. This median age is above the median age for the country which is 29.7, but includes people under 18 which our survey did not. The highest represented age group was the 48 – 57 year old group (16%).

The two highest education categories were Bachelor's degree (31%) and Masters (31%). 49% worked full time, with 15% working part time and 14% retired. 22% earned a gross household monthly income of 8,000- 11,900 shekels and 22% earned between 4,000 and 7,999 shekels.

The majority of respondents were secular Jews (70 %) and 16% were orthodox. In contrast, 0.3% of respondents were ultra-orthodox Jews, 0.6% Muslims, 1.2% Christians and 1.5% Druze. While the percentages of Druze and Christians closely match the national statistics (2016) at 1.61% and 1.95% respectively, the percentages for Muslim and ultra-orthodox are significantly lower than the national statistics, which are 17.66% and 11.8% respectively.

The top three areas of residence were Jerusalem (29% of respondents) , the Central District (21%) and the Northen District (19%).

Skill levels.

Birdwatching expertise and skill were measured by three different questions. Respondents were asked to indicate their level of expertise and 34% identified themselves as intermediate birders, with 6% identifying as casual birders, 20% as novice birders, 27% as advanced and 13% as expert.

Respondents were then asked how many birds they could identify by sight and by sound without help from a field guide. The highest answers for birds identified by sound fell at the two extreme ends of the choices given, with 40% of respondents indicating that they could identify fewer than 50 birds and 26% indicating that they could identify more than 200 birds. Relatively very few people indicated amounts between 50 and 200 birds.

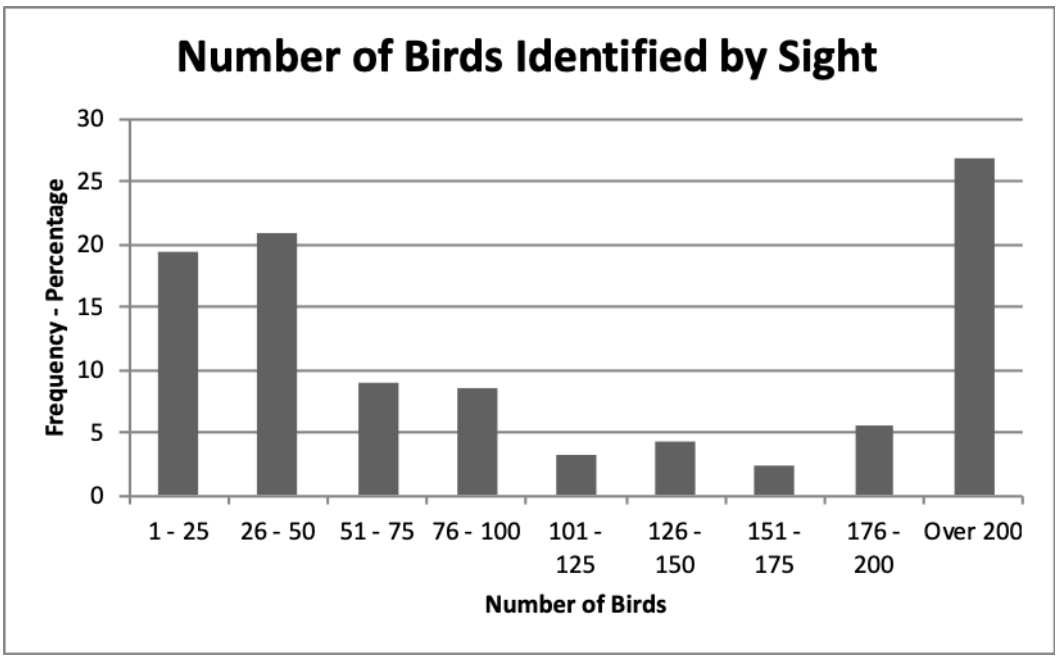

Figure 1. Frequency chart – number of birds identified by sight

When asked how many birds they could identify by sound 59% of respondents indicated that they could only identify fewer than 25 species. Given the high number of people who could identify more than 200 by sight and the fairly high number of advanced and expert birders, this result is somewhat surprising.

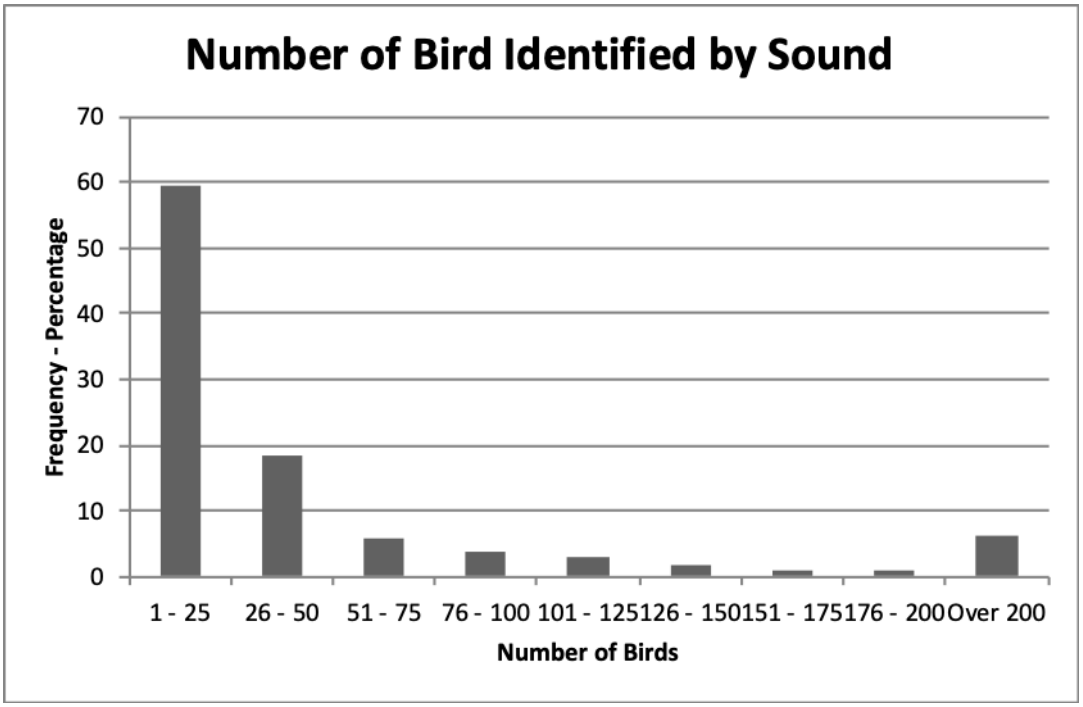

Figure 2. Frequency chart – number of birds identified by sound

Birding activities.

33% of respondents keep an ongoing life list of birds they have seen; however 52% don't keep any kind of bird lists. In contrast, 72% of those surveyed indicated that they had posted their sighting reports and/or photographs online or through other social media. The most popular locations were Facebook (48%) and WhatsApp groups (37%). (See Appendix A, Question 7 for write-in list of other lists kept; and Question 9 for social media/internet sites used).

The top six activities conducted in the last 12 months also indicated a high involvement online. They were:

1. Helped others to identify birds they saw (71%)
2. Photographed birds (68%).

3. Read articles or magazines online (65%).
4. Checked social media site to see what people were reporting (62%).
5. Used online resource or app to identify birds (53%)
6. Participated in a bird count or survey (53%).

Participants were also active in the field and 53% reported that they had spent more than 14 days birdwatching in the last 12 months.

Motivation.

Responses to the 24 statements about motivation were all very high, indicating a high level of motivation across all categories. Mean scores were calculated from the Likert scale scores for each respondent, on a 1 to 5 scale with 1 being Strongly Disagree and 5 being Strongly Agree. Based on this, the lowest scored motivation was "to compete with other birders" (*M = 1.47*). The highest score was "to enjoy the sights, smells and sounds of nature" (*M = 4.76*), with most items scoring above 3 out of a possible 5.

Table 1

Motivations of Birdwatchers : Average Scores Based on Likert Scale- 1 (Strongly Disagree) to 5 (Strongly Agree)

Motivations	N	Average score
To enjoy the sights, smell and sounds of nature	326	4.70
To get outdoors for a chance to enjoy the natural environment	328	4.66
To learn more about the natural world	330	4.64
To study birds in their natural habitat	325	4.49
Because birds are beautiful to be around	329	4.32
Because birds are beautiful to be around	322	4.26
To contribute to conservation of birds and nature	324	4.24
To see kinds of birds I have never seen before	324	4.21
To see kinds of birds I have rarely seen before	321	4.07
To contribute to society's knowledge and understanding about birds	318	4.03
To see or hear as many different kinds of birds as I can	324	3.89
To challenge my abilities	321	3.84
To help birds	321	3.78
To feel refreshed when I am tired	320	3.70
To relax from work obligations or other responsibilities	322	3.69
To help scientists learn more about birds	317	3.66
To give something back to nature	316	3.60
To make friends with people I would not have met otherwise	325	3.30
To be around people who share my interest	328	3.16
To feel part of a large community who like birds	324	3.04
To have a chance to feel like I am an expert at something	323	2.97
To be alone	317	2.94
To spend time with family and friends who like birds	320	2.79
To compete with other birders	320	1.42

Based on prior literature research, six questions were chosen to represent each of four main motivation types – affiliation, conservation, achievement and appreciation. In order to determine that the questions chosen were indeed representative of these four groups, a rotated factor analysis was performed. The factor analysis confirmed that there were indeed four main groups of motivations and that the questions chosen aligned with these groups as expected (see Appendix B, Table 13). Cronbach Alpha tests confirm that there is a relatively high internal consistency among the six motivations in each of the four groups.

Commitment.

In contrast to the motivation scores, commitment scores were very low. Mean scores were calculated from the Likert scale scores for each respondent, on a 7-point scale from 1 (Strongly disagree) and 7 (Strongly agree). A 7-point scale was used instead of a 5-point scale in order to get a finer resolution on the answers. All four of the commitment statements scored below the mid-point of 3.5 as follows:

1) Other leisure activities don't interest me as much as birding (*M = 3.46*)
2) I would rather go birding than do most anything else (*M = 2.76*)
3) If I stopped birding, I would probably lose touch with many of my friends (*M = 2.56*)
4) If I could not go birding, I am not sure what I would do (*M = 2.40*)

Influences and limitations.

The top four influences on getting involved with birdwatching were birding companions (46%), SPNI activities (38%), books and articles (36%) and friends (34%). The top two things limiting people from participating in birding activities were lack of time (60%) and family obligations (26%).

It is important to note that during analysis of the variables it became clear that participants had misinterpreted the mobility limitation to have something to do with transportation or their ability to travel. This variable was therefore excluded from the analysis.

Analysis of Variables Based on Gender

Chi-square tests were used to explore differences between men and women on level of expertise, reported knowledge of bird species, birding activities, and limitations to participation. (See Appendix B, Table 1 for additional statistics.) Two-tailed independent sample t-tests were used to explore differences between men and women on commitment and motivation. (See Appendix B, Table 2.)

The relationship between gender and level of expertise was significant in a chi-square test, $X^2(4, N=324)= 58.225, p=.001$. Only 0.7% of women identified their skill level identified as expert (actually only one woman!). The majority of women identified as intermediate (46%). The majority of men identified themselves as advanced (35%) or expert (23%).

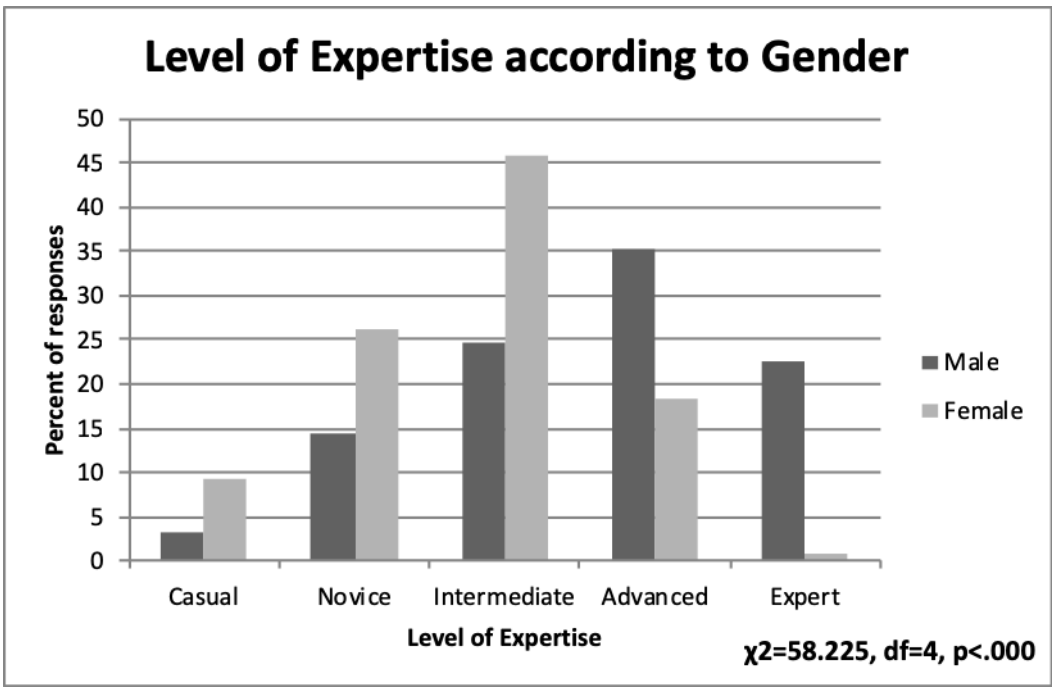

Figure 3. Level of expertise according to gender

The same differences were seen when asked how many species respondents could identify by sight without a field guide, $X^2(4, N=325)= 96.740, p<.000$. Again the men reported higher skill levels with 45% of males reporting 200 or more species and 64% of females reporting 50 species or less.

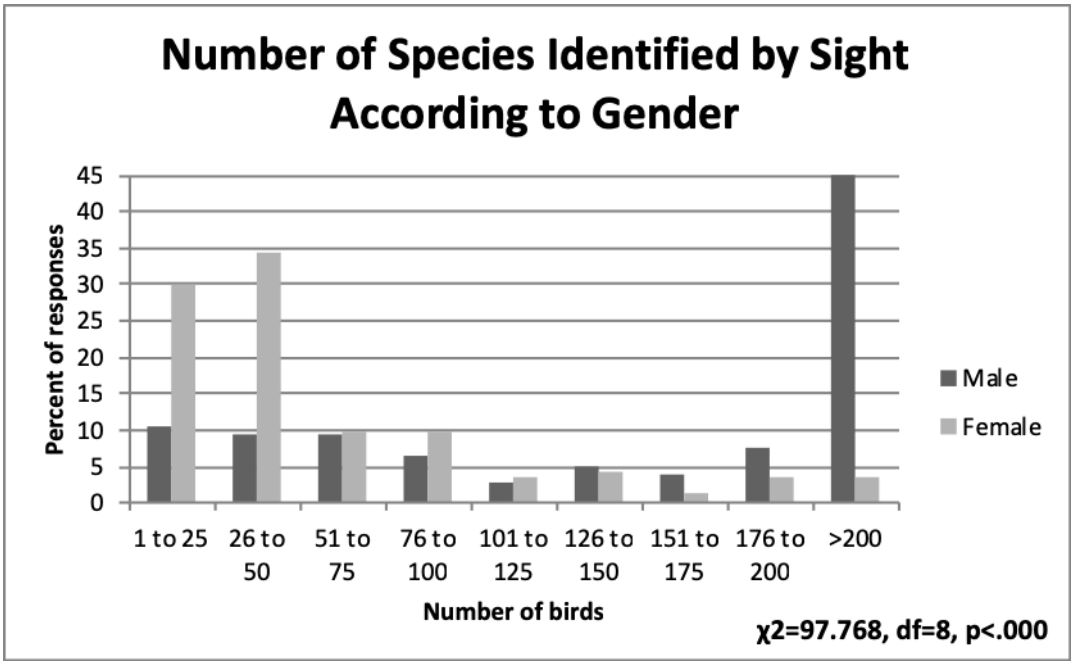

Figure 4. Number of species birders can identify by sight without a field guide according to gender

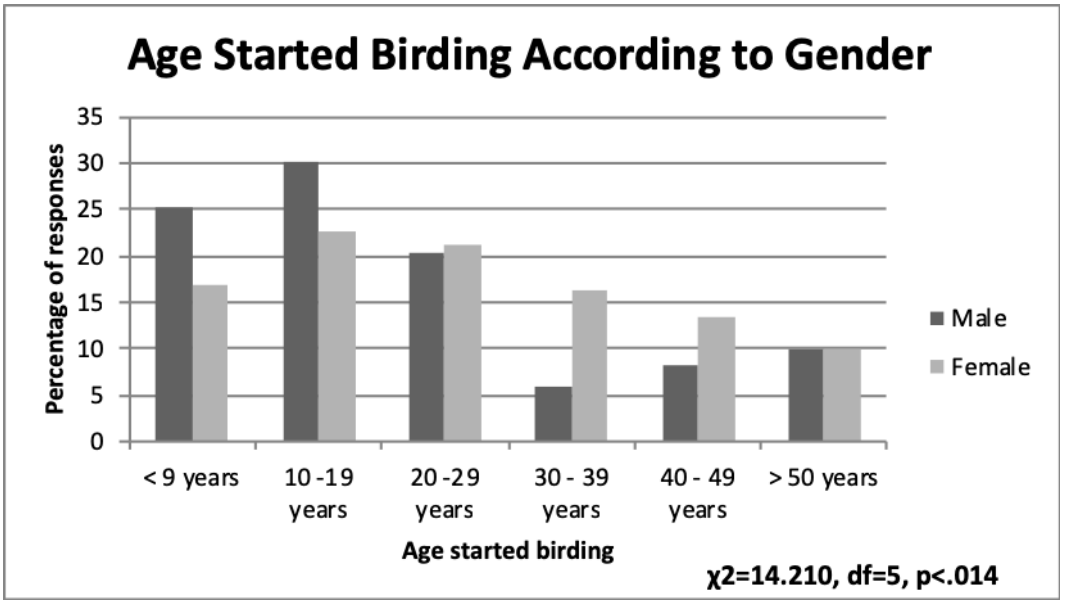

Figure 5. Age participants started birding according to gender

Men were more likely to start birding before the age of twenty, $X^2(5, N=324)= 14.210, p=.014$. Only 40% of women started birding younger than twenty as opposed to 56% of males. More women started birding in their twenties, thirties and forties than men.

Females were more likely to: (See Appendix 2, Table 1 for Chi-square results)

- Not keep bird lists.
- Create art about birds.
- Spend more days participating in guided bird trips in the last year.

Men were more likely to:

- Keep a life list.
- Post sightings on all types of social media.
- Keep detailed notes.
- Check identification online.
- Check online reports of other birders.
- Use apps or online resources to attract birds.
- Read articles or magazines online.
- Rent a car or stay in hotel overseas in order to go birding.
- Help others to identify birds that they see.
- Spend more days birding in past year.
- Spend more days birding more than 2 hours from home in past year.
- Spend more days birding overseas in past year.
- Spend more days travelling to see rare birds in past year.
- Spend more days travelling to photograph birds in past year.
- Own more equipment.
- Purchase more equipment overseas.

There were no significant differences between men and women about who or what influenced them to start birdwatching. However, women were more likely than men to have issues that limited their ability to birdwatch the way they would like. These include: having no one to go birding with (15%); not knowing where to go birding (13%); not having the right equipment (15%); not feeling safe birding alone (23%); and lacking

in confidence in their ability (23%). It is interesting to note that a higher percentage of men than women also indicated that time (men 72%, women 62%) and family obligations (men 35%, women 24.5%) were an issue limiting their participation, however these differences were not statistically significant.

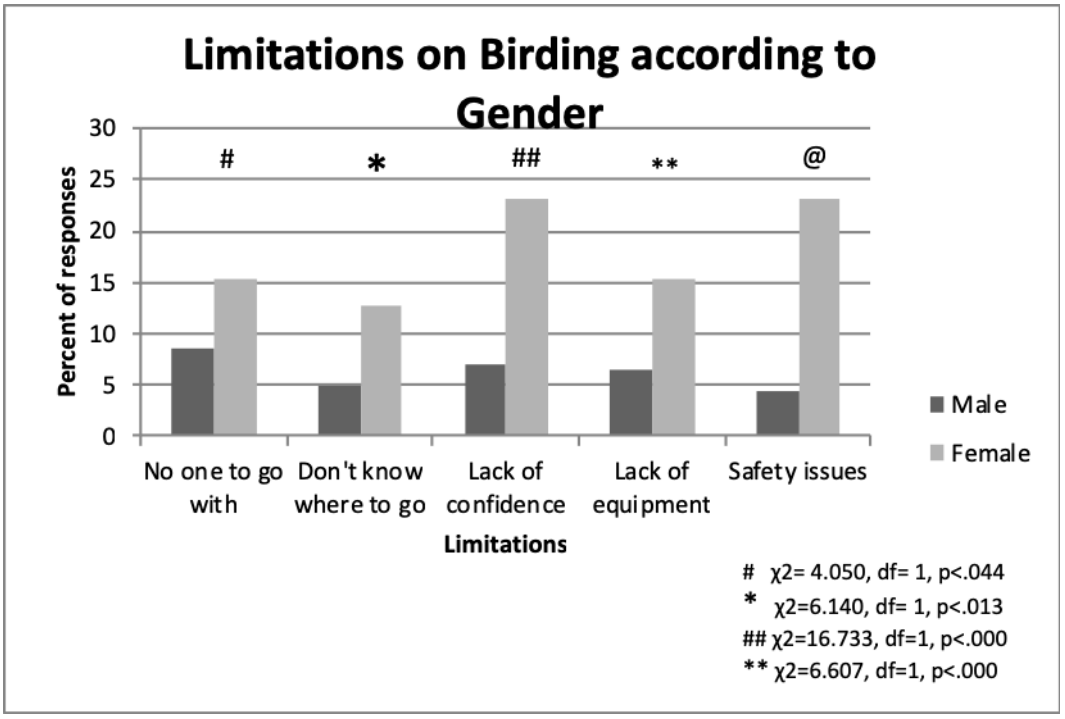

Figure 6. Issues that limited participation in birding activities according to gender

In a two-tailed independent samples t-test, men and women only differed significantly on five out of the 24 motivation questions (based on a 5-point likert scale – strongly disagree to strongly agree). Women scored higher on three of the questions: to feel part of a larger community who likes birds, $t(311)= -2.462, p=.014$; to spend time with friends and family who like birds, $t(309)= -2.101, p=.036$; and to give back to

nature, *t(303)= -2.464, p=.014.* Men scored higher on two of the questions: to compete with other birders, *t(307)= 3.675, p<.000,* and to be alone, *t(304)= 3.469, p=.001*. However, results show that overall men and women are very similar in their motivations for birding.

In overall mean commitment score (two-tailed independent samples t-test), there is no difference between men and women, but in 2 of the 4 questions men score significantly higher (based on a 7-point likert scale – strongly disagree to strongly agree). Men are more likely to agree with the statement "no other leisure activity interests me as much as birding", *t(319)= 3.113, p=.002,* and with the statement "I would rather go birding than do most anything else*", t(317)= 4.024, p<.000*.

Analysis of Variables Based on Age

Although age was asked as an open ended question, the answers were grouped according to age groups for the purpose of analysis. Chi-square tests were used to explore differences between age groups men and women on level of expertise, reported knowledge of bird species, birding activities, and limitations to participation. (See Appendix B, Table 5 for additional statistics.)

There was a significant difference in level of expertise according to age group, X^2 *(20, N=302)= 37.471, p=.010.* Although expertise might be expected to increase with age, the youngest age group, 18-27 year olds, were more likely to identify themselves as either intermediate or advanced birders (each 32%). The biggest groups of expert birders were in the 28-37 year group (19%) or the 38-47 year group (20%). 28-37 year olds were

more likely to identify as novice birders (30%). 38-47 year olds were more likely to be advanced (30%) and those 58 and older were more likely to identify as intermediate (50% and 49%).

Table 2

Level of Expertise According to Age Group (Percentage of each Age Group)

Age	Casual birders	Novice Birders	Intermediate Birders	Advanced Birders	Expert Birders	Total
18-27 years	0	25	31.8	31.8	11.4	100
28-37 years	3.7	29.6	24.1	24.1	18.5	100
38-47 years	3.4	23.3	30	23.3	20	100
48-57 years	6.6	14.8	29.5	37.6	11.5	100
58-67 years	4.5	11.4	50	27.3	6.8	100
Over 68 years	12.8	10.3	48.7	23.1	5.1	100

Older birders, 58 years or more, were also less likely to be able to identify birds with-out a field guide, $X^2(20, N=302)= 37.471, p=.010$. Only 8% of this age group could identify over 200 species of birds, while younger birders were more able to do so. The 48 – 57 age group were the most likely to be able to identify more than 200 species (41%)

Overall, all the age groups had a high rate of involvement in birding activities on social media and the internet, however the 38-47 age group was more likely to post

sightings or photographs (81%). Facebook was popular among all the age groups but the 18-27 age group was much more likely to post on Facebook (63%). This age group was also more likely to post on WhatsApp (47%). The top Telegram users were in the 48-57 age group (31%).

There were several significant differences in limitations based on age group. 18-27 year olds were more likely to be limited by time constraints (79%), lack of transportation (5%), cost of participating (30%) and lack of proper equipment (21%). 38-47 year olds were more likely to identify family obligations (53%) and the 68 and over age group was more likely to identify health as the biggest limitation (18%).

Analysis of Variables Based on Level of Expertise

Chi-square tests were used to explore differences between levels of expertise and interest, reported knowledge of bird species, birding activities, influences, and limitations to participation. (See Appendix B, Tables 3 for additional statistics.). ANOVA tests were used to explore the relationships between level of expertise and commitment and motivation (See Appendix B, Table 4).

Higher levels of expertise corresponded to higher levels of interest, $X^2(8, N=348)= 117.525, p<.000$. Not surprisingly, higher levels of interest also corresponded to being able to identify more species of birds without a field guide both by sound, $X^2(16, N=365)= 301.963, p<.000$, and by sight, $X^2(16, N=361)= 171.935, p<.000$. Experts could identify more than 200 species of birds by sight (94%) and 35% of experts could identify more than 200 species by sound.

The different levels of expertise are also related to the age participants started birding, $X^2(20, N=364)= 68.525, p<.000$. 86% of experts reported that they started birding before the age of 19 and as did 58% of advanced birders. The biggest groups of casual birders were those who started birding at over 50 years old and those under 9 years old (each 24%).

Table 3

Level of Expertise According to Age Started Birding (Percentage of each Level)

Age	Casual birders	Novice Birders	Intermediate Birders	Advanced Birders	Expert Birders	Total
9 years or less	23.8	10.0	16.0	29.3	40.8	22.3
10 – 19 years	9.5	15.7	25.6	28.3	44.9	26.1
20 – 29 years	14.3	22.9	20.0	25.3	8.2	20.1
30 – 39 years	14.3	20.0	12.0	6.1	2.0	10.7
40 – 49 years	14.3	20.0	12.8	6.1	2.0	11.0
Over 50 years	23.8	11.4	13.6	5.1	2.0	9.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

Expert birders were also more likely to keep a life list (62.2%) and were the biggest group keeping local, year, country, regional and other lists. Casual birders mostly did not keep any list at all (86%). Experts were also most likely to post their sightings and photographs on social media (96%), and they also were the most likely to post on all the

different forms of social media and internet sites. The most significant site used by experts was Facebook (78%).

Experts were the largest group of birders participating in 17 out of the 32 different activities checked (see Appendix B, Table 3 for Chi-square results):

- Kept detailed notes.
- Checked identity of bird calls online.
- Checked reports of sightings on social media.
- Used an app to attract birds to them.
- Participated in Champions of the Flyway.
- Wrote an article or blog on birds.
- Attended a protest or signed a petition about conservation of birds.
- Rented a car overseas specifically to go birding.
- Stayed in a hotel overseas specifically to go birding.
- Participated in a bird count or survey.
- Participated in a wildlife count or survey.
- Attended a conference or day of study about birds.
- Attended a lecture or class about birds.
- Helped others to identify birds they had seen.
- Hired a professional bird guide overseas to go birding.
- Taught about birds in a formal setting.
- Taught about birds in an informal setting.

Advanced birders were the biggest group participating in:

- Read about birds online
- Stay in a hotel in Israel specifically to go birding.
- Photograph birds.

Intermediate birders were the biggest group that:

- Sponsor a team in Champions of the Flyway.

In addition expert birders were more likely to spend 14 or more days participating in any kind of birding (75%). They are also more likely to spend more than 14 days a year doing the following activities: birding more than 2 hours away from home (62%);

birding overseas (19%); participating in bird ringing (54%); volunteering at birding centers (21%); and travelling to search for rare birds that were reported (13%).

When asked about what influenced them when they started birding, 45% of expert birders identified bird clubs and 26.5% identified a teacher or a professor. 58% of advanced birders said that birding companions were the most influential.

Casual birders were the largest group of birders to be affected by limitations. A high percentage of casual birders were limited by having no one to go birding with (29%); by not knowing where to go birding (24%); by lack of confidence in their abilities (43%); by lack of proper equipment (29%); and by the lack of non-Sabbath activities (19%). Several levels of expertise reported that family obligations were an important limitation in their lives.

Expert birders purchased the most birding equipment overseas; however, advanced birders were more likely to buy 100% of their equipment overseas (6.8%). Advanced birders were the largest group to be members of a local or international conservation organization (66%).

In ANOVA tests, the mean motivations scores for all the levels of expertise were fairly high and fairly equal. However, in five of the motivations advanced birders had higher mean scores and in seven of the motivations expert birders had a higher mean score. Tukey HSD post hoc tests showed some significant differences between groups – mostly between casual and novice birders and higher levels of expertise (See Appendix 2, Table 4, for all the differences and mean scores).

Advanced birders had highest mean scores in:

- Make friends with people who like birds.
- Improve birding skills and abilities.
- Challenge skills and abilities.
- Enjoy the sights, smells and sounds of nature.
- Be outdoors.

Expert birders had highest mean scores in:

- Feel like an expert.
- Compete with other birders.
- Help scientists.
- Contribute to conservation of birds.
- Contribute to the knowledge about birds.
- Study birds in natural habitat.
- Be alone.

Relationship Between Motivation and Participation in Activities.

Studies have indicated that motivation can affect the types of activities that birdwatchers participate in and this directly affects success of programing of events by birdwatching and conservation organizations (Scott et al., 1999: Ditter et al., 1992; Scott and Cole, 1999; Scott and Thigpen, 1999) Two-tailed independent sample t-tests were run to determine if there was any relationship between the 4 different motivation groups (Affiliation, Conservation, Achievement and Appreciation) and the activities birders conducted in the last 12 months (See Appendix B, Tables 9 – 12). Conservation motivation had significant relationships with the most different birding activities (19).

The following significant relationships were found:

Affiliation motivation group:

- Kept detailed notes
- Checked bird ID on the internet
- Checked sightings on social media
- Used app to attract birds
- Read article about birds online
- Participated in Champions of the Flyway
- Sponsored Champions of the Flyway
- Wrote articles or blog about birds
- Attended a protest or signed a petition
- Rented car in Israel to go birding
- Stayed in hotel in Israel to go birding
- Participated in a butterfly survey
- Attended a conference about birds
- Attended a lecture about birds
- Helped others to ID birds
- Taught in an informal setting
- Taught in formal settings
- Photographed birds

Conservation motivation group:

- Fed birds at home
- Planted trees at home
- Put up bird houses at home
- Kept detailed notes
- Used app to attract birds
- Read article online
- Participated in a Hula or Eilat bird festival.
- Participated in Champions of the Flyway
- Wrote article or blog about birds
- Attended a protest or signed petition
- Stayed in a hotel in Israel to go birding
- Participated in a bird survey
- Participated in a butterfly survey
- Participated in a cleanup activity
- Attended a conference about birds
- Attended a lecture or class about birds
- Donated to a conservation organization
- Helped others to ID birds
- Taught in a formal setting
- Taught in an informal setting
- Photographed birds

Achievement motivation group:

- Kept detailed notes
- Checked bird ID on the internet
- Checked bird call ID on the internet
- Checked sightings on social media
- Used app to attract birds
- Read article about birds online
- Rented a car overseas to go birding
- Stayed in a hotel in Israel to go birding
- Participated in a butterfly survey
- Attended a lecture or class about birds
- Helped others to ID birds
- Hired a guide in Israel to go birding
- Hired a guide overseas to go birding
- Taught in an informal setting
- Photographed overseas

Appreciation motivation group:

- Checked bird ID on the internet
- Checked sightings on social media
- Read article about birds online
- Rented a car overseas to go birding
- Stayed at a hotel in Israel to go birding
- Participated in a butterfly survey
- Attended a lecture or class about birds
- Helped others to ID birds
- Hired a guide in Israel to go birding
- Hired a guide overseas to go birding

Factors Influencing Membership in Conservation Organizations.

There were three factors that were related to whether a participant was a member of a conservation organization. The first was interest level. Participants with higher levels of interest were more likely to be members of organizations, $X^2(2, N=312)=9.826, p=.007$. The highest group of members was very interested individuals (71%). In addition, participants with higher levels of expertise were also more likely to be members of organizations, $X^2(4, N=325)=23.083, p<.000$. The highest group of members were advanced birders (40%).

Motivations were also related to membership. Participants with higher affiliation, $t(318) = 3.039, p=.003$; conservation, $t(319) = 3.242, p=.001$; and appreciation scores were more likely to be members, $t(320) = 2.324, p=.021$. There was no significant relationship between membership and achievement motivation.

Discussion

The most striking results from the survey point to a large gender gap among birders in Israel. There is marked difference in self-reported levels of expertise and skill levels between men and women. While this follows the trends of studies of North American birders, the difference due to gender appears to be more pronounced. McFarlane (1994) reported that 37% of advanced birders and 60% of casual birders were women. A study of the American Birding Association, whose members are already more likely to be more advanced birders, reported that 66% were male and 34% female (Kim, et al, 1997). However in Israel, 58% of birders in the top two categories were men (expert and advanced) as opposed to 19% women, with only 1 woman identifying herself as being an expert. While women in Israel do report that lack of self-confidence, concerns for safety and a feeling that they don't know where to go or want to go birding alone, this does not seem to fully explain this very large difference in skill levels. It is possible that the culture of Israeli society, which is still very gender divided in many ways, has influenced birdwatching participation as well.

The question has been raised as to whether these big gender differences are accurate and whether women's lack of confidence in their skills is leading them to under-report their abilities and level of expertise. In addition, it could be that overconfidence on the part of the men in the survey has skewed the results as well, especially given the high number of young people who identified themselves as experts. Since this survey relied on self-reporting and did not try to test skill levels in any way, it is not possible to answer these questions. Further study could be done to actually test skill levels to try to see if actual skills correlate with self-reported skills. However, I would argue that perception of

one's skills and abilities is a key factor in determining how one participates in birding activities and how one is perceived by others. Since lack of self-confidence was identified as an issue by 23% of women but only 7% of men, clearly self-confidence in one's ability, or the lack thereof, is a key part of how a person would perceive their skill levels and expertise. Since everyone in the survey is being given equal freedom to report their perceived skill levels, the results are an important way to evaluate the community of birders.

Scott et al. (2005) and Lee et al. (2015) suggest that there is no difference between male and female birdwatchers in their level of serious commitment to birding but that men and women have different styles of birding. The similarities in motivation and commitment scores between men and women in this survey would suggest that the same is true here in Israel. There are differences, however, in how women and men participate. Women were more likely to want to bird in groups and with a guide, while men were much more interested in listing, competition, birding alone, and travelling to see birds. Men own more equipment and are more likely to be active on social media.

The fact that most experts and most males started birding before the age of 20 suggests that this is a key time for the formation of skills, habits and identity as birdwatchers and that any program to build self-confidence and skill levels among women needs to start with this age group. Further study of women birders in Israel is recommended to determine what is preventing women from achieving higher skill levels or higher levels of self-confidence in their skills.

McFarlane (1994) identified that the primary motivation for casual birders in her study was appreciation; the primary motivation for novice and intermediate birders was conservation; and the primary motivation for advanced birders was achievement. The primary motivations is Israel however, are very different with a primary motivation of conservation for casual and expert birders and a motivation of achievement for novice, intermediate and advanced birders. However, the results in Israel back up McFarlane's suggestion that motivations change with increasing levels of specialization – in her study, the shift was from appreciation to conservation to achievement. In Israel, however, the shift in primary motivations seems to be from conservation to achievement and back again to conservation. Overall, although all motivations scores were fairly high, the main motivation for Israeli birders seems to be achievement, development of skills and seeing birds. The question is whether the individual motivations of a large number of birders are driving a culture that puts a high value on achievement, or whether the community of birders as a whole has been influenced by a small elite who promote and highlight these values. Either way, I suggest that this culture of achievement may contribute to the lack of self-confidence reported by women and the overall lower skill levels of women. It is difficult to explain the contrast between the high levels of achievement motivation reported by women and their low self-reported skill levels. Given that women seem to participate in birding in different ways than men, it may be that they are getting lost in the predominant culture of the community.

McFarlane and Boxall (1994) found that more experienced and committed birders were more likely to participate in pro-environmental behaviors. They donated more money to conservation causes, volunteered more for conservation organizations, were

more likely to belong to conservation organizations and spend more money on habitat improvements. Israeli expert birders are also more likely to donate money to causes (30%), volunteer more than 14 days a month (21.4%), and be members of conservation organization (63%). Expert birders are also more likely to participate in protests or sign petitions related to bird and nature conservation (59.2%). However, casual birders are more likely to conduct habitat improvement activities around their houses and one can assume this includes spending money on these activities. 52% of them feed birds at home, 23.8% plant trees to attract birds and 28.6% put up bird houses in their gardens. This corresponds to the primary motivation for casual birders which is conservation. Other pro-environmental behaviors of expert birders also correspond to their primary motivation of conservation.

Expert birders are more likely to participate in conservation activities that are more related to citizen science activities. They are more likely to keep notes (59.2%), post sighting to eBird (34.7%) and the IOC website (51%). They are also more likely to take part in bird counts or surveys (83.7%), butterfly surveys (10.2%) and other wildlife surveys (38.8%). Experts are also more likely to keep lists of various kinds. In question 28, several people said that they would love to see more opportunities to take part in surveys, counts and other citizen science projects. This suggests great potential for increasing citizen science research around the country, and if experts are partnered with less experienced birders, this could also be a way to increase birding skills. It could also help younger birders who have less access to transportation and women who feel uncomfortable birding alone.

Another striking result of the survey is the participants' ability to identify birds by sound without help. 59% of participants reported that they could identify less than 25 species of birds by sound. In contrast, over 24% of those surveyed could identify 200 or more species of birds by sight without help of a field guide. This marked difference could point to a lack of education and training about bird calls and their identification. It could also be connected to a lack of resources for people wanting to learn more about bird sounds. There is no locally produced CD of local bird calls. Birders who want to learn need to use online resources such as Xenocanto website or purchase an App that includes bird calls and songs. I suspect that with the increase in the use of smart phones and social media in the last few years, more people have access to online resources and applications than before. However, most of these resources are for European birds and the user has to search for birds relevant to Israel. Many of the songs provided are not relevant to Israel either, as they are mostly heard on the European breeding grounds and not on migration over Israel.

Regarding the demographics of the Israeli birdwatching community, it is important to note that a bias was introduced to the survey by making it an online survey. Many ultra-orthodox Jews do not use smart phones and computers. If they came to the Jerusalem Bird Observatory, we were able to ask them to fill out a paper copy of the survey. However, only a few people participated in this way. As a result, the ultra-orthodox population may be underrepresented in this survey. It is also possible that this is just an underserved population and that there are only a few birdwatchers in the community. The low numbers of Muslims could indicate that this is an underserved population as well. It could also mean that we were not able to access the birdwatchers in

the community with our sampling method. Further study is needed to identify which of these theories is correct.

While the lack of survey responses from the ultra-orthodox and Muslim populations could be a result of the sampling method used, when backed up with anecdotal experience, it is much more likely that these populations are seriously underserved by birdwatching courses, tours and activities. The experience of the Jerusalem Bird Observatory suggests that there is much room for growth in these areas. Most of the birders surveyed indicated a high involvement with social media and either posted or checked sighting online. Much of the information sharing, advertising and personal connections between birders are done through these social media sites. This has a direct effect on the ultra-orthodox population as many of them do not use internet or social media. Other methods of sharing information need to be found for this community in particular. Arab and Druze communities are reliant on materials and information in Arabic. Courses and activities are also needed in Arabic and this means that trained Arabic speakers are needed to lead these activities. There is great potential here as well to increase the numbers of birdwatchers and birding activities for the Muslim and Druze communities. Further study is needed to see how best these populations could be better served.

Programmatic Application of Research Results

Increasing Participation of Women in Birding

- Increase efforts to recruit and retain girls in afterschool birdwatching clubs.
- Survey girls and parents of girls to see what limits their participation and progression in birdwatching.
- Focus programming efforts to meet the needs of women – guided groups in a variety of locales around the country.
- Bring advanced and expert female birders to the attention of the public by inviting them to write more articles, give more lectures and lead more activities.
- Create an all women birding club similar to the Feminist Bird Clubs that are successful in New York and other parts of the US.
- Increase visibility of women and girls in publicity materials and at public events.
- Creation of birding app or social media group that allows women to connect for sharing rides, finding birding companions etc.

Increasing Overall Expertise in Bird Call Identification Skills

- Regular posting of bird of the month on birding social media sites that puts emphasis on bird calls and sounds.
- Offering workshops around the country focusing on identification of bird calls and songs.
- Creation of an online library of local bird calls and sounds.

Programming that Focuses on Affiliation, Conservation and Appreciation Motivations

- Explore options for programs and activities that build community and connect birders to each other.
- Offer conservation program opportunities for the birdwatching community such as having a community work day to restore habitat in a prime birding area. This could be connected to birding tour in the area, a survey of birds in the area and then a project to restore the site.
- Offer activities that focus on the appreciation motivation such as art workshops, art exhibitions etc.

Serving Hard to Serve Communities

- Offer more programs, bird walks and activities in periphery areas and urban communities.
- Translate all birding materials and teaching aids into Arabic for use in programs and activities in Arab communities.
- Offer birdwatching for beginner's courses and courses for activity leaders in Arabic.
- Offer birdwatching for beginners courses appropriate for the ultra-orthodox community.
- Recruit ultra-orthodox activity leaders to offer birdwatching activities in the ultra-orthodox communities.

- Identify key birdwatching areas near ultra-orthodox and Muslim communities to act as program sites and focus on these areas in programming.

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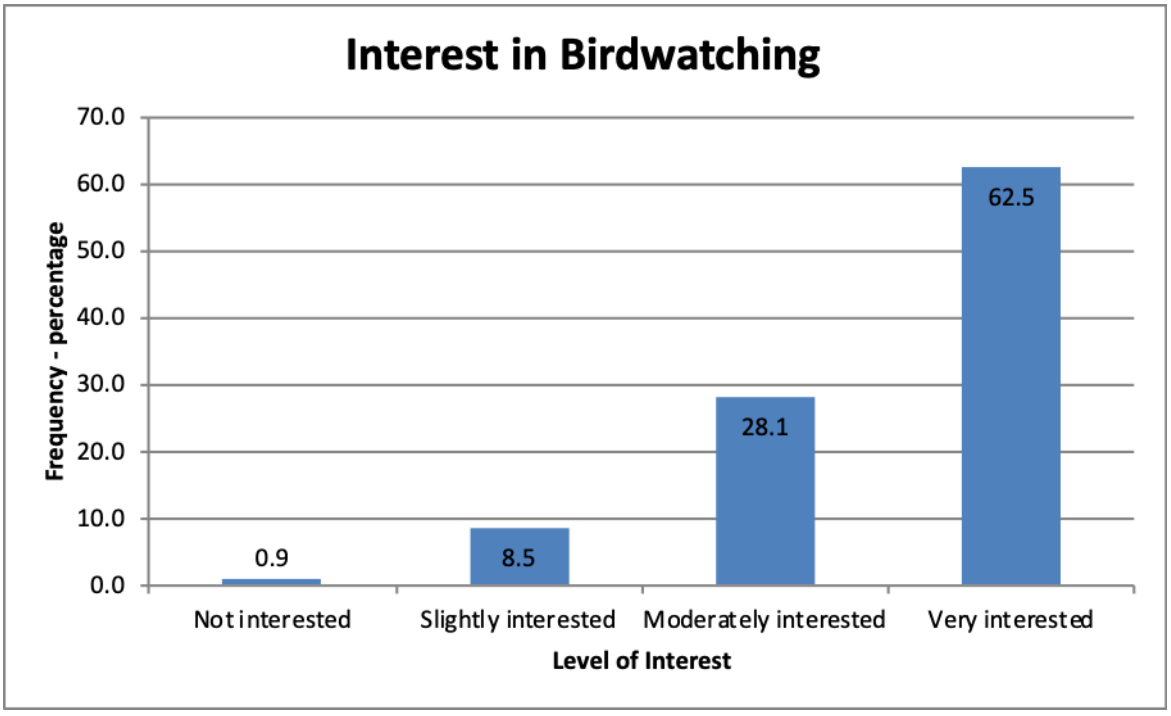
Appendix A
Results of Survey – Frequency Charts

Question 1 - What is your current level of interest in birdwatching?

Interest in Birdwatching	Frequency	Percent	Valid Percent
Not interested	3	.8	.9
Slightly interested	30	8.1	8.5
Moderately interested	99	26.7	28.1
Very interested	220	59.3	62.5
Total	352	94.9	100.0
Missing	19	5.1	
Total	371	100.0	

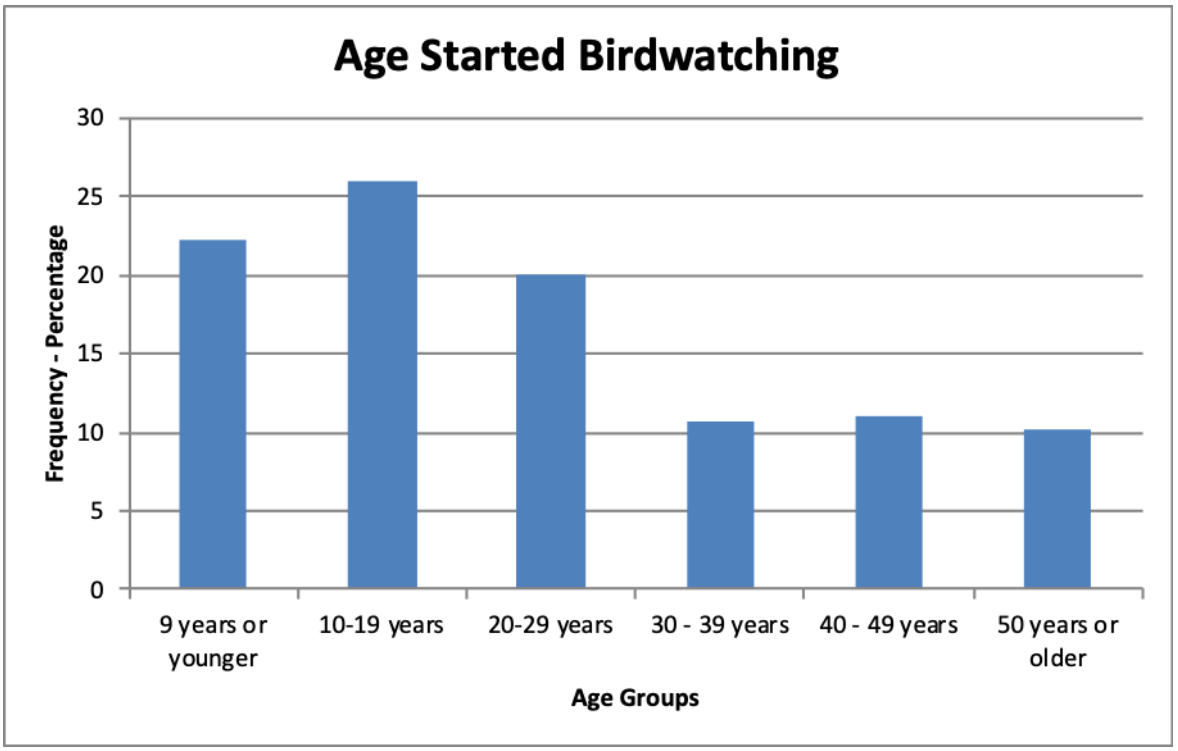
Frequency graph – Interest in birdwatching.



Question 2 - At what age did your interest in birdwatching start to develop?

Age started birdwatching	Frequency	Percent	Valid Percent
9 years or younger	81	21.8	22.2
10-19 years	95	25.6	26.0
20-29 years	73	19.7	20.0
30 - 39 years	39	10.5	10.7
40 - 49 years	40	10.8	11.0
50 years or older	37	10.0	10.1
Total	365	98.4	100.0
Missing	6	1.6	
Total	371	100.0	

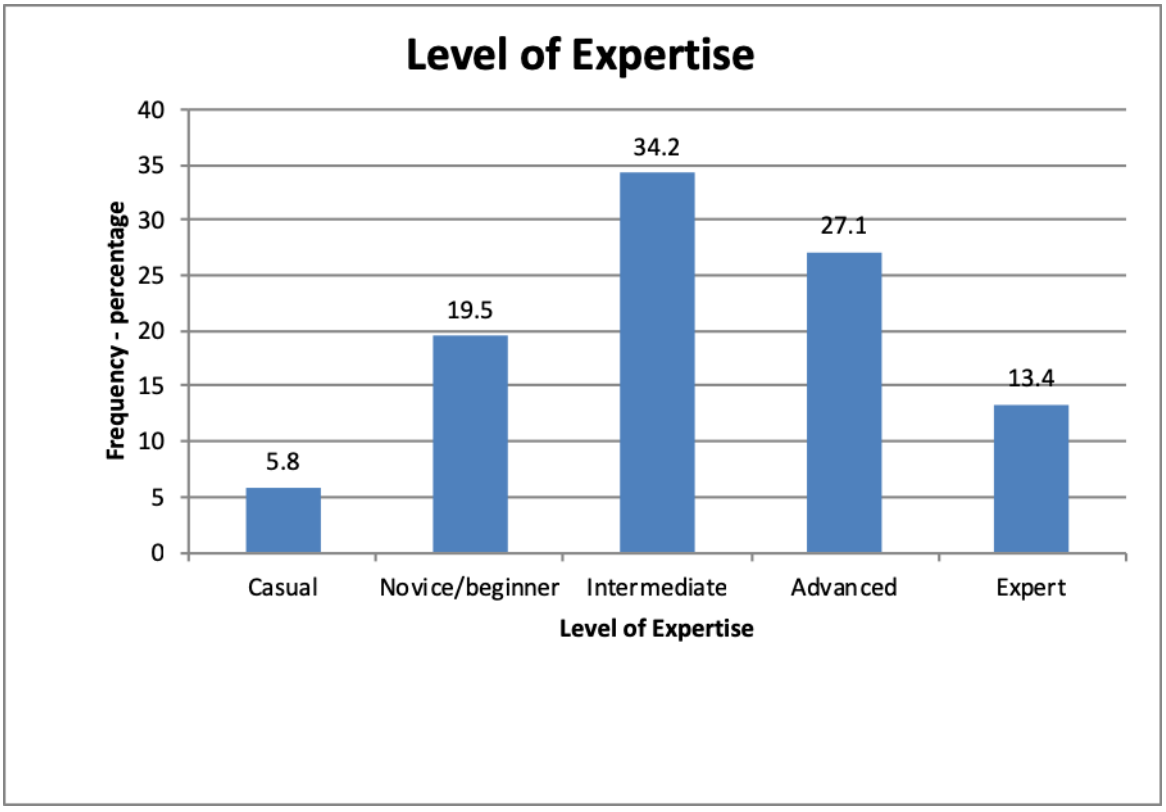
Frequency graph – Age started birdwatching



Question 3 - How would you rate your level of expertise in birding?

Level of Expertise	Frequency	Percent	Valid Percent
Casual	21	5.7	5.8
Novice/beginner	71	19.1	19.5
Intermediate	125	33.7	34.2
Advanced	99	26.7	27.1
Expert	49	13.2	13.4
Total	365	98.4	100.0
Missing	6	1.6	
Total	371	100.0	

Figure 3. Frequency graph – Level of expertise



Question 4 - How many species of birds would you estimate you can identify by sight without a field guide to help?

Birds identified by sight	Frequency	Percent	Valid Percent
1 - 25	71	19.1	19.4
26 - 50	76	20.5	20.8
51 - 75	33	8.9	9.0
76 - 100	31	8.4	8.5
101 - 125	12	3.2	3.3
126 - 150	16	4.3	4.4
151 - 175	9	2.4	2.5
176 - 200	20	5.4	5.5
>200	98	26.4	26.8
Total	366	98.7	100.0
Missing	5	1.3	
Total	371	100.0	

Question 5 - How many species of birds would you estimate you can identify by sound without a field guide to help?

Birds ID by sound	Frequency	Percent	Valid Percent
1 - 25	214	57.7	59.3
26 - 50	66	17.8	18.3
51 - 75	21	5.7	5.8
76 - 100	13	3.5	3.6
101 - 125	11	3.0	3.0
126 - 150	7	1.9	1.9
151 - 175	3	.8	.8
176 - 200	4	1.1	1.1
>200	22	5.9	6.1
Total	361	97.3	100.0
Missing	10	2.7	
Total	371	100.0	

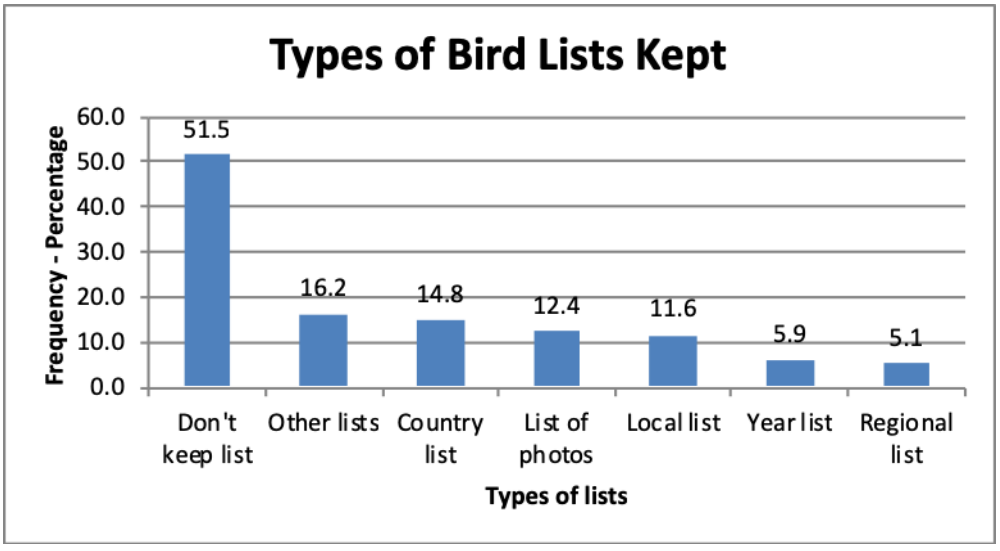
Question 6 - Do you keep a life list?

Life list	Frequency	Percent	Valid Percent
Yes	121	32.6	32.6
No Answer	250	67.4	67.4
Total	371	100.0	100.0
Missing	0		
Total	371		

Question 7 - What other types of lists do you keep? Check all that apply.

Types of lists kept	Frequency Yes	Percent Yes	Frequency No answer	Percent No answer	Total
Don't keep list	191	51.5	180	48.5	371
Local list	43	11.6	328	88.4	371
Year list	22	5.9	349	94.1	371
Country list	55	14.8	316	85.2	371
Regional list	19	5.1	352	94.9	371
List of photos	46	12.4	325	87.6	371
Other lists	60	16.2	311	83.8	371

Frequency graph – Types of bird lists kept.



Write-in answers for other kinds of lists kept by participants

Type of list	Number of responses
List of birds ringed	25
List on Birdbase website	1
List of birds on stamps	1
List of waders seen	1
Car /bus list	1
Meeting list	1
List on eBird	1
Garden list	1
Observations	1
On website	1
Point counts	1
Trip lists	5
Uncommon birds seen	1

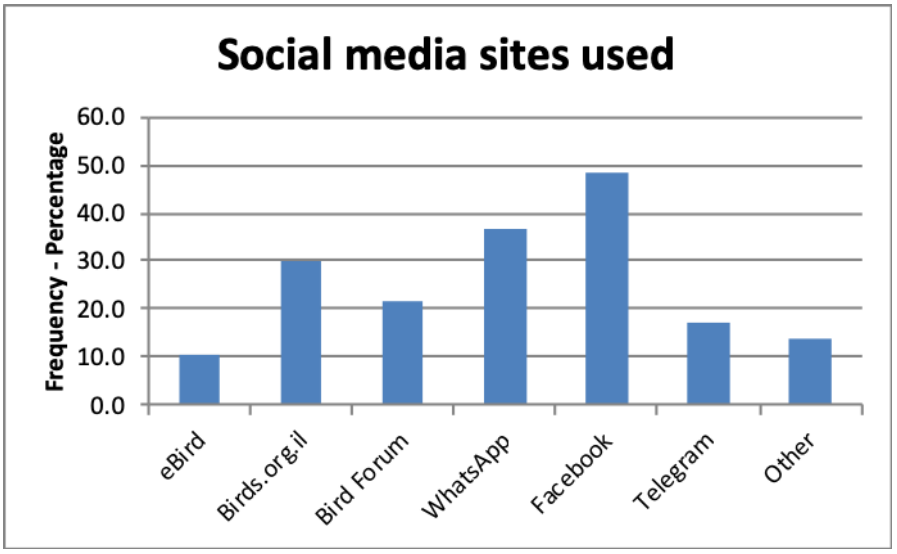
Question 8 - Have you ever posted your sightings or photographs on the Internet or social media?

Posted sighting on Internet or Social Medeia	Frequency	Percent	Valid Percent
Yes	264	71.2	73.9
No Answer	93	25.1	26.1
Total	357	96.2	100.0
Missing	14	3.8	
Total	371	100.00	

Questions 9 - Where have you posted your sightings or photographs on the Internet or social media? Check all that apply.

Social Media and Internet Sites Used	Frequency Yes	Percent Yes	Frequency No answer	Percent No answer	Total
eBird	39	10.5	33.2	89.5	317
Birds.org.il	111	29.9	260	70.1	317
Bird Forum	81	21.8	290	78.2	317
WhatsApp	136	36.7	235	6.3	317
Facebook	19	48.2	192	51.8	317
Telegram	63	17.0	308	83	317
Other	21	13.7	320	86.3	317

Frequency graph – Social media site used.



Write-in answers for other kinds of social media/websites used by participants

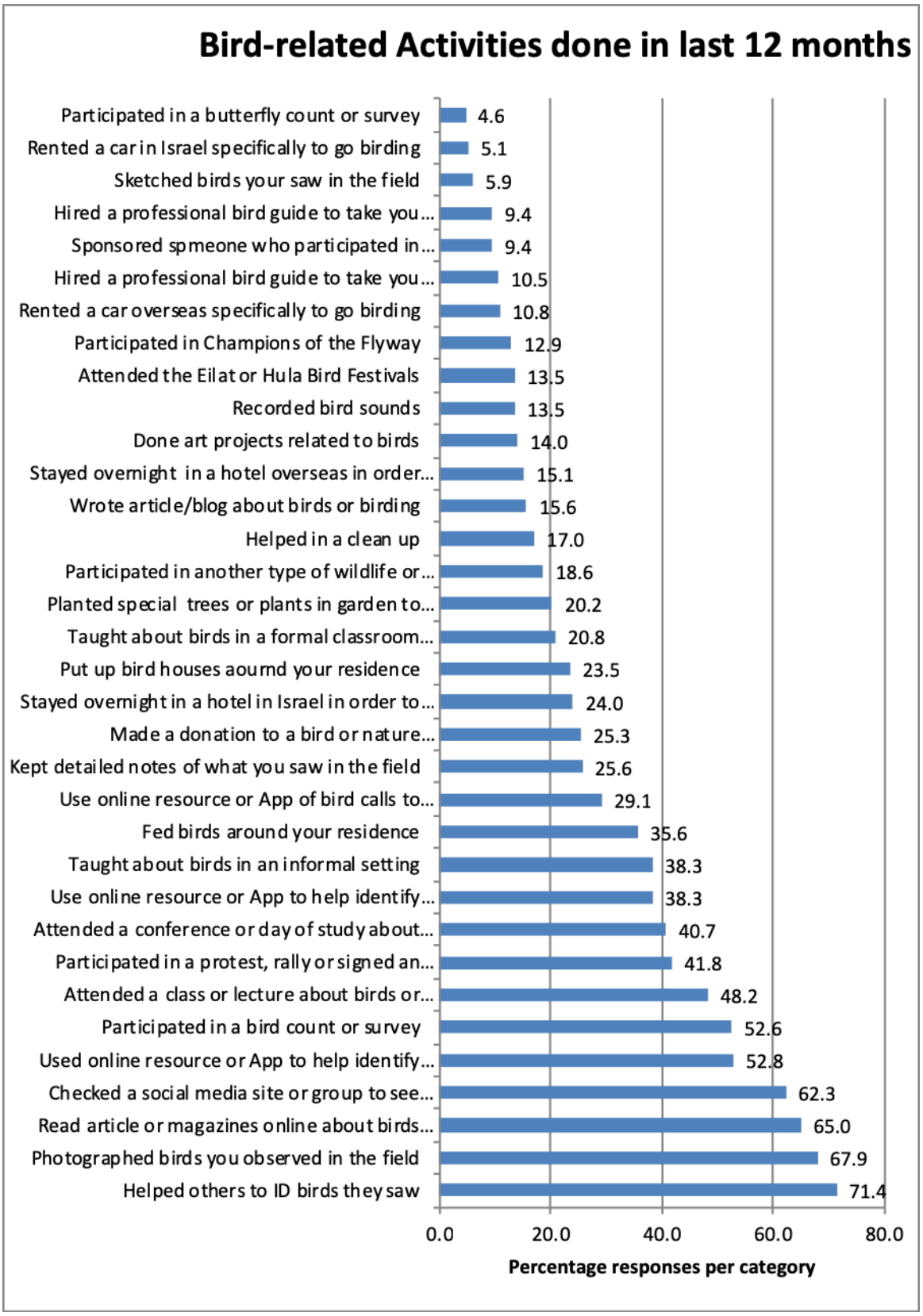
Type of list	Number of responses
Photo forums	7
Birdbase website	13
Yardbirds website	5
Bird surveys	3
Email	6
Friends	1
Info site of Israeli birders	1
Instagram	1
Israbirding website	2
My website	3
Pen and paper	1
Reports to experts	1

Question 10 - In the last 12 months have you participated in any of the following kinds of activities? Check all that apply.

Activities Done in Last 12 Months	Frequency Yes	% Yes	Frequency No answer	% No answer	Total
Fed birds at home	132	35.6	239	64.4	371
Planted trees for birds	75	20.2	296	79.8	371
Put up bird houses at home	87	23.5	284	76.5	371
Recorded bird sounds	50	13.5	321	86.5	371
Sketched birds in the field	22	5.9	349	94.1	371
Did art projects about birds	52	14.0	319	86.0	371
Kept detailed notes about birds	95	25.6	276	74.4	371
Used online site or App to ID bird	196	52.8	175	47.2	371
Used online site or App to ID sound	142	38.3	229	61.7	371
Went online to check bird sightings	231	62.3	323	87.1	371
Used online bird calls to attract birds	108	29.1	263	70.9	371
Read article online	241	65.0	130	35.0	371
Attended Eilat or Hula Festival	50	13.5	321	86.5	371
Participated in Champions of Flyway	48	12.9	323	87.1	371
Sponsored someone in Champions of Flyway	35	9.4	336	90.6	371
Wrote article/blog about birds	58	15.6	313	84.4	371
Attended protest, rally or signed petition	155	41.8	216	58.2	371
Rented car in Israel to see birds	19	5.1	352	94.9	371
Rented car overseas to see birds	40	10.8	331	89.2	371
Stayed overnight in hotel in Israel to see birds	89	24.0	282	76.0	371
Stayed overnight in hotel overseas to see birds	56	15.1	315	84.9	371

Participated in bird count or survey	195	52.6	176	47.4	371
Participated in butterfly count or survey	17	4.6	354	95.4	371
Participated in other wildlife count or survey	69	18.6	302	81.4	371
Participated in cleanup activity	63	17.0	308	83.0	371
Attended conference or day of study about birds	151	40.7	220	59.3	371
Attended class or lecture about birds	179	48.2	192	51.8	371
Donated to bird or nature conservation organization	94	25.3	277	74.7	371
Helped someone ID birds they saw	265	71.4	106	28.6	371
Hired professional guide in Israel	39	10.5	332	89.5	371
Hired professional guide overseas	35	9.4	336	90.6	371
Taught in a formal classroom setting	77	20.8	294	79.2	371
Taught in an informal setting	142	38.3	229	61.7	371
Photographed bird observed in the field	252	67.9	119	32.1	371

Frequency chart – Bird-related Activities Conducted in Last 12 Months.



Question 11 - How many days in the past 12 months have you participated in the following activities?

Number of Days Spent Birdwatching in Last 12 Months	Frequency	Percent	Valid Percent
None	19	5.1	5.4
1-3 days	62	16.7	17.7
4-6 days	26	7.0	7.4
7 - 9 days	22	5.9	6.3
10-13 days	24	6.5	6.8
14 or more days	198	53.4	56.4
Total	351	94.6	100.0
Missing	20	5.4	
Total	371	100.0	

Number of Days Travelled more than 2 Hours Away from home to see birds	Frequency	Percent	Valid Percent
None	54	14.6	16.1
1-3 days	113	30.5	33.7
4-6 days	51	13.7	15.2
7-9 days	22	5.9	6.6
10-13 days	26	7.0	7.8
14 or more days	69	18.6	20.6
Total	335	90.3	100.0
Missing	36	9.7	
Total	371	100.0	

Number of Days Birded Overseas	Frequency	Percent	Valid Percent
none	182	49.1	59.5
1-3 days	78	21.0	85.0
4-6 days	18	4.9	90.8
7-9 days	9	2.4	93.8
10-13 days	5	1.3	95.4
14 or more days	14	3.8	100.0
Total	306	82.5	
Missing	65	17.5	
Total	371	100.0	

Number of Days Went on Field Trip Lead By a Guide	Frequency	Percent	Valid Percent
none	132	35.6	42.9
1-3 days	98	26.4	31.8
4-6 days	30	8.1	9.7
7-9 days	13	3.5	4.2
10-13 days	10	2.7	3.2
14 or more days	25	6.7	8.1
Total	308	83.0	100.0
Missing	63	17.0	
Total	371	100.0	

Number of Days Participated in Bird Ringing	Frequency	Percent	Valid Percent
none	106	28.6	35.1
1-3 days	75	20.2	24.8
4-6 days	27	7.3	8.9
7-9 days	12	3.2	4.0
10-13 days	5	1.3	1.7
14 or more days	77	20.8	25.5
Total	302	81.4	100.0
Missing	69	18.6	
Total	371	100.0	

Number of days participated in a Bird Club Activity	Frequency	Percent	Valid Percent
none	190	51.2	65.7
1-3 days	46	12.4	15.9
4-6 days	16	4.3	5.5
7-9 days	5	1.3	1.7
10-13 days	8	2.2	2.8
14 or more days	24	6.5	8.3
Total	289	77.9	100.0
Missing	82	22.1	
Total	371	100.0	

Number of Days Volunteered for Local Bird or Nature Organization	Frequency	Percent	Valid Percent
none	163	43.9	58.0
1-3 days	56	15.1	19.9
4-6 days	18	4.9	6.4
7-9 days	5	1.3	1.8
10-13 days	2	.5	.7
14 or more days	37	10.0	13.2
Total	281	75.7	100.0
Missing	90	24.3	
Total	371	100.0	

Number of Days Travelled Specifically to See a Rare Bird	Frequency	Percent	Valid Percent
none	144	38.8	48.0
1-3 days	85	22.9	28.3
4-6 days	38	10.2	12.7
7-9 days	13	3.5	4.3
10-13 days	9	2.4	3.0
14 or more days	11	3.0	3.7
Total	300	80.9	100.0
Missing	71	19.1	
Total	371	100.0	

Number of Days Travelled to Specifically Photograph Birds	Frequency	Percent	Valid Percent
none	175	47.2	57.2
1-3 days	42	11.3	13.7
4-6 days	21	5.7	6.9
7-9 days	9	2.4	2.9
10-13 days	8	2.2	2.6
14 or more days	51	13.7	16.7
Total	306	82.5	100.0
Missing	65	17.5	
Total	371	100.0	

Question 12 - How many of the following equipment do you own? Please indicate a number.

Number Of Equipment Owned	Binoculars Percent of Respones	Scope Percent of Respones	Tripod Percent of Respones	Camera Percent of Respones	Sound equipment Percent of Respones	Field Guides Percent of Respones	Reference Books Percent of Respones
0	12.4	66.0	56.6	36.1	90.0	14.0	31.8
1	44.5	25.9	25.9	36.1	4.3	23.5	12.1
2	21.9	3.2	10.2	18.3	1.1	19.1	9.4
3	11.9	0.5	1.3	4.0	0.0	10.2	8.1
4	2.7	0.0	1.6	0.3	0.3	6.2	7.8
5	1.1	0.0	0.0	0.5	0.0	6.2	6.5
6	0.3	0.0	0.0	0.0	0.0	1.9	1.6
7	0.0	0.0	0.0	0.3	0.3	1.3	1.1
8	0.0	0.0	0.0	0.0	0.0	3.0	0.3
9	0.0	0.0	0.0	0.0	0.0	0.3	0.3
10	0.8	0.3	0.0	0.3	0.0	4.3	5.9
11	0.0	0.0	0.0	0.0	0.0	0.0	0.3
12	0.3	0.0	0.0	0.0	0.0	0.5	0.5
15	0.0	0.0	0.0	0.0	0.0	1.3	1.3
16	0.0	0.0	0.0	0.0	0.0	0.3	0.0
20	0.0	0.0	0.0	0.0	0.0	1.1	3.2
22	0.0	0.0	0.0	0.0	0.0	0.0	0.3
25	0.0	0.0	0.0	0.0	0.0	0.8	0.5
26	0.3	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.8	0.8
31	0.0	0.0	0.0	0.0	0.0	0.0	0.3
33	0.0	0.0	0.0	0.0	0.0	0.0	0.3
35	0.0	0.0	0.0	0.0	0.0	0.0	0.5
50	0.0	0.0	0.0	0.0	0.0	0.8	1.1
60	0.0	0.0	0.0	0.0	0.0	0.0	0.3
100	0.0	0.0	0.0	0.0	0.0	0.0	0.8
150	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total	96.0	96.0	95.7	96.0	96.0	95.7	95.4
Missing	4.0	4.0	4.3	4.0	4.0	4.3	4.6
Mean	1.66	.38	.59	.97	.10	3.93	5.927
Std. Deviation	1.923	.769	.863	1.087	.513	6.380	14.4012

Question 13 - What percentage of your equipment would you estimate that you purchased overseas or ordered online from overseas?

Percentage of Equipment Purchased Overseas	Frequency	Percent	Valid Percent
0%	135	36.4	41.2
1 - 25%	81	21.8	24.7
26 - 50%	32	8.6	9.8
51 - 75%	26	7.0	7.9
76 - 99%	38	10.2	11.6
100%	16	4.3	4.9
Total	328	88.4	100.0
Missing	43	11.6	
Total	371	100.0	

Question 14 - To what extent do you agree or disagree that you personally interact with birds for each of the following reasons?

Affiliation Motivations

To be around people who share my interest	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	45	12.1	13.7		
2 -Somewhat disagree	54	14.6	16.5		
3 -Neither agree nor disagree	65	17.5	19.8		
4- Somewhat agree	95	25.6	29.0		
5 -Strongly agree	69	18.6	21.0		
Total	328	88.4	100.0		
Missing	43	11.6			
Total	371	100.0		3.2713	1.33278

To make friends with people who I would not have met otherwise	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	47	12.7	14.5		
2 -Somewhat disagree	40	10.8	12.3		
3 -Neither agree nor disagree	58	15.6	17.8		
4- Somewhat agree	93	25.1	28.6		
5 -Strongly agree	87	23.5	26.8		
Total	325	87.6	100.0		
Missing	46	12.4			
Total	371	100.0		3.4092	1.37725

To feel part of a larger community who likes birds	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	56	15.1	17.3		
2 -Somewhat disagree	51	13.7	15.7		
3 -Neither agree nor disagree	62	16.7	19.1		
4- Somewhat agree	1	0.3	0.3		
5 -Strongly agree	101	27.2	31.2		
Total	324	87.3	100.0		
Missing	47	12.7			
Total	371	100.0		3.1367	1.34237

To feel like an expert at something	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	69	18.6	21.4		
2 -Somewhat disagree	45	12.1	13.9		
3 -Neither agree nor disagree	61	16.4	18.9		
4- Somewhat agree	92	24.8	28.5		
5 -Strongly agree	56	15.1	17.3		
Total	323	87.1	100.0		
Missing	48	12.9			
Total	371	100.0		3.0650	1.405

To compete with other birders	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	234	63.1	73.1		
2 -Somewhat disagree	47	12.7	14.7		
3 -Neither agree nor disagree	21	5.7	6.6		
4- Somewhat agree	12	3.2	3.8		
5 -Strongly agree	6	1.6	1.9		
Total	320	86.3	100.0		
Missing	51	13.7			
Total	371	100.0		1.4656	.91251

To spend time with friends and family who like birds	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	72	19.4	22.5		
2 -Somewhat disagree	54	14.6	16.9		
3 -Neither agree nor disagree	72	19.4	22.5		
4- Somewhat agree	83	22.4	25.9		
5 -Strongly agree	39	10.5	12.2		
Total	320	86.3	100.0		
Missing	51	13.7			
Total	371	100.0		2.8844	1.34458

Conservation Motivations

To help birds	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	18	4.9	5.6		
2 -Somewhat disagree	25	6.7	7.8		
3 -Neither agree nor disagree	54	14.6	16.8		
4- Somewhat agree	103	27.8	32.1		
5 -Strongly agree	121	32.6	37.7		
Total	321	86.5	100.0		
Missing	50	13.5			
Total	371	100.0		3.8847	1.16288

To give something back to nature	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	33	8.9	10.4		
2 -Somewhat disagree	26	7.0	8.2		
3 -Neither agree nor disagree	49	13.2	15.5		
4- Somewhat agree	104	28.0	32.9		
5 -Strongly agree	104	28.0	32.9		
Total	316	85.2	100.0		
Missing	55	14.8			
Total	371	100.0		3.6962	1.29079

To learn more about the natural world	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	2	.5	.6		
2 -Somewhat disagree	1	.3	.3		
3 -Neither agree nor disagree	9	2.4	2.7		
4- Somewhat agree	59	15.9	17.9		
5 -Strongly agree	259	69.8	78.5		
Total	330	88.9	100.0		
Missing	41	11.1			
Total	371	100.0		4.7333	.58485

To help scientists learn more about birds	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	15	4.0	4.7		
2 -Somewhat disagree	31	8.4	9.8		
3 -Neither agree nor disagree	71	19.1	22.4		
4- Somewhat agree	95	25.6	30.0		
5 -Strongly agree	105	28.3	33.1		
Total	317	85.4	100.0		
Missing	54	14.6			
Total	371	100.0		3.7697	1.15038

To contribute to the conservation of birds and nature	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	3	.8	.9		
2 -Somewhat disagree	10	2.7	3.1		
3 -Neither agree nor disagree	32	8.6	9.9		
4- Somewhat agree	107	28.8	33.0		
5 -Strongly agree	172	46.4	53.1		
Total	324	87.3	100.0		
Missing	47	12.7			
Total	371	100.0		4.3426	.84928

To contribute to the knowledge and understanding about birds	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	13	3.5	4.1		
2 -Somewhat disagree	6	1.6	1.9		
3 -Neither agree nor disagree	44	11.9	13.8		
4- Somewhat agree	114	30.7	35.8		
5 -Strongly agree	141	38.0	44.3		
Total	318	85.7	100.0		
Missing	53	14.3			
Total	371	100.0		4.1447	1.00369

Achievement Motivations

To see kinds of birds I have never seen before	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	7	1.9	2.2		
2 -Somewhat disagree	11	3.0	3.4		
3 -Neither agree nor disagree	28	7.5	8.6		
4- Somewhat agree	104	28.0	32.1		
5 -Strongly agree	174	46.9	53.7		
Total	324	87.3	100.0		
Missing	47	12.7			
Total	371	100.0		4.3179	.92481

To see kinds of birds I have rarely seen before	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	11	3.0	3.4		
2 -Somewhat disagree	17	4.6	5.3		
3 -Neither agree nor disagree	32	8.6	10.0		
4- Somewhat agree	103	27.8	32.1		
5 -Strongly agree	158	42.6	49.2		
Total	321	86.5	100.0		
Missing	50	13.5			
Total	371	100.0		4.1838	1.04007

To see or hear as many different kinds of birds as I can	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	21	5.7	6.5		
2 -Somewhat disagree	19	5.1	5.9		
3 -Neither agree nor disagree	42	11.3	13.0		
4- Somewhat agree	99	26.7	30.6		
5 -Strongly agree	143	38.5	44.1		
Total	324	87.3	100.0		
Missing	47	12.7			
Total	371	100.0		4.0000	1.18033

To improve my birding skills and abilities	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	9	2.4	2.8		
2 -Somewhat disagree	9	2.4	2.8		
3 -Neither agree nor disagree	24	6.5	7.5		
4- Somewhat agree	90	24.3	28.0		
5 -Strongly agree	190	51.2	59.0		
Total	322	86.8	100.0		
Missing	49	13.2			
Total	371	100.0		4.3758	.94314

To challenge my abilities	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	23	6.2	7.2		
2 -Somewhat disagree	17	4.6	5.3		
3 -Neither agree nor disagree	51	13.7	15.9		
4- Somewhat agree	92	24.8	28.7		
5 -Strongly agree	138	37.2	43.0		
Total	321	86.5	100.0		
Missing	50	13.5			
Total	371	100.0		3.9502	1.20312

To study birds in their natural habitats	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	4	1.1	1.2		
2 -Somewhat disagree	2	.5	.6		
3 -Neither agree nor disagree	16	4.3	4.9		
4- Somewhat agree	79	21.3	24.3		
5 -Strongly agree	224	60.4	68.9		
Total	325	87.6	100.0		
Missing	46	12.4			
Total	371	100.0		4.5908	.72557

Appreciation Motivations

To enjoy sights, smells and sounds of nature	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	2	.5	.6		
2 -Somewhat disagree	2	.5	.6		
3 -Neither agree nor disagree	4	1.1	1.2		
4- Somewhat agree	55	14.8	16.9		
5 -Strongly agree	263	70.9	80.7		
Total	326	87.9	100.0		
Missing	45	12.1			
Total	371	100.0		4.7638	.56245

To get outdoors for a chance to enjoy nature	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	3	.8	.9		
2 -Somewhat disagree	2	.5	.6		
3 -Neither agree nor disagree	10	2.7	3.0		
4- Somewhat agree	57	15.4	17.4		
5 -Strongly agree	256	69.0	78.0		
Total	328	88.4	100.0		
Missing	43	11.6			
Total	371	100.0		4.7104	.64368

To feel refreshed when I am tired	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	17	4.6	5.3		
2 -Somewhat disagree	26	7.0	8.1		
3 -Neither agree nor disagree	76	20.5	23.8		
4- Somewhat agree	89	24.0	27.8		
5 -Strongly agree	112	30.2	35.0		
Total	320	86.3	100.0		
Missing	51	13.7			
Total	371	100.0		3.7906	1.16233

To relax from work obligations or other responsibilities	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	27	7.3	8.4		
2 -Somewhat disagree	29	7.8	9.0		
3 -Neither agree nor disagree	57	15.4	17.7		
4- Somewhat agree	81	21.8	25.2		
5 -Strongly agree	128	34.5	39.8		
Total	322	86.8	100.0		
Missing	49	13.2			
Total	371	100.0		3.7888	1.28451

To be alone	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	66	17.8	20.8		
2 -Somewhat disagree	41	11.1	12.9		
3 -Neither agree nor disagree	84	22.6	26.5		
4- Somewhat agree	69	18.6	21.8		
5 -Strongly agree	57	15.4	18.0		
Total	317	85.4	100.0		
Missing	54	14.6			
Total	371	100.0		3.0315	1.37988

Because birds are beautiful to be around	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Highly disagree	10	2.7	3.0		
2 -Somewhat disagree	9	2.4	2.7		
3 -Neither agree nor disagree	27	7.3	8.2		
4- Somewhat agree	77	20.8	23.4		
5 -Strongly agree	206	55.5	62.6		
Total	329	88.7	100.0		
Missing	42	11.3			
Total	371	100.0		4.3982	.96720

Question 15 - How much do you agree or disagree with the following statements?

Other leisure activities don't interest me as much as birding	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Strongly disagree	79	21.3	24.1		
2 -Moderately disagree	61	16.4	18.6		
3 -Disagree a little	38	10.2	11.6		
4 -Neither agree or disagree	40	10.8	12.2		
5 -Agree a little	40	10.8	12.2		
6 -Moderately agree	31	8.4	9.5		
7 -Strongly agree	39	10.5	11.9		
Total	328	88.4	100.0		
Missing	43	11.6			
Total	371	100.0		3.46	2.078

I would rather go birding than do most anything else	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Strongly disagree	69	18.6	21.2		
2 -Moderately disagree	53	14.3	16.3		
3 -Disagree a little	32	8.6	9.8		
4 -Neither agree or disagree	37	10.0	11.3		
5 -Agree a little	47	12.7	14.4		
6 -Moderately agree	44	11.9	13.5		
7 -Strongly agree	44	11.9	13.5		
Total	326	87.9	100.0		
Missing	45	12.1			
Total	371	100.0		2.76	2.123

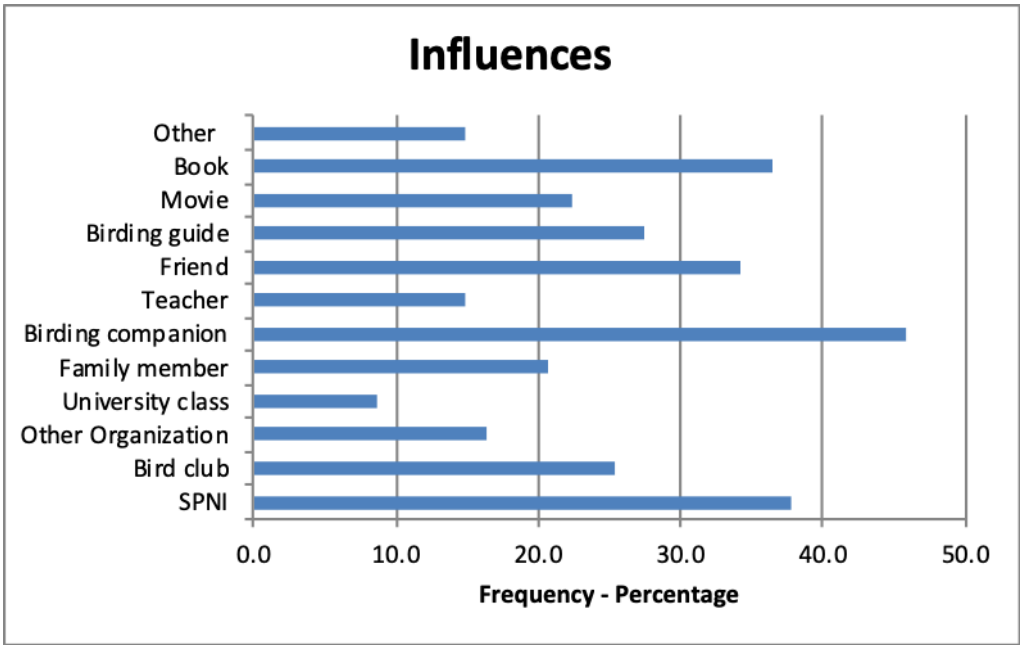
If I stopped birding, I would probably lose touch with most of my friends	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Strongly disagree	155	41.8	47.7		
2 -Moderately disagree	47	12.7	14.5		
3 -Disagree a little	19	5.1	5.8		
4 -Neither agree or disagree	34	9.2	10.5		
5 -Agree a little	38	10.2	11.7		
6 -Moderately agree	23	6.2	7.1		
7 -Strongly agree	9	2.4	2.8		
Total	325	87.6	100.0		
Missing	46	12.4			
Total	371	100.0		2.56	1.877

If I couldn't go birding, I am not sure what I would do	Frequency	Percent	Valid Percent	Mean	Std. Deviation
1 -Strongly disagree	169	45.6	51.8		
2 -Moderately disagree	48	12.9	14.7		
3 -Disagree a little	20	5.4	6.1		
4 -Neither agree or disagree	28	7.5	8.6		
5 -Agree a little	33	8.9	10.1		
6 -Moderately agree	17	4.6	5.2		
7 -Strongly agree	11	3.0	3.4		
Total	326	87.9	100.0		
Missing	45	12.1			
Total	371	100.0		2.40	1.835

Question 16 - Which, if any, of the following individuals or groups helped you become interested in birds and birdwatching? Check all that apply.

Influences	Frequency Yes	Percent Yes	Frequency No answer	Percent No answer	Total
Birding clubs	94	25.3	277	74.7	371
SPNI activities	140	37.7	231	62.3	371
Other national organizations	61	16.4	310	83.6	371
University class	32	8.6	339	91.4	371
Family member	77	20.8	294	79.2	371
Birding companion	170	45.8	201	54.2	371
Teacher or professor	55	14.8	316	85.2	371
Friend	127	34.2	244	65.8	371
Bird tour guide	102	27.5	269	72.5	371
Documentary or film	83	22.4	288	77.6	371
Book, magazine or article	135	36.4	236	63.6	371
Other	55	14.8	316	85.2	371

Frequency chart – what influenced birders to get involved with birding.



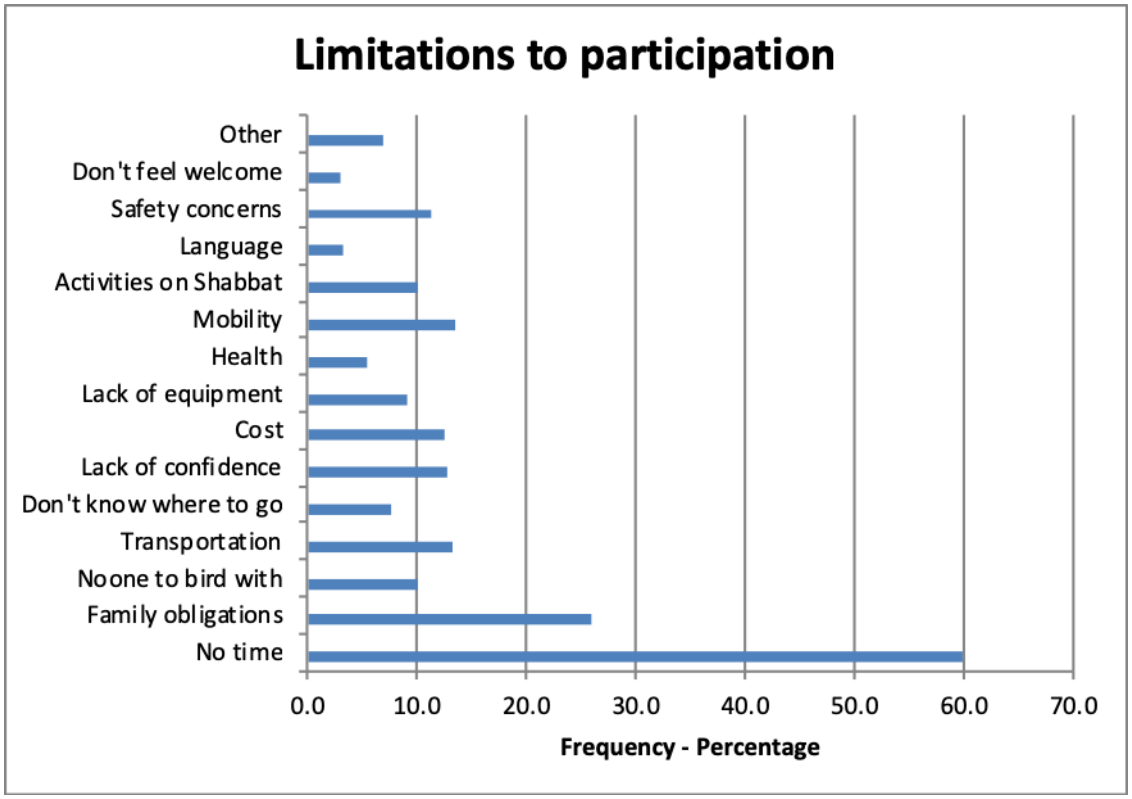
Write in answers for other kinds of things that influenced participants to get involved with birding

Type of list	Number of responses
Love of birds and nature	5
Personal experience and inclination	8
Childhood memories and experiences	3
Photography	2
Living in a rural area	2
Ringing station	1
Trips to park with children	1
Birding Facebook page/social media	3
Army/national service	2
A friend invited me	3
RSPB in UK	1
I was born with it	1
Reptile youth club at Haifa Zoo	1
Class at Avshalom Institute	1
Yardbirds website	2
Learned about Icarus and Daedalus and developed preoccupation with flight	1
Training course as a kindergarten teacher	1
Amir Balaban's raptor poster	1
Safari in Africa	1

Question 17 - Which of the following issues, if any, affect your ability to participate in birding the way you would like to? Check all that apply.

Limitations	Frequency Yes	Percent Yes	Frequency No answer	Percent No answer	Total
Lack of time	222	59.8	149	40.2	371
Too many family obligations	96	25.9	275	74.1	371
Don’t have anyone to go with	37	10.0	334	90.0	371
Lack of transportation	49	13.2	322	86.8	371
Don’t know where to go	28	7.5	343	92.5	371
Lack of confidence in ability	47	12.7	324	87.3	371
Costs too much	46	12.4	325	87.6	371
Don’t have right equipment	34	9.2	337	90.8	371
Health restrictions	20	5.4	351	94.6	371
Mobility restrictions	50	13.5	321	86.5	371
Lack of non-Shabbat activities	37	10.0	334	90.0	371
Language barriers	12	3.2	359	96.8	371
Don’t feel safe birding alone	42	11.3	329	88.7	371
Don’t feel welcome by other birders	11	3.0	360	97.0	371
Other	26	7.0	345	93.0	371

Frequency graph – What limits birders from participating fully in birdwatching.



Write-in answers for other kinds of things that limited participants to birding as much as they could.

Type of list	Number of responses
Laziness/can't get up in the morning	3
Army/ National service	3
Don't know how to start	1
Organized trips too far from home	1
Other things to do/other priorities	2
Other hobbies	2
Cost of gas	1
Hearing impaired	1
No restrictions/Happy with amount I go birding	8

Question 18 - What is your age?

Age Groups	Frequency	Percent	Valid Percent
18 - 27 years	44	11.9	14.6
28 - 37 years	54	14.6	17.9
38-47 years	60	16.2	19.9
48 - 57 years	61	16.4	20.2
58 - 67 years	44	11.9	14.6
68 and over	39	10.5	12.9
Total	302	81.4	100.0
Missing	69	18.6	
Total	371	100.0	

Question 19 - What is your gender?

Gender	Frequency	Percent	Valid Percent
Male	182	49.1	56.0
Female	143	38.5	44.0
Total	325	87.6	100.0
Missing	46	12.4	
Total	371	100.0	

Question 20 - What is your highest achieved education level?

Education	Frequency	Percent	Valid Percent
High School	53	14.3	16.2
Associated degree	23	6.2	7.0
BA or BSc	101	27.2	30.9
Teaching Diploma	9	2.4	2.8
Masters	100	27.0	30.6
Doctorate or Professional	33	8.9	10.1
Other	8	2.2	2.4
Total	327	88.1	100.0
Missing	44	11.9	
Total	371	100.0	

Question 21 - What is your household gross monthly income level?

Income	Frequency	Percent	Valid Percent
Less than 4,000 NIS	41	11.1	13.7
4,000 to 7,999 NIS	66	17.8	22.1
8,000 to 11,999 NIS	67	18.1	22.4
12,000 to 15,999 NIS	41	11.1	13.7
16,000 to 19,999 NIS	28	7.5	9.4
20,000 - 23,999 NIS	18	4.9	6.0
24,000 to 27,999 NIS	11	3.0	3.7
28,000 NIS or more	27	7.3	9.0
Total	299	80.6	100.0
Missing	72	19.4	
Total	371	100.0	

Question 22 - What is your employment status?

Employment	Frequency	Percent	Valid Percent
In Army/National Service	11	3.0	3.3
Student	29	7.8	8.8
Unemployed	8	2.2	2.4
Part time	49	13.2	14.9
Full time	162	43.7	49.2
Retired	47	12.7	14.3
Other	23	6.2	7.0
Total	329	88.7	100.0
Missing	42	11.3	
Total	371	100.0	

Question 23 - What is your religious identification?

Religion	Frequency	Percent	Valid Percent
Secular Jew	226	60.9	69.5
Reform/Conservative Jew	14	3.8	4.3
Orthodox Jew	53	14.3	16.3
Ultra-Orthodox Jew	1	.3	.3
Christian	4	1.1	1.2
Muslim	2	.5	.6
Druze	5	1.3	1.5
Other	20	5.4	6.2
Total	325	87.6	100.0
Missing	46	12.4	
Total	371	100.0	

Question 24 - What District of Israel do you live in?

District	Frequency	Percent	Valid Percent
Jerusalem	94	25.3	28.6
Northern	61	16.4	18.5
Haifa	17	4.6	5.2
Central	69	18.6	21.0
Tel Aviv	32	8.6	9.7
Southern	40	10.8	12.2
Yehuda and Shomrom	14	3.8	4.3
I live outside Israel	2	.5	.6
Total	329	88.7	100.0
Missing	42	11.3	
Total	371	100.0	

Question 25 - Are you a member of any local, national or international birding or conservation organizations?

Membership in conservation organization	Frequency	Percent	Valid Percent
Yes	166	44.7	50.9
No	160	43.1	49.1
Total	326	87.9	100.0
Missing	45	12.1	
Total	371	100.0	

Question 26 - Are you a member of the Israel Bird Club run by SPNI?

Membership in SPNI Bird Club	Frequency	Percent	Valid Percent
No	68	18.3	21.1
Yes	254	68.5	78.9
Total	322	86.8	100.0
Missing	49	13.2	
Total	371	100.0	

Question 27 - What do you think is the biggest threat to birds in Israel today? Open ended question

Threat	Number of responses
Habitat loss and destruction	124
Development/construction/urbanization	76
Indifference/ignorance/lack of awareness	13
Pesticides/poisoning	39
Hunting and poaching	31
Invasive species	31
Pollution	21
Reduced open green space	21
Humans/people	18
Power lines/electrocution	16
Cats	10
Extinction of species	7
Population growth	7
Politics/security issues	6
Drying of wetlands/water bodies/fish ponds	5
Intensive agriculture/farmers	5
Irresponsible birders/twitchers	5
Irresponsible photographers	5
Global climate change	5
Interference with nests	3
Airports/planes	3
Lack of money or resources for environmental organizations	3
Solar energy fields	2
Capitalism	2
Feral dogs	2
Roads	2
Rubbish	2
Deforestation and planting of non-local species	2
Shrinking orchards and agricultural areas	1
Desertification	1
JNF forests	1
ATV's/Off road vehicles	1
Plastic bags	1
Lack of information and materials for Arab sector	1
There are no threats	1
I don't know enough to answer	4

Question 28 - What services or activities would you like to see offered that could help you become more involved with birds and birdwatching? Open ended question

Services and activities	Number of responses
Master class or academic level classes for public	3
Tours and activities for people with no transportation	3
More lectures – evenings and after hours	8
Experts helping with identification in the field	2
Bird photography trainings and meetings	2
Option to rent or borrow birding or photography equipment	3
Budget for bird research, ringing equipment	3
Education and outreach to schools and kindergartens	5
Workshops on basic bird biology	2
More local ringing stations around country	3
Birding trips and tours aimed at adults	5
Pelagic trips	1
Option to participate in large scale surveys, bird counts and ringing	6
Better birding facilities at nature centers and national parks	1
More activities in periphery, in north, in south	1
Professional day of study	2
More citizen science opportunities	1
More activities in urban areas	1
More trips with private cars	1
More PR and advertising	4
More activities of less able bodied people – less walking	2
Activities in English	2
Conferences	2
More kids friendly activities not on Shabbat	1
More youth activities in north and south	4
To retire	3
More bird watching parks and reserves around country	6
Regional information and education	1
Non-Shabbat activities	3
Transportation on Shabbat	2
Beginning birdwatching course	6
Affordable or free activities	6
More activities on Shabbat	2
Trips on Sundays or evenings during the week	4
A good App for sharing information and finding birding companions	2
A good local birdwatching App	1
More activities and clubs close to home	15
Club and activities in Kiryat Shmona and Galilee	2
Activities and clubs for Druze community	1
More information on where to find birds and what's around	4
Course in a variety of topics	2

Activities and trainings in Tel Aviv	2
Information and activities in conservation issues	2
Options to initiate encounters between birders/build community	2
Internet based training courses	1
Meetings for advanced birders	1
More materials and information in Arabic	1

Appendix B

STATISTICAL ANALYSIS

Table 1

Factors that were Significant in Relation to Gender - Using Chi Square Tests

Chi Square Tests	N	% Male	% Female	X^2 Value	df	p value	Significance
Level of Interest	**312**			**10.841**	**3**	**0.013**	Men more likely to have higher level of interest.
Slightly interested		5.1	12.7				
Moderately interested		24.7	32.1				
Very interested		70.2	55.2				
Level of expertise	**324**			**58.225**	**4**	**0.000**	Men more likely to have higher level of expertise.
Casual		3.3	9.2				
Novice		14.3	26.1				
Intermediate		24.7	45.8				
Advanced		35.2	18.3				
Expert		22.5	0.7				
Age Started birding	**324**			**14.210**	**5**	**0.014**	Men more likely to start earlier
Less than 9 years old		25.3	16.9				
10-19 years		30.2	22.5				
20-29 years		20.3	21.1				
30-39 years		6	16.2				
40-49 years		8.2	13.4				
More than 50 years old		9.9	9.9				
# bird can ID by sight	**325**			**96.740**	**4**	**0.000**	Men more likely to ID more birds
1 -50 species		19.8	64.3				
51-100 species		15.9	19.6				
101- 150 species		7.7	7.7				
151 - 200 species		11.5	4.9				
Over 200 species		45.1	3.5				
# birds can ID by sound	**321**			**41.294**	**4**	**0.000**	Men more likely to ID more birds by sound
1 -50 species		66.1	95.0				
51-100 species		14.4	2.8				
101- 150 species		6.7	2.1				
151 - 200 species		1.1	0.0				
Over 200 species		11.7	0.0				
Keeps life list	**319**	**43.6**	**25.0**	**11.850**	**1**	**0.001**	Men more likely to keep a life list
Types of lists kept	**325**						
Don't keep any lists		44.5	62.9	10.912	1	0.001	Women more likely
Year List		8.8	2.1	6.518	1	0.011	Men more likely
Country List		19.2	9.8	5.574	1	0.018	Men more likely
Other lists		20.9	10.5	6.334	1	0.012	Men more likely

Posts on social media/internet	**320**	**82.7**	**61.7**	**17.796**	**1**	**0.000**	Men more likely
ebird	325	16.5	2.1	18.166	1	0.000	Men more likely
IOC portal	325	37.9	23.1	8.184	1	0.004	Men more likely
Bird Forum	325	34.6	7.0	35.082	1	0.000	Men more likely
WhatsApp	325	43.4	29.4	6.751	1	0.009	Men more likely
Facebook	325	56.6	41.3	7.532	1	0.006	Men more likely
Telegram	325	29.1	2.8	38.368	1	0.000	Men more likely
Other	325	18.7	10.5	4.197	1	0.040	Men more likely
Activities	325						
Creates art projects		9.9	20.3	6.988	1	0.008	Women more likely
Keeps detailed notes		30.8	20.3	4.562	1	0.033	Men more likely
Checked ID of calls online		48.9	27.3	15.691	1	0.000	Men more likely
Checked reports of sightings		72.5	54.5	11.325	1	0.001	Men more likely
Used App of calls attract birds		39.6	18.2	17.378	1	0.000	Men more likely
Read articles online		73.6	58.7	8.034	1	0.005	Men more likely
Participated in Champions		17.6	7.7	6.823	1	0.009	Men more likely
Wrote articles/blogs		23.1	7.7	13.887	1	0.004	Men more likely
Rented car overseas to bird		15.9	5.6	8.489	1	0.004	Men more likely
Stayed in hotel overseas		22.5	9.1	10.435	1	0.001	Men more likely
Helped others to ID birds		78.6	67.8	4.782	1	0.029	Men more likely
# number of days birding last 12 months	**322**			**17.982**	**5**	**0.003**	Men spent more days
None		4.4	5.7				
1-3 days		13.3	24.8				
4-6 days		4.4	9.9				
7-9 days		4.4	8.5				
10-13 days		8.8	5.7				
14 + days		64.6	45.4				
# days over 2 hours from home	**306**			**28.365**	**5**	**0.000**	Men spent more days
None		15.6	18.0				
1-3 days		23.1	45.9				
4-6 days		17.3	12.8				
7-9 days		8.1	6.0				
10-13 days		6.9	8.3				
14 + days		28.9	9.0				
# days birded overseas	**280**			**14.363**	**5**	**0.013**	Men spent more days
None		53.1	67.5				
1-3 days		24.4	25.8				
4-6 days		8.1	3.3				
7-9 days		4.4	1.7				
10-13 days		3.1	0.0				
14 + days		6.9	1.7				
# days on a guided bird trip	**282**			**17.789**	**5**	**0.003**	Women spent more days
None		53.5	29.1				
1-3 days		25.2	40.2				
4-6 days		8.4	11.0				
7-9 days		3.9	5.5				
10-13 days		1.9	4.7				
14 + days		7.1	9.4				
# days travelled to see a rare bird	**272**			**19.005**	**5**	**0.002**	Men spent more days
None		39.02	59.3				
1-3 days		7.9	28.8				
4-6 days		18.2	6.8				
7-9 days		6.5	1.7				
10-13 days		3.9	0.8				
14 + days		4.5	2.5				

# days travelled to photograph birds	**278**			**23.343**	**5**	**0.000**	Men spent more days
		47.8	69.7				
None		13.8	14.3				
1-3 days		6.3	7.6				
4-6 days		4.4	0.8				
7-9 days		3.1	0.8				
10-13 days		24.5	6.7				
14 + days							
Limitations	**325**						
No one to bird with		8.2	15.4	4.050	1	0.044	Women more likely
Don't know where to go		4.9	12.6	6.140	1	0.013	Women more likely
Lack of confidence		7.1	23.1	16.733	1	0.000	Women more likely
Don't have right equipment		6.6	15.4	6.607	1	0.010	Women more likely
Don't feel safe alone		4.4	23.1	25.351	1	0.000	Women more likely
% equipment bought overseas	**316**			**8.073**	**5**	**0.003**	Men more likely to purchase overseas
None		31.5	52.2				
1-25%		24.7	29.9				
26-50%		11.8	7.2				
51-75%		10.1	5.8				
75 - 99%		16.3	6.5				
100%		5.6	4.3				

Table 2

Factors that were significantly Different in Relation to Gender - Using Two-Tailed Independent t-tests

Two-tailed Independent t-tests	N	Mean M	Mean F	t	df	p value	Significance
Equipment owned	324	17.63	8.57	3.956	322	0.000	Men own more
Total number of activities	323	10.52	9.17	2.250	322	0.025	Men did more activities
Motivation							
Feel part of community	313	2.88	3.25	-2.462	311	0.014	Women score higher
Compete with other birders	309	1.56	1.2	3.675	307	0.000	Men score higher
Bird with family and friends	311	2.67	2.98	-2.101	309	0.036	Women score higher
Give back to nature	305	3.44	3.8	-2.464	303	0.014	Women score higher
Be alone in nature.	306	3.16	2.62	3.469	304	0.001	Men score higher
Commitment							
Other activities don't interest me as much as birding	321	4.28	3.33	3.113	319	0.002	Men scored higher
I would rather go birding	319	4.84	3.56	4.024	317	0.000	Men scored higher

Table 3

Factors that were significant in Relation to Level of Expertise - Using Chi Square Tests

	N	% Casual	% Novice	% Intermediate	% Advanced	% Expert	X^2 Value	df	p Value	Significance
Level of Interest	**348**						**117.525**	**8**	**0.000**	higher expertise = higher interest
Slightly interested		42.1	19.7	6.2	1.0	0.0				
Moderately interested		36.8	52.1	36.3	11.3	6.3				
Very interested		21.1	28.2	57.5	87.6	93.6				
Age Started birding	**364**						**68.525**	**20**	**0.000**	higher expertise started early
Less than 9 years old		23.8	10.0	16.0	29.3	40.8				
10-19 years		9.5	15.7	25.6	28.3	44.9				
20-29 years		14.3	22.9	20.0	25.3	8.2				
30-39 years		14.3	20.0	12.0	6.1	2.0				
40-49 years		14.3	20.0	12.8	6.1	2.0				
More than 50 years old		23.8	11.4	13.6	5.1	2.0				
# bird can ID by sight	**365**						**301.963**	**16**	**0.000**	Higher expertise can ID more
1 -50 species		85.7	85.9	44.0	12.1	0.0				
51-100 species		14.3	12.7	32.0	12.1	0.0				
101- 150 species		0.0	0.0	14.4	9.1	2.0				
151 - 200 species		0.0	1.4	4.0	21.2	4.1				
Over 200 species		0.0	0.0	5.6	45.5	93.9				
# birds can ID by sound	**361**						**171.935**	**16**	**0.000**	Higher expertise = higher number of birds id by sound
1 -50 species		95.2	100.0	91.9	68.4	18.8				
51-100 species		4.8	0.0	4.0	16.3	25.0				
101- 150 species		0.0	0.0	4.0	8.2	10.4				
151 - 200 species		0.0	0.0	0.0	2.0	10.4				
Over 200 species		0.0	0.0	0.0	5.1	35.4				
Keeps life list	**357**	9.5	14.1	30.1	45.4	62.2	**40.609**	**4**	**0.000**	higher levels more likely to keep

Types of lists kept	365								
Don't keep lis		85.7	69.4	56.8	39.4	28.6	36.035	4	0.000	Lower levels more likely
Local list									
Year list		0.0	5.6	10.4	14.1	24.5	13.761	4	0.008	higher levels more likely
Country list		0.0	1.4	1.6	11.1	16.3	22.041	4	0.000	higher levels more likely
Regional list		4.8	5.6	8.0	20.2	40.8	38.983	4	0.000	higher levels more likely
Other lists		0.0	2.8	4.0	5.1	14.3	10.534	4	0.032	higher levels more likely
		9.5	5.6	13.6	24.2	26.5	15.521	4	0.004	higher levels more likely
Posts on social media/internet	356	2.9	58.6	70.2	87.2	95.7	40.458	4	0.000	higher levels more likely
Ebird		0.0	1.4	4.0	16.2	34.7	47.476	4	0.000	higher levels more likely
IOC Portal		4.8	12.7	22.4	48.5	51.0	45.987	4	0.000	higher levels more likely
Bird forum		0.0	7.0	11.2	30.3	65.3	80.695	4	0.000	higher levels more likely
WhatsApp		9.5	33.8	29.6	41.4	65.3	27.629	4	0.000	higher levels more likely
Facebook		23.8	32.4	44.0	58.6	77.6	34.040	4	0.000	higher levels more likely
Telegram		0.0	1.4	5.6	30.3	51.0	79.673	4	0.000	higher levels more likely
Activities									
Kept detailed notes		4.8	14.1	19.2	31.3	59.2	42.634	4	0.000	Experts most likely
Checked call on web or app		9.5	31.0	32.8	49.5	57.1	22.988	4	0.000	Experts most likely
Checked reports social media		33.3	46.5	59.2	75.8	85.7	34.875	4	0.000	Experts most likely
Used calls app to attract birds		0.0	14.1	20.0	41.4	65.3	59.183	4	0.000	Experts most likely
Read articles online		38.1	47.9	66.4	78.8	77.6	27.815	4	0.000	Adv. +expert most likely
Participated in Champions		0.0	1.4	4.0	19.2	46.9	73.058	4	0.000	Experts most likely
Sponsored team for Champions		4.8	4.2	16.0	6.1	10.2	10.290	4	0.036	intermediate most likely
Wrote article about birds		4.8	4.2	4.8	16.2	65.3	110.208	4	0.000	Experts most likely
Attended a protest		9.5	32.4	35.2	56.6	59.2	28.675	4	0.000	Experts most likely
Rented a car overseas to bird		0.0	1.4	8.8	12.1	32.7	35.589	4	0.000	Experts most likely
Stayed in hotel in Israel to bird		0.0	16.9	24.0	35.4	24.5	15.399	4	0.004	advanced most likely
Stayed in hotel overseas to bird		0.0	0.8	9.6	22.2	40.8	43.644	4	0.000	Experts most likely
Participated in bird survey		42.9	35.2	0.6	62.6	83.7	34.834	4	0.000	Experts most likely
Participated in wildlife survey		14.3	19.7	12.0	18.2	38.8	16.864	4	0.002	Experts most likely
Attended a bird conference		4.8	22.5	36.8	49.5	77.6	52.296	4	0.000	Experts most likely
Attended a bird lecture		33.3	45.1	44.0	50.5	69.4	11.986	4	0.017	Experts most likely
Helped others to ID birds		28.6	60.6	68.0	86.9	89.8	44.098	4	0.000	Experts most likely
Hired a bird guide overseas		0.0	1.4	8.8	11.1	24.5	20.611	4	0.000	Experts most likely
Taught in formal setting		9.5	14.1	16.0	25.3	38.8	16.103	4	0.003	Experts most likely
Taught in informal setting		4.8	19.7	29.6	53.5	73.5	59.536	4	0.000	Experts most likely
Photographed birds		47.6	66.2	62.4	86.9	79.6	13.366	4	0.010	advanced most likely

# number of days birding last 12 months	350						11.826	20	0.000	Experts and advanced have higher number of days
None		30.0	4.5	8.4	0.0	0.0				
1-3 days		35.0	38.8	18.5	3.1	6.3				
4-6 days		5.0	14.9	7.6	6.3	0.0				
7-9 days		0.0	3.0	7.6	9.4	4.2				
10-13 days		10.0	9.0	7.6	6.3	2.1				
14 + days		20.0	29.9	50.4	75.0	87.5				
# days over 2 hours from home	334						100.907	20	0.000	Experts and advanced have higher number of days
None		40.0	31.7	14.2	9.9	2.1				
1-3 days		40.0	41.3	39.8	27.5	17.0				
4-6 days		10.0	19.0	16.8	15.4	8.5				
7-9 days		0.0	0.6	6.2	13.2	4.3				
10-13 days		5.0	3.2	8.8	11.0	6.4				
14 + days		5.0	3.2	14.2	23.1	61.7				
# days birded overseas	305						52.383	20	0.000	Experts and advanced have higher number of days
None		88.2	71.7	68	47.1	37.2				
1-3 days		5.9	18.3	21	36.5	30.2				
4-6 days		0	8.3	5	4.7	9.3				
7-9 days		5.9	0	4	3.5	2.3				
10-13 days		0	0	2	2.4	2.3				
14 + days		0	1.7	0	5.9	18.6				
# days ringing birds	301						49.286	20	0.000	Experts and advanced have higher number of days
None		68.8	44.8	41.4	28.0	10.9				
1-3 days		25.0	27.6	25.3	22.0	23.9				
4-6 days		0.0	8.6	10.1	11.0	6.5				
7-9 days		0.0	5.2	4.0	3.7	4.3				
10-13 days		0.0	3.4	1.0	2.4	0.0				
14 + days		6.3	10.3	18.2	32.9	54.3				
#days volunteering	281						50.320	20	0.000	Experts and advanced have higher number of days
None		93.8	70.4	68.5	46.8	26.2				
1-3 days		6.3	13.0	14.1	27.3	33.3				
4-6 days		0.0	1.9	5.4	9.1	11.9				
7-9 days		0.0	0.0	1.1	1.3	7.1				
10-13 days		0.0	0.0	2.2	0.0	0.0				
14 + days		0.0	14.8	8.7	15.6	21.4				

# days travelled to see a rare bird	299					82.866	20	0.000	Experts and advanced
None		100.0	77.6	51.5	30.4	15.6			have higher number of
1-3 days		0.0	15.5	31.7	31.6	40.0			days
4-6 days		0.0	5.2	9.9	21.5	17.8			
7-9 days		0.0	1.7	4.0	6.3	6.7			
10-13 days		0.0	0.0	1.0	6.3	6.7			
14 + days		0.0	0.0	2.0	3.8	13.3			
Influences	365								
Bird club		19.0	18.3	24.0	25.3	44.9	12.158	4	0.016	Experts more likely
Birding companions		23.8	36.6	44.0	57.6	53.1	13.178	4	0.010	Advanced more likely
Teachers		4.8	9.9	11.2	20.2	26.5	11.779	4	0.019	Experts more likely
Limitations	365								
Family obligations		33.3	18.3	20.0	34.3	32.7	9.811	4	0.044	Advanced more likely
No one to bird with		28.6	11.3	12.8	7.1	0.0	15.456	4	0.004	Casual more likely
Don't know where to go		23.8	16.9	8.0	1.0	0.0	26.555	4	0.000	Casual more likely
Lack of confidence		42.9	29.6	11.2	3.0	0.0	50.588	4	0.000	Casual more likely
Don't have right equipment		28.6	19.7	6.4	5.1	2.0	24.773	4	0.000	Casual more likely
Lack of non- Shabbat activities		19.0	4.2	9.6	16.2	4.1	10.511	4	0.033	Casual more likely
% of equipment purchased overseas	328					64.247	20	0.000	higher levels purchase
None		70.0	60.9	46.8	27.0	13.6			more overseas
1-25%		5.0	25.0	22.5	32.6	22.7			
26-50%		0.0	3.1	11.7	11.2	15.9			
51-75%		10.0	3.1	6.3	6.7	20.5			
75 - 99%		15.0	4.7	6.3	15.7	25.0			
100%		0.0	3.1	6.3	6.7	2.3			
Age Group	302					33.962	20	0.026	
18-27 years		0	18.6	13.5	16.5	12.8			Highest casual - 68+
28-37 years		13.3	27.1	12.5	15.3	25.6			Highest novice 28-37
38-47 years		13.3	23.7	17.3	16.5	30.8			Highest Int - 58-67
48-57 years		26.7	15.3	17.3	27.1	17.9			Highest Adv - 48-57
58-67 years		13.3	8.5	21.2	14.1	7.7			highest Exp -- 38 -47
Over 68 years		33.3	6.8	18.3	10.6	5.1			
Membership in conservation org.	325	15.8	48.4	42.3	65.6	63.4	23.083	4	0.000	Higher levels of expertise more likely to be members

Table 4

Motivations that were significantly Different Between Levels of Expertise - Using One-way ANOVA Test

	Casual (Mean score)	Novice (Mean score)	Intermed-iate (Mean score)	Advanced (Mean score)	Expert (Mean score)	df Between groups	df Within groups	Mean Square	F	Sig.
Make friends with birders	2.67[a]	3.21	3.41	3.73[a]	3.45	4	319	5.463	2.942	.021
Feel like an expert	2.44[b]	2.84[c]	2.94	3.27	3.55[bc]	4	318	6.447	3.362	.010
Compete with other birders	1.17	1.47	1.31[d]	1.60	1.70[d]	4	315	2.103	2.576	.038
Help scientists	3.47	3.44[c]	3.67[d]	3.97	4.27[cd]	4	312	5.816	4.595	.001
Contribute to conservation	4.05[a]	4.06[c]	4.33	4.44[a]	4.70[c]	4	319	3.219	4.666	.001
Contribute to knowledge	3.89	3.86[c]	4.11[d]	4.19	4.65[cd]	4	313	4.432	4.600	.001
Improve birding skills	3.72[ef]	4.30	4.40[f]	4.56[e]	4.30	4	317	2.858	3.305	.011
Challenge birding skills	3.17[a]	3.86	3.91	4.15[a]	4.12	4	316	4.099	2.899	.022
Study birds in nature	3.95[g]	4.62[g]	4.52[g]	4.71[g]	4.77[g]	4	320	2.815	5.654	.000
Enjoy sights and sounds of nature	4.21[g]	4.75[g]	4.81[g]	4.87[g]	4.70[g]	4	320	1.796	6.013	.000
Be outdoors	4.26[a]	4.71	4.70	4.88[a]	4.58	4	323	1.763	4.434	.002
Be alone	2.82	2.82	2.75[d]	3.33	3.51[d]	4	312	7.460	4.070	.003
Conservation Motivation Group	3.98	3.86 [c]	4.12	4.18	4.38[c]	4	326	1.982	3.574	.007
Achievement Motivation Group	3.78 [a]	4.22	4.21	4.38 [a]	4.27	4	326	1.586	2.515	.041

a – statistically significant difference between casual and advanced birders.
b - statistically significant difference between casual and expert birders.
c - statistically significant difference between novice and expert birders.
d - statistically significant difference between intermediate and expert birders.
e – statistically significant difference between casual and advanced birders.
f - statistically significant difference between casual and intermediate birders.
g - statistically significant difference between casual and all other groups of birders

Table 5

Factors that were significant in Relation to Age Group - Using Chi Square Tests

	N	18-27 years	28-37 years	38-47 years	48-57 years	58-67 years	>68 years	X^2 Value	df	p Value	Significance
Level of expertise	302							33.962	20	.026	Intermediate birders are more likely to be 58 years or more. Advanced birders are more likely to be 48-57 years old. Experts are more likely to be 28 – 47 years old
Casual		0.0	3.7	3.3	6.6	4.5	12.8				
Novice		25.0	29.6	23.3	14.8	11.4	10.3				
Intermediate		31.8	24.1	30.0	29.5	50.0	48.7				
Advanced		31.8	24.1	23.3	37.7	27.3	23.1				
Expert		11.4	18.5	20.0	11.5	6.8	5.1				
# bird can ID by sight	302							37.471	20	0.010	48-57 year olds and 38-47 year olds more like to identify more birds. Older people less likely to be able to identify birds
1 -50 species		34.1	37.0	41.7	32.8	52.3	43.6				
51-100 species		15.9	14.8	10.0	13.1	27.3	25.6				
101- 150 species		4.5	3.7	10.0	6.6	9.1	10.3				
151 - 200 species		15.9	14.8	5.0	6.6	2.3	12.8				
Over 200 species		29.5	29.6	33.3	41.0	9.1	7.7				
# birds can ID by sound	299							35.849	20	0.016	All age levels not high in identification. Higher ID skills with 38-47 year olds.
1 -50 species		79.5	79.6	71.2	66.7	93.2	92.1				
51-100 species		13.6	11.1	6.8	13.3	4.5	7.9				
101- 150 species		2.3	7.4	6.8	6.7	0.0	0.0				
151 - 200 species		0.0	0.0	0.0	3.3	0.0	0.0				
Over 200 species		4.5	1.9	15.3	10.0	2.3	0.0				
Types of lists kept											
Year list	302	4.5	5.6	3.3	18.0	2.3	0.0	19.255	5	0.002	48-57 year old most likely
Posts on social media/internet	298	77.3	77.4	81.4	80.3	62.8	52.6	15.081	5	0.010	Younger people more likely. Most likely group 38-47 year olds.

Types of Social Media	302									
WhatsApp		47.7	46.3	38.3	44.3	27.3	7.7	21.810	5	0.001	Younger people more likely.
Facebook		63.6	57.4	51.7	55.7	36.4	23.1	19.859	5	0.001	Younger people more likely.
Telegram		20.5	16.7	23.3	31.1	6.8	0.0	20.939	5	0.001	48-57 age group most likely.
Activities											
Fed birds	302	15.9	27.8	45.0	39.3	43.2	53.8	17.525	5	0.004	Older people more likely.
Planted trees	302	6.8	14.8	25.0	34.4	20.5	12.8	15.696	5	0.008	48-57 years more likely.
Put up bird house	302	9.1	14.8	26.7	31.1	22.7	30.8	10.970	5	0.052	48-57 years more likely.
Checked call on web or	302	46.9	51.9	50.0	50.8	27.3	15.4	20.997	5	0.001	38-57 years more likely.
app	302	77.3	74.1	70.0	63.9	59.1	41.0	16.128	5	0.006	Younger people more likely.
Check reports social	302	40.9	38.9	33.3	32.8	22.7	10.3	13.130	5	0.022	Younger people more likely.
media	302	6.8	27.8	18.3	21.3	6.8	15.4	11.923	5	0.036	28-37 years more likely.
Used calls app attract	302	52.3	59.3	43.3	39.3	43.2	23.1	13.811	5	0.017	Younger people more likely.
birds	302	18.2	18.5	15.0	32.8	38.6	43.6	17.664	5	0.003	Older people more likely.
Wrote article about birds	302	27.3	31.5	25.0	14.8	9.1	5.1	16.808	5	0.005	Younger people more likely.
Attended a protest	302	11.4	22.2	28.3	41.0	31.8	30.8	12.463	5	0.029	48-57 years more likely.
Stay in hotel Israel to bird	302	79.5	72.2	68.3	80.3	63.6	53.8	10.980	5	0.052	Younger more likely.
Participated wildlife survey											
Made a donation											
Photographed birds.											
# days birded overseas	302							40.934	25	0.023	48-67 year more likely.
None		67.4	66.7	65.5	49.1	44.1	68.0				
1-3 days		26.9	25.0	16.4	28.3	47.1	20.0				
4-6 days		9.3	2.1	9.1	3.8	2.9	4.0				
7-9 days		0.0	0.0	3.6	3.8	2.9	8.0				
10-13 days		0.0	0.0	0.0	7.5	0.0	0.0				
14 + days		2.3	6.3	5.5	7.5	2.9	0.0				
# days ringing birds	302							46.221	25	.006	Younger people more likely.
None		11.4	20.0	32.7	42.0	58.3	57.1				
1-3 days		22.7	26.0	28.8	28.0	22.2	9.5				
4-6 days		9.1	12.0	9.6	6.0	5.6	9.5				
7-9 days		2.3	8.0	3.8	2.0	2.8	0.0				
10-13 days		4.5	4.0	0.0	2.0	0.0	0.0				
14 + days		50.0	30.0	2.5	20.0	11.1	23.8				

Influences											
Other organization	302	11.4	25.9	21.7	24.6	15.9	0.0	14.717	5	0.012	28-37 years more likely
Limitations											
Time	302	79.5	85.2	68.3	77.0	50.0	38.5	34.628	5	0.000	Younger more likely.
Family obligations	302	9.1	35.2	53.3	39.3	9.1	10.3	45.195	5	0.000	38-47 years more likely
Lack of transportation	302	54.5	16.7	8.3	6.6	2.3	7.7	65.961	5	0.000	Younger more likely.
Cost	302	29.5	24.1	10.0	8.2	9.1	5.1	19.032	5	0.002	Younger more likely.
Lack of equipment	302	20.5	16.7	8.3	4.9	6.8	2.6	12.911	5	0.024	Younger more likely.
Health issues	302	2.3	3.7	5.0	3.3	4.5	17.9	13.229	5	0.021	Older more likely.
% of equipment purchased overseas	**294**							40.821	25	**0.024**	**48-57 years overall more likely to buy overseas.**
None		**40.9**	**40.4**	**40.7**	**29.5**	**46.3**	**48.6**				**58 – 67 years more likely to buy everything overseas.**
1-25%		**36.4**	**25.0**	**13.6**	**31.1**	**19.5**	**16.2**				
26-50%		**13.6**	**5.8**	**6.8**	**8.2**	**17.1**	**13.5**				
51-75%		**4.5**	**13.5**	**11.9**	**9.8**	**4.9**	**5.4**				
75 - 99%		**4.5**	**15.4**	**18.6**	**13.1**	**0.0**	**13.5**				
100%		**0.0**	**0.0**	**8.5**	**8.2**	**12.2**	**2.7**				
Membership in Israel Bird Club	295	4.7	23.1	20.0	21.7	27.3	36.0	12.723	5	0.026	Older people more likely to be members

Table 6

Variables that were Significant in Relation to Age Using Pearson's Correlation Tests

Pearson's correlation	N	Pearson's correlation	p value	Significance
Amount of equipment owned				
Field guides owned	300	.126	0.029	Older people own more.

Table 7

Factors that were Significant in Relation to Membership in a Conservation Organization - Using Chi Square Tests

	N	Mean Yes	Mean No	X^2 Value	df	p Value	Significance
Expertise	325			23.083	4	.000	Higher levels of expertise are more likely to be members in conservation organizations.
Casual		1.80	1.01				
Novice		18.70	20.80				
Intermediate		28.30	40.30				
Advanced		35.50	19.50				
Expert		15.70	9.40				
Level of Interest	313			9.826	2	.007	Higher levels of interest are more likely to be members of conservation organizations.
Slightly interested		5.1	12.3				
Moderately interested		23.6	32.3				
Very interested		71.3	55.5				

Table 8

Factors that were Significant in Relation to Membership in a Conservation Organization - Using Two-tailed Independent t-test

Two tailed Independent t-tests	N	Mean Yes	Mean No	t	df	p value	Significance
Motivation							
Affiliation	320	3.04	2.72	3.039	318	.003	There is a relationship.
Conservation	321	4.25	3.98	3.242	319	.001	There is a relationship.
Achievement	320	4.31	4.18	1.824	318	.069	No relationship.
Appreciation	322	4.20	4.02	2.324	320	.021	There is a relationship

Table 9

Birdwatching activities that were Significant in Relation to Affiliation Motivation - Using Two-tailed Independent t-tests

Affiliation Motivation	N	Yes answers	Mean Yes	t	df	p
Kept notes	331	89	3.2227	3.863	329	.000
Checked ID	331	183	2.9900	2.052	329	.041
Checked sightings	331	217	2.9926	2.626	329	.009
Used calls app	331	100	3.0523	1.994	329	.047
Read	331	225	2.9874	2.628	329	.009
Champions	331	45	3.2237	2.503	329	.013
Sponsored	331	33	3.2475	2.246	329	.025
Wrote	331	55	3.2406	2.972	329	.003
Protest	331	149	3.0718	3.103	329	.002
Rent Car Israel	331	17	3.4235	2.352	329	.019
Hotel Israel	331	88	3.2458	4.115	329	.000
Butterfly survey	331	16	3.3812	2.093	329	.037
Conference	331	139	3.1011	3.405	329	.001
Lecture	331	165	3.1479	4.981	329	.000
Help ID birds	331	245	2.9797	2.798	329	.005
Formal teaching	331	71	3.1634	2.700	329	.007
Informat teaching	331	133	3.1202	3.587	329	.000
Photograph	331	237	2.9610	2.056	329	.041

Table 10

Birdwatching activities that were Significant in Relation to Conservation Motivation - Using Two-tailed Independent t-tests

Conservation Motivation	N	Yes answers	Mean Yes	t	df	p
Fedbird	332	120	4.3464	4.265	330	.000
Plant tree	332	70	4.3024	2.325	330	.021
Bird box	332	79	4.3198	2.758	330	.006
Kept notes	332	89	4.3963	4.171	330	.000
Used calls app	332	100	4.2527	2.159	330	.032
Read	332	225	4.2188	3.625	330	.000
Festival	332	46	4.4312	3.074	330	.002
Champions	332	45	4.5578	4.315	330	.000
Wrote	332	55	4.4048	3.131	330	.002
Protest	332	149	4.2573	3.090	330	.002
Hotel Israel	332	88	4.3057	2.758	330	.006
Bird survey	332	184	4.3125	5.478	330	.000
Butterfly survey	332	16	4.7188	3.310	330	.001
Cleanup	332	56	4.4571	3.764	330	.000
Conference	332	140	4.3214	4.317	330	.000
Lecture	332	167	4.2818	4.091	330	.000
Donation	332	88	4.3504	3.432	330	.001
Help ID birds	332	245	4.1818	2.646	330	.009
Formal teaching	332	71	4.3685	3.205	330	.001
Informal teaching	332	133	4.3373	4.463	330	.000
Photography	33	235	4.1742	2.160	330	.031

Table 11

Birdwatching activities that were Significant in Relation to Achievement Motivation - Using Two-tailed Independent t-tests

Achievement Motivation	N	Yes answers	Mean Yes	t	df	p
Kept notes	331	89	4.4861	3.423	329	.001
Checked ID	331	183	4.3231	2.071	329	.039
Checked sound	331	133	4.3494	2.017	329	.045
Ckecked sightings	331	216	4.3458	3.295	329	.001
Used calls app	331	100	4.4187	2.671	329	.008
Read	331	225	4.3492	3.627	329	.000
Rent Car OV	331	38	4.5596	2.624	329	.009
Hotel Israel	331	88	4.5924	4.963	329	.000
Butterfly survey	331	16	4.6667	2.188	329	.029
Lecture	331	166	4.3394	2.242	329	.026
Help ID birds	331	244	4.3370	3.701	329	.000
Guide Israel	331	37	4.6486	3.329	329	.001
Guide OV	331	34	4.5029	2.018	329	.044
Informal teaching	331	132	4.3937	2.844	329	.005
Photograph	331	234	4.3531	4.026	329	.000

Table 12

Birdwatching activities that were Significant in Relation to Appreciation Motivation - Using Two-tailed Independent t-tests

Appreciation Motivation	**N**	**Yes answers**	**Mean Yes**	**t**	**df**	**p**
Checked ID	333	183	4.1826	2.060	331	.040
Checked sightings	333	216	4.1762	2.314	331	.021
Read	333	225	4.1793	2.579	331	.010
Rent car Israel	333	17	4.4706	2.163	331	.031
Rent car OV	333	38	4.3904	2.610	331	.009
Hotel Israel	333	88	4.3295	3.436	331	.001
Butterfly survey	333	16	4.4687	2.084	331	.038
Lecture	333	166	4.1890	2.023	331	.044
Help ID birds	333	246	4.1694	2.573	331	.011
Guide Israel	333	37	4.3937	2.602	331	.010
Guide OV	333	34	4.3627	2.204	331	.028

Table 13

Results of Factor Analysis of Motivation items (Principal Components Extraction, Varimax Rotation)

Factor name	Factor 1 Achievement Motivations	Factor 2 Conservation Motivation	Factor 3 Appreciation Motivation	Factor 4 Affiliation Motivation
Shared Interest	.104	.191	.118	.802
Make friends	.074	.230	.113	.664
Part of community	.121	.291	.046	.753
Feel like expert	.174	.190	.003	.636
Compete with birders	.119	-.006	.080	.429
Time with family/friends	.116	.322	.150	.454
Help birds	-.033	.809	.131	.137
Give back to nature	-.011	.724	.155	.149
Learn about nature	.321	.371	.172	.030
Help scientists	.151	.613	-.087	.255
Contribute to conservation	.058	.788	-.033	.210
Contribute to knowledge	.110	.770	.037	.232
See bird never seen before	.858	.053	.127	.121
See birds rarely seen before	.864	.058	.126	.089
See as many different species	.827	.081	.177	.143
Improve skills	.757	.067	.259	.258
Challenge skills	.697	.037	.223	.350
Study birds	.382	.194	.436	.063
Enjoy sights and sound nature	.215	.299	.674	-.122
Be outdoors	.266	.235	.712	-.008
Feel refreshed	.003	-.025	.777	.251
Relax	.085	-.169	.753	.266
Be alone	.222	-.153	.451	.219
Because birds are beautiful	.348	.237	.537	-.025
Eingenvalue	**6.995**	**3.095**	**1.854**	**1.696**
Proportion of variance explained	**29.144**	**12.895**	**7.724**	**7.066**
Cumulative variance explained	**29.144**	**42.039**	**49.763**	**59.829**
Cronbach's alpha	**.881**	**.825**	**.753**	**.795**