

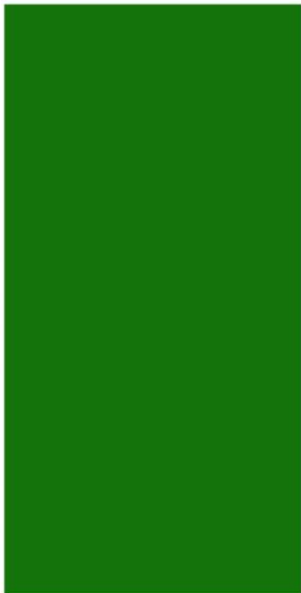


SOUTH DAKOTA

South Dakota Results of the **Wildlife Viewer Survey**

Enhancing Relevancy and Engaging Support from a Broader Constituency

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Acknowledgements

This state report is part of a larger project funded by the U.S. Fish and Wildlife Service's Multistate Conservation Grant Program (grant # F21AP00617-00), which is jointly managed by the Association of Fish and Wildlife Agencies and the Service's Wildlife and Sport Fish Restoration Program. This state-level survey sampling, analysis, and report was funded by the South Dakota Department of Game, Fish, and Parks.

We thank the 2022 Wildlife Viewing and Nature Tourism Academy in-person and virtual attendees for their participation in the Recommendations Workshop. We thank Patricia Allen for coordination with the Association of Fish and Wildlife Agencies and the U.S. Fish and Wildlife Service. We thank Dr. Jessica Barnes, Kelsey Jennings, and Dr. Willanda Chaves for their contributions to the development of the survey and the regional report that was the foundation for this state report.

Note that significant portions of the regional report (Sinkular et al. 2022), in particular in the background, are replicated verbatim in this report. We do so with permission from all of the regional report authors. In addition, the state reports for this project all use a similar template.

Suggested Citation

Sinkular, E.N., Pototsky, P.C., Wolter, F., & Dayer, A.A. 2022. South Dakota Results of the Wildlife Viewer Survey: Enhancing Relevancy and Engaging Support from a Broader Constituency. Virginia Tech: Blacksburg, Virginia.

EXECUTIVE SUMMARY

Background

Wildlife viewing (closely observing, photographing, or feeding wildlife, maintaining plantings or natural areas for the benefit of wildlife, or taking trips to parks or other natural areas to feed, photograph, or observe wildlife) is one of the fastest growing wildlife-related recreation activities in the United States (U.S. Fish and Wildlife Service, 2018). As participation in wildlife viewing continues to grow, so do questions about the characteristics of wildlife viewers and their perceptions of state agencies.

Historically, state fish and wildlife agencies (hereafter, state agencies) have depended on hunters, trappers, and anglers to fund the agencies' conservation efforts, partially influenced by the North American Model of Conservation (Price Tack et al., 2018). In this system, state agencies rely heavily on funds derived from sales taxes on certain sporting equipment and receipts from licenses and permits purchased by hunters, anglers, and trappers to support their operations (For more information: <https://www.ecfr.gov/current/title-50/chapter-I/subchapter-F/part-80>). In recent years, surveys show a plateau or decline in participation in hunting and angling, while participation in wildlife viewing continues to rapidly grow (U.S. DOI et al., 2016). However many state agencies do not have robust funding mechanisms in place which wildlife viewers can contribute through.

As the number of viewers continues to rise, it is increasingly important that state agencies understand who these wildlife viewers are, including their perspectives on and expectations of state agencies and wildlife conservation. Wildlife viewers have the potential to significantly aid state agencies in achieving their conservation goals (AFWA & WMI, 2019) through financial contributions and a range of behaviors. This study of wildlife viewers in South Dakota, one of 15 states that participated in state-level surveying, represents a key step in implementing the strategies outlined in the Fish and Wildlife Relevancy Roadmap (AFWA & WMI, 2019) by providing the South Dakota Department of Game, Fish, and Parks (hereafter, GFP) with updated information (Gigliotti 2002, 2012; Southwick 2022) and new tools to connect with a broader constituency of wildlife viewers.

Methods

To understand wildlife viewers, our Virginia Tech research team collaborated with the Association of Fish and Wildlife Agencies' (AFWA) Wildlife Viewing and Nature Tourism Working Group (WVNTG) to conduct a multi-state survey of wildlife viewers (i.e., the Wildlife Viewer Survey) in 2021, with additional sampling at the state level in 15 states. For the 15 states with

additional sampling, the survey was adapted to be most applicable to each state. A Steering and Executive Committee, which consisted of members of the WVNTG and other state agency representatives, worked closely with us throughout the duration of this project. In South Dakota, this survey consisted of a random sample of participants from the GFP camping reservation database who were over the age of 18, and reported participating in wildlife viewing (defined as closely observing, photographing, or feeding wildlife, maintaining plantings or habitat for the benefit of wildlife, or taking trips to parks or other natural areas with the purpose of observing, feeding, or photographing wildlife) in the past five years.

The survey questionnaire was informed by the Multi-State Steering and Executive Committees, state agency representatives, and findings from a variety of surveys, including the Virginia Wildlife Recreation Study Report (Grooms et al., 2020), National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (hereafter, National Survey of Wildlife Recreation; U.S. DOI et al., 2016), and a survey conducted by the North American Waterfowl Management Plan (NAWMP) Human Dimensions Working Group (NAWMP, 2021). Respondents answered questions about their wildlife viewing behaviors, identities, preferences, and experience with their state agencies.

For this report, we analyzed survey responses by comparing “consumptive viewers” (those who participated in hunting, trapping, and/or angling in the past five years) and “nonconsumptive viewers” (those who did not participate in these other recreational activities). We chose to compare consumptive and nonconsumptive viewers’ responses throughout the report because this project’s focus is to expand state agency relevance to a broader constituency, particularly for those wildlife viewers who are not already engaged in hunting, trapping, and angling. Analysis consisted primarily of chi-square or t-tests conducted in the Statistical Package for Social Science (SPSS).

Findings

In the following subsections, we review findings for the state of South Dakota, which consisted of a statewide descriptive analysis and a consumptive versus nonconsumptive comparative analysis based on 463 completed survey responses. Our survey examined demographics, behaviors, frequency, and preferences of viewing activities of wildlife viewers in South Dakota. We also examined South Dakota wildlife viewers’ current relationships with and preferences for support from GFP. The majority of survey respondents (77%) were classified as consumptive viewers and roughly 23% were classified as nonconsumptive viewers. Despite small sample sizes for some of our response options, we were able to examine statistically significant differences between consumptive and nonconsumptive viewers in a variety of survey topics. In a small number of cases, statistical tests could not be conducted due to the low amounts of

respondents selecting certain items. Overall, we found that consumptive and nonconsumptive viewers are distinctive groups; consumptive and nonconsumptive viewers have different preferences, behaviors, and levels of participation in wildlife viewing. Additionally, more nonconsumptive viewers identified as women in comparison to consumptive viewers. Generally, we can define consumptive viewers as more experienced and skilled viewers than nonconsumptive viewers. We also found that consumptive viewers tended to have higher levels of experience with, familiarity with, and financial contributions (past and future) to GFP than nonconsumptive viewers.

Wildlife viewer demographics

Just about three-quarters our respondents reported their total household income as \$50,000 or higher. Approximately 29% of wildlife viewers surveyed lived in a major city, 27% reported living in a small city, and the remaining 44% reported living in a rural area or small town. The vast majority of respondents identified as White, and about 5% identified as BIPOC (Black, Indigenous or people of color).

Consumptive and nonconsumptive viewer comparisons

We found no differences in the demographic characteristics of consumptive and nonconsumptive viewers in terms of income and education level. When analyzing binary gender identity (due to low sample size, only binary identity could be evaluated), more consumptive wildlife viewers identified as men and more nonconsumptive wildlife viewers identified as women. Similarly, slightly more consumptive viewers indicated living in rural areas in comparison to nonconsumptive viewers. Due to small sample sizes, we were unable to test for statistically significant differences in ethn racial identity between consumptive and nonconsumptive viewers.

Wildlife viewing behaviors

Viewing interests and activities

Wildlife viewers most commonly participated in wildlife viewing by visiting parks and natural areas with the purpose of observing, feeding, or photographing wildlife. Roughly 90% of respondents in South Dakota were interested in viewing land mammals and just over 80% were interested in viewing birds. In addition to visiting parks and other locally-managed areas to view wildlife, many wildlife viewers participated in viewing at their own home. In a typical year, over half of the survey respondents reported viewing for 30 days or more per year.

Impacts of the COVID-19 pandemic on wildlife viewing

We also asked wildlife viewers how the COVID-19 pandemic impacted their overall participation in wildlife viewing and interpreted these findings using “R3” terminology (recruitment, retention, and reactivation) from the Outdoor Recreation Adoption Model. Over 90% of wildlife viewers in South Dakota were classified as “retained,” meaning the pandemic had no impact on their overall participation in wildlife viewing—they were wildlife viewing prior to the COVID-19 pandemic, and continued wildlife viewing during the pandemic. Less than 2% of respondents indicated they stopped viewing during the COVID-19 pandemic. Compared to a typical year, total participation in wildlife viewing declined during the first year of the COVID-19 pandemic for viewing outside of South Dakota or the U.S. For 2022, wildlife viewers anticipated spending an amount of time viewing wildlife that was comparable to a typical year.

Skill level and support

In terms of expertise as a wildlife viewer, the majority of survey respondents self-identified as beginner, novice, or intermediate level viewers rather than advanced or expert. Just over 80% of all viewers reported having participated in wildlife viewing for roughly more than 20% of their lives. Over half of wildlife viewers own (or have rented or borrowed) specialized equipment for viewing in recent years. Family and friends were the strongest form of social support that influenced viewer participation.

Consumptive and nonconsumptive viewer comparisons

Overall, we found that the wildlife viewing behaviors of consumptive and nonconsumptive viewers tended to be somewhat different. In comparison to consumptive viewers, more nonconsumptive viewers participated in visiting parks and natural areas to observe, feed, or photograph wildlife. More consumptive viewers were interested in viewing fish than nonconsumptive viewers; however, nonconsumptive viewers were more interested in viewing insects, and amphibians in comparison to consumptive viewers. Nonconsumptive viewers spent fewer days viewing wildlife than consumptive viewers. In addition, more consumptive viewers reported viewing on the property of a friend or family member or other private property in comparison to nonconsumptive viewers. Due to small sample sizes, we were unable to test if there was a difference in the impact of the COVID-19 pandemic on overall participation in wildlife viewing between consumptive and nonconsumptive viewers; however, the vast majority of viewers were classified as “retained,” meaning there was no overall impact on their participation in wildlife viewing.

In terms of wildlife viewing expertise, we found that more nonconsumptive viewers classified themselves as beginner or novice and more consumptive viewers classified themselves as intermediate or advanced. Additionally, more consumptive viewers reported viewing for a longer percentage of their lives in comparison to nonconsumptive viewers. There was no significant difference in the percentage of consumptive and nonconsumptive viewers who owned, borrowed, or rented specialized equipment for wildlife viewing in the past five years. Finally, we found no difference in the reported extent of social support received from family, friends, peers, and friends. peers.

Conservation behaviors

We investigated the likelihood of wildlife viewers in South Dakota participating in a number of conservation-related activities, either generally or with/in support of GFP. Overall, wildlife viewers most often reported being likely to clean up trash or litter or participate in civic engagement (such as voting or advocating) related to wildlife conservation. They least often reported being likely to donate to support wildlife conservation or inform/teach others about wildlife conservation. When comparing wildlife viewers' likelihood to engage in conservation behaviors generally or with/in support of GFP wildlife viewers expressed a slightly higher likelihood of engaging in behaviors independently of GFP.

Consumptive and nonconsumptive viewer comparisons

When comparing consumptive and nonconsumptive viewers, we generally found no difference between consumptive and nonconsumptive wildlife viewers' reported levels of likelihood to participate in the majority of conservation behaviors investigated in this report. Consumptive viewers were slightly more likely to enhance habitat or purchase products whose proceeds benefit wildlife than nonconsumptive viewers. In comparison to consumptive viewers, nonconsumptive viewers were slightly more likely to donate to conservation efforts in support of GFP.

Wildlife viewing barriers

We surveyed wildlife viewers in South Dakota about a variety of topics that limited their participation in wildlife viewing. Our results indicate that distance to wildlife viewing locations and lack of free time are the greatest barriers, with half or more than half of wildlife viewers reporting *somewhat* to *a great deal* of limitation to their participation. Respondents in South Dakota were least limited by safety concerns in wildlife viewing locations or lack of transportation to wildlife viewing locations.

We specifically investigated the degree to which wildlife viewers experience accessibility challenges, which were defined as “[t]he difficulties someone experiences interacting with the physical or social environment when engaging in a meaningful activity such as birding. These may be the result of mobility challenges, blindness or low vision, intellectual or developmental disabilities (including Autism), mental illness, being Deaf or Hard of Hearing or other health concerns” (Birdability, 2021). We found that just 12% of wildlife viewers in South Dakota experienced *somewhat to a great deal* of accessibility challenges when participating in wildlife viewing.

Consumptive and nonconsumptive viewer comparisons

We found no statistically significant differences between nonconsumptive and consumptive viewers in regards to accessibility challenges.

Relationships with GFP

Finally, we explored South Dakotan wildlife viewers’ familiarity and experiences with, perceptions and trust of, and financial contributions to GFP.

Familiarity with GFP

Given that respondents were from a GFP email list, not surprisingly three-quarters of viewers were *moderately* or *very* familiar with GFP. However, less than half of all wildlife viewers were *moderately* or *very familiar* with GFP staff. The majority of survey respondents in South Dakota reported that they felt the state agency’s level of prioritization of programs and services for wildlife viewing was *about right*; just about one-third of respondents felt it was *too low* or *far too low*. Still, survey respondents generally indicated moderate levels of trust in GFP as an agency and in GFP staff. Wildlife viewers also scored GFP moderately, on average, on various facets of trust (capability, benevolence, and integrity).

Experience with GFP programs and services

Over 90% of respondents had used or engaged in at least one GFP program and service in the last five years, with camping being the most popular activity. Other popular programs and services included GFP visitor or education centers and information about wildlife in South

Dakota. Wildlife viewers least commonly accessed GFP technical assistance or information about wildlife habitat or volunteer opportunities, not related to data collection.

Financial contributions to GFP

Almost all respondents had made at least one purchase or contribution to GFP in the past five years. In general, more wildlife viewers had contributed via nonvoluntary mechanisms (e.g., fees, licenses, and required habitat or conservation stamps) than voluntary mechanisms (e.g., donations and voluntarily purchased habitat or conservation stamps) in the past five years. GFP fishing licenses were the most commonly purchased item. We also examined the likelihood of wildlife viewers to contribute via voluntary and nonvoluntary funding mechanisms in the future. About 60% of survey respondents in South Dakota indicated that they were *moderately, very, or extremely likely* to purchase a fishing license or a GFP lands access pass, permit, or entrance fee in the next five years. This list included items that are currently not available from GFP. For example, about one-half of wildlife viewers indicated that they were *moderately, very, or extremely likely* to purchase a lottery ticket for which the proceeds go to habitat conservation in the next five years, if they had the opportunity to do so. Additionally, we found that over one-third of wildlife viewers were *very or extremely likely* to increase their contributions to GFP if they knew their funds would be used for habitat conservation or to support conservation of the types of wildlife they like to view.

Viewing support preferences

To better support wildlife viewers' participation, the most respondents reported that GFP can provide viewers with more information about where to go to see wildlife, more information about wildlife in South Dakota, and access to more places to view wildlife. Finally, we found that the most preferred channels of state agency communication for wildlife viewers in South Dakota were the GFP website, email updates or e-newsletters, and printed materials (such as brochures and maps).

Consumptive and nonconsumptive viewer comparisons

Broadly, we found that consumptive and nonconsumptive viewers have somewhat different perceptions of and experiences with GFP. Overall, consumptive viewers were considerably more familiar with and had stronger relationships with GFP in terms of: past and future contributions to GFP, and interest in receiving wildlife viewing support from GFP.

For example, nonconsumptive viewers were far less familiar with the two of the five tested aspects of GFP: staff and lands. There was no statistically significant difference in terms of trust in GFP; both consumptive and nonconsumptive viewers have similar, moderate levels of trust in the state agency. There were only three statistically significant differences in terms of GFP programming. More nonconsumptive viewers utilized GFP visitor or education centers in comparison to consumptive viewers while more consumptive viewers indicated experience with conservation law enforcement and volunteer data collection opportunities.

The most pronounced differences between consumptive and nonconsumptive viewers were in their financial contributions to GFP. Consumptive viewers most commonly contributed via the purchase of a fishing license, whereas nonconsumptive viewers most commonly contributed through a land access pass or fee.

We also found that, in general, more nonconsumptive viewers were interested in receiving further support from GFP for their wildlife viewing activities than consumptive. Both consumptive and nonconsumptive viewers were interested in more information about wildlife, information about where to go to see wildlife, and access to more places to go wildlife viewing.

Conclusions

The South Dakota results of the Wildlife Viewer Survey provide a profile of wildlife viewers that can be utilized by GFP to overcome barriers to broader relevance, public engagement, and financial support as called for in the Roadmap to Relevancy (AFWA & WMI, 2019). Our profile includes what viewers like to participate in, how they view and trust state agencies, what services and programs they wish agencies to provide, how they most like to support conservation through action or funding, and more.

As GFP aims to better engage wildlife viewers in South Dakota, we recommend three general needs to establish a lasting and equitable relationship: 1) provide more wildlife viewing information and access, 2) promote around-the-home viewing opportunities, especially near population centers, and 3) develop social support networks for wildlife viewers. If interested in achieving broader relevancy to constituents, we recommend that GFP focus their engagement efforts on wildlife viewers who do not hunt or fish. Support for this currently underserved group might include resources for around-the-home viewing, birding, and information on wildlife viewing tailored for beginners. This strategy will additionally serve the established constituency of hunters and anglers that also view wildlife. Finally, we recommend the development of wildlife viewer-specific GFP contribution mechanisms, with an emphasis on establishing mechanisms appealing to wildlife viewers who do not hunt, trap, or fish. An initial

strategy for establishing these mechanisms is by developing a wildlife viewing membership or other program that uses gathered funds for species conservation or conservation education.

The following report details the methodology, findings, and conclusions from analyses of South Dakota data from the Wildlife Viewer Survey. Accompanying Appendices contain the survey instrument and supplemental results tables.

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BACKGROUND

Introduction

Across the United States, state fish and wildlife agencies (hereafter, state agencies) are key players in the conservation of wildlife and their habitats (AFWA, 2017). State agencies have legal authority and responsibility to steward wildlife resources as a public trust, in the interest of all current and future members of the public (Organ et al., 2012). To that end, the 50 state agencies manage public lands and waterways, provide technical support for conservation on private lands, conduct wildlife research and monitoring, and govern wildlife harvests and wildlife-associated recreation, among other activities (Organ et al., 2012; AFWA, 2017). Since their inception, the work of many state agencies has been largely funded through the sale of hunting and fishing licenses, boating and shooting permits, and taxes on recreation equipment under a user-pay user-benefit model (Organ et al., 2012). However, a shifting user-base and cultural conditions call for re-examining and possibly revising this model. In particular, declines or stagnation in hunting and angling among an increasingly urbanized population have made it clear that the sustainability of state agencies and their contributions to wildlife conservation is contingent on expanding and diversifying the financial and political support provided by the public (U.S. DOI et al., 2016; AFWA & WMI, 2019). Specifically, agencies face the challenge of maintaining their current supporters while increasing their relevance to and engagement with new and broader constituencies (AFWA & WMI, 2019). These broader constituencies include people in diverse demographic, social, and geographic groups. In addition, this includes recreationists who are invested in wildlife and the outdoors, but may have values, interests, and behaviors that differ from those of the hunting and angling communities that have traditionally been the target audience for agencies (AFWA & WMI, 2019). Central among these nontraditional recreation groups are people who participate in wildlife viewing, one of the fastest growing outdoor recreation activities in the United States (U.S. DOI et al., 2016).

Wildlife Viewers

Wildlife viewing is a broad category of wildlife-associated recreation that includes intentionally observing, photographing, or feeding wildlife, improving or maintaining wildlife habitats, and visiting parks and natural areas for the primary purpose of wildlife viewing (U.S. DOI et al., 2016). As of 2016, over a third of U.S. adults participate in various forms of wildlife viewing, including 14.3 million additional wildlife viewers reported since 2011 (U.S. DOI et al., 2016). From 2011 to 2016, the number of U.S. adults participating in wildlife viewing increased by 14.3 million, or an increase in participation to over one-third of the adult population. Viewers spend nearly \$76 billion on their viewing activities annually, including \$170 million in access fees for public lands (U.S. DOI et al., 2016). Specifically, in South Dakota, the 2011 National Survey of

Hunting, Fishing, and Wildlife-Associated Recreation (hereafter, National Survey of Wildlife Recreation) estimated 384,000 wildlife-watching participants in South Dakota, almost one-half of all state residents. Between 2001 and 2011, in-state wildlife-watching expenditures did not change significantly.

Birdwatchers and other viewers also directly contribute funds to wildlife and habitat conservation (Fulton et al., 2017). A study in New York State found that people who bird (including those who both hunt and bird) are more likely than non-recreationists and hunters to donate to conservation (Cooper et al., 2015). They are also more likely to participate in pro-environmental behaviors such as conducting habitat enhancement, joining environmental groups, and supporting conservation policy (Cooper et al., 2015). Similar patterns have been seen in Virginia, where recreationists who identify as birders or other viewers (alone or in addition to identifying as hunters and anglers) engage in a range of conservation activities more often than those who only hunt or fish (Grooms et al., 2020). Additionally, wildlife viewing is a means of connecting people to nature and garnering general support for wildlife conservation (Kellert et al., 2017). Wildlife viewers are thus a critical constituency for state fish and wildlife agencies, especially given stable or declining rates of participation in hunting and angling over the past decade (U.S. DOI et al., 2016) and the ongoing need to generate broader support for agency efforts. However, viewers' direct support of wildlife agencies is currently limited. In part, this limited support is due to a lack of dedicated funding streams for wildlife viewers that would parallel the licenses, permits, and excise taxes that connect hunters and anglers to state agencies (Organ et al., 2012). Limited financial support from viewers may also be due to their perceptions that agencies serve them less than hunters and anglers (Grooms et al., 2019). Additionally, birders and other viewers tend to have lower levels of trust in state and federal agencies, relative to other entities (Fulton et al., 2017) and in comparison with hunters and anglers (Grooms et al., 2020).

While wildlife viewers undoubtedly benefit from the work of state agencies through activities such as habitat management and research, as well as established wildlife viewing programs that serve viewers directly, agency relationships with this emerging constituency are still relatively new in some states. The Fish and Wildlife Relevancy Roadmap (hereafter, Relevancy Roadmap) developed by the Association of Fish and Wildlife Agencies (AFWA) and Wildlife Management Institute (WMI) in 2019 identified limited capacity to understand and plan for engagement with new groups as key barriers in the ability of agencies to broaden their public support and serve diverse constituencies (AFWA & WMI 2019). The Relevancy Roadmap articulates a need for "increase[d] acquisition and application of social science information" to address these barriers with "science that is as robust and comprehensive as the ecological information relied upon in the past" (AFWA & WMI, 2019, p. 11). Indeed, important insights about wildlife viewer

behaviors and their relationships with agencies have emerged from social science surveys at both state (e.g., Cooper et al., 2015; Grooms et al., 2020) and national levels (e.g., U.S. DOI et al., 2016; Fulton et al., 2017; NAWMP, 2021). (For a review of the current literature on wildlife viewing, see Sinkular et al., 2021) Nonetheless, key knowledge gaps remain about the activities, experiences, perceptions, needs, and preferences of wildlife viewers across the country—critical information for agencies to become more inclusive of and relevant to wildlife viewers, fulfill their missions and public trust directives, and sustainably advance fish and wildlife conservation for generations to come.

Project Background

A 2021 Multistate Conservation Grant Program (MSCGP) grant was awarded to the Association of Fish and Wildlife Agencies' (AFWA) Education, Outreach & Diversity (EOD) Committee - Wildlife Viewing and Nature Tourism (WVNT) Working Group and Virginia Tech to address barriers to the relevancy and inclusivity of state agencies for wildlife viewers. The project included a synthesis of current literature on the behaviors, interests, experiences, and preferences of wildlife viewers (Sinkular et al., 2021); a national-scale web-based survey ($n = 4,030$) that built upon previous research to deepen understanding of wildlife viewers across all four AFWA regions (West, Midwest, Northeast, and Southeast); and recommendations for improved engagement between state agencies and wildlife viewers, co-produced by the research team and staff from state agencies across the country. State agencies were offered the opportunity to opt in to additional survey data collection and analysis within their state in addition to the regional-level survey data and analysis. State-level sampling provided states with the unique opportunity to have results specific to the wildlife viewing constituencies in their state.

A six-member Executive Committee and a 16-member Steering Committee were established to guide implementation of the project by the Virginia Tech team. The Executive Committee, which included the Chair of the WVNT Working Group and other MSCGP proposal co-authors from five state agencies, provided big-picture, strategic guidance for the project and was also responsible for final decisions on a number of fine-scale details in survey design and administration. The Steering Committee, which included human dimensions, wildlife viewing, and nongame wildlife staff from 11 additional state agencies, participated in routine project meetings, liaised with others in their agencies related to the project, and provided feedback to ensure that the survey would be relevant to wildlife viewers and produce data that meet the needs of state agencies. Each of the states that participated in the state-level surveys participated in the Steering Committee. In doing so, they provided feedback on the design of the survey instrument and the state sampling approach.

About this Report

This report presents analysis of data from the Wildlife Viewer Survey (hereafter, Survey) for the state of South Dakota and concludes with evidence-based communications and engagement strategies that the South Dakota Department of Game, Fish, and Parks (hereafter, GFP) can implement to increase their relevance to wildlife viewers and the participation of wildlife viewers in activities that support agencies' conservation goals. The results and conclusions contained in this report contribute to the implementation of multiple strategies of the Relevancy Roadmap by identifying opportunities to enhance the relevancy of state fish and wildlife agencies to wildlife viewers, particularly those who are not already engaged in hunting and angling, avenues for building partnerships with viewers to support implementation of state conservation plans, and potential strategies for engaging viewers in conservation funding mechanisms (AFWA & WMI, 2019).

METHODS

Survey Instrument

Building upon other national and state-specific survey efforts of wildlife recreationists, and based on input from the Steering Committee and state agency representatives, we first developed the regional survey instrument, which consisted of 116 closed-ended questions about wildlife viewers' recreation and conservation behaviors and relationships with their state wildlife agencies.

After completing the regional survey, we adapted it for the state of South Dakota through the addition of survey items about familiarity with GFP, as well as the removal of survey options which were not applicable to the state for survey items about past behavior (see Appendix A for full survey instrument). For all questions which directly relate to the role of the state wildlife agency, GFP was directly named. GFP's Human Dimensions Specialist led implementation and sampling of the survey from a database of GFP emails.

Survey questions covered wildlife viewers':

- Duration, location, and frequency of participation in wildlife viewing
- Participation in other forms of outdoor recreation
- Level of specialization as a wildlife viewer
- Travel- and equipment-related expenditures for wildlife viewing
- Barriers to and social support for participating in wildlife viewing
- Likelihood of participating in conservation behaviors
- Pattern of participation in wildlife viewing during the COVID-19 pandemic
- Familiarity with, perceptions of, and trust in the state agency
- Experience with agency programs and services
- Past financial contributions to state wildlife agencies
- Likelihood to support agencies financially and through conservation behaviors in the future
- Preferred forms of viewing support and communications from the state agency
- Demographic characteristics

To aid in respondent recall, survey questions about behaviors are usually asked with reference to a distinct period of time (e.g., the past year) (Vaske, 2019, Chapter 4). Due to the impact of the COVID-19 pandemic during the survey administration period and the desire to provide state agencies with information from a less unusual time, we instead asked respondents to reflect on "a typical year," which we defined in the survey instrument as "a recent year (within the last ~5 years) that was not impacted by unusual circumstances like the COVID-19 pandemic."

Survey Sampling and Administration

The survey was administered to separate samples in 15 states, primarily through panel surveys purchased through Qualtrics (Figure 1). As South Dakota's panel population was lower, we were unable to conduct a panel survey.

Instead, South Dakota residents were randomly selected from an internal 2021 GFP camping reservation database ($N \sim 15,000$). Once adjusted for undeliverable, opt-out, and ineligible surveys (Final $N = 11,435$), South Dakota received 617 usable surveys, with 463 surveys fully completed. The survey was administered through a GFP-branded web-based survey through the Qualtrics online survey platform. Recipients received an email explaining the survey's purpose, how gathered information would be used, and that to ensure data quality and security, GFP administers public web-based surveys through Qualtrics, a professional online survey platform company. Participants then received a second email with a secure link to complete the survey. This email also explained how the individual could "opt-out" of participating in the survey and invited them to review the "Conservation Social Science in Action" [For more information: <https://arcg.is/eraG9>] service map to learn more about the importance and use of GFP public opinion surveys. Recipients then received three participation reminders, each with different message descriptions, in five day intervals prior to the closing of the survey. Respondents who completed the online survey received a thank-you message. The GFP Human Dimensions specialist then exported and cleaned the data of identifiable information before sending the files to Virginia Tech. As this survey was based on a GFP database, no quotas were set.

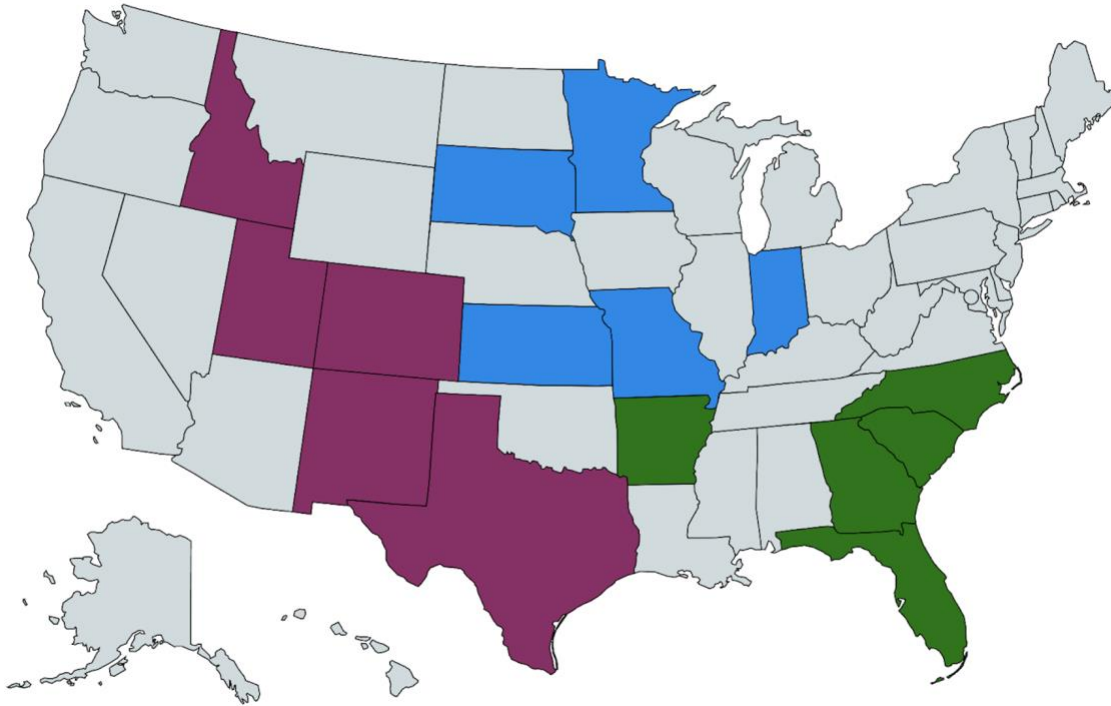


Figure 1: Map of state-level sampling

Map of the United States showing the 15 states that participated in state-level sampling for the Wildlife Viewer Survey. Participating states are colored according to their AFWA region assigned in the regional Wildlife Viewer Survey report (Sinkular et al., 2022).

Eligibility

Only individuals who had participated in some form of wildlife viewing in the past five years were able to complete the survey. This study did not examine traits of non-wildlife viewers. The survey provided a definition of both “wildlife” and “wildlife viewing” to ensure the inclusion of a broad range of people who participate in various forms of wildlife viewing and the exclusion of those who only observe wildlife incidentally during other outdoor activities. The following definitions were adapted from the 2016 National Survey of Wildlife Recreation (U.S. DOI et al., 2016):

For this survey, wildlife refers to all animals, such as birds, fish, insects, mammals, amphibians, and reptiles, that are living in natural environments, including in urban and semi-urban places. Wildlife does not include animals living in artificial or captive environments, such as aquariums, zoos, or museums, or domestic animals such as farm animals or pets.

Wildlife viewing refers to intentionally observing, photographing, or feeding wildlife; improving or maintaining wildlife habitat; or visiting parks and natural areas for the primary purpose of wildlife viewing. Wildlife viewing does not include simply noticing wildlife while doing something else, such as gardening, exercising, hunting, or fishing, or intentionally scouting for game.

Data Analysis

In this report, we generally present response frequencies for each survey question from wildlife viewers across the entire state, referred to throughout the report as the “statewide sample”, as well as separate response frequencies for “consumptive” and “nonconsumptive” wildlife viewers. Theoretical and applied frameworks both characterize wildlife recreation activities and recreationists by so-called “consumptive” and “nonconsumptive” definitions, based on their use of and impact on wildlife (Tremblay, 2001; Vaske & Roemer, 2013). Within this definition, consumptive activities, such as hunting, fishing, and trapping, generally result in the harvest or catching of species from their habitat, while nonconsumptive activities, such as hiking, birdwatching, and other forms of wildlife viewing, do not (Duffus & Deardon, 1990). We recognize the assignment of recreational activities into these categories is not clear-cut, as activities traditionally deemed nonconsumptive can also result in substantial negative impacts on wildlife, including mortality (Green & Higginbottom, 2000). Still, we compare consumptive and nonconsumptive viewers’ responses throughout the report because of the focus of this project on expanding relevancy to a broader constituency for state agencies. Consumptive wildlife viewers were defined as those who participated in trapping, hunting, and angling (or some combination of the three) as additional forms of outdoor recreation during the past five years. Nonconsumptive wildlife viewers were those without this experience and were the smaller group of the two. The statewide group, although identical in size to the consumptive and nonconsumptive groups, is visually represented in most figures with hatching on the statewide sample bars. We used the Statistical Package for Social Science (SPSS) to produce descriptive statistics for survey questions and to conduct inferential statistical tests (i.e., t-test, chi-square, or ANOVA) to explore differences across consumptive and nonconsumptive wildlife viewers. We considered differences statistically significant with a p value of .05 or lower. Results from these tests are described in the Results section and also included in Appendix B.

RESULTS

Survey response

The South Dakota participants for the Wildlife Viewer Survey received back 617 surveys with 463 fully completed surveys. The remaining 154 respondents did not fully complete the survey or failed attention checks (Appendix C). Out of 463 wildlife viewers, 77% of our sample could be classified as consumptive viewers, meaning that, in addition to wildlife viewing, they reported participating in hunting, trapping, and fishing in the past five years. Specifically, 21% of wildlife viewers in South Dakota also fish; 3.2% also hunt; 47% hunt and fish; and 6.1% hunt, fish, and trap. So, 23% of our sample were classified as nonconsumptive viewers, meaning that they did not report participation in hunting, trapping, and fishing in the past five years.

Demographics

Age

We asked respondents to indicate their birth year, with options ranging from 1920 to “After 2003” (i.e., most recent age eligible). Respondents who indicated they were born in 2003 were then asked a follow-up question, “Are you 18 years of age?”, in order to account for those who had not yet turned 18 at the time of survey completion.

The reported ages of all respondents in South Dakota ranged from 23 to 85 (Mean [M] = 55, Standard Deviation [SD] = 13). Over half of all respondents in South Dakota (51%) were 55 years old or older, while 39% were between 34 - 54 years old and only 4.8% were 34 years old or younger. A t-test indicated that the mean age of consumptive wildlife viewers ($M = 55$, $SD = 13$) was not significantly different to the mean age of nonconsumptive wildlife viewers ($M = 56$, $SD = 14$; $t = 0.68$, $df = 438$, $p = .497$; Table 1; Figure 2).

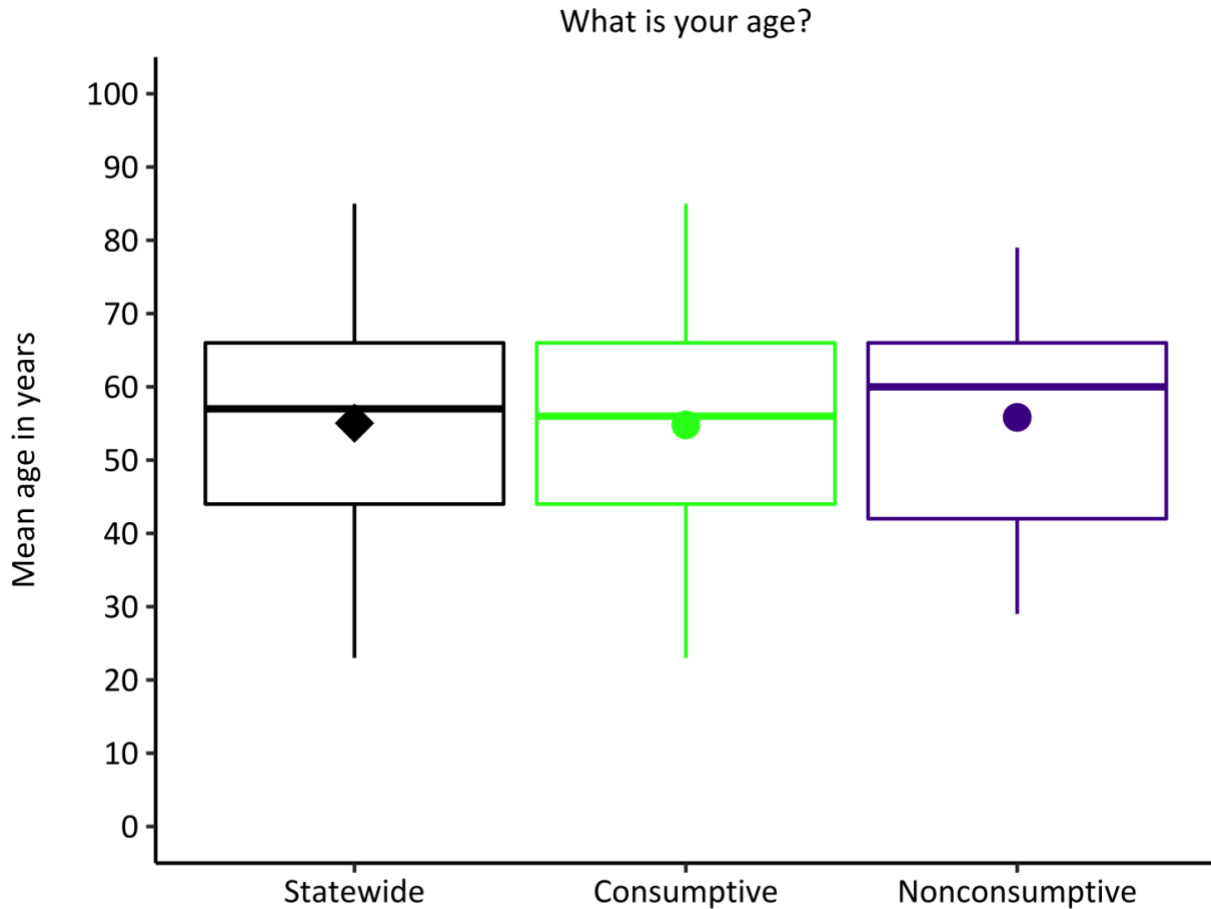


Figure 2: Respondent age

Boxplots (median and interquartile ranges within the boxes) showing the differences in the age of wildlife viewers in South Dakota across the state (statewide) and for consumptive and nonconsumptive viewers. Points represent the mean age (diamond for statewide group, circles for consumptive and nonconsumptive groups) and whiskers represent the minimum and maximum values for the dataset. A t-test indicated no statistically significant difference in the mean age of consumptive and nonconsumptive wildlife viewers (Table 1).

Gender

We provided respondents with five gender-inclusive response options, as suggested by Speil et al. (2019). These options included “man,” “woman,” “non-binary,” “prefer to not disclose,” and “prefer to self-describe” accompanied by an open textbox. The majority of respondents were men (63%), followed by women (35%; Figure 3). A small percentage of respondents (2.7%) selected other response options; 2% chose to not describe their gender and less than 1% selected prefer to self-describe. Due to low sample sizes, self-describing respondents and any that preferred not to disclose their gender identity, were not included in the following gender identity analysis of consumptive and nonconsumptive wildlife viewers. A chi-square test

indicated a statistically significant difference in the binary gender identity of consumptive and nonconsumptive wildlife viewers ($\chi^2 = 26.57, df = 1, p < .001$; Table 2; Figure 3). More nonconsumptive viewers identified as women (55%) than comparison to men (41%).

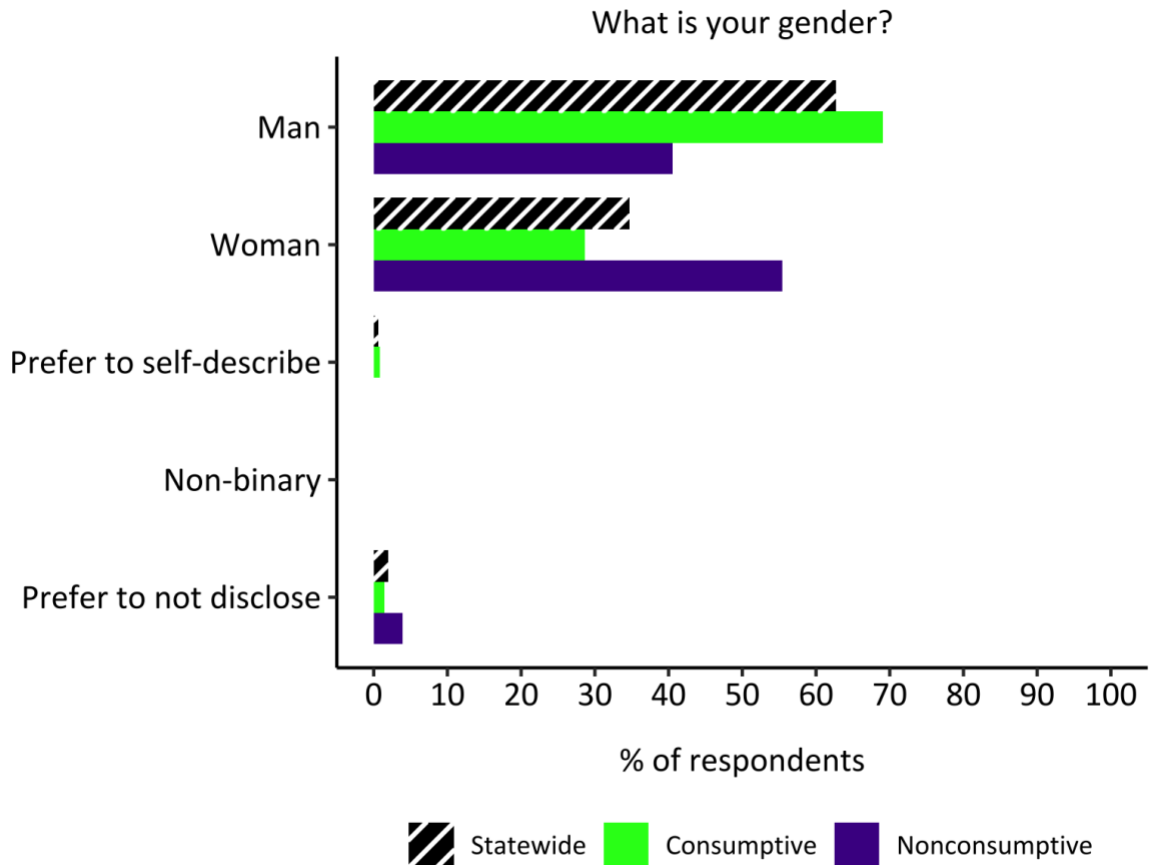


Figure 3: Respondent gender identity

Gender identity of wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. A chi-square test indicated a statistically significant difference in the binary gender identity of consumptive and nonconsumptive wildlife viewers (Table 2).

Education

We included five response options for education in order to gain more specific information from respondents. The largest portion of respondents, 39% reported holding a bachelor’s degree. Less than a third of respondents combined reported completing a high school diploma, equivalent or less (12%) or some college (14%). About 13% held an associate’s or technical degree and 22% held a professional, master’s or doctoral degree. A chi-square test indicated no statistically significant difference in the level of educational attainment of consumptive and nonconsumptive viewers ($\chi^2 = 5.29, df = 4, p = .205$; Table 3; Figure 4).

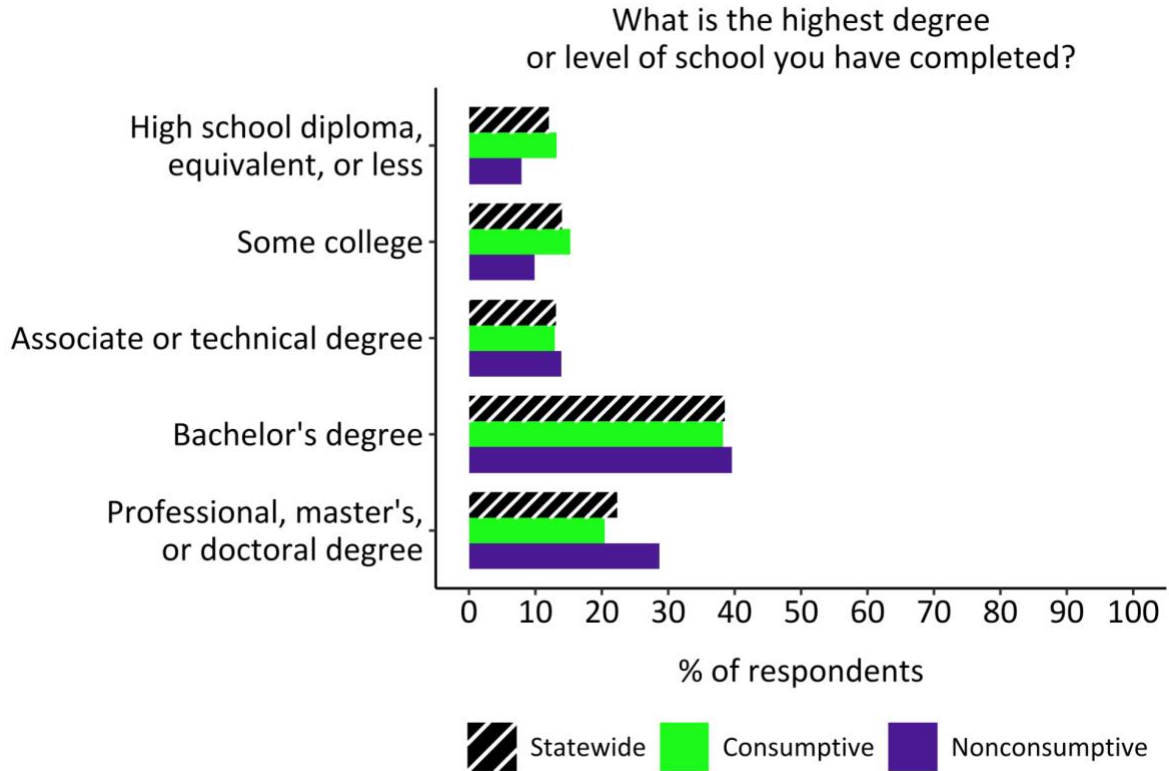


Figure 4: Respondent educational attainment

The highest level of education completed by wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. A chi-square test indicated no statistically significant difference in the education level of consumptive and nonconsumptive wildlife viewers (Table 3).

Race and ethnicity

We provided respondents with a list of eight race or ethnicity options and asked them to select all categories that applied to them. These options were consistent with recommendations from the U.S. Census Bureau, which suggests asking a single question that includes race and ethnicity, rather than a question about race and another about ethnicity, in order to ease respondent burden (Matthews et al., 2015). Our findings of surveyed wildlife viewers skewing toward White were consistent with demographics in South Dakota, though more so than the general population (U.S. Census Bureau, 2021)

While the statewide sample was primarily “White” (97%), respondents also identified as American Indian or Alaska Native (1.8%) (hereafter, “Indigenous”), Asian (0.7%), Hispanic, Latino, or Spanish (0.7%) and Native Hawaiian or other Pacific Islander (0.2%). No respondents identified as “Middle Eastern or North African” or “Black or African American.” Only 1.3% of respondents identified as “some other race or ethnicity.” In addition, 2.2% of respondents identified with more than one race or ethnicity, which we refer to as “multiracial.” Due to low

sample sizes for other ethnoracial identities, analysis of these identities for consumptive and nonconsumptive viewers was collapsed into two groups: White-only and Black, Indigenous, and people of color (hereafter, BIPOC). The BIPOC group includes all other ethnoracial identities, including individuals who identified as White and another race or ethnicity. Due to small sample sizes, a chi-square test could not be conducted to compare nonconsumptive and consumptive viewers when comparing between White-only and BIPOC groups (Table 5; Figure 5).

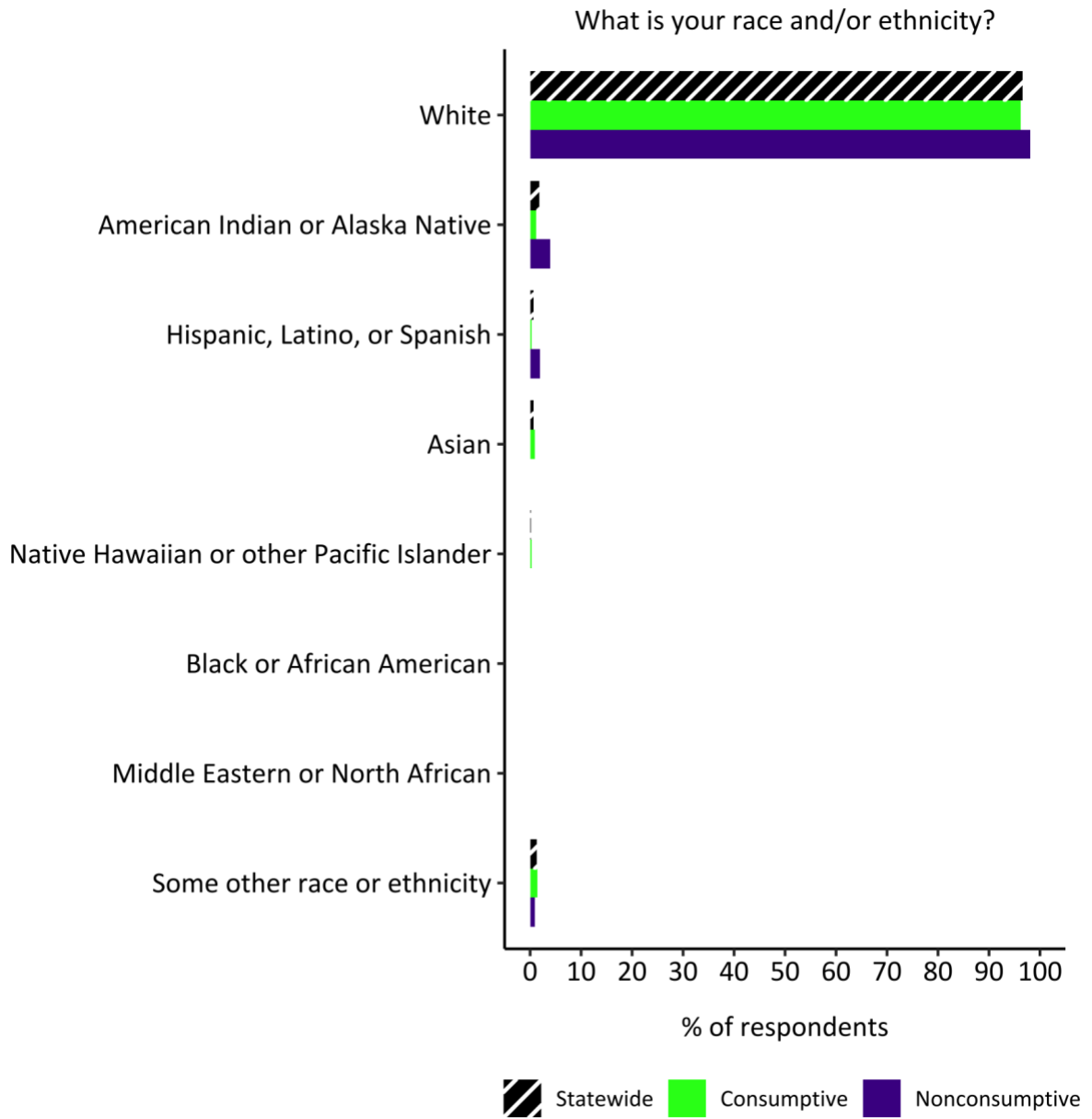


Figure 5: Respondent ethnoraical identity

Ethnoraical identity of wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option to reflect their ethnoraical identity. Due to low sample sizes, analysis of ethnoraical identity for consumptive and nonconsumptive viewers could not be conducted (Table 5).

Household income

The survey asked respondents to select their total household income from six categories ranging from “Less than \$24,999” to “\$125,000 or more”, with each category increasing by \$25,000. In order to ease respondent burden, we reduced these options from the 10 categories presented in the National Survey of Wildlife Recreation, which ranged from “less than \$20,000” to “\$150,000 or more” (U.S. DOI et al., 2016). A seventh option, listed as “prefer not to answer,” was also included and was selected by 12% ($n = 55$) of respondents. This group of responses was excluded from the following analysis.

Only one-fifth (20%) of our respondents reported their total household income as \$49,999 or less. Over one-third of respondents (39%) reported a total household income of \$50,000-99,999 and 40% of survey respondents reported a total household income of \$100,000 or more. Due to low sample size in the responses of those who participated in wildlife watching from South Dakota in the 2011 National Survey of Wildlife Recreation, we were unable to compare our results on household income (U.S. DOI et al., 2011). South Dakota-specific data from the 2016 National Survey of Wildlife Recreation was not collected. We compared the income level between consumptive and nonconsumptive wildlife viewers using a chi-square test, with the “Less than \$24,999” and “\$25,000 - \$49,999” combined due to small sample sizes found no statistically significant difference ($\chi^2 = 2.61$, $df = 3$, $p = .45$; Table 6; Figure 6).

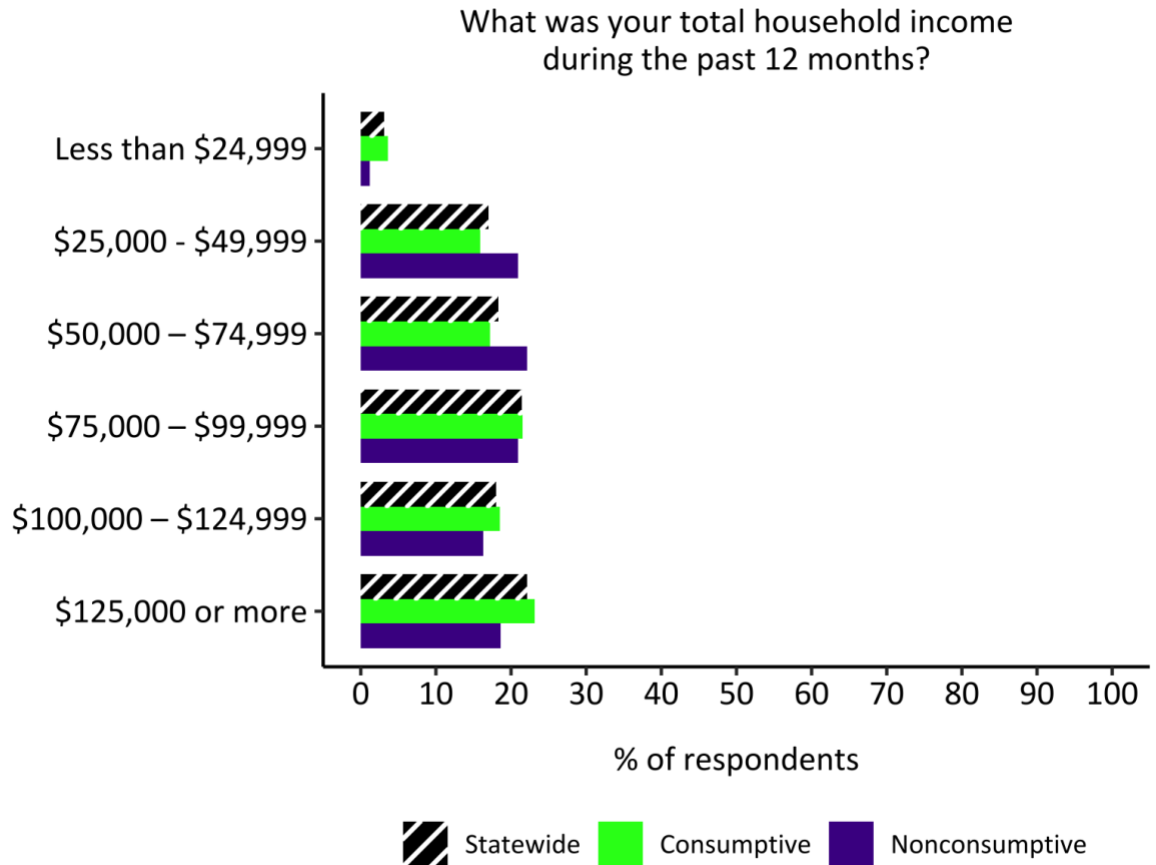


Figure 6: Respondent household income

The total household income range reported by wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. A chi-square test, which combined “Less than \$24,999” and “\$25,000 - \$49,999” found no statistically significant differences in the income levels of consumptive and nonconsumptive wildlife viewers (Table 6).

Residential location

We asked respondents to indicate the size of the area in which they currently live, with the following categories: “Rural area (less than 2,500 people),” “Small town (2,500 - 9,999 people),” “Small city (10,000 - 49,999 people),” or “Urban area (50,000 or more people).” These residential classifications are consistent with the definitions used by the U.S. Census (2010).

Our sample was more rural than that of the South Dakotan sample in the 2011 National Survey of Hunting, Fishing, and Wildlife-Associated Recreation (U.S. DOI et al., 2011), in which 43% of wildlife viewers lived in “Metropolitan Statistical Areas” with populations of 50,000 or more (U.S. DOI et al., 2016). In our survey, only 29% of South Dakota respondents self-reported living in an area with a population of 50,000 or more, and 32% self-reported living in a rural area (Table 7; Figure 7). A chi-square test found statistically significant differences in the residential

location of consumptive and nonconsumptive wildlife viewers ($\chi^2 = 12.39, df = 3, p = .006$; Table 7; Figure 7). Over twice the amount of nonconsumptive viewers reported living in a small town (21%) in comparison to consumptive viewers (9.2%). Conversely, more consumptive viewers (34%) lived in rural areas in comparison to nonconsumptive viewers (26%).

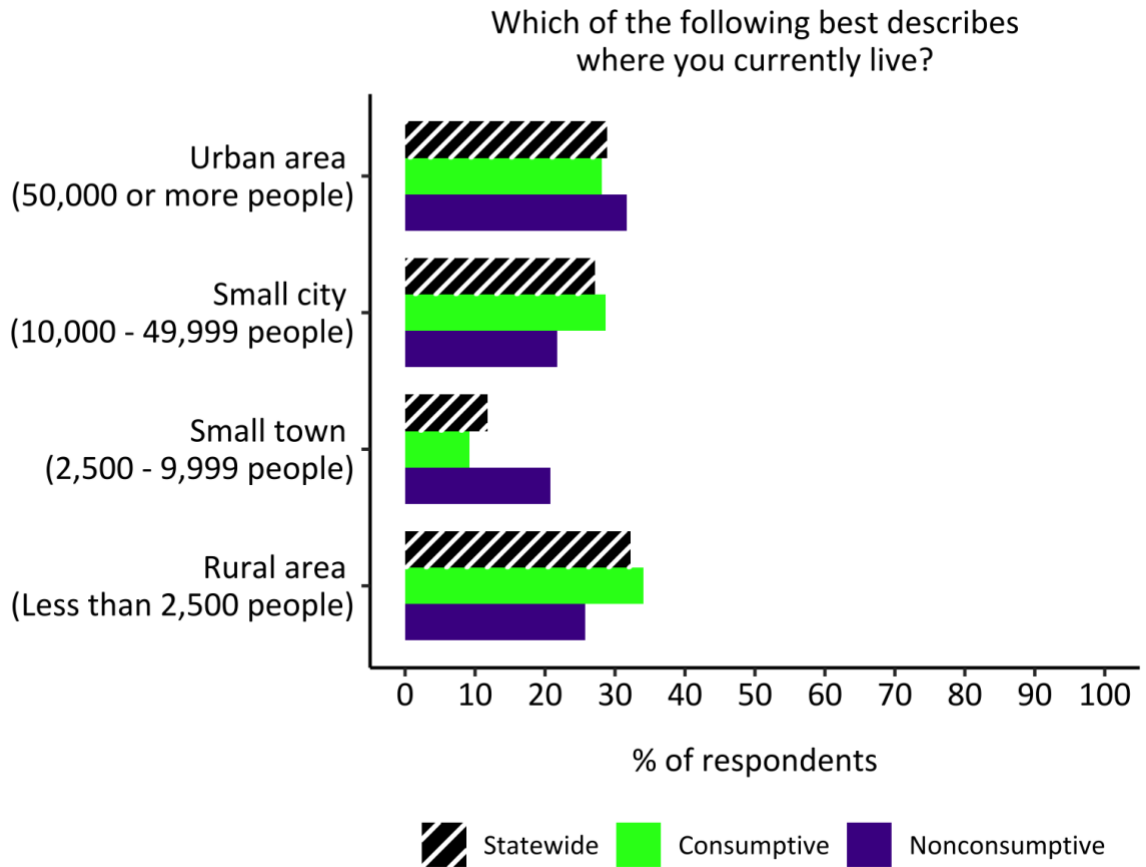


Figure 7: Respondent self-reported size of residential area

The self-reported size of the area in which wildlife viewers in South Dakota reside for statewide, consumptive, and nonconsumptive groups. A chi-square test indicated a statistically significant difference in the residential location of consumptive and nonconsumptive wildlife viewers (Table 7).

Wildlife viewing behaviors

Forms of wildlife viewing

As described in the Methods, the National Survey of Wildlife Recreation defines wildlife viewing as “closely observing, feeding, and photographing wildlife, visiting parks and natural areas around the home because of wildlife, and maintaining plantings and natural areas around the home for the benefit of wildlife” (U.S. DOI et al., 2016). Under this definition, wildlife viewing must occur as an intentional objective of the recreational activity; it does not include incidental

viewing. The survey noted: “Wildlife viewing does not include simply noticing wildlife while doing something else, such as gardening, exercising, hunting or fishing, or intentionally scouting for game.” Incidental viewing, or observing wildlife while doing other recreational activities, is not considered wildlife viewing under this definition and was thus excluded from this survey effort.

We presented respondents with a list of seven wildlife viewing activities adapted from the National Survey of Wildlife Recreation and asked them to select all activities they participate in during a typical year (i.e., a recent year [within the last five years] that was not impacted by unusual circumstances like the COVID-19 pandemic). For those who started viewing wildlife during the pandemic, we asked them to answer all questions about "a typical year" for the past year. The sum of percentages exceeds 100 because 80% of respondents selected more than one behavior. The two most popular wildlife viewing behaviors amongst respondents in South Dakota was visiting parks and natural areas to observe, photograph, or feed wildlife (76%) and photographing or taking pictures of wildlife elsewhere (65%). The next most commonly reported behavior among wildlife viewers was taking trips or outings to any other location to observe, photograph, or feed wildlife (62%) and closely observing wildlife or trying to identify unfamiliar types of wildlife (62%). Over half of all residents in South Dakota indicated they feed wild birds (53%). The least commonly reported activity was feeding other wildlife, which one in five (20%) South Dakotan viewers indicated participating in.

Chi-square tests indicated statistically significant differences for only one of the wildlife viewing activities between consumptive and nonconsumptive wildlife viewers: visiting parks and natural areas to observe, photograph, or feed wildlife. Significantly more nonconsumptive viewers (86%) indicated participating in this activity in comparison to consumptive viewers (74%; $\chi^2 = 5.64$, $df = 1$; $p = .017$; Table 8; Figure 8).

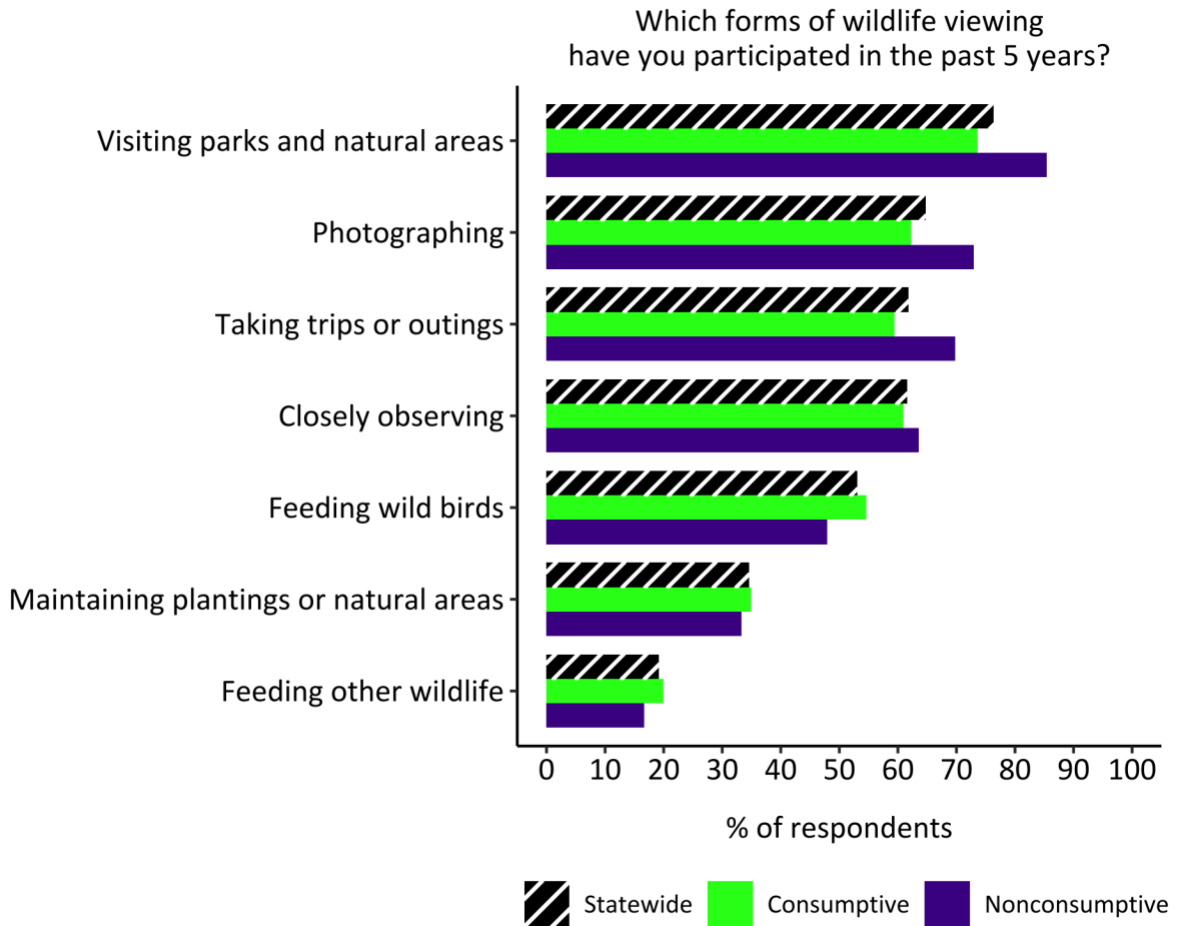


Figure 8: Forms of wildlife viewing

Forms of wildlife viewing that wildlife viewers in South Dakota reported participating in over the past five years for statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option. Chi-square tests indicated only one statistically significant difference for wildlife viewing activities. Significantly more nonconsumptive viewers participated in visiting parks and natural areas than consumptive viewers (Table 8).

Types of wildlife

Based on previous studies, wildlife viewers most commonly view birds, land mammals, and large mammals, including marine mammals (U.S. DOI et al., 2016; Grooms et al., 2019). We asked wildlife viewers to indicate the types of wildlife they liked to view (which included observing, photographing, or feeding). The list of eight types of wildlife to view, not limited to those found in South Dakota, was adapted from the Virginia Wildlife Recreation Survey (Grooms et al., 2019) and the National Survey of Wildlife Recreation (U.S. DOI et al., 2016).

Land mammals were the most popular type of wildlife viewed, with 90% of respondents statewide selecting this response option (because respondents could select more than one item, the sums of all percentages per wildlife type exceed 100). In addition, 82% indicated interest in viewing birds and 37% indicated interest in viewing fish. The least popular type of wildlife, besides the mutually exclusive response option “other types of wildlife” (0.9% of respondents selected this), was amphibians, with only 25% of respondents selecting this response option.

Both nonconsumptive and consumptive viewers were most interested in viewing land mammals. Chi-square tests indicated statistically significant differences in all wildlife type viewing preferences between consumptive and nonconsumptive wildlife viewers except for land mammals and reptiles. More nonconsumptive viewers expressed interest in viewing birds, insects, and amphibians in comparison to consumptive viewers. In regards to out of state viewing, more nonconsumptive viewers expressed interest in viewing marine mammals. Finally, more consumptive viewers were interested in viewing fish in comparison to nonconsumptive viewers (Table 9; Figure 9).

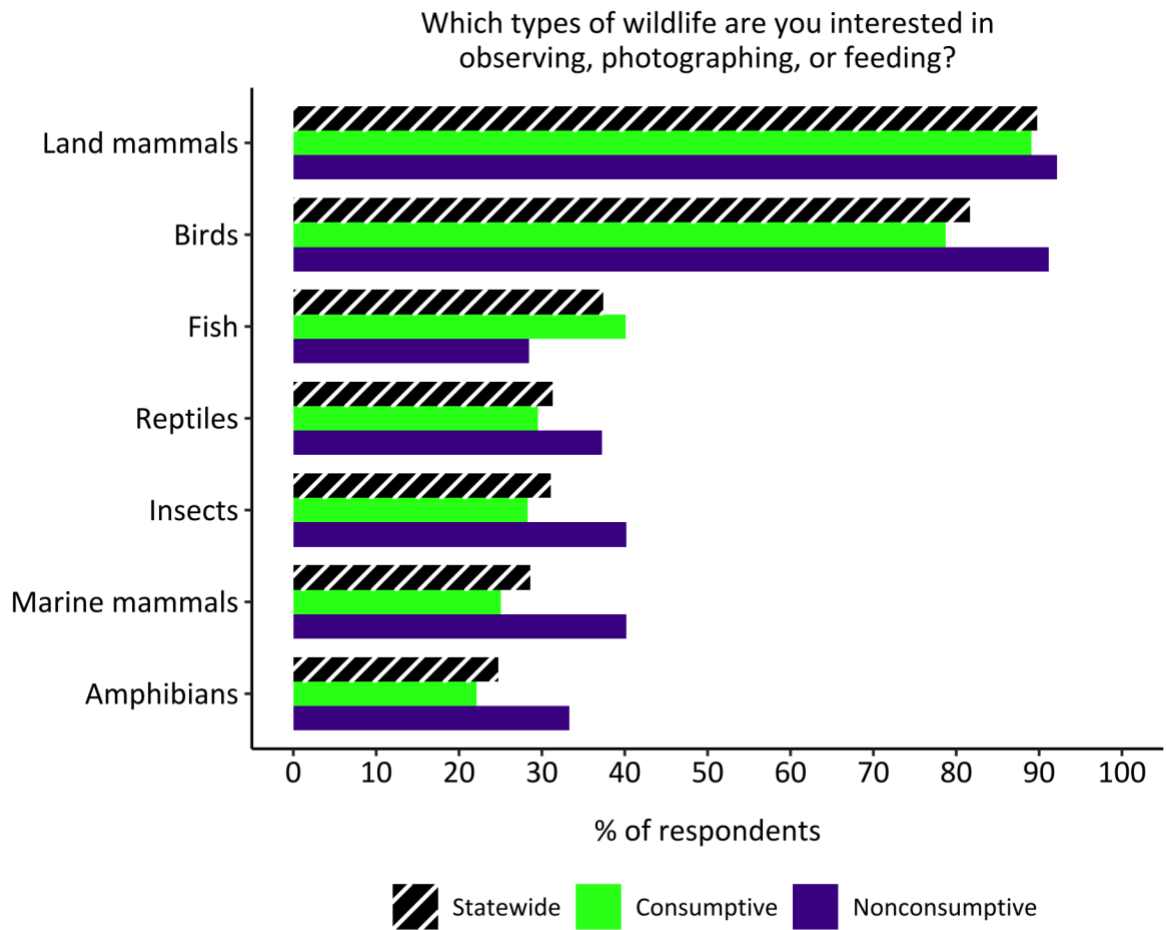


Figure 9: Interest in types of wildlife for wildlife viewing

Types of wildlife that wildlife viewers in South Dakota reported interest in observing, photographing, or feeding for statewide, consumptive, and nonconsumptive groups. Note that percentages for individual response categories sum to more than 100% because respondents were able to select more than one option. Chi-square tests indicated several statistically significant differences in wildlife type viewing preferences between consumptive and nonconsumptive wildlife viewers; nonconsumptive viewers were significantly more likely to report interest in birds, insects, marine mammals, and amphibians in comparison to consumptive viewers. Consumptive viewers indicated a greater interest in fish than nonconsumptive viewers (Table 9).

Recreational specialization of wildlife viewers

Across diverse forms of outdoor recreation, specialization refers to a continuum of intensity in an individual’s interest and involvement in a given activity (Scott & Shafer, 2001). The best approach to measuring specialization is an area of active research and debate among scholars, but there is consensus that specialization is multidimensional, and as such, it is generally measured through multiple questions in survey research, rather than a single item (Needham et al., 2009). Specialization is consistently discussed and measured through three dimensions,

often referred to as affective, behavioral, and cognitive (outlined in more detail below; Needham et al., 2009). We developed a series of survey questions to evaluate each of these dimensions of specialization, drawing on concepts and items from a previous survey of eBird participants conducted by the North American Waterfowl Management Plan (NAWMP) Human Dimensions Working Group (Harshaw et al., 2021) and a survey of anglers conducted by Needham et al. (2009). We present results for these dimensions separately below, as recommended by Lee and Scott (2004), in order to retain insights into each dimension.

Affective specialization: Centrality

Following Harshaw et al. (2021) and Needham et al. (2009), we assessed the affective dimension of viewers' specialization through the concept of centrality, which reflects how important wildlife viewing is in an individual's life. Respondents were asked to indicate their extent of agreement, on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), with three statements: 1) "A lot of my life is organized around wildlife viewing," 2) "Wildlife viewing has a central role in my life," and 3) "Being a wildlife viewer is an important part of who I am." Responses to these three statements, which provide information regarding the centrality of wildlife viewing to an individual's life, comprised a reliable scale (Cronbach's alpha = .88), so we combined these variables by calculating the mean response to these items for an overall centrality measure (Table 10; Figure 10). The mean level of centrality was 3.01 in South Dakota, indicating that, on average, respondents selected *neither agree nor disagree*. A t-test indicated no statistically significant differences in the mean level of centrality when comparing consumptive and nonconsumptive viewers ($t = 0.27$, $df = 460$; $p = .738$; Table 10; Figure 10).

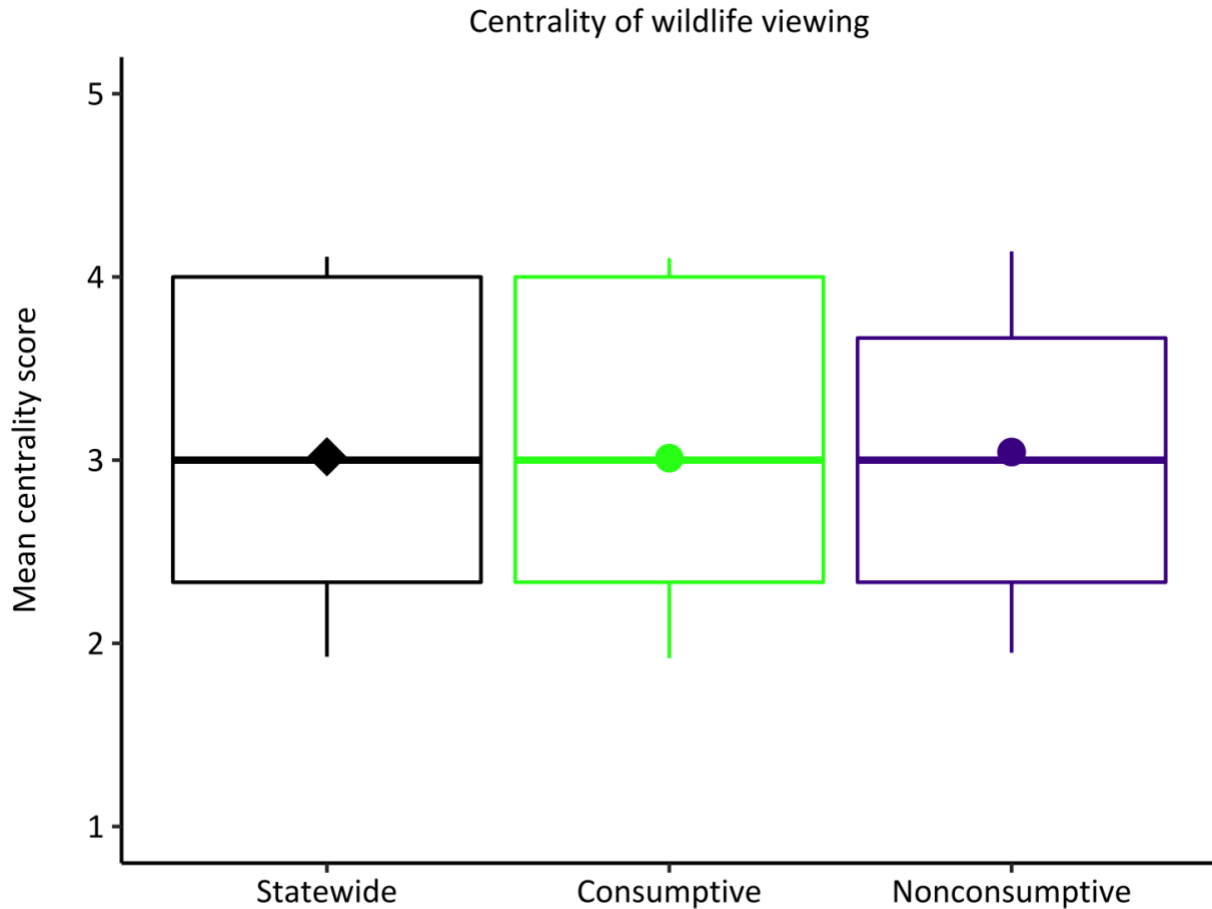


Figure 10: Centrality of wildlife viewing

Boxplots (median and interquartile ranges within the boxes) showing the differences in the measure of centrality of wildlife viewing in the lives of wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. Points represent the mean centrality measure (diamond for statewide group, circles for consumptive and nonconsumptive group) calculated as the mean of respondents' extent of agreement with three statements about the importance of wildlife viewing in their lives on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Whiskers represent the mean \pm 1 standard deviation. A t-test indicated that the mean measure of centrality of wildlife viewing to an individual's life did not vary significantly when comparing consumptive and nonconsumptive viewers (Table 10).

Behavioral specialization: Equipment usage and percentage of life

We measured the behavioral dimension of specialization through respondents' use of specialized equipment for wildlife viewing and the duration of their experience in wildlife viewing. In South Dakota, 21% of all wildlife viewers reported owning or renting specialized equipment, such as binoculars, cameras, mobile apps, spotting scopes, field guides, or specialized clothing in the past five years (Figure 11; Table 11). A chi-square test indicated no

statistically significant difference between consumptive and nonconsumptive viewers in terms of owning, renting, or borrowing specialized equipment ($\chi^2 = 0.25$, $df = 1$, $p = .616$; Table 11; Figure 11).

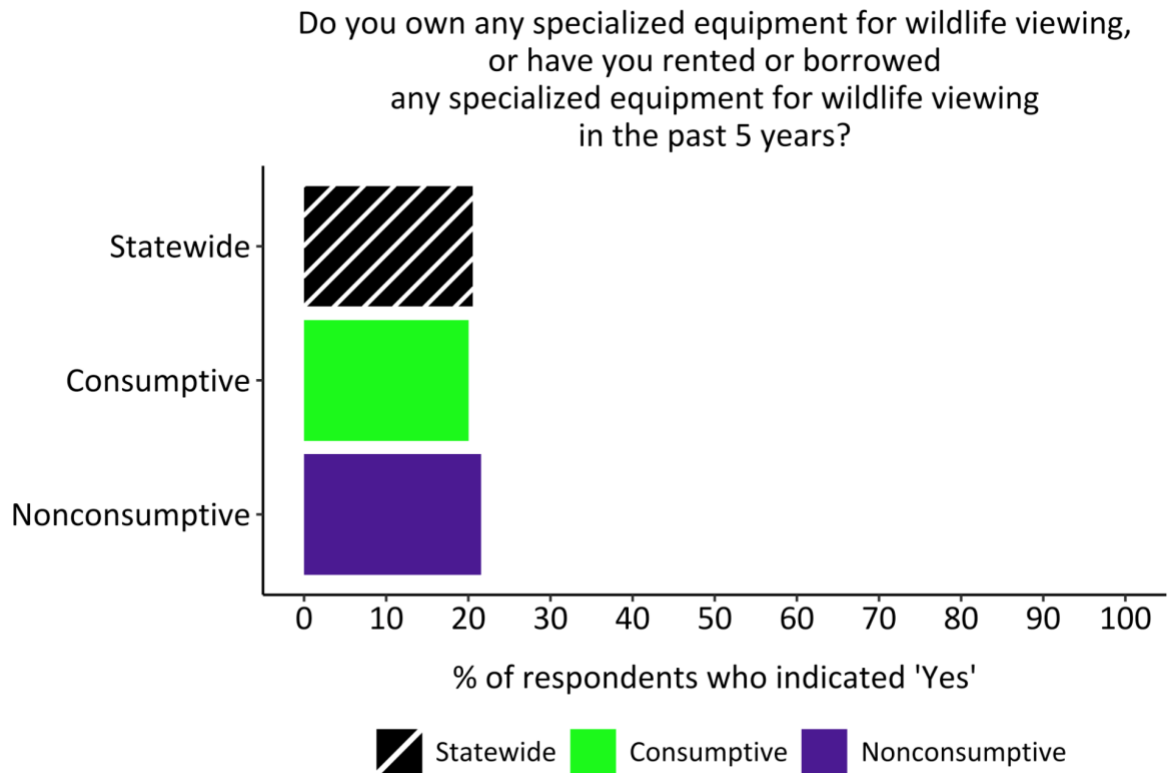


Figure 11: Owning, renting, or borrowing specialized equipment for wildlife viewing

Percent of wildlife viewers in South Dakota who reported owning, renting, or borrowing specialized equipment for wildlife viewing in the past 5 years for statewide, consumptive, and nonconsumptive groups. A chi-square test indicated no statistically significant difference between consumptive and nonconsumptive wildlife viewers (Table 11).

As another measure of behavioral specialization, we also asked survey respondents to indicate how many years they had been participating in wildlife viewing and provided response options in five-year categories. To ease respondent burden, we did not present this question to respondents who indicated in a previous question that they had only started viewing during the COVID-19 pandemic. As the COVID-19 pandemic began about 18 months before the survey was administered, we added the 8 wildlife viewers who reported that they started viewing during the pandemic to the 1-5 years category. One in five viewers in South Dakota had more than 50 years of wildlife viewing experience (Table 12).

In order to account for the effect of the age of respondents, we roughly estimated the percentage of life during which wildlife viewers had participated in wildlife viewing by creating

five-equally sized categories (1-20%, 21-40%, 41-60%, 61-80%, and 81-100% of life). Just a third of respondents in South Dakota indicated participating in wildlife viewing for less than half their life. One in five viewers reported viewing for one-fifth of their life (19% viewed for 0-20% of their lives). Similarly, about one in five viewers (19%) participated in wildlife viewing for 21-40% of their life. The majority of viewers participated in some form of wildlife viewing for 41%-100% of their lives (63% of respondents). A chi-square test indicated a statistically significant difference in this measure of experience as a percentage of life spent viewing when comparing consumptive and nonconsumptive viewers ($\chi^2 = 13.92$, $df = 1$, $p = .008$; Table 13; Figure 12). Twice the number of nonconsumptive viewers participated in viewing for only 0-20% of their lives (31%) in comparison to consumptive viewers (15%). Conversely, near twice as many consumptive viewers (29%) indicated participating in wildlife viewing for 81-100% of their lives in comparison to nonconsumptive viewers (17%).

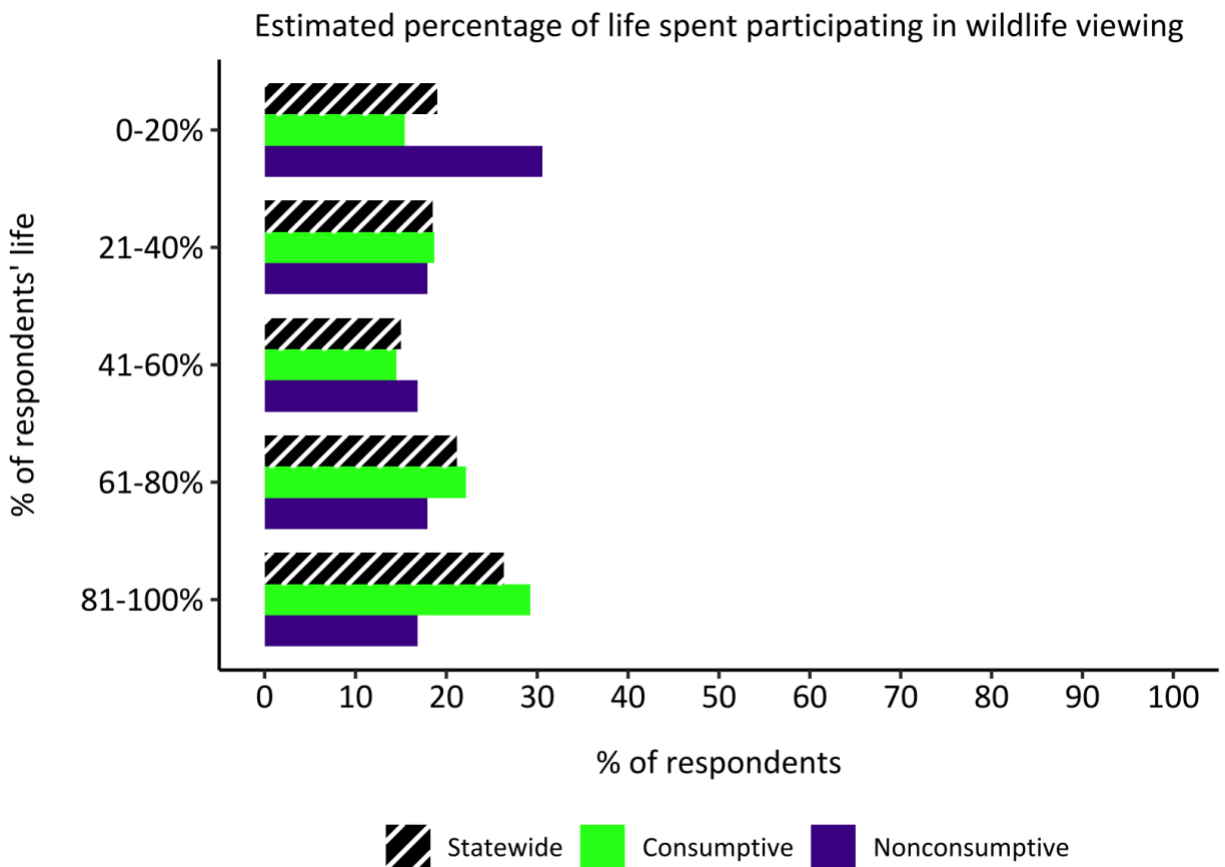


Figure 12: Estimated percentage of life spent viewing

The estimated percentage of life during which wildlife viewers had participated in wildlife viewing in five categories (1-20%, 21-40%, 41-60%, 61-80%, and 81-100% of life) for statewide, consumptive, and nonconsumptive groups. A chi-square test indicated a significantly significant difference in this measure of experience as a percentage of life spent viewing when comparing consumptive and nonconsumptive viewers (Table 13).

Cognitive specialization: Skill level

Due to the number of diverse activities and types of wildlife that are included under the umbrella of wildlife viewing, we used a single, broad item to measure the cognitive dimension of specialization through viewers' self-rated level of expertise, ranging from beginner to expert. We asked respondents "How would you rate your skill level in wildlife viewing?" and provided them with five options ranging from "beginner" to "expert." In South Dakota, 48% of respondents considered themselves beginner or novice wildlife viewers. Just over one in three (37%) viewers in South Dakota rated their skill level as intermediate. Only 13% of respondents considered themselves to be advanced, and only 2.2% considered themselves to be expert wildlife viewers (Table 14; Figure 13). A chi-square test with the "Expert" category combined with "Advanced" indicated a statistically significant difference in self-rated expertise levels between consumptive and nonconsumptive wildlife viewers ($\chi^2 = 15.69$, $df = 3$, $p = .001$; Table 14; Figure 13). More consumptive viewers rated themselves as intermediate and advanced (54%) in comparison to nonconsumptive viewers (35%).

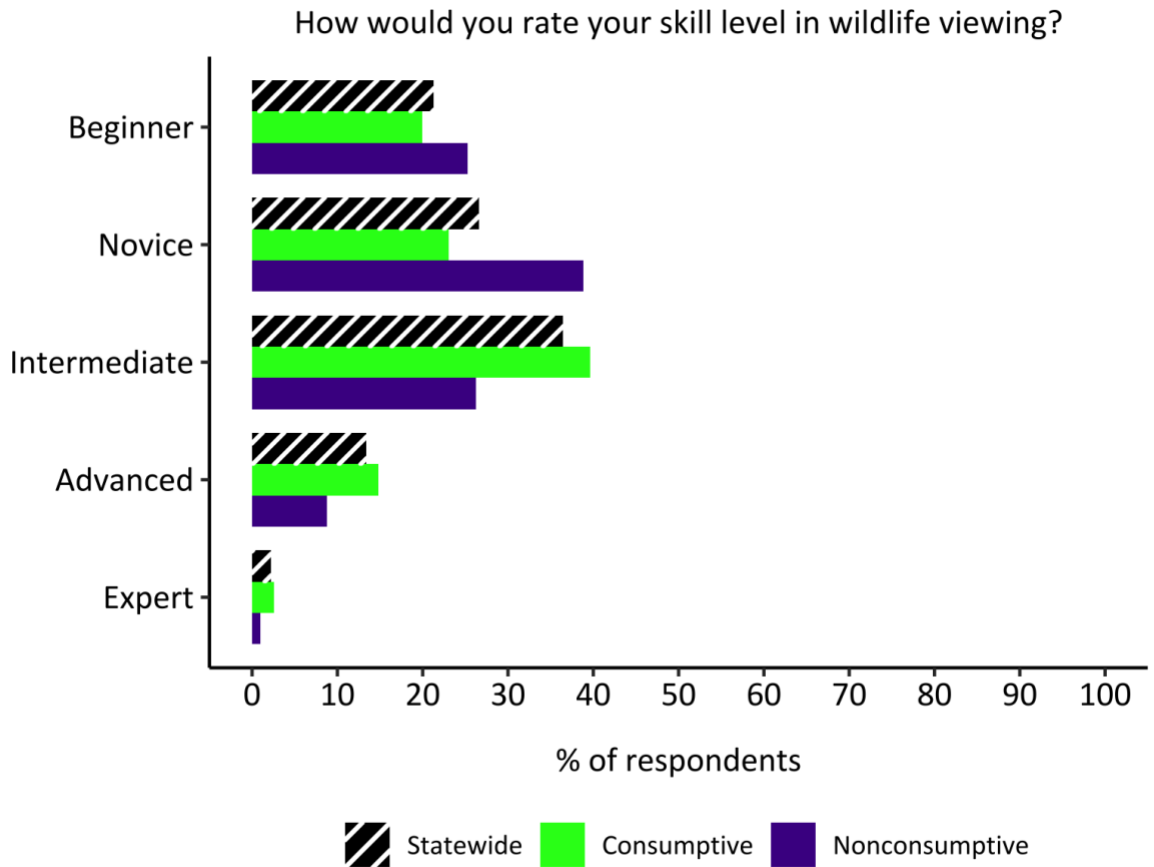


Figure 13: Respondents’ self-rate wildlife viewing skill level

Respondents’ self-rated level of skill in wildlife viewing for statewide, consumptive, and nonconsumptive groups. Due to low sample sizes, the “Advanced” and “Expert” categories were combined for analysis. A chi-square test indicated a statistically significant difference in self-rated expertise levels between consumptive and nonconsumptive wildlife viewers (Table 14).

COVID-19 impacts on wildlife viewing participation and the R3 Framework

On March 11th, 2020, the World Health Organization declared the COVID-19 virus as a pandemic (Cucinotta & Vanelli, 2020). This pandemic dramatically altered everyday activities worldwide as federal, state, and local governments enacted public health policies to mitigate the spread of this highly contagious virus (Cucinotta & Vanelli, 2020). For example, the COVID-19 pandemic and associated mitigations brought about unprecedented and dynamic changes in outdoor recreation behaviors in many states throughout the country, which we are only beginning to understand. A study by Rice et al. (2020) indicated that, as limitations were instituted on travel on a wide range of scales, participation in outdoor activities declined significantly overall, with disproportionately negative effects for urban residents. However,

another study showed slight increases in participation in wildlife viewing and recreation close to home (Hochocka et al., 2021).

While South Dakota did not implement significant closures during the COVID-19 pandemic, we surveyed about its impacts on participation for comparison against other states. For this survey, we examined how COVID-19 affected wildlife viewers and the nature of their participation in wildlife viewing and identified any potential valuable management implications for state fish and wildlife agencies interested in supporting wildlife viewing. We examined participation in wildlife viewing using the Outdoor Recreation Adoption Model (also referred to as the “R3 Framework” [recruitment, retention, and reactivation]) vis a vis the first year of the pandemic (Byrne & Dunfee, 2018). By comparing the number of days spent viewing in the first year of the COVID-19 pandemic against a typical year, we categorized wildlife viewers into four groups: “churned” (i.e., stopped viewing during the pandemic), retained (i.e., maintained viewing throughout the pandemic), “recruited” (i.e., began wildlife viewing for the first time during the pandemic), and “reactivated” (i.e., had participated in wildlife viewing in the past, were not actively participating when the pandemic began, but resumed participation during or after March 2020).

The majority of respondents in South Dakota (93%) fell into the “retained” category, meaning the COVID-19 pandemic had no impact on their overall participation in wildlife viewing. The next largest group was the “reactivated” viewers (3.7%), meaning those who weren’t actively participating in wildlife viewing in March 2020 (but had been at a previous point in time). These viewers then resumed their participation during or after March 2020. Less than 2% of wildlife viewers indicate they were “churned” meaning that they stopped viewing during the pandemic, or “recruited” or began participating in wildlife viewing for the first time during or after March 2020. A chi-square could not be conducted due to small sample sizes in a variety of categories (Table 15; Figure 14).

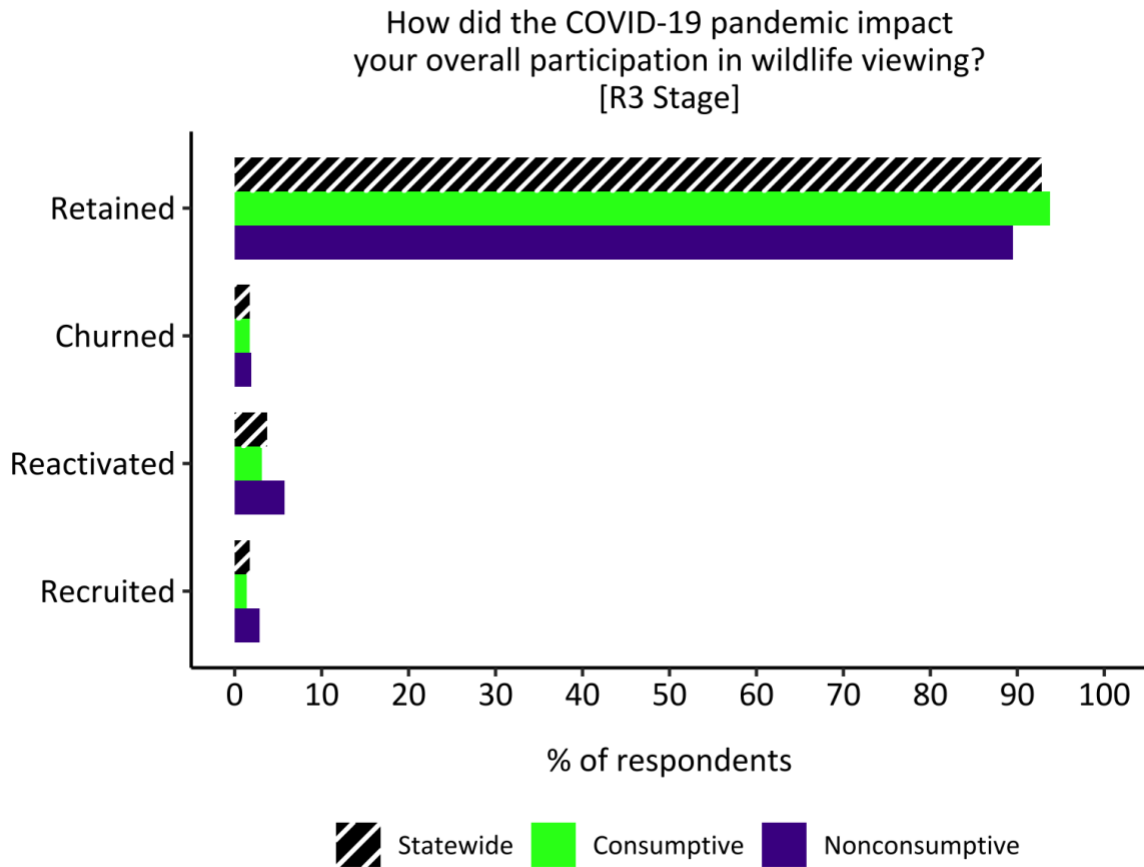


Figure 14: COVID-19 impact on wildlife viewing as R3

Impact of the COVID-19 pandemic on wildlife viewers’ overall participation in wildlife viewing for statewide, consumptive, and nonconsumptive groups. Respondents were separated into four groups; retained (maintained throughout the pandemic), churned (stopped viewing during the pandemic), reactivated (had participated in wildlife viewing in the past, were not actively participating when the pandemic began, but resumed participation during or after March 2020), and recruited (began wildlife viewing for the first time during the pandemic). A chi-square was not conducted due to small sample sizes in all categories with the exception of retained (Table 15).

Time spent wildlife viewing

In this section of the survey, wildlife viewers estimated the number of days they spent wildlife viewing during a typical year, the first year of the COVID-19 pandemic (March 2020 - February 2021), and the number of days that they anticipated wildlife viewing in the upcoming year (the next 12 months from the date of survey completion). Wildlife viewers who indicated they were recruited (see COVID-19 section) during the pandemic were not asked to report the number of days they spent viewing during a typical year, as the first year of the COVID-19 pandemic was assumed to be their only year participating in wildlife viewing. For each time period, we specified three locations, following the National Survey of Wildlife Recreation’s (U.S. DOI et al.,

2016) definition of “around the home” (“within one mile of home”) and “away from home” (“at least one mile away from home”), the latter of which we further stratified to two locations: “more than one mile away from your home, but within your state” and “outside of your state or outside of the United States.” We were interested in this nuance to better understand the impact of the COVID-19 pandemic on travel that occurred for wildlife viewing (Hochachka et al., 2021). For all time periods and locations, we provided respondents with seven time intervals, each 30 days long, and a single option for “0 days” and “211 or more days.”

We first reviewed days viewing during a typical year ($n = 449$ around the home, $n = 453$ away from home, and $n = 445$ outside of South Dakota or the U.S.; Table 16; Figures 15-17). Nearly all respondents (89%) reported participating in wildlife viewing around the home for 1 day or more in a typical year (Table 16; Figure 15). A substantial proportion (37%) reported wildlife viewing around the home for “211 or more days” in a typical year, which approximates to 17 days a month or more. Similar to around the home but a bit higher, 93% of wildlife viewers reported participating in wildlife viewing away from home for 1 day or more during a typical year. Only 6.8% of wildlife viewers spent 211 or more days in a typical year viewing away from home. Of all three wildlife viewing locations, wildlife viewers were less apt to participate in wildlife viewing outside of their state or country in a typical year, but still well over half of respondents (67%) participated in wildlife viewing outside their state or country for 1 day or more.

Due to low group size for each category for consumptive and nonconsumptive viewers, statistical testing was done by comparing “0 days,” “1-30 days,” and “> 30 days” per year. A chi-square with three categories (“0 days,” “1-30 days,” and “> 30 days”) indicated a statistically significant difference in the amount of time spent viewing outside of their state or country in a typical year between consumptive and nonconsumptive viewers. More nonconsumptive viewers spending more than 30 days viewing around the home (Table 17; Figure 15). There was no statistically significant difference between consumptive and nonconsumptive viewers for time spent viewing around the home and away from home (Table 17; Figure 17).

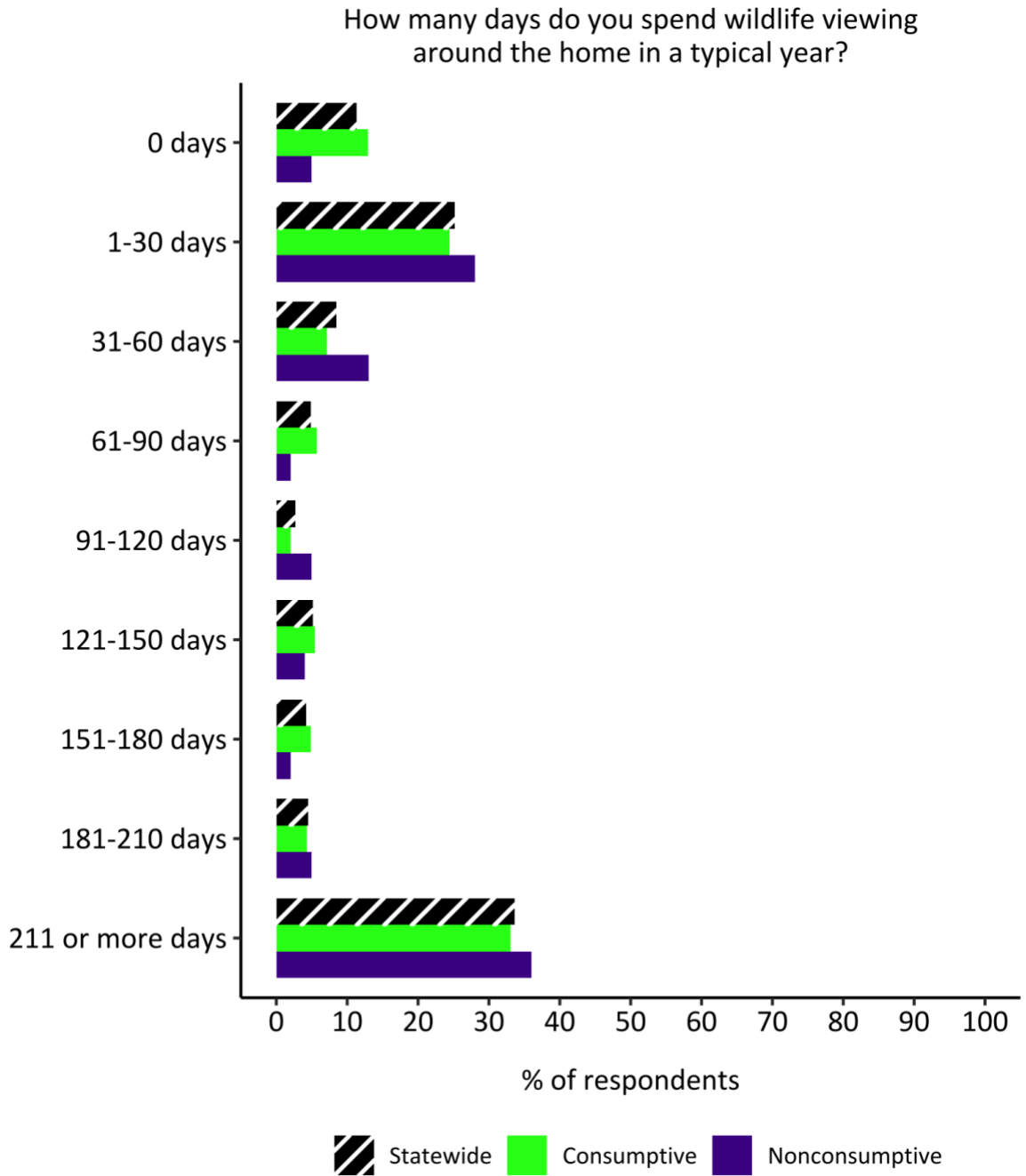


Figure 15: Days spent viewing around the home in a typical year

Days wildlife viewers in South Dakota reported spending wildlife viewing around the home during a typical year for statewide, consumptive, and nonconsumptive groups. Typical year response omits wildlife viewers who began participating in wildlife viewing during the pandemic, as they had not yet viewed wildlife in a typical year. A chi-square run with only three categories (“0 days”, “1-30 days”, and “>30 days”), due to low sample sizes, indicated no statistically significant difference in time spent viewing around the home in a typical year between consumptive and nonconsumptive viewers (Table 17).

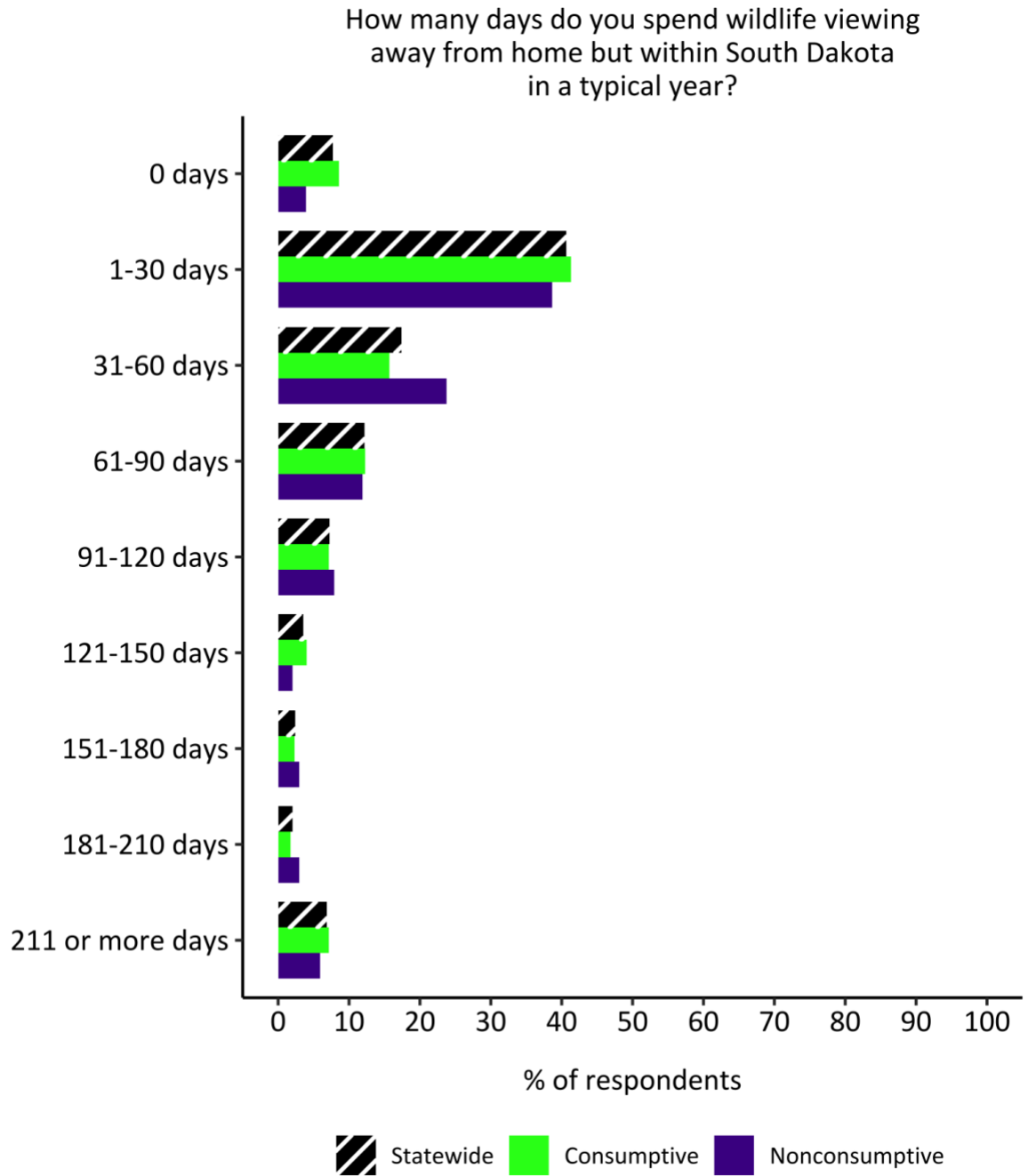


Figure 16: Days spent viewing away from home in a typical year

Days wildlife viewers in South Dakota reported spending wildlife viewing away from home, but within South Dakota, during a typical year for statewide, consumptive, and nonconsumptive groups. Typical year response omits wildlife viewers who began participating in wildlife viewing during the pandemic, as they had not yet viewed in a typical year. A chi-square test indicated that there was no statistically significant difference in away-from-home viewing in a typical year for consumptive and nonconsumptive viewers (Table 17).

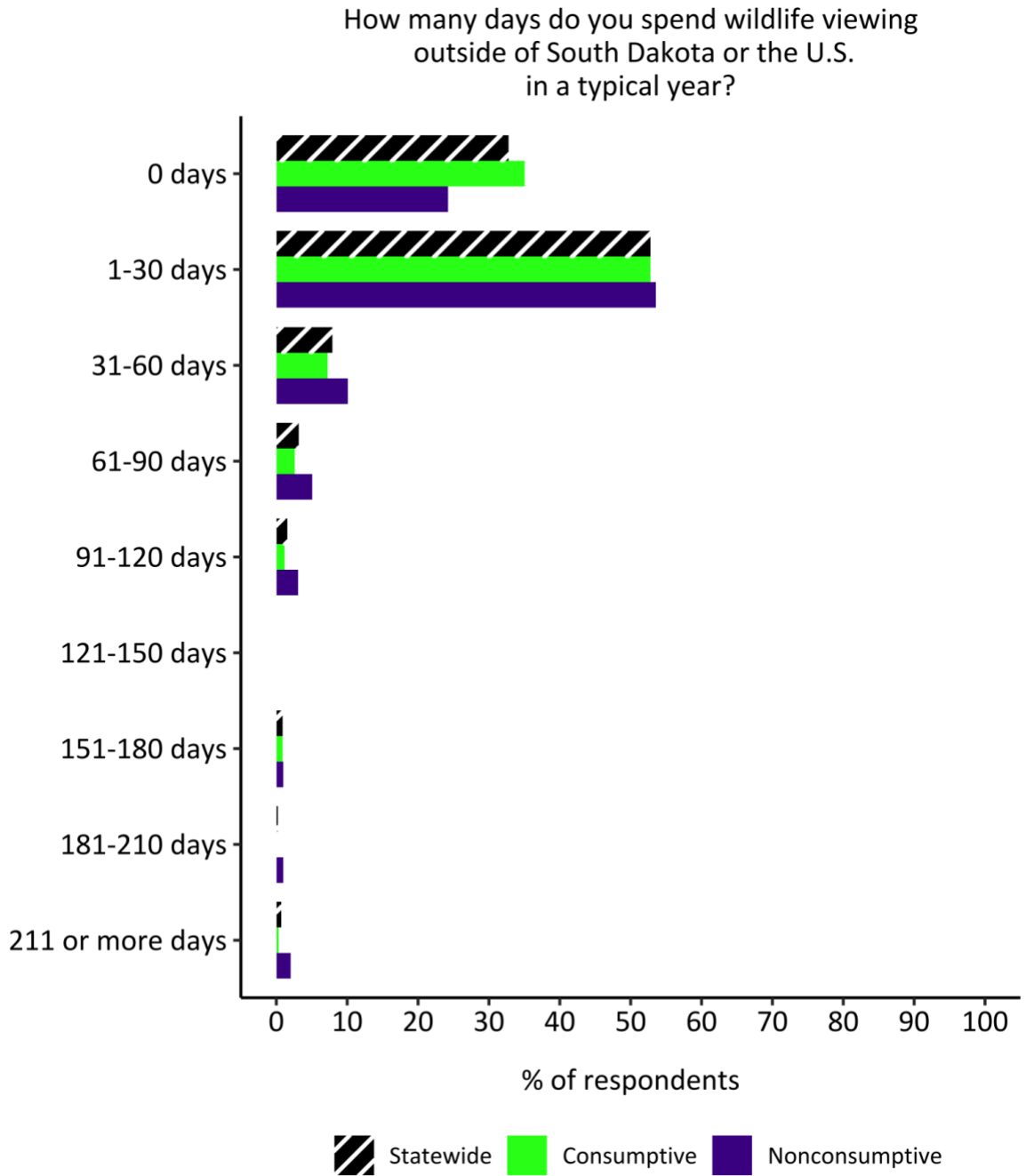


Figure 17: Days spent viewing out of state or U.S. in a typical year

Days wildlife viewers in South Dakota reported spending wildlife viewing outside of South Dakota or the U.S. during a typical year for statewide, consumptive, and nonconsumptive groups. Typical year response omits wildlife viewers who began participating in wildlife viewing during the pandemic, as they had not yet viewed wildlife in a typical year. A chi-square test indicated that there was a statistically significant difference in out-of-state-or-country viewing in a typical year for consumptive and nonconsumptive viewers (Table 17).

Next, we reviewed days spent viewing during the first year of the COVID-19 pandemic ($n = 450$ around the home, $n = 453$ away from home, and $n = 433$ outside state or country; Table 16; Figure 18-20). The same portion of respondents (89%) as a typical year reported participating in wildlife viewing around the home for one day or more in the first year of the COVID-19. About a third of the respondents statewide (32%) reported participation in wildlife viewing around the home for 211 or more days during the first year of the COVID-19 pandemic. Participation in away from home (89% of respondents participated for one day or more) viewing decreased slightly in comparison to a typical year (93%). Only 6.5% of respondents reported participation in wildlife viewing away from home for 211 or more days during the first year of the COVID-19 pandemic. More than half of respondents (64%) reported participating in wildlife viewing out-of-state-or-country during the first year of the COVID-19 pandemic, a very slight decrease in comparison to a typical year (67%).

The chi-square tests for the first year of the pandemic indicated the same patterns for statistical significance as a typical year. The first two chi-square tests indicated that there was no statistically significant difference in time spent viewing around the home or away from home during the first year of the COVID-19 pandemic between consumptive and nonconsumptive viewers (Table 17; Figure 18). Finally, the third chi-square test indicated that there was a statistically significant difference in out-of-state-or-country viewing during the first year of the pandemic for consumptive and nonconsumptive viewers, with more consumptive viewers spending zero days viewing outside of South Dakota or the U.S. in comparison to nonconsumptive viewers (Table 17; Figure 20).

How many days did you spend wildlife viewing around the home during the first year of the COVID-19 pandemic (March 2020 - February 2021)?

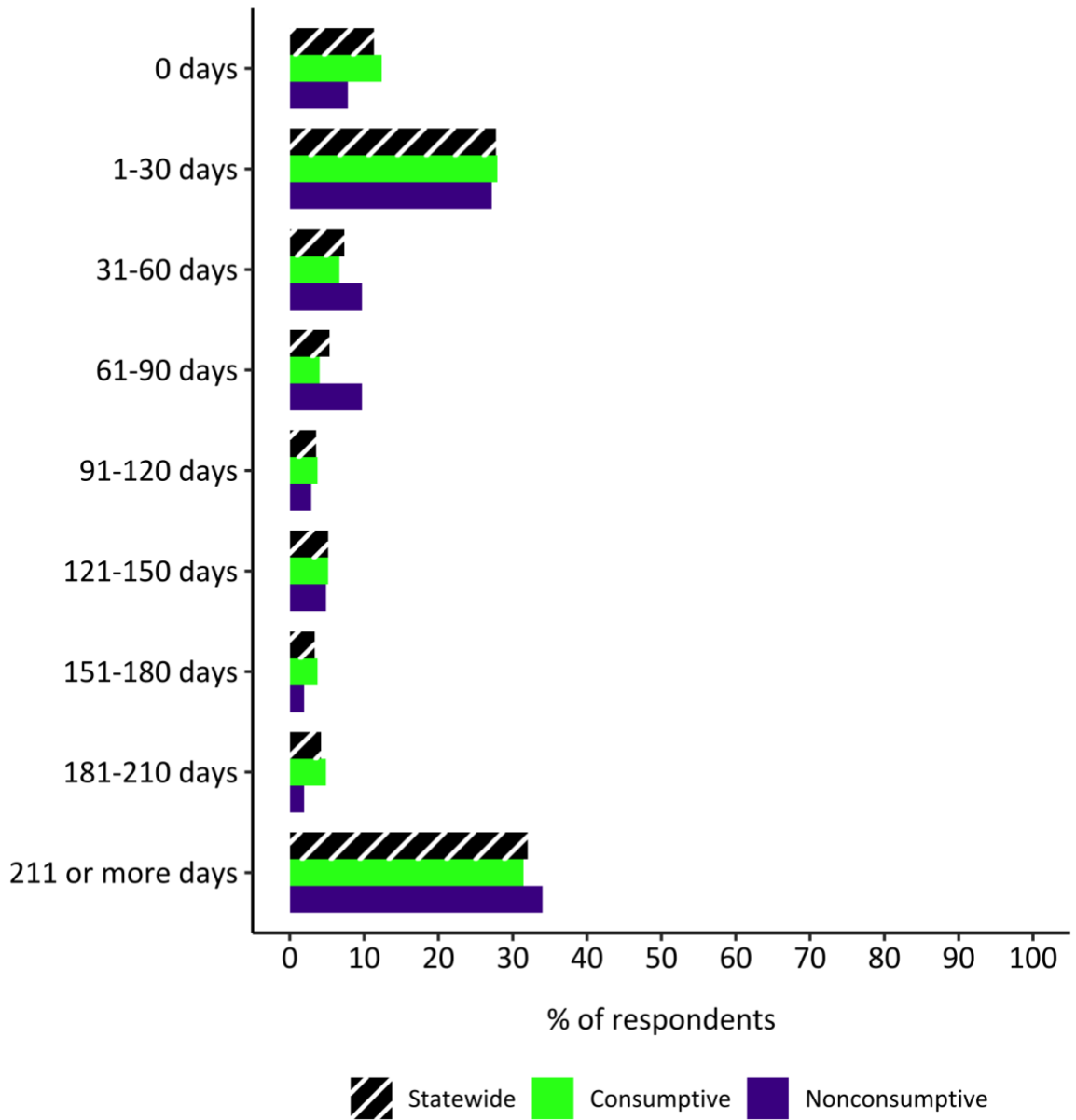


Figure 18: Days spent viewing around the home in first year of COVID-19 pandemic

Days wildlife viewers in South Dakota reported spending wildlife viewing around the home during the first year of the pandemic (March 2020-February 2021) for statewide, consumptive, and nonconsumptive groups. This includes wildlife viewers who began participating in wildlife viewing during the pandemic. A chi-square run with only three categories (“0 days,” “1-30 days,” and “> 30 days”), due to low sample sizes, indicated no statistically significant difference in time spent viewing around the home during the first year of the pandemic between consumptive and nonconsumptive viewers (Table 17).

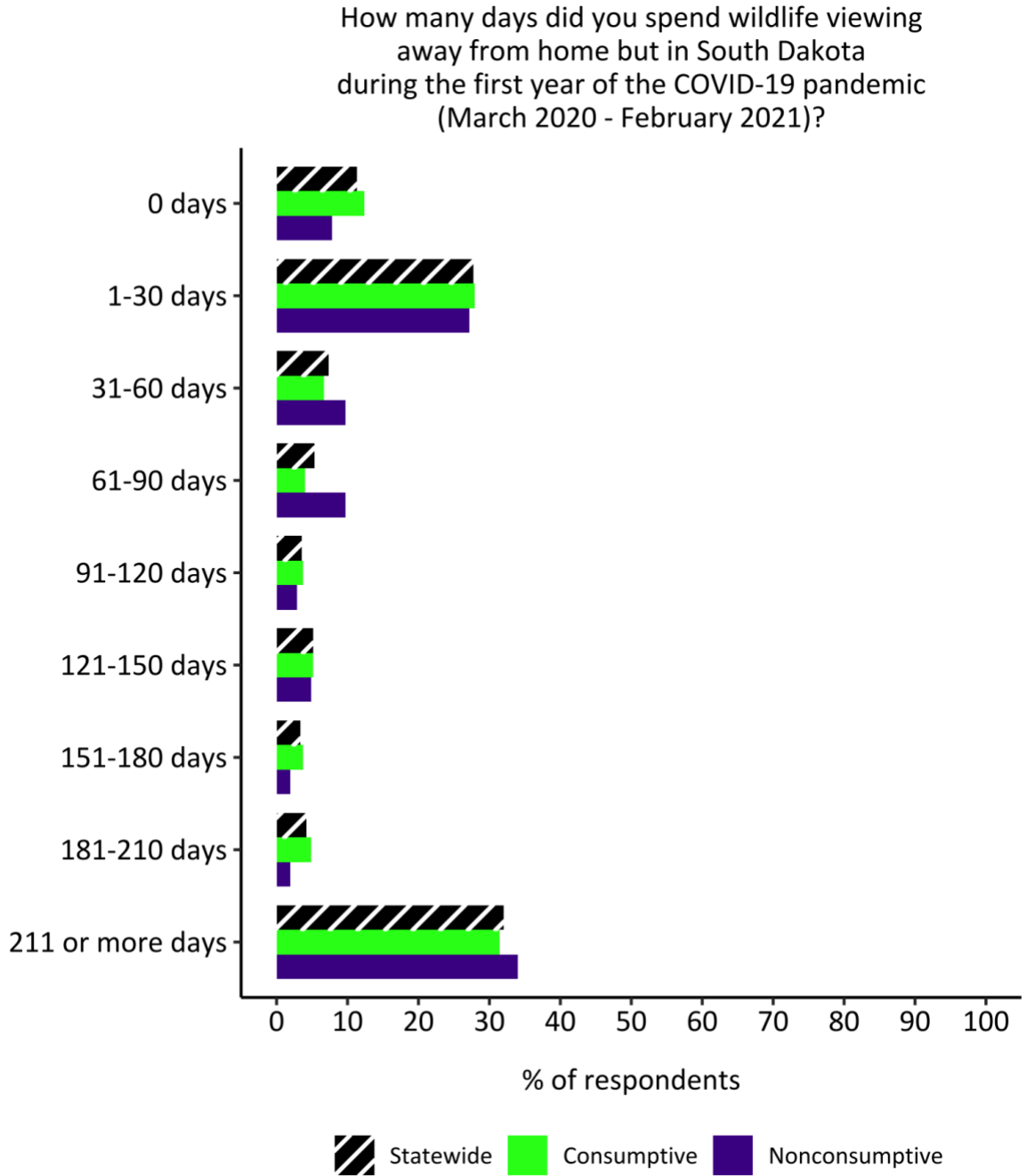


Figure 19: Days spent viewing away from home in first year of COVID-19 pandemic

Days wildlife viewers in South Dakota reported spending wildlife viewing away from home but within South Dakota during the first year of the pandemic (March 2020-February 2021) for statewide, consumptive, and nonconsumptive groups. This includes wildlife viewers who began participating in wildlife viewing during the pandemic. A chi-square run with only three categories (“0 days,” “1-30 days,” and “> 30 days”), due to low sample sizes, indicated that there was no statistically significant difference in away-from-home viewing during the first year of the pandemic for consumptive and nonconsumptive viewers (Table 17).

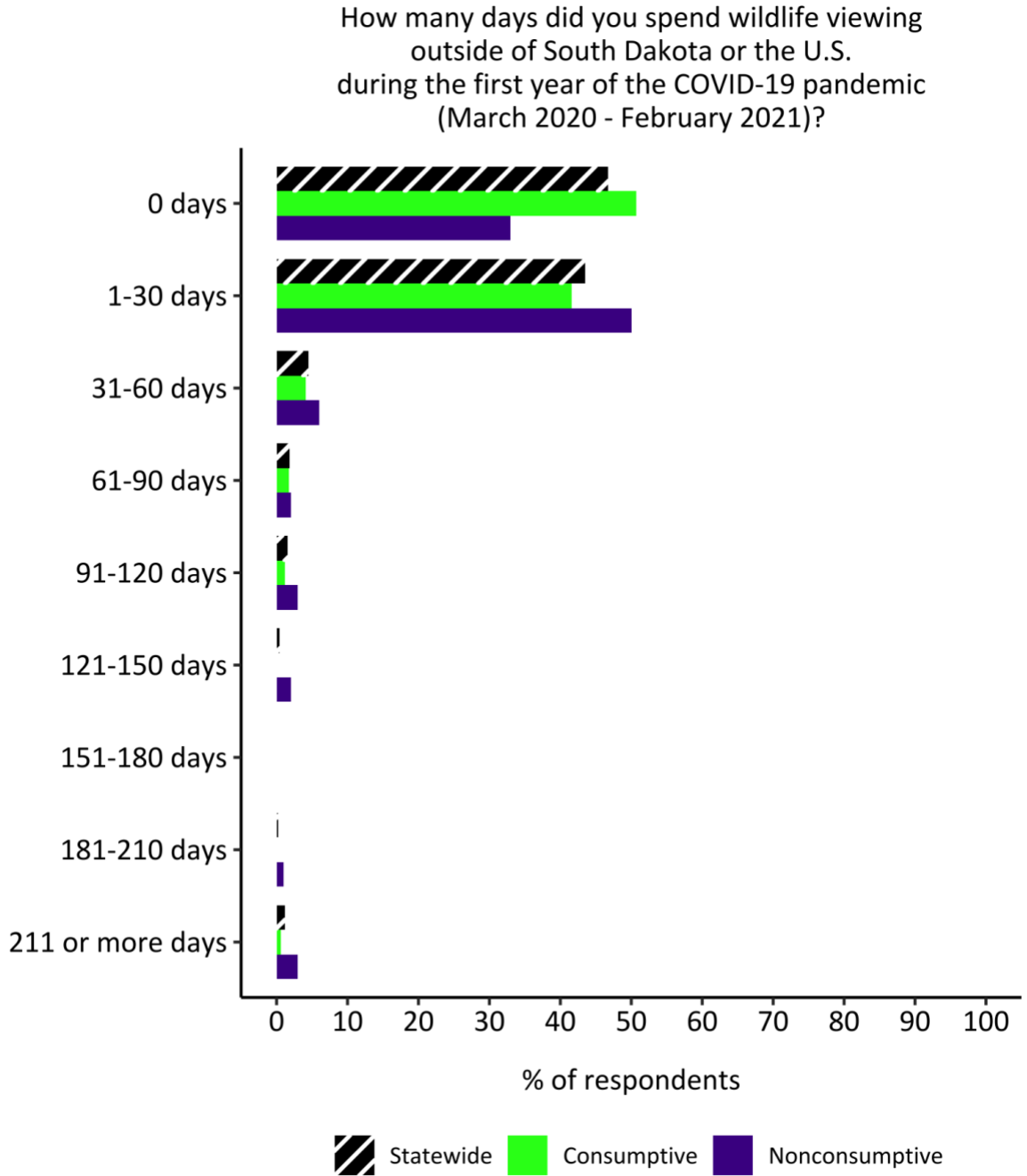


Figure 20: Days spent viewing out of state or U.S. in first year of COVID-19 pandemic

Days wildlife viewers in South Dakota reported spending wildlife viewing outside of South Dakota or the U.S. during the first year of the pandemic (March 2020-February 2021) for statewide, consumptive, and nonconsumptive groups. This includes wildlife viewers who began participating in wildlife viewing during the pandemic. A chi-square run with only three categories (“0 days,” “1-30 days,” and “> 30 days”), due to low sample sizes, indicated that there was a statistically significant difference in time spent out-of-state-or-country viewing the first year of the pandemic between consumptive and nonconsumptive viewers (Table 17).

Finally, we asked respondents about days they anticipate viewing in the three locations during the next year (Table 16; Figures 21-23). Anticipated viewing was higher in all three locations when compared to the first year of the pandemic and was much closer to values reported during a typical year. Similarly to a typical year and the first year of the COVID-19 pandemic, 89% of respondents anticipated spending one or more days viewing around the home and 92% anticipated spending one or more days viewing away from home. We also note a slight increase in anticipated participation outside of state or country compared to the first year of the COVID-19 pandemic, with 68% of respondents saying they anticipated spending one or more days viewing outside of their state or country.

The chi-square tests for anticipated time spent viewing in the upcoming year indicated the same levels of statistical significance as those for a typical year and the first year of the COVID-19 pandemic. The first two chi-square tests with three categories (“0 days,” “1-30 days,” and “> 30 days”) indicated no statistically significant differences in the expected time spent viewing around the home and away-from-home in the upcoming year between consumptive and nonconsumptive viewers (Table 17; Figure 21). Finally, the third chi-square test indicated that there was a statistically significant difference in out-of-state-or-country viewing in the upcoming year for consumptive and nonconsumptive viewers, with more consumptive viewers anticipating they would spend zero days viewing outside of South Dakota or the U.S. (Table 17; Figure 23).

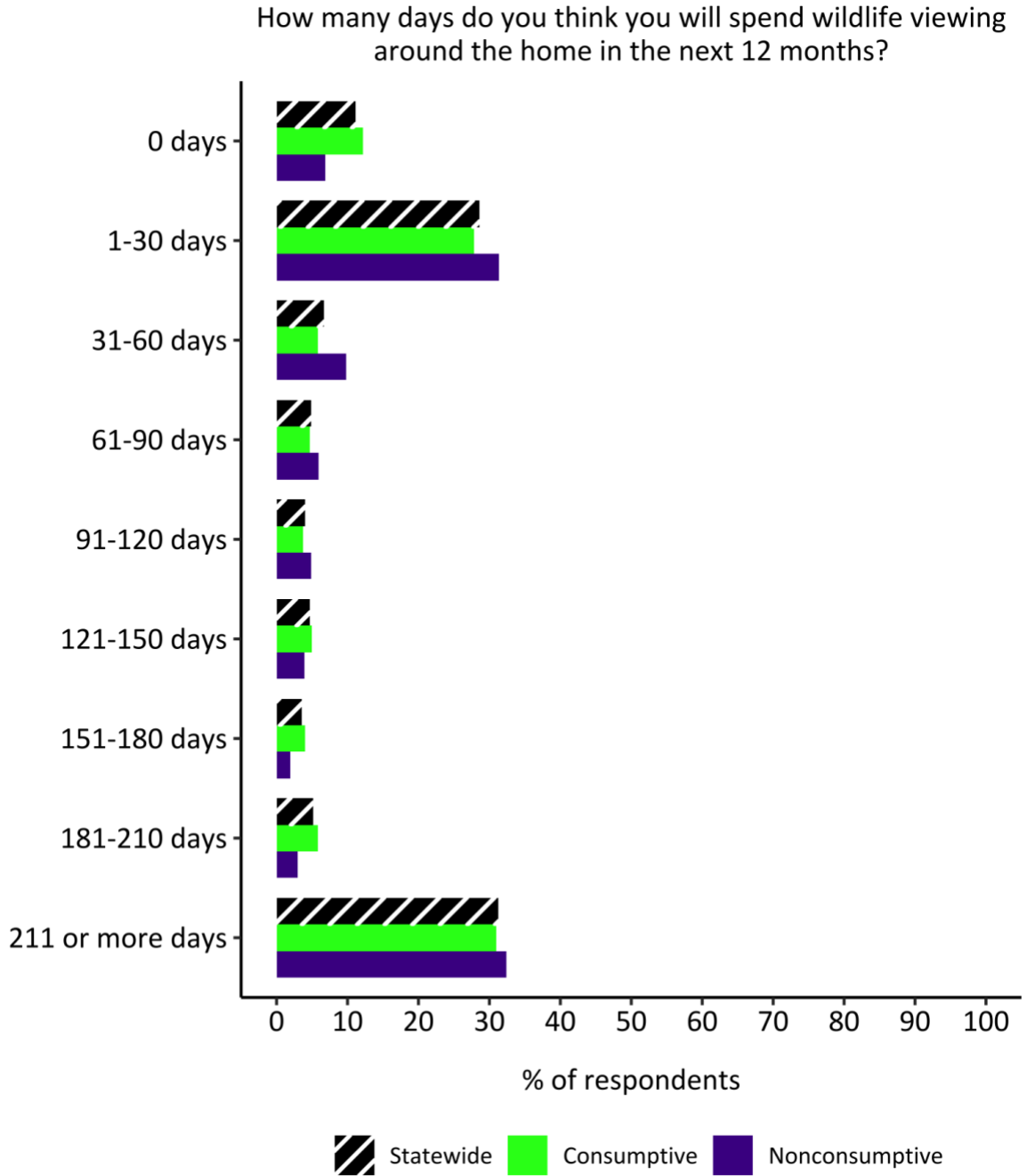


Figure 21: Days anticipated spent viewing around the home in the upcoming year

Days wildlife viewers in South Dakota anticipated spending wildlife viewing around the home in the upcoming year for statewide, consumptive, and nonconsumptive groups. This includes wildlife viewers who began participating in wildlife viewing during the pandemic. A chi-square run with three categories (“0 days,” “1-30 days,” and “> 30 days”), due to low sample sizes, indicated no statistically significant differences in time spent viewing around the home in the upcoming year between consumptive and nonconsumptive viewers (Table 17).

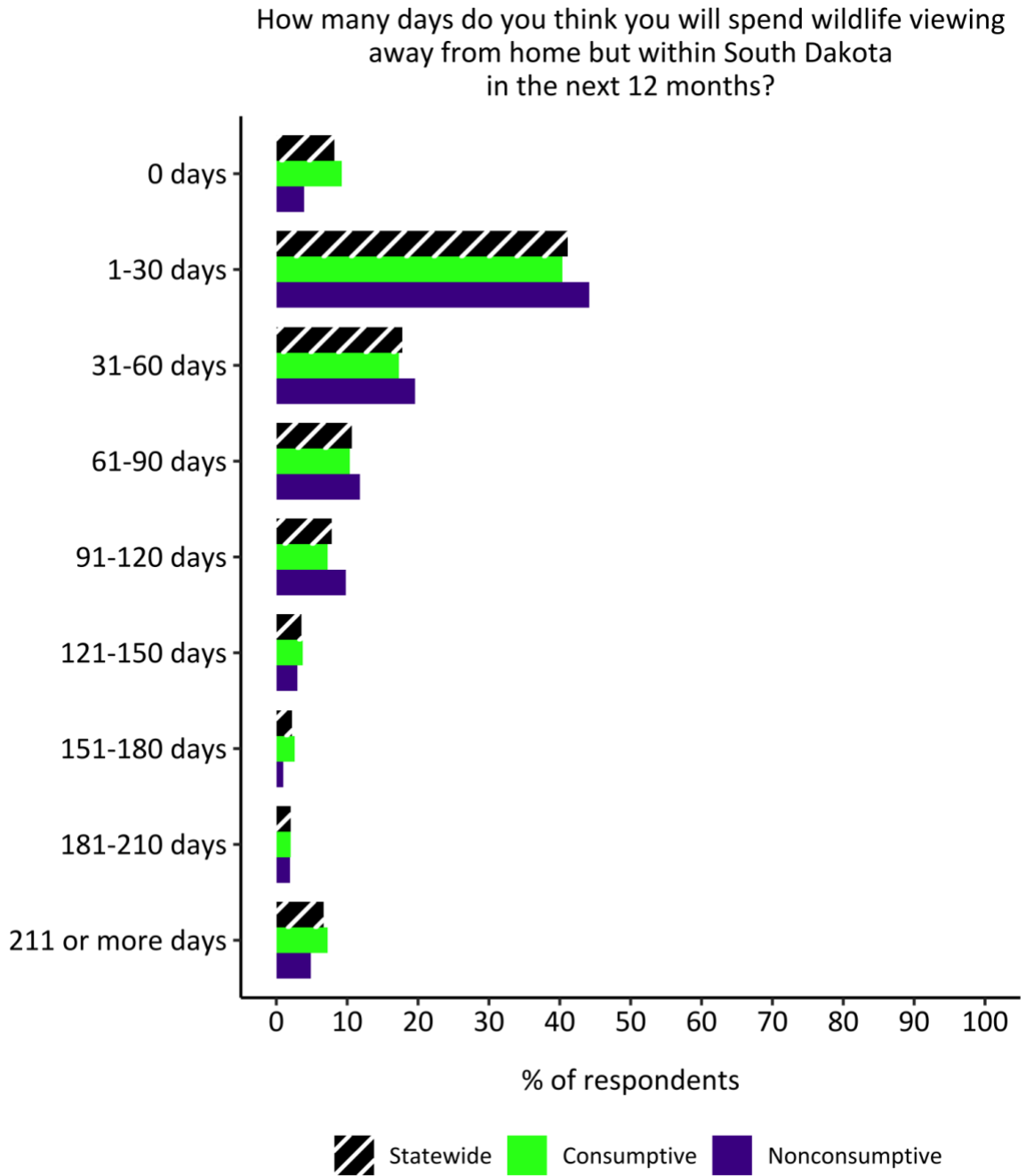


Figure 22: Days anticipated spent viewing away from home in the upcoming year

Days wildlife viewers in South Dakota anticipated spending wildlife viewing away from home but within South Dakota in the upcoming year for statewide, consumptive, and nonconsumptive groups. This includes wildlife viewers who began participating in wildlife viewing during the pandemic. A chi-square run with only three categories (“0 days,” “1-30 days,” and “> 30 days”), due to low sample sizes, indicated that there were no statistically significant differences in away-from-home viewing in the upcoming year for consumptive and nonconsumptive viewers (Table 17).

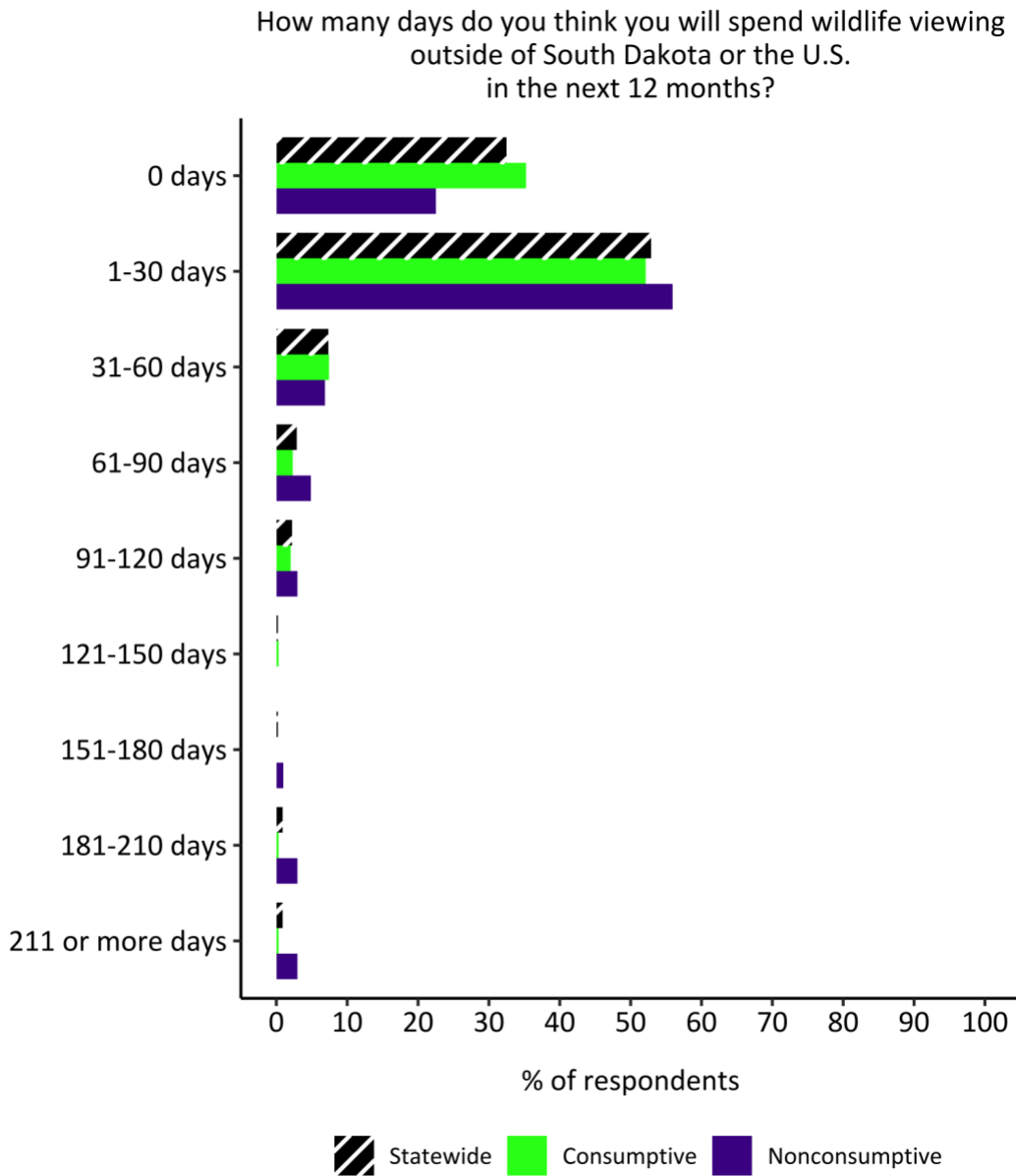


Figure 23: Days anticipated spent viewing out of state or U.S. in the upcoming year

Days wildlife viewers in South Dakota anticipated spending wildlife viewing outside of South Dakota or the U.S. in the upcoming year for statewide, consumptive, and nonconsumptive groups. This includes wildlife viewers who began participating in wildlife viewing during the pandemic. A chi-square run with only three categories (“0 days,” “1-30 days,” and “> 30 days”), due to low sample sizes, indicated that there was a statistically significant difference in time spent viewing around the home in the upcoming year between consumptive and nonconsumptive viewers (Table 17).

Wildlife viewing location

In addition to understanding around-the-home, away-from-home, and out-of-state viewing, we further examined the land ownership status of locations where respondents participate in wildlife viewing within South Dakota. Wildlife viewing takes place across all land ownership statuses: from state and privately-owned land (Bensen, 2001) to federally-owned land (Abrams et al., 2020), with vastly different managerial implications for each setting. We asked respondents: “In a typical year, in which locations do you participate in wildlife viewing in South Dakota?” This question was adapted from the Virginia Wildlife Recreation Survey (Grooms et al., 2019) to include options more applicable to the state setting. A list of seven locations was provided, featuring a mix of public, private, and tribal lands. In addition, an option reading: “I am unsure who owns or manages the areas where I participate in wildlife viewing” (2.8% of respondents selected this) was also provided. Finally, a mutually exclusive option reading: “I do not participate in wildlife viewing in any of the above locations” (3.5% of respondents selected this) was also provided. This mutually exclusive option was excluded from analysis.

About 85% of respondents reported viewing in more than one location (Table 18; Figure 24). Respondents most commonly reported wildlife viewing at state-managed areas (90%), such as state parks, forests, boat landings, fishing areas, conservation areas, or Wildlife Management Areas. Next, respondents frequently indicated viewing on their own home or property (79%). Respondents also commonly indicated viewing on federally-managed areas (71%) and locally-managed areas (62%), such as town or county parks, trails, or open spaces. The least common location for wildlife viewing was tribal lands (5.8%).

A t-test indicated no statistically significant differences in the mean number of wildlife viewing locations for consumptive ($M = 3.74$, $SD = 1.58$) and nonconsumptive viewers ($M = 3.63$, $SD = 1.52$; $t = -0.65$, $df = 461$, $p = .253$), with both groups averaging just under four locations. However, significantly more consumptive viewers (53%) indicated viewing on property of friends or family in comparison to nonconsumptive viewers (38%; $\chi^2 = 7.04$, $df = 1$, $p = .008$; Table 18; Figure 24). Second, more consumptive viewers (25%) also reported viewing on other private property more than nonconsumptive viewers (15%; $\chi^2 = 4.25$, $df = 1$, $p = .039$).

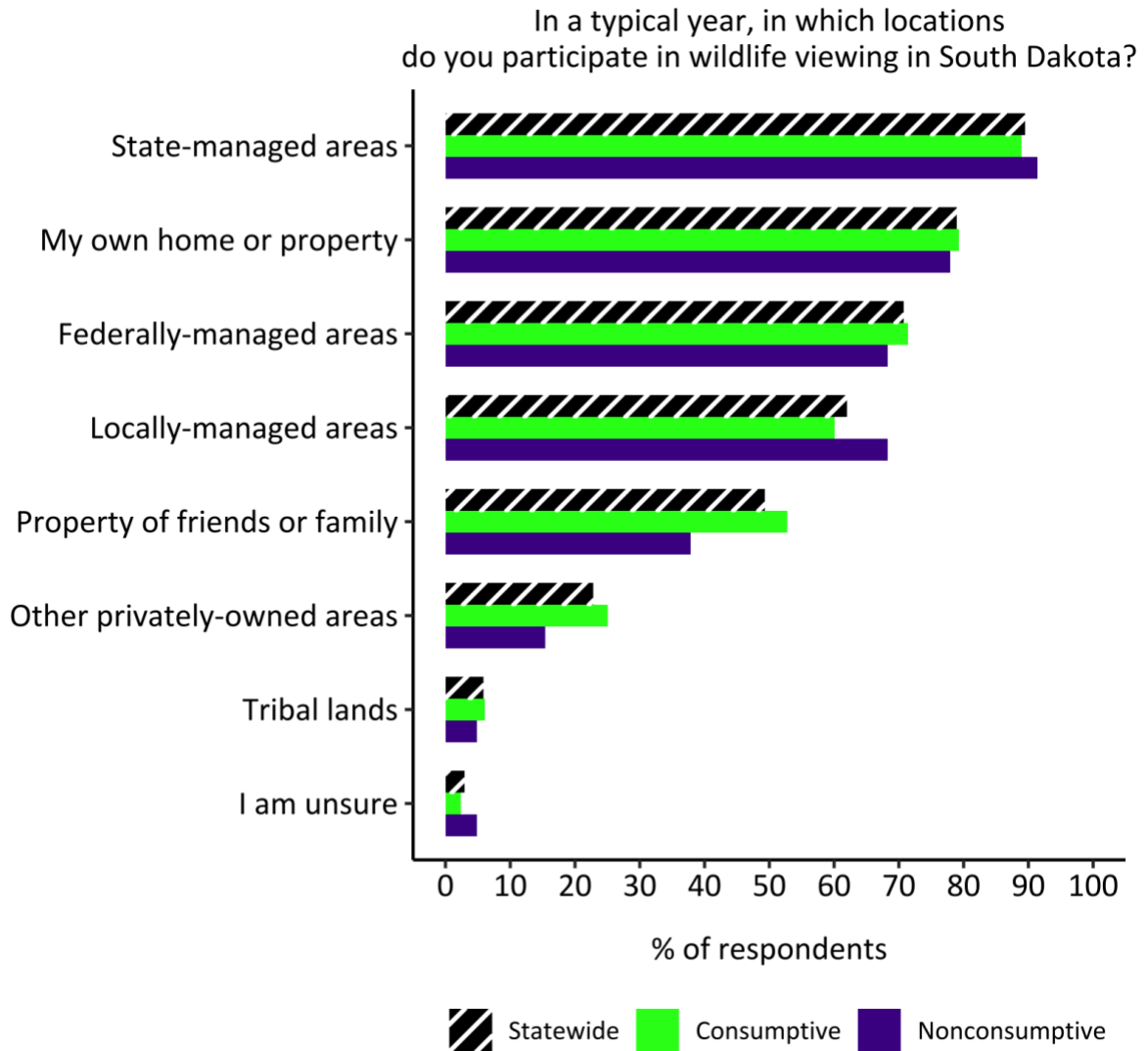


Figure 24: Wildlife viewing locations

Locations wildlife viewers in South Dakota reported participating in wildlife viewing in a typical year for statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option. A chi-square test between consumptive and nonconsumptive viewers revealed more consumptive viewers participate in wildlife viewing on property of friends and family or other private property in comparison to nonconsumptive viewers (Table 18).

Wildlife viewing-related expenditures

Wildlife viewing-related expenditures generate significant economic activity; the National Survey of Wildlife Recreation valued wildlife viewing-related expenditures at \$75.9 billion in 2016. This 2016 survey also assessed wildlife viewers’ trip-related expenses (food and lodging, transportation, and other trip costs), equipment expenditures (wildlife-watching equipment, auxiliary equipment, and special equipment), and total other expenses (land leasing and

owning, plantings, membership dues and contributions, magazines, books, and DVDs; U.S. DOI et al., 2016). To ease respondent burden, we collapsed the National Survey of Wildlife Recreation categories into two: trip-related costs and all other wildlife viewing expenses and equipment. We provided respondents with a drop-down box consisting of 12 equal-sized (\$50 increments) options informed by the range of responses in the National Survey of Wildlife Recreation.

About a quarter (26%) of survey respondents reported spending \$100 or less on wildlife viewing trip-related costs annually. Just less than 15% of respondents reported spending no money on trip-related costs annually, and 16.6% of respondents reported spending \$501 or more on trip-related costs annually. For analysis purposes, we created three categories: \$0, \$1 - \$100, and \$101 or higher. A chi-square test comparing nonconsumptive and consumptive expenditures found no statistically significant differences at this level ($\chi^2 = 0.80$, $df = 2$, $p = .669$; Table 19; Figure 25).

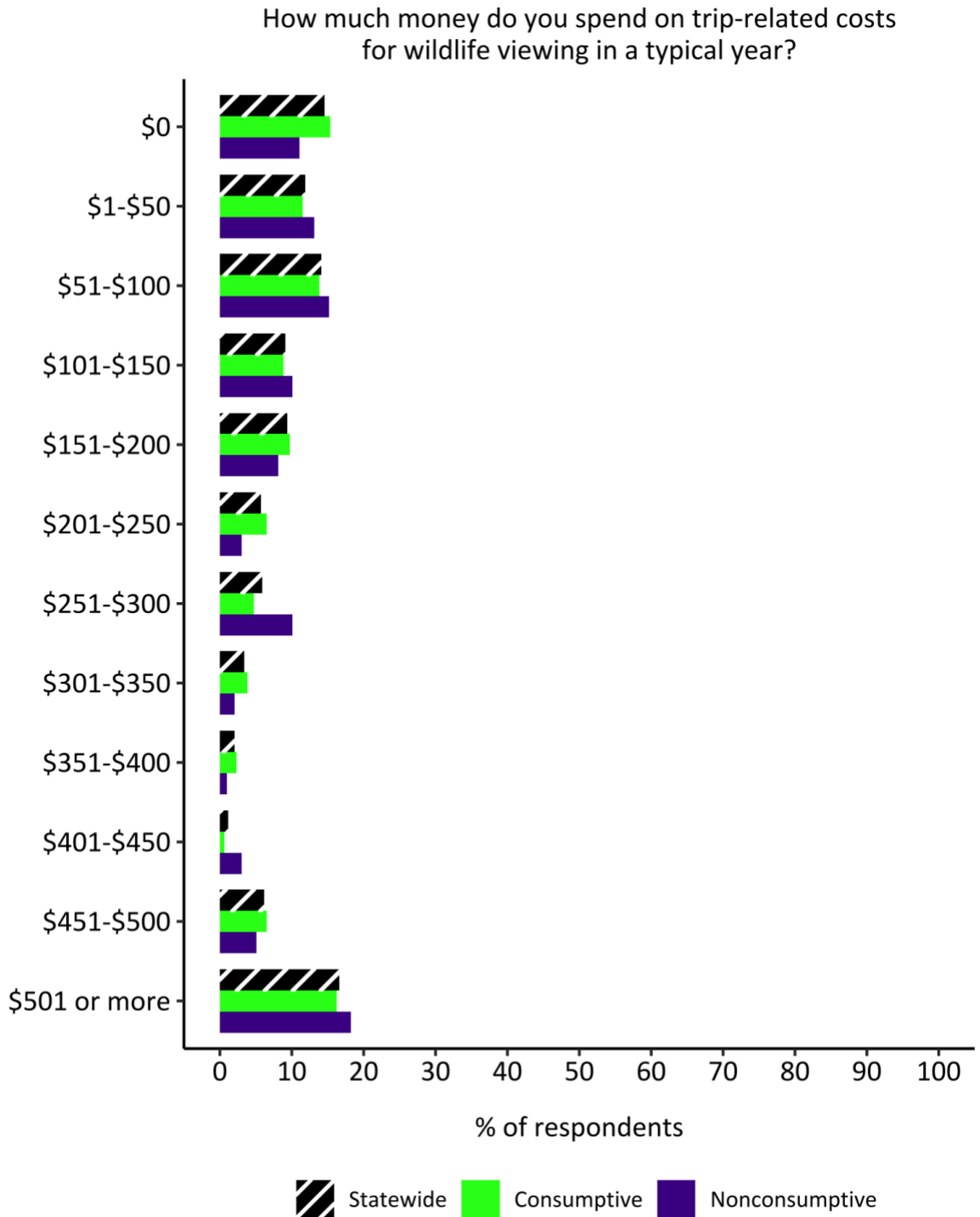


Figure 25: Trip-related wildlife viewing expenditures

Trip-related expenditures for wildlife viewing in a typical year reported by wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. A chi-square test with three categories (\$0; \$1 - \$100; and \$101 or higher) found no statistically significant differences between consumptive and nonconsumptive viewers (Table 19).

We also asked wildlife viewers about their other wildlife viewing-related costs, such as binoculars, hiking or boating equipment for viewing, field guides, bird feeders or bird foods, or membership dues for wildlife viewing organizations. About one-third of the respondents (32%) indicated spending \$100 or less on other wildlife viewing-related expenses. Less than 16% of respondents reported spending no money annually and 13.5% of respondents reported spending \$501 or more during a typical year. For analysis purposes, we created three categories: \$0, \$1 - \$100, and \$101 or higher. A chi-square test comparing nonconsumptive and consumptive expenditures found a statistically significant difference ($\chi^2 = 7.22$, $df = 2$, $p = .027$ Table 20; Figure 26). Nearly twice as many nonconsumptive viewers (43%) spent \$1 - \$100 in comparison to consumptive viewers (29%). More consumptive viewers (55%) indicated spending \$101 or higher in comparison to nonconsumptive viewers (43%).

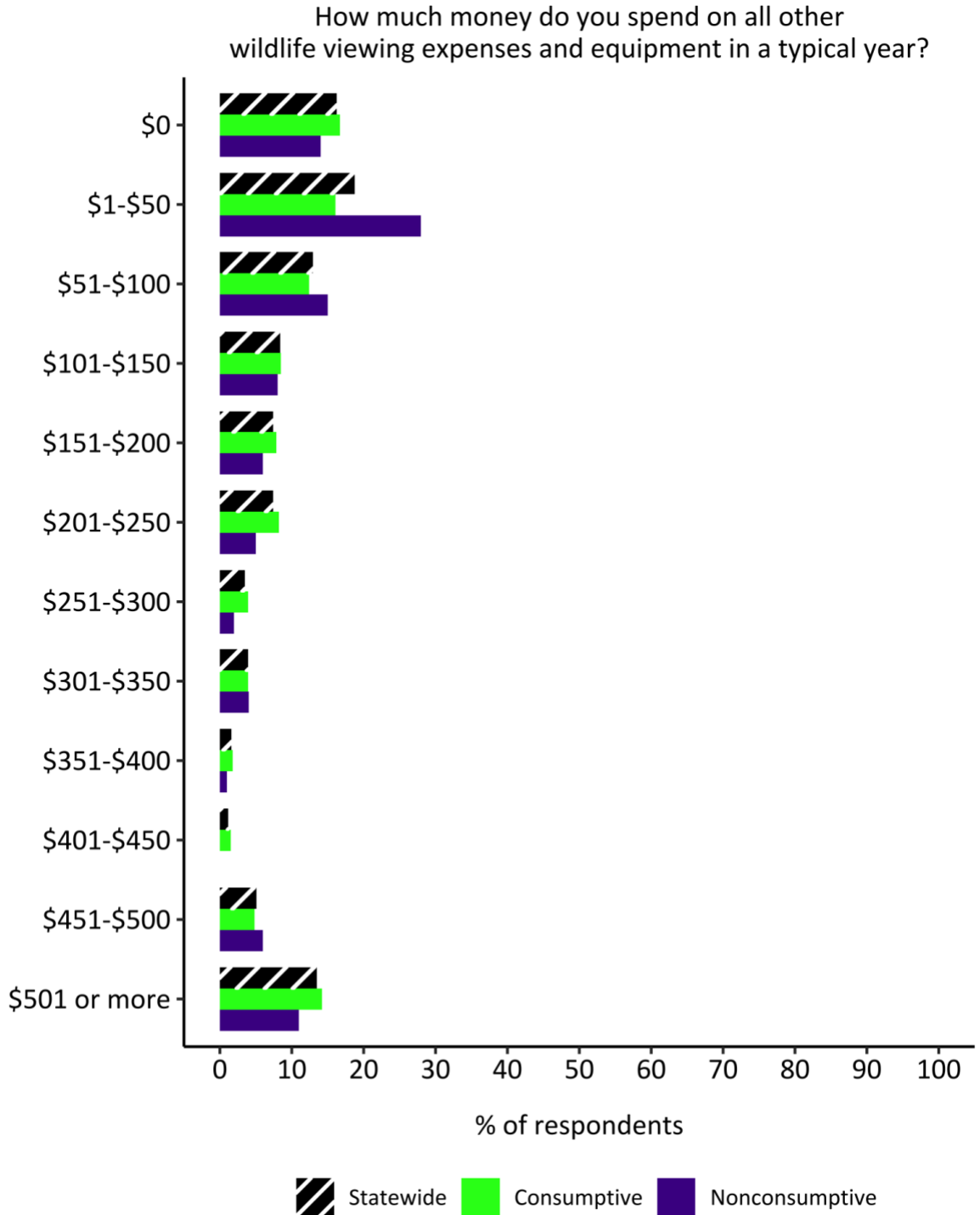


Figure 26: Other wildlife viewing-related expenditures

Other wildlife viewing-related expenditures in a typical year reported by wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. A chi-square test with three categories (\$0; \$1 - \$100; and \$101 or higher) found a statistically significant difference between consumptive and nonconsumptive viewers (Table 20).

Other outdoor recreation

Recent research has demonstrated that many wildlife recreationists participate in multiple forms of outdoor recreation that may include both consumptive and nonconsumptive uses of wildlife (Grooms et al., 2019). In order to explore this overlap in recreation participation among wildlife viewers, we asked respondents to indicate which other form(s) of outdoor recreational activity, out of a list of 18 options, they participate in during a typical year besides wildlife viewing. The list of other outdoor recreation activities used in the survey was adapted from the Virginia Wildlife Recreation Survey (Grooms et al., 2019).

Overall in South Dakota, nearly all (99.8%) of viewers indicated that they participate in at least one other form of outdoor recreation. On average, respondents indicated participation in about seven other forms of outdoor recreation ($M = 6.76$, $SD = 2.84$). As the sampling method for this survey was associated with campground users in South Dakota, 95% of all respondents indicated participation in camping. Over half of wildlife viewers reported participating in running, walking, or jogging (68%) and hiking or backpacking (65%). Over 40% of respondents reported participation in botanizing (43%), motorized boating (42%), swimming (41%) and recreational shooting (41%). In South Dakota, the least popular forms of outdoor recreation among wildlife viewers were geocaching (9.7%), horseback riding (5.0%), and rock climbing (4.1%).

As the classification of consumptive and nonconsumptive viewers used throughout this report was generated with the responses from this survey question, additional analyses on differences between consumptive and nonconsumptive viewers could not be performed for hunter, angler, and trapper-viewers or those who did not participate in any other forms of outdoor recreation. In South Dakota, just over half of respondents indicated that they participated in trapping (6.1%), hunting (18%) or fishing (48%), with fishing being most popular. Specifically, 21% of wildlife viewers in South Dakota only fish; 3.2% only hunt; 46% hunt and fish; and 6.1% hunt, fish, and trap. All wildlife viewers who participated in trapping also participated in hunting.

Chi-square tests indicated many statistically significant differences between consumptive and nonconsumptive wildlife viewers, although with low number of respondents for several of the categories for both consumptive and nonconsumptive viewers (Table 21; Figure 27).

Significantly more nonconsumptive viewers participate in running, walking or jogging; botanizing; and road or mountain biking in comparison to nonconsumptive viewers. Conversely, significantly more consumptive viewers participated in motorized boating, recreational shooting or archery, off-highway vehicle use, and foraging in comparison to nonconsumptive viewers.

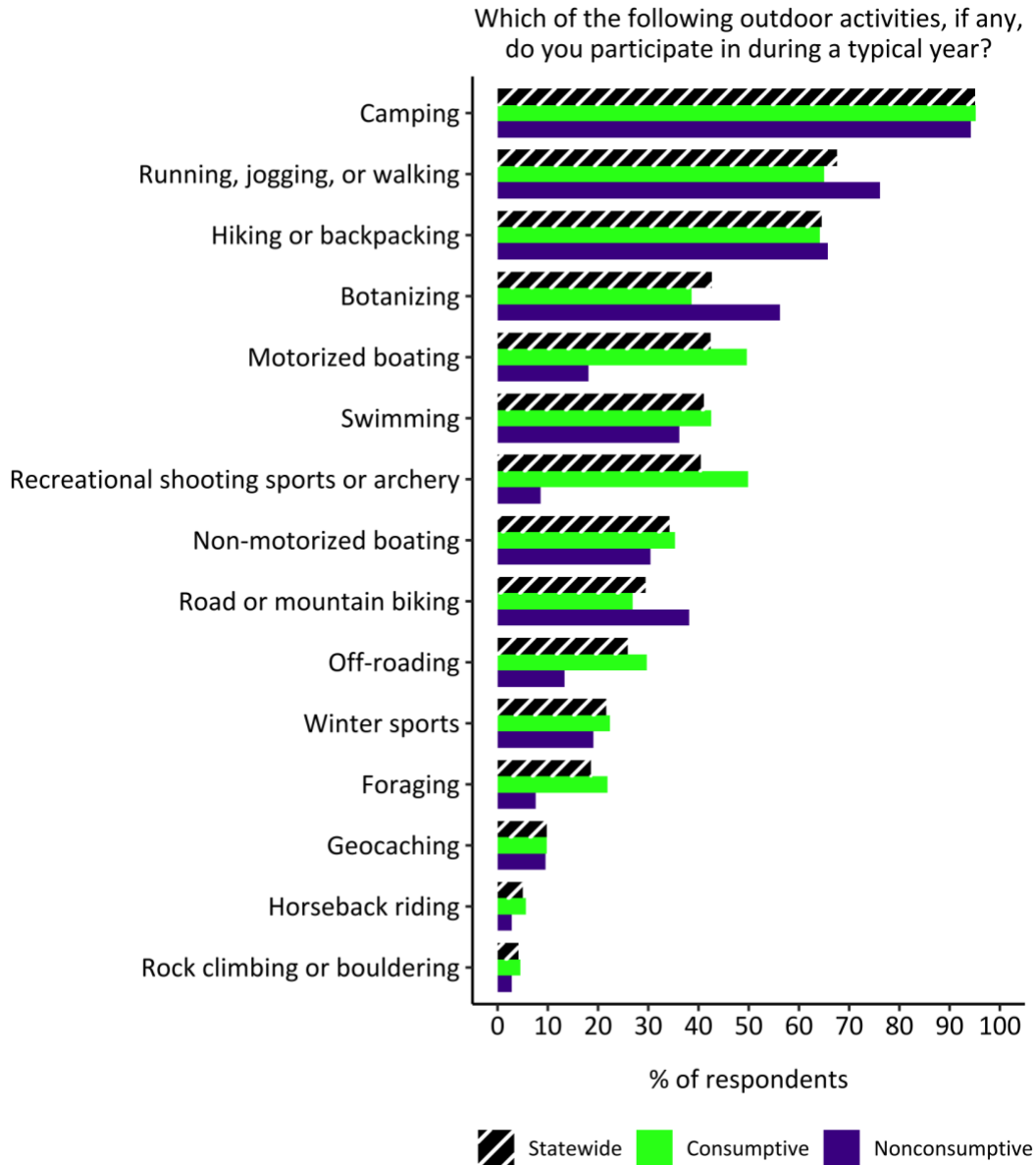


Figure 27: Other outdoor recreation activities

Outdoor activities that wildlife viewers in South Dakota report participating in during a typical year for statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option. Hunting, trapping and fishing are omitted from the figure as these activities were used to generate the consumptive and nonconsumptive group definitions and the category for no other activities is excluded since all of these viewers are “nonconsumptive” by default. Chi-square tests indicated statistically significant differences between consumptive and nonconsumptive wildlife viewers for running, walking, or jogging; botanizing; motorized boating; recreational shooting; biking; off highway vehicles; and foraging (Table 21).

Conservation behaviors

The literature shows that wildlife viewers, particularly hunter–birdwatchers (similar to our consumptive viewers, which also includes anglers), are more likely to engage in pro-environmental behaviors, or conservation behaviors, than non-wildlife viewers (Cooper et al., 2015). We asked respondents to indicate how likely they would be to participate in seven different conservation behaviors within the next five years, if they had the opportunity to do so. These conservation behaviors were adapted from survey items used by Larson et al. (2018) and were selected to represent each of the four pro-environmental behavior domains identified in that study. Larson et al. (2018) described pro-environmental behaviors in the following four domains: 1) conservation lifestyle, which includes private, household activities with environmental benefits, such as recycling and green consumerism; 2) land stewardship, which involves interaction with local ecosystems to create, manage, or monitor wildlife habitats; 3) social environmentalism, which refers to activities that center on social interaction, such as communicating with or teaching others about the environment or environmental actions; and 4) environmental citizenship, which refers to financial or political contributions to environmental causes through donations, voting, and other forms of advocacy.

Wildlife viewers most often reported being likely to clean up trash or litter, with 64% of respondents selecting that they were *very likely* or *extremely likely* to participate in this conservation behavior (Table 22; Figure 28). South Dakotans were next most likely to participate in civic engagement (such as voting and advocating to support conservation; 44%) and purchase products that benefit wildlife or whose proceeds support conservation (34%). Respondents least often reported being *very likely* or *extremely likely* to donate to conservation efforts (18% *very likely* or *extremely likely*) or inform or teach others about wildlife conservation (18% *very likely* or *extremely likely*).

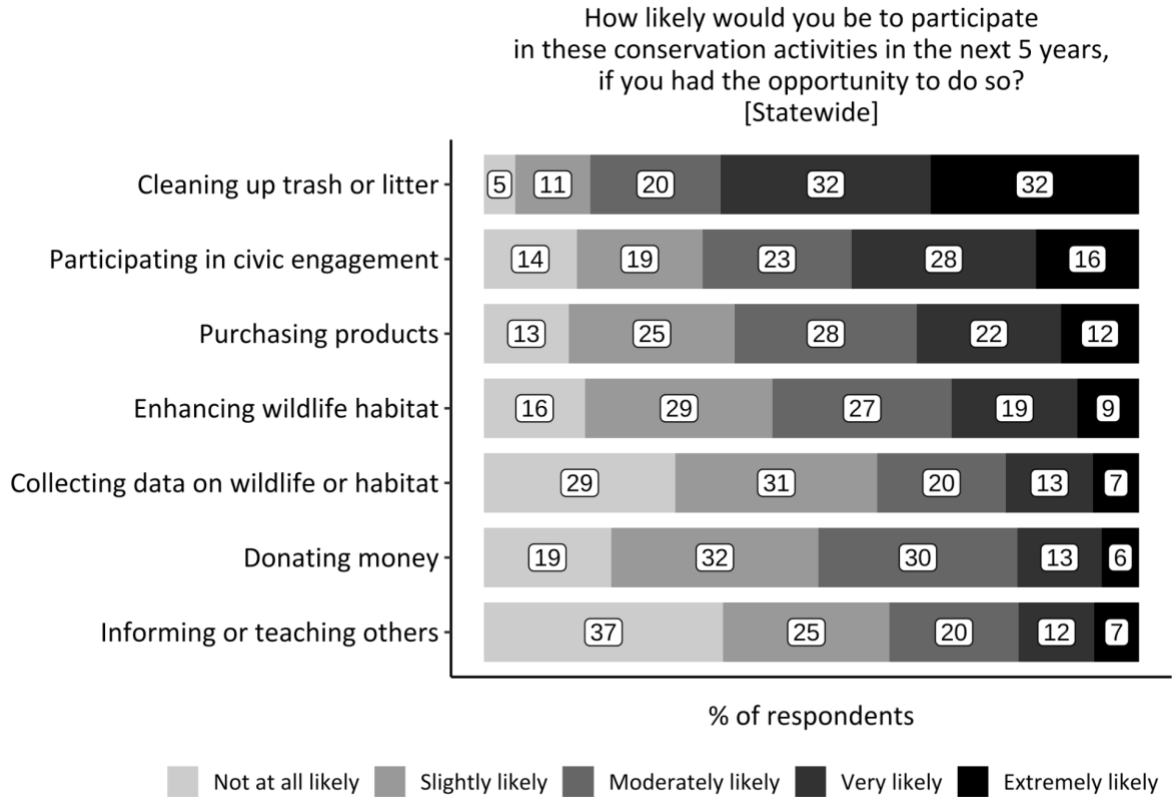


Figure 28: Likelihood of participating in conservation behaviors, statewide sample

Wildlife viewers’ reported likelihood of participating in different conservation behaviors at the statewide level in the next 5 years, if they had the opportunity to do so. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of gray darkens with increasing likelihood of participation (Table 22).

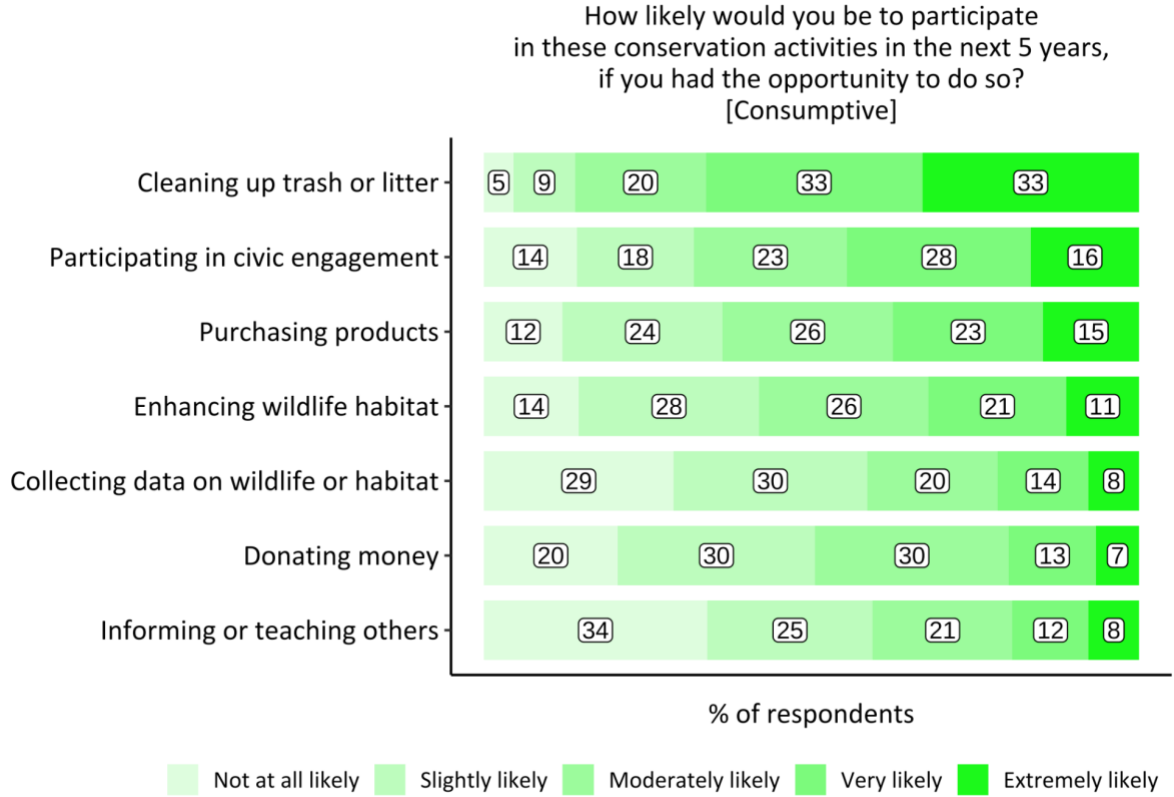


Figure 29: Likelihood of participating in conservation behaviors, consumptive respondents

Consumptive wildlife viewers' reported likelihood of participating in different conservation behaviors in the next 5 years, if they had the opportunity to do so. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of green darkens with increasing likelihood of participation (Table 23).

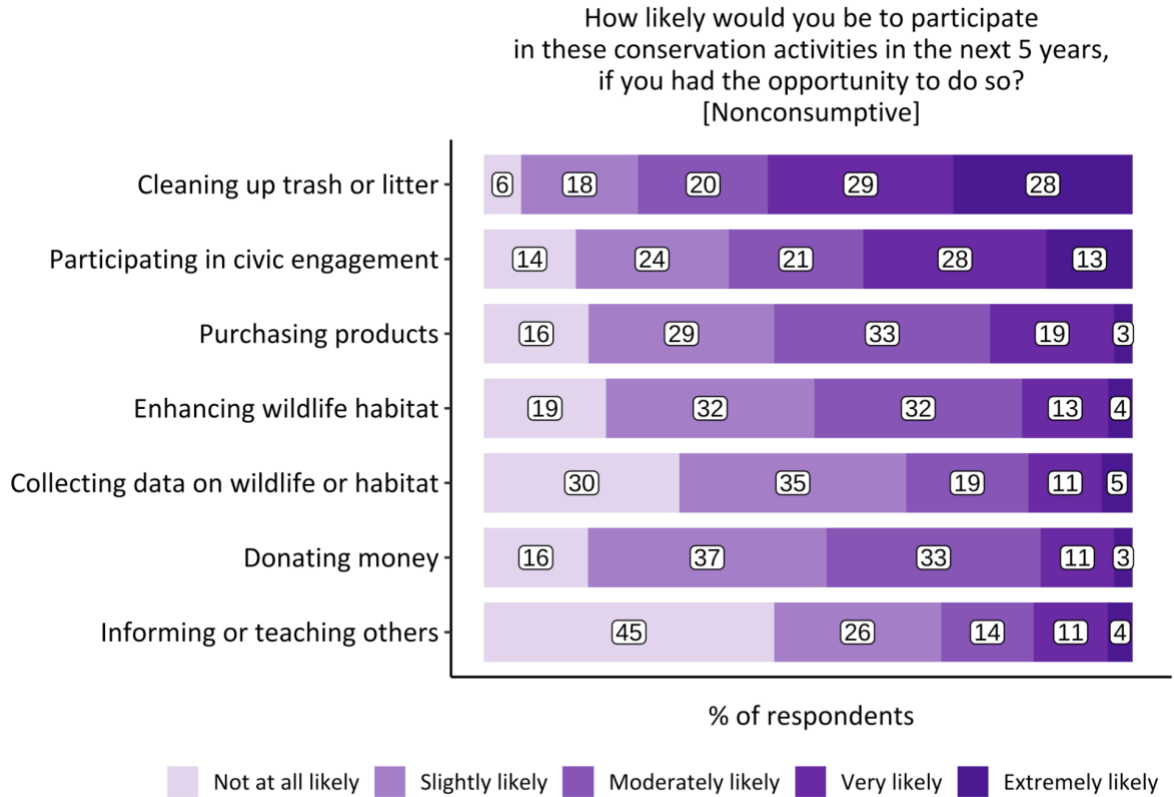


Figure 30: Likelihood of participating in conservation behaviors, nonconsumptive respondents

Nonconsumptive wildlife viewers’ reported likelihood of participating in different conservation behaviors in the next 5 years, if they had the opportunity to do so. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of purple darkens with increasing likelihood of participation (Table 23).

We also asked respondents to indicate how likely they would be to participate in these same seven conservation behaviors with or in support of GFP within the next five years if they had the opportunity to do so. Again, wildlife viewers most often reported being *very likely* or *extremely likely* to clean up trash or litter (60%), support civic engagement (38%) or purchase products that benefit wildlife or whose proceeds support conservation (30%). They least often reported being *very likely* or *extremely likely* to donate toward conservation efforts (13%) or to inform or teach others about wildlife conservation (13%; Table 24; Figure 31).

Next, we compared likelihood to participate in conservation behaviors with or independent of the GFP. Response patterns for this question were similar to the likelihood of wildlife viewers to conduct these activities independent of GFP. A paired-samples t-test revealed that viewers were slightly more likely to engage in all behaviors on their own in comparison to with GFP.

Chi-square tests indicated only a handful of statistically significant differences between consumptive and nonconsumptive viewers. Consumptive viewers expressed a higher likelihood to participate in enhancing habitat or purchasing environmentally friendly products on their own in comparison to nonconsumptive viewers. Generally, there was no statistically significant difference in the likelihood of nonconsumptive and consumptive viewers to participate in any conservation behaviors with the GFP, with the exception of a direct donation. Nonconsumptive respondents were more likely to donate to GFP than consumptive viewers ($\chi^2 = 12.83, df = 3, p = .005$; Table 23; Table 25; Figures 29; Figure 30; Figure 32; Figure 33).

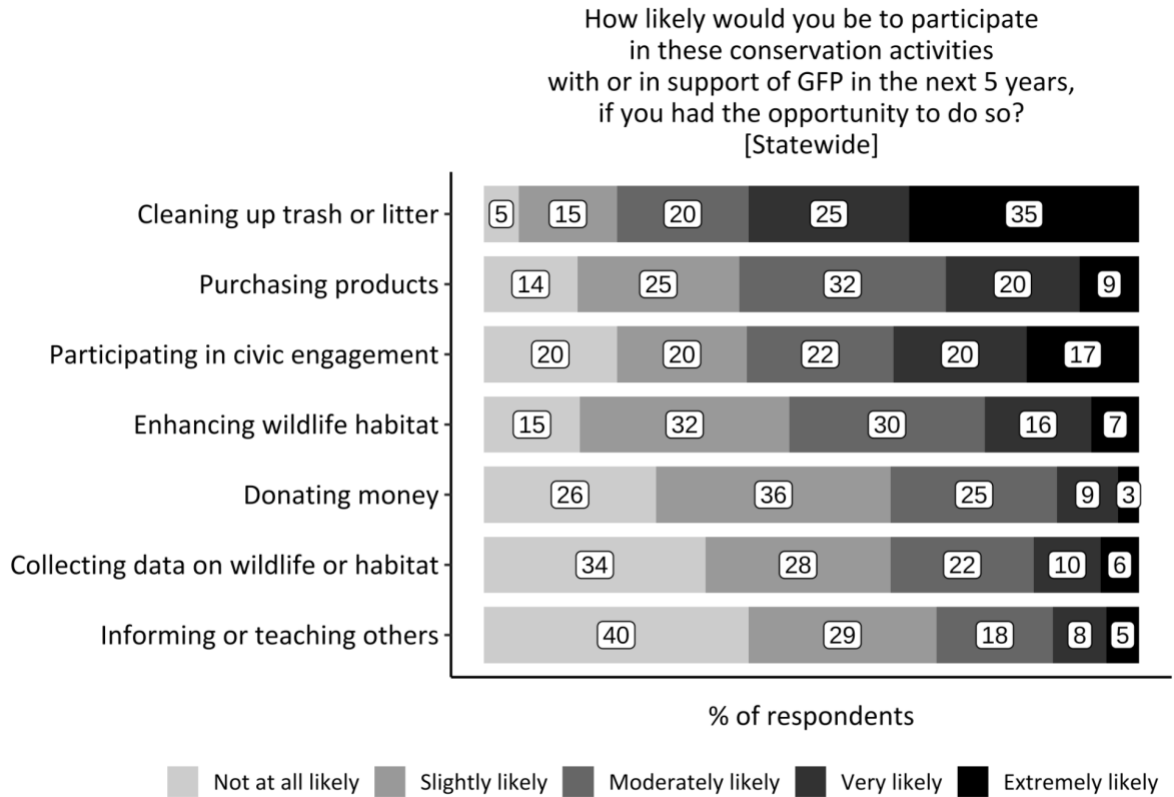


Figure 31: Likelihood of participating in conservation behaviors with or in support of state agency, statewide sample

Wildlife viewers’ reported likelihood of participating in different conservation behaviors at the statewide level with or in support of GFP in the next 5 years, if they had the opportunity to do so. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of gray darkens with increasing likelihood of participation (Table 24).

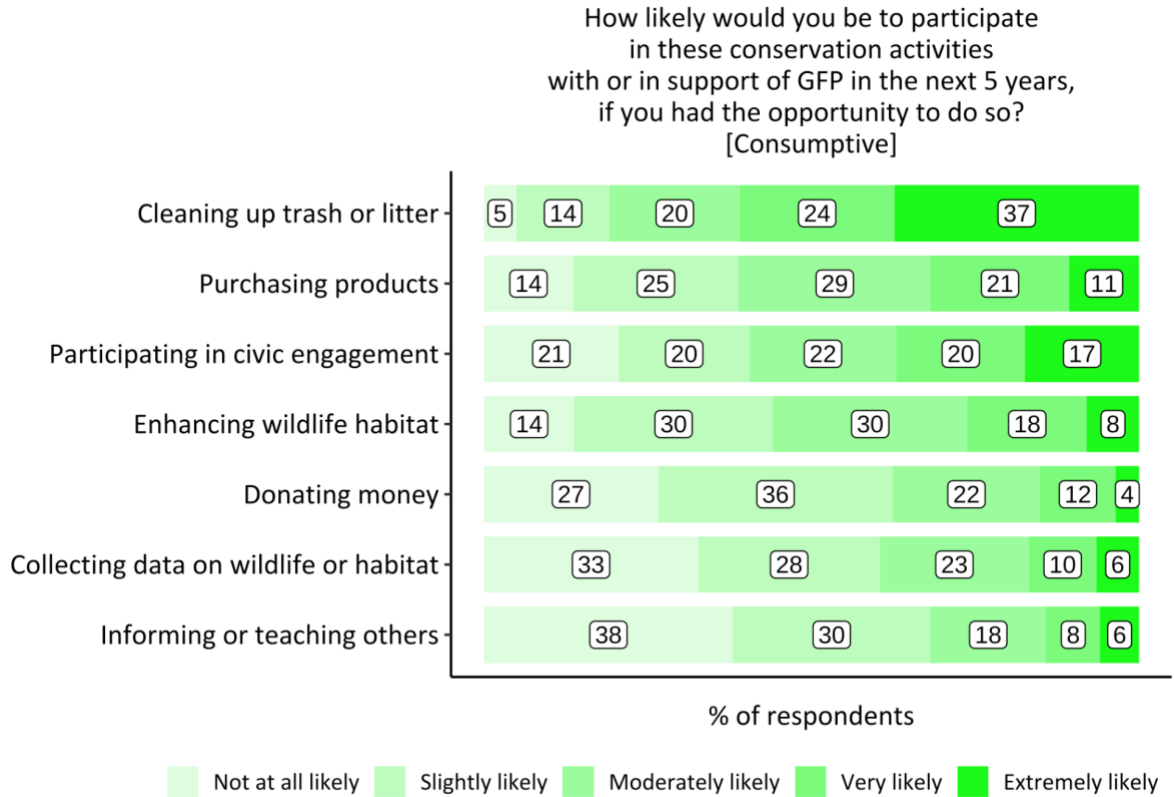


Figure 32: Likelihood of participating in conservation behaviors with or in support of state agency, consumptive respondents

Consumptive wildlife viewers’ reported likelihood of participating in different conservation behaviors with or in support of GFP in the next 5 years, if they had the opportunity to do so. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of green darkens with increasing likelihood of participation (Table 25).

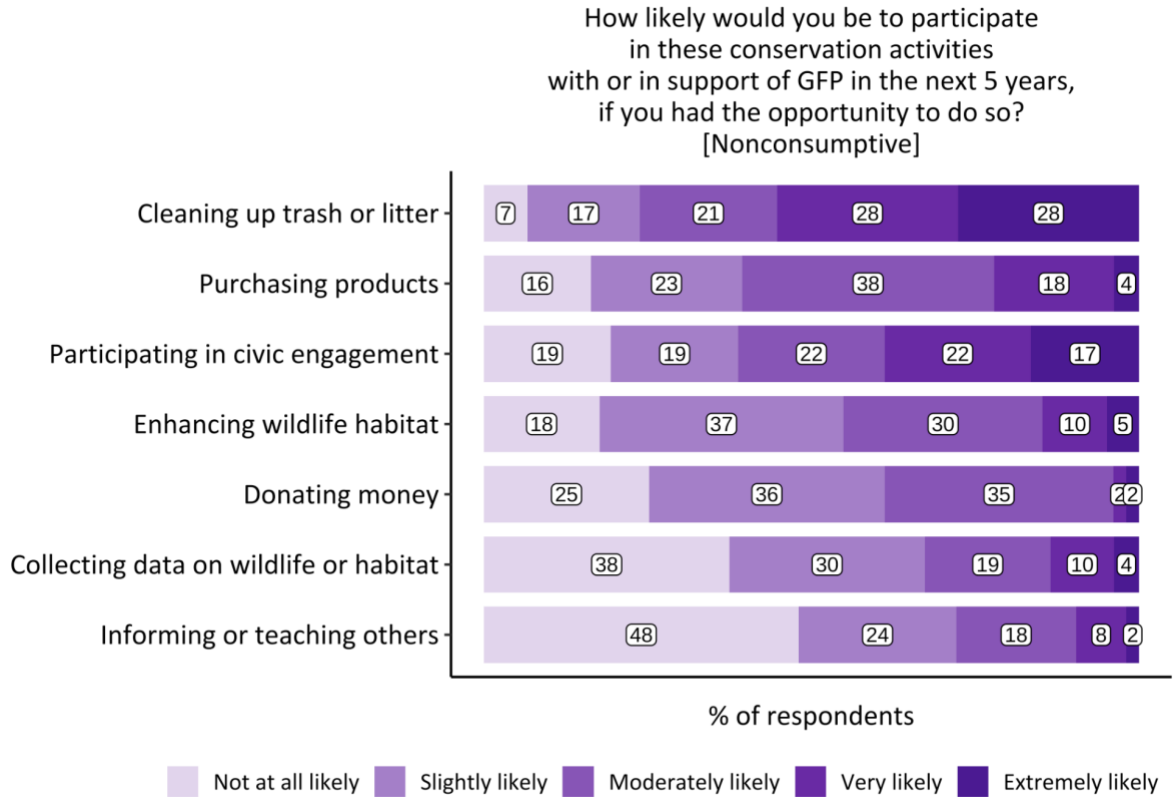


Figure 33: Likelihood of participating in conservation behaviors with or in support of state agency, nonconsumptive respondents

Nonconsumptive wildlife viewers’ reported likelihood of participating in different conservation behaviors with or in support of GFP in the next 5 years, if they had the opportunity to do so. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of purple darkens with increasing likelihood of participation (Table 25).

Barriers to wildlife viewing

Wildlife viewers experience a variety of barriers to their participation in the activity including but not limited to time, lack of financial or transportation resources, or not knowing where to view wildlife (U.S. DOI et al., 2016; Grooms et al., 2019; NAWMP, 2021). To examine barriers to participation in wildlife viewing, we provided respondents with a list of 14 common barriers and asked them to indicate the extent to which each of the barriers limited their participation in wildlife viewing, with response options ranging from 1 (*not at all*) to 5 (*a great deal*). We adapted the list from the National Survey of Birdwatchers (NAWMP, 2021) with input from our Multi-State Steering Committee.

Our results indicate that lack of free time for wildlife viewing is the greatest barrier of those examined in this study, with over half (55%) of respondents indicating that time limited

participation in wildlife viewing *somewhat, quite a bit, or a great deal*. This was followed by distance to high-quality viewing locations (42% limited *somewhat, quite a bit, or a great deal*) and crowds in wildlife viewing locations (26% limited *somewhat, quite a bit, or a great deal*; Table 26; Figure 34). Similarly, 26% of respondents were limited *somewhat, quite a bit, or a great deal* by not knowing where to go wildlife viewing. The barriers that limited wildlife viewers in South Dakota the least were safety concerns in wildlife viewing locations or lack of transportation to wildlife viewing locations, with only 7.1% of respondents indicating that these two barriers limited their participation in wildlife viewing *somewhat, quite a bit, or a great deal*. Chi-square tests comparing nonconsumptive and consumptive viewers could not be conducted for any barrier due to small sample size (Table 27; Figures 35-36). Though, descriptively, nonconsumptive viewers were limited to a greater extent by many of the barriers in comparison to consumptive viewers (Table 27; Figures 35-36).

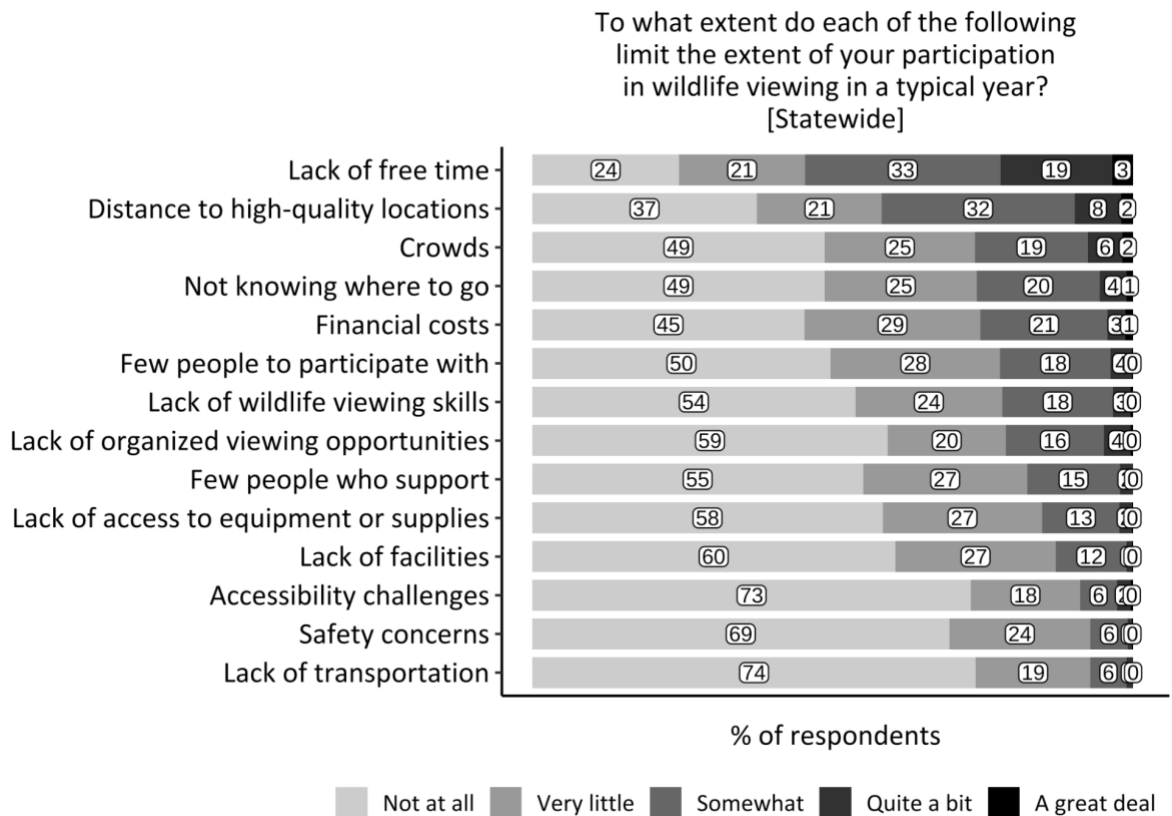


Figure 34: Barriers to wildlife viewing, statewide sample

Wildlife viewers' reported extent to which each of the barriers limited their participation in wildlife viewing at the statewide level. Blocks represent the percentage of respondents who fell into each of the five categories: *not at all* to *a great deal*. The lightest gray boxes represent the viewers that indicated an item as being *not at all* a barrier to their participation; boxes darken as the level of barrier increases (Table 26).

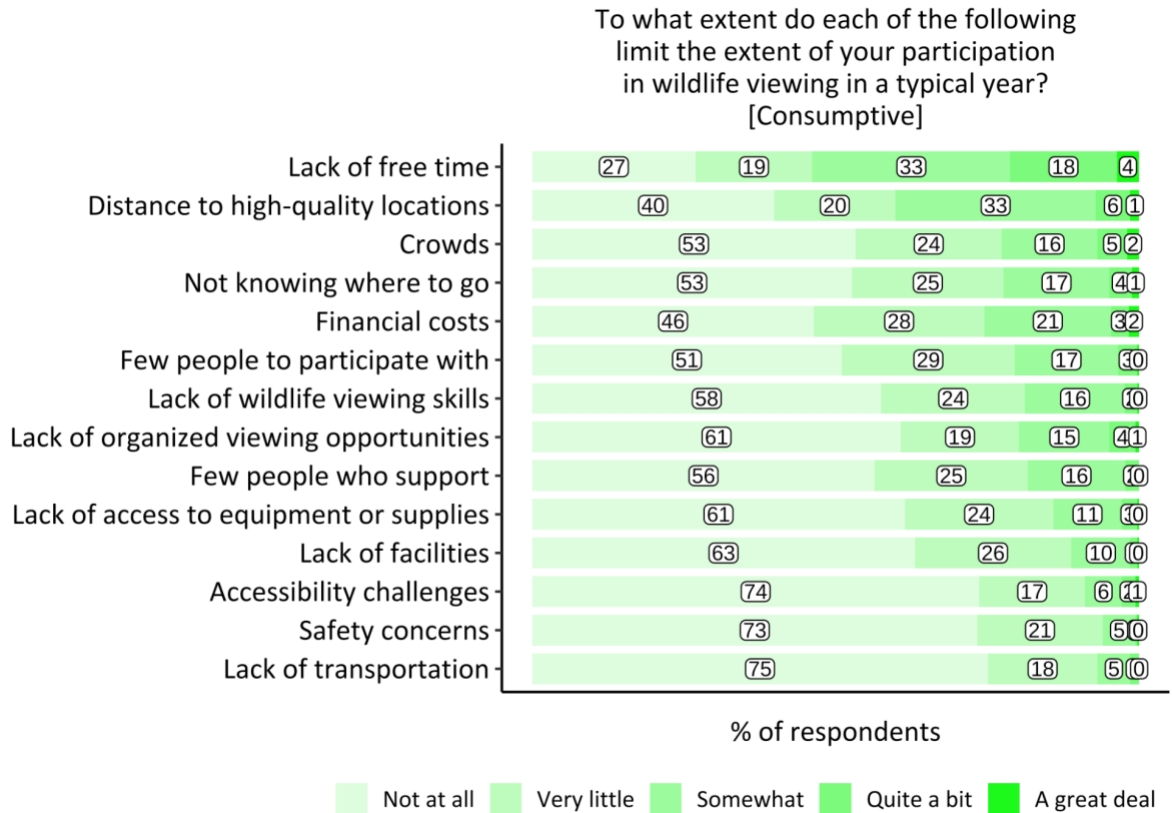


Figure 35: Barriers to wildlife viewing, consumptive respondents

Consumptive wildlife viewers' reported extent to which each of the barriers limited their participation in wildlife viewing. Blocks represent the percentage of respondents who fell into each of the five categories: *not at all* to *a great deal*. The lightest green boxes represent the viewers that indicated an item as being *not at all* a barrier to their participation; boxes darken as the level of barrier increases (Table 27).

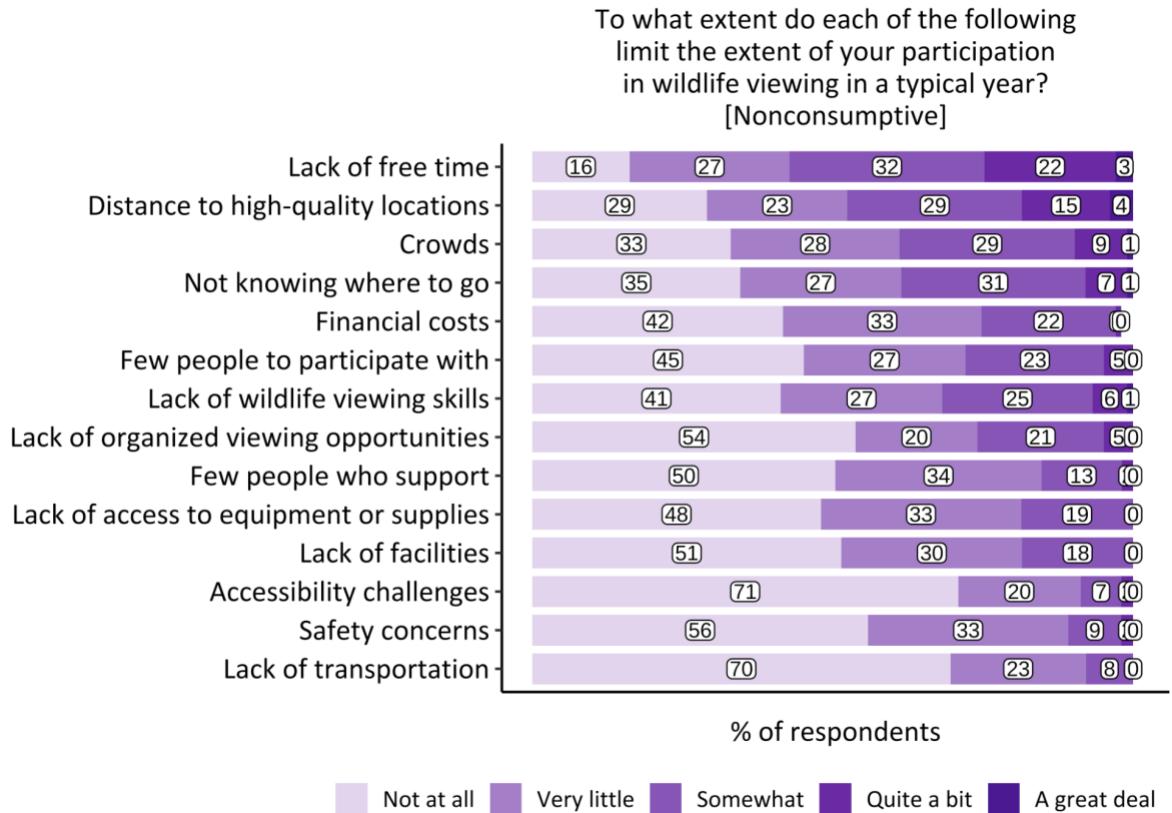


Figure 36: Barriers to wildlife viewing, nonconsumptive respondents

Nonconsumptive wildlife viewers’ reported extent to which each of the barriers limited their participation. Blocks represent the percentage of respondents who fell into each of the five categories: *not at all* to *a great deal*. The lightest purple boxes represent the viewers that indicated an item as being *not at all* a barrier to their participation; boxes darken as the level of barrier increases (Table 27).

Groups that encourage participation in wildlife viewing

Social support, or the resources either perceived or provided by friends, family, mentors, peers, and other groups (Gottlieb & Bergen, 2010), is linked to sustained higher levels of participation in outdoor recreation. For example, birders who have a friend or relative who also birds spend more time birding and have more birding knowledge than those who do not (Schoffman et al. 2015; Rutter et al., 2021). To further understand mechanisms of social support for wildlife viewing, we asked our respondents to what extent family, friends, peers, and mentors encourage their participation, with response options ranging from 1 (*not at all*) to 5 (*a great deal*).

Respondents indicated that family provided the greatest extent of encouragement to participate, with 70% indicating that family members encouraged their wildlife viewing *somewhat, quite a bit, or a great deal*. This was followed by friends at 57%, peers at 44%, and

mentors at 25%. Respondents relied on social support from mentors the least out of all four groups, with 54% of all respondents indicating that mentors did not encourage their participation at all.

Chi-square tests revealed no statistically significant difference in the extent to which family members, friends, peers, and mentor groups encouraged participation in wildlife viewing when comparing consumptive and nonconsumptive viewers. Due to small sample size, *quite a bit* and *a great deal* were combined when analyzing social support provided by mentors and peers (Tables 28-31; Figures 38-39).

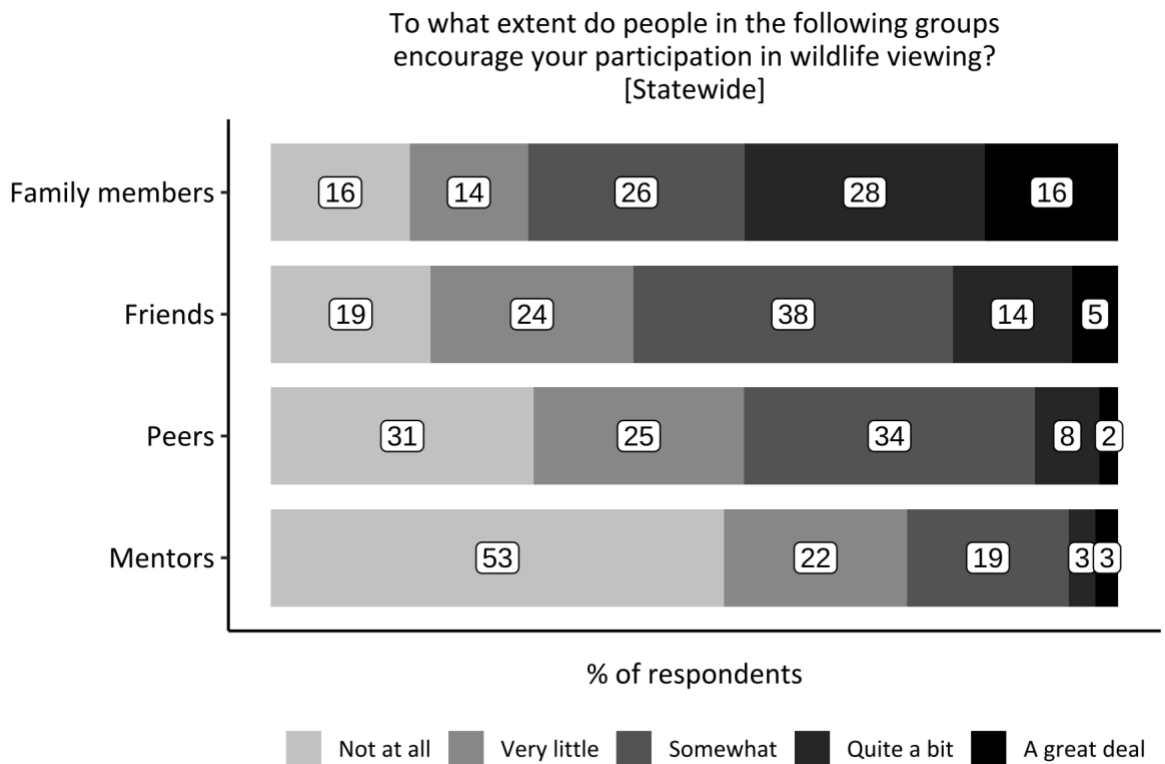


Figure 37: Groups that encourage viewing, statewide sample

The degree to which wildlife viewers at the statewide level feel encouraged to participate in wildlife viewing by four groups of people: family, friends, peers, and mentors. Blocks represent the percentage of respondents who fell into each of the five categories. The lightest shade of gray represents viewers that indicated the least amount of social support: *not at all*; blocks darken with increasing levels of support (Tables 28 - 31).

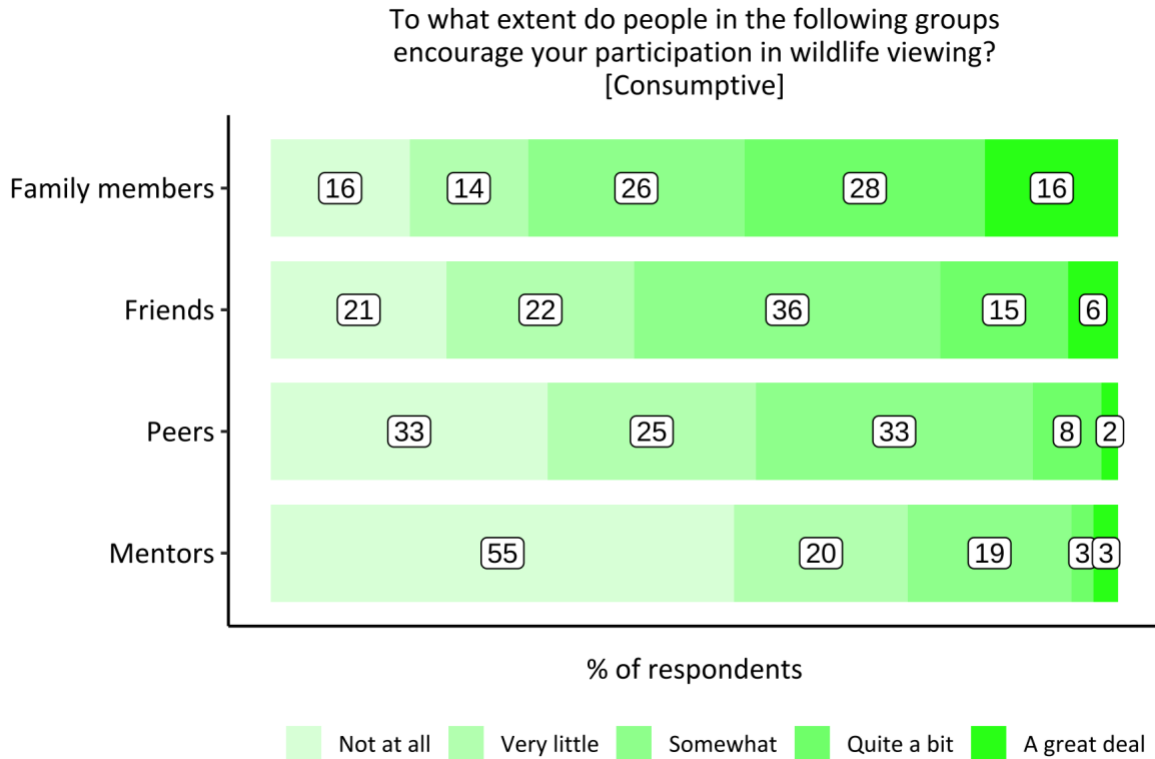


Figure 38: Groups that encourage viewing, consumptive respondents

The degree to which consumptive wildlife viewers in South Dakota feel encouraged to participate in wildlife viewing by four groups of people: family, friends, peers, and mentors. Blocks represent the percentage of respondents who fell into each of the five categories. The lightest shade of green represents viewers that indicated the least amount of social support: *not at all*; blocks darken with increasing levels of support (Tables 28 - 31).

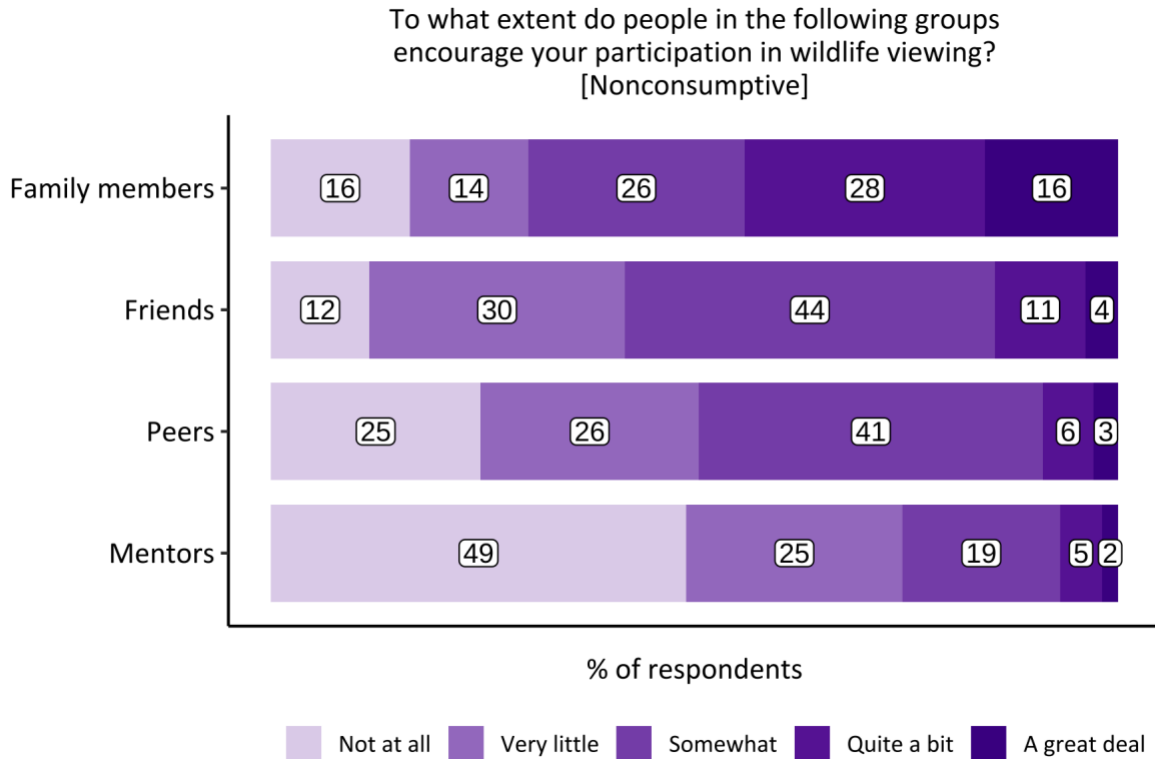


Figure 39: Groups that encourage viewing, nonconsumptive respondents

The degree to which nonconsumptive wildlife viewers in South Dakota feel encouraged to participate in wildlife viewing by four groups of people: family, friends, peers, and mentors. Blocks represent the percentage of respondents who fell into each of the five categories. The lightest shade of purple represents viewers that indicated the least amount of social support: *not at all*; blocks darken with increasing levels of support (Tables 28 - 31).

Accessibility and wildlife viewing

According to the Centers for Disease Control, 26% of American adults experience some type of disability (CDC, 2020). Historically, surveys and planning efforts for wildlife viewing have largely overlooked the needs and concerns of wildlife viewers with disabilities, beyond achieving Americans with Disabilities Act compliance (Williams et al., 2004; Michopoulou et al., 2015). As people with disabilities comprise a significant portion of the adult U.S. population, we considered how this lack of focus on addressing their needs impacts their wildlife viewing experience. To do so, we asked respondents about the extent to which they experience accessibility challenges related to wildlife viewing. We used a definition of the term “accessibility challenges” developed by Birdability (Rose & McGregor, 2021). Birdability defines accessibility challenges as:

The difficulties someone experiences in interacting with or while using the physical or social environment while trying to engage in a meaningful activity (such as wildlife viewing). This may be a result of a mobility challenge, blindness or low vision, intellectual or developmental disabilities (including Autism), mental illness, being Deaf or Hard of Hearing, or other health concerns.

We found that 12% of wildlife viewers in South Dakota experience *somewhat, quite a bit, or a great deal* of accessibility challenges (Table 32; Figure 40). A chi-square test with two categories (*Not at all, and very little* as the first category; and *somewhat, quite a bit, and a great deal* as a second category) found no difference in the extent of accessibility challenges consumptive and nonconsumptive viewers experience ($\chi^2 = 0.44, df = 1, p = .506$; Table 32; Figure 40).

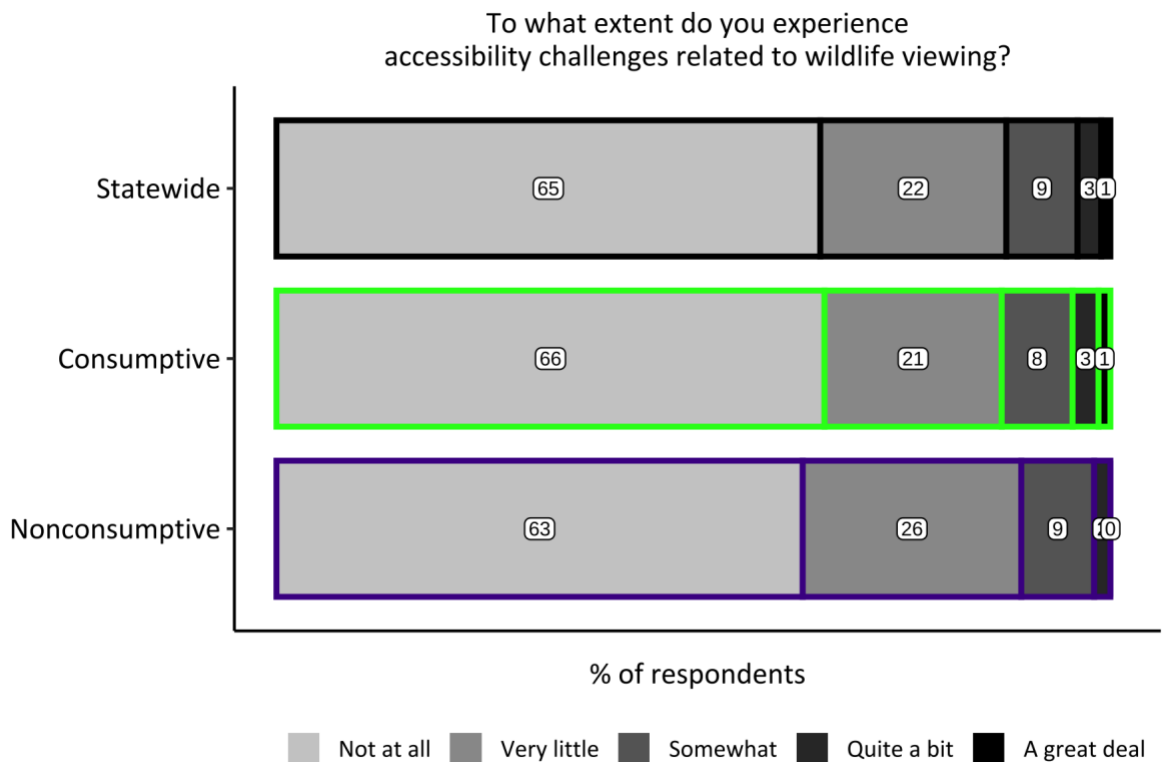


Figure 40: Accessibility challenges and wildlife viewing, all respondents

Wildlife viewers' extent to which they experience accessibility challenges for statewide, consumptive, and nonconsumptive groups. Blocks represent the percentage of respondents who fell into each of the five categories: *not at all* to *a great deal*. A chi-square test with two categories (Category 1: *not at all* and *very little*; Category 2: *somewhat, quite a bit, and a great deal*) found no difference between consumptive and nonconsumptive groups (Table 32).

Familiarity

An individual's familiarity with an organization or entity may serve as an indicator of likelihood to contribute financially and a metric of that individual's perception of the entity (Katz, 2017). As state agencies endeavor to increase their engagement with a broader constituency (AFWA & WMI, 2016), familiarity may serve as an important indicator in measuring viewers' relationships with agencies and likelihood to provide financial support (Katz, 2017; Grooms, 2021). Consumptive viewers, such as hunters and anglers, may have more interaction with state fish and wildlife agencies due to permitting and license regulations (Grooms, 2021).

We utilized a variety of questions to thoroughly examine familiarity. We asked wildlife viewers to indicate their level of familiarity with their state fish and wildlife agency, with five unipolar options ranging from *not at all familiar* to *extremely familiar*. Most wildlife viewers were *moderately* or *very* familiar with GFP (65%). Almost one in five, 17% of respondents were *extremely familiar* with GFP and only 3.7% were not familiar with the agency at all (Table 33; Figure 41). Due to low sample sizes, we combined the *not at all* and *slightly familiar* for analysis purposes. A chi-square revealed a statistically significant difference in familiarity when comparing consumptive and nonconsumptive viewers ($\chi^2 = 12.83$, $df = 3$, $p = .005$; Table 33; Figure 41). Over 25% of nonconsumptive viewers were *not at all* or *slightly familiar* with GFP, compared to only 16% of consumptive viewers.

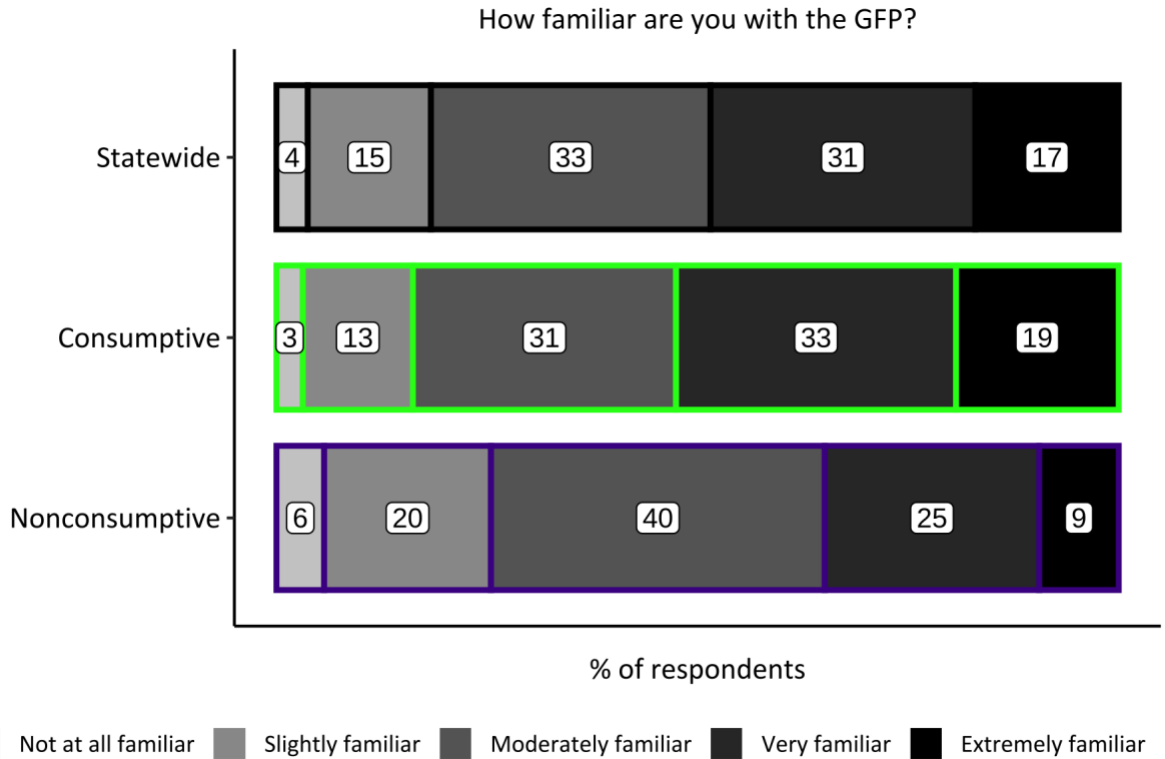


Figure 41: Familiarity with GFP, all respondents

Wildlife viewers’ self-reported level of familiarity with GFP for statewide, consumptive, and nonconsumptive groups. Blocks represent the percentage of respondents who fell into each of the five categories: *not at all familiar* to *extremely familiar* (Table 33).

Next, we investigated specific aspects of familiarity, including familiarity with GFP staff, programs, lands, and mission. We found that 18% of respondents reported being *not at all familiar* with GFP staff. The majority of respondents, 64%, reported that they were *slightly* or *moderately* familiar with agency staff, and 18% were *very* or *extremely familiar* with GFP staff. Less than one-tenth of respondents were *not at all familiar* with GFP programs or lands (Tables 35-36; Figure 42). Nearly three-quarters (71%) of respondents were *slightly* or *moderately* familiar with GFP programs and just 6.3% were *very* or *extremely familiar* (Table 35; Figure 42).

Chi-square tests indicated highly statistically significant differences in familiarity between consumptive and nonconsumptive viewers in only two of the four surveyed aspects of GFP (Tables 34-37; Figure 42). Nonconsumptive viewers were more likely to be *not at all familiar* with GFP lands and programs in comparison to than consumptive viewers.

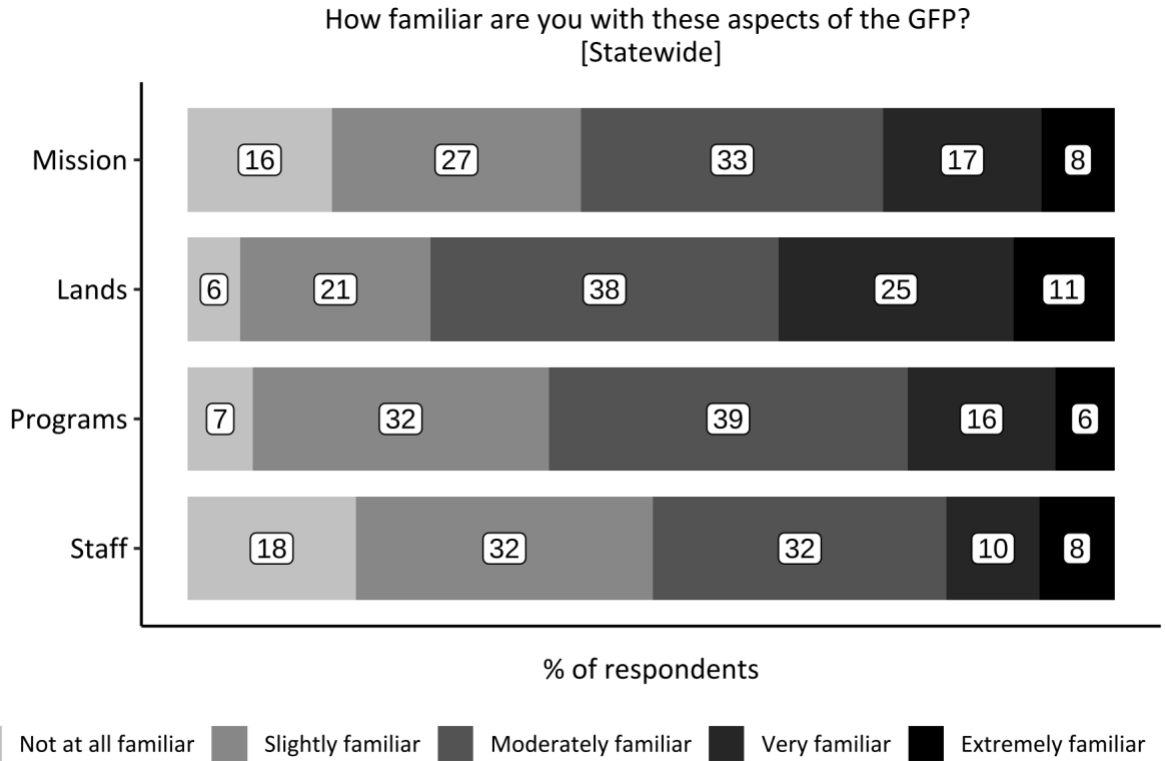


Figure 42: Familiarity with different aspects of GFP, statewide sample

Wildlife viewers' self-reported level of familiarity with specific aspects of GFP (mission, lands, programs, and staff) at the statewide level. Blocks represent the percentage of respondents who fell into each of the five categories: *not at all familiar* to *extremely familiar* (Tables 34-37).

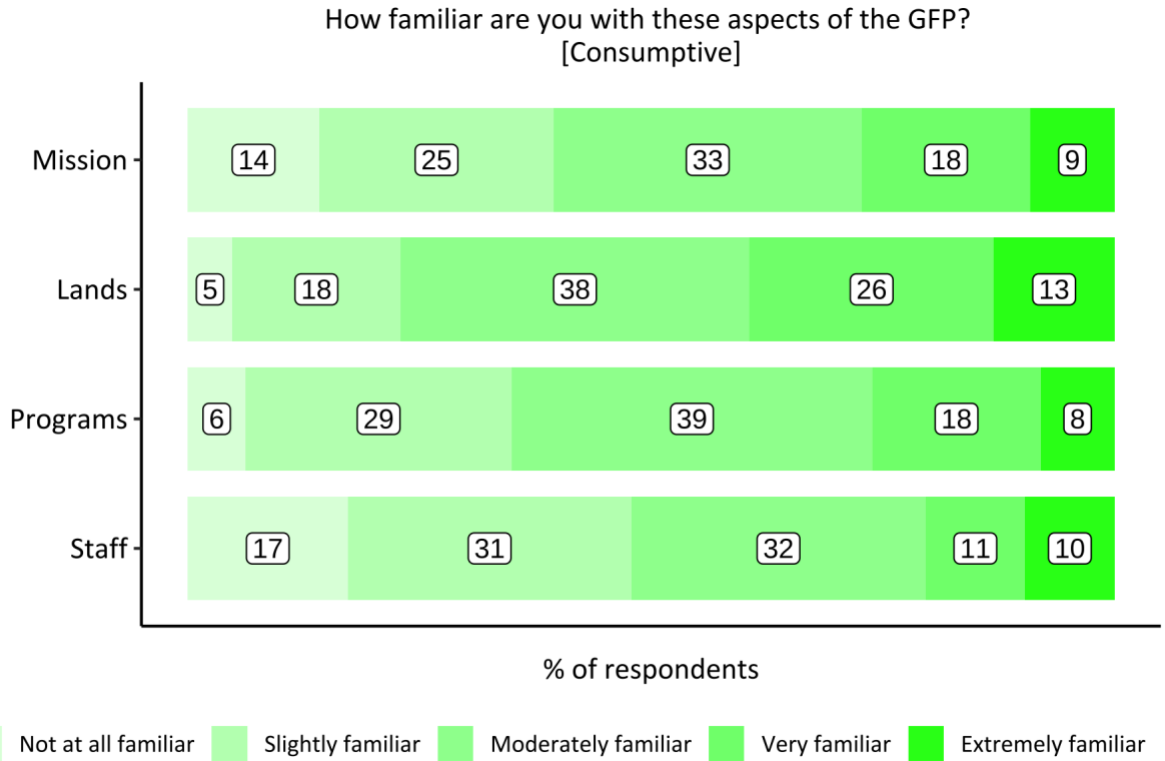


Figure 43: Familiarity with different aspects of GFP, consumptive respondents

Consumptive wildlife viewers' self-reported level of familiarity with specific aspects of GFP (mission, lands, programs, and staff). Blocks represent the percentage of respondents who fell into each of the five categories: *not at all familiar* to *extremely familiar* (Tables 34-37).

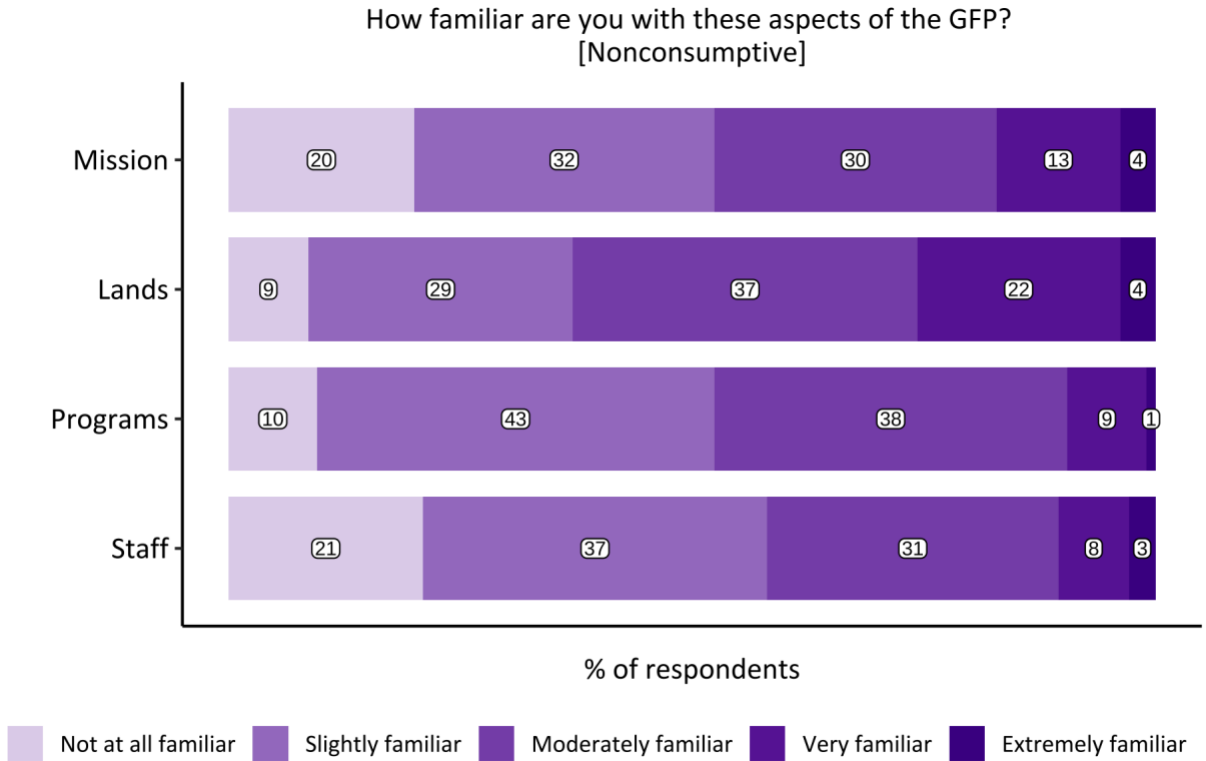


Figure 44: Familiarity with different aspects of GFP, nonconsumptive respondents

Nonconsumptive wildlife viewers’ self-reported level of familiarity with specific aspects of GFP (mission, lands, programs, and staff). Blocks represent the percentage of respondents who fell into each of the five categories: *not at all familiar* to *extremely familiar* (Tables 34-37).

Perception of state agency prioritization of programs and services for wildlife viewing

To further examine wildlife viewer perceptions of GFP, we examined viewers’ thoughts on GFP’s prioritization of programs and services that support wildlife viewing. In previous research in Virginia, no differences between birder-viewers and hunter-anglers were found when comparing the prioritization of programs and services that support wildlife viewing (Grooms et al., 2021). The majority of both consumptive and nonconsumptive viewers in Virginia felt that the agency was giving about the right level of prioritization to programs and services that support wildlife viewers, followed by about a quarter who thought that it was not high enough (Grooms et al., 2021). In this survey, we evaluated respondents’ perceptions of GFP by examining how wildlife viewers perceive the level of prioritization the state agency places on programs and services that support wildlife viewing. We provided respondents with a five-point bipolar scale ranging from 1 (*far too low*) to 5 (*far too high*), with *about right* as the middle third option and a sixth option of “I don’t have an opinion,” which 25% ($n = 114$) of respondents from the state level selected and were treated as missing values in the following analysis.

The majority of respondents in South Dakota reported that they felt the level of prioritization of programs and services for wildlife viewing was *about right* (65%). About a third of respondents (33%) reported the level of prioritization was *too low* or *far too low*, indicating interest in seeing additional efforts from the State of South Dakota to support wildlife viewing. Only 1.5% of respondents felt that the level of prioritization was *too high* or *far too high*. A chi-square test examining the differences between consumptive and nonconsumptive viewers regarding the perceived levels of prioritization of wildlife viewing was conducted with two categories (Category 1: *Far too low* and *too low*; Category 2: *About right*, *too high*, and *far too high*) and found no statistically significant differences ($\chi^2 = 3.38$, $df = 1$, $p = .066$; Table 38; Figure 45).

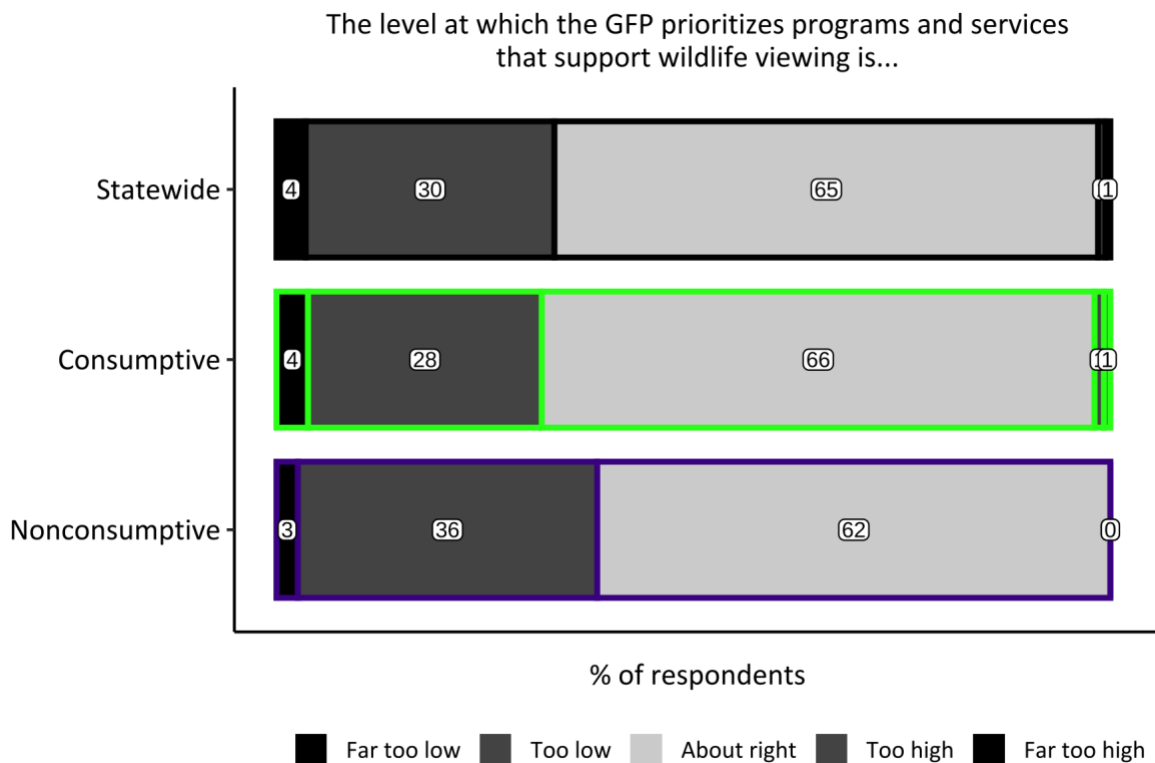


Figure 45: Perception of GFP prioritization of programs and services for wildlife viewing, all respondents

Wildlife viewers' perception of GFP's prioritization of programs and services for wildlife viewing for statewide, consumptive, and nonconsumptive groups. Blocks represent the percentage of respondents who fell into each of the five categories: *far too low* to *far too high*. The lightest shade of gray indicates the percentage of respondents who felt the level of prioritization was *about right* (Table 38).

Experiences with state agency programs and services

We further explored wildlife viewer relationships with GFP by asking about which state agency programs and services, out of a list of ten, they had engaged with in the past five years. This list was modified by state agency representatives from South Dakota to reflect the items offered by GFP. A 11th option, "I have not used or engaged in any of these agency programs and services in

the last five years,” was provided, which was selected by 9.5% of all survey respondents in South Dakota.

Of the remaining 89% of respondents who reported utilizing at least one agency program and service, 14% of them selected only one response option. Wildlife viewers in South Dakota most commonly used GFP lands (97%) and visitor or education centers (73%). The next most used agency service was information about wildlife viewing opportunities in the state (35%) and GFP law enforcement officers (27%). The least used agency programs were volunteer opportunities, not related to data collection (5.8%) and technical assistance or information about improving wildlife habitat (5.8%).

Chi-square tests were conducted for all programs and services, with the exception of agency lands (which could not be conducted due to small sample sizes, though, this was the most commonly used service by both groups). Significantly more nonconsumptive viewers utilized GFP visitor or education centers (82%) in comparison to consumptive viewers ($\chi^2 = 5.17$, $df = 1$, $p = .02$). Significantly consumptive viewers indicated experiencing conservation law enforcement and volunteer data collection opportunities in comparison to nonconsumptive viewers (Table 39; Figure 46).

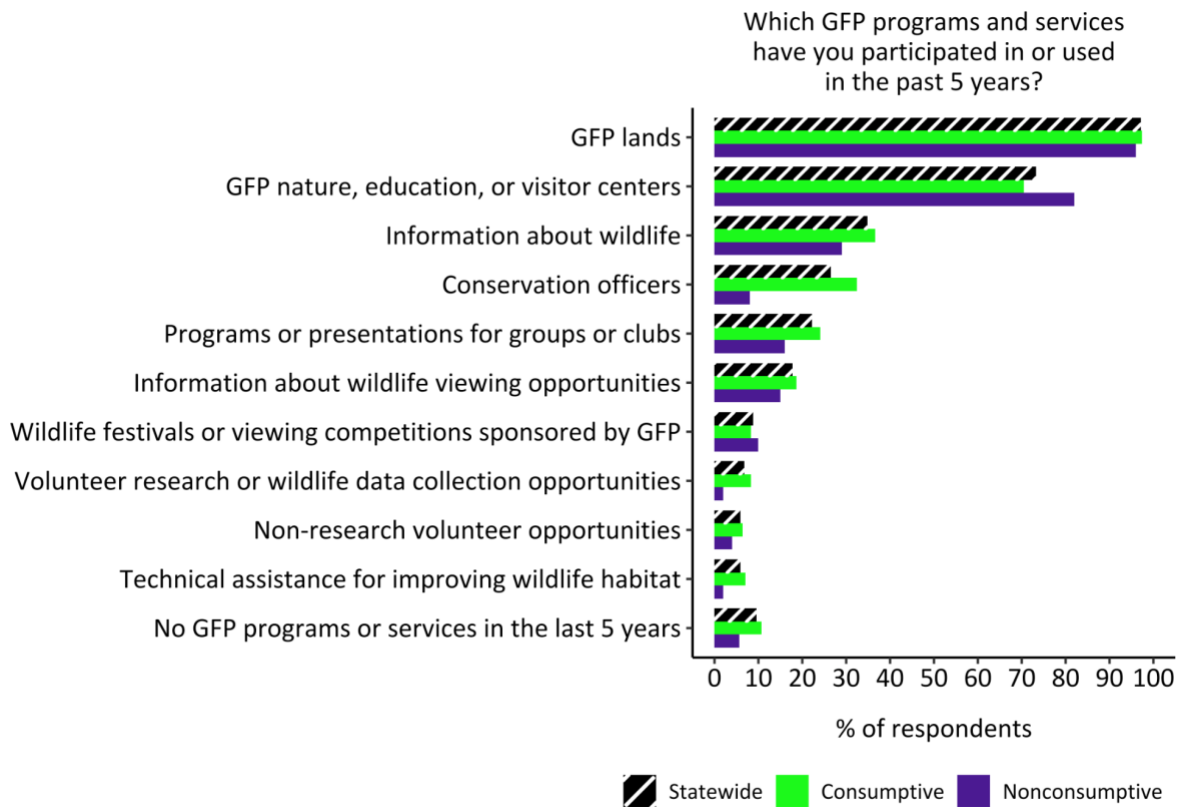


Figure 46: Experience with GFP programs and services, all respondents

GFP programs and services utilized by wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option to reflect which programs and services they utilized. Chi-square tests indicated statistically significant differences in participation for consumptive and nonconsumptive viewers for visitor or education centers, conservation law enforcement, and volunteer data collection (Table 39).

Programs and services for children and youth

A follow-up question asked wildlife viewers if children or youth in their household had engaged in any GFP programming, such as school-based programs, camps, or youth and family events. Respondents were provided with three options: “Yes, children or youth in my household have engaged in some of these programs,” “No, children or youth in my household have not engaged in any of these programs,” and “Not applicable.” Over half (53%) of respondents reported the question was not applicable. Over half of the respondents who had youth or children in their household reported them engaging in GFP programs and services (60%). Only 40% of respondents with children or youth indicated they had not engaged in any programming (Table 40; Figure 47). A chi-square test indicated no statistically significant differences in the

percentage of children or youth participating in GFP programs when comparing nonconsumptive and consumptive viewers ($\chi^2 = 0.07$, $df = 1$, $p = .78$; Table 40; Figure 47).

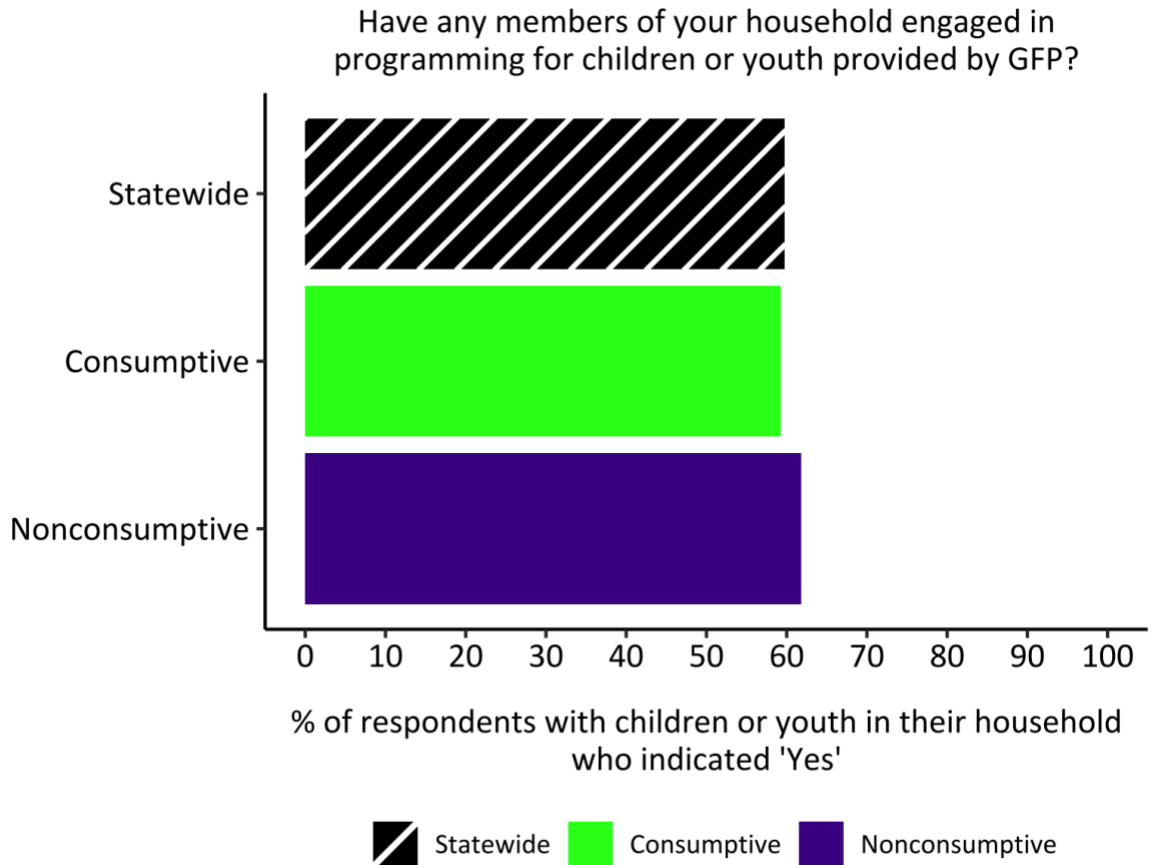


Figure 47: Experience with programs and services for youth, all respondents

Wildlife viewers' engagement with GFP youth programming for statewide, consumptive, and nonconsumptive groups. Respondents without children or youth in their household are excluded. Bars represent the percentage of respondents with children or youth in their household who indicated "Yes; children or youth in my household have engaged in some of these programs." A chi-square test indicated that, for respondents with children or youth in their household, there was no statistically significant difference in engagement in programs for children or youth (Table 40).

Trust

Trust is defined as the willingness to "accept vulnerability to the actions of the trusted party," meaning an individual expects an entity or agency to fulfill a task or action (Gefen, 2002). Past research indicates that Americans are more trusting of their state fish and wildlife agencies than local and federal governments and elected officials (Manfredo et al., 2018). Birders specifically are twice as trusting of state agencies and federal wildlife and land management agencies than elected officials (NAWMP, 2021).

As an overall measure of trust, we first asked wildlife viewers to indicate their trust in 1) their state agency as an entity and 2) the staff at their state agency. For trust in the state agency as an entity and in state agency staff, we measured trust on a five-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The mean level of trust in the agency was 3.82 ± 1.06 , which, on our scale, nearly corresponds to *slightly agree* (4). Similarly, trust in agency staff was 3.93 ± 1.03 . When comparing consumptive and nonconsumptive viewers, two t-tests indicated that mean levels of trust in GFP and GFP staff were not statistically significantly different (Table 41; Figures 48-49).

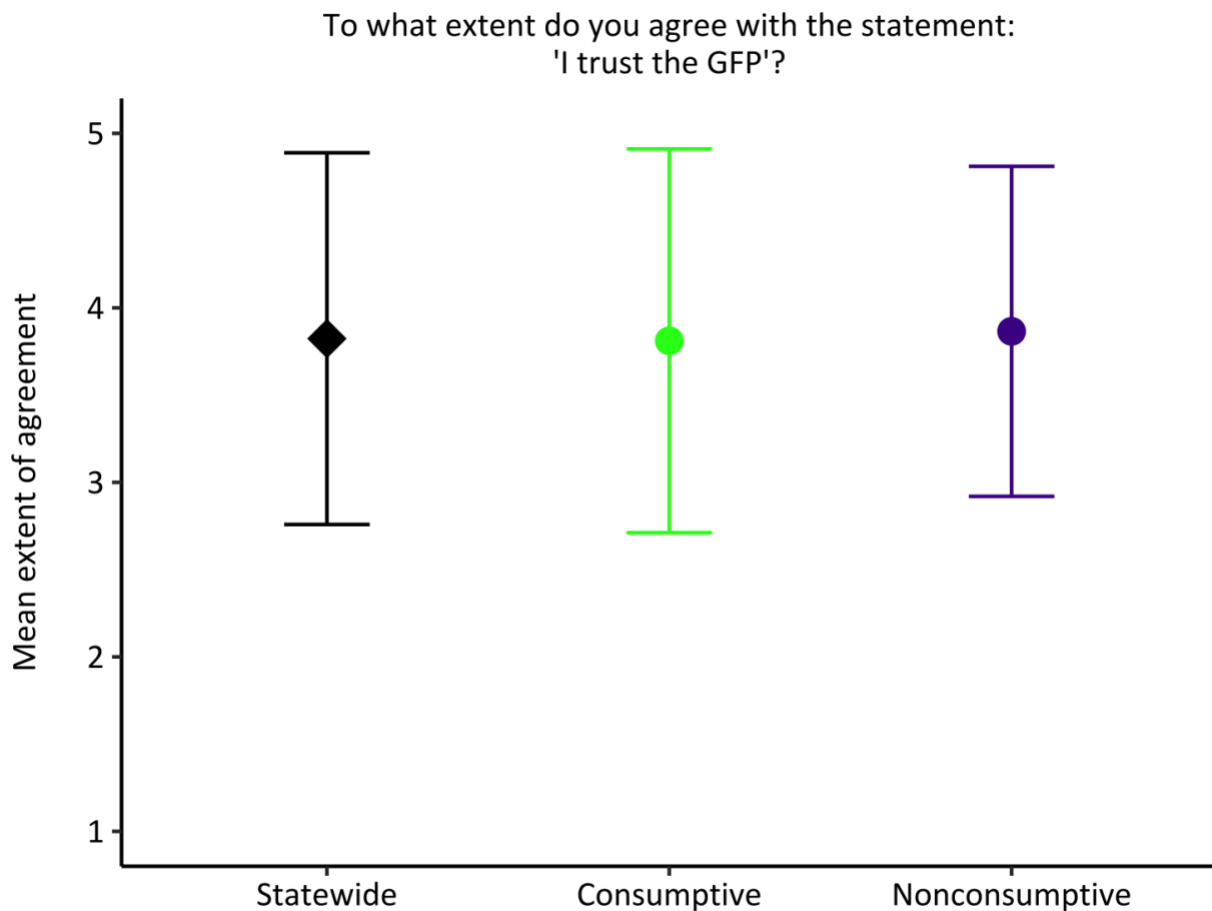


Figure 48: Mean trust in GFP, all respondents

The mean extent to which wildlife viewers in South Dakota agree with the statement “I trust the South Dakota Department of Game, Fish, and Parks” on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Points (diamond for statewide group, circles for consumptive and nonconsumptive group) indicate the mean extent of agreement on a 5-point scale and error bars indicate one standard deviation. A t-test indicated no statistically significant differences in the mean level of trust in GFP as an entity for consumptive and nonconsumptive wildlife viewers (Table 41).



Figure 49: Mean trust in GFP staff, all respondents

The mean extent to which wildlife viewers in South Dakota agree with the statement “I trust South Dakota Department of Game, Fish, and Parks staff” on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Points (diamond for statewide group, circles for consumptive and nonconsumptive group) indicate the mean extent of agreement on a 5-point scale and error bars indicate one standard deviation. A t-test indicated no statistically significant differences in the mean level of trust in GFP staff for consumptive and nonconsumptive wildlife viewers (Table 41).

Then we measured three aspects of trust according to Gefen (2002): capability, benevolence, and integrity. In our survey, we included 12 items asking wildlife viewers to indicate “the extent to which they agreed with the following statements.” Three of these items were reverse-coded attention checks and removed from analysis. The remaining nine items were dedicated to the three components of the Gefen Trust Framework. The first component, benevolence, included three statements: “I expect that South Dakota Department of Game, Fish, and Parks intentions are benevolent,” “I expect that South Dakota Department of Game, Fish, and Parks is well meaning,” and “I expect that South Dakota Department of Game, Fish, and Parks has good

intentions toward viewers.” Benevolence had a mean extent of agreement score of 4.04 ± 0.85 out of 5, which, on our scale, nearly corresponds to *slightly agree* (4). The second component, capability, included three statements: “South Dakota Department of Game, Fish, and Parks understands the environment they work in,” “South Dakota Department of Game, Fish, and Parks knows about wildlife viewing,” and “South Dakota Department of Game, Fish, and Parks knows how to support wildlife viewing.” Our capability measure had a mean extent of agreement score of 4.01 ± 0.78 , which, on our scale, nearly corresponds to *slightly agree* (4). The final component, integrity, included three statements “I do not doubt the honesty of South Dakota Department of Game, Fish, and Parks,” “I expect that South Dakota Department of Game, Fish, and Parks will keep the promises they make,” and “Promises made by South Dakota Department of Game, Fish, and Parks are likely to be reliable.” This item had the lowest mean extent of agreement score of the three Gefen components of trust: 3.19 ± 0.55 which, on our scale, most closely corresponds to *neither agree nor disagree* (3). T-tests indicated no statistically significant difference in any of the Gefen trust scores when comparing consumptive and nonconsumptive viewers (Table 41; Figures 50-52).

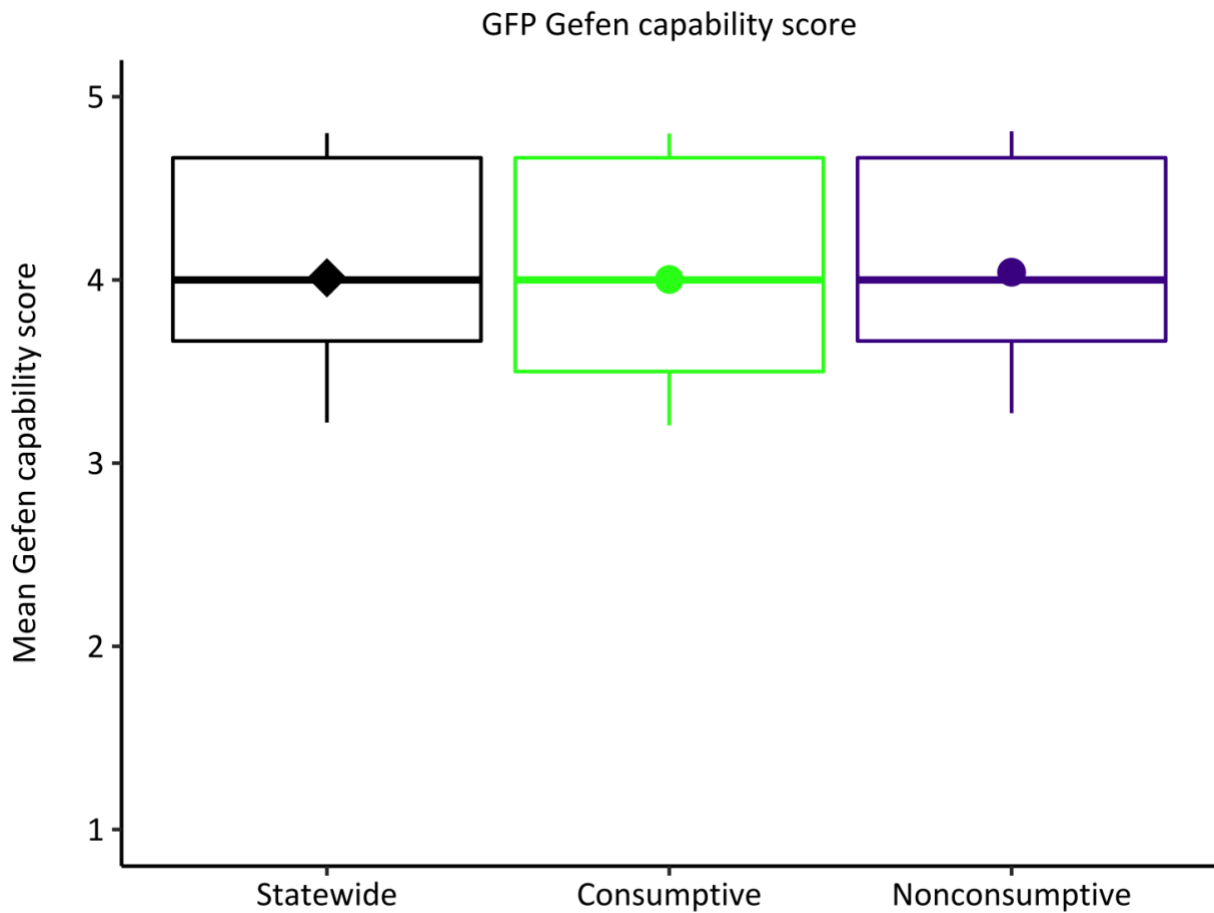


Figure 50: Gefen capability score, all respondents

Boxplots (median and interquartile ranges within the boxes) showing the differences in wildlife viewers' mean Gefen capability score on a 5-point scale. Points represent the mean Gefen capability measure (diamond for statewide group, circles for consumptive and nonconsumptive groups) calculated as the mean of respondents' extent of agreement with three statements about the capability of the state agency on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). A t-test indicated no statistically significant difference between the Gefen capability scores of consumptive and nonconsumptive viewers (Table 41).

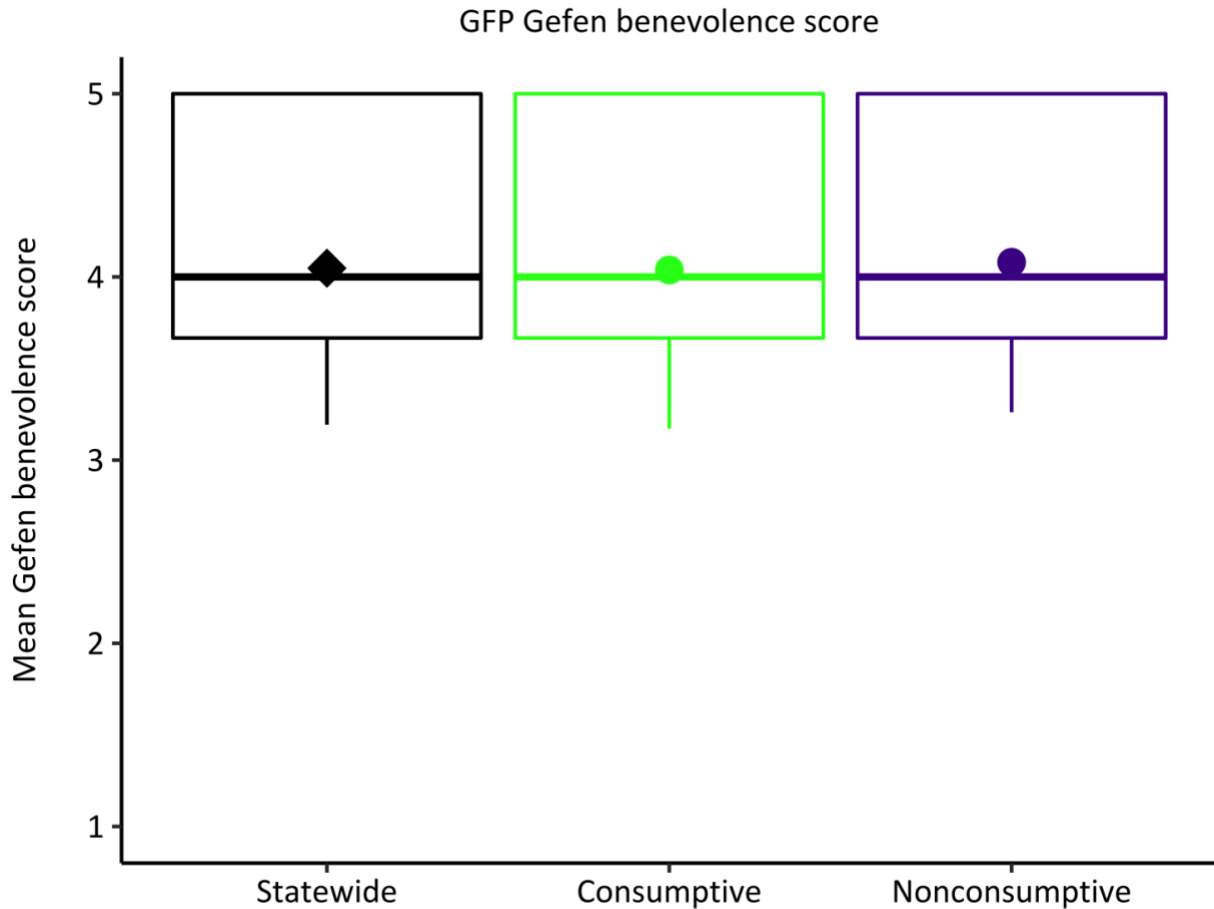


Figure 51: Gefen benevolence score, all respondents

Boxplots (median and interquartile ranges within the boxes) showing the differences in wildlife viewers' mean Gefen benevolence score on a 5-point scale. Points represent the mean Gefen benevolence measure (diamond for statewide group, circles for consumptive and nonconsumptive groups) calculated as the mean of respondents' extent of agreement with three statements about the benevolence of the state agency on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). A t-test indicated no statistically significant difference between the Gefen benevolence scores of consumptive and nonconsumptive viewers (Table 41).

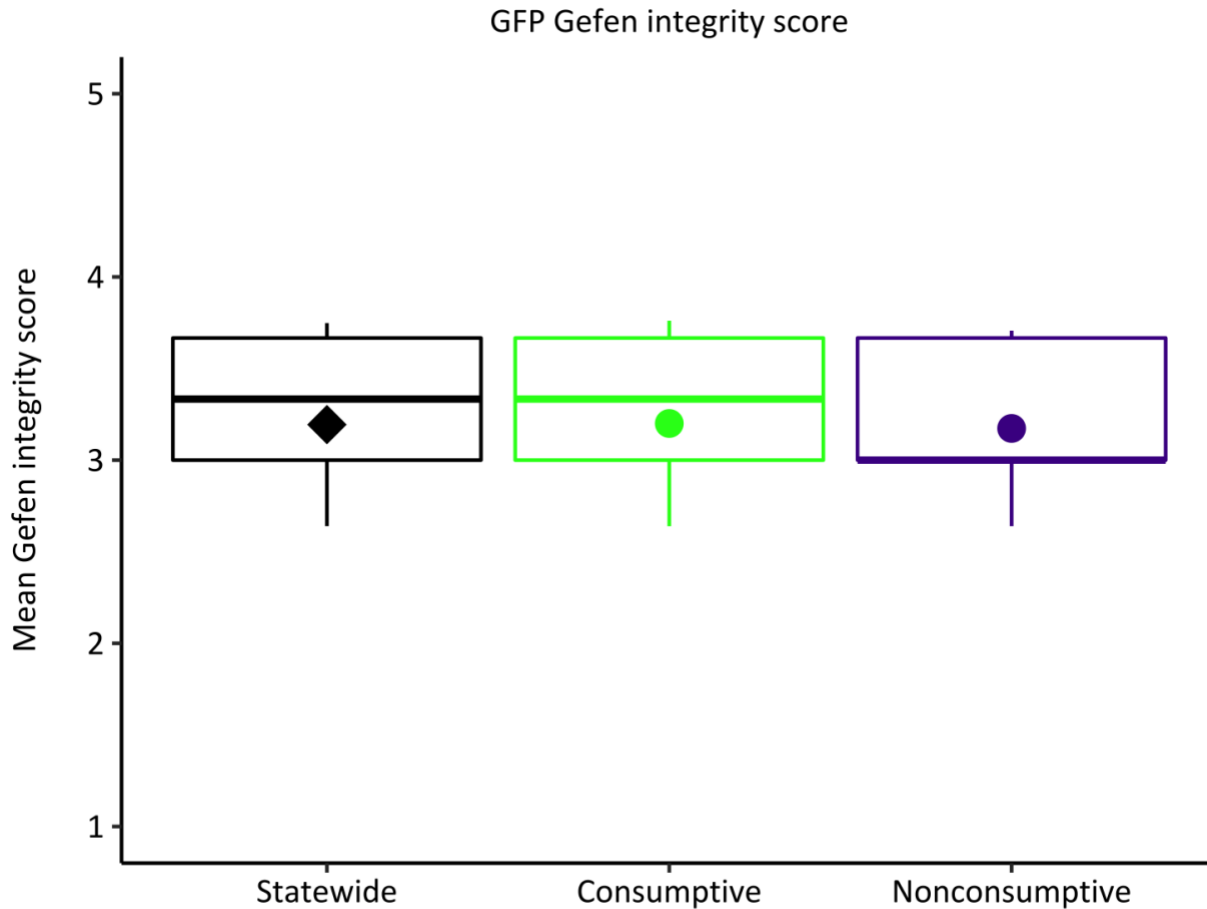


Figure 52: Gefen integrity score, all respondents

Boxplots (median and interquartile ranges within the boxes) showing the differences in wildlife viewers’ mean Gefen integrity score on a 5-point scale. Points represent the mean Gefen integrity measure (diamond for statewide group, circles for consumptive and nonconsumptive groups) calculated as the mean of respondents’ extent of agreement with three statements about the integrity of the state agency on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). A t-test indicated no statistically significant difference between the Gefen integrity scores of consumptive and nonconsumptive viewers (Table 41).

Past purchases and contributions

State agencies are closely tied to their constituency for funding to support programming and conservation (Grooms et al., 2021). State agencies have relied, and many still rely, heavily on hunters and anglers to support these efforts, through the North American Model of Conservation (Price Tack et al., 2015). As participation in wildlife viewing continues to grow, it is important to understand the mechanisms viewers use to financially support state agencies, as they may be different from those used by the traditional hunter and angler constituency. In this section of the survey, we asked viewers how they had financially contributed to their state fish

and wildlife agencies, listing a variety of potential expenditures or purchases. The literature shows that wildlife viewers are both conservationists (Cooper et al., 2015) and interested in supporting their state agencies financially; however, few funding avenues exist for wildlife viewers to contribute directly to state agencies (Grooms et al., 2021).

We developed a list of 13 potential purchases or contributions and asked wildlife viewers to select all that they made in the last five years. Based on available programs from GFP, we removed options not available in South Dakota: conservation license plates, state income tax donation, lottery tickets for which the proceeds go to conservation, and a land donation. We added the option of a raffle ticket. A 14th, mutually exclusive option, “I have not made any of these purchases or contributions” was also provided, which only 1.1% of respondents selected ($n = 5$; Table 42). For analysis purposes, we further split the contributions into voluntary (contributions made as more of a donation) and nonvoluntary (contributions required in order to receive access to an area or activity; as in Grooms et al., 2021). Understanding preferences towards voluntary and nonvoluntary funding mechanisms may aid state agencies in developing targeted strategies for increasing contributions from wildlife viewers.

First, we examined what nonvoluntary funding mechanisms wildlife viewers utilized. Nonconsumptive viewers contributed most via a lands access pass, permit, or entrance fee (89%) and consumptive viewers contributed most frequently via a fishing license (92%). Only 30% of non-consumptive viewers contributed through the purchase of a fishing license. Three-quarters of consumptive viewers had purchased hunting licenses and over two-thirds had purchased a required conservation or habitat stamp. Chi-square tests indicated highly statistically significant differences when comparing the majority of past nonvoluntary purchases or contributions of consumptive and nonconsumptive viewers, with the only exception of fees for a program or event hosted by GFP. Significantly more nonconsumptive viewers had contributed via a lands access pass, permit, or entrance fee in comparison to consumptive viewers. More consumptive viewers had contributed via a required conservation or habitat stamp, hunting license, and fishing license in comparison to nonconsumptive viewers (Table 42; Figure 53).

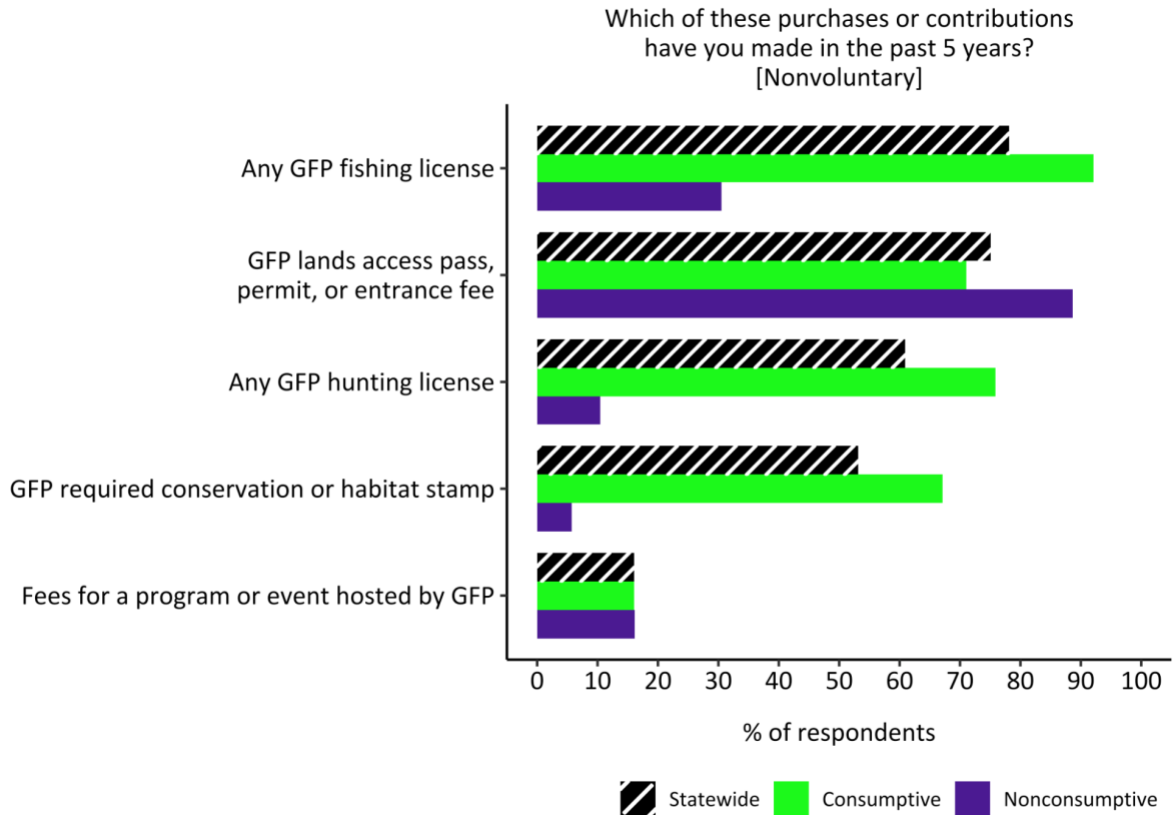


Figure 53: Past nonvoluntary financial contributions to GFP, all respondents

Nonvoluntary purchases or contributions made towards GFP in the past five years by wildlife viewers in South Dakota in statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option to reflect their contributions. Chi-square tests indicated statistically significant differences when comparing all past nonvoluntary purchases or contributions of consumptive and nonconsumptive viewers, with the exception of a fee for a program or event hosted by GFP (Table 42).

Next, we examined voluntary mechanisms of contributions. Overall, wildlife viewers in South Dakota were much less likely to have contributed to their agencies via voluntary mechanisms than nonvoluntary mechanisms. For example, only 31% of wildlife viewers reported contributing through the most common voluntary mechanism, which was tangible products (such as books, maps, and other merchandise) from GFP. This was followed by a raffle ticket (for an item or trip) for which the proceeds go to habitat conservation, which was selected by 23% of respondents. Wildlife viewers least commonly reported contributing through direct donations of money to GFP, with only 5.4% contributing via this mechanism. Chi-square tests indicated only two items with statistically significant differences when comparing past voluntary contributions of nonconsumptive and consumptive viewers. More consumptive

viewers using any mechanism indicated contributing via these two mechanisms than nonconsumptive viewers (Table 42; Figure 54).

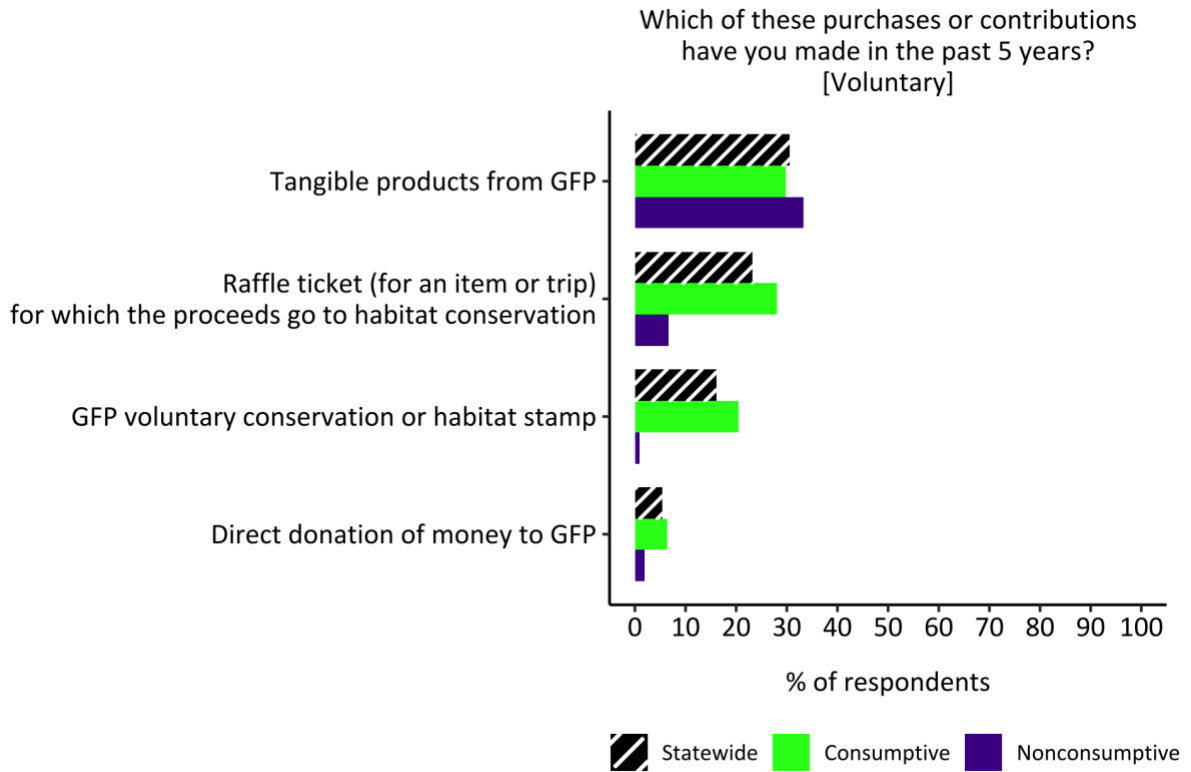


Figure 54: Past voluntary contributions to GFP, all respondents

Voluntary purchases or contributions made towards GFP in the past five years by wildlife viewers in South Dakota in statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option to reflect their contributions. Chi-square tests indicated statistically significant differences when comparing past purchases of habitat stamps and raffle tickets of consumptive and nonconsumptive viewers (Table 42).

Future purchases and contributions

Next, we assessed the likelihood of respondents making any of the following purchases or expenditures in the upcoming five years with the question, “How likely are you to make the following purchases or contributions in the next 5 years, assuming these options are available in South Dakota?” The question was similar to the previous item about past purchases, with the modification to a unipolar scale from 1 (*not at all likely*) to 5 (*extremely likely*). In addition, the hidden response options from the previous section were included in this question in order to gauge wildlife viewers’ likelihood to purchase these currently unavailable items if they were made available in the future.

First, we examined wildlife viewers' likelihood to financially contribute to GFP via nonvoluntary funding mechanisms in the next five years. Almost 90% of respondents in South Dakota were *moderately, very, or extremely likely* to purchase a GFP lands access pass, permit, or entrance fee. Following closely behind, over three out of four respondents (84%) in South Dakota indicated that they were *moderately, very, or extremely likely* to purchase a fishing license in the next five years. Well over half of all respondents in South Dakota indicated they were *moderately, very, or extremely likely* to purchase a hunting license (64%) or a required habitat stamp (64%). The least popular nonvoluntary financial mechanism was a fee for a program or event, though, over half of all respondents (54%) indicated they were *moderately, very, or extremely likely* to contribute through this mechanism (Table 43; Figure 55).

Chi-square tests indicated statistically significant differences in the likelihood to contribute to GFP financially in the future when comparing consumptive and nonconsumptive viewers for three nonvoluntary funding mechanisms. Far more nonconsumptive viewers indicated that they were *not at all likely* to purchase or contribute via a fishing license, hunting license, or required habitat stamp in comparison to consumptive viewers (Table 44). For example, the majority of nonconsumptive viewers reported that they were *not at all likely* to purchase any GFP hunting license (69%) or GFP required conservation or habitat stamp (65%; Table 44; Figures 56-57). There was no statistically significant difference between consumptive and nonconsumptive viewers when comparing their stated likelihood to contribute via a GFP lands access pass, permit, or entrance fee; or fees for a program or event hosted by GFP (Table 44; Figures 56-57).



Figure 55: Likelihood of future nonvoluntary contributions, statewide sample

Wildlife viewers’ reported likelihood of making nonvoluntary purchases or contributions at the statewide level in the next 5 years, assuming all options are available in South Dakota. Each block represents the percentage of respondents who fell into each of the five categories: *not at likely* to *extremely likely*. The shade of gray darkens with increasing likelihood to purchase or contribute to GFP via nonvoluntary funding mechanisms (Table 43).

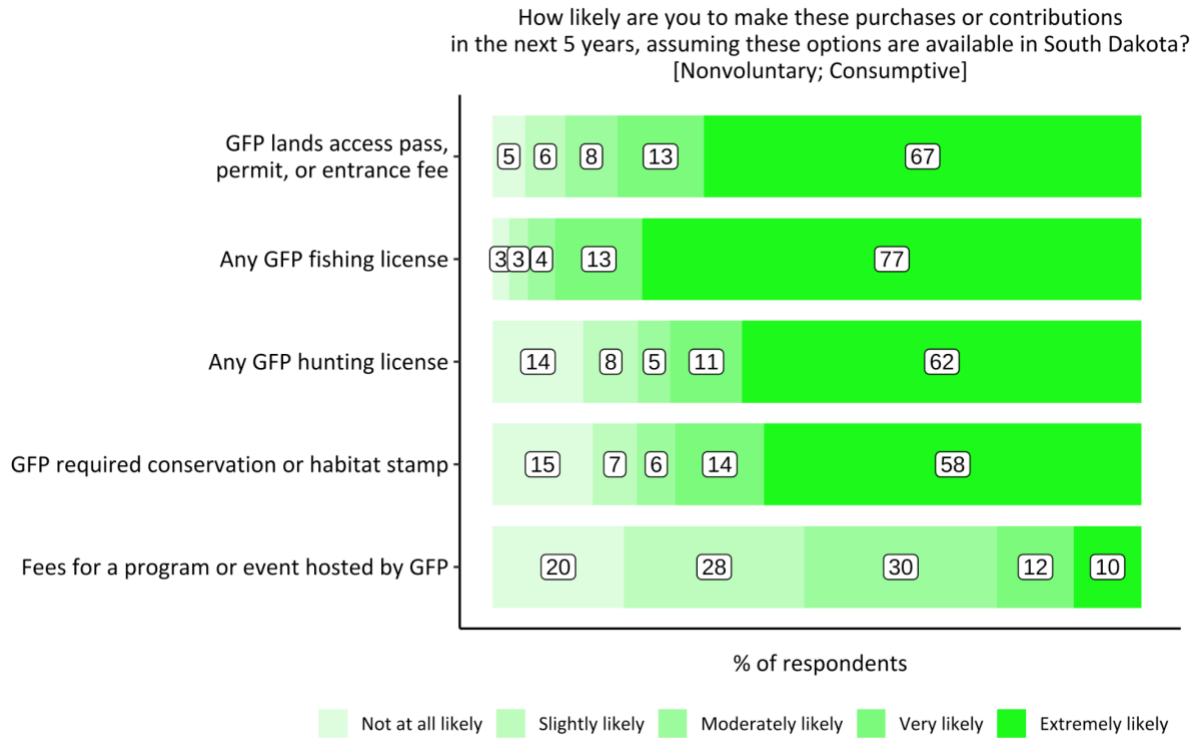


Figure 56: Likelihood of future nonvoluntary contributions, consumptive respondents

Consumptive wildlife viewers’ reported likelihood of making nonvoluntary purchases or contributions in the next 5 years, assuming all options are available in South Dakota. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of green darkens with increasing likelihood to purchase or contribute to GFP via nonvoluntary funding mechanisms (Table 44).

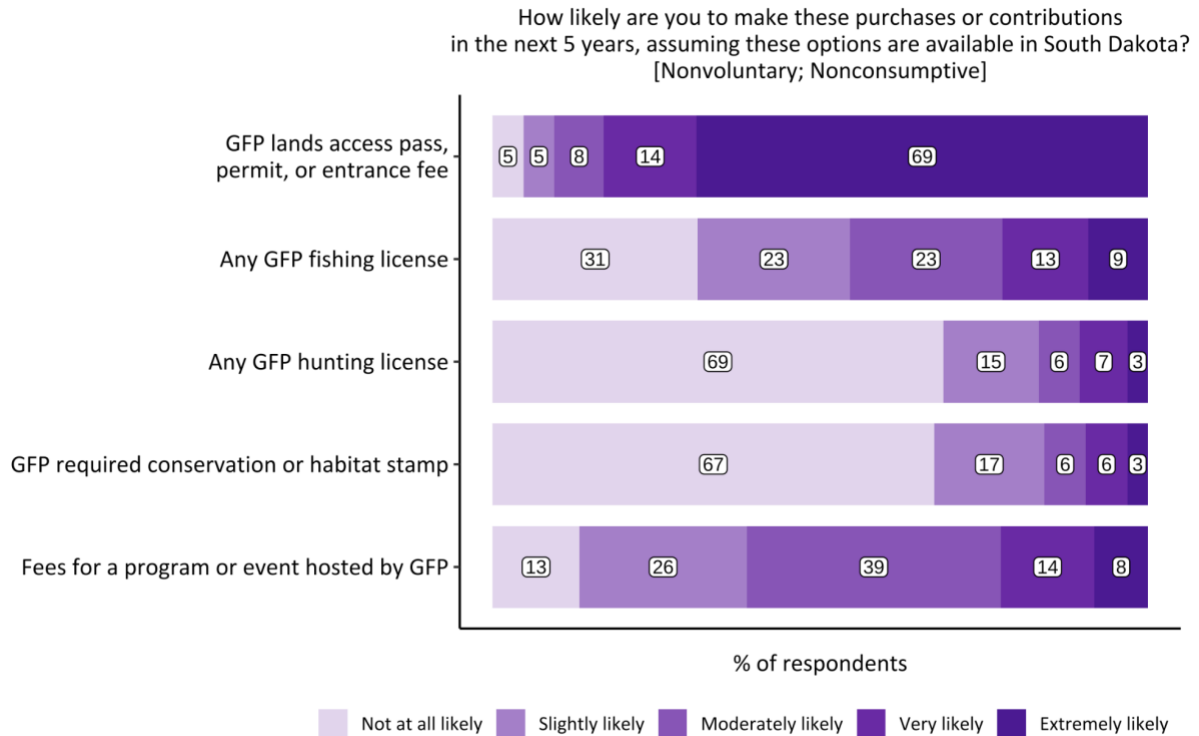


Figure 57: Likelihood of future nonvoluntary contributions, nonconsumptive respondents

Nonconsumptive wildlife viewers’ reported likelihood of making nonvoluntary purchases or contributions in the next 5 years, assuming all options are available in South Dakota. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of purple darkens with increasing likelihood to purchase or contribute to GFP via nonvoluntary funding mechanisms (Table 44).

We also examined wildlife viewers’ likelihood to financially contribute to GFP via voluntary funding mechanisms in the next five years. Half of over half of all respondents in South Dakota indicated they were *moderately, very, or extremely likely* to purchase tangible products from GFP (such as books, maps, and other merchandise; 55%), conservation lottery tickets (50%), or raffle tickets (for an item or trip) for which the proceeds go to conservation (50%). Over a third of respondents in South Dakota indicated that they were *moderately, very, or extremely likely* to purchase a habitat stamp (voluntary, 38%) or virtual products from GFP (such as podcasts, e-books, and other online materials; 36%). Viewers in South Dakota indicated they were least likely to contribute via a direct donation of money to GFP (47% were *not at all likely* to donate in this manner) or a donation land to GFP through a conservation easement (78% were *not at all likely* to donate in this manner; Table 43; Figure 58). Unlike with nonvoluntary funding mechanisms, chi-square tests indicated only two statistically significant differences in the likelihood to contribute to GFP financially in the future when comparing consumptive and nonconsumptive viewers for voluntary funding mechanisms. Slightly more consumptive viewers

indicated they were *moderately*, *very*, or *extremely likely* to contribute via a lottery ticket in which the proceeds go to conservation or a conservation raffle than nonconsumptive viewers (Table 44; Figures 58-59). Due to small sample sizes in the *very* and *extremely likely* categories, a chi-square test comparing the likelihood of consumptive and nonconsumptive viewers to contribute via a donation land to GFP through a conservation easement or direct donation of money to GFP could not be conducted.

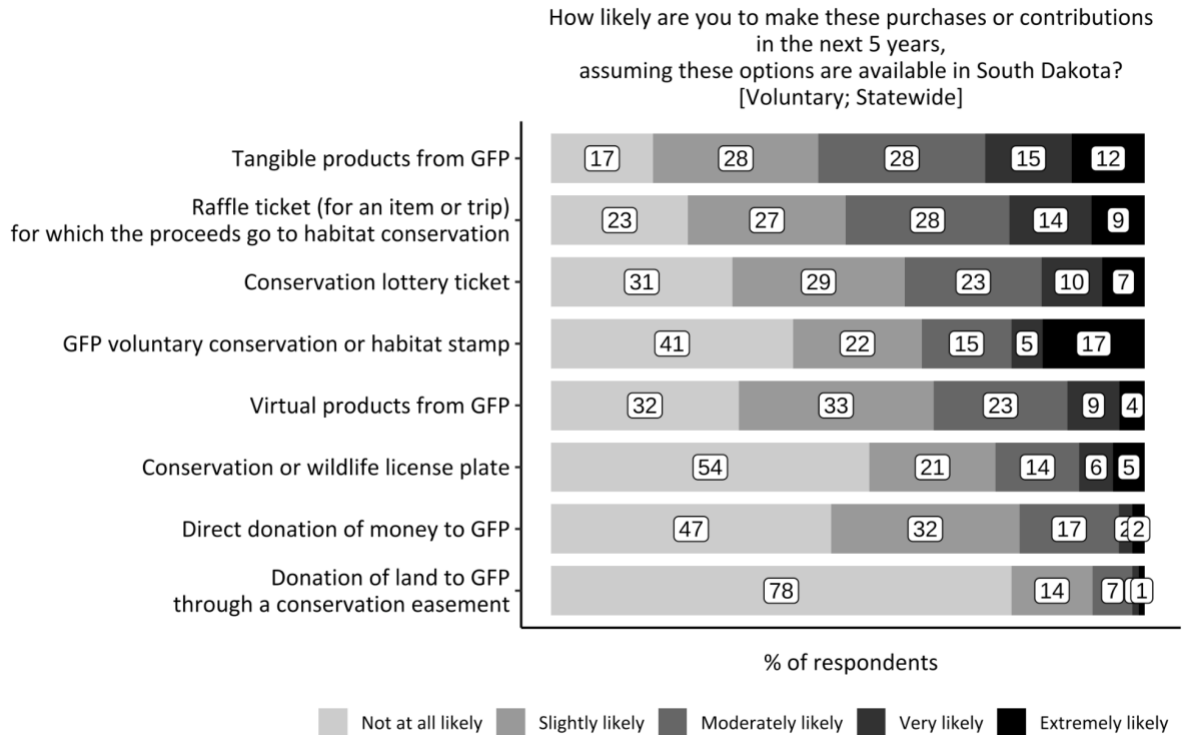


Figure 58: Likelihood of future voluntary contributions, statewide sample

Wildlife viewers’ reported likelihood of making voluntary purchases or contributions at the statewide level in the next 5 years, assuming all options are available in South Dakota. Each block represents the percentage of respondents who fell into each of the five categories: *not at likely* to *extremely likely*. The shade of gray darkens with increasing likelihood to purchase or contribute to GFP via voluntary funding mechanisms (Table 43).

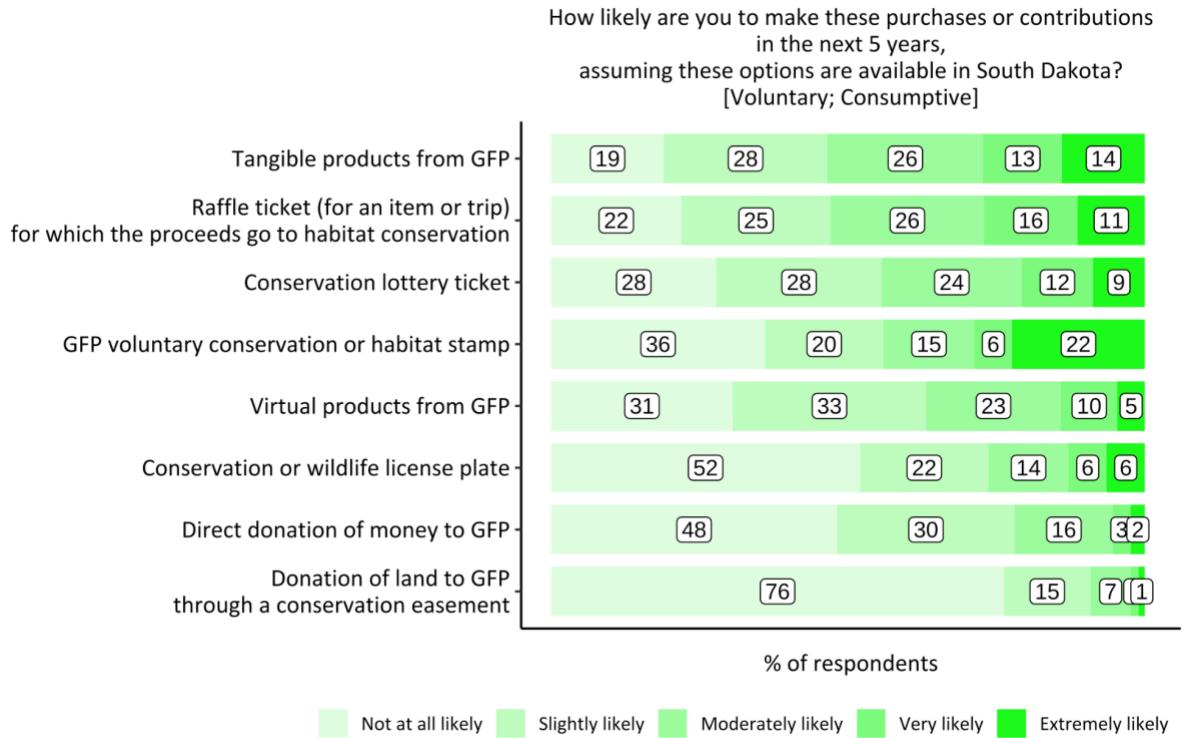


Figure 59: Likelihood of future voluntary contributions, consumptive respondents

Consumptive wildlife viewers’ reported likelihood of making voluntary purchases or contributions in the next 5 years, assuming all options are available in South Dakota. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of green darkens with increasing likelihood to purchase or contribute to GFP via voluntary funding mechanisms (Table 44).

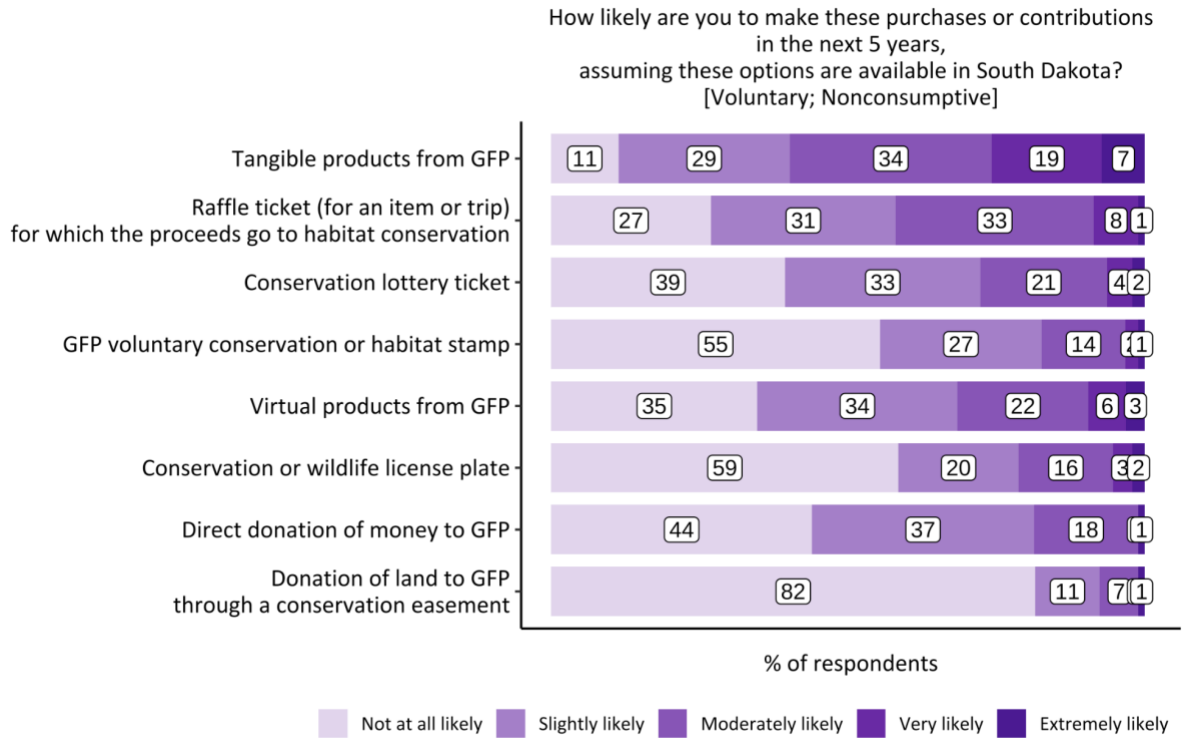


Figure 60: Likelihood of future voluntary contributions, nonconsumptive respondents

Nonconsumptive wildlife viewers’ reported likelihood of making voluntary purchases or contributions in the next 5 years, assuming all options are available in South Dakota. Each block represents the percentage of respondents who fell into each of the five categories: *not at all likely* to *extremely likely*. The shade of purple darkens with increasing likelihood to purchase or contribute to GFP via voluntary funding mechanisms (Table 44).

Encouraging additional financial support

Wildlife viewers have expectations for how state agencies use their funds (Grooms et al., 2020). In this section, we further investigate those expectations. We asked, “How likely would you be to provide more financial support than you currently do to the South Dakota Department of Game, Fish, and Parks, if your contributions were used in the following ways?” We provided respondents with a list of seven potential mechanisms for agencies utilizing their funds. The 5-point scale for respondent answers ranged from 1 (*not at all likely*) to 5 (*extremely likely*).

In South Dakota, respondents indicated that they were most likely to provide additional financial support to GFP if their contributions were used to support the conservation of the types of wildlife they like to view (56% *moderately, very, or extremely likely*) or habitat conservation (52% *moderately, very, or extremely likely*). Respondents were least likely to increase their contribution if they knew their funds supported opportunities and resources for wildlife viewing (43% *moderately, very, or extremely likely*) or more education or outreach opportunities related to conservation (again, 43% *moderately, very, or extremely likely*; Table

45; Figure 61). Chi-square tests indicated no statistically significant differences in the likelihood of consumptive and nonconsumptive viewers to provide additional financial support (Note that *very* and *extremely likely* were combined for analysis purposes in two options 1) supported more opportunities or resources for wildlife and 2) provide more education or outreach related to wildlife viewing; Table 46; Figures 62-63).

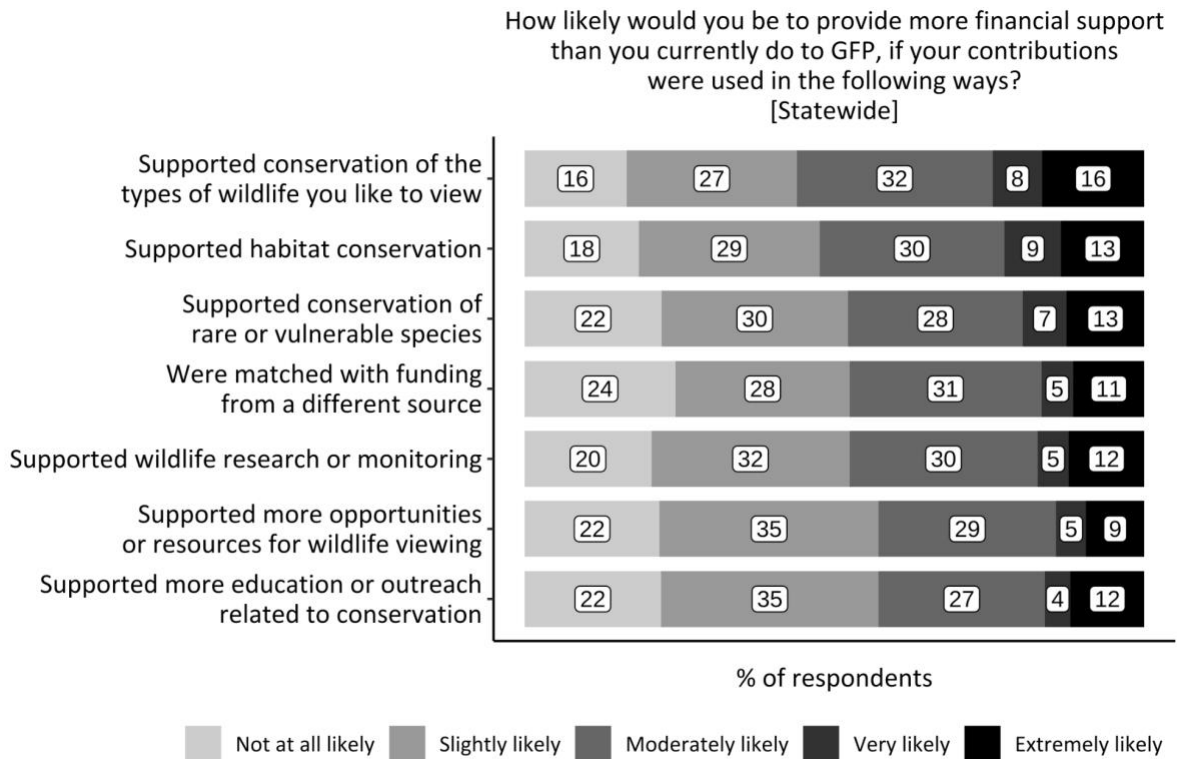


Figure 61: Encouraging additional support, statewide sample

Wildlife viewers' reported likelihood of providing more financial support than they currently do to GFP, at the statewide level, if their contributions were used in various ways. Each block represents the percentage of respondents who fell into each of the five categories: *not at likely* to *extremely likely*. The shade of gray darkens with increasing likelihood to provide additional financial support to GFP, given these potential uses of funds (Table 45).

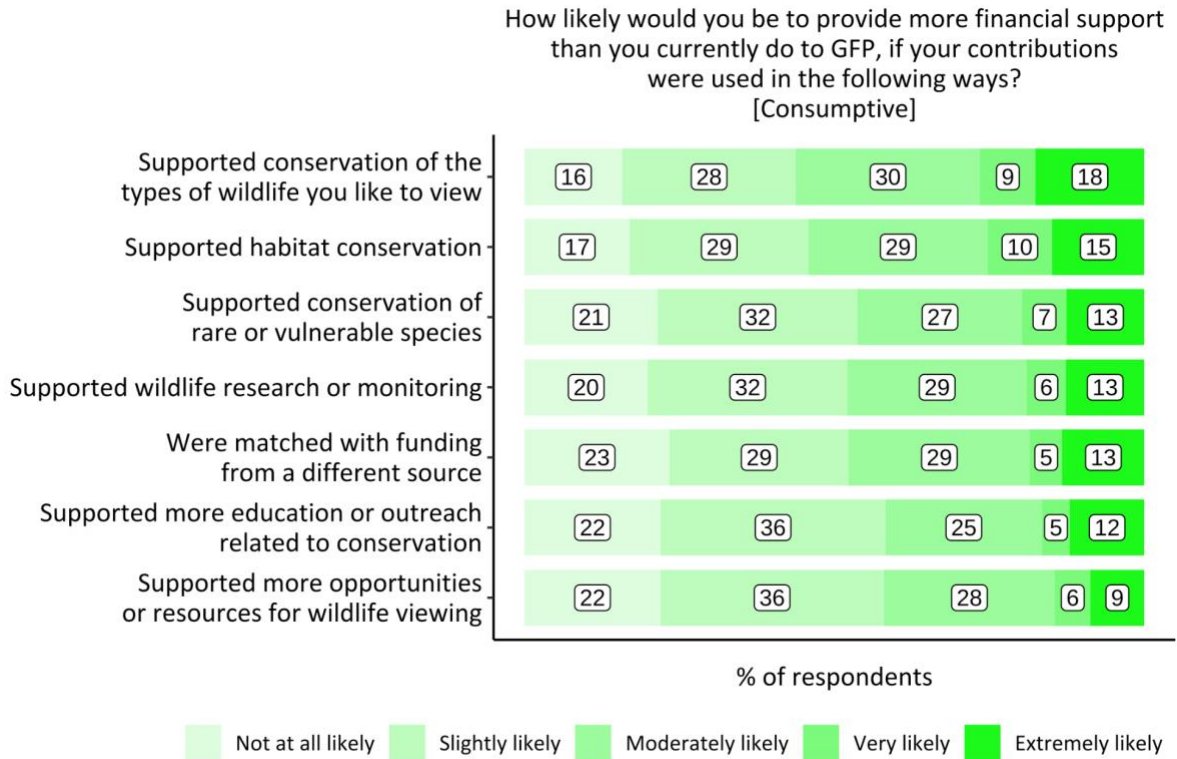


Figure 62: Encouraging additional support, consumptive respondents

Consumptive wildlife viewers' reported likelihood of providing more financial support than they currently do to GFP, if their contributions were used in various ways. Each block represents the percentage of respondents who fell into each of the five categories: *not at likely* to *extremely likely*. The shade of green darkens with increasing likelihood to provide additional financial support to GFP, given these potential uses of funds (Table 46).

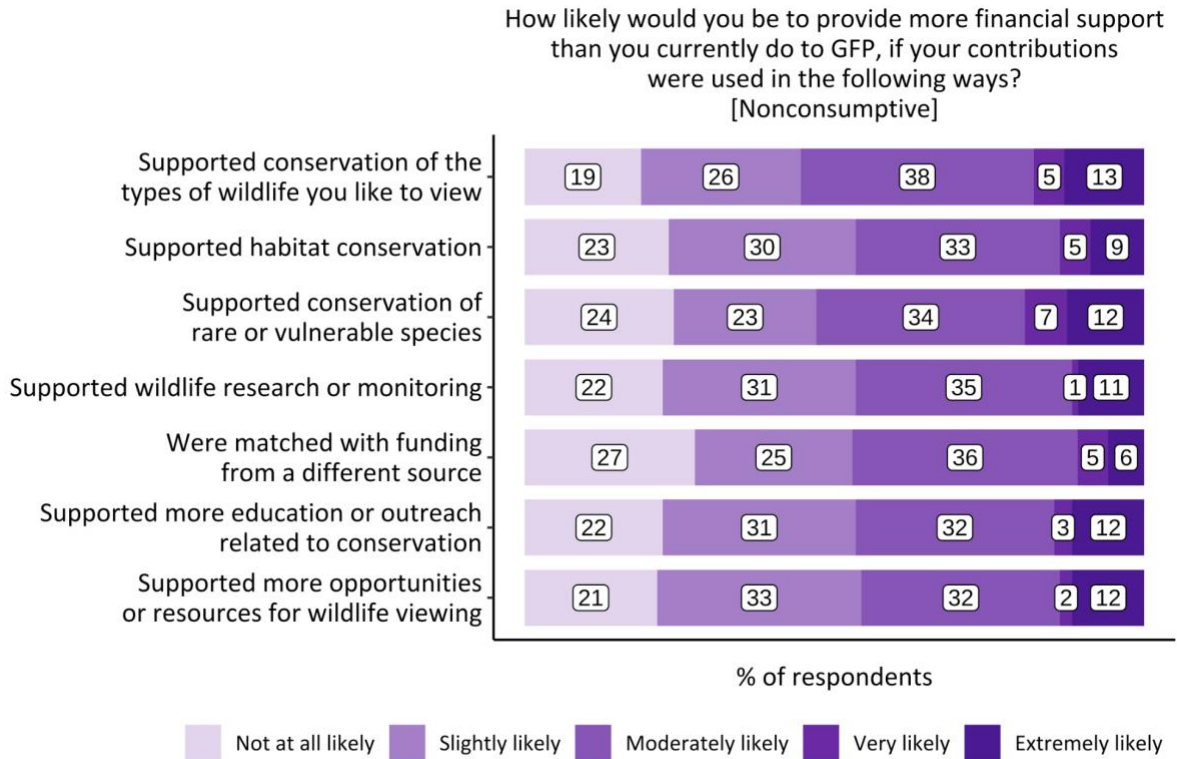


Figure 63: Encouraging additional support, nonconsumptive respondents

Nonconsumptive wildlife viewers’ reported likelihood of providing more financial support than they currently do to GFP, if their contributions were used in various ways. Each block represents the percentage of respondents who fell into each of the five categories: *not at likely* to *extremely likely*. The shade of purple darkens with increasing likelihood to provide additional financial support to GFP, given these potential uses of funds (Table 46).

State agency support for wildlife viewing

AFWA’s Relevancy Roadmap outlines broad recommendations for state fish and wildlife agencies to engage a broader constituency, including “increased and improved partnering and collaboration to increase engagement with, and service to, a broader constituency” (AFWA, 2016). Understanding what programs and services wildlife viewers prefer enables agencies to identify and prioritize programs to better engage this constituency. In addition, supporting wildlife viewers, through management programs and other changes, may help to increase relationships between viewers and agencies (AFWA, 2016; Grooms et al., 2021). To this end, we provided respondents with a list of 17 programs and services that may be available to support wildlife viewing and asked the question, “Which of the following potential programs or services from South Dakota Department of Game, Fish, and Parks would better support your wildlife viewing activities in South Dakota?” This list of items was initially developed based on focus groups conducted for a study of wildlife recreationists in Virginia (Grooms et al., 2019), which we then adapted based on feedback from our multi-state Steering Committee including GFP

representatives. An 18th, mutually exclusive option, “I am not interested in any of these options to support my wildlife viewing activities”, was also provided (19% of respondents $n = 87$, selected this option). The following paragraph details the preferences of the 81% of respondents who expressed interest in at least one program or service from the GFP.

Statewide, respondents were most interested in receiving more information about where to go to see wildlife (47%) and more information about wildlife in South Dakota (38%). These response options were followed by access to more high-quality places to go wildlife viewing (36%), information when and where to view wildlife where there is no hunting (35%) and information on how to view wildlife (30%). In addition, respondents were also interested in more amenities for wildlife viewing (such as viewing platforms, blinds, or signs; 24%) and opportunities for youth (24%). Respondents were least interested in volunteer opportunities, not related to data collection (10%) and access to more wildlife viewing staff (8.7%).

Chi-square tests indicated quite a few statistically significant differences when comparing consumptive and nonconsumptive viewers for the additional support items explored in this survey (Table 49; Figure 66). More nonconsumptive viewers interested in all four surveyed types of information (when and where to view where there is no hunting, about wildlife in South Dakota, how to view wildlife, and where to view wildlife) than consumptive viewers. Additionally, nonconsumptive viewers were also more interested in programs to improve their wildlife viewing skills and more wildlife viewing events than consumptive viewers. Finally, over twice as many consumptive viewers (22%) were not interested in any of these options to support their wildlife viewing experience than nonconsumptive viewers (9.5%; Figure 64; Table 47).

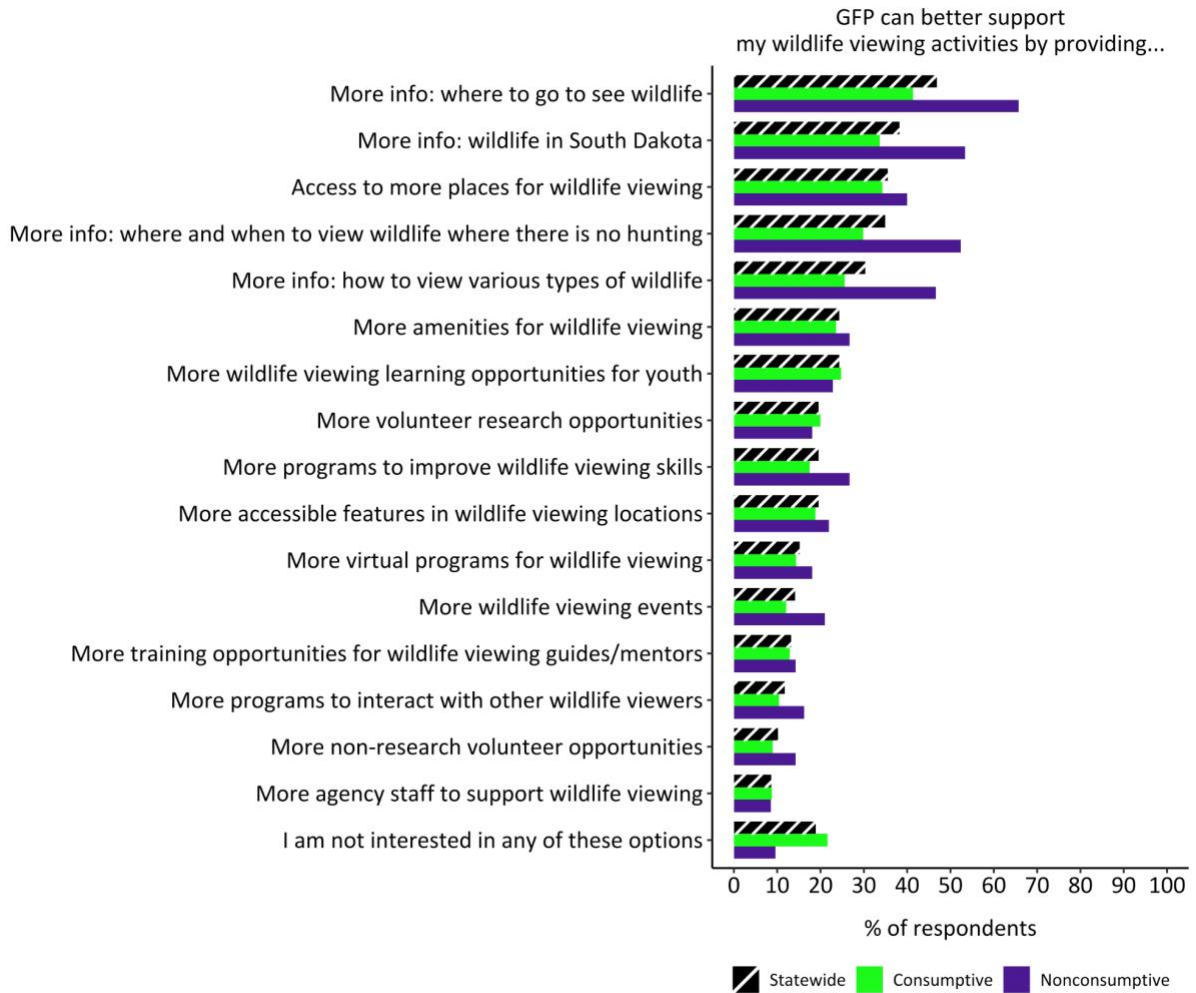


Figure 64: GFP support for wildlife viewing, all respondents

GFP programs and services indicated by wildlife viewers that would better support their wildlife viewing activities for statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one program or service to reflect their opinion. Chi-square tests indicated that significantly more nonconsumptive viewers were interested in the provision of more information (when and where to view where there is no hunting, about wildlife in South Dakota, how to view wildlife, and where to view wildlife), more wildlife viewing events or festivals and more programs to improve their wildlife viewing skills. Significantly more consumptive viewers indicated they were not interested in any of the response options provided to support their wildlife viewing activities (Table 47).

Preferred communication

We examined viewers' interest in methods of receiving information from state agencies to understand how GFP can best communicate with wildlife viewers in South Dakota about recreation opportunities and conservation issues. In this question, we provided wildlife viewers with a list of 15 popular virtual and non-virtual communication channels and asked through which, if any, they were interested in receiving information from GFP. A 16th, mutually exclusive

option of, “I would prefer not to receive information from South Dakota Department of Game, Fish, and Parks” was selected by 6.5% of respondents in South Dakota ($n = 30$; Table 48; Figure 65).

Over half of respondents preferred the GFP website (68%), email updates (67%), and printed materials (such as brochures and maps; 61%) as communication channels. Over one-third of respondents expressed interest in receiving communication from Facebook (35%) and the local news (42%). Just less than a third of respondents expressed interest in receiving information via an online magazine (31%); or a mailed newsletter or other subscription (30%). The least popular form of state agency communication was blogs (4.3%), Twitter (4.3%) and TikTok (3.0%; Table 48; Figure 65).

Chi-square tests indicated statistically significant differences, in terms of the popularity of state agency communication channels for consumptive and nonconsumptive viewers, for only one response option: podcasts. Nearly three times as many nonconsumptive viewers (14%) were interested in receiving information through a podcast than consumptive viewers (5.6%). Chi-square tests could not be conducted to compare interest in blogs, TikTok, and Twitter between consumptive and nonconsumptive viewers; these were communication methods that the fewest respondents expressed interest in (Table 48; Figure 65).

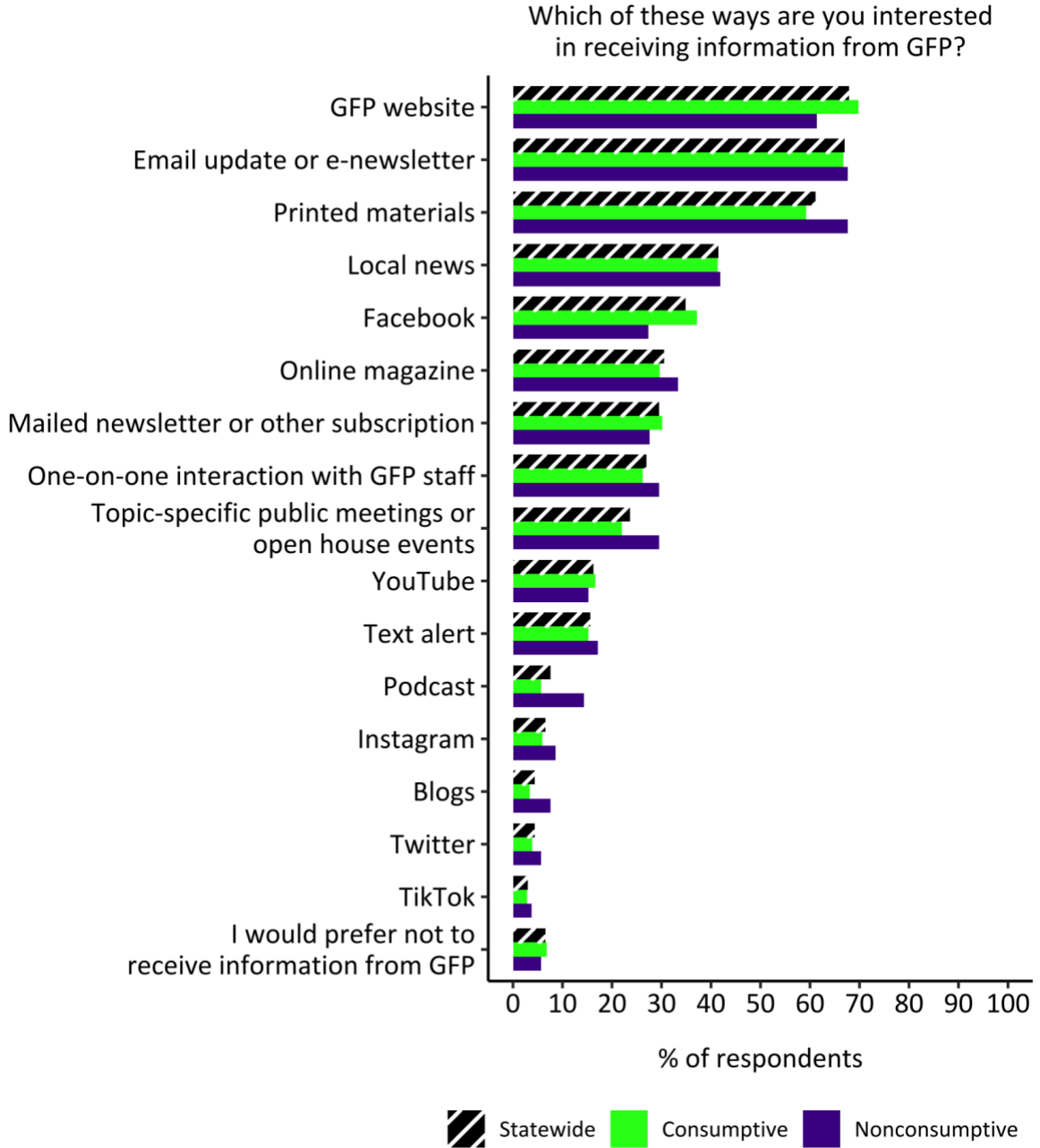


Figure 65: Preferred communication from GFP, all respondents

Preferred method of communication for GFP information of wildlife viewers in South Dakota for statewide, consumptive, and nonconsumptive groups. Note that individual categories sum to more than 100% because respondents were able to select more than one option to reflect their preferred method of communication. Chi-square tests indicated that significantly more consumptive viewers were interested in receiving information from the GFP via a podcast (Table 48).

DISCUSSION AND CONCLUSION

The South Dakota Results of the Wildlife Viewer Survey provides a profile of wildlife viewers that can be utilized by GFP to overcome barriers to broader relevance, public engagement, and financial and political support (AFWA & WMI, 2019). In the following subsections, we apply this profile to discuss how GFP may best support wildlife viewers in South Dakota, broaden their relevance to wildlife viewers who do not hunt or fish, and develop financial support opportunities for wildlife viewers.

Supporting wildlife viewers in South Dakota

We recommend three general approaches to better engage wildlife viewers in South Dakota and establish a lasting and equitable relationship: 1) provide more wildlife viewing information and access, 2) promote around-the-home viewing opportunities, especially around urban areas, and 3) develop social support networks for wildlife viewers.

Provide wildlife viewing information and access

Wildlife viewers in South Dakota were particularly interested in more information on when, where, and how to view wildlife, as well as increased access to wildlife viewing locations. There is an apparent desire for GF, possibly in partnership with the South Dakota Department of Tourism (For more information: <https://sdvisit.com/>), to play a key role as an information resource on wildlife viewing in South Dakota, as they have started to do on their website through the Wildlife Watching page (For more information: <https://gfp.sd.gov/wildlife-watching/>). Expanding awareness and ease of access to these resources in South Dakota and continuing to build out this information (e.g., adding information on how to view different types of wildlife in addition to where) could encourage enhanced participation in wildlife viewing in South Dakota, as most wildlife viewers classify their skill level as beginner to intermediate. For example, GFP could add a subpage of “Wildlife Viewing Tips” (see Birding Basics from the Virginia DNR for an example to support South Dakota wildlife viewers in building their wildlife viewing skills (For more information: <https://dwr.virginia.gov/wildlife-watching/birding-basics/>)). The agency should also consider whether the desire for more access to wildlife viewing locations is due to a lack of awareness of the birding and wildlife trail or gaps in coverage on the trail. GFP may wish to continue spotlighting and promoting their South Dakota Birding Trails Map , which does an excellent job describing trails throughout the state (For more information: <https://sdgfp.maps.arcgis.com/apps/webappviewer/index.html?id=dba213d2f0f14c8f9c79ec8ccede92d9>). Additional communication about this resource, potentially through emails or printed materials (such as a QR code) may guide more viewers to this site. Based on the finding

that over half of survey respondents report participation in wildlife viewing on state-managed lands, including state parks, these areas may have potential for development of additional infrastructure to further support access for wildlife viewing and enhanced outreach regarding their value as wildlife viewing areas. Potentially, promoting privately-managed lands that work in collaboration with GFP to provide wildlife related recreation access for wildlife viewing may increase viewing opportunities.

To address the issue of lack of awareness of wildlife viewing information or to distribute more information, wildlife viewers were most interested in receiving such information from GFP via the GFP website, email updates, or printed materials. Finally, specific information on bird and mammal viewing opportunities in South Dakota will appeal to the most wildlife viewers, although all types of wildlife were of interest to at least one-quarter of viewers.

Promote around-the-home viewing opportunities

GFP may connect with more wildlife viewers if they develop means to serve those who view around their homes, where the majority of viewers participate in viewing. Just about three-quarters of viewers participate around their home, on state-managed lands, and on federally-managed lands.

The predominant barrier to viewing reported by respondents was distance to viewing sites and lack of free time, which could be mitigated by promoting programs that viewers could easily do at or near their homes. One opportunity for growth in around-the-home viewing is for GFP to continue their encouragement of wildlife habitat management planting wildlife habitat at home, building on the existing web content (For more information: <https://gfp.sd.gov/landowner-programs/>). The current material appears targeted to larger landowners and could benefit from also targeting smaller landowners (similar to Georgia DNR's Create Backyard Habitat, for more information: <https://georgiawildlife.com/create-backyard-habitat>). Importantly, backyard wildlife habitat creation and maintenance provides an opportunity to engage viewers with conservation and the wildlife they appreciate in a new way; compared to other forms of wildlife viewing explored in our survey, fewer wildlife viewers currently participate in establishing or maintaining wildlife habitat.

Develop social support networks for wildlife viewers

Finally, GFP could develop and increase social support networks for all wildlife viewers. Family and friends were the most commonly reported source of social support that influenced viewer participation. We identify a need for growth in social support from mentors in particular; a role GFP could potentially fill or foster. One potential avenue to do so would be through programs similar to GFP's Hunt 101 and Fishing with Friends programming that focus on wildlife viewing.

These programs may also benefit those historically underserved in wildlife recreation and by state and federal fish and wildlife agencies, including Black, Indigenous, and people of color (Flores et al., 2018; Loukaitou-Sideris & Mukhija, 2019; Winter et al., 2019; Sánchez et al., 2020; Thomas et al., 2022). As the Outdoor Campus locations in South Dakota (For more information about the Outdoor Campus in Sioux Falls visit: <https://gfp.sd.gov/toc-east/>) are largely near urban and BIPOC populations, they may be well-poised to implement such programming.

Given that 12% of wildlife viewers in South Dakota experience *somewhat to a great deal* of accessibility challenges, GFP could look for opportunities to connect with local organizations dedicated to supporting people living with disabilities, such as Birdability, to collaborate on developing further wildlife viewing opportunities. Birdability supports a user-based map, which reviews the accessibility of different birding sites throughout the country (For more information: <https://gis.audubon.org/birdability/>). As of report-writing (October 2022), only one site is currently spotlighted, the Dewey Gevik Conservation Learning Area. Adding other state-managed lands to the Birdability map may assist in reaching broader audiences.

Broadening relevance to wildlife viewers who do not hunt or fish

Engaging with nonconsumptive recreationists serves as an opportunity for GFP to expand their constituency and achieve relevancy goals (AFWA 2016) by connecting with a group not currently involved in hunting and angling and thereby not as closely tied to the agency. Our analysis of consumptive viewers (viewers who also fish or, in fewer cases, also hunt, trap, or some combination of the three) and nonconsumptive viewers (viewers who do not engage in hunting, trapping, or fishing) revealed variation in differences in wildlife viewers' likelihood to engage with or financially support GFP. Generally, consumptive viewers in South Dakota are more active and involved in viewing than nonconsumptive viewers; consumptive viewers participate in wildlife viewing more, spend more on wildlife viewing, and are more broadly active in wildlife viewing and outdoor recreation. Consumptive viewers also tended to have higher levels of experience and financial contributions (past, present, and future) to GFP than nonconsumptive viewers. Thus, we identify nonconsumptive viewers as a key demographic for which their lack of familiarity with the agency likely drives a lack of connection to GFP. Increasing familiarity of wildlife viewers with GFP may also lead to increased interest in participating in conservation behaviors in collaboration with the GFP and contributing financially to the agency. In addition to a need to increase basic agency familiarity, the provision of services that specifically serve nonconsumptive viewers, including support for around-the-home viewing, birding, and information on wildlife viewing programs and networked support opportunities tailored for beginners, is an important next step in developing relationships with this currently underserved group.

Benefits to current constituents who also view wildlife

While consumptive and nonconsumptive recreationists are often treated as separate groups, both our findings and research published elsewhere (e.g., Cooper et al., 2015; Grooms et al., 2021) indicate that interest in wildlife viewing is common ground for many wildlife recreationists. Furthermore, almost one-third of both consumptive and nonconsumptive viewers believe GFP is not prioritizing programs for wildlife viewers enough. Our findings show that consumptive recreationists desire all forms of support from GFP related to wildlife viewing programs. In addition, we found that consumptive and nonconsumptive viewers are interested in similar programs, services, and support, with the only differences being consumptive viewers were more enthusiastically interested in all forms of state agency support (most likely due to established viewer-agency relationships from their hunting and angling activities). Thus, we suggest that engaging with and providing further support to nonconsumptive viewers will additionally serve and align with the interests of consumptive viewers.

Developing financial contribution opportunities for wildlife viewers

We found a strong potential for GFP to engage wildlife viewers in opportunities to contribute financially to the agency. For example, over half of wildlife viewers reported interest in purchasing a lottery ticket for which the proceeds would go to conservation, in the next five years. Notably, the conservation lottery ticket is unavailable from GFP at this time (One example is the Go Outdoors Colorado Fund, or more information: <https://goco.org/>) so GFP agency may consider supporting development of a lottery fund that contributes to conservation. Additionally, GFP may consider building upon existing raffle efforts to include wildlife viewing equipment (such as photography equipment and binoculars).

Engaging wildlife viewers who do not hunt or fish in funding conservation

Engaging nonconsumptive viewers in supporting GFP financially will require re-thinking current funding models. Wildlife viewing does not appear to be a “gateway” to consumptive activities like hunting and fishing, which traditionally fund GFP, as nonconsumptive viewers expressed little to no interest in supporting most typical/currently available funding mechanisms in the next five years. One option is the development of a wildlife viewer pass or membership similar to the Virginia Department of Wildlife Resources’ “Restore the Wild Membership” (see description in Sinkular et al., 2022). Such a membership could provide wildlife viewers with a specialized access pass, potentially to Wildlife Management Areas and/or other perks (e.g., merchandise, wildlife viewing equipment, tours of Wildlife Management Areas, etc.) based on purchase level. As nonconsumptive viewers most commonly contributed to the agency through a land access pass, considerable options exist to capitalize on this finding. Additionally, this is particularly relevant as we found that some nonconsumptive viewers had indeed purchased fishing licenses in the past five years, possibly as a way to gain access to wildlife viewing

locations, contribute to GFP, or due to a “COVID-19 bump” in companion license purchases. To capitalize on the connection between wildlife viewing and fishing, information on viewing fish, or wildlife viewing in general, may also be mentioned on the “Fish” tab on the agency’s website. Nonconsumptive viewers have also purchased GFP land access passes, permits, or paid entry fees for agency-owned parks and recreation areas, underscoring a potential interest in gaining access to more wildlife viewing locations and relevancy of a specialized access pass as part of a viewer pass or membership program. Wildlife viewer-specific funding mechanisms could provide a way for GFP to increase their connection with viewers, particularly nonconsumptive viewers, and provide funds for grant-matching. But it is critical to keep in mind that people must feel that the money is going to a good cause—one that they believe in or that will serve their interests. For wildlife viewers in South Dakota, this means using funds for species-level conservation or habitat management.

Conclusion

The South Dakota results of the Wildlife Viewer Survey builds on earlier investigations (Gigliotti 2002, 2012; Southwick 2022) and fills multiple knowledge gaps about wildlife viewers in the state: what they like to participate in, how they view and trust GFP as a state agency, what services and programs they wish GFP provided, how they are most likely to support conservation through action and funding, and more. This baseline information, which can be compared across the country and to other states, can enable GFP to start building, adapting, or strengthening programming, funding models, and other efforts to better connect and interact with wildlife viewers. In turn, these efforts will enable GFP to become more relevant to a larger constituency than they are currently.

While much work can be done using the data already collected and analyzed in the report, many additional opportunities exist to take this study to the next level through implementing activities at the state level and diving deeper into the data already collected. The Wildlife Viewing and Nature Tourism Working Group is poised to support the implementation of these findings. However, the full implementation of the recommendations outlined above will be best realized with a phase 2 multi-state grant, allowing the Working Group and GFP to continue to work in collaboration with Virginia Tech in implementing survey results.

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APPENDIX A. Survey Instrument

South Dakota Wildlife Viewer Survey



Thank you for your interest in taking South Dakota Game, Fish and Park's (GFP's) Wildlife Viewing Survey!

ABOUT THIS SURVEY

Wildlife viewing (the intentional observation, photography, or feeding of wildlife, as well as improving or maintaining wildlife habitat or visiting parks and natural areas for the primary purpose of viewing wildlife) is **one of the fastest growing outdoor activities** in the United States. **South Dakotans value and enjoy wildlife in many ways.** The last broad public survey about wildlife watching was about a decade ago. **The purpose of this survey is to learn about the activities, experiences, and preferences of South Dakotans who recreationally participate in wildlife viewing.** This survey is being conducted by GFP, with funding, in part, from the Association of Fish and Wildlife Agencies (AFWA).

Your input and feedback is very important. It helps GFP understand existing, and anticipate future, wildlife viewing needs and expectations of South Dakotans. The information also helps GFP estimate economic contributions associated with intentional wildlife viewing as an outdoor recreation activity.

It should take you about 15 minutes to complete the survey. After completing questions on a page (screen), if the survey doesn't automatically advance to the next questions, click on the direction arrow at the bottom of the screen.

Your participation is **voluntary and anonymous.** Your responses will never be presented in a way that they can be connected to your identity. The anonymous results of the survey will be published in summary form in reports and journal articles. Anonymous survey data may be archived online in a publicly accessible format. There are **no known risks** associated with participating in this survey; there are **no right or wrong answers** and **you can leave the survey at any time.**

Q1 Are you at least 18 years old?

- Yes
- No

Q2 GFP would like to know about your participation in different kinds of wildlife viewing. In which, if any, of the following forms of wildlife viewing have you participated in the past 5 years? (Please select all that apply.)

Note: For this survey, "**wildlife**" refers to all animals, such as birds, fish, insects, mammals, amphibians, and reptiles, that are living in natural environments, including in urban and semi-urban places. Wildlife does not include animals living in artificial or captive environments, such as aquariums, zoos, or museums, or domestic animals such as farm animals or pets. "**Wildlife viewing**" refers to intentionally observing, photographing, or feeding wildlife; improving or maintaining wildlife habitat; or visiting parks and natural areas for the primary purpose of wildlife viewing. **Wildlife viewing does not include simply noticing wildlife while doing something else, such as gardening, exercising, hunting, or fishing, or intentionally scouting for game.**

- Closely observing wildlife or trying to identify unfamiliar types of wildlife
- Photographing or taking pictures of wildlife
- Feeding wild birds
- Feeding other wildlife
- Maintaining plantings or natural areas for the benefit of wildlife
- Visiting parks and natural areas to observe, photograph, or feed wildlife
- Taking trips or outings to any other location to observe, photograph, or feed wildlife
- I did not participate in any of these forms of wildlife viewing in the last 5 years.

GFP would like to understand your wildlife viewing activities.

Q3 Which of the following types of wildlife are you interested in observing, photographing, or feeding? Your choices do not have to be South Dakota specific. (Please select all that apply.)

- Insects or spiders** (such as butterflies, dragonflies, beetles, etc.)
- Amphibians** (such as frogs, salamanders, etc.)
- Reptiles** (such as turtles, snakes, etc.)
- Birds** (such as songbirds, waterfowl, birds of prey, etc.)
- Land mammals** (such as deer, bears, elk, etc.)
- Marine mammals** (such as whales, seals, dolphins, etc.)
- Freshwater or saltwater fish** (such as sunfishes, darters, trout, salmon, sea bass, etc.)
- None of the above, I am interested in observing, photographing, or feeding other types of wildlife.**
- None of the above, I am not interested in observing, photographing, or feeding any types of wildlife**

Q4 How would you rate your skill level in wildlife viewing? (Please select one.)

- Beginner
- Novice
- Intermediate
- Advanced
- Expert

Q5 Do you own any specialized equipment for wildlife viewing (such as binoculars, cameras, mobile apps, spotting scopes, field guides, or specialized clothing), or have you rented or borrowed any specialized equipment for wildlife viewing in the past 5 years?

Yes

No

GFP would like to know about your travel, supplies, and equipment expenses related to wildlife viewing.

Q6 How much money do you spend on the following expenses related to wildlife viewing in a typical year? (For each expense category below, please select the response that contains your best estimate of how much you typically spend.) **Note:** By "**a typical year**," we mean a recent year (within the last ~5 years) that was not impacted by unusual circumstances like the COVID-19 pandemic.

Q7 Trip-related costs for wildlife viewing (such as transportation, lodging, guide fees, or access fees)

▼ \$0 ... \$501 or more

Q8 All other wildlife viewing expenses and equipment (such as binoculars, hiking or boating equipment for viewing, field guides, bird feeders or bird food, or membership dues for wildlife viewing organizations)

▼ \$0 ... \$501 or more

GFP would like to know more about the role of wildlife viewing in your life.

Q9 To what extent do you *agree or disagree* with the following statements?

(Please select one response per statement.)

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I think of myself as a wildlife viewer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being a wildlife viewer is an important part of who I am .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlife viewing has a central role in my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A lot of my life is organized around wildlife viewing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlife viewing is not an important part of my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who look like me participate in wildlife viewing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel welcome among other wildlife viewers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Being a wildlife viewer is not a key part of who I	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

am.					
I teach or mentor others in wildlife viewing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlife viewing is one of the most enjoyable activities I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

GFP is also interested in your history with wildlife viewing.

Q10 How did the COVID-19 pandemic impact your overall participation in wildlife viewing? (Please select one.)

- No impact;** I was wildlife viewing prior to the COVID-19 pandemic, and I continued wildlife viewing during the pandemic.
- I was wildlife viewing prior to the COVID-19 pandemic, but I **stopped wildlife viewing** during the pandemic.
- While I previously participated in wildlife viewing, I was not currently wildlife viewing when the COVID-19 pandemic started. During the pandemic, I **started wildlife viewing again.**
- I **started wildlife viewing for the first time** during the COVID-19 pandemic.

Q11 For about how many years have you participated in wildlife viewing? (Please select the category that contains your best estimate.)

▼ 1-5 years ... 96 or more years

In this section of the survey, GFP asks you about how much time you spend wildlife viewing in different locations and during different periods of time.

Q12 How many days do you spend wildlife viewing in each of the following locations in a typical year? By "a typical year," we mean a recent year (within the last ~5 years) that was not impacted by unusual circumstances like the COVID-19 pandemic.

(Please select the response that contains your best estimate for the number of days you spent viewing in each location. If you did not participate in wildlife viewing in these locations, please select 0 days.)

	0 days	1-30 days	31-60 days	61-90 days	91-120 days	121-150 days	151-180 days	181-210 days	211 or more days
Around or within 1 mile of your home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More than 1 mile away from your home, but within your state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outside of your state or outside of the United States	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q13 How many days did you spend wildlife viewing in each of the following locations during the first year of the COVID-19 pandemic (March 2020 - February 2021)?

(Please select the response that contains your best estimate for the number of days you spent viewing in each location. If you did not participate in wildlife viewing in these locations in the first year of the COVID-19 pandemic, please select 0 days.)

	0 days	1-30 days	31-60 days	61-90 days	91-120 days	121-150 days	151-180 days	181-210 days	211 or more days
Around or within 1 mile of your home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More than 1 mile away from your home, but within your state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outside of your state or outside of the United States	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14 How many days did you spend wildlife viewing in each of the following locations during the first year of the COVID-19 pandemic (March 2020 - February 2021)?

(Please select the response that contains your best estimate for the number of days you spent wildlife viewing in each location. If you did not participate in wildlife viewing in these locations during the first year of the COVID-19 pandemic, please select 0 days.)

	0 days	1-30 days	31-60 days	61-90 days	91-120 days	121-150 days	151-180 days	181-210 days	211 or more days
Around or within 1 mile of your home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More than 1 mile away from your home, but within your state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outside of your state or outside of the United States	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q15 How many days do you think you will spend wildlife viewing in each of the following locations in the next 12 months?

(Please select the response that contains your best estimate for the number of days you expect to spend wildlife viewing in each location. If you do not expect to participate in wildlife viewing in these locations in the upcoming year, please select 0 days.)

	0 days	1-30 days	31-60 days	61-90 days	91-120 days	121-150 days	151-180 days	181-210 days	211 or more days
Around or within 1 mile of your home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More than 1 mile away from your home, but within your state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outside of your state or outside of the United States	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

GFP would like to know more about where you participate in wildlife viewing in South Dakota.

Q16 In a typical year, in which South Dakota locations do you participate in wildlife viewing? (Please select all that apply.) **Note:** By "**a typical year,**" we mean a recent year (within the last ~5 years) that was not impacted by unusual circumstances like the COVID-19 pandemic.

- My own home or property
- Property of friends or family
- Other privately-owned areas (such as lands owned by land trusts, non-profit organizations, private companies, or individuals)
- Locally-managed areas (such as town or county parks, trails, or open spaces)
- State-managed areas (such as state parks, boat landings, urban fishing areas, SD School & Public Lands, or GFP Game Production Areas)
- Federally-managed areas (such as National Parks, National Wildlife Refuges, Bureau of Land Management Land, National Grasslands, Waterfowl Production Areas, or National Forests)
- Tribal lands
- I am unsure who owns or manages the areas where I participate in wildlife viewing.
- I do not participate in wildlife viewing in any of the above locations.

The next few questions will help GFP understand the factors that support and limit your participation in wildlife viewing.

Q17 To what extent do people in each of the following groups encourage your participation in wildlife viewing? *(Please select one response per statement.)*

	Not at all	Very little	Somewhat	Quite a bit	A great deal
Family member(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friend(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mentor(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q18 To what extent do you experience accessibility challenges related to wildlife viewing? *(Please select one.)*

Note: By “**Accessibility challenges**” we mean the difficulties someone experiences in interacting with or while using the physical or social environment while trying to engage in a activity (such as wildlife viewing). This may be a result of a mobility challenge, blindness or low vision, intellectual or developmental disabilities (including Autism), mental illness, being Deaf or Hard of Hearing, or other health concerns. *(Definition from Birdability.org)*

- Not at all
- Very little
- Somewhat
- Quite a bit
- A great deal

Q19 To what extent do each of the following limit your participation in wildlife viewing in a typical year? (Please select one response per statement.)

Note: By "**a typical year,**" we mean a recent year (within the last ~5 years) that was not impacted by unusual circumstances like the COVID-19 pandemic.

	Not at all	Very little	Somewhat	Quite a bit	A great deal
Lack of free time to participate in wildlife viewing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Few people who support your wildlife viewing activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Few people to participate in wildlife viewing with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of organized viewing opportunities within your community or social groups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of wildlife viewing skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of access to equipment or supplies for wildlife viewing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial costs associated with wildlife viewing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distance to high-quality locations for wildlife viewing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Not knowing where to go wildlife viewing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of transportation to wildlife viewing locations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessibility challenges for yourself or the people you go wildlife viewing with	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of facilities at wildlife viewing locations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety concerns when wildlife viewing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crowds in wildlife viewing locations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

GFP is also interested in your participation in other kinds of outdoor recreation.

Q20 Which of the following outdoor activities, if any, do you participate in during a typical year? (Please select all that apply.)

Note: By "**a typical year**," we mean a recent year (within the last ~5 years) that was not impacted by unusual circumstances like the COVID-19 pandemic.

- Road or mountain biking
- Camping
- Rock climbing or bouldering
- Fishing
- Foraging (for wild foods such as mushrooms or berries)
- Geocaching
- Hiking or backpacking
- Horseback riding
- Hunting
- Viewing wildflowers, other plants, or fungi
- Recreational shooting sports or archery
- Swimming
- Motorized boating
- Trapping
- Non-motorized boating (such as kayaking or canoeing)

- Off-roading or Off Highway Vehicles (*such as ATVs or snowmobiles*)
- Running, jogging, or walking
- Winter sports (*such as skiing, snowboarding, or snowshoeing*)
- I do not participate in any of these outdoor activities.

GFP wants to know more about your interest in participating in wildlife or habitat conservation activities in the future.

Q21 How likely would you be to participate in each of the following conservation activities in the next 5 years, if you had the opportunity to do so? (Please select one response per conservation activity.)

	Not at all likely	Slightly likely	Moderately likely	Very likely	Extremely likely
Informing or teaching others about wildlife conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhancing wildlife habitat (<i>the place or environment where wildlife live and grow</i>)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in civic engagement (<i>such as voting or advocating</i>) related to wildlife conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collecting data on wildlife or habitat to contribute to science or management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Donating money to support wildlife conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Purchasing products that benefit wildlife or whose proceeds support conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cleaning up trash or litter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q22 We would like to know more about your familiarity with different aspects of South Dakota Game, Fish, and Parks (GFP)? (Please select one response per statement.)

	Not at all familiar	Slightly familiar	Moderately familiar	Very familiar	Extremely familiar
GFP (state agency itself)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFP staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFP programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFP lands	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFP mission	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q23 Regardless of your level of familiarity with GFP, we are interested in your thoughts about how the agency currently prioritizes programs and services that support wildlife viewing. Please complete the following statement:

The level at which GFP prioritizes programs and services that support wildlife viewing is...

- Far too low
- Too low
- About right
- Too high
- Far too high
- I don't have an opinion.

GFP is interested in learning about any experiences you may have with the programs and services the state agency offers.

Q24 GFP offers a variety of programs and services that connect people with wildlife and support wildlife viewing. Which of the following GFP programs and services, if any, have you participated in or used in the past 5 years? (Please select all that apply.)

- Volunteer research or wildlife data collection opportunities
- Volunteer opportunities, not related to research or data collection
- Technical assistance or information about improving wildlife habitat
- Information about wildlife viewing opportunities in the state
- Information about wildlife in the state
- Attended programs or presentations for groups or clubs
- Visited GFP lands (e.g., Game Production Areas, state parks, and recreation areas)
- Visited GFP nature, education, or visitor centers (e.g., Outdoor Campuses in Sioux Falls and Rapid City, state park visitor centers)
- Wildlife festivals, viewing, or photography competitions sponsored by GFP
- Conservation Officer (wildlife law enforcement and landowner relations)
- I have not used or engaged in any of these agency programs or services in the last 5 years.

Q25 Have any members of your household engaged in programming for children or youth provided by GFP (such as school-based programs, camps, or youth and family events)? (Please select one.)

- Yes;** children or youth in my household have engaged in some of these programs.
- No;** children or youth in my household have not engaged in any of these programs.
- Not applicable;** I do not have children or youth in my household.

Q26 How satisfied were you with the following GFP programs and services? (Please select one response per program and service type.)

	Not at all satisfied	Somewhat satisfied	Extremely satisfied
Volunteer research or wildlife data collection opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteer opportunities, not related to research or data collection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technical assistance or information about improving wildlife habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information about wildlife viewing opportunities in the state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information about wildlife in the state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attended programs or presentations for groups or clubs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visited GFP lands (e.g., Game Production Areas, state parks, and recreation areas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Visited GFP nature, education, or visitor centers (e.g., Outdoor Campuses in Sioux)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Falls and Rapid City,
state park visitor
centers)

Wildlife festivals,
viewing, or
photography
competitions
sponsored by GFP

Conservation Officer
(wildlife law
enforcement and
landowner relations)

Programming for
children or youth

I was not satisfied
with any of the
agency programs or
services that I have
experienced.



GFP would also like to understand how the state agency can best meet the needs of wildlife viewers in South Dakota.

Q27 Which of the following potential programs or services from GFP would better support your wildlife viewing activities in South Dakota? (Please select all that apply.)

GFP can better support my wildlife viewing activities by providing...

- Access to more **places** to go wildlife viewing
- More information about **where** to go to see wildlife
- More information about **where and when to view wildlife where there is no hunting**
- More information about **wildlife in South Dakota**
- More information about **how** to view various types of wildlife
- More programs to **meet and interact** with other wildlife viewers
- More programs to improve wildlife viewing **skills**
- More **virtual programs** for wildlife viewing (*such as video classes, online presentations, or wildlife cameras*)
- More opportunities to be involved in **volunteer research or wildlife data collection activities**
- More opportunities to be involved in **other volunteer activities**, not related to research or data collection
- More opportunities for **youth** to learn how to participate in wildlife viewing
- More **training** opportunities for wildlife viewing guides or mentors
- More wildlife viewing **events** (*such as wildlife viewing festivals or competitions*)

- More agency **staff** to support wildlife viewing
- More **amenities** for wildlife viewing (*such as viewing platforms, blinds, or signs*)
- More **accessible features** in wildlife viewing locations (*such as paved trails, accessible parking, or tactile signage*)
- I am **not interested** in any of these options to support my wildlife viewing activities.

GFP would like to know about your past financial support of the agency. Below are a variety of ways that wildlife conservation and recreation opportunities provided by GFP are financially supported by the public in South Dakota.

Q28 Which of the following purchases or contributions, if any, have you made in the past 5 years? (Please select all that apply.)

- Any South Dakota hunting license
- Any South Dakota fishing license
- South Dakota conservation or habitat stamp when required with purchase of a hunting license
- South Dakota conservation or habitat stamp voluntarily purchased independent of a hunting license
- GFP lands access pass, permit, or entrance fee
- Fees for a program or event hosted by GFP
- Direct monetary donation to GFP
- Raffle ticket (for an item or trip) for which the proceeds go to habitat conservation
- Tangible products from GFP (such as books, paper maps, clothing, and other merchandise)
- I have not made any of these purchases or contributions.

Next, GFP would like to know about future purchases or contributions you may make.

Q29 How likely are you to make the following purchases or contributions in the next 5 years, assuming these options are available in South Dakota? (Please select one response for each type of contribution, regardless of whether or not the option is currently available. **Note:** to be allowed, some options may require a legislative change in South Dakota (e.g., donating a land conservation easement to GFP, lottery ticket with monetary payout, conservation or wildlife license plate).

	Not at all likely	Slightly likely	Moderately likely	Very likely	Extremely likely
Any South Dakota hunting license	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Any South Dakota fishing license	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
South Dakota conservation or habitat stamp <i>when required with purchase of a hunting license</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
South Dakota conservation or habitat stamp <i>voluntarily purchased independent of a hunting license</i>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation or wildlife license plate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFP lands access pass, permit, or entrance fee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fees for a program or event hosted by GFP

Donation of land to GFP through a conservation easement

Direct monetary donation to GFP

Raffle ticket (for item or trip) for which the proceeds go to habitat conservation

Lottery ticket (monetary payout) for which the proceeds go to habitat conservation

Virtual products from GFP (such as podcasts, e-books, electronic maps, and other online materials)

Tangible products from GFP (such as books, paper maps, clothing, and other merchandise)

GFP would like to understand what might encourage you to provide additional financial support to wildlife conservation through the state agency.

Q30 How likely would you be to provide more financial support than you currently do to GFP, if your contributions were used in the following ways? (Please select one response per statement.)

	Not at all likely	Slightly likely	Moderately likely	Very likely	Extremely likely
Supported habitat conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supported conservation of rare or vulnerable species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supported conservation of the types of wildlife you like to view	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supported more opportunities or resources for wildlife viewing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supported more education or outreach related to wildlife conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supported wildlife research or monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Were matched with funding from a different source	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

GFP would also like to know more about your interest in supporting the state agency by participating in future wildlife or habitat conservation activities.

Q31 How likely would you be to participate in each of the following conservation activities *with or in support of GFP* in the next 5 years, if you had the opportunity to do so? (Please select one response per conservation activity.)

	Not at all likely	Slightly likely	Moderately likely	Very likely	Extremely likely
Informing or teaching others about wildlife conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhancing wildlife habitat (the place or environment where wildlife live and grow)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participating in civic engagement (such as voting or advocating) related to wildlife conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collecting data on wildlife or habitat to contribute to science or management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Donating money to support wildlife conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Purchasing products that benefit wildlife or whose proceeds support conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cleaning up trash or litter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

GFP would like to understand how you feel about the state agency

Q32 To what extent do you agree or disagree with each of the following statements about GFP? (Please select one response per statement.)

	Strongly disagree	Somewhat disagree	Neither disagree nor agree	Somewhat agree	Strongly agree
I trust GFP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I trust the staff at GFP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I doubt the honesty of GFP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Promises made by GFP are likely to be reliable .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect that GFP will keep promises they make.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not doubt the honesty of GFP.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect that GFP is well-meaning .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect that GFP has good intentions toward wildlife viewers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I expect that GFP's intentions are benevolent .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I doubt that GFP is well-meaning .	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFP knows about wildlife viewing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFP understands the environment they work in.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

GFP knows how to **support** to wildlife viewers.

GFP **does not** know about wildlife viewing.

Finally, GFP would like to learn how the state agency can best communicate with wildlife viewers in South Dakota about recreation and wildlife conservation opportunities.

Q33 Which, if any, of the following ways are you interested in receiving information from GFP? (Please select all that apply.)

Note: Your responses are for data collection only. GFP will not receive your specific response nor contact you as a result of this survey.

- Printed materials (such as brochures and maps)
- Mailed newsletter or other subscription
- Email update or e-newsletter
- Online magazine
- GFP website
- Local news (such as television or online or print newspapers)
- Blogs
- Facebook
- Twitter
- Tik-Tok
- Instagram
- YouTube
- Podcast
- Text alert
- One-on-one interaction (in-person and virtual) with agency staff

- Topic specific public meetings or open house events
- I would prefer not to receive information from GFP.

This is the final section of the survey. We have just a few more quick questions about you.

Q34 For about how many years total have you lived in South Dakota?

▼ Less than 1 ... 99

Q35 In what year were you born?

(Please select your birth year from the drop-down list.)

▼ After 2003 ... 1920

Q36 What is your race and/or ethnicity? (If appropriate, you may select more than one.)

- American Indian or Alaska Native
- Asian
- Black or African American
- Hispanic, Latino, or Spanish
- Middle Eastern or North African
- Native Hawaiian or other Pacific Islander
- Some other race or ethnicity
- White

Q37 What was your total household income during the past 12 months? (Please select one.)

- Less than \$24,999
- \$25,000 - \$49,999
- \$50,000 – \$74,999
- \$75,000 – \$99,999
- \$100,000 – \$124,999
- \$125,000 or more
- I prefer not to answer.

Q38 What is your gender? (Please select one.)

- Man
- Woman
- Non-binary
- Prefer to not disclose
- Prefer to self-describe _____

Q39 What is your five-digit zip code? _____

Q40 Which of the following best describes where you currently live? (Please select one per statement.)

- Rural area (Less than 2,500 people)
- Small town (2,500 - 9,999 people)
- Small city (10,000 - 49,999 people)
- Urban area (50,000 or more people)

Q41 What is the highest degree or level of school you have completed? *(Please select one.)*

- High school diploma, equivalent, or less
- Some college
- Associate's or technical degree
- Bachelor's degree
- Professional, master's or doctoral degree

APPENDIX B. Tables

Table 1. Age

	Statewide (mean)	Consumptive (mean)	Nonconsumptive (mean)	Significance (t)
Age	55.0	54.8	55.8	0.78
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 438$</p>				

Table 2. Gender

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Man	62.7	69.1	40.6	26.57***
Woman	34.7	28.7	55.4	
Non-binary	0	0	0	
Not Disclose	2.0	1.4	4.0	
Self-Describe	0.7	0.9	0.0	
<p>Note that statistical tests are between consumptive and nonconsumptive groups, with only “man” and “woman” due to low sample size. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 3. Education

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Professional, master's or doctoral degree	22.3	20.4	28.7	5.92
Bachelor's degree	38.5	38.2	39.6	
Associate's or technical degree	13.1	12.9	13.9	
Some college	14.0	15.2	9.9	
High school diploma, equivalent, or less	12.0	13.2	7.9	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 4. Race and ethnicity (for descriptive analysis)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)
American Indian or Alaska Native	1.8	1.2	3.9
Asian	0.7	0.9	0.0
Black or African American	0.0	0.0	0.0
Hispanic, Latino, or Spanish	0.7	0.3	2.0
Middle Eastern or North African	0.0	0.0	0.0
Native Hawaiian or other Pacific Islander	0.2	0.3	0.0
White	96.6	96.2	98.0
Multiracial	2.2	1.2	5.9
Some other race or ethnicity	1.3	1.5	1.0

Table 5. Race and ethnicity (for statistical analysis)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
BIPOC	4.7	4.1	6.9	n/a
White	95.3	95.9	93.1	
Due to low sample sizes for the BIPOC category, no statistical analysis was conducted.				

Table 6. Household income

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Less than \$24,999	3.1	3.6	1.2	2.61
\$25,000 - \$49,999	17.0	15.9	20.9	
\$50,000 – \$74,999	18.3	17.2	22.1	
\$75,000 – \$99,999	21.4	21.5	20.9	
\$100,000 – \$124,999	18.0	18.5	16.3	
\$125,000 or more	22.2	23.2	18.6	
<p>Due to low sample sizes a chi-square analysis was conducted with “Less than \$24,999” and “\$25,000 - \$49,999” combined. Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 3$</p>				

Table 7. Residential location

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Rural area (Less than 2,500 people)	32.2	34.1	25.7	12.39**
Small town (2,500 - 9,999 people)	11.8	9.2	20.8	
Small city (10,000 - 49,999 people)	27.1	28.7	21.8	
Urban area (50,000 or more people)	28.9	28.1	31.7	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 3$</p>				

Table 8. Forms of wildlife viewing

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Visiting parks and natural areas to observe, photograph, or feed wildlife	76.4	73.7	85.4	5.64*
Photographing or taking pictures of wildlife	64.7	62.2	72.9	3.68
Taking trips or outings to any other location to observe, photograph, or feed wildlife	61.8	59.4	69.8	3.38
Closely observing wildlife or trying to identify unfamiliar types of wildlife	61.6	61.0	63.5	0.20
Feeding wild birds	53.0	54.6	47.9	1.32
Maintaining plantings or natural areas for the benefit of wildlife	34.5	34.9	33.3	0.08
Feeding other wildlife	19.2	20.0	16.7	0.52
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 9. Types of wildlife

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Land Mammals	89.8	89.1	92.2	0.80
Birds	81.6	78.8	91.2	8.06**
Fish	37.4	40.1	28.4	4.57*
Reptiles	31.3	29.5	37.3	2.19
Insects	31.1	28.3	40.2	5.16*
Marine Mammals	28.6	25.1	40.2	8.78**
Amphibians	24.7	22.1	33.3	5.29*
Other Wildlife	0.9	1.2	0.0	n/a

Due to low sample sizes for the “other wildlife” category, a chi-square analysis could not be conducted. Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.
 * $p = .01 - .05$
 ** $p = .001 - .01$
 *** $p < .001$
 $df = 1$

Table 10. Affective specialization: Centrality scale

Specialization	Statewide (Mean)	Consumptive (Mean)	Nonconsumptive (Mean)	Significance (t)
Centrality	3.01	3.01	3.04	0.27
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 460$</p>				

Table 11. Behavioral specialization: specialized equipment

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Yes, I have owned, rented, or borrowed specialized equipment.	20.6	20.1	22.3	0.25
No, I have not owned, rented, or borrowed specialized equipment.	79.4	79.9	77.7	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 12. Behavioral specialization: years viewing

# of years spent viewing	Statewide (%)	Consumptive (%)	Nonconsumptive (%)
1-5 years	12.4	10.7	18.2
6-10 years	8.9	6.8	16.2
11-15 years	5.3	5.3	5.1
16-20 years	9.8	9.5	11.1
21-25 years	6.4	7.1	4.0
26-30 years	7.3	6.8	9.1
31-35 years	6.4	7.4	3.0
36-40 years	8.2	9.8	3.0
41-45 years	6.4	6.8	5.1
46-50 years	8.7	8.6	9.1
51-55 years	6.2	6.2	6.1
56-60 years	7.6	8.9	3.0
61-65 years	3.2	3.0	4.0
66 or more years	3.2	3.3	3.0

Table 13. Behavioral specialization: experience as percentage of life spent viewing

% of life spent viewing	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
0-20%	19.0	15.4	30.5	13.92**
21-40%	18.5	18.6	17.9	
41-60%	15.0	14.5	16.8	
61-80%	21.2	22.2	17.9	
81-100%	26.4	29.3	16.8	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 14. Cognitive specialization: self-rated level of expertise

Self-rated skill level	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Beginner	21.3	19.9	26.0	15.69**
Novice	26.6	23.1	38.5	
Intermediate	36.5	39.6	26.0	
Advanced	13.4	14.8	8.7	
Expert	2.2	2.6	1.0	
<p>Due to low sample sizes for the "Expert" category, a chi-square test was conducted with "Advanced" and "Expert" combined into one group. Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 3$</p>				

Table 15. COVID-19 impacts on wildlife viewing participation and the R3 Framework

R3 Category	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Retained	92.8	93.8	89.5	n/a
Churned	1.8	1.7	1.9	
Reactivated	3.7	3.1	5.7	
Recruited	1.8	1.4	2.9	
Due to low sample sizes for the “Churned”, “Reactivated” and “Recruited” categories, a chi-square test could not be conducted.				

Table 16. Time spent wildlife viewing (Statewide)

Statewide				
Year	Location	0 days (%)	1 - 30 days (%)	> 30 days (%)
Typical Year	Around home	11.4	25.2	63.5
	Away from home	7.7	40.6	52.7
	Outside of state or country	32.8	52.8	14.4
First year of COVID-19 pandemic	Around home	11.3	27.8	60.9
	Away from home	11.5	42.4	46.1
	Outside of state or country	46.2	53.9	9.9
Upcoming year	Around home	11.2	28.6	60.3
	Away from home	8.2	41.4	50.7
	Outside of state or country	32.5	52.9	14.6

Table 17. Time spent wildlife viewing: Consumptive and nonconsumptive

		C (%)	N (%)	C (%)	N (%)	C (%)	N (%)	Significance (χ^2)
Year	Location	0 days (%)		1 - 30 days (%)		> 30 days (%)		
Typical year	Around home	812.95	5.9	24.4	27.7	62.6	66.3	3.874
	Away from home	8.5	4.9	41.3	38.2	50.1	56.9	2.234
	Outside of state or country	35.1	25.0	52.8	53.0	12.2	22.0	7.603*
First year of COVID-19 pandemic	Around home	12.4	7.8	28.9	27.2	59.7	65.0	1.896
	Away from home	11.1	12.6	43.1	39.8	45.7	47.6	0.420
	Outside of state or country	50.3	32.0	42.0	50.5	7.7	17.5	13.996***
Upcoming year	Around home	12.2	7.8	27.8	31.1	60.0	61.2	1.690
	Away from home	9.2	4.9	40.3	43.7	50.4	51.5	2.075
	Outside of state or country	35.2	23.2	52.1	55.3	12.6	21.4	7.813*

Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.
 * $p = .01 - .05$
 ** $p = .001 - .01$
 *** $p < .001$
 $df = 2$

Table 18. Wildlife viewing location

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
State-managed areas	89.5	88.9	91.3	0.49
My own home or property	79.0	79.3	77.9	0.09
Federally-managed areas	70.7	71.4	68.3	0.38
Locally-managed areas	62.0	60.1	68.3	2.28
Property of friends or family	49.2	52.8	37.9	7.04**
Other private property	22.8	25.1	15.4	4.25*
Tribal lands	5.8	6.1	4.8	0.25
I am unsure	2.9	2.3	4.8	n/a
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 19. Wildlife viewing trip-related expenditures

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
\$0	14.6	15.3	12.0	0.803
\$1-\$50	11.8	11.5	13.0	
\$51-\$100	14.1	13.9	15.0	
\$101-\$150	9.1	8.8	10.0	
\$151-\$200	9.3	9.7	8.0	
\$201-\$250	5.7	6.5	3.0	
\$251-\$300	5.9	4.7	10.0	
\$301-\$350	3.4	3.8	2.0	
\$351-\$400	2.1	2.4	1.0	
\$401-\$450	1.1	0.6	3.0	
\$451-\$500	6.2	6.5	5.0	
\$501 or more	16.6	16.2	18.0	
<p>Due to low sample sizes, we created three categories for analysis: \$0, \$1 - \$100, and \$101 or higher. Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 11$</p>				

Table 20. Other wildlife viewing-related expenditures

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
\$0	16.2	16.7	14.9	7.228*
\$1-\$50	18.8	16.1	27.7	
\$51-\$100	13.0	12.4	14.9	
\$101-\$150	8.4	8.5	7.9	
\$151-\$200	7.4	7.9	5.9	
\$201-\$250	7.4	8.2	5.0	
\$251-\$300	3.5	3.9	2.0	
\$301-\$350	3.9	3.9	4.0	
\$351-\$400	1.6	1.8	1.0	
\$401-\$450	1.2	1.5	0.0	
\$451-\$500	5.1	4.8	5.9	
\$501 or more	13.5	14.2	10.9	
<p>Due to low sample sizes, we created three categories for analysis: \$0, \$1 - \$100, and \$101 or higher. Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ <i>df</i> = 11</p>				

Table 21. Other outdoor recreation

Other Outdoor Recreation	Statewide (% selecting item)	Consumptive (% selecting item)	Nonconsumptive (% selecting item)	Significance (χ^2)
Camping	95.0	95.2	94.3	0.15
Fishing	74.0	n/a		
Running, Walking, or Jogging	67.5	65.0	76.2	4.64*
Hiking or Backpacking	64.5	64.1	65.7	0.08
Hunting	55.8	n/a		
Botanizing	42.5	38.7	56.2	10.20***
Motorized Boating	42.4	49.6	18.1	32.92***
Swimming	41.1	42.6	36.2	1.36
Recreational Shooting	40.5	49.9	8.6	57.40***
Non-Motorized Boating	34.2	35.3	30.5	0.83
Biking	29.4	26.9	38.1	4.90*
Off Highway Vehicles	26.0	29.7	13.3	11.29**

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Winter Sports	21.6	22.4	19.0	0.54
Foraging	18.6	21.8	7.6	10.84**
Geocaching	9.7	9.8	9.5	0.00
Horseback Riding	5.0	5.6	2.9	1.29
Climbing	4.1	4.5	2.9	n/a
Trapping	6.1	n/a		
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 22. Conservation behaviors (general; statewide)

Statewide					
	Not at all likely (%)	Slightly likely (%)	Moderately likely (%)	Very likely (%)	Extremely likely (%)
Teaching Others	36.5	25.4	19.7	11.6	6.8
Enhancing Habitat	15.5	28.6	27.3	19.2	9.4
Civic engagement	14.2	19.2	22.7	28.2	15.7
Collecting Data	29.3	30.8	19.7	13.3	7.0
Donating	19.4	31.7	30.3	12.9	5.7
Purchasing products	13.0	25.3	27.8	22.0	11.9
Cleaning up trash	4.8	11.4	20.0	32.0	31.8

Table 23. Conservation behaviors (General; consumptive-nonconsumptive)

	Not at all likely (%)		Slightly likely (%)		Moderately likely (%)		Very likely (%)		Extremely likely (%)		Significance (χ^2)
	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	
Teaching Others	34.1	44.8	25.3	25.7	21.3	14.3	11.6	11.4	7.7	3.8	6.33
Enhancing Habitat	14.5	18.9	27.6	32.1	25.9	32.1	21.0	13.2	11.1	3.8	9.96*
Civic engagement	14.2	14.2	17.9	23.6	23.3	20.8	28.1	28.3	16.5	13.2	2.15
Collecting Data	29.0	30.2	29.5	34.9	19.9	18.9	13.9	11.3	7.7	4.7	2.27
Donating	20.5	16.0	30.1	36.8	29.5	33.0	13.4	11.3	6.5	2.8	4.51
Purchasing products	12.0	16.2	24.4	28.6	26.1	33.3	22.9	19.0	14.6	2.9	13.10*
Cleaning up trash	4.6	5.7	9.4	18.1	19.9	20.0	33.0	28.6	33.0	27.6	6.83
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>											

Table 24. Conservation behaviors (With agency support; statewide)

Statewide					
	Not at all likely (%)	Slightly likely (%)	Moderately likely (%)	Very likely (%)	Extremely likely (%)
Teaching Others	40.4	28.7	17.8	8.1	5.0
Enhancing Habitat	14.7	31.9	29.9	16.3	7.2
Civic engagement	20.3	19.9	22.3	20.3	17.2
Collecting Data	33.9	28.2	21.9	10.2	5.9
Donating	26.3	35.8	25.4	9.3	3.2
Purchasing products	14.3	24.7	31.5	20.4	9.1
Cleaning up trash	5.4	15.0	20.1	24.6	35.0

Table 25. Conservation behaviors (With agency support; consumptive-nonconsumptive)

	Not at all likely (%)		Slightly likely (%)		Moderately likely (%)		Very likely (%)		Extremely likely (%)		Significance (χ^2)
	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	
Teaching Others	38.1	48.1	30.1	24.0	17.7	18.3	8.3	7.7	5.9	1.9	5.57
Enhancing Habitat	13.8	17.6	30.3	37.3	29.7	30.4	18.2	9.8	7.9	4.9	6.40
Civic engagement	20.6	19.4	20.0	19.4	22.4	22.3	19.7	22.3	17.4	16.5	0.36
Collecting Data	32.7	37.5	27.7	29.8	22.7	19.2	10.3	9.6	6.5	3.8	2.08
Donating	26.6	25.2	35.8	35.9	22.5	35.0	11.5	1.9	3.6	1.9	12.83*
Purchasing products	13.6	16.3	25.2	23.1	29.4	38.5	21.1	18.3	10.7	3.8	7.03
Cleaning up trash	5.0	6.7	14.3	17.1	19.8	21.0	23.6	27.6	37.3	27.6	3.61
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Due to low sample sizes, for analysis purposes <i>very</i> and <i>extremely likely</i> were combined for donating. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>											

Table 26. Barriers to wildlife viewing (Statewide)

Statewide					
	Not at all (%)	Very little (%)	Somewhat (%)	Quite a bit (%)	A great deal (%)
Lack of free time	24.5	21.0	32.5	18.6	3.5
Few people who support viewing	55.1	27.3	15.4	2.2	0.0
Few people to view with	49.7	28.2	18.4	3.5	0.2
Lack of organized viewing opportunities	59.2	19.6	16.3	4.4	0.4
Lack of viewing skills	53.8	24.4	18.4	2.9	0.4
Lack of access to equipment	58.4	26.5	12.9	2.0	0.2
Financial cost	45.4	29.2	21.2	2.9	1.3
Distance to viewing locations	37.4	20.8	32.1	7.7	2.0
Not knowing where to go viewing	48.7	25.3	20.4	4.4	1.1
Lack of transportation to viewing locations	73.8	19.1	6.0	1.1	0.0
Accessibility challenges	73.0	18.1	6.2	2.2	0.4
Lack of facilities at viewing locations	60.4	26.8	11.7	0.9	0.2
Safety concerns when viewing	69.4	23.5	6.2	0.7	0.2
Crowds in viewing locations	48.7	25.0	18.8	5.8	1.8

Table 27. Barriers to wildlife viewing (Consumptive-nonconsumptive)

	Not at all (%)		Very little (%)		Somewhat (%)		Quite a bit (%)		A great deal (%)		Significance (χ^2)
	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	
Lack of free time	26.9	16.2	19.3	26.7	32.6	32.4	17.6	21.9	3.7	2.9	n/a
Few people who support viewing	56.4	50.5	25.2	34.3	16.0	13.3	0.0	0.0	2.3	1.9	n/a
Few people to view with	51.0	45.2	28.5	26.9	17.0	23.1	3.2	4.8	0.3	0.0	n/a
Lack of organized viewing opportunities	60.7	53.8	19.5	20.2	14.9	21.2	4.3	4.8	0.6	0.0	n/a
Lack of viewing skills	57.5	41.3	23.7	26.9	16.5	25.0	2.0	5.8	0.3	1.0	n/a
Lack of access to equipment	61.4	48.0	24.5	33.3	11.2	18.6	2.6	0.0	0.3	0.0	n/a
Financial cost	46.4	41.7	28.1	33.0	20.9	22.3	2.9	2.9	1.7	0.0	n/a
Distance to viewing locations	39.8	29.1	20.1	23.3	33.0	29.1	5.7	14.6	1.4	3.9	n/a
Not knowing where to go viewing	52.7	34.7	24.9	26.7	17.5	30.7	3.7	6.9	1.1	1.0	n/a
Lack of transportation to viewing locations	75.1	69.6	18.1	22.5	5.4	7.8	1.4	0.0	0.0	0.0	n/a
Accessibility challenges	73.6	70.9	17.5	20.4	6.0	6.8	2.3	1.9	0.6	0.0	n/a
Lack of facilities at	63.0	51.5	25.8	30.1	9.7	18.4	1.1	0.0	0.3	0.0	n/a

viewing locations											
Safety concerns when viewing	73.4	55.9	20.6	33.3	5.4	8.8	0.3	2.0	0.3	0.0	n/a
Crowds in viewing locations	53.3	33.0	24.1	28.2	15.8	29.1	4.9	8.7	2.0	1.0	n/a
Test for statistical significance could not be conducted due to small number of respondents selecting certain levels of the scale.											

Table 28. Groups that encourage participation in wildlife viewing (Family)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all	16.4	17.3	13.3	3.94
Very little	14.0	14.7	11.4	
Somewhat	25.5	23.5	32.4	
Quite a bit	28.4	28.6	27.6	
A great deal	15.7	15.9	15.2	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 29. Groups that encourage participation in wildlife viewing (Friends)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all	18.9	20.7	12.5	7.76
Very little	23.9	22.2	29.8	
Somewhat	37.7	36.1	43.3	
Quite a bit	14.0	15.1	10.6	
A great deal	5.5	6.0	3.8	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 30. Groups that encourage participation in wildlife viewing (Mentors)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all	53.5	54.7	49.5	1.47
Very little	21.6	20.5	25.2	
Somewhat	19.1	19.3	18.4	
Quite a bit	3.1	2.6	4.9	
A great deal	2.7	2.9	1.9	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Due to low sample sizes, <i>quite a bit</i> and <i>a great deal</i> were combined for analysis purposes. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 31. Groups that encourage participation in wildlife viewing (Peers)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all	31.0	32.7	25.5	2.76
Very little	24.8	24.6	25.5	
Somewhat	34.4	32.7	40.2	
Quite a bit	7.6	8.1	5.9	
A great deal	2.2	2.0	2.9	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Due to low sample sizes, <i>quite a bit</i> and <i>a great deal</i> were combined for analysis purposes. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 32. Accessibility and wildlife viewing

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all	65.2	65.7	63.5	0.44
Very little	22.3	21.2	26.0	
Somewhat	8.5	8.5	8.7	
Quite a bit	2.8	3.1	1.9	
A great deal	1.1	1.4	0.0	
<p>Due to low responses in the <i>a great deal</i> category, a chi square test was conducted with two categories. Category 1: not at all and very little; Category 2: somewhat, quite a bit, and a great deal. Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 33. Basic agency familiarity

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all familiar	3.7	3.1	5.7	11.781**
Slightly familiar	14.6	13.1	19.8	
Moderately familiar	33.2	31.3	39.6	
Very familiar	31.4	33.2	25.5	
Extremely familiar	17.0	19.3	9.4	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Due to low sample sizes, <i>very</i> and <i>extremely familiar</i> were combined for analysis purposes. Statistically significant test values in bold. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 34. Familiarity with specific state agency characteristics (GFP staff)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all familiar	18.1	17.3	21.0	7.08
Slightly familiar	32.1	30.6	37.1	
Moderately familiar	31.7	31.7	31.4	
Very familiar	10.0	10.8	7.6	
Extremely familiar	8.1	9.6	2.9	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 35. Familiarity with specific state agency characteristics (GFP programs)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all familiar	7.0	6.3	9.5	17.25**
Slightly familiar	31.9	28.7	42.9	
Moderately familiar	38.7	38.9	38.1	
Very familiar	16.0	18.2	8.6	
Extremely familiar	6.3	8.0	1.0	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 36. Familiarity with specific state agency characteristics (GFP lands)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all familiar	5.7	4.8	8.6	13.25*
Slightly familiar	20.5	18.1	28.6	
Moderately familiar	37.6	37.7	37.1	
Very familiar	25.3	26.3	21.9	
Extremely familiar	10.9	13.0	3.8	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 37. Familiarity with specific state agency characteristics (GFP mission)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Not at all familiar	15.5	14.2	20.0	7.42
Slightly familiar	26.9	25.3	32.4	
Moderately familiar	32.6	33.2	30.5	
Very familiar	17.1	18.2	13.3	
Extremely familiar	7.9	9.1	3.8	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 4$</p>				

Table 38. Perception of state agency prioritization of programs and services for wildlife viewing

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Far too low	3.5	3.8	2.6	3.38
Too low	29.8	28.0	35.9	
About right	65.2	66.3	61.5	
Too high	0.9	1.1	0.0	
Far too high	0.6	0.8	0.0	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. Respondents that indicated 'no opinion' ($n = 114$) for this question were excluded in analysis. A chi-square test was conducted with two categories. Category 1: Far too low and too low; Category 2: About right, too high, and far too high.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 39. Experiences with state agency programs

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Agency lands	97.1	97.4	96.0	n/a
Visitor or education centers	73.2	70.4	82.0	5.17*
Wildlife information	34.8	36.7	29.0	1.95
Conservation law enforcement	26.5	32.5	8.0	23.26***
Programs for groups or clubs	22.1	24.1	16.0	2.89
Wildlife viewing opportunities	17.8	18.6	15.0	0.69
No agency programs or services	9.5	10.6	5.7	2.36
Viewing festivals	8.8	8.4	10.0	0.25
Volunteer data collection	6.8	8.4	2.0	4.82*
Other volunteer opportunities	5.8	6.4	4.0	0.81
Technical assistance or information about habitat	5.8	7.1	2.0	3.54
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 40. Programs and services for children and youth

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Yes, youth have engaged in programming	59.7	59.3	61.8	0.07
No, youth have not engaged in programming	40.3	40.7	38.2	
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. Responses indicating no youth or children (statewide $n = 566$) in their household were excluded from analysis.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 41. Measures of trust in GFP

	Statewide (Mean)	Consumptive (Mean)	Nonconsumptive (Mean)	Significance (t)
"I trust GFP"	3.8	3.8	3.9	-0.46
"I trust GFP staff"	3.9	3.9	3.9	0.59
Gefen capability score	4.01	4.0	4.0	-0.45
Gefen benevolence score	4.05	4.0	4.1	-0.44
Gefen integrity score	3.19	3.2	3.2	0.44
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$</p> <p><i>"I trust GFP"</i> $df = 446$ <i>"I trust GFP staff"</i> $df = 443$ <i>Gefen capability score</i> $df = 449$ <i>Gefen benevolence score</i> $df = 449$ <i>Gefen integrity score</i> $df = 451$</p>				

Table 42. Past purchases and contributions (nonvoluntary and voluntary)

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Habitat Stamp (Required)	53.1	67.1	5.7	122.84***
Hunting License	61.0	75.8	10.5	145.57***
Fishing License	78.1	92.1	30.5	180.17***
Habitat Stamp (Voluntary)	16.1	20.5	1.0	23.00***
Land Access Fee	75.1	71.1	88.7	13.55***
Program Fee	16.1	16.0	16.2	0.00
Direct Donation	5.4	6.5	1.9	3.28
Tangible Product	30.6	29.8	33.3	0.48
Raffle Ticket	23.2	28.1	6.7	20.88***
None	1.1	0.6	2.9	n/a
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold. * $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 43. Future purchases and contributions (Statewide)

Statewide					
	Not at all likely (%)	Slightly likely (%)	Moderately likely (%)	Very likely (%)	Extremely likely (%)
Habitat Stamp (Required)	26.9	9.0	6.0	12.0	46.1
Hunting License	26.0	9.8	5.2	10.3	48.7
Fishing License	8.9	7.3	8.4	13.3	62.0
Habitat Stamp (Voluntary)	40.7	21.7	15.1	5.3	17.2
License Plate	53.6	21.3	14.1	5.6	5.4
Land Access Fee	5.0	5.9	7.9	13.5	67.8
Program Fee	18.6	27.2	31.9	12.4	9.9
Land Donation (Easement)	77.5	13.7	6.7	1.0	1.0
Direct Donation	47.2	31.7	16.8	2.3	2.1
Lottery Ticket	23.1	26.6	27.5	13.9	8.9
Virtual Product	31.6	32.8	22.6	8.8	4.3
Tangible Product	17.2	27.8	28.1	14.5	12.3
Conservation Raffle Ticket	30.5	29	23.1	10.2	7.2

Table 44. Future purchases and contributions (Consumptive-nonconsumptive)

	Not at all likely (%)		Slightly likely (%)		Moderately likely (%)		Very likely (%)		Extremely likely (%)		Significance (χ^2)
	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	
Habitat Stamp (Required)	15.4	67.4	6.8	16.8	5.9	6.3	13.6	6.3	58.2	3.2	134.68***
Hunting License	14.0	68.8	8.5	14.6	5.0	6.3	11.1	7.3	61.5	3.1	143.22***
Fishing License	2.6	31.3	2.8	23.2	4.3	23.2	13.4	13.1	76.9	9.1	205.73***
Habitat Stamp (Voluntary)	36.0	55.4	19.9	27.2	15.4	14.1	6.3	2.2	22.4	1.1	n/a
License Plate	52.0	58.5	21.6	20.2	13.5	16.0	6.4	3.2	6.4	2.1	4.68
Land Access Fee	5.0	4.7	6.2	4.7	8.0	7.5	13.3	14.2	67.5	68.9	0.41
Program Fee	20.3	13.3	27.8	25.5	29.7	38.8	11.8	14.3	10.5	8.2	4.77
Land Donation (Easement)	76.3	81.5	14.6	10.9	6.8	6.5	1.4	0.0	1.0	1.1	n/a
Direct Donation	48.1	44.0	30.0	37.4	16.5	17.6	3.0	0.0	2.4	1.1	n/a
Lottery Ticket	27.8	39.4	27.8	33	23.6	21.3	12	4.3	8.7	2.1	12.56*
Raffle Ticket	21.9	26.9	25.2	31.2	25.8	33.3	15.8	7.5	11.3	1.1	15.09**
Virtual Product	30.6	34.7	32.6	33.7	22.7	22.1	9.5	6.3	4.6	3.2	n/a
Tangible Product	19.0	11.3	27.5	28.9	26.3	34.0	13.3	18.6	13.9	7.2	8.28

Note that statistical tests are between consumptive and nonconsumptive groups. Due to small sample sizes, Statistically significant test values in bold.

* $p = .01 - .05$

** $p = .001 - .01$

*** $p < .001$

$df = 4$

Table 45. Encouraging additional financial support (Statewide)

Statewide					
	Not at all likely (%)	Slightly likely (%)	Moderately likely (%)	Very likely (%)	Extremely likely (%)
Habitat conservation	18.5	29.2	29.8	9.1	13.4
Conservation of rare and vulnerable species	22.1	30.1	28.2	7.1	12.5
Conservation of preferred viewing species	16.5	27.5	31.6	8.0	16.5
Opportunities and resources for wildlife viewing	21.8	35.3	28.7	4.8	9.4
More education or outreach related to conservation	22.0	35.1	26.8	4.1	11.9
Wildlife research or monitoring	20.5	32.0	30.3	5.1	12.2
Funds matched by different source	24.4	28.1	30.9	5.2	11.5

Table 46. Encouraging additional financial support (Consumptive-nonconsumptive)

	Not at all likely (%)		Slightly likely (%)		Moderately likely (%)		Very likely (%)		Extremely likely (%)		Significance (χ^2)
	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	C (%)	NC (%)	
Habitat conservation	17.0	23.3	28.9	30.1	28.9	33.0	10.4	4.9	14.9	8.7	7.10
Conservation of rare and vulnerable species	21.5	24.0	32.2	23.1	26.6	33.7	7.2	6.7	12.5	12.5	3.88
Conservation of preferred viewing species	15.8	18.8	28.0	25.7	29.8	37.6	8.9	5.0	17.6	12.9	4.66
Opportunities and resources for wildlife viewing	21.9	21.4	36.0	33.0	27.6	32.0	5.7	1.9	8.7	11.7	0.78
More education or outreach related to conservation	21.9	22.3	36.3	31.1	25.2	32.0	4.5	2.9	12.0	11.7	2.17
Wildlife research or monitoring	19.9	22.3	32.2	31.1	28.9	35.0	6.3	1.0	12.7	10.7	5.91
Funds matched by different source	23.4	27.5	28.9	25.5	29.2	36.3	5.2	4.9	13.2	5.9	5.76

Note that statistical tests are between consumptive and nonconsumptive groups. Due to small sample sizes, *very* and *extremely likely* were combined for opportunities and resources for wildlife viewing and more education or outreach related to conservation. Statistically significant test values in bold.

* $p = .01 - .05$

** $p = .001 - .01$

*** $p < .001$

$df = 4$

Table 47. State agency support for wildlife viewing

	Statewide (%)	Consumptive (%)	Nonconsumptive (%)	Significance (χ^2)
Info - where to view wildlife	46.9	41.3	65.7	19.42***
Info - about wildlife in the state	38.2	33.7	53.3	13.23***
More wildlife viewing locations	35.6	34.3	4.0	1.16
Info - where to view where there is no hunting	34.9	29.8	52.4	18.23***
Info - how to view	30.4	25.6	46.7	17.07***
More opportunities for youth	24.3	24.7	22.9	0.15
More wildlife viewing amenities	24.3	23.6	26.7	0.41
Programs to improve my viewing skills	19.5	17.4	26.7	4.41*
Volunteer data collection opportunities	19.5	19.9	18.1	0.17
More accessible features	19.5	18.8	21.9	0.49
I am not interested in any of these options.	18.9	21.6	9.5	7.76**
Virtual programs	15.2	14.3	18.1	0.89
More wildlife viewing events	14.1	12.1	21.0	5.27*
More training for guides	13.2	12.9	14.3	0.13
Programs to interact with other viewers	11.7	10.4	16.2	2.63

Other volunteer opportunities	10.2	9.0	14.3	2.48
More wildlife viewing staff	8.7	8.7	8.6	0.00
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

Table 48. Preferred GFP communication methods

	Statewide (% selecting item)	Consumptive (% selecting item)	Nonconsumptive (% selecting item)	Significance (χ^2)
Website	67.8	69.8	61.3	2.67
Email Update	67.0	66.8	67.6	0.02
Printed Materials	61.1	59.2	67.6	2.44
Local News	41.5	41.4	41.9	0.00
Facebook	34.9	37.2	27.4	3.46
Online Magazine	30.5	29.7	33.3	0.51
Mailed Newsletter, Subscription	29.6	30.1	27.6	0.24
Staff	27.0	26.2	29.5	0.45
YouTube	16.3	16.6	15.2	0.11
Text	15.7	15.2	17.1	0.22
Podcast	7.6	5.6	14.3	8.62**

Instagram	6.5	5.9	8.6	0.93
None	6.5	6.8	5.7	0.14
Blogs	4.3	3.4	7.6	n/a
Twitter	4.3	3.9	5.7	n/a
Tik-Tok	3.0	2.8	3.8	n/a
<p>Note that statistical tests are between consumptive and nonconsumptive groups. Statistically significant test values in bold.</p> <p>* $p = .01 - .05$ ** $p = .001 - .01$ *** $p < .001$ $df = 1$</p>				

APPENDIX C. Reverse coded items and attention checks

1. Attention checks for the question, “In which, if any, of the following forms of wildlife viewing have you participated in the past 5 years?”
 - a. Respondent selected [“Closely observing wildlife or trying to identify unfamiliar types of wildlife”] AND [“None of the above, I am not interested in observing, photographing, or feeding wildlife”]
OR
 - b. Respondent selected [“Photographing or taking pictures of wildlife”] AND [“None of the above, I am not interested in observing, photographing, or feeding wildlife”]
OR
 - c. Respondent selected [“Feeding wild birds”] AND [“None of the above, I am not interested in observing, photographing, or feeding wildlife”]
OR
 - d. Respondent selected [“Feeding other wildlife”] AND [“None of the above, I am not interested in observing, photographing, or feeding wildlife”]
OR
 - e. Respondent selected [“Visiting parks and natural areas to observe, photograph, or feed wildlife”] AND [“None of the above, I am not interested in observing, photographing, or feeding wildlife”]
OR
 - f. Respondent selected [“Taking trips or outings to any other location to observe, photograph, or feed wildlife”] AND [“None of the above, I am not interested in observing, photographing, or feeding wildlife”]

2. Attention checks for “Now, we would like to know more about the role of wildlife viewing in your life. To what extent do you agree or disagree with the following statements?”
 - a. Respondent selected [“Strongly Agree”] FOR [“Being a wildlife viewer is an important part of who I am”] AND [“Being a wildlife viewer is not a key part of who I am”]
OR

- b. Respondent selected [“Strongly Disagree”] FOR [“Being a wildlife viewer is an important part of who I am”] AND [“Being a wildlife viewer is not a key part of who I am”]
OR
 - c. Respondent selected [“Strongly Agree”] FOR [“Wildlife viewing is not an important part of my life”] AND [“Wildlife viewing has a central role in my life”]
OR
 - d. Respondent selected [“Strongly Disagree”] FOR [“Wildlife viewing is not an important part of my life”] AND [“Wildlife viewing has a central role in my life”]
3. Attention checks for “How many days do you spend wildlife viewing in each of the following locations in a typical year?”
- a. Respondent selected [211 or more days] IS SELECTED FOR [“Outside of your state or the United States”] AND [“More than 1 mile away from your home, but within your state”] OR [“Around or within 1 mile of your home”]
4. Attention checks for “How many days did you spend wildlife viewing in each of the following locations during the first year of the COVID-19 pandemic (March 2020 - February 2021)?”
- a. Respondent selected [211 or more days] IS SELECTED FOR [“Outside of your state or the United States”] AND [“More than 1 mile away from your home, but within your state”] OR [“Around or within 1 mile of your home”]
5. Attention checks for “How many days do you think you will spend wildlife viewing in each of the following locations in the next 12 months?”
- a. Respondent selected [211 or more days] IS SELECTED FOR [“Outside of your state or the United States”] AND [“More than 1 mile away from your home, but within your state”] OR [“Around or within 1 mile of your home”]
6. Attention checks for “Next, we would like to know more about how you feel about the South Dakota Department of Game, Fish, and Parks. To what extent do you agree or disagree with each of the following statements about the South Dakota Department of Game, Fish, and Parks?”
- a. Respondent selected [“Strongly Agree”] FOR [“I doubt the honesty of the South Dakota Department of Game, Fish, and Parks”] AND [“I can count on the South

Dakota Department of Game, Fish, and Parks to be truthful”] OR [“Strongly Disagree”] IS SELECTED FOR [“I doubt the honesty of South Dakota Department of Game, Fish, and Parks”] AND [“I can count on South Dakota Department of Game, Fish, and Parks to be truthful”]

- b. Respondent selected [“Strongly Agree”] FOR [“I expect that South Dakota Department of Game, Fish, and Parks’s intentions are benevolent”] AND [“I doubt that South Dakota Department of Game, Fish, and Parks is well meaning”] OR [“Strongly Disagree”] FOR [“I expect that South Dakota Department of Game, Fish, and Parks’s intentions are benevolent”] AND [“I doubt that South Dakota Department of Game, Fish, and Parks is well meaning”]
- c. Respondent selected [“Strongly Agree”] FOR [“South Dakota Department of Game, Fish, and Parks knows very little about wildlife viewing”] AND [“South Dakota Department of Game, Fish, and Parks knows how to support wildlife viewers”] OR [“Strongly Disagree”] FOR [“South Dakota Department of Game, Fish, and Parks knows very little about wildlife viewing”] AND [“South Dakota Department of Game, Fish, and Parks knows how to support wildlife viewers”]