VIRGINIA WILDLIFE VIEWING PLAN

2021 - 2031

Virginia Department of Wildlife Resources

About the Contributors to the Plan

The Virginia Wildlife Viewing Plan is the culmination of a 3.5-year collaborative effort between the Virginia Department of Wildlife Resources (DWR) and Virginia Tech's Department of Fish and Wildlife Conservation. Brian Moyer (Deputy Director, Outreach Division, DWR) served as the agency's project leader. Dr. Ashley Dayer (Assistant Professor, Virginia Tech and Principal Investigator for this project), Dr. Jessica Barnes (Research Scientist, Virginia Tech), and Dr. Ashley Peele (Research Scientist, Virginia Tech) led the complementary study effort to inform this plan, facilitated the process to develop the content of this plan, and coordinated its writing. They oversaw the data collection and analysis efforts of Graduate Research Assistant Bennett Grooms, Research Technician Jonathan Rutter, and Undergraduate Research Assistant Elizabeth Tsang. Research Technician Jillian Everly also contributed to survey data entry. Additionally, Brian Moyer (DWR), Jessica Ruthenberg (DWR), Meagan Thomas (DWR), Jeff Trollinger (DWR), Sergio Harding (DWR), Becky Gwynn (DWR), Marc Puckett (DWR), Steve Living (DWR), and Michelle Prysby (Virginia Master Naturalists) contributed to the writing of this plan. A Technical Advisory Committee of DWR employees from across Virginia and representing a variety of divisions within the agency (see Appendix A for members) worked with a Stakeholder Advisory Committee representing wildlife and outdoor organizations, agencies, and sectors from Virginia (see Appendix A for members) to develop content for the plan.

Acknowledgements

We appreciate the 4,271 wildlife recreationists and members of the public in the Commonwealth of Virginia that participated in the focus groups (Grooms et al. 2019) and surveys (Grooms et al. 2020) that informed this plan. Their time and thoughtful reflections ensured that this plan was based on an understanding of experiences of a broad constituency.

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Executive Summary

Wildlife viewing, defined as intentionally observing, feeding, or photographing wildlife, is one of the most popular outdoor recreation activities in the United States. The 2016 National Survey of Hunting, Fishing, and Wildlife-Associated Recreation reported that there are approximately 86 million wildlife viewers aged 16 or older in the U.S. – more than one-third of the adult population – and participation in wildlife viewing has been increasing since the mid-1990s (USDOI et al. 2016). Consistent with national trends, in 2016, about 35% of Virginia's population viewed wildlife, amounting to 2.1 million wildlife viewers in the state (Rockville Institute, 2020). A growing body of literature shows that wildlife viewers contribute to habitat and wildlife conservation financially, politically, and through participation in other conservation activities (Cooper et al., 2015; Hvenegaard, 2002; McFarlane & Boxall, 1996). In 2016, Virginia wildlife viewers spent over $3.2 billion for their wildlife viewing activities, both in and out of state, on equipment purchases, membership dues and contributions, and trip-related expenses, including food and lodging, transportation, and access fees for public and private lands (Rockville Institute, 2020). Beyond its direct conservation potential, wildlife viewing is also a means of connecting more people to nature (Kellert et al., 2017).

Wildlife viewers, as a substantial and growing proportion of the U. S. public, are thus a critical constituency for wildlife agencies, especially given stable or declining rates of participation in hunting and angling and associated revenues over the past decade (Dunfee et al., 2019). In 2017, the Virginia Department of Wildlife Resources (DWR) became the first state to include wildlife viewing as a distinct recreation activity in its Recruitment, Retention, and Reactivation (hereafter, R3) Plan, which is part of the nationwide R3 initiative to align the operations of wildlife agencies with an overall objective of increasing public engagement in outdoor recreation. This inclusion of viewers reflects the DWR's over fifty-year history of working to support participation in wildlife viewing and conserve viewable, nongame species. This work began slowly, with origins in scientific projects focused on single wildlife species, and has evolved today to include comprehensive habitat management on agency lands that provides opportunities for wildlife viewing; targeted research and conservation of viewable, nongame wildlife; promotion of and structural support for nature tourism; informal and formal wildlife and habitat education; and programming to support safe viewing experiences and prevent human-wildlife conflict. Still, an analysis conducted by agency staff and stakeholders at an R3 workshop in August 2017 identified limited outreach and engagement with wildlife viewers and a perception that the agency is not an advocate for these constituents as threats to the DWR's ability to achieve its R3 objectives and overall mission (DWR, n.d.). To improve engagement, understanding, and mutual support between wildlife viewers and the DWR, in 2018 agency staff collaborated with Virginia Tech to initiate human dimensions research and a participatory planning process designed to help the agency better serve Virginia's many and diverse wildlife viewers.

This Wildlife Viewing Plan is the first comprehensive plan developed for the DWR for engaging with and supporting wildlife viewers. It was co-produced by an 18-member Technical Advisory Committee (TAC), composed of DWR staff, and a 20-member Stakeholder Advisory Committee (SAC), composed of individuals and organizational representatives with experience and interest in wildlife viewing in Virginia. The SAC and TAC met in person and virtually to identify issues related to wildlife viewing in Virginia; develop a values statement and broad goals for the plan; strategically consider the internal and external conditions that may shape the DWR's success in supporting wildlife viewing; discuss general directions for objectives and strategies under each plan goal; and brainstorm specific tactics the DWR

could employ to increase participation in wildlife viewing and conservation and engagement between wildlife viewers and the agency. The resulting plan provides direction and priorities to orient the DWR's efforts related to wildlife viewing through 2031, but relies on the experience and expertise of agency staff and partners to define and implement specific tactics that will fulfill the values and achieve the goals outlined here for wildlife viewing in Virginia. In addition to providing standalone guidance, this plan provides a basis for the development of an operational R3 plan for wildlife viewing.

Wildlife Recreation Study

In concert with the planning process for this Wildlife Viewing Plan, the DWR contracted with researchers at Virginia Tech to conduct human dimensions research on the behaviors and interests of the growing number and diversity of wildlife recreationists (including birders, other wildlife viewers, hunters, and anglers) throughout the Commonwealth of Virginia. This mixed-methods study consisted of focus groups (Grooms et al. 2019); a survey distributed to a random sample of Virginia residents and to recreationists currently connected to DWR through license sales, agency communications, or citizen science (Grooms et al. 2020); and a web-based analysis of wildlife viewing organizations in the state (Tsang et al. *in review*). Results from each phase of the Wildlife Recreation Study were presented to the SAC and TAC during planning meetings, in order to support the development of data-driven goals, objectives, and strategies for this Wildlife Viewing Plan. Initial focus groups with wildlife recreationists provided rich and detailed insight into the recreation and conservation experiences of hunters, anglers, birders, and other wildlife viewers in their own words. Subsequent surveys produced more generalizable findings that were used to understand the wildlife viewing community as a whole and how wildlife viewing intersects with other kinds of wildlife recreation. Finally, a web-based stakeholder analysis provided information about the breadth of organizations and agencies that support wildlife viewing in Virginia and the resources and activities they provide. This analysis infused the planning process for this Wildlife Viewing Plan with information about the priorities of the many wildlife viewing organizations that were not represented on the SAC.

Values, Goals, Objectives, and Strategies

The SAC and TAC for the Wildlife Viewing Plan developed a set of values, goals, and objectives to guide the DWR's efforts related to wildlife viewing for the next 10 years. The Values Statement for the Wildlife Viewing Plan emphasizes the importance of wildlife and their habitats; the fundamental relationship between wildlife-related recreation and wildlife conservation; the shared privilege and stewardship responsibility inherent in the governance of Virginia's natural resources as a public trust; and the need for wildlife organizations and agencies to work cooperatively to expand exposure to and experience with the unique and diverse wildlife of Virginia. It further holds that wildlife viewing opportunities in Virginia should be connected to wildlife conservation; biologically, socially, and financially sustainable; abundant, diverse, and accessible for all people in the Commonwealth; and adapted over time, based on the best available science.

The following goals build from the principles contained in the Values Statement and capture overarching ideas about what DWR should strive to accomplish related to wildlife viewing. In the plan, each goal is accompanied by multiple objectives (more specific targets that will contribute to the realization of plan goals) and strategies (a suite of methods the agency might use to achieve the plan's objectives).

Goal 1: Connect diverse segments of the public to wildlife and wildlife viewing in Virginia

Engaging diverse communities has been a challenge for fish and wildlife agencies across the country, but it is essential for fulfilling agency directives to govern wildlife resources as a trust for <u>all</u> members of the public (Dunfee et al., 2019). Additionally, expanding participation in wildlife viewing can directly advance

conservation, given the contributions wildlife viewers make to the scientific knowledge of wildlife populations (McKinley et al., 2017) and their participation in activities, from land stewardship to advocacy, that support wildlife and habitats (Cooper et al., 2015). Goal 1 of the Wildlife Viewing Plan thus focuses on connecting diverse segments of the public to wildlife and wildlife viewing. Associated objectives include increasing participation in wildlife viewing among underrepresented gender, ethno-racial, and socio-economic groups; providing opportunities that promote positive engagement between urban communities and wildlife; fostering an appreciation for wildlife and participation in wildlife viewing among youth and families; supporting viewers with little or no experience so they form enduring connections to wildlife and viewing; and connecting other outdoor recreation groups, such as paddlers and campers, to wildlife viewing.

Goal 2: Provide a variety of wildlife viewing opportunities accessible to all in the Commonwealth
Results from the Wildlife Recreation Survey indicated that wildlife viewers feel DWR can better serve them by providing more access to locations for viewing birds and other wildlife and more information about the locations, such as Wildlife Management Areas and the Virginia Bird and Wildlife Trail, that are already available (Grooms et al., 2020). Goal 2 of the Wildlife Viewing Plan is oriented towards increasing opportunities for viewers to experience wildlife at destinations across the state and close to home.

Goal 3: Promote wildlife and habitat conservation through wildlife viewing
Fish and wildlife agencies face sometimes competing directives to both connect people to wildlife and conserve natural resources in light of human impacts on species and habitats. The capacity of wildlife viewers and other recreationists outside of hunting and angling communities to advance wildlife conservation is central to the imperative for fish and wildlife agencies to meaningfully engage with these constituencies (Dunfee et al., 2019). Goal 3 of the Wildlife Viewing Plan seeks to maximize the connection between wildlife viewing and wildlife and habitat conservation by increasing opportunities for viewers to directly perform conservation activities and by cultivating a culture of responsible wildlife viewing in the Commonwealth.

Goal 4: Connect broader constituencies to the Virginia Department of Wildlife Resources through wildlife viewing
The explicit inclusion of wildlife viewing in DWR's updated mission and R3 planning are evidence of increasing support within the agency for engaging with wildlife viewers as key constituents. However, more actively engaging with and prioritizing the needs of wildlife viewers as stakeholders may present challenges to existing agency culture and structure. The final goal of the plan focuses specifically on fostering mutual understanding and support between wildlife viewers and DWR. Objectives under this goal aim to increase viewers' awareness of DWR and its relevance to their activities; promote two-way dialogue and trust between viewers and the agency; and increase financial connections between wildlife viewers and DWR's conservation work.

Implementation and Evaluation
Successful implementation of this Wildlife Viewing Plan over the next 10 years relies on coordination and cooperation across agency divisions and ongoing attention to the staffing and financial resources needed to implement plan strategies, achieve plan objectives, and realize the plan goals of promoting broader participation in wildlife viewing and more meaningful engagement between wildlife viewers and the DWR. The final section of this document outlines which agency divisions, and, in some cases programs, will be central to the implementation of each of the strategies outlined in this plan and a possible framework for tracking incremental progress towards the plan's ambitious goals.

Table of Contents

PART I: Introduction to the Wildlife Viewing Plan 8

ABOUT THE VIRGINIA DWR 8

ABOUT THE VIRGINIA DWR WILDLIFE VIEWING PLAN 9

How the Plan was Developed 9

Interim Changes to the Plan 10

Plan Format 10

PART II: Wildlife Viewing in the U.S. and Virginia 12

WILDLIFE VIEWING IN THE U.S. 12

Defining wildlife viewing 12

National-level trends in wildlife viewing 12

Demographic patterns in wildlife viewing 13

Activities and expenditures of U.S. wildlife viewers 14

WILDLIFE VIEWING IN VIRGINIA 14

Virginia's wildlife and wildlife viewing opportunities 14

State-level trends in wildlife viewing 15

Activities and expenditures of Virginia's wildlife viewers 16

PART III: Agency Engagement with Wildlife Viewers 17

WILDLIFE VIEWING AND STATE FISH AND WILDLIFE AGENCIES 17

A BRIEF HISTORY OF THE DWR AND WILDLIFE VIEWING 18

Watchable Wildlife Program 18

Wildlife Viewing in the DWR's R3 Plan 19

HOW THE DWR MISSION SUPPORTS WILDLIFE VIEWING 20

Habitat Conservation and Management 20

Wildlife Research and Conservation 23

Nature Tourism 26

Wildlife and Habitat Education 32

Education and Outreach Related to Human-Wildlife Interaction 36

Conservation Police Officers 37

HOW WILDLIFE VIEWERS SUPPORT THE DWR 37
Citizen Science 37
Financial Support 40
SWOT ANALYSIS 42
PART IV: Wildlife Recreation Study 44
WILDLIFE RECREATION FOCUS GROUPS 45
Methods 45
Key Findings 45
WILDLIFE RECREATION SURVEY 46
Methods 46
Key Findings 47
WEB-BASED STAKEHOLDER ANALYSIS 49
Methods 49
Key Findings 49
APPLYING HUMAN DIMENSIONS RESEARCH 50
PART V: Values, Goals, Objectives, and Strategies 51
VALUES STATEMENT 51
GOALS, OBJECTIVES, AND STRATEGIES 52
GOAL 1: Connect diverse segments of the public to wildlife and wildlife viewing in Virginia 53
Objective 1: Increase participation by underrepresented gender, ethno-racial, and socio-economic groups in wildlife viewing events, programs, and activities led by DWR and partners 53
Objective 2: Increase engagement of urban populations in activities that connect people to wildlife and wildlife viewing 54
Objective 3: Increase awareness of wildlife and opportunities for participating in wildlife viewing among youth and families. 54
Objective 4: Develop resources to help viewers with little or no experience progress from initial awareness of recreational opportunities to continued participation and identification as a wildlife viewer 55
Objective 5: Raise awareness of wildlife viewing among groups that participate in other forms of outdoor recreation, in order to enrich their outdoor experience and introduce a new and related activity. 56
GOAL 2: Provide a variety of wildlife viewing opportunities accessible to all in the Commonwealth 56

Objective 1: Encourage increased wildlife viewing on agency lands and waters through habitat management and communications about these properties. 56

Objective 2: Increase use of Virginia Bird and Wildlife Trail sites for wildlife viewing activities. 57

Objective 3: Increase access to wildlife viewing opportunities at or close to home. 58

GOAL 3: Promote wildlife and habitat conservation through wildlife viewing opportunities 58

Objective 1: Increase volunteer engagement by connecting wildlife viewers to conservation opportunities. 58

Objective 2: Foster a culture of responsible wildlife viewing. 59

GOAL 4: Connect broader constituencies to the Virginia Department of Wildlife Resources through wildlife viewing 60

Objective 1: Increase awareness of the scope of DWR's mission and its relevance to wildlife viewing. 60

Objective 2. Increase dialogue and recognition between the agency and wildlife viewers to cultivate improved relationships. 60

Objective 3: Increase monetary contributions of wildlife viewers to support DWR's work with wildlife and habitat conservation. 61

PART VI: Implementation and Evaluation 62

PLAN IMPLEMENTATION 62

PLAN EVALUATION 69

References 83

Appendix A: Stakeholder and Technical Advisory Committees 87

STAKEHOLDER ADVISORY COMMITTEE MEMBERS 87

TECHNICAL ADVISORY COMMITTEE MEMBERS 88

Appendix B: Potential Tactics for Plan Implementation 89

Part I
Introduction to the DWR and the Wildlife Viewing Plan

ABOUT THE VIRGINIA DWR

The Virginia Department of Wildlife Resources (DWR) is guided by a mission to ***conserve*** and manage wildlife populations and habitat for the benefit of present and future generations; ***connect*** people to Virginia's outdoors through boating, education, fishing, hunting, trapping, wildlife viewing, and other wildlife-related activities; and ***protect*** people and property by promoting safe outdoor experiences and managing human-wildlife conflicts (DWR, 2020). This mission statement was approved by the agency's Governor-appointed Board of Directors in 2016 to clarify the DWR's mandate to manage Virginia's wildlife resources, as embodied in the Code of Virginia. The Virginia General Assembly has charged the Board and DWR with species management (§29.1-103), public education (§29.1-109), law enforcement (§29.1-109), and regulations (§29.1-501) related to the state's wildlife. To fulfill its mission, the DWR has more specific goals to manage wildlife populations and habitats to meet the balanced needs among diverse human communities; recruit, retain, and re-engage people who enjoy wildlife and boating activities; and promote people's awareness and appreciation of their role in wildlife conservation. Formerly named the Virginia Department of Game and Inland Fisheries, as of July 1, 2020, the agency was renamed the Department of Wildlife Resources, in order to reflect the wide range of its responsibilities and to clarify that its efforts are relevant to all Virginians interested in wildlife and the outdoors.

In support of its mission, the agency has implemented a Recruitment, Retention, and Reactivation (hereafter, R3) initiative intended to align agency operations with an overall objective of increasing public engagement with Virginia's outdoors through hunting, fishing, recreational shooting, boating, and wildlife viewing. The DWR's relationships with hunters, anglers, and boaters are long-standing, rooted in both agency management of opportunities for hunting, fishing, and boating and the contributions these activities make to the agency through license purchases and excise taxes. Relationships between the DWR and the estimated 2.1 million wildlife viewers in Virginia (USDOI, 2016) are substantially newer and

less established. An analysis conducted by agency staff and stakeholders at an R3 workshop in August 2017 identified limited outreach and engagement with wildlife viewers and a perception that the agency is not an advocate for these constituents as threats to the DWR's ability to achieve its R3 objectives and overall mission (DWR, n.d.). To improve engagement, understanding, and support between wildlife viewers and the agency, in 2018, DWR staff initiated human dimensions research and a participatory planning process designed to help the agency better serve Virginia's many and diverse wildlife viewers. This Wildlife Viewing Plan (hereafter, the plan) is a product of those efforts.

ABOUT THE VIRGINIA DWR WILDLIFE VIEWING PLAN

This Wildlife Viewing Plan is the first comprehensive plan for engaging with and supporting wildlife viewing developed for the DWR. It includes a value statement, broad goals, and specific objectives to orient the DWR's efforts related to wildlife viewing through 2031. The plan is not an operational plan, in that it does not prescribe specific actions to be taken by the agency. Rather, it is a strategic plan that provides the agency with direction and priorities and then relies on the experience and expertise of agency staff and partners to define and implement specific strategies and tactics that will fulfill the values and achieve the goals outlined here for wildlife viewing in Virginia. In addition to providing standalone guidance, this plan provides a basis for the development of an operational R3 plan for wildlife viewing.

How the Plan was Developed

DWR initiated a multi-faceted process to develop this Wildlife Viewing Plan that included a participatory planning process and a three-part study of wildlife recreationists. Consistent with its mission "to serve the needs of the Commonwealth," the DWR uses stakeholder engagement to ensure that agency activities are informed by public interests. In addition to broad public engagement through public meetings and public comment periods on new regulations, since 1999 the DWR has worked with researchers at Virginia Tech to assemble a Stakeholder Advisory Committee (SAC) for many new management plans developed by the agency. These SACs represent a cross-section of Virginians with diverse interests in the various natural resources covered by these plans. In each case, the SAC has been responsible for establishing the values and broad goals that undergird the management plan, while a team of agency professionals, or Technical Advisory Committee (TAC), has been responsible for developing specific objectives and management strategies based on those goals (Lafon, 2004). Researchers from Virginia Tech have been involved in designing, facilitating, and evaluating the engagement process and in editing and formatting final plans. Beginning with the first Deer Management Plan in 1999, this process has now been implemented for the management of populations of white-tailed deer, elk, wild turkey, black bear, and stocked trout. It has also been used to consider agency approaches to hound hunting, and now, efforts to support wildlife viewing.

This Wildlife Viewing Plan was jointly developed by an 18-member Technical Advisory Committee (TAC), composed of DWR staff, and a 20-member Stakeholder Advisory Committee (SAC), composed of individuals and organizational representatives with experience and interest in wildlife viewing in Virginia (**Appendix A**). The SAC and TAC met in person twice in 2019 to identify issues related to wildlife viewing in Virginia and to develop the values statement and goals for the plan (see **Part V**). Due to the COVID-19 pandemic, the planning process was transitioned to a web-based format between March and July 2020. The SAC and TAC met in a series of six web-meetings to first, affirm the values statement and goals of the Wildlife Viewing Plan, and then, discuss general directions and specific ideas for objectives and strategies under each plan goal. In the course of the planning process, the SAC and TAC conducted an

analysis of the conditions that may shape the success of the plan, referred to as a SWOT analysis, to reflect strategic consideration of internal strengths and weaknesses, and external opportunities and threats. This process was similarly used in the development of DWR's R3 plan, which recommends that a SWOT analysis be conducted for each R3 activity, including wildlife viewing (DWR, n.d.).

Individuals from the TAC and the Virginia Tech team worked with content from these joint meetings to write the objectives and strategies and a complete Wildlife Viewing Plan. The rich and innovative ideas that emerged from the planning meetings for specific, actionable steps DWR could take to increase participation in wildlife viewing and conservation and engagement between wildlife viewers and the agency were organized into a list of potential tactics (**Appendix B**). The plan document was reviewed and revised by the full SAC and TAC in October 2020, and then posted online for public comment from [dates]. Written and electronic public comments (**Appendix C**) were considered in a final plan revision. The plan was then presented to, and endorsed by, the DWR Board of Directors on [date].

For many DWR plans, this participatory planning process has been combined with survey research and/or focus groups to generate broader understanding of public behavior and interests and to inform plan goals, objectives, and strategies. The planning process for this Wildlife Viewing Plan occurred in concert with an agency-supported wildlife recreation study (see **Part IV**), consisting of focus groups (Grooms et al. 2019), a web-based stakeholder analysis (Tsang et al. *in review*), and a survey distributed to a random sample of Virginia residents and to recreationists currently connected to DWR through license sales, agency communications, or citizen science (Grooms et al. 2020). These research activities were approved by and conducted in compliance with the requirements of the Virginia Tech Institutional Review Board (Protocol #17-754). Data collected through this research were shared by the Virginia Tech team during combined SAC and TAC planning meetings to facilitate the development of data-driven goals, objectives, and strategies for the plan. Results from each component of the study are described in detail in the reports cited above; they are also integrated into this planning document, where relevant.

Interim Changes to the Plan

This Plan was developed to reflect enduring values related to wildlife viewing in Virginia, and is based on conversations that specifically anticipated future conditions internal and external to the agency that might shape the success of this Plan. It is thus expected that this plan will provide relevant guidance and priorities for engagement between DWR and wildlife viewers through 2031. However, like other DWR management plans, this plan is intended to be a dynamic and flexible tool which remains responsive to changing social, environmental, technical, and administrative conditions. This plan is also intended to be accompanied by ongoing assessment of progress towards plan goals (see **Part VI**), and it is expected that the data generated from evaluation will be integrated into future plan implementation and updates. Thus, specific objectives and strategies may be added, deleted, or amended by DWR as new circumstances demand. Recognizing the importance of adaptive changes in management approaches, the SAC endorsed this flexibility in updating objectives and strategies before 2031. DWR staff will submit changes to plan goals to the SAC for review before implementing changes, and updates will be provided as addenda to the Plan on the agency website.

Plan Format

The following sections of this Wildlife Viewing Plan summarize the current state of wildlife viewing in Virginia and provide the agency with guidance on supporting wildlife viewing activities in the future. **Part II** presents background information on trends in wildlife viewing across the United States and within Virginia, drawn from national-level surveys of outdoor recreationists. **Part III** provides an overview of the ways in which DWR is connected to wildlife viewers across the state through funding

streams, programs, services, and resources. **Part IV** summarizes the three components of the Wildlife Recreation Study conducted to inform the plan. **Part V** contains values, goals, objectives, and strategies co-produced by agency staff and stakeholders to orient DWR's engagement with wildlife viewers for the next 10 years. The plan concludes with **Part VI**, which provides an approach to implementation and evaluation of the goals, objectives, and strategies of the Wildlife Viewing Plan. **Appendices** to the plan contain a list of SAC and TAC members; suggested tactics for implementation of plan strategies; and a record of public comments submitted in response to the draft Wildlife Viewing Plan.

Part II
Wildlife Viewing in the U.S. and Virginia

WILDLIFE VIEWING IN THE U.S.

Defining wildlife viewing

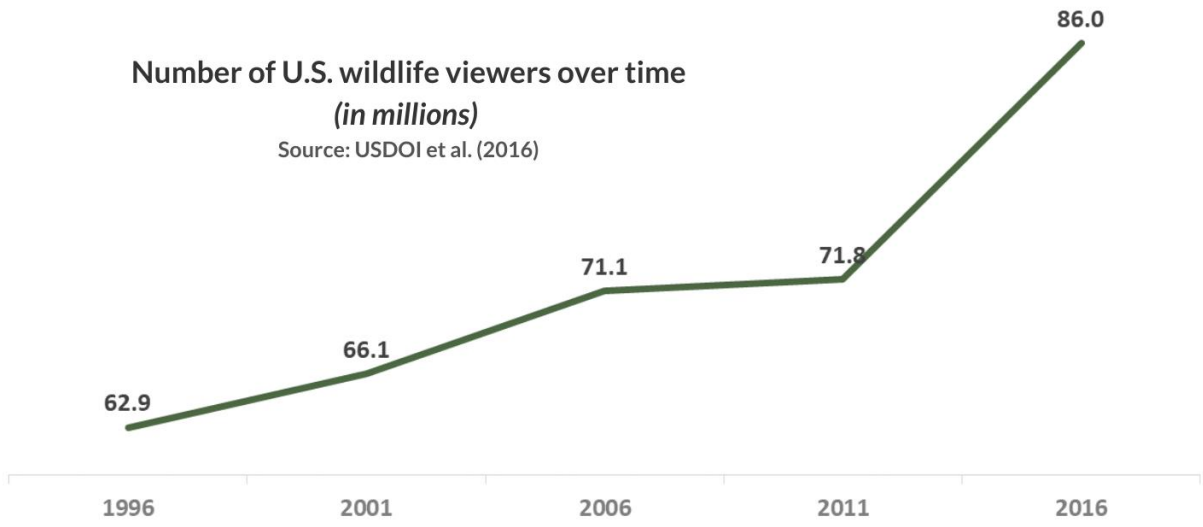
Wildlife viewing, or wildlife watching, is one of the most popular outdoor recreation activities in the United States. This Wildlife Viewing Plan considers anyone who *intentionally observes, photographs, feeds, or collects data about wildlife* to be a "wildlife viewer," with "wildlife" referring to all animals that live in natural or wild environments, including in urban and semi-urban spaces. This definition is an adaptation of the definition of "wildlife watcher" used by the U.S. Fish and Wildlife Service (USFWS) in the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (hereafter, National Survey) to explicitly include data collection as a wildlife viewing activity. The National Survey defines "wildlife watchers" as people who observe, feed, or photograph wildlife, and considers both away-from-home viewing (traveling at least 1 mile from home for the primary purpose of participating in these activities) and at-home viewing (taking a special interest in wildlife within 1 mile of home) (USDOI et al. 2016).

Wildlife Viewing
intentionally observing, photographing, feeding, or collecting data about wildlife (all animals that live in natural or wild environments, including in urban and semi-urban spaces)

National-level trends in wildlife viewing

The 2016 National Survey reported that there are approximately 86 million wildlife watchers aged 16 or older in the U.S. – more than one-third of the adult population (USDOI et al. 2016). Other recent surveys have put the number of U.S. wildlife viewers as low as 21 million, though only away-from-home viewing was considered (Outdoor Foundation 2019), and as high as 190 million, without intentionality taken into account (Bowker et al. 2012). The total number of wildlife viewers in the U.S. has been increasing since

the mid-1990s (Cordell et al. 2008; USDOI et al. 2016). The USFWS reported 14.3 million additional viewers between 2011 and 2016, increasing the national participation rate from 30 to 34%. This increase comes primarily from a rise in around-the-home wildlife viewing (USDOI et al., 2016), while away-from-home wildlife viewing rates have remained stable (Outdoor Foundation, 2019; USDOI et al., 2016).



In contrast to viewing, hunting rates declined (Cordell et al., 2008; USDOI et al., 2016), or at least remained stable (Outdoor Foundation, 2019), during this time period. Today, there are 11.5 million hunters in the U.S., compared to 14.1 million in 1996 (USDOI et al., 2016); the total number of hunting days per year has similarly declined (Mockrin, Aiken, & Flather, 2012). Rates of participation in angling in the U.S. consistently fall between those of viewing and hunting, and appear to be mostly stable over time (Cordell et al., 2008; Outdoor Foundation, 2019; USDOI et al., 2016). Considering demographic, economic, climatic, and land use changes, the US Forest Service projects a decline in participation rates for hunting and angling over the next four decades (Bowker et al. 2012). Wildlife viewing, conversely, is predicted to maintain its high participation rate even as the US population expands (Bowker et al. 2012).

Demographic patterns in wildlife viewing

The demographic composition of the U.S. outdoor recreation community differs from that of the U.S. public, with patterns varying by type of activity (Cordell, 2012; Outdoor Foundation, 2019; USDOI et al., 2016). Among wildlife viewers in particular, Black, Indigenous, and people of color (BIPOC; also referred to as ethno-racial minority groups), urban residents, young people, and low-income people are all underrepresented at the national level (Lee & Scott, 2011; USDOI et al., 2016). The most widely-cited explanations for the underrepresentation of BIPOC in outdoor recreation include socioeconomic disadvantage (e.g. Solop et al., 2003), cultural differences (e.g. Krymkowski et al., 2014), language barriers (e.g. Fernandez, Shinew, & Stodolska, 2015), and experiences with discrimination (e.g. Krymkowski et al., 2014). In the context of birding, Robinson (2005) also posits that underrepresentation of BIPOC may be self-perpetuating within social networks; individuals are unlikely to begin birding if they are not introduced to the activity by someone they know, and they are then unlikely to introduce others to it. Meanwhile, factors including user fees for visiting outdoor areas may limit recreation participation for low-income individuals (More & Stevens, 2000). Importantly, constraints to participation in wildlife watching are compounded among people who belong to multiple underrepresented groups, for example, Black people in urban areas or Hispanic young adults without a college education (Lee & Scott, 2011).

In contrast to other forms of wildlife-associated recreation, particularly hunting and fishing, the gender distribution among wildlife viewers has historically been evenly divided between men and women (USDOI et al., 2006; Moore et al., 2008). However, the National Survey reported that in 2016, 42% of around-the-home viewers and only 33% of away-from-home viewers were female (USDOI et al., 2016). These newer trends are consistent with studies of birders that found that women are often more casual in their birding activities (McFarlane & Boxall, 1996) and more constrained by factors, such as safety concerns, that apply to away-from-home viewing (Johnson et al., 2001). While gender patterns in wildlife viewing are complex, social research has made it clear that women engage with wildlife and in wildlife viewing differently than men and with different motives. Compared to men, women value wildlife more for aesthetic, ethical, and emotional reasons (Miller & McGee, 2000). They also tend to focus less on developing skills and competing (Cooper & Smith, 2010) and more on the conservation-oriented aspects of viewing (Scott et al., 2005).

Activities and expenditures of U.S. wildlife viewers

A growing body of literature shows that wildlife viewers contribute to conservation, financially and through other conservation behaviors (Cooper et al., 2015; Hvenegaard, 2002; McFarlane & Boxall, 1996). Even without purchasing licenses and permits, they have a significant economic impact. Nationally, viewers spend nearly $76 billion annually on travel and equipment associated with their activities, including $170 million in access fees for public lands (USDOI et al., 2016). Beyond its conservation potential, wildlife viewing is also a means of connecting more Americans to nature, which has been recognized as increasingly important in light of the physical, mental, and social benefits that people incur by spending time outdoors (Kellert et al., 2017). Wildlife viewers are therefore important stakeholders in the missions of wildlife agencies, especially as participation in hunting and its associated revenues decline.

WILDLIFE VIEWING IN VIRGINIA

Virginia's wildlife and wildlife viewing opportunities

Virginia is an exceptional destination for wildlife viewing. With its central latitude, relatively mild climate, elevations spanning from the Atlantic Coastal Plain to the Appalachian Mountains, and geographic position along the Atlantic Flyway, the Commonwealth contains a wealth of natural diversity. Virginia offers wildlife viewers the opportunity to observe 400 species of birds, 150 species of mammals, 150 species of amphibians and reptiles, 226 species of freshwater fish, plus over 2,000 butterfly, dragonfly, and other invertebrate species. Virginia's most popular wildlife for viewing include everything from large mammals such as elk, black bear, and whales; to striking birds such as majestic bald eagles and colorful warblers and tanagers; to small charismatic fauna, such as box turtles, green tree frogs, and monarch butterflies. Previous surveys have revealed that Virginians value viewing opportunities for game species as well as non-game species, with particular interest in seeing deer (McMullin et al., 2000) and black bears (Responsive Management, 2010).

With its location on the Atlantic Flyway, one of the wildlife viewing highlights in Virginia is the opportunity to observe spring and fall bird migrations. Each spring, warblers and other neotropical songbirds travel north through Virginia, returning to North America for their breeding season after spending their winter in Central and South America. This annual journey presents a marvelous opportunity to experience the colors and sounds of spring migration. Many of these songbirds migrate at night, and, as they pass through the Commonwealth, they seek patches of forest as stopovers to rest and replenish their energy. Places like Virginia's National Wildlife Refuges, State Parks, Wildlife

Management Areas, and local nature trails can be ideal places to spot these migrants. Fall presents an additional opportunity to see these songbirds as they pass through the Commonwealth on their return journey south for the winter. Virginia's Eastern Shore, located at the tip of the Delmarva Peninsula, is a particularly spectacular location for viewing fall bird migration; it is one of the most important bird migration areas in North America. The unique narrowing shape of the Peninsula funnels migrating birds and butterflies down towards the Eastern Shore's southern tip each fall, producing the opportunity to observe an abundance of raptors, songbirds, and monarch butterflies. Fall also provides an opportunity to observe raptor migration. Raptors migrate during the daytime, providing great viewing opportunities as they soar high in the air. The best places to see migrating raptors in the fall is at Virginia's designated fall Hawkwatch sites, the majority of which are located in the mountains. In addition, a fall Hawkwatch, operated by Coastal Virginia Wildlife Observatory in Kiptopeke State Park on the Eastern Shore, provides one of the best vantage points in the U.S. to view the raptor migration.

State-level trends in wildlife viewing

Consistent with national trends, patterns of participation in outdoor recreation in Virginia are shifting. According to the Virginia report for the most recent version of the National Survey (Rockville Institute, 2020), there are 2.1 million wildlife viewers in Virginia, which comprises about 35% of the state's population. For comparison, in 2016, it was estimated that there were 957,000 anglers and 259,000 hunters in Virginia, a combined 16% of the population (Rockville Institute, 2020). Since 1991, the estimated number of wildlife viewers in the state has increased slightly, while the estimated number of both anglers and hunters declined (USDOI, 1991; Rockville Institute, 2020). These trends are reflected in a general decline in both hunting and fishing license sales in Virginia over the past decade (DWR, 2020). High participation in wildlife viewing in Virginia has also been observed in other state recreation surveys. For instance, according to the America's Wildlife Values Virginia State Report (Dietsch et al., 2018), 77% of their 578 respondents indicated they were interested in viewing wildlife in the future. Of those interested in future viewing, 22% were actively participating in wildlife viewing, and 51% had never participated in wildlife viewing before. While not specifically focused on wildlife viewing, in the most recent version of the Virginia Outdoors Demand Survey (DCR, 2017), 71% of households had participated in "visiting natural areas," which was about a 20% increase from the previous report (2011). Additionally, boating license sales have continued to increase in Virginia. While this is not necessarily a reflection of an increase in wildlife viewing, boating provides opportunities for purposeful and casual wildlife viewing.

Demographic patterns of under-representation among wildlife viewers at the national scale are largely reflected on the state level as well. Compared to the larger Virginia population (USCB, 2018), Virginia wildlife viewers were on average more White (83% vs. 71%), less Hispanic (6% vs. 10%), more male (54% vs. 49%), older (71% vs. 53% older than 44), wealthier (44% vs. 36% with an annual income over $100,000), and more educated (41% vs. 36% with a college degree) (Rockville Institute, 2020).

In 2016,

35% of Virginia's adult population viewed wildlife around or away from home

Amounting to a collective...

251 million days spent viewing

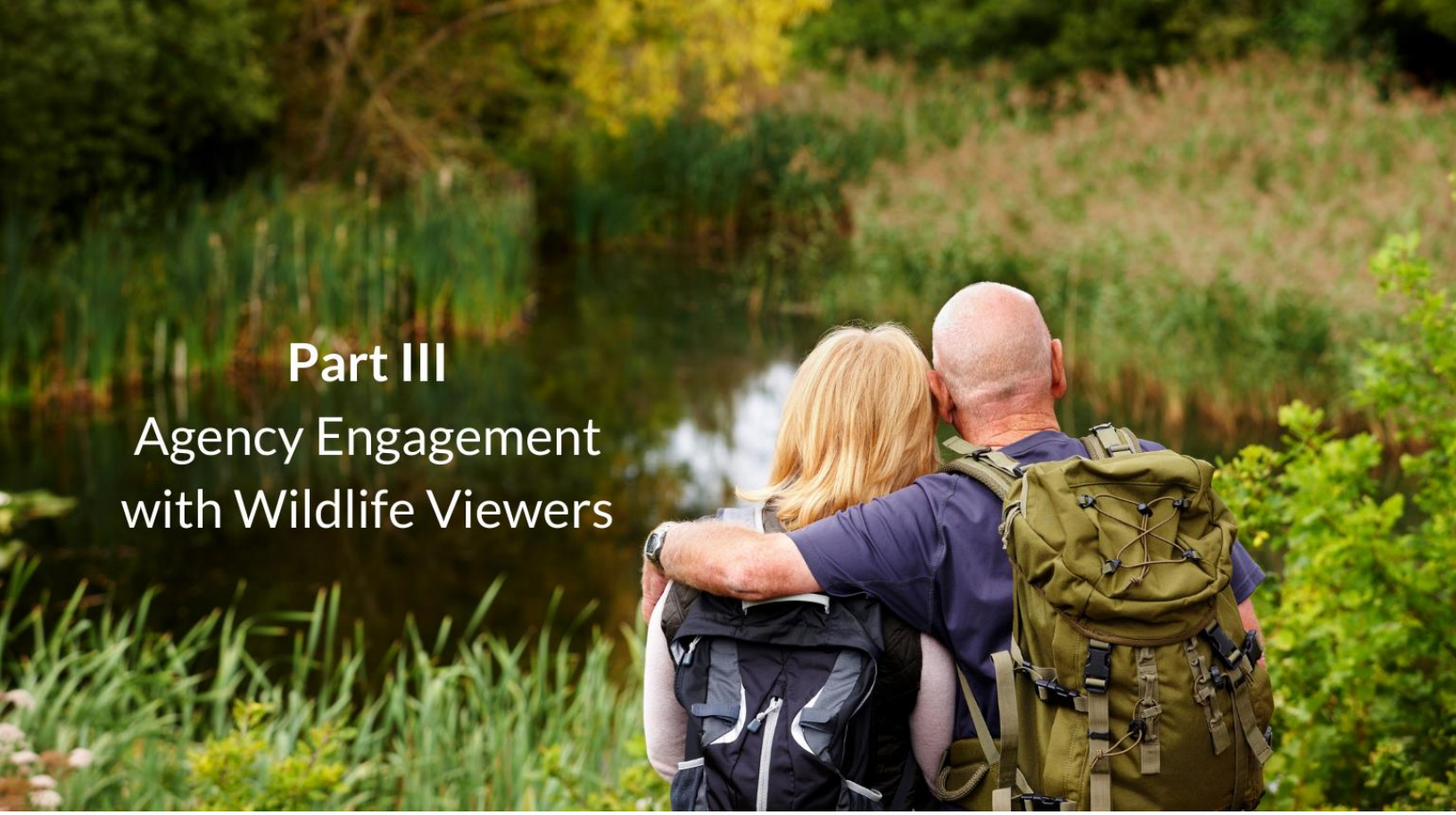
24 million viewing trips

$3.2 billion in viewing-related expenses

Source: Rockville Institute (2020)

Activities and expenditures of Virginia's wildlife viewers

Nearly all of Virginia's wildlife viewers view wildlife around their homes, while 46% of viewers in the state traveled a mile or further away from home for their viewing activities in 2016 (*Note*: some viewers participate in both away-from-home and around-the-home viewing, so totals do not sum to 100%). These viewers had a combined total of 251 million days participating in wildlife viewing in 2016, and took 24 million trips for their wildlife viewing activities (Rockville Institute, 2020). In 2016, Virginia wildlife viewers spent over $3.2 billion for their wildlife viewing activities, both in and out of the state, resulting in an average expenditure of $1,559 per viewer. About a third of these dollars were spent on equipment and other supplies, including equipment for viewing, camping, and backpacking; costs associated with leasing or owning land; membership dues and contributions; and informational materials. The remaining 66% of expenditures went to trip-related expenses, such as food and lodging, transportation, and access fees for public and private lands (Rockville Institute, 2020). This 2016 estimate of expenditures is a dramatic increase compared to the 2011 iteration of the National Survey Virginia report, which estimated that Virginia viewers had a total expenditure of $1.0 billion for their viewing activities, with an average expenditure of only $474 per viewer (USDOI et al., 2011).



Part III
Agency Engagement with Wildlife Viewers

WILDLIFE VIEWING AND STATE FISH AND WILDLIFE AGENCIES

Wildlife viewers, as a substantial and growing proportion of the U.S. public, have significant potential to engage with and contribute to the work of fish and wildlife agencies. However, consumptive recreationists (i.e., hunters and anglers) have long been the primary stakeholders for wildlife agencies. Their social, political, and financial contributions provide critical support to agency conservation efforts, a paradigm that is central to the participation-supported North American Model of Wildlife Conservation (Mahoney & Jackson III, 2013). Indeed, hunters spend over $825 million annually, and anglers over $586 million, on licenses and permits alone (USDOI et al., 2016). However, the North American Model also holds that wildlife is not privately owned, but rather is held in trust by the government (Organ et al., 2012). Under this Public Trust Doctrine, wildlife agencies exist to serve all beneficiaries of wildlife resources; this responsibility is often considered at odds with the North American Model's traditional prioritization of consumptive recreationists (Jacobson et al., 2010; Serfass et al., 2018) and the underrepresentation of certain demographic groups within wildlife agencies' constituencies.

There are now renewed calls for wildlife agencies to consider more diverse beneficiaries, including wildlife viewers, in agency planning and decision-making (Decker et al., 2016; Dunfee et al., 2019). However, there are considerable challenges to more meaningful engagement between agencies and groups such as wildlife viewers, that may think about, value, and interact with wildlife quite differently than do agency staff and traditional hunting and angling constituents. To help wildlife agencies meet the needs of new and diverse constituencies, the Association of Fish and Wildlife Agencies (AFWA) and Wildlife Management Institute (WMI) released the *Fish and Wildlife Relevancy Roadmap: Enhanced Conservation through Broader Engagement* (hereafter, Relevancy Roadmap) in 2019 (Dunfee et al., 2019). This guidance document describes 19 barriers emerging from agency capacity and culture, constituent capacity and culture, and political and legal constraints on agency actions that currently limit

the relevance of and support for wildlife conservation among the public. For example, these barriers include the perception that fish and wildlife agencies are focused solely on hunters and anglers and that agencies have limited capacity to understand and plan for engagement with other constituencies. The Relevancy Roadmap also presents strategies, tactics, and specific steps for overcoming each barrier, consistently highlighting the need for adaptation, collaboration, and the application of social science to collect information about the needs and interests of diverse agency beneficiaries.

This Wildlife Viewing Plan embodies implementation of the underlying philosophy of the Relevancy Roadmap and many of its strategies. The following section of this plan details existing relationships and mutual relevance between DWR and Virginia's wildlife viewers, including the ways in which DWR's conservation and management activities directly support wildlife viewing and the ways in which wildlife viewers help the agency advance wildlife and habitat conservation. **Part IV** then presents an overview of the research DWR has contracted in an effort to better understand wildlife viewers in Virginia, followed by the agency's operational plan for enhancing engagement with this constituency in **Part V**.

A BRIEF HISTORY OF THE DWR AND WILDLIFE VIEWING

DWR has been working to support nongame species and opportunities for wildlife viewing for more than forty years. The agency's work with nongame species – those that are neither hunted, trapped, nor fished – began slowly, with origins in scientific projects focused on single wildlife species. The Department began funding bald eagle nest surveys in the 1970s and was instrumental in the federal listing of the bald eagle as endangered in 1978. The agency has worked ever since to help restore the state's population of this species to where it is today. In the mid-1980s, the Department reinforced its commitment to the conservation of all wildlife in Virginia by establishing the Nongame Wildlife Program and dedicating staff and resources to nongame species. From 1985-1989, the agency partnered with the Virginia Society of Ornithology to conduct the first Virginia Breeding Bird Atlas. These efforts opened the door to DWR's engagement with additional recreationists, beyond the agency's long-standing hunting and fishing constituencies. In 1996, Virginia became the first eastern state to begin a NatureMapping Program (called Wildlife Mapping in Virginia) to engage citizen scientists in collecting wildlife observations.

Watchable Wildlife Program

In 1998, House Bill 38 was passed in the State legislature. This bill dedicated a portion of the state sales tax on outdoor equipment to DWR, beginning in 2000. More than a hundred groups supported this legislation, including many outside the traditional hunting or fishing constituents. House Bill 38 provided financial support for species and programs that were not supported by other funding mechanisms, and the agency used this transfer money to develop the first Watchable Wildlife Program in 2001. The goal of DWR's Watchable Wildlife Program is to increase support for wildlife conservation by providing and promoting opportunities for wildlife viewing and nature appreciation. The Watchable Wildlife Program has historically served three key functions: 1) promoting nature tourism, 2) providing interpretation of wildlife and habitats, and 3) facilitating opportunities for citizen science. Initially, DWR employed two Watchable Wildlife Biologists, located in different regions of Virginia, and a Watchable Wildlife Manager. However, between 2014 and 2019, the program was coordinated by a single biologist, located in DWR's Chesapeake District Office. This biologist coordinated the statewide Virginia Bird and Wildlife Trail (VBWT), wildlife viewing-related digital media, and led and implemented programming in DWR's Region 1. A second Watchable Wildlife Biologist position was hired in the program in the spring of 2020. The two biologists now work together to lead and implement wildlife viewing programs throughout the

Commonwealth. Watchable Wildlife Biologists have diverse expertise and backgrounds, with a combination of skills in wildlife biology, wildlife conservation, communication, and education. This interdisciplinary background is essential for leading the diverse facets of the program, which are described in more detail in the sections below.

Wildlife Viewing in the DWR's R3 Plan

In 2017, the Department joined in a nationwide effort to recruit, retain, and reactivate (R3) people into outdoor recreation. The effort was a result of the continued decline in hunter and angler participation numbers and the need to provide continued and stable funding for state fish and wildlife agencies. Virginia DWR recognized that 1) hunter, angler, and boater numbers would likely not rebound to historic levels and 2) many others in addition to these traditional constituents appreciate wildlife, participate in wildlife recreation, and share the Department's mission to conserve wildlife in Virginia. Virginia DWR was the first state to include wildlife viewing at the same level of hunting and angling in an R3 plan, along with recreational shooting sports and boating which the agency also manages. Inclusion of wildlife viewing as an R3 activity facilitates strategic planning about how to recruit, retain, and reactivate participants in wildlife viewing under the framework of the Outdoor Recreation Adoption Model. This conceptual model is used widely by fish and wildlife agencies to strategically consider the phases that individuals progress through as they adopt new recreation activities and then become fully involved. Prior to the R3 plan, the wildlife viewing program had consisted of a set of activities or products that the DWR produced for the wildlife viewing *customer*. With the inclusion of wildlife viewing in the R3 plan, the DWR recognized and made public the importance of the wildlife viewing audience as a *stakeholder* and equal partner that should participate in and contribute to the DWR's decision-making processes. The Virginia DWR contracted with VT to develop this recreational plan to provide guidance for including recreationists who view wildlife as stakeholders and partners in the mission to conserve, connect and protect wildlife, people, and property.

HOW THE DWR MISSION SUPPORTS WILDLIFE VIEWING

The DWR supports wildlife viewing through all facets of the agency's mission to conserve, connect, and protect. The agency broadly supports wildlife viewing through habitat management on DWR lands; support for habitat conservation on private lands; and research and management of nongame wildlife species. The Department has continued to connect people to Virginia's outdoors and wildlife through the creation of the Virginia Bird and Wildlife Trail, live streaming wildlife cameras, educational materials, support of wildlife viewing festivals, providing and funding wildlife viewing amenities, and outreach via social media and print. Finally, the DWR works to protect people and property by managing human-wildlife conflict and promoting safe outdoor experiences. The DWR supports participation in wildlife viewing through the conservation and management of habitat that supports diverse wildlife communities; research and conservation of nongame wildlife species; infrastructure and events for nature tourism; interpretation of wildlife and habitats; wildlife and conservation education.

Conserve and manage wildlife populations and habitat for the benefit of present and future generations

HABITAT CONSERVATION AND MANAGEMENT

The lands owned and managed by the DWR are a critical resource for engaging people with wildlife. The DWR manages Wildlife Management Areas (WMAs), as well as fish hatcheries, boat ramps, and lakes. The land associated with each of these properties could be, and in some cases already is, used to support wildlife viewing activities.

Wildlife Management Areas

As indicated in Virginia's 2015 Wildlife Action Plan (DWR, 2015), the loss or degradation of habitats constitutes the most serious threat to the sustainable management and conservation of Virginia's wildlife. In order to conserve and manage high-quality habitats that support healthy and diverse populations of Virginia's wildlife species, the DWR maintains a statewide system of wildlife management areas (WMAs) and an associated habitat management program. The DWR acquired its first WMA in the 1930s to conserve habitat through the purchase of large tracts of land for habitat management and waterfowl refuges. As of 2020, the agency manages 46 WMAs, comprising over 200,000 acres across Virginia.

Most of Virginia's WMAs were purchased, in part, with funds from the USFWS' Wildlife and Sportfish Restoration Program (WSFR), and practices used to achieve management goals are supported primarily through funds generated from hunting, fishing, and trapping license sales and Federal grant programs, especially those administered by the USFWS. As a condition of receiving grants for land acquisition, the

WSFR program requires DWR to define the purpose (e.g., habitat conservation, endangered species restoration, hunting access, fishing access) for which the property is to be purchased. That defined purpose establishes the stated management intent in perpetuity or until the original purpose is successfully achieved. DWR's primary management objective on WMAs is to conserve and manage high-quality wildlife habitats that support healthy and diverse populations of Virginia's native wildlife. All uses, including hunting, fishing, wildlife viewing, and other human activities, are secondary and must be compatible with this primary goal.

Where feasible and compatible with the DWR's conservation goals, the WMA program facilitates public access to habitats on WMAs and the wildlife resources they support. Some WMAs are supported by volunteer friends groups who help maintain WMAs as multi-use recreation areas. Though WMAs are open to the public, visitors are currently required to possess a hunting, fishing, or trapping license; a Restore the Wild membership (see "Financial Support" below); or a standalone WMA access permit. Restore the Wild Membership and the WMA access permit provide ways for Virginians who do not otherwise pay into the system to fully participate in funding the management and conservation of these public lands. The membership and permit fees are set at the same amount as a standard hunting or fishing license.

Many citizens of the Commonwealth view WMAs as places to experience wildlife habitats at their very best (DWR, 2011). Surveys of users in 2010 showed that the top uses of WMAs included hunting (54% of visitors), fishing (22%), sighting-in firearms (13%), hiking or walking (11%), and viewing wildlife (6%) (DWR, 2011). Other, less-frequent uses include wildflower viewing and nature-related photography. The uses vary based on the specific resources available on each property, the availability of other public lands in the area, seasonality, and the proximity of the WMAs to larger population bases.

WMAs have the potential to provide viewers with an extensive and well-distributed public land base across the Commonwealth that can complement the network of other public lands such as National Wildlife Refuges, National Forests, National Parks, and state and local parks. Of the DWR's 46 WMAs, 32 are currently designated as sites on the Virginia Bird and Wildlife Trail (see below), with an additional WMA being added to this network in 2020. The DWR's WMAs are also designated as eBird hotspots. These public birding locations allow birders to associate their observations with the hotspot, generating aggregated results on bird diversity in that location. On many WMA hotspots, over one hundred bird species have been identified by citizen scientists. Hog Island WMA, a 3,908-acre peninsula on the James River with a diversity of habitats, attracts a vast number of birds across all seasons; eBirders have identified 273 species on this WMA and submitted almost 2,000 eBird checklists.

While WMAs offer prime viewing habitat, amenities and infrastructure on these properties are very limited, by design. Some WMAs have a network of roads, but the majority are unpaved and many are behind permanently or seasonally closed gates, such that they may best be navigated by foot. There are no restrooms or visitor centers, and signage is minimal, although WMAs do have kiosks and some interpretive signage. However, in contrast to many public lands on which visitors are encouraged to stick to the trails, venturing off-road by foot is allowed on WMAs.

A handful of agency projects have enhanced amenities available on WMAs to support wildlife viewing opportunities. In 2019, Watchable Wildlife staff worked in coordination with other DWR staff to develop multimedia interpretation and communications on Red-cockaded Woodpecker (RCWs) in recognition of the arrival of a nesting pair at Big Woods WMA. These interpretive communication efforts included the development of an RCW viewing area at the WMA, with interpretive and directional signage; an RCW webpage on the DWR website with natural history and conservation information about the birds; a series of blog articles announcing the arrival of the pair and following their nesting season; a press release; and an article for *Virginia Wildlife* magazine. The agency has undertaken significant habitat restoration work for Golden-winged Warblers and Cerulean Warblers at Highland WMA. At G. Richard Thompson WMA, interpretive signage on high altitude forest birds has been installed, and the WMA supports wildflower viewing in the spring, featuring large-flowered trillium. Two observation platforms were installed at Hog Island WMA to provide viewers with additional photography and wildlife viewing opportunities, and a boardwalk, viewing platform and trail, financed through the Non-game Wildlife and Endangered Species Program, allows easy walking access for viewing the marsh at Ragged Island WMA.

Boating Access Sites and Facilities

The DWR's Boating Access Program is administered by the Lands and Access Program, and includes maintenance and management of approximately 230 boating access sites across Virginia. These sites provide access to opportunities to view wildlife from power boats as well as paddlecraft. Target species include wading birds such as herons and egrets, bald eagles and osprey, and a variety of shorebirds and seabirds, as well as amphibians and reptiles, especially turtles, snakes, and frogs. Mammals, including deer, beaver, and raccoon may also be viewed from the water. It should be noted that activities not directly related to the launching or landing of boats and fishing are prohibited at DWR boat ramps, due to the funding mechanisms utilized for the construction, upkeep, and maintenance of these facilities.

Fish Hatcheries and Public Fishing Lakes

The DWR manages over 176,000 acres of public lakes and 27,300 miles of fishable streams, as well as nine fish hatcheries (5 coldwater and 4 warmwater). The agency's public fishing lakes provide great opportunities for viewing waterfowl, aquatic mammals, aquatic flowers and other plants, and a myriad of other aquatic species. These properties have a variety of opportunities to either view from the shore

or launch a canoe or kayak and view from the water. In addition, pollinator habitat and interpretive signage has been installed at Lake Shenandoah and Vic Thomas State Fish Hatchery to promote both the recruitment of pollinators and connections between visitors and these wildlife. Fish food vending machines are also available at most DWR fish hatcheries, and there is a nature trail with interpretive signage has been established at the Montebello Fish Hatchery. The DWR's fish hatcheries are distributed across Virginia: the King and Queen Hatchery is located in eastern Virginia, the Front Royal Hatchery is in Northern Virginia, the Vic Thomas Hatchery is Southside and the Marion, Wytheville and Buller Hatcheries in Southwest Virginia. Fish hatcheries are open to the public, but require an Agency Access Permit, Restore the Wild Membership, or any basic license from the Department.

Virginia DWR's Private Lands Habitat Assistance Program

Over 80% of land in Virginia is privately-owned, and the DWR's work with Virginia's private landowners is important in accomplishing its mission. The DWR has a long history of working with private landowners to accomplish their habitat development and conservation goals. Over time, private lands assistance efforts have expanded from relying primarily on District Wildlife Biologists to provide habitat technical assistance, to launching a team of five designated Private Lands Biologists within the Private Lands Habitat Assistance Program to provide that service. These biologists make habitat recommendations and assist landowners with cost-share habitat incentive program enrollment and long-term wildlife planning. While the initial impetus for expanding capacity for private lands work was quail conservation, that mission evolved over time. Of the over 5,000 private landowner site visits Private Lands Biologists have made over the last decade, at least half are for non-game wildlife or pollinators. The landowners assisted through this program have diverse and overlapping wildlife management goals for their property. Quail management remains a focus for many, for the pleasure of seeing, listening to, or hunting bobwhite. Others using the program simply want more wildlife to watch, photograph and enjoy. It is notable that many people who hunt wildlife and enjoy wild game table fare also love to watch wildlife on their land. The two activities are not mutually exclusive. DWR Private Lands Biologists have many satisfied customers; To quote one, "Not only do I hear and see bobwhite quail in places they haven't been since my youth, but I also enjoy a tremendous number of other species, game and nongame, including woodcock, multiple flycatchers especially Eastern Kingbird, plenty of whip-poor-will, and wild turkey. The deer, rabbits, squirrels and other mammals are likewise prospering." (attrib. Dr. Waring Trible, Essex County, Virginia).

WILDLIFE RESEARCH AND CONSERVATION

Over the past 50 years, but in many cases going back much further, DWR has conducted (directly or via contract with academic institutions or other organizations) research on the Commonwealth's vast array of wildlife species. This work directly supports agency conservation efforts, has informed the listing of

threatened and endangered species, and provides information on the status of wildlife populations for wildlife-related recreation.

Beginning in the mid-1920s, DWR's efforts were focused on white-tailed deer restoration and trout stocking. Later efforts were undertaken to study and restore elk, Northern Bobwhite (quail), beaver, and wild turkey. During the 1960s and 1970s, research expanded again with a significant effort to study Black Bears and promote waterfowl conservation. For the past 50 years or more, DWR has taken a much more comprehensive view of wildlife. Research on non-hunted, declining species, such as Bald Eagle and Peregrine Falcon, was undertaken to assist in the recovery of these species, even prior to these activities being consolidated into comprehensive Nongame Wildlife program in 1995. In 2001, DWR began receiving State Wildlife Grants to identify Species of Greatest Conservation Need (SGCN) and conduct research on these species. SGCN are designated as most in need of conservation action in a state based on their declining population status or the need for more information to better determine their status. As a condition of receiving this annual appropriation, each state was required to develop a State Wildlife Action Plan (SWAP) with a list of SGCN. By concentrating research and management on these species, an agency could prevent further declines in these species and avert the need to list them later. Over the last two decades, with the assistance of this additional money, DWR has invested heavily to understand the distribution, abundance, and habits of the diverse wildlife species that occur in Virginia's rapidly changing terrestrial, aquatic, subterranean, and marine habitats. These research efforts have informed conservation actions ranging from conservation planning to species propagation/reintroduction and land acquisition. Below is an overview of research projects conducted on nongame wildlife by the DWR prior to and since the advent of the Virginia SWAP. DWR staff communicate about these conservation activities to the public via presentations to clubs, schools, and academics, as well as articles in magazines, radio interviews, and other media.

Freshwater Mussels

The DWR's freshwater mussel restoration program was begun in earnest in the 1990s and is now one of the premier threatened and endangered mussel conservation programs in the country. Fourteen Atlantic Slope mussel species and 36 Tennessee drainage mussel species have been propagated at DWR facilities, of which 41 have been released into rivers

and streams across eastern and southwestern Virginia to augment and restore existing mussel populations.

Reptiles and Amphibians

A variety of reptiles and amphibians have been studied, including Spotted, Bog, Wood and Snapping turtles, sea turtles, Eastern Hellbenders, Shenandoah Salamander, and Eastern Tiger Salamander. Recent efforts have placed special emphasis on citizen monitoring of the Green Salamander, a priority species under the state's SWAP and a candidate species for potential Endangered Species Act listing. Since 2014, known localities of this species across the state have increased from 10 to more than 150, largely due to citizen reports. These efforts have highlighted that the species is much more widespread and abundant in Virginia than previously thought and has also led to novel natural history findings as a result of citizen observations. These observations resulted in the formal protection of a city park in Norton, VA as a "Green Salamander Sanctuary" – the first of its kind nationally. DWR further engaged with volunteers on amphibian research by acting as the Virginia coordinator of the North American Amphibian Monitoring Program through 2015. Additionally, DWR provides funding and field support to the Virginia Sea Turtle Stranding and Salvage Network, which coordinates sea turtle nest monitoring efforts in the Commonwealth and is administered by the Virginia Aquarium & Marine Science Center Foundation.

Fish

In the 1990s, the DWR initiated its conservation programs for a variety of native, non-sport fish species, including Roanoke Logperch, Candy Darter, Clinch Dace, Pygmy, Orangefin and Yellowfin Madtoms, and Black-banded Sunfish. Even crayfish and aquatic and terrestrial snails have been the focus of research and conservation projects conducted by the DWR. These efforts generally involve local university research teams coordinating with the DWR's Aquatic Nongame Biologists. While many of these imperiled species are located in the Tennessee drainages of Southwest Virginia, several are in the Atlantic Slope rivers and watersheds. Restoration efforts also now allow for boat trips to watch Atlantic Sturgeon spawning behavior from April to June in the lower James River.

Birds

Over the past five decades, the DWR has both undertaken and partnered on a variety of research, monitoring, and management projects on a diversity of imperiled birds, such

as shorebirds (plovers and oystercatchers), colonial waterbirds (terns, skimmers, gulls, waders, etc), secretive marsh birds, raptors (Peregrine Falcon, Bald Eagle, Golden Eagle) and landbirds (Golden-winged Warbler, Cerulean Warbler, Loggerhead Shrike, Red-cockaded Woodpecker, etc). Conservation efforts arising from this research have resulted in significant progress toward the recovery of many of these birds in Virginia, including Piping and Wilson's Plovers, American Oystercatcher, Bald Eagle, Peregrine Falcon and Red-cockaded Woodpecker. In addition to these research and conservation efforts, the DWR has funded and guided two Virginia Breeding Bird Atlas projects, the first in the 1980s, and the second beginning in 2016. These efforts have advanced knowledge of the population status and distributional changes of Virginia's breeding birds, while engaging the largest number of volunteers of any DWR citizen science effort to date (see "Virginia Breeding Bird Atlases" section below). DWR also engages annually with citizen scientists by coordinating the North American Breeding Bird Survey for Virginia. Additional DWR research efforts that engaged volunteers in discrete projects include secretive marsh bird surveys in 2007 and canoe-based riparian breeding bird surveys in 2008 (in partnership with the Virginia Society of Ornithology).

Mammals

In addition to the mammals mentioned previously, the DWR has advanced conservation actions impacting a wide range of other mammals. The DWR has been a leader in studying bats and funding bat research, including on the impact of the devastating White-nosed Syndrome on bat populations, and listing several bat species under the Endangered Species Act due to precipitous population declines. DWR specialists have conducted research and worked with partners on species such as Spotted Skunk, Coyote, River Otter, and weasels, as well as lesser-known mammals like Rock Vole, Allegheny Woodrat, Northern Flying Squirrel, and Fisher. DWR has supported research on marine mammals (e.g., whales, seals and dolphins) and, over the last several years, has provided field assistance to the Chesapeake Bay Bridge and Tunnel Winter Seal Haul-out Surveys carried out by the Naval Facilities Engineering Command, Atlantic.

Connect people to Virginia's outdoors through boating, education, fishing, hunting, trapping, wildlife viewing, and other wildlife-related activities

NATURE TOURISM

Promoting nature tourism connects people to wildlife viewing; it illustrates the recreational value of birds and wildlife, while also supporting their conservation. Participation in nature tourism activities increases public awareness and appreciation of wildlife and their habitats Furthermore, as people travel to seek Virginia's birds, wildlife, and natural habitats, they generate tourism dollars for the state and demonstrate the importance of Virginia's wildlife and habitats to Virginia's economy. When DWR and partners can articulate these recreational and economic benefits, it can garner support for wildlife conservation efforts with some audiences. Due to these conservation benefits, much of the Watchable

Wildlife program's work has historically focused on nature tourism through its establishment of the Virginia Bird and Wildlife Trail and by supporting birding and wildlife festivals.

The wealth of natural diversity in Virginia provides abundant recreational options for nature/outdoor travelers to Virginia. A 2019 survey by TravelTrakAmerica found that travelers to Virginia who participated in sports, recreation, and nature/outdoor travel, indicated that they participated in the following activities/sites during their visit to Virginia: National park/ monuments/ recreation areas (28%), beach (25%), State park/ monuments/ recreation areas (24%), rural sightseeing (22%), gardens (13%), wildlife viewing (12%), hiking/backpacking/canyoneering (10%), camping (7%), fishing (7%), and bird watching (6%).

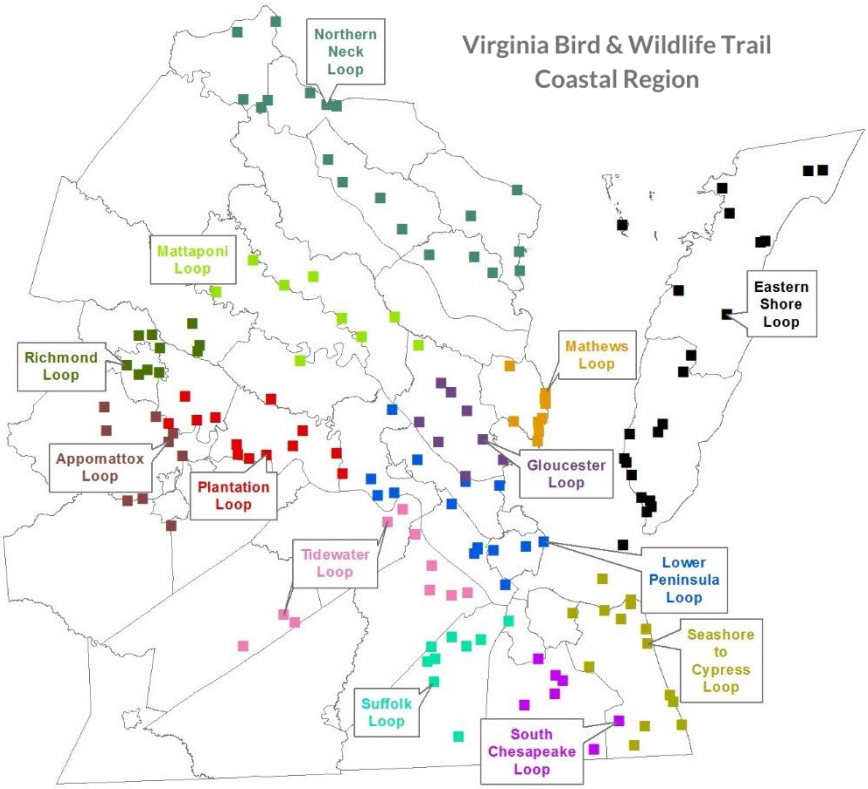
The Virginia Bird and Wildlife Trail

The Virginia Bird and Wildlife Trail (originally named the Virginia Birding and Wildlife Trail) formed the foundation of the Watchable Wildlife Program and is the program's hallmark. The VBWT is a statewide guide to the best sites for viewing birds and other wildlife in the Commonwealth. It compiles over 600 designated viewing sites into a single resource to help people explore Virginia's outdoors and find its native wildlife; it includes everything from nationally-renowned birding hotspots to favorite local haunts, from city parks to national parks, and from public lands to private bed and breakfasts. Its goal has been to increase awareness, appreciation, and conservation of Virginia's wildlife and native habitats. It strives to accomplish that goal by promoting wildlife viewing as a recreational activity in Virginia and by demonstrating the economic value of wildlife by generating ecotourism dollars. The online guide to the VBWT, housed on the DWR website, was utilized by nearly 200,000 people in 2020. The vast majority of these users are located in Virginia and the mid-Atlantic region, but it is also used by people throughout the U.S.

The idea for the VBWT originated with the Great Texas Coastal Birding Trail. A small group of DWR staff traveled to Texas in 2000 to learn more about that state's trail, discuss its impacts on conservation and economic development, and develop an idea for Virginia to provide more targeted opportunities for wildlife viewing. The passage of House Bill 38 in 1998 by the Virginia General Assembly was also critical, creating a mechanism to transfer a portion of the state sales tax collected from the sale of outdoor recreation equipment (as defined every five years in the U.S. Fish and Wildlife Service National Survey on Fishing, Hunting and Wildlife-Associated Recreation) to the DWR. To support the development of the VBWT specifically, DWR applied for multiple Virginia Department of Transportation - Transportation Enhancement Grants (available through the federal TEA-21 program), eventually securing over $1M in funding to build the statewide trail. In addition, funding was provided by the National Oceanic and Atmospheric Administration's Coastal Zone Management Program, coordinated by the Virginia Department of Environmental Quality, for the Coastal Phase trail guide. The Virginia Tourism Corporation provided considerable in-kind support with marketing and publication distribution.

The designation process for VBWT viewing sites began in earnest in 2001 with the Coastal Phase and culminated with the Piedmont Phase in 2004. Originally, there were over 660 designated sites organized into 65 driving loops. DWR staff made presentations to well over 400 groups and engaged over 500 partner groups during the development of the VBWT. These partners, including nonprofit organizations, state and local tourism groups, local governments, businesses and many more, wrote letters of support for VBWT funding proposals. As part of the development process, the DWR solicited site nominations

from all of the partner groups. Nearly 1,000 nominations were submitted and evaluated for inclusion. Fermata, Inc., the consultant that developed the Great Texas Coastal Birding Trail, collaborated with the DWR in the development of the VBWT, conducted the site evaluations, and provided feedback about the wildlife at each site and the habitats and viewing experiences available. Once the final sites were selected for designation, DWR staff contacted site owners/managers for a review of their respective site descriptions to ensure they were satisfied with the publication text. Finally, all the sites were organized into loops and those loops were evaluated and modified by the local communities. Surrounding communities were also given the opportunity to submit potential names for their respective loops. Driving directions were included to facilitate navigating from site to site on each loop, since GPS technology was not readily available at the time the VBWT was developed.



With the advent of easy access to GPS technology, navigational apps on cell phones, and the transition to online guides, over time, the loops and the driving directions have become less important. The DWR focuses its efforts now on identifying and promoting the "best" sites in each region. Two versions of the guide are available online – one that is similar in format to the original book, found on the DWR website, and the other is an interactive website, called *Find Wildlife*. Each VBWT site has its own webpage in the online Find Wildlife guide which includes a detailed description of the site, a list of the types of wildlife present, driving directions, and an indication of available facilities, including whether sites are handicap-accessible. At least 251 VBWT sites (about 39%) have handicap-accessible facilities.

The agency still accepts nominations for new VBWT sites and adds a few new designations each year. The DWR's Watchable Wildlife Program has developed a series of regional brochures to promote visitation in a few high tourism regions, such as Virginia Beach, the Eastern Shore, Williamsburg, and Richmond. These brochures, which contain a map and short descriptions of each site with viewing tips and seasonal highlights, are distributed at visitor centers, the viewing sites themselves, and at relevant local businesses. More brochures are planned for additional regions of the Commonwealth, pending available funding and sponsors. Rack cards advertising the VBWT and its website are distributed annually throughout the Commonwealth to all of the state-run Welcome Centers and state-certified visitor centers. The DWR also annually advertises the VBWT in the *Virginia Travel Guide*.

Wildlife Viewing Amenities
In order to expand wildlife viewing opportunities in locations across the state, the Watchable Wildlife Program provides technical assistance and/or small grants to localities and VBWT sites to support the establishment of trails, interpretive signs, and viewing amenities. The grants are provided on an ad hoc basis. Recent examples of this support include technical assistance and the funding of an interpretive sign at the Snicker's Gap Hawkwatch site in Clarke County and funding support for the development of trails and viewing platforms at Lake Hanover Natural Area in Hanover County. The DWR also partnered with the NOAA Coastal Zone Management (CZM) Program of the Virginia Department of Environmental Quality and County of Northampton to design and fund the installation of an observation platform at Willis Wharf, on the Eastern Shore of Virginia. This project was intended to enhance ecotourism on the Eastern Shore by supporting viewing of shorebirds and waders, especially during low tides. The DWR also assisted the CZM Program with the addition of interpretive signage and stationary binoculars on the Willis Wharf platform.

Public Opportunities for Wildlife Recreation (POWRR) Properties
In 2020, the DWR initiated the Public Opportunities for Wildlife Recreation (POWRR) program to facilitate the use of private land for publically accessible wildlife-dependent recreation activities such as hunting, trapping, fishing, boating, and wildlife viewing. This initiative was launched in an effort to expand and ultimately replace the existing Public Access Lands for Sportsmen (PALS) program, which was historically marketed exclusively to hunters. In 2020, DWR received a $2.9 million grant from the Voluntary Public Access and Habitat Incentive Program (VPA HIP), administered by the U.S. Department of Agriculture's Natural Resource and Conservation Service. This grant is being used to provide cash incentives to participating landowners for allowing public access to their land, as well as funding needed infrastructure upgrades (e.g. installation of gates, signs, parking lots, wildlife viewing platforms, etc.) and habitat enhancements on participating properties within southwest Virginia. Furthermore, a Wildlife Habitat Biologist was hired in 2020 to oversee these habitat enhancement efforts which may include access control, brush management, early successional habitat management, land clearing, prescribed burning, land reclamation (abandoned mined land), range planting, recreational land grading or shaping, shallow water development and management, stream habitat improvement and management, upland wildlife habitat management, wildlife habitat planting and woody residue treatment.

Between properties enrolled through the PALS program and a previous VPA HIP grant, over 30,000 acres of private land are enrolled in this program and accessible for wildlife-dependent recreation. The program began accepting new landowner applications in October 2020. By 2023, the program is projected to have at least 20 participating landowners with more than 60,000 acres enrolled. This additional acreage will be used for the creation of at least six new public viewing sites for elk, ten new viewing sites for the Virginia Bird and Wildlife Trail, and eight boating access sites for hand-launched vessels.

Wildlife Viewing Festivals
The Watchable Wildlife Program also has a long history of sponsoring and aiding localities in the planning of wildlife viewing festivals, including the Winter Wildlife Festival and Great Dismal Swamp Migration Celebration and the former Eastern Shore Birding & Wildlife Festival, "Gone to the Birds" Festival, and Mountain Lake Migratory Bird Festival. The benefits of these festivals are many: they provide a celebration of seasonal wildlife events, community and social support to birders and wildlife viewers, an introduction into birding and wildlife viewing for those first exploring these recreational activities, and nature tourism benefits to the local communities, and they increase awareness and appreciation for wildlife and natural habitats.

The ***Winter Wildlife Festival*** in Virginia Beach celebrated its 10th anniversary in 2020. DWR has been a proud sponsor of this annual event since its inception. This festival, which takes place the last weekend of January, is put on by the City of Virginia Beach Department of Parks and Recreation with support from a variety of agencies and organizations. It celebrates the birds and wildlife that overwinter along Virginia's coast, which includes a wide diversity of waterfowl, seabirds, and sea mammals. Festival participants have the opportunity to register for guided field trips, visit an exhibit hall, learn from wildlife and conservation professionals in a keynote and workshops, and attend children's activities at the partnering City library. The DWR's Watchable Wildlife Program has supported the planning process by participating in the festival steering committee and providing subject matter expertise and coordinating with other DWR staff in leading some of the field trips, setting up an exhibit table, instructing some of the workshops, and helping to judge the photography contest. The 2020 festival was attended by 518 registered field trip and workshop participants, 1500 visitors to its exhibit hall, and 250 attendees at the keynote. It is a very popular and well-liked festival, with 97% of 2020's post-festival survey respondents indicating that they "would attend Winter Wildlife Festival next year."

The ***Great Dismal Swamp Migration Celebration*** (formerly named the Great Dismal Swamp Birding Festival) has occurred at Great Dismal Swamp National Wildlife Refuge since 2007. Located in Suffolk and Chesapeake, this event occurs over a long weekend at the end of April each year as a celebration of spring migration. The Refuge is one of the best locations in the Commonwealth to observe spring migrants, especially warblers, and birders visit the Refuge in particular for the opportunity to see Swainson's Warbler. DWR was a founding partner of the festival and has supported the Refuge in multiple ways over the years. In the earlier years of the festival, DWR provided sponsorship funds and Watchable Wildlife staff helped with planning efforts on the steering committee, led field trips, instructed workshops, and set up an exhibit booth. In the last few years, the Refuge has sought to simplify the festival with less involvement from partners, however DWR continues to provide annual financial support for the event. Total attendance at festival field trips has consistently been around 500 people in the most recent years.

The ***Mountain Lake Migratory Birding Festival*** was held for approximately 8 years, in the early 2000s, at the Mountain Lake Hotel in Giles County. Mountain Lake is one of only two natural lakes in Virginia and sits atop Salt Pond Mountain at just over 3000 feet elevation. Sitting in the spine of the Allegheny Mountains, this makes it a prime spot for warbler and other passerine migrants in the Spring, as they migrate along the mountains at night. Early mornings often saw huge numbers of birds literally dropping out of the sky at sunrise. The festival often drew upwards of 300-500 people. DWR was one of the inaugural sponsors of this festival along with the New River Valley Bird Club, a local bird store in Blacksburg, and the Mountain Lake Hotel and Resort. Sadly, the major festival organizer Peggy Opengari passed away in 2009, and we could not find another local sponsor to take over the festival.

The ***Eastern Shore Birding & Wildlife Festival*** ran for twenty-four years on Virginia's Eastern Shore, from 1992-2016. Based out of the Town of Cape Charles, this festival occurred over a weekend in early October to celebrate the annual fall migration that occurs along Virginia's Eastern Shore. This festival offered a large number of guided field trips and workshops to view migratory birds and other wildlife, a keynote speaker, an exhibit hall, and family activities at Kiptopeke State Park. Leadership for the festival varied over the years, but was largely run by volunteers with support from local and state agencies. DWR was a founding partner of the festival and was highly involved in it from the outset. The agency provided this festival with major sponsorship funds and planning support from DWR staff who participated in the steering committee and most often fulfilled the role of coordinating the field trips and trip leaders and providing subject expertise. In addition to providing the planning support, DWR staff led field trips, set up a DWR exhibit booth, helped judge the youth poster artwork contest, and helped judge the photography contest. In its final year, 390 people from around the country pre-registered for this festival's field trips; 48% of its paid participants were from outside of Virginia and 80% were from outside of the Eastern Shore. The festival ended when a local entity or volunteer could no longer be found to organize the event.

The ***"Gone to the Birds Festival"*** occurred for three years in downtown Richmond from 2008 - 2010. The event was held by the Richmond Audubon Society and the City of Richmond to highlight the spectacular phenomenon of over 30,000 purple martins flocking up prior to their fall migration. For a one- to two-week time period each fall, the purple martins would dramatically descend upon a stand of Bradford pear trees located near the Richmond 17th Street Farmers' Market. To support the festival, DWR provided interpretation, set up an exhibit table, and in one year provided a small sponsorship. The festival was popular and drew large crowds, but ended simply because the purple martins stopped appearing.

Elk-related Tourism

From 2012-2014, in partnership with the Rocky Mountain Elk Foundation, DWR restored elk to a designated Elk Management Zone (EMZ) in Southwest Virginia, encompassing Buchanan, Dickenson, and Wise counties. In order to ensure the success of this restoration with a sustainable population of elk in the EMZ, DWR also developed a 10-year Elk Management Plan to benefit all Virginians, including those interested in elk viewing and elk tourism (DWR, 2019). To create a public elk viewing opportunity, DWR worked with multiple partners and volunteers to establish a public elk viewing area in Vansant, on Buchanan County property near the Southern Gap Outdoor Adventure Center. The area, which is a designated site on the VBWT, consists of three sheltered viewing stations with bench seating overlooking restored grassland habitat. Together, DWR, the Rocky Mountain Elk Foundation, and volunteers restored these lands degraded by a strip mine operation to a beneficial habitat for elk and

other wildlife. In addition to the elk, these viewing stations also provide the opportunity to view grassland birds, wild turkey, white-tailed deer, butterflies, and the occasional black bear.

Elk have become a major tourism draw to the area ever since the restoration. Based on annual visitation to their visitor center, which provides access to the elk viewing area, Southern Gap Outdoor Adventure Center estimates that 8,000 - 10,000 people view elk at this area each year. In addition to this public viewing area, two local entities lead elk tours to the nearby elk restoration zone (the site where the elk were originally released). Breaks Interstate Park leads 20 paid elk tours, available to the public, each year with total annual attendance averaging at 300 people. Park staff also lead unpaid tours for potential partnering agencies and school groups that are attended by an additional 75-100 people annually. Rocky Mountain Elk Foundation leads tours for local groups and organizations and these are attended by another 1,100 people annually. Additionally, the first Southern Gap Elk Fest was held in the fall of 2020 with an estimated attendance of 2,700 over the four-day event, based on visitation to the Southern Gap Outdoor Adventures complex. The festival's elk tours were attended by 215 registered participants.

WILDLIFE AND HABITAT EDUCATION

DWR also connects people to wildlife through formal educational curriculum for students from preschool through 12th grade and through informal education, including the interpretation of wildlife and habitats. Interpretation is a communication process that translates scientific topics and terminology into those that are relevant and meaningful for its audience. By providing interpretive expertise, the Watchable Wildlife Program helps people to better understand and connect with Virginia's wildlife and habitats. This intellectual and emotional connection provides an introductory step that can lead people towards conservation action. To this end, Watchable Wildlife staff have helped to develop interpretive signage and print materials; write content for the DWR's varied digital media; and deliver public talks and training on birds and other wildlife, birding, wildlife viewing, and gardening for birds and other wildlife. Watchable Wildlife staff also provide internal technical assistance to DWR in the form of expertise on wildlife viewing, wildlife viewing constituents, and interpretive best practices.

Habitat Education

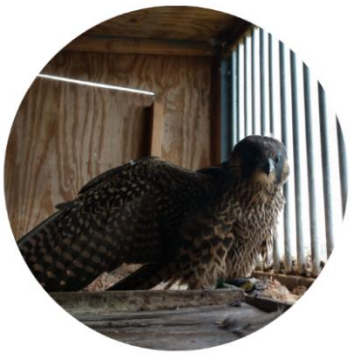
In order to increase the public's awareness of habitat issues and adopt stewardship practices on their own properties that conserve or restore habitats for wildlife, DWR implements the habitat education program. The program provides resources and educational workshops for corporate landowners, private landowners, schools, and homeowners to improve habitat in their community that will benefit Virginia's

songbirds, mammals, amphibians and other wildlife. The DWR habitat education program delivers hands-on programs, presentations and events to teachers, homeowners, business leaders, decision-makers and others about how to conserve and restore wildlife habitat in order to inform their land-use and land-management practices. In addition, the program provides hands-on habitat education programs, trainings and support-materials for teachers, volunteers, such as Master Naturalists, Master Gardeners, youth leaders, environmental educators and others to implement native habitats in their areas. The DWR habitat education program works with a host of partners and sister agencies to develop materials specific to native plants, invasive species, and how-to instruction for creating and maintaining healthy native habitat in Virginia.

Red-cockaded Woodpecker interpretive signage at Big Woods WMA

Wildlife Viewing Cameras

DWR offers live-streaming wildlife viewing cameras as a way to increase appreciation of wildlife and provide an educational experience.



Richmond Falcon Cam. The Watchable Wildlife Program coordinates the Richmond Falcon Cam. The Richmond Falcon Cam has followed the same peregrine falcon nesting site in downtown Richmond for over a decade. This popular camera provides an intimate look at a nesting pair of peregrine falcons rearing their young that would not be obtainable otherwise. The camera's live stream is broadcast on a DWR webpage that also contains educational blog posts reporting on the falcons' nest status throughout the nesting season and an FAQ about the nest's history. The Falcon Cam was viewed by nearly 82,000 people in 2020. The majority of viewers are from Virginia and the mid-Atlantic U.S., but it also is followed by people throughout the U.S. and around the globe.

Elk Cam. The agency also offers an elk cam. Located on a remote, private property in the town of Vansant, Virginia, this camera provides the public with live-streaming views of southwest Virginia's elk herd during their breeding season. The camera enables people living all over the Commonwealth, and beyond, to observe the splendor of Virginia's elk, and it is hoped to motivate tourism to the southwest part of the state (see "Elk-related Tourism" under Nature Tourism above). In 2019, the elk cam was viewed by nearly 163,000 people.

Shad Cam. Staff in DWR's Aquatics Division oversee the Shad Cam, a webcam that allows viewers to watch the spring migration of shad and herring as they move through the fish ladder at Bosher's Dam at Richmond on their way up the James River.

Eagle Cam. Watchable Wildlife staff also formerly coordinated an Eagle Cam, located at Norfolk Botanical Garden, that provided views of a bald eagle nesting pair during the breeding season. Camera viewership was in the millions annually. However, one of the eagles was killed in a collision with an airplane from the adjacent Norfolk International Airport in 2012. The nest was removed due to concerns about bird aircraft strike hazards and the camera was decommissioned.

Media Resources and Outreach

In recent years, the Watchable Wildlife Program has shifted much of its interpretive work away from signage and instead has been focusing more on increasing online content for a variety of digital media. A more recent effort by the Watchable Wildlife Program has been updating species profiles on Virginia's Species of Greatest Conservation Need. These webpages feature a mix of natural history, wildlife viewing, and conservation information, along with easy ways for the public to contribute. The Watchable Wildlife Program has also authored print and digital resources with how-to information on birding, and content for *Notes from the Field*, the DWR's electronic newsletter. The most significant Watchable Wildlife Program contributions to the DWR's digital media have been coordination of two DWR social media campaigns: Virginia is for Frogs and Year of the Bird. For DWR's 2015 Virginia is for Frogs campaign, the Watchable Wildlife Program worked with the agency Herpetologist to develop a webpage full of resources for the public and educators; coordinated a "Frog Friday" featured weekly on DWR's social media throughout the year; helped deliver special trainings for Virginia Master Naturalists and science educators; developed frog exhibit materials for use at events, including a special frog exhibit booth at the Virginia Living Museum; and developed promotional give-away items. This campaign, in particular the Frog Friday component, struck a chord with the public and garnered media attention. The DWR's Outreach Media Team reported that Meltwater, a digital monitoring service, valued the news coverage spawned by Frog Friday at $20,000. In 2018, the Watchable Wildlife Program worked together with the agency's Nongame Bird Conservation Biologist to support the international Year of the Bird, a centennial celebration of the Migratory Bird Treaty Act, with monthly DWR blog articles to support the campaign's monthly themes. DWR's *Virginia Wildlife Magazine* also featured an expanded bird section of their photo contest issue with a focus on migratory birds.

Virginia is for Frogs exhibit booth at the Virginia Living Museum

Pre-K Through 12 Education

Virginia Wildlife Grant Program. Launched in 2014 in partnership with the Wildlife Foundation of Virginia, DWR has offered this grant program to connect youth to the outdoors. It provides a funding source to non-profits, schools, and government agencies in need of support for projects that will recruit and retain youth participation in outdoor recreational activities relevant to the DWR's mission, including wildlife viewing. Wildlife viewing has been one of the grant program's major areas of connection and support. It was the program's most funded activity in 2017-2019, supporting 10 projects at nearly $20,000 in 2017, 10 projects at nearly $24,000 in 2018, and 6 projects at over $14,000 in 2019. Support of the Grant Program is generated through the sale of gear and other merchandise from Go Outdoors Virginia, private donations, and fundraising events.

Project WILD. Project WILD is a Pre-K 12 education program provided to Virginia teachers through in-service workshops. Teachers receive one of six Project WILD curriculum guides through DWR sponsored workshops. The guides contain interdisciplinary lessons that support state standards and wildlife management and natural resource concepts. Lessons get students outside as young scientists to explore the natural world through investigations and creative activities. Students have the opportunity to participate in wildlife based citizen science projects through teacher led field investigations on the school grounds. Each year DWR sponsors between 50 and 60 three to eight hour teacher in-service workshops reaching 600 – 800 teachers from pre K through grade 12. There is no cost to the school system or to the educators to attend the workshops or for the Project WILD guide and supplementary materials provided.

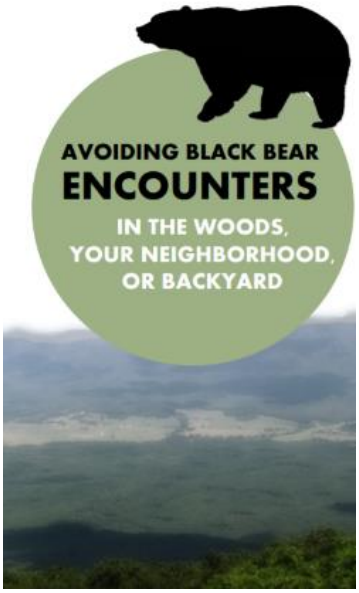
Trout in the Classroom. Trout in the Classroom is an educational program in which elementary, middle, and high school students raise trout from eggs to fingerlings and then directly release the fish in a stream or river. The program is administered across the country through partnerships between schools, state wildlife agencies, and a variety of nongovernmental organizations. In Virginia, the Trout in the Classroom (TIC) program has been operating since 2005, with trout eggs supplied by DWR fish hatcheries and classroom presentations, field trips, and other technical assistance coordinated by partner organizations, especially Trout Unlimited. In some cases, Trout Unlimited chapters provide some of the equipment such as temperature-controlled tanks, necessary for the program; in others, schools write grants or obtain funding from other sources. When the trout are ready for release, local Trout Unlimited chapters work with DWR biologists to release the trout into agency-approved waters. The program increases student knowledge of water quality and conservation, with an underlying goal of connecting increasingly urban students with their local environments and wildlife resources in the Commonwealth. During the 2014-2015 school year, over 230 schools with 242 TIC tanks participated in the program (Trout Unlimited Virginia Council, 2020).

Protect people and property by promoting safe outdoor experiences and managing human-wildlife conflicts

EDUCATION AND OUTREACH RELATED TO HUMAN-WILDLIFE INTERACTION

DWR's District Biologists and Watchable Wildlife staff provide information about human and wildlife interactions through a variety of methods including the development of promotional materials and direct technical assistance. For example, DWR has developed a series of campaigns to discourage feeding or getting too close to wildlife, due to the risks associated with the habituation of animals to humans. The most significant campaign is "Bear Aware" which provides guidance for avoiding conflict with bears around the home, while camping, and while in nature. With other state agencies, DWR also supports Bear Wise, a regional program developed by black bear biologists to provide information about how to keep bears wild and prevent problems between bears and neighborhoods and communities. Other publications focus on interacting with elk, leaving fawns alone, and managing backyard bird feeders. While the risk of disease is very small, the agency also provides guidance on risks emerging from potential contact with wildlife disease (e.g. Lyme disease, bear mange) and outreach on actions to avoid exposure. In the event that conflict with wildlife does occur, the Agency contracts with the United States Department of Agriculture (USDA) to host a Wildlife Conflict Helpline; this helpline fields thousands of calls annually and provides technical assistance to callers.

In addition to general information on human-wildlife interactions, DWR develops targeted informational materials and classes about safety and best management practices for viewing and other outdoor related activities. DWR provides classes for more than 30,000 boaters, 10,000 hunters, and hundreds of anglers and wildlife viewers each year to ensure the safety of wildlife recreationists. DWR also distributes information about recreational seasons, hunting and boating safety, and access restrictions through a variety of media including email, social media, advertisements, and the distribution of more than 250,000 print guides. Although conflicts between hunters and wildlife viewers are extremely rare, DWR works to promote coexistence between these recreation groups and to promote safety in areas where both activities occur, particularly on WMAs. All hunting season and WMA rules and access recommendations are listed on the agency's website and at each WMA kiosk. The Watchable Wildlife Program also includes information about hunting seasons on the VBWT website, since some Trail sites are also used for hunting.



CONSERVATION POLICE OFFICERS

DWR employs over 150 Conservation Police Officers that are responsible for enforcing wildlife, boat and fish regulations and all other criminal and regulatory laws in the Commonwealth and play a significant role in ensuring the safety of people, property and wildlife. Conservation Police Officers respond to nearly 59,000 calls for service each year that range from public safety to trespassing and wildlife crimes. In many instances, DWR's Conservation Police are the first and only contact people have with the Agency and thus play a significant role in education and outreach, and in connecting the public to DWR. In fact, part of the Conservation Police mission is to "provide education and outreach in an effort to gain voluntary compliance with and promote public understanding and support of the Commonwealth's wildlife, fish, and boating regulations." Conservation Police provide education and outreach in a variety of ways including planning and organizing community outreach programs; teaching hunting, firearm, and boating safety; and participating in Agency outreach events.

HOW WILDLIFE VIEWERS SUPPORT THE DWR

Wildlife viewers and other wildlife enthusiasts are critical to the success of the DWR. Each year, wildlife viewers directly contribute volunteer time, observational data, and financial resources to support the agency's work to conserve wildlife and habitats and connect people to nature.

CITIZEN SCIENCE

Opportunities for citizen science – scientific research conducted by volunteer scientists, rather than or in collaboration with professional scientists – provide an important connection between DWR and wildlife viewers. Most of the agency's citizen science effort has been in the form of sponsorships to other groups that host citizen science programs, such as the Virginia Master Naturalist Program and the Virginia Bluebird Society. Over the years, several citizen science projects have originated from the efforts or proposals of agency personnel. Once initiated by the agency, many of these projects have eventually been outsourced to other groups, largely due to a lack of staff capacity. For example, the agency initiated a Frog and Toad Call Survey, which is now respectively coordinated by the Virginia Living Museum as part of Frog Watch. The Watchable Wildlife Program also promotes regional and national citizen science opportunities that occur annually, such as the Christmas Bird Count and Great Backyard Bird Count.

Adopt-a-Trail

To maintain up-to-date information on the VBWT's 600 sites, the DWR's Watchable Wildlife Program coordinates an Adopt-a-Trail Project, in which volunteer groups adopt local loop(s) of the Trail. Volunteers visit the sites 1-4 times a year to verify existing VBWT information on each site, evaluate site conditions, communicate with site owners or managers, and report on VBWT signage conditions. Volunteers also record their observations of birds and wildlife into the Wildlife Mapping project on

iNaturalist and eBird. The project was initiated in 2016 as a project within the Virginia Master Naturalist framework, but now welcomes participation from other groups. As an example, a professor at University of Virginia - Wise incorporated the project into a Vertebrate Zoology course in 2019 and continues to use the program within current curriculum. Thus far, 50% of VBWT loops have been adopted and the Watchable Wildlife Program is actively recruiting additional volunteer groups in an effort to achieve a 100% loop adoption rate.

Virginia Master Naturalist (VMN) Program

The VMN program is a statewide corps of volunteers providing education, outreach, and service dedicated to the beneficial management of natural resources and natural areas within their communities. With 29 chapters across Virginia, the program aims to extend the capacities of both state and local natural resource agencies and organizations to be able achieve their missions in new ways, engage new audiences, and work towards creating a citizenry more informed about and involved in natural resource conservation and management. The program, because of its chapter-based structure, also promotes learning about, exploring, and stewarding natural areas through social groups.

Local VMN chapters recruit and train volunteers through a 40+ hour course that includes both classroom and field instruction on a wide array of natural resource topics, including many wildlife and habitat-related topics. In a typical year, 400 new volunteers graduate from the VMN basic training course and 2,200 or more VMN volunteers report service in four primary areas: education, stewardship, citizen science, and chapter administration. In 2019, VMN volunteers contributed more than 45,000 hours of stewardship to improve local natural resource conditions on more than 580 sites through invasive plant management in parks, creation and maintenance of habitats for pollinators and other wildlife, trail maintenance of hundreds of miles of trails, and litter cleanup events. Volunteers also contributed more than 63,000 hours of time to more than 50 citizen science studies of birds, phenology, mammals, butterflies, stream health, and more. In addition, volunteers made more than 170,000 contacts through educational programs in their communities that totaled 47,000 hours of service. These programs included day camps and afterschool programs for youth, talks for local community groups, and activities at numerous special events, such as local Earth Day celebrations. Since the program's inception in 2005, VMN volunteers have contributed more than one million hours of service with a value of more than $23.8 million to the Commonwealth of Virginia.

The VMN program is based at Virginia Tech and Virginia Cooperative Extension, but it is co-sponsored by six other state agencies, including DWR. As a founding sponsor of the VMN program, DWR provides state-level funding that supports program staff, volunteer recognition items, educational events, and general program infrastructure. DWR staff serve as advisors for approximately 25% of VMN chapters and as instructors for numerous basic training courses and continuing education programs. DWR staff also serve as contacts or coordinators for projects that involve VMN volunteers, including statewide projects such as the Adopt-a-Trail project for the Virginia Bird and Wildlife Trail and local projects, and stewardship work at some Wildlife Management Areas. The VMN program provides DWR and its other sponsoring agencies with a platform to communicate with a constituency of wildlife watchers who may not be otherwise connected with the agency. DWR regularly provides content for the VMN newsletter and social media, online and in-person continuing education events, and information about volunteer opportunities.

Some key collaborative projects between the VMN program and DWR include:

- *The Virginia Bird and Wildlife Trail Adopt-a-Trail project.* VMN chapters adopt sites on the Virginia Bird and Wildlife Trail at which they document and report observations of wildlife and monitor for trail conditions and access issues. Thus far, VMN chapters have adopted 50% of the VBWT loops. They have been instrumental in helping DWR update their VBWT database, recommending the removal of sites due to access or quality issues and the nomination of new VBWT sites, such as Windsor Castle Park in Smithfield. They have also provided insight and feedback to DWR on how to improve the VBWT program as a whole based on their communications with individual VBWT site owners and managers.
- *Demonstration habitat projects.* VMN chapters have collaborated with DWR personnel to create new habitat gardens using native plants on publicly accessible sites such as Pleasant Grove in Fluvanna County, Yowell Meadow Park in Culpeper, and schoolyards in York and Poquoson.
- *Projects at Wildlife Management Areas.* VMN chapters have assisted with stewardship, education, and citizen science at DWR's Wildlife Management Areas. For example, at Merrimac Farm Wildlife Management Area in Prince William County, VMN volunteers have planted and maintained a wildlife habitat garden, re-blazed trails to improve public access, provided general cleanup assistance, and co-led educational events for the public.
- *Fisheries projects.* VMN collaborations with DWR are not limited to land. VMN volunteers have assisted DWR personnel with fish stocking, fish surveys, freshwater mussel counts, and aquatic habitat improvements at sites like Claytor Lake State Park.
- *Vernal Pool Cooperative of Virginia.* VMN volunteers are trained by Virginia Commonwealth University, DWR, and veteran VMN volunteers to seek out and monitor vernal pools on public properties. Once trained, VMN volunteers establish contact with the natural resource manager of a property for guidance and needed permissions as well as collect data on species-use within that property's vernal pools. From 2014 to present, volunteers have collected over 34,000 data measurements which are accessible to project managers including DWR staff and partners at Virginia Commonwealth University.

Virginia Breeding Bird Atlases

The largest citizen science projects undertaken by the agency (and the largest in the Commonwealth) to date have been the two Virginia Breeding Bird Atlases (VABBA and VABBA2). The first Atlas was conducted from 1985-1989, and the second from 2016-2020. These Atlas projects document the geographic distribution and breeding and population status of Virginia's diverse breeding bird communities, and are vital for not only providing information critical for conservation planning and action, but also for their extensive engagement with volunteers and partner organizations. The VABBA2 project recruited 1,500 volunteer citizen scientists who contributed data to the project's eBird portal. Additionally, the project engaged with over 58 NGOs, 8 universities, and many county, state, and federal agencies to build a network of avian conservation partners. During the data-collection phase of this effort, over 80 programs and workshops were held around the state, reaching thousands of wildlife viewers, including birders, Master Naturalists, students, and more. When the project completed its final field season in 2020, the VABBA2 database included over 600,000 breeding records and over 5 million birds reported by volunteers, and over 70,000 hours of volunteer effort logged to the project. Starting in 2021, VABBA2 data will be reviewed, analyzed, and compared to the first VABBA to shed light on changes in Virginia's avian communities over the past thirty years, with the ultimate goal of helping to inform future avian management and conservation strategies. However, the community of volunteers cultivated throughout this project represent an additional key resource developed through this effort.

Many of these volunteers stand ready and eager to engage with DWR on future wildlife and habitat monitoring efforts.

Wildlife Mapping

The other long-running citizen science project organized by the agency has been Wildlife Mapping, a project of the Watchable Wildlife Program. Wildlife Mapping started in 1997 to document the distribution of Virginia's wildlife in order to augment the work of DWR's biologists and partners. In 2015, the project was updated to utilize the iNaturalist platform for data entry, making the project open to public participation and modernizing the data entry process. DWR's highest priority with the project is to collect data on Virginia's Species of Greatest Conservation Need, as listed in Virginia's Wildlife Action Plan. Once verified by DWR staff, observations gathered from this project are added to the Virginia Species Observations database, which is maintained by DWR and used to assist environmental review and conservation planning efforts. Participation in this project has been high over the years, particularly by the Virginia Master Naturalists. By October of 2020, 522 people had reported 41,892 observations of wildlife to DWR's Wildlife Mapping Project in iNaturalist.

FINANCIAL SUPPORT

DWR's personnel and programs are supported through a variety of funding streams, including both federal funding (WSFR) and constituent-driven funding. The latter includes purchases of hunting and fishing licenses and access permits, as well as boat taxes, titles and registrations. DWR approaches recreationists as having dynamic and overlapping identities, and it is clear from previous research (Cooper et al., 2015) that wildlife recreationists participate in multiple kinds of recreation; for example, some hunters also view birds and other wildlife, and some wildlife viewers also participate in boating and recreational shooting. Wildlife viewers undoubtedly purchase some number of these licenses, permits, and registrations each year. Additionally, wildlife viewers purchase state and federal duck stamps; the money generated from these stamps is dedicated to wetland habitat restoration. Additional funding streams to which wildlife viewers and other constituents contribute include:

Sales Tax

Wildlife enthusiasts fund DWR through a portion (2%) of the state sales tax applied to outdoor-related goods and equipment, as stipulated by House Bill 38, which was passed by the Virginia General Assembly in 1998 and implemented in 2000. House Bill 38 allows for the transfer of up to $13 million annually to the Department from these taxes. The amount distributed each year is tied directly to the figures provided in the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, conducted every five years by the U.S. Fish and Wildlife Service and the U.S. Census Bureau. The maximum amount that can be received by DWR is calculated by adding the "Equipment" and "Auxiliary Equipment" expenditures in Virginia for hunting, fishing, and wildlife watching and multiplying that total by 0.02. These expenditure categories include optics, hunting and fishing supplies, wildlife viewing supplies, and some hiking and camping equipment.

Nongame Fund
Wildlife viewers can also donate directly to DWR's threatened and endangered species programs by tax checkoff or direct donations to the nongame fund. Donations to the nongame fund fluctuates widely but averages about $150,000 annually. All monies contributed are used to conserve and manage endangered species and other nongame wildlife or to support opportunities for viewing these species. "Nongame wildlife" includes protected wildlife, endangered and threatened wildlife, aquatic wildlife, specialized habitat wildlife both terrestrial and aquatic, and mollusks, crustaceans, and other invertebrates under the jurisdiction of the Board of Wildlife Resources.

License Plates
In addition, wildlife enthusiasts can purchase a "wildlife conservationist" license plate, for which proceeds are returned to DWR's general fund, which supports the agency's work across all divisions, programs, and projects. Nine different license plates highlight a variety of species, including the largemouth bass, black bear, bluebird, brook trout, bald eagle, mallard, turkey, and whitetail deer. The newest conservationist license plate was released in October 2020 and features the state salamander, the red salamander. The sale of the conservationist license plate generates an average of $375,000 annually.

Restore the Wild
Launched in April 2019, Restore the Wild is a membership initiative that provides an opportunity for wildlife viewers to contribute to DWR and join in the agency's mission to conserve Virginia's wildlife. All proceeds from the membership initiative are dedicated to habitat restoration efforts which benefit native flora and fauna. Members at all levels receive an access permit that carries the same benefits and status as a hunting or fishing license relative to entry onto DWR properties. Restore the Wild continues to evolve as a program to include a more general call for support since the inception of the initiative in 2019, allowing individuals to donate their time, money or expertise to "restoring the wild." To date, Restore the Wild has raised over $46,000 and funded six habitat projects covering more than 180 acres. These projects have benefitted two federally endangered species, rusty-patched bumble bee and red-cockaded woodpecker, plus numerous other species. DWR continues to look for ways to use the framework of Restore the Wild to connect people to DWR and conservation through events and other opportunities, such as an inaugural "Run for the Wild" virtual event and citizen science projects.

SWOT ANALYSIS

The SAC and TAC for this plan performed a SWOT analysis, a tool used often in strategic planning to consider the internal strengths (S) and weaknesses (W) and external opportunities (O) and threats (T) that will define the success of a project or organization. For this plan, **strengths** include the unique resources or capabilities the DWR has that could be used to support wildlife viewing, while **weaknesses** refer to internal structures or policies and staffing or budgeting constraints that might limit the capacity of the agency to support wildlife viewing. **Opportunities** draw attention to gaps for supporting wildlife viewing that the DWR might fill and any conditions that are changing nationally or in the state that may expand the role or relevancy of the DWR for wildlife viewing. **Threats**, on the other hand, include potential national or state-level changes, including in legislation or funding, that may restrict the capacity or relevancy of the DWR for wildlife viewing. Conducting a SWOT analysis for the Wildlife Viewing Plan allowed the SAC and TAC to think strategically about the broader context for this Wildlife Viewing Plan and develop a plan that is likely to be successful given the agency's internal and external realities. This analysis also highlighted new possibilities for DWR to support wildlife viewing in creative and innovative ways. The following table summarizes each component of the SWOT analysis.

STRENGTHS (internal to DWR)	**WEAKNESSES** (internal to DWR)
Knowledgeable and passionate DWR personnel across divisions, including the Watchable Wildlife Program Funding sources that can connect wildlife viewers to the agency Programming for wildlife viewing, including festivals and web cameras Public lands and waters Digital and print outreach materials, including the DWR website, magazine, and newsletter Partnerships and relationships with conservation organizations, other agencies, volunteers, and license purchasers Agency mission, vision, and strategic planning formally reflect the importance of connecting people to wildlife and wildlife viewing Increasing attention to wildlife viewing within the agency Data on wildlife observations submitted by citizen scientists and agency volunteers	Limited staff with a focus on wildlife viewing and addition of personnel takes a long time Difficult for the public to identify and contact DWR biologists Limited interagency coordination and organizing structure for wildlife viewing programs and services Limited agency funding currently generated from viewers presents challenges for sustainably prioritizing and supporting wildlife viewing Wildlife viewing on WMAs constrained by safety concerns related to simultaneous use of WMAs for hunting and viewing, general lack of information about the purpose of WMAs and their location, and limitations on infrastructure and recreation activities on WMAs Limited staff capacity to expand and fully support opportunities to engage in citizen science Residual prioritization of hunting and angling due to agency history and funding streams Limited communication about how the agency uses data contributed by citizen scientists

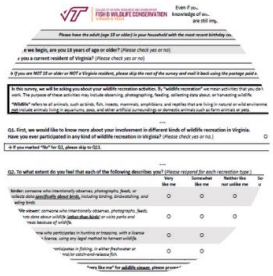
OPPORTUNITIES (external to DWR)	**THREATS** (external to DWR)
Abundant and unique wildlife and viewing opportunities around the state Growing interest in wildlife, wildlife viewing, native plants, backyard habitat, wildlife photography Growing awareness of human impacts on nature Potential to expand access to viewing locations, including on private lands Potential for new and existing federal and agency-level funding streams to expand support for wildlife viewing Potential to provide additional support for viewing among a variety of groups, including youth and young adults, people of color, urban populations, and beginning viewers Potential to connect more people to citizen science opportunities and to communicate the value and use of collected data Potential to use online platforms to promote wildlife and wildlife viewing Potential to form partnerships for enduring, large-scale impact with local, regional, and national nature-based organizations, county and local governments, and state parks Opportunities to engage volunteers through DWR Wildlife Ambassadors, VA Master Naturalists, and citizen science, especially the VABBA2 network	Human pressure on wildlife and habitats, including human population growth, urbanization, privatization, habitat loss, and degradation Broad social trends including increasing limitations in free time, reliance on technology, and fear of wildlife and/or the outdoors Recreational pressure on and potential loss of existing access points for wildlife viewing Potential funding limitations emerging from reliance on sales tax transferred to the agency from state and federal government Limited public awareness of how state wildlife conservation is funded Increase in technology-assisted wildlife viewing through social media, apps, and wildlife cameras may reduce direct outdoor experiences Distrust and differences in interests and values between constituency groups, including different recreation types and recreationists in different geographic regions Funding sources for nongame species are focused on conserving endangered species or species of greatest conservation need, rather than connecting people to wildlife and the outdoors

Part IV
Wildlife Recreation Study

The *Fish and Wildlife Relevancy Roadmap* points to the need for agencies to conduct and apply social science to identify, understand, and plan for engagement with groups outside of the hunting and angling communities they have traditionally served (AFWA & WMI 2019). Consistent with the recommendations of the Relevancy Roadmap, DWR contracted with researchers at Virginia Tech to conduct human dimensions research on the behaviors and interests of the growing number and diversity of wildlife recreationists throughout the Commonwealth of Virginia. This mixed-methods study included focus groups (Grooms et al., 2019) and a survey conducted with birders, other wildlife viewers, hunters, and anglers (Grooms et al., 2020), as well as a web-based stakeholder analysis (Tsang et al., *in review*). An overview of each phase of this study and key findings are described below.

WILDLIFE RECREATION STUDY

Focus groups



Mail and online surveys

Web-based stakeholder analysis

WILDLIFE RECREATION FOCUS GROUPS

Adapted from *Wildlife Recreationists in Virginia: Focus Group Results* (Grooms et al., 2019)

Methods

A series of eight focus groups were conducted across the Commonwealth between March and July 2018 with four wildlife recreation groups: *birders, general wildlife viewers, hunters*, and *anglers* (Grooms et al. 2019). Two 90-minute focus groups were held with each of the four recreation groups, and each focus group included up to 15 participants. A total of 83 recreationists participated in the focus groups, including 53 men and 31 women. Participants represented 36 counties in Virginia and were predominantly avid recreationists, many having 26+ years of involvement within their recreation group. Semi-structured focus group conversations explored recreationists' conservation behaviors; awareness of and trust in DWR; satisfaction with DWR programs; perceptions of relative treatment of various wildlife recreation groups; and willingness to support DWR and expectations for doing so. Recordings of each event were transcribed and coded to identify themes of responses and allow for comparisons among the four recreation groups.

Key Findings

Conservation behaviors. Recreationists participated in multiple conservation behaviors, and most commonly discussed educating others about wildlife viewing and conservation and enhancing habitat for wildlife. Their motivations for contributing to conservation were mostly related to their desire to interact with others (i.e., affiliative motives), to decompress and have fun (i.e., appreciative motives), and to prevent species decline and habitat loss (i.e., protecting wildlife motives). Primary constraints to conservation behaviors differed among recreation groups. Birders and wildlife viewers noted structural constraints, such as lack of time, money, and poor personal health as impeding their conservation behaviors.

Awareness of and experiences with DWR. Focus groups participants also discussed their perception of DWR's role and their familiarity and satisfaction with the agency's programs and services. All groups of recreationists considered DWR to have roles in: 1) serving the needs of hunters and anglers, 2) conserving and managing wildlife and habitat, and 3) connecting people to wildlife and conservation. Recreationists were familiar with a variety of DWR *programs* and *services*, which were grouped into the following categories: 1) wildlife and habitat research and management, 2) hunter and angler programs, 3) wildlife viewing programs, 4) outreach and conservation education, 5) citizen science and volunteer opportunities, 6) recreation access, and 7) laws and regulations. Birders and wildlife viewers were more familiar with programs related to wildlife viewing and outreach and conservation education (e.g., festivals and organizations sponsored by the agency). Birders and wildlife viewers also mentioned their experiences using WMAs and the VBWT. Additionally, all four recreation groups had experience with services and programs related to citizen science and volunteer opportunities, such as the Virginia Breeding Bird Atlas. All four recreation groups were generally satisfied with their experiences with DWR programs and services. Specifically, birders and wildlife viewers discussed their satisfaction with DWR conservation courses and environmental education efforts. All four wildlife recreation groups also spoke about their overall satisfaction with the agency and DWR employees. Dissatisfaction in DWR programs and services was less common, especially among birders and viewers; however, these groups did express some frustration with what they perceived to be limited management of habitat for nongame wildlife by the agency.

Trust and perceived equity. Birders and wildlife viewers were generally less trusting of the DWR than hunters and anglers and focused discussion on the factors that would improve their trust. Trust in the agency among birders and wildlife viewers was often rooted in positive, personal interactions with DWR employees and positive perceptions of past demonstrated effectiveness by the agency. Birders described their trust in the agency improving when agency employees engaged with their local bird clubs, maintained sustained relationships with them, and were perceived as having similar values. All four recreation groups also noted their trust would improve if the agency had access to more resources (e.g., funding and staff) to serve their recreational needs. Birder and wildlife viewer *distrust* in the DWR tended to be based on perceptions of the agency not meeting their needs and on perceived unfairness in agency policies and processes. Birders and wildlife viewers discussed feeling that hunters and anglers were better served by the agency and attributed this to not having a mechanism similar to hunter and angler funding (e.g., Pittman-Robertson excise tax, license sales) by which they could contribute funds to the agency.

Supporting DWR. All four wildlife recreation groups were generally *willing to support* DWR and noted four main methods to do so: 1) donating or providing funds, 2) involving others in DWR activities, 3) participating in DWR programs, and 4) volunteering. Involving others in DWR activities was the most common mode of support discussed by all recreationist groups. Monetary donations and contributions were a less prominent mode of support, but included the purchase of hunting and fishing licenses, funds provided through the Pittman-Robertson Act, Virginia's House Bill 38, and contributions to the nongame fund. Compared to hunters and anglers, birders and wildlife viewers more often discussed supporting the agency through volunteer work. Many recreationists also discussed expectations coupled with their support. Birders and wildlife viewers wanted their support to benefit their recreation activities and to provide tangible results and feedback.

WILDLIFE RECREATION SURVEY

Adapted from *Supporting Wildlife Recreationists in Virginia: Survey report to inform the Virginia Department of Wildlife Resources' Wildlife Viewing Plan* (Grooms et al., 2020)

Methods

In order to collect generalizable information about wildlife recreationists in Virginia, Virginia Tech researchers conducted a survey with two different samples: a random sample of Virginia residents (hereafter, "Public") and a second sample of recreationists currently connected to DWR through hunting and fishing license sales, the agency's *Notes from the Field* e-newsletter, or the Virginia Breeding Bird Atlas (hereafter, "DWR-affiliated") (Grooms et al. 2020). The survey was administered online and, for the public sample only, also by mail, between October 2019 and January 2020, followed by a non-response survey conducted between December 2019 and May 2020. The survey questionnaire was developed based on insights from the focus groups described above (Grooms et al. 2019), feedback from the Stakeholder and Technical Advisory Committees of this Wildlife Viewing Plan, and past research on the survey topics. The survey explored respondents' wildlife recreation identities (i.e., hunter, angler, birder, and wildlife viewer); participation in wildlife recreation and conservation; experiences with and perceptions of DWR; and interest in future engagement with DWR through conservation, funding streams, and communications.

Key Findings

A total of 3626 surveys were returned; this includes 2610 responses from the DWR-affiliated sample (response rate = 20.4%) and 1016 responses from the Public sample (response rate = 7.7%). For both samples, the majority of respondents were male, above the age of 60, White, and non-Hispanic/Latino. Most respondents also had a Bachelor's degree or higher, a total annual income of at least $75,000 per year, and lived in rural areas. The majority of respondents in both the Public and DWR-affiliated samples identified as wildlife viewers and birders. Because birding is a form of wildlife viewing, we grouped wildlife viewers and birders together as "all viewers," which represented a total of 77.2% of respondents in the DWR-affiliated sample (n = 2015) and 68.2% of respondents in the Public sample (n = 693). In both samples, the majority of hunters and anglers also identified as birders and/or wildlife viewers.

Virginia's wildlife viewers. Compared to their representation in Virginia's population, people who are non-White, Hispanic/Latino, or female; those who have less formal education than a Bachelor's degree; people residing in urban or suburban areas; people under the age of 54; and those who earn less than $50,000 a year were under-represented among viewers in our study. The majority of self-identified birders and wildlife viewers in our Public sample had more than 10 years of experience with birding or wildlife viewing, respectively. For both birding and wildlife viewing, years of experience was related to strength of identity as a birder or wildlife viewer; the mean number of days participated in birding and wildlife viewing over the last year; and the percent of days travelled away from home for viewing.

Wildlife viewing locations. The survey explored how birders and other wildlife viewers currently use public and private lands and how DWR might enhance access to viewing in these locations. Fewer wildlife viewers and birders reported using Wildlife Management Areas (WMAs) and Virginia Bird and Wildlife Trail (VBWT) sites, compared to other public lands, including other state-managed areas (e.g., state parks, state forests, boat landings, and Natural Area Preserves). Comparing use of WMAs and VBWT sites, more wildlife viewers and birders in both samples reported visiting WMAs for their activities than VBWT sites. However, because all national wildlife refuges, most state parks, many sites in Shenandoah National Park and George Washington Jefferson National Forest, and WMAs and local parks throughout the state are designated as VBWT sites, it is possible that low reported rates of VBWT use actually reflect lack of awareness about the Trail. In fact, among all viewers (including birders and wildlife viewers) who had not used WMAs and VBWT sites in the past five years, the most common perceived constraint was a lack of awareness of where to access these lands. Almost half of all viewers thought DWR could better support their viewing activities by providing more information about accessing VBWT sites and WMAs and where to go to see birds and other wildlife, and between 30 and 40% of all viewers indicated that DWR could support them by providing more access to locations for seeing birds and other wildlife. The vast majority of all viewers had participated in birding and wildlife viewing around their home.

Types of wildlife viewers. Consistent with DWR's approach to wildlife recreationists as dynamic and overlapping, survey responses allowed the identification of four "recreation types" that account for the multiple and intersecting recreation identities of wildlife viewers. These types included Birder-viewers (Public n = 352, DWR-affiliated n = 534), Viewer-hunter-anglers (Public n = 270, DWR-affiliated n = 1076), and Birder-viewer-hunter-anglers (Public n = 81, DWR-affiliated n = 436). The analysis also identified Hunter-anglers (Public n = 104, DWR-affiliated n = 300) among survey respondents. Individuals in the four recreation types differed in expected ways in terms of the average amount of time they spent birding, wildlife viewing, hunting, and fishing over the past year and over their lifetimes. Across recreation types, Birder-viewer-hunter-anglers spent the greatest amount of time in the past year birding and wildlife viewing; Viewer-hunter-anglers spent more time hunting and fishing than other

recreation types. These patterns suggest that, on average, wildlife recreationists who participate in multiple recreation activities spend more time engaged in each form of wildlife recreation. The four recreation types were also characterized by a few notable differences in socio-demographics. The vast majority of Hunter-anglers, Viewer-hunter-anglers, and Birder-Viewer-hunter-anglers were male, while the majority of Birder-viewers were female. Birder-viewers also had the most formal education among the recreation types.

Wildlife viewers and conservation. We measured five broad categories of conservation behavior among wildlife recreationists, including: 1) informing or teaching others about wildlife conservation; 2) improving habitat on public or private lands; 3) advocating or voting related to wildlife conservation; 4) collecting data on wildlife or habitat to contribute to science or management; and 5) contributing to fundraising efforts for wildlife conservation. Recreation types that included a birder identity component (i.e., Birder-viewers and Birder-viewer-hunter-anglers) had higher levels of participation in all five conservation behaviors measured in our survey, compared to recreation types that lacked a birder identity component. 'Benefiting wildlife' was the top motivator for all five conservation behaviors, followed closely by 'accomplishing something important' and, for some behaviors, 'doing something enjoyable'. In contrast, recreationists who did not participate in conservation behaviors most often indicated that not having enough time was an 'extremely' or 'very important' barrier to their participation.

Perceptions of and trust in DWR. As expected, wildlife recreationists in the DWR-affiliated sample were more familiar with the agency than recreationists in the Public sample. On average, respondents from all four recreation types thought that DWR currently gives higher priority to hunters and anglers than birders and other wildlife viewers. Across the recreation types, Birder-viewer-hunter-anglers had the highest mean levels of trust in the agency, while Birder-viewers had the lowest mean levels of trust. Among the recreation types, Birder-viewers had the highest rates of participation within the past five years with the VBWT, volunteer research and wildlife data collection, and wildlife organizations sponsored by DWR. With the exception of law enforcement, Birder-viewer-hunter-anglers had the highest rates of participation in all other DWR programs and services listed in the survey. All recreation types generally expressed high levels of satisfaction in all DWR programs they had used.

DWR support for wildlife viewers. All DWR-affiliated viewers preferred electronic modes of communication commonly used by DWR, especially email updates, e-newsletters, and the DWR website, while all Public viewers preferred communication via printed materials. In response to a question about what DWR could do to better support their recreation activities in Virginia, a majority of Birder-viewers desired access to more places to go birding and wildlife viewing, as well as more information about accessing WMAs and sites along the VBWT, compared to the other recreation types. Satisfaction with existing DWR programs and services was high among those who had engaged with them, with the majority of respondents reporting that they were 'somewhat' or 'extremely satisfied' with the experience.

Wildlife viewer support for DWR. The majority of Birder-viewers and Birder-viewer-hunter-anglers reported they were likely to support DWR within the next 12 months through conservation activities including habitat management, collecting data, advocacy, fundraising, or teaching others. Birder-viewers were least likely among recreation types to have purchased any Virginia hunting, angling, or sportsman licenses within the past year.. Although few survey respondents had purchased a DWR Restore the Wild Membership (0.6 - 2.4%), there was high interest among recreation types with a birder identity in purchasing this membership in the future.

WEB-BASED STAKEHOLDER ANALYSIS

For additional details, see Tsang et al. (*in review*)

Methods

The focus groups and surveys conducted in this study explored the interests and experiences of individual wildlife viewers. Those data were supplemented with a web-based stakeholder analysis focused on the activities of wildlife viewing organizations, including federal, state, and local agencies, non-governmental organizations, and businesses (hereafter, collectively referred to as organizations). Between May and August 2019, researchers at Virginia Tech analyzed the websites of 214 organizations in Virginia that conduct or promote wildlife viewing activities in the state. Identification of wildlife viewing organizations began with brainstorming by the SAC and TAC, followed by a systematic Google search (Tsang et al., *in review*). Guided by the goals of the Wildlife Viewing Plan, information on the characteristics of wildlife viewing organizations; how these stakeholders engage with wildlife; and their involvement in conservation activities was collected from organization websites.

Key Findings

Of the organizations analyzed, 20 were the affiliations of SAC members; 35 were identified through brainstorming by members of the SAC and TAC; and 159 additional organizations were identified through a systematic Google search. These organizations included 35 county and independent city government bodies (16% of organizations), 17 federal government agencies (8%), 15 state government agencies (7%), 36 businesses (17%) and 111 NGOs (52%), which included clubs, nature centers, museums, foundations, and conservancies. There was a strong geographic trend in the distribution of wildlife viewing organizations in the state, with over twice as many organizations headquartered or active in the coastal and northeastern metropolitan areas of Virginia (DWR Regions 1 and 4) than in the inland and more rural central and southwestern regions (DWR Regions 2 and 3).

Recreation activities. The majority of organizations analyzed indicated an interest in all wildlife in general on their websites, and a third showed a specific interest in viewing birds. Few organizations specifically mentioned a focus on or activities directed towards amphibians and reptiles, fish, or insects and spiders. In terms of how organizations interact with wildlife, the majority were involved in wildlife observation or data collection, while around 20% promoted handling or feeding wildlife or wildlife photography. This analysis also confirmed at an organizational level the overlap between wildlife viewing and hunting and angling activities seen among individuals in the Wildlife Recreation Survey. Hunting and/or angling activities were promoted by almost a third of the Virginia wildlife viewing organizations included in the study. Importantly, the vast majority of these organizations were local, state, or federal government agencies.

Conservation activities. Based on their websites, wildlife viewing organizations in Virginia most commonly distribute resources, including providing online information about wildlife and wildlife viewing, offering products or services, and conferring grants and scholarships. The majority of organizations also hosted or connected viewers to social activities. While over 40% of organizations mentioned programming for youth on their websites, only three organizations described any sort of targeted focus on engaging ethno-racial minorities with wildlife or wildlife viewing. Almost half of organizations indicated involvement in habitat management, with ten times as many organizations involved in or supporting land stewardship on public lands, compared to private lands. Over a third of organizations collected data on wildlife, with far fewer involved in monitoring habitats or environmental

conditions. Overall, wildlife viewing organizations demonstrated the least involvement in activities such as advocating or fundraising for conservation causes.

APPLYING HUMAN DIMENSIONS RESEARCH

Results from each phase of the Wildlife Recreation Study were presented to the SAC and TAC during planning meetings, in order to support the development of data-driven goals, objectives, and strategies for this Wildlife Viewing Plan. Initial focus groups with wildlife recreationists provided rich and detailed insight into the recreation and conservation experiences of hunters, anglers, birders, and other wildlife viewers in their own words. Subsequent surveys with recreationists already affiliated with DWR and a random sample of the Virginia public produced more generalizable findings that were used to understand the wildlife viewing community as a whole and how wildlife viewing intersects with other kinds of wildlife recreation. Finally, a web-based stakeholder analysis provided information about the breadth of organizations and agencies that support wildlife viewing in Virginia and the resources and activities they provide. This analysis infused the planning process for this Wildlife Viewing Plan with information about the priorities of the many wildlife viewing organizations that were not represented on the SAC.

Part V
Values, Goals, Objectives, and Strategies

This section of the Wildlife Viewing Plan presents values, goals, objectives, and strategies to guide DWR's engagement with wildlife viewers in Virginia through 2031. The following **values statement** expresses core ideas about desirable ends (or outcomes) and means (general approaches that should be used to pursue those outcomes) for DWR's management of wildlife viewing opportunities. These values provide guidance on the principles and priorities that should orient all of DWR's efforts related to wildlife viewing under this plan.

VALUES STATEMENT

This Wildlife Viewing Plan is grounded in the following assertions:

1. Wildlife and their habitats have value and should be protected.
2. There can be no wildlife-related recreation without wildlife conservation. Active conservation, monitoring, and/or management are required in order to maintain healthy wildlife populations, flourishing habitats, and sustainable opportunities for wildlife-related recreation.
3. The wildlife and other natural resources of Virginia are a public trust, managed by the state for the benefit of all residents of the Commonwealth. This trust entails a shared privilege and responsibility to ethically engage with and steward Virginia's natural resources.
4. Wildlife organizations and agencies should work cooperatively to expand exposure to and experience with the unique and diverse wildlife of Virginia through education, outreach, and volunteer and wildlife viewing opportunities.

Wildlife viewing opportunities in Virginia should be:

Connected to wildlife conservation: Wildlife viewing opportunities should promote conservation and cultivate a stewardship ethic among Virginia residents.

Sustainable: Opportunities for wildlife viewing should be biologically, socially, and financially sustainable over time. Viewing opportunities should support, and not undermine, the health of wildlife and their habitats. Further, wildlife viewers should engage with wildlife responsibly, ethically, and respectfully, to ensure the sustainability of wildlife populations, habitats, and viewing opportunities. Additionally, viewing opportunities should be prioritized and supported with stable funding.

Diverse: Abundant and varied opportunities for engaging with the rich variety of naturally occurring wildlife and habitats in Virginia should be available throughout the state. High-quality wildlife viewing experiences should be accessible and promoted to all people in the Commonwealth.

Evidence-based: Wildlife viewing opportunities should be adapted over time, based on the best available science and information regarding, among other topics, the status of wildlife populations, the impacts of recreation on wildlife and their habitats, demographic and cultural change, and public preferences for viewing experiences.

GOALS, OBJECTIVES, AND STRATEGIES

The following goals, objectives, and strategies build from the principles contained in the Values Statement above to provide DWR with direction for increasing participation in wildlife viewing and strengthening mutual support between the agency and wildlife viewers. For the purposes of this plan, **goals** are broad statements that capture overarching ideas about what DWR should strive to accomplish related to wildlife viewing. The following goals were co-produced by the SAC and TAC for this plan, based on initial planning conversations about the challenges to broader participation in wildlife viewing in Virginia and meaningful engagement between wildlife viewers and DWR. Each goal is accompanied by multiple **objectives -** specific targets or milestones that will contribute to the realization of plan goals. Unlike goals, objectives are generally more measurable and have determined timelines. Unless otherwise noted, the timeframe for achievement of all objectives in this plan is 2031, the end of this plan period. Each objective is followed by **strategies**, a suite of methods the agency might use to achieve the plan's objectives. The objectives and strategies for this plan were developed by members of the TAC, with assistance from researchers at Virginia Tech, to capture the conversations and ideas from combined meetings between the SAC and TAC. Actionable steps suggested during the planning process are referred to in this plan as **tactics** and are included in Appendix C, organized underneath the strategies that encompass them.

The four goals of the Wildlife Viewing Plan are presented below as distinct areas of work to be conducted by DWR. In reality, the goals of this plan are closely connected to each other and progress on any one goal or objective may contribute to the achievement of others. For example, as the agency works to improve communication about and access to its lands and waterways for wildlife viewing (*Goal 2, Objective 1*) and promote Virginia Bird and Wildlife Trail sites (*Goal 2, Objective 2*), it may also

facilitate increased engagement in wildlife viewing by diverse members of the public (*Goal 1*). Similarly, connecting wildlife viewers to volunteer opportunities that contribute to DWR's science and management needs (*Goal 3, Objective 1*) will likely deepen understanding of the agency's mission among wildlife viewers (*Goal 4, Objective 1*) and forge relationships with this constituency (*Goal 4, Objective 2*). All goals are also connected in that they each rely on a statewide approach to implementation that covers all agency regions, the allocation of sufficient staffing resources, and coordinated effort across agency divisions. The roles that individual divisions may play in implementing this Wildlife Viewing Plan are described in further detail in **Part VI**: Implementation and Evaluation.

GOAL 1: Connect diverse segments of the public to wildlife and wildlife viewing in Virginia

DWR's mission directs the agency to connect people to Virginia's outdoors through a variety of activities, specifically including wildlife viewing. Engaging diverse communities has been a challenge for fish and wildlife agencies across the country, but it is essential for fulfilling agency directives to govern wildlife resources as a trust for all members of the public (Dunfee et al., 2019). Additionally, expanding participation in wildlife viewing can directly advance conservation, given the contributions wildlife viewers make to the scientific knowledge of wildlife populations (McKinley et al., 2017) and their participation in practices, from land stewardship to advocacy and donating, that support wildlife and habitats (Cooper et al., 2015). Goal 1 of the Wildlife Viewing Plan focuses on increasing participation in wildlife viewing by underrepresented groups and youth and families; supporting viewers with little or no experience so they form enduring connections to wildlife and viewing; and connecting other outdoor recreation groups, such as paddlers and campers, to wildlife viewing.

Objective 1: Increase participation by underrepresented gender, ethno-racial, and socio-economic groups in wildlife viewing events, programs, and activities led by DWR and partners

Multiple surveys have shown that the composition of the wildlife viewing community in Virginia is not representative of state-level demographics. Compared to their representation in Virginia's population, people who are female, non-White or Hispanic/Latino, younger than 54, and lower-income, and those who do not have a college degree are all underrepresented among viewers (Rockville Institute, 2018; Grooms et al., 2020) (see Part II, "State-level trends in wildlife viewing"). These patterns are especially pronounced among the wildlife recreationists who are already connected to DWR (Grooms et al., 2020). Social research has illuminated that these groups face unique constraints to outdoor recreation related to safety and access to information, transportation, fee-based locations, and equipment (e.g., Johnson et al., 2001; More & Stevens, 2017). A web-based analysis of the activities of wildlife viewing organizations in Virginia (Tsang et al., in review) indicated that there is substantial room for DWR to lead efforts within the state to increase inclusion of underrepresented groups in wildlife viewing (Tsang et al., in review). Agency leaders have recently laid a strong foundation for this work by hiring DWR's first Chief Diversity and Inclusion Officer and passing a resolution that makes addressing diversity a priority. The following strategies build on this progress with best practices distilled from the literature for increasing diversity, equity, and inclusion in conservation and outdoor recreation. They focus on increasing organizational and media representation (Eells, 2010; Bonta et al., 2015; Taylor, 2015; Frazer & Anderson, 2018); conducting outreach to underrepresented groups (Krymkowski et al., 2014; Metcalf, Burns, & Graefe, 2013; Robinson, 2005; Solop et al., 2003); and building partnerships with organizations that already work with these communities. Inclusivity can also be supported by increased agency attention to the ways in which race, gender, and socio-economic status have historically shaped and continue to shape people's relationships with wildlife and conservation (Finney, 2014; Merchant, 2010) and differences in what nature and wildlife viewing mean for diverse peoples (Gould et al., 2018).

Strategies:

1. Use best practices and market research to target communications to a diversity of wildlife viewers, including through increased representation of underrepresented groups in DWR communication materials.
2. Develop strategic partnerships with organizations focused on and representative of underrepresented groups to promote wildlife viewing and support social networks for viewers from these groups, especially those new to viewing.
3. Enhance the accessibility and relevance of DWR lands, programs, and resources for underrepresented groups.
4. Promote cultural competence and diversity and inclusion in agency approaches to hiring and training staff.

Objective 2: Increase engagement of urban populations in activities that connect people to wildlife and wildlife viewing

Since 1940, Virginia's human population has almost tripled and population centers have shifted from rural communities to growing urban metropolitan areas along interstate highways and the Atlantic coast. These demographic changes and accompanying urbanization and modernization have resulted in shifts in social values related to wildlife, the level and nature of public interest in wildlife recreation (Dietsch et al., 2018), and public perceptions of and trust in state fish and wildlife agencies (Manfredo et al., 2017). The SWOT analysis for this plan drew attention to declines in exposure to wildlife and increases in fear of wildlife and wild spaces among the public as an underlying threat to the ability of DWR to increase participation in and support for wildlife viewing in Virginia (see Part III: "SWOT Analysis"). The SAC and TAC also identified challenges emerging from divergent public preferences for encouraging versus controlling wildlife in urban areas and divergent wildlife values and interests between urban and rural communities. Finally, limited programming for urban wildlife viewing was discussed as a weakness in DWR's current efforts to promote wildlife viewing. While only a quarter of Virginia's population lives in rural areas, the Wildlife Recreation Survey indicated that almost half of wildlife viewers who are affiliated with DWR through license sales, agency communications, and citizen science are rural residents, with urban and suburban populations consequently underrepresented among viewers (Grooms et al., 2020). Engaging people who reside in urban and suburban areas in wildlife viewing thus poses unique challenges for DWR. The following strategies and potential tactics (see Appendix B) guide the agency to provide opportunities that promote positive engagement between these human communities and wildlife.

Strategies:

1. Expand access to and awareness of locations for wildlife viewing in and near urban areas.
2. Develop and promote programs and activities that support wildlife viewing in urban areas.
3. Develop communications materials that foster positive engagement between human communities and wildlife in urban areas.

Objective 3: Increase awareness of wildlife and opportunities for participating in wildlife viewing among youth and families.

Environmental and wildlife values are formed at a young age and are difficult to change in adulthood (Manfredo et al, 2016). Engaging with youth and their families is thus critical for wildlife agencies as they seek to establish appreciation for wildlife that will foster public engagement in wildlife recreation and conservation into the future. Recognizing the importance of these formative years, stakeholders involved in this planning process consistently drew attention to the challenge of fostering interest in wildlife and

wildlife viewing in younger generations. Research has shown that youth participation in outdoor recreation is constrained by increasingly limited free time and lack of independent access to transportation, while technology and new media can both distance youth from nature and connect them to opportunities for viewing and conserving wildlife they would not otherwise have (Barton, 2012). In particular, girls and Black youth spend less time outdoors and more time with electronic devices than boys and White youth, respectively, and have weaker connections to nature (Larson et al., 2019). Concerns about engaging youth with wildlife are reflected in the activities of wildlife viewing organizations across the state. Over 40% (n = 86) of the wildlife viewing organizations analyzed for this plan described youth-specific programming on their websites (Tsang et al, in review). The strategies below direct DWR to capitalize on existing energy and efforts, including the agency's own programs, to strengthen experiences with wildlife and wildlife viewing for youth.

Strategies:

1. Develop educational materials targeting families, with an emphasis on wildlife viewing, conservation of natural resources, and outdoor activities.
2. Create and aid the development of activities that can be used or distributed by schools, partner organizations, libraries, and others to encourage wildlife viewing.
3. Incorporate additional focus on Virginia's wildlife and ways to get involved in wildlife viewing and conservation into current agency-sponsored school programs.
4. Offer agency programs that engage youth and families in wildlife viewing and habitat conservation.

Objective 4: Develop resources to help viewers with little or no experience progress from initial awareness of recreational opportunities to continued participation and identification as a wildlife viewer.

Results from the Virginia Wildlife Recreation Survey suggest that serving beginner viewers will require unique and targeted approaches. The survey found that individuals' level of experience with wildlife viewing was related to the frequency of their activities and the locations in which they viewed wildlife (Grooms et al., 2020). For example, compared to less experienced viewers, a higher percentage of more experienced viewers had travelled away from home to view wildlife. Viewers with less experience were also interested in different types of programs and services from DWR. Specifically among birders, those with less experience birding were more interested in agency programming for youth, viewing events and activities, and opportunities to recruit others to birding than more experienced birders. A web-based stakeholder analysis indicated that wildlife viewing organizations across Virginia are heavily involved in social engagement activities, including leading wildlife viewing trips and workshops, participating in community events, and hosting volunteers (Tsang et al., in review). The Outdoor Recreation Adoption Model (see Part III: "DWR and wildlife viewing") emphasizes the importance of this kind of social support for the development of the motivations and skills that individuals need to continue wildlife viewing and to identify as a wildlife viewer. Partner organizations can thus play an important role in the effectiveness of DWR's R3 efforts to recruit and retain participants in wildlife viewing.

Strategies:

1. Create introductory resources, activities, and programs to help new and inexperienced wildlife viewers get started.
2. Feature viewers with a variety of specialization levels in DWR media and communications.
3. Connect beginner viewers with partner organizations that can foster continued participation in wildlife viewing through viewing opportunities and social support.

Objective 5: Raise awareness of wildlife viewing among groups that participate in other forms of outdoor recreation, in order to enrich their outdoor experience and introduce a new and related activity.

Opportunities exist to expand appreciation for wildlife and participation in wildlife viewing among recreationists who are already spending time outdoors, but without a focus on wildlife, for example, running, hiking, camping, or paddling. The Wildlife Recreation Survey found that many of these recreationists are using VBWT sites and WMAs (Grooms et al., 2020), providing points of contact that could be used by the DWR to communicate the compatibility of other outdoor activities with wildlife viewing. The survey also revealed that many recreationists participate in wildlife viewing as well as hunting or angling; the DWR can build bridges between recreation groups by communicating the ways in which wildlife viewing while afield might enrich these other forms of wildlife recreation. The agency's R3 Plan approaches recreationists as having dynamic and overlapping identities and sets up the potential for participation in any one kind of outdoor recreation to provide an entry-point to participation in other forms of outdoor recreation (DWR, n.d.).

Strategies:

1. Partner with organizations and events that broadly promote engagement with nature and the outdoors in order to reach outdoor recreationists and introduce viewing as a companion activity.
2. Develop informational and communications materials that promote DWR, the VBWT, and wildlife viewing to specific outdoor recreationists (for example, paddlers, trail runners, mountain bikers, or campers).

GOAL 2: Provide a variety of wildlife viewing opportunities accessible to all in the Commonwealth

DWR manages over 206,000 acres of land and waterways in Virginia. Some of these properties, such as Wildlife Management Areas (WMAs), are principally managed for conservation, while others, such as boating access sites, are principally managed for recreation. Results from the Wildlife Recreation Survey indicated that wildlife viewers feel DWR can better serve them by providing more access to locations for viewing birds and other wildlife and more information about the locations that are already available (Grooms et al., 2020). Goal 2 of the Wildlife Viewing Plan is oriented towards increasing opportunities for viewers to experience wildlife at destinations across the state and close to home.

Objective 1: Encourage increased wildlife viewing on agency lands and waters through habitat management and communications about these properties.

The lands and waterways owned and managed by DWR provide abundant opportunities for wildlife viewing, and are thus a critical resource for expanding participation in wildlife viewing and connecting wildlife viewers to the agency. However, a SWOT analysis (see Part III) conducted for this plan identified a number of agency weaknesses related to viewer access to and use of Wildlife Management Areas (WMAs). These challenges were related to the need for more communication about the purpose and locations of WMAs among the public and wildlife viewers, in particular, and the need for a strategy to address safety concerns related to multiple recreational activities on WMAs, specifically hunting and viewing. In line with the SWOT analysis, the Wildlife Recreation Survey found that just less than half of wildlife viewers had visited WMAs during the past 12 months for viewing birds or other wildlife, with use of WMAs being higher among viewers who are already connected to DWR (Grooms et al., 2020). Being unaware of where to access WMAs was the primary factor constraining use of these properties among wildlife viewers who had not visited them in the past five years. Further, almost half of all wildlife viewers

in the survey indicated that DWR could better support their viewing activities by providing more information about accessing WMAs (Grooms et al., 2020). The following strategies were developed to foster viewer interest in, awareness of, and access to all agency lands and waters, without undermining the fundamental conservation goals of these properties.

Strategies:

1. Continue to conduct holistic habitat management on DWR properties that supports opportunities for wildlife viewing and is consistent with the DWR Wildlife Action Plan.
2. Develop communications that clarify the purpose of agency properties, the methods used to manage them, and the ability of these lands and waters to support multiple forms of wildlife recreation.
3. Create simple, user-friendly communications and interpretation materials about wildlife viewing opportunities on various DWR properties, specific rules and restrictions for each property, amenities and accessibility, and appropriate safety information.
4. Ensure on-site signage is effective, with accurate, up-to-date information about access and clearly marked entry points and parking areas.

Objective 2: Increase use of Virginia Bird and Wildlife Trail sites for wildlife viewing activities.

The Virginia Bird and Wildlife Trail (VBWT) is a curated collection of the best locations for viewing birds and other wildlife across the Commonwealth (see Part III: "Virginia Bird and Wildlife Trail"). This system of trails emerged as one of DWR's strengths in the SWOT analysis for this plan (see Part III: "SWOT Analysis"). However, the Wildlife Recreation Survey indicated that the agency could work to increase promotion and awareness of this resource among wildlife viewers. Reported use of VBWT sites by viewers who responded to the Wildlife Recreation Survey was lower than rates of use for all other viewing locations listed in the survey, including other public areas, such as federal, state, and local parks, and privately-owned areas (Grooms et al., 2020). Use of VBWT sites was highest among birders affiliated with DWR; about 40% of birders affiliated with DWR, many of whom are Virginia Breeding Bird Atlas (VABBA2) volunteers, had used Trail sites for birding in the past year. As was the case with WMAs, use of VBWT sites by wildlife viewers is principally constrained by lack of awareness of how to access these properties (Grooms et al., 2020). In fact, because all national wildlife refuges, most state parks, many sites in Shenandoah National Park and George Washington Jefferson National Forest, and local parks throughout the state are designated as VBWT sites, it is possible that low reported rates of VBWT use actually reflect lack of awareness about the Trail. With hundreds of locations across the Commonwealth, including near urban centers, the VBWT is a key resource for connecting diverse public groups to opportunities for engaging with Virginia's wildlife and wild spaces.

Strategies:

1. Expand promotion of the VBWT to improve awareness and understanding of the VBWT among wildlife viewers.
2. Strengthen relationships with the owners or managers of VBWT sites and trail users to ensure the continued accessibility of these sites for wildlife viewing and to promote opportunities for public engagement in wildlife viewing, habitat management, or other activities on VBWT sites.
3. Expand partnerships with counties, friend groups, wildlife viewing organizations, and other volunteers to support routine maintenance and reporting on VBWT sites.
4. Increase the accessibility of VBWT sites, including DWR properties, for viewers with physical disabilities.

Objective 3: Increase access to wildlife viewing opportunities at or close to home.

The overwhelming majority of wildlife viewers in the Wildlife Recreation Survey reported viewing birds or other wildlife around their own home or property in the past year; this includes people across varying levels of experience with viewing and strength of identity as a wildlife viewer (Grooms et al., 2020). DWR can support home-based viewing as a way to encourage broader participation in wildlife viewing across the state. In a state in which over 80% of land is privately owned, the agency can also contribute to wildlife viewing opportunities by supporting the conservation of wildlife habitat in backyards and on other private property. DWR provides resources and technical assistance to support the conservation of wildlife habitat on private lands through the work of agency-supported private lands biologists and online resources designed for homeowners, landowners, schools, and businesses. DWR's wildlife cameras, including the Richmond falcon cam, elk cam, and shad cam, also provide valuable, up-close wildlife viewing from anywhere with an internet connection. However, use of these resources is substantially higher among wildlife viewers who are already connected to DWR through license sales, communications, or citizen science (Grooms et al., 2020). The following strategies emphasize increased promotion of a variety of programs and resources that can recruit, retain, and reactivate participation in wildlife viewing close to home.

Strategies:

1. Ensure that DWR's Habitat for Wildlife resources are easily accessible, up-to-date, and widely promoted and distributed.
2. Create and promote DWR resources, programs, and events that support wildlife viewing at or close to home.
3. Increase promotion of wildlife viewing opportunities external to the agency that viewers can participate in from or close to home.

GOAL 3: Promote wildlife and habitat conservation through wildlife viewing

Fish and wildlife agencies face sometimes competing directives to both connect people to wildlife and conserve natural resources in light of human impacts on species and habitats. Building on the notion that Virginia's wildlife resources are a public trust, managed by DWR for the benefit of current and future generations, the Values Statement for this plan consistently emphasizes the connection between wildlife viewing activities and the stewardship of wildlife resources in the state. Specifically, the Values Statement holds that wildlife viewing fundamentally relies on the conservation of wildlife and habitats; should support, and not undermine, conservation; and should provide an entry-point to conservation activities. The capacity of wildlife viewers and other recreationists outside of hunting and angling communities to advance wildlife conservation is central to the imperative for fish and wildlife agencies to meaningfully engage with these constituencies (Dunfee et al., 2019). Goal 3 of the Wildlife Viewing Plan thus seeks to maximize the connection between wildlife viewing and wildlife and habitat conservation by increasing opportunities for viewers to directly perform conservation activities and cultivating a culture of responsible wildlife viewing in the Commonwealth.

Objective 1: Increase volunteer engagement by connecting wildlife viewers to conservation opportunities.

The Wildlife Recreation Study documented considerable engagement of wildlife viewers in conservation activities including teaching others about wildlife conservation; improving wildlife habitat on public and private lands; advocating, voting, or fundraising related to conservation; and collecting data to contribute to wildlife science or management (Grooms et al., 2020; Tsang et al., in review). Surveyed

wildlife viewers also indicated that they would be likely to engage in these same conservation activities specifically to support the work of DWR and that they are principally motivated to participate in conservation by the altruistic prospect of benefitting wildlife (Grooms et al., 2020). DWR can build on foundations established through its existing volunteer and citizen science projects and provide additional opportunities for wildlife viewers to contribute to the agency's conservation goals. In particular, the Virginia Breeding Bird Atlases (VABBA) sponsored by the agency have demonstrated the ability of citizen science projects to engage large numbers of wildlife viewers in conservation and with the agency (see Part III: "Virginia Breeding Bird Atlases"). This project has established a network of volunteers throughout the state that could be mobilized by other agency projects. Importantly, birders and other wildlife viewers made it clear in focus groups that their satisfaction with volunteer projects and their retention as volunteers relies on continued communication with the agency about the impact of their financial and scientific contributions (Grooms et al. 2019).

Strategies:

1. Develop resources that communicate avenues for wildlife viewers to engage in volunteer conservation activities, such as citizen science, habitat stewardship, outreach, and advocacy.
2. Provide opportunities for volunteers to assist with habitat stewardship on DWR lands to accomplish management goals.
3. Develop and promote citizen science projects that are aligned with DWR's management and conservation goals, and mechanisms for incorporating data generated by citizen scientists in DWR decision-making processes.
4. Work with partner organizations to create and coordinate volunteer opportunities for wildlife viewers and to recruit volunteers.
5. Implement best practices across volunteer programs to promote volunteer satisfaction and retention.
6. Develop pathways for volunteers to transition between projects in order to retain current agency volunteers and reactivate former volunteers.

Objective 2: Foster a culture of responsible wildlife viewing.

The SWOT analysis conducted for this plan identified human impacts on wildlife and habitats as an underlying threat to wildlife viewing opportunities in Virginia (see Part III). These impacts include broad patterns in urbanization and habitat loss in portions of the state, as well as the potential for outdoor recreationists to cause smaller-scale disturbance of wildlife and habitats in the course of their activities. DWR can play a role in fostering a culture of responsible engagement with wildlife by incorporating content about safety, ethics, and stewardship into new and existing points of contact between the agency and wildlife viewers. This objective brings together all three components of DWR's mission, directing the agency to connect people to wildlife while ensuring Virginia's natural resources are conserved for future generations by encouraging behaviors that protect both people and property.

Strategies:

1. Emphasize responsible wildlife viewing, including stewardship, ethics, and safety, in new and existing DWR communication materials, signage, and programs.
2. Work with partner organizations to incorporate stewardship, ethics, and safety into new and existing programs and events.

GOAL 4: Connect broader constituencies to the Virginia Department of Wildlife Resources through wildlife viewing

The explicit inclusion of wildlife viewing in DWR's updated mission and R3 planning are evidence of increasing support within the agency for engaging with wildlife viewers as key constituents. The SWOT analysis conducted for this plan identified this inclusion of wildlife viewing in organizational planning as a key strength in the ability of DWR to engage the public in wildlife viewing and conservation. However, more actively engaging with and prioritizing the needs of wildlife viewers as stakeholders challenges the legacy and paradigm of the North American Model of Conservation (see Part III: "Wildlife viewing and state fish and wildlife agencies") and may require difficult institutional change (Jacobson et al., 2010). The final goal of the plan focuses specifically on fostering mutual understanding and support between wildlife viewers and DWR. Objectives under this goal aim to increase viewers' awareness of DWR and its relevance to their activities; promote two-way dialogue and trust between viewers and the agency; and increase financial connections between wildlife viewers and DWR's conservation work.

Objective 1: Increase awareness of the scope of DWR's mission and its relevance to wildlife viewing.

Results from the Wildlife Recreation Study suggest that there is a need to increase awareness of and familiarity with DWR among the wildlife viewing community. In the survey, wildlife viewers who did not also identify as a hunter or angler were, on average, far less familiar with DWR than respondents who were hunters and anglers (Grooms et al., 2020). Further, focus groups revealed limited understanding of the ways in which DWR's mandated role applies to nongame wildlife conservation and recreation (Grooms et al., 2019). Many wildlife viewers perceived DWR to have an exclusive focus on hunting and fishing and referenced the agency's name (which was the Virginia Department of Game and Inland Fisheries at the time) as evidence of this. Some focus group participants described DWR's protection of nongame wildlife as a fortunate, but unintended consequence of managing habitat for hunting and fishing, rather than a key component of the agency's mission (Grooms et al., 2019). The agency's name change in early 2020 has the potential to clarify DWR's relevance to the conservation and enjoyment of all wildlife in Virginia, and this Wildlife Viewing Plan further details how the agency's efforts directly relate to wildlife viewing. Still, much remains to be done to increase understanding of the relevance of DWR's mission, vision, and values to wildlife viewing.

Strategies:

1. Develop a communication strategy to share the DWR mission, the role of DWR in conservation and outdoor recreation, and the agency's commitment to diverse constituencies, including wildlife viewers.
2. Sponsor, participate in, and organize events (virtual and in-person) that generate interest in wildlife viewing and engage the public with DWR staff and programs.

Objective 2. Increase dialogue and recognition between the agency and wildlife viewers to cultivate improved relationships.

Wildlife viewers, on average, have expressed lower levels of trust in DWR than other recreation groups, particularly in terms of trust in the agency to serve their recreation needs (Grooms et al. 2020). Focus groups with birders and other wildlife viewers highlighted the role of positive, personal interactions with agency employees in establishing and strengthening trust with the wildlife viewing community (Grooms et al. 2019). Trust of the agency by the wildlife viewing community is also shaped by perceptions of the agency's effectiveness and fairness (Grooms et al. 2019). The following strategies identify routes to foster increased trust and improved relationships with wildlife viewers by increasing internal training on the importance of wildlife viewing to DWR, strengthening external communication about the relevance

of DWR's activities to wildlife viewing, and establishing mechanisms for two-way communication between viewers and the agency.

Strategies:

1. Train DWR staff about the importance of wildlife viewing to DWR's mission, agency programs that support wildlife viewing, and ways in which viewers support the agency.
2. Establish and communicate mechanisms through which wildlife viewers can provide input to the agency.
3. Expand the scope of the Executive Director's advisory group to include regular communication and opportunities for feedback on issues relevant to wildlife viewing organizations.
4. Highlight the relevance of DWR's work to wildlife viewers through content published in partner and DWR communication channels.
5. Train agency volunteers to become "ambassadors" that can serve as a conduit for communication between DWR and the wildlife viewing community.
6. Foster ongoing engagement with agency volunteers and recognition of their contributions.

Objective 3: Increase monetary contributions of wildlife viewers to support DWR's work with wildlife and habitat conservation.

The SWOT analysis conducted by the SAC and TAC for the Wildlife Viewing Plan identified funding under each analysis category; it emerged as a strength, weakness, opportunity, and threat that might support or challenge DWR's efforts to expand engagement in wildlife viewing and between wildlife viewers and the agency (see Part III: "SWOT Analysis"). Wildlife viewers currently support the operational and conservation work of DWR through a variety of mechanisms (see Part III: "Funding"). Programs like Restore the Wild, DWR's Nongame Fund, and transfer money from state sales tax on optics and other viewing-related equipment provide the infrastructure for wildlife viewers to financially support DWR's efforts. However, around 70% of agency funding comes from sales of hunting and fishing licenses and excise taxes on hunting and fishing equipment transferred to the agency; another portion comes from registration and titling fees and sales and use taxes for boats. The lack of similarly consequential funding streams between wildlife viewers and DWR has raised concerns that activities that make more sizable financial contributions to the agency may continue to be prioritized over wildlife viewing (Grooms et al., 2019; also see Part III: "SWOT Analysis"). The Wildlife Recreation Survey indicated that Restore the Wild memberships have the potential to substantially engage viewers in financially supporting DWR. Over 23% of wildlife viewers who are not also hunters or anglers indicated that they are likely to support the work of DWR by purchasing a Restore the Wild membership in the next 12 months (Grooms et al., 2020). The following strategies focus on increasing internal and external awareness of the ways in which wildlife viewers can and do support the work of DWR and exploring additional ways to fund habitat conservation and viewing-related programming.

Strategies:

1. Increase internal training and awareness among DWR staff of the ways in which wildlife viewers financially support DWR.
2. Streamline and expand external promotion of existing funding mechanisms through which wildlife viewers can support DWR.
3. Implement DWR-sponsored events in which registration fees support wildlife or habitat conservation.
4. Explore opportunities to work with corporate or retail partners to generate funding for wildlife conservation and viewing-related programming.

Part VI
Implementation and Evaluation

This section provides additional details to guide the implementation and evaluation of the goals, objectives, and strategies defined in **Part V** of DWR's Wildlife Viewing Plan.

PLAN IMPLEMENTATION

Successful implementation of this Wildlife Viewing Plan over the next 10 years relies on coordination and cooperation across agency divisions. The majority of strategies will be connected to the efforts of the Outreach Division and the Watchable Wildlife Program within the Wildlife Division. However, as evidenced by the range of DWR programs and services described in Part III, all agency divisions will be connected to the DWR's wildlife viewing efforts. These contributions will vary widely based on the division, program, or position, and might include everything from the continued conservation of wildlife species and their habitats to development of the technological infrastructure needed for communicating with and managing data collected by wildlife viewers. Table 1 below outlines which agency divisions, and, in some cases programs, will be central to the implementation of each of the strategies outlined in this plan. All strategies are listed in the table, but agency staff will need to prioritize which strategies to focus on each year and over the course of the plan. It is expected that annual prioritization of strategies will be reflected in the operational plan developed for wildlife viewer R3 (recruitment, retention, and reactivation) each year.

While this table is a starting point, DWR staff will need to identify a key point person for coordinating implementation of the Wildlife Viewing Plan and an interagency committee, perhaps building from the TAC that developed this plan, that can lead efforts to move this plan forward. Additionally, while this plan was developed cognizant of current staffing and funding conditions within the DWR, its successful implementation will require ongoing assessment and filling of gaps in staff capacity required to implement plan strategies, achieve plan objectives, and realize the plan goals of promoting broader

participation in wildlife viewing and more meaningful engagement between wildlife viewers and the DWR. While some plan strategies can be effectively implemented with existing staff, full implementation of the plan will likely require additional human and financial resources. To facilitate effective implementation across agency divisions, components of this Wildlife Viewing Plan could be incorporated into existing Employee Work Profiles (EWPs), which outline the responsibilities of individual DWR employees and the percentage of their time allotted to each of those activities. Incorporation into EWPs would also contribute to annual evaluation of inputs, outputs, and outcomes related to this plan.

	Outreach Division	Wildlife Division	Watchable Wildlife Program	Fisheries Division	Human Dimensions Program	GIS & Mapping Program	Law Enforcement Division	Human Resources Division	Director's Office	All DWR
GOAL 1: Connect diverse segments of the public to wildlife and wildlife viewing in Virginia										
Objective 1: Increase participation by underrepresented gender, ethno-racial, and socio-economic groups in wildlife viewing events, programs, and activities led by DWR and partners.										
1. Use best practices and market research to target communications with a diversity of wildlife viewers.	•		•		•				•	
2. Represent and foster inclusivity of underrepresented groups through media, language, messaging, and venue in all DWR communication materials.	•		•							•
3. Develop strategic partnerships with organizations focused on and representative of underrepresented groups to promote wildlife viewing and support social networks for viewers from these groups, especially those new to viewing.			•						•	•
4. Enhance the accessibility and relevance of DWR lands, programs, and resources for underrepresented groups.		•		•			•			
5. Promote cultural competence and diversity and inclusion in agency approaches to hiring and training staff.	•							•	•	•
Objective 2: Increase engagement of urban populations in activities that connect people to wildlife and wildlife viewing.										
1. Expand access to and awareness of locations for wildlife viewing in and near urban areas.	•		•							
2. Develop and promote programs and activities that support wildlife viewing in urban areas.			•							
3. Develop communications materials that foster positive engagement between human communities and wildlife in urban areas.	•		•							
Objective 3: Increase awareness of wildlife and opportunities for participating in wildlife viewing among youth and families.										
1. Develop educational materials targeting families, with an emphasis on wildlife viewing, conservation of natural resources, and outdoor activities.	•	•	•	•						
2. Create and aid the development of activities that can be used or distributed by schools, partner organizations, libraries, and others to encourage wildlife viewing.	•		•							

	Outreach Division	Wildlife Division	Watchable Wildlife Program	Fisheries Division	Human Dimensions Program	GIS & Mapping Program	Law Enforcement Division	Human Resources Division	Director's Office	All DWR
3. Incorporate additional focus on Virginia's wildlife and ways to get involved in wildlife viewing and conservation into current agency-sponsored school programs.	•		•							
4. Offer agency programs that engage youth and families in wildlife viewing and habitat conservation.	•	•	•	•						
Objective 4: Develop resources to help viewers with little or no experience progress from initial awareness of recreational opportunities to continued participation and identification as a wildlife viewer.										
1. Create introductory resources, activities, and programs to help new and inexperienced wildlife viewers get started.	•		•							
2. Feature viewers with a variety of specialization levels in DWR media and communications.	•									•
3. Connect beginner viewers with partner organizations that can foster continued participation in wildlife viewing through viewing opportunities and social support.	•		•							
Objective 5: Raise awareness of wildlife viewing among groups that participate in other forms of outdoor recreation, in order to enrich their outdoor experience and introduce a new and related activity.										
1. Partner with organizations and events that broadly promote engagement with nature and the outdoors in order to reach outdoor recreationists and introduce viewing as a companion activity.	•	•	•	•					•	
2. Develop informational and communications materials that promote DWR, the VBWT, and wildlife viewing to specific outdoor recreationists (for example, paddlers, trail runners, mountain bikers, or campers).	•	•	•	•						
GOAL 2: Provide a variety of wildlife viewing opportunities accessible to all in the Commonwealth										
Objective 1: Encourage increased wildlife viewing on agency lands and waters through habitat management and communications about these properties.										
1. Continue to conduct holistic habitat management on DWR properties that supports opportunities for wildlife viewing and is consistent with the DWR Wildlife Action Plan.		•		•						
2. Develop communications that clarify the purpose of agency properties and the ability of these lands and waters to support multiple forms of wildlife recreation.	•	•	•	•						

	Outreach Division	Wildlife Division	Watchable Wildlife Program	Fisheries Division	Human Dimensions Program	GIS & Mapping Program	Law Enforcement Division	Human Resources Division	Director's Office	All DWR
3. Create simple, user-friendly communications and interpretation materials about wildlife viewing opportunities on various DWR properties, specific rules and restrictions for each property, amenities and accessibility, and appropriate safety information.	•	•	•	•			•			
4. Ensure on-site signage is effective, with accurate, up-to-date information about access and clearly marked entry points and parking areas.		•		•						
Objective 2: Increase use of Virginia Bird and Wildlife Trail sites for wildlife viewing activities.										
1. Expand promotion of the VBWT to improve awareness and understanding of the VBWT among wildlife viewers.	•		•			•				
2. Strengthen relationships with the owners or managers of VBWT sites and trail users to ensure the continued accessibility of these sites for wildlife viewing and to promote opportunities for public engagement in wildlife viewing, habitat management, or other activities on VBWT sites.	•	•	•	•	•		•			
3. Expand partnerships with counties, friend groups, wildlife viewing organizations, and other volunteers to support routine maintenance and reporting on VBWT sites.			•							
4. Increase the accessibility of VBWT sites, including DWR properties, for viewers with physical disabilities.		•	•	•						
Objective 3: Increase access to wildlife viewing opportunities at or close to home.										
1. Ensure that DWR's Habitat for Wildlife resources are easily accessible, up-to-date, and widely promoted and distributed.	•	•	•	•						
2. Create and promote DWR resources, programs, and events that support wildlife viewing at or close to home.	•		•							
3. Increase promotion of wildlife viewing opportunities external to the agency that viewers can participate in from or close to home.	•		•							
GOAL 3: Promote wildlife and habitat conservation through wildlife viewing										
Objective 1: Increase volunteer engagement by connecting wildlife viewers to conservation opportunities.										
1. Develop resources that communicate avenues for wildlife viewers to engage in volunteer conservation activities, such as citizen science, habitat stewardship, outreach, and advocacy.	•		•							

	Outreach Division	Wildlife Division	Watchable Wildlife Program	Fisheries Division	Human Dimensions Program	GIS & Mapping Program	Law Enforcement Division	Human Resources Division	Director's Office	All DWR
2. Provide opportunities for volunteers to assist with habitat stewardship on DWR lands to accomplish management goals.	•	•	•	•						
3. Develop and promote citizen science projects that are aligned with DWR's management and conservation goals, and mechanisms for incorporating data generated by citizen scientists in DWR decision-making processes.	•	•	•	•		•				
4. Work with partner organizations to create and coordinate volunteer opportunities for wildlife viewers and to recruit volunteers.	•	•	•							
5. Implement best practices across volunteer programs to promote volunteer satisfaction and retention.	•	•	•	•	•					•
6. Develop pathways for volunteers to transition between projects in order to retain current agency volunteers and reactivate former volunteers.	•	•	•	•						
Objective 2: Foster a culture of responsible wildlife viewing.										
1. Emphasize responsible wildlife viewing, including stewardship, ethics, and safety, in new and existing DWR communication materials, signage, and programs.	•		•							
2. Work with partner organizations to incorporate stewardship, ethics, and safety into new and existing programs and events.	•		•							
GOAL 4: Connect broader constituencies to the Virginia Department of Wildlife Resources through wildlife viewing										
Objective 1: Increase awareness of the scope of DWR's mission and its relevance to wildlife viewing.										
1. Develop a communication strategy to share the DWR mission, the role of DWR in conservation and outdoor recreation, and the agency's commitment to diverse constituencies, including wildlife viewers.	•	•	•	•					•	
2. Sponsor, participate in, and organize events (virtual and in-person) that generate interest in wildlife viewing and engage the public with DWR staff and programs.	•	•	•	•			•			

	Outreach Division	Wildlife Division	Watchable Wildlife Program	Fisheries Division	Human Dimensions Program	GIS & Mapping Program	Law Enforcement Division	Human Resources Division	Director's Office	All DWR
Objective 2. Increase dialogue and recognition between the agency and wildlife viewers to cultivate improved relationships.										
1. Train DWR staff about the importance of wildlife viewing to DWR's mission, agency programs that support wildlife viewing, and ways in which viewers support the agency.	•		•					•	•	
2. Establish and communicate mechanisms through which wildlife viewers can provide input to the agency.	•		•						•	
3. Expand the scope of the Executive Director's advisory group to include regular communication and opportunities for feedback on issues relevant to wildlife viewing organizations.									•	
4. Highlight the relevance of DWR's work to wildlife viewers through content published in partner and DWR communication channels.	•	•	•	•						
5. Train agency volunteers to become "ambassadors" that can serve as a conduit for communication between DWR and the wildlife viewing community.	•		•							
6. Foster ongoing engagement with agency volunteers and recognition of their contributions.	•	•	•	•						•
Objective 3: Increase monetary contributions of wildlife viewers to support DWR's work with wildlife and habitat conservation.										
1. Increase internal training and awareness among DWR staff of the ways in which wildlife viewers financially support DWR.	•									•
2. Streamline and expand external promotion of existing funding mechanisms through which wildlife viewers can support DWR.	•		•							
3. Implement DWR-sponsored events in which registration fees support wildlife or habitat conservation.	•	•	•	•			•			
4. Explore opportunities to work with corporate or retail partners to generate funding for wildlife conservation and viewing-related programming.	•		•						•	

PLAN EVALUATION

This section outlines a possible framework for tracking incremental progress towards the plan's ambitious goals, both at the end of the plan, in 2031, and periodically throughout its ten-year timeframe. The framework is based on McCawley's (2001) *Logic Model for Program Planning and Evaluation*, which has been effectively used to evaluate another DWR R3 program (Valdez et al., 2019). This framework organizes evaluation using logic models, which are graphical representations of the small steps and cause-and-effect relationships that lead to desired results. In the framework, logic models are defined in relation to a **situation -** or the problem **-** addressed by the activity being evaluated. For this plan, logic models were constructed for each plan objective, since these objectives were developed to capture underlying issues in wildlife viewing in Virginia (for more information about the situation reflected in each objective, see Part V).

The logic models in this framework account for the inputs required for plan implementation, and differentiate between outputs (what the agency does) and outcomes (changes that occur as a result of what the agency does). **Inputs** are the human, financial, and material resources that are invested to accomplish plan objectives, and generally include staff, partner, or volunteer time; funding; partnerships with other agencies or organizations; research projects and analyses; and internal trainings. In this logic model, **outputs** capture the agency's activities and include both what the DWR does or produces as well as the relationships that are formed or strengthened by the activities of agency staff. For example, outputs might include programs or services that are delivered; facilities and signage that are installed; and program participants, customers, partners, and decision-makers who are reached. **Outcomes** are the impacts of agency efforts and are divided into short-term, medium-term, and long-term outcomes. *Short-term outcomes* generally focus on changes in awareness, knowledge, skills, or attitudes, while *medium-term outcomes* build upon short-term outcomes to produce changes in behavior or policies. For this plan, *long-term outcomes* refer to changes in the economic, social, environmental, or political conditions that shape wildlife viewing in Virginia. Desired long-term outcomes for this plan often reflect the language of objectives and fundamentally include increases in participation in wildlife viewing in the state, as well as increased engagement between the DWR and wildlife viewers through recreation, volunteer opportunities, and funding streams.

The following framework is intended only as a starting point. As agency staff begin to implement strategies and specific tactics, they will need to refine an approach to evaluation for each objective and develop processes for tracking outputs and measuring outcomes. Below each logic model is a list of possible measurement tools that can be used to evaluate outcomes. While *outputs* could be assessed on an annual basis, evaluation of *outcomes* will generally require in-depth measurements, often in relation to a baseline. The Wildlife Recreation Survey conducted in association with this plan (see Part IV), as well as myriad other state-wide or agency surveys, provide valuable baseline information for many outcomes. Follow-up data derived from future DWR or state-wide surveys will be important for evaluating those outcomes; others might be assessed using approaches such as Google Analytics, analysis of eBird or iNaturalist observations, or tracking requests for DWR programs, services, and resources.

Goal 1, Objective 1

Representation of gender, ethno-racial, and socio-economic groups in wildlife viewing

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations Trainings	Printed media, publications and reports Digital media Contact lists Programs, events, and workshops Evaluation measures updated over time	Increased awareness of and interest in DWR programs, events, and communications among underrepresented groups Increased satisfaction with DWR programs, events, and communications among underrepresented groups Increased use of digital and social media content designed for target populations Increased cultural competency and awareness of diversity and inclusion issues among DWR employees	Increased participation of target populations in wildlife viewing events or programs directly affiliated with DWR Increased participation of target populations in hunting and fishing Number of Virginia Wildlife Grant Program applications from under-represented groups	Increased overall participation of target populations in wildlife viewing Virginia's wildlife viewing population is more representative of Virginia's population Increased diversity among DWR employees Increased number of Virginians who identify as a wildlife viewer

Example measurement tools: Survey of Notes from the Field subscribers; Survey of VBWT visitors; National Survey of Fishing, Hunting and Wildlife-related Recreation; event surveys; Wildlife Recreation Survey

Goal 1, Objective 2
Participation in wildlife viewing by urban populations

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Print media, publications and reports Digital media Contact lists Programs, events, and workshops Facilities and signage Evaluation measures updated over time	Increased contact between the DWR and urban populations Increased awareness of urban viewing locations Increased interest in urban wildlife viewing programs and materials Increased engagement with digital urban wildlife content Increase in wildlife viewing skills among urban residents	Increased number Virginia Wildlife Grant Program applications from urban areas Increased requests for VBWT brochures from urban areas Increased sale of agency memberships, licenses, and permits from urban areas Increased eBird and iNaturalist observations from urban areas Increased participation in DWR programs focused on urban viewing	Increased participation in wildlife viewing among urban populations Increased number of urban residents that identify as wildlife viewers Positive attitudes towards wildlife among urban populations Decreased number of wildlife conflict calls from urban areas Increased number of Virginians who identify as a wildlife viewer

Example measurement tools: Utilize Google analytics; survey of *Notes from the Field* subscribers; survey of VBWT users/visitors; metrics of social media engagement; Wildlife Recreation Survey

Goal 1, Objective 3
Participation in wildlife viewing by youth and families

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Contact lists Programs, events, and workshops Equipment rentals Evaluation measures updated over time	Increased knowledge about wildlife and wildlife viewing among youth and families Increase in wildlife viewing skills among youth and families Increased interest in DWR youth programs Increased breadth of DWR partnerships related to viewing among youth and families	Increased youth and family attendance at wildlife viewing festivals Increased requests for Project Wild or habitat education program Increased use of DWR programs for youth, including loaner equipment, videos, curriculum kits, etc. Increased use of DWR online content geared towards youth and families	Increase participation of youth and families in wildlife viewing events or programs directly affiliated with DWR Growth in demand for wildlife viewing programs in Virginia Increased engagement between DWR and youth and families through school programs Increased number of Virginians who identify as a wildlife viewer

Example measurement tools: Attendance numbers at events; school participation (number of students participating in agency curricula); website traffic on DWR education pages; Wildlife Recreation Survey

Goal 1, Objective 4

Continued participation among wildlife viewers with little or no experience

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Contact lists Programs, events, and workshops Evaluation measures updated over time	Increased knowledge of wildlife viewing opportunities among less experienced viewers Increased interest among birding/viewing guides and organizations in supporting viewers with less experience Increased expertise among birding/viewing guides for supporting less experienced viewers	Increased use of DWR resources relevant to wildlife viewing Increased number of less experienced wildlife viewers utilizing the VBWT and agency lands Increased recruitment of new wildlife viewers by more experienced viewers	Formerly less experienced viewers continue to participate in and gain experience with wildlife viewing Increased number of Virginians who identify as a wildlife viewer

Example measurement tools: National Survey of Hunting, Fishing and Wildlife-related Recreation: number of people traveling to view wildlife; number of days spent viewing wildlife; Wildlife Recreation Survey

Goal 1, Objective 5

Participation in wildlife viewing among groups that participate in other forms of outdoor recreation

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Contact lists Programs, events, and workshops Evaluation measures updated over time	Increased awareness of wildlife and wildlife viewing among outdoor recreationists Increased number of partnerships with organizations that do not traditionally focus on wildlife	Increased participation in Run for the Wild Increased participation in DWR wildlife viewing programs and workshops by people who primarily identify with other outdoor recreation activities	Increased number of VIrginians who identify as a wildlife viewer Increased number of hunting and/or fishing license holders participating in wildlife viewing Increased number of wildlife recreationists who participate in multiple outdoor activities

Example measurement tools: Survey VBWT visitors about other outdoor recreation activities; Pop-up surveys of visitors to the wildlife viewing page on the Agency website; WIldlife Recreation Survey

Goal 2, Objective 1
Wildlife viewing on agency lands

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Programs, events, and workshops Wildlife habitat improved Facilities and signage Evaluation measures updated over time	Increased understanding of agency properties Increased understanding of where to access information on property amenities, restrictions, and accessibility Increased use of online WMA information Increased social media engagement related to agency lands (e.g., posts at WMAs) Increased interest in using agency lands for wildlife viewing	Increased sale of Restore the Wild memberships and WMA access permits Increased number of subscribers to wildlife viewing and habitat newsletters Increase visitation to agency lands for wildlife viewing activities Increased eBird and iNaturalist observations submitted from agency lands	Increased visitor satisfaction with agency lands for wildlife viewing Increased number of trips wildlife viewers make for their viewing activities each year Increased perception that agency lands support multiple recreation activities

Example measurement tools: WMA Visitor Surveys; electronic visitor counters; evaluation of social media engagement; evaluation of citizen science contributions; Wildlife Recreation Survey

Goal 2, Objective 2
Wildlife viewing on Virginia Bird and Wildlife Trail sites

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Contact lists Programs, events, and workshops Facilities and signage Evaluation measures updated over time	Increased public knowledge of the VBWT and its locations Increased use of VBWT guide materials (e.g. online guide and Find Wildlife) Increased requests for VBWT brochures and rack cards Increased awareness among partners of the Adopt-a-Trail program	Increased visitation to VBWT sites Increased participation in wildlife viewing or volunteer activities occurring on VBWT sites Increased subscribers to wildlife viewing newsletter Increased eBird and iNaturalist observations on VBWT sites Increased allocation of grants to support wildlife viewing infrastructure on VBWT sites More VBWT sites adopted by volunteer groups	Increased travel-related spending in Virginia as a result of VBWT visitation Increased visitor satisfaction with VBWT site quality and opportunities for wildlife viewing Increased satisfaction from VBWT partners (i.e., site owners)

Example measurement tools: National Survey increase in wildlife viewing trips/days viewing; Google analytics for the VBWT portion of the Agency website and the Find Wildlife app; Wildlife Recreation Survey

Goal 2, Objective 3
Wildlife viewing around the home

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Programs, events, and workshops Evaluation measures updated over time	Increased ability among viewers to take advantage of home-based wildlife viewing opportunities Increased number of views and downloads from the "habitat" portion of the DWR website Increased interest in DWR's wildlife cameras	Increase in product sales related to wildlife viewing at home (e.g. feeders, bird seed, bird houses) Increased sales of of native plant species and Habitat at Home resources Increased participation in events that promote home-based viewing Increased viewing of DWR's wildlife cameras Increased participation among Virginians in external viewing programs (e.g., Audubon Christmas Bird Count)	Increased participation in wildlife viewing around the home Increased satisfaction with DWR content related to around the home wildlife viewing Increased number of landowners working with DWR biologists to promote wildlife habitat on their land Increased backyard habitat for birds, pollinators, and other wildlife

Example measurement tools: Agency certifications; eBird and iNaturalist observations; Agency-certified habitats; Wildlife Recreation Survey

Goal 3, Objective 1
Engagement of wildlife viewers in volunteer opportunities

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Communication channels Contact lists Programs, events, and workshops Evaluation measures updated over time	Increase in requests for information regarding available volunteer opportunities Increased ability among viewers to take advantage of volunteer opportunities Growth in contact list of potential agency volunteers	Increased participation in DWR volunteer opportunities (# of participants, participant hours) Increased participation in external projects promoted by DWR Increase in iNaturalist, eBird, and Backyard Habitat observations Growth in stewardship committees for agency lands Increased voting and advocacy relevant to DWR and wildlife viewing	Increased use of volunteers across divisions and in a larger variety of projects Increased public satisfaction with DWR volunteer opportunities Increased amount of citizen science data incorporated into VAFWIS Increase in number or scale of projects Lands and Access staff can commit to as a product of increased/reliable volunteer assistance

Example measurement tools: Google Analytics; evaluation of volunteer opportunities across DWR; surveys to VMNs and other agency volunteers

Goal 3, Objective 2
Foster a culture of responsible wildlife viewing

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Programs, events, and workshops Evaluation measures updated over time	Increased recognition and awareness of the "Leave no Trace" campaign Increased viewership of ethics-related materials on the DWR website Increased knowledge among viewers of guidance promoted by DWR on feeding and interacting with wildlife Increased ability of Virginia Master Naturalists and agency volunteers to implement responsible viewing practices	Less trash improperly disposed of at publicly accessible wildlife viewing locations and events Decrease in public complaints about mistreatment of wildlife Decrease in citations related to mistreatment or harassment of wildlife	Wildlife viewing activities in Virginia have little impact on wildlife and their habitats

Example measurement tools: Survey of Master Naturalists and other DWR program volunteers; Google Analytics for visitation to DWR's online resources; Law Enforcement citations; internal survey of Lands and Facilities staff

Goal 4, Objective 1
Awareness of DWR's mission and relevance to wildlife viewing

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations	Printed media, publications and reports Digital media Evaluation measures updated over time	Increased knowledge of the agency and its updated name Increased awareness of the DWR's role in wildlife conservation and recreation Increased awareness of DWR's role in youth programming in schools	Increased news media reporting of agency's outreach efforts Increased use of DWR website Increased followers or activity on DWR social media accounts Increased participation in DWR wildlife viewing events and programs	Increased perception that DWR prioritizes wildlife viewing, along with other forms of wildlife recreation Increased levels of familiarity between wildlife viewers and the agency

Example measurement tools: Survey of Virginians regarding the Agency; news media content analysis of agency's outreach efforts; Google Analytics for social media efforts; Wildlife Recreation Survey

Goal 4, Objective 2
Relationships between the DWR and wildlife viewers

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations Trainings	Printed media, publications and reports Digital media Communication channels Programs, events, and workshops Evaluation measures updated over time	Increased understanding among DWR staff about the importance of wildlife viewing to the agency Increased perception among wildlife viewers that the DWR is relevant to wildlife viewing Increased knowledge of the DWR's efforts to support wildlife viewing Public comments from wildlife viewers on this Wildlife Viewing Plan	Increased attendance by wildlife viewers at public agency meetings Increased public input concerning Agency actions and decisions Increased submissions to agency media from wildlife viewing partners Increased partnership requests from wildlife viewing organizations, clubs, and groups Increased number of VMN volunteer hours on DWR lands and projects	Increased input received from wildlife viewers in relation to agency operations and regulations changes Retention of a robust cadre of volunteers Increased agreement that the DWR represents the values of wildlife viewers

Example measurement tools: Content analyses of public comments; evaluation of social media engagement

Goal 4, Objective 3
Financial support from wildlife viewers

Inputs	Outputs	Short-term outcomes	Medium-term outcomes	Long-term outcomes
Funding for projects Staff time Partnerships Research projects and evaluations Trainings	Printed media, publications and reports Digital media Events Evaluation measures updated over time	Increased ability among wildlife viewers to identify and take advantage of options for financially supporting the DWR Increased understanding of the purpose and benefits of the Restore the Wild membership	Increased Restore the Wild memberships Increased nongame fund contributions Increased purchase of conservationist license plates Increased corporate sponsorships Increased tax-based donations to the agency Increased public engagement in Restore the Wild programming	Broad support for new funding mechanisms Additional funds available to support habitat restoration and viewing opportunities Increased satisfaction with agency use of nongame fund contributions

Example measurement tools: Survey of Restore the Wild Members, Customer satisfaction surveys

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Appendix A: Stakeholder and Technical Advisory Committees

STAKEHOLDER ADVISORY COMMITTEE MEMBERS

Aaron Floyd	Blue Ridge Discovery Center
Bill Williams	Coastal Virginia Wildlife Observatory
Bob Schamerhorn	Virginia Audubon Society; wildlife photographer
Conner McBane	Appalachian Trail Conservancy
Doug Rogers	Virginia Bluebird Society
Evan Spears	Virginia Department of Conservation and Recreation
Jennifer Dalke	The Nature Conservancy
Kathie Driscoll	The Nature Foundation at Wintergreen; Lynchburg Birding Club
Kathy Funk	Rocky Mountain Elk Foundation
Kristen Sinclair	Fairfax County Park Authority
Larry Mendoza	Virginia Herpetological Society
Laura Neale	Virginia Society of Ornithology
Lauren Cruz	U.S. Fish and Wildlife Service, Eastern Virginia Rivers National Wildlife Refuge Complex
Lindsay Hermanns	Virginia Tech, Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS)
Mary Foster	Virginia Master Naturalists; Virginia Southside Bird Club
Meg Riddle	George Washington National Forest
Michelle Prysby	Virginia Master Naturalist program; Virginia Cooperative Extension
Nancy Vehrs	Virginia Native Plant Society
Sandra Tanner	Virginia Tourism
Steve McCurdy	Butterfly Society of Virginia

TECHNICAL ADVISORY COMMITTEE MEMBERS

Gray Anderson	Chief of Wildlife
Mike Bednarski	Chief, Aquatic Wildlife Resources Division
George Braxton	Chief Diversity and Inclusion Officer
John Copeland	Fisheries Biologist III
Nelson Lafon	Forest Wildlife Program Manager
Sergio Harding	Nongame Bird Conservation Biologist
Edward Herndon	Recruitment, Retention, and Reactivation (R3) Coordinator
Ron Hughes	Region 4 Lands and Facilities Manager
Stephen Living	Lands and Facilities Manager
Jimmy Mootz	Outreach Education Coordinator
Brian Moyer	Deputy Director of Outreach
Paige Pearson	Public Information Officer
Jessica Ruthenberg	Watchable Wildlife Biologist
Betsy Stinson	District Wildlife Biologist
Meagan Thomas	Watchable Wildlife Biologist
Jeff Trollinger	Assistant Chief, Aquatic Wildlife Resources Division
Rene Valdez	Human Dimensions Specialist
Dan Wilson	Fisheries Biologist

Appendix B: Potential Tactics for Plan Implementation

This appendix contains potential tactics that could be used to implement each of the strategies of the Wildlife Viewing Plan. As described in the plan, these tactics reflect ideas suggested during combined meetings between the SAC and TAC for engaging more people with wildlife, wildlife viewing, and DWR. The plan's strategies were developed from these tactics, and the original tactics are retained here to provide DWR staff with a menu of specific, actionable steps they might adopt and/or adapt as they seek to achieve the objectives of the Wildlife Viewing Plan.

GOAL 1: Connect diverse publics to wildlife and wildlife viewing in Virginia

Objective 1: Increase participation by underrepresented gender, ethno-racial, and socio-economic groups in wildlife viewing events, programs, and activities led by DWR and partners

1. **Use best practices and market research to target communications to a diversity of wildlife viewers, including through increased representation of underrepresented groups in DWR communication materials.**
    a. Conduct research and evaluation to quantify the effectiveness of current outreach programs targeting under-represented groups.
    b. Increase representation of women, BIPOC, and other under-represented groups in DWR social media, blog articles and promotional materials.
2. **Develop strategic partnerships with organizations focused on and representative of underrepresented groups to promote wildlife viewing and support social networks for viewers from these groups, especially those new to viewing.**
    a. Develop strategic partnerships with groups such as Outdoor Afro and Latino Outdoors whose missions are to connect BIPOC with the outdoors; this ensures that programs targeting communities of color are led by individuals who are connected to and understand these communities.
    b. Collaborate with Virginia chapters of MANRRS (Minorities in Agriculture, Natural Resources and Related Sciences) to make connections between college-age people of color and wildlife viewing activities.
    c. Promote an increase in diversity among members and staff (including leadership) of wildlife and outdoor recreation organizations and associated events.
    d. Promote recruitment and stronger social networks for under-represented groups through "bring a friend" events.
3. **Enhance the accessibility and relevance of DWR lands, programs, and resources for underrepresented groups.**
    a. Increase the relevance of DWR-sponsored festivals and events to under-represented groups, and target promotion of events to these groups.
    b. Target promotion of the Virginia Wildlife Grant Program to communities and youth organizations consisting of underrepresented groups.
    c. Promote access to DWR areas for wildlife or recreation organizations in order to promote participation and use among underrepresented groups, including through fee waivers.
    d. Consider interpretive and educational signage at select WMAs in Spanish or other

languages based on the area's demographic needs, beyond current regulatory signage.

4. **Promote cultural competence and diversity and inclusion in agency approaches to hiring and training staff.**
    a. Develop training and resources to increase cultural competency and awareness of the need for diversity and inclusion among DWR staff.
    b. Provide leadership and guidance on how to engage BIPOC in wildlife viewing through publicly available resources on diversity and inclusion in wildlife viewing designed for wildlife professionals and wildlife viewers.
    c. Recruit qualified candidates from under-represented groups in an effort to increase diversity of agency employees, particularly among biological and law enforcement staff.

Objective 2: Increase engagement of urban populations in activities that connect people to wildlife and wildlife viewing

1. **Expand access to and awareness of locations for wildlife viewing in and near urban areas.**
    a. Highlight locations in urban areas to see birds and wildlife that are easy to access and have amenities.
    b. Consider how to work with partners to acquire and manage land in urban areas for wildlife viewing.
2. **Develop and promote programs and activities that support wildlife viewing in urban areas.**
    a. Increase outreach to educators in urban areas, with a particular focus on increasing their understanding of how to access DWR resources and funding, such as the Virginia Wildlife Grant Program.
    b. Coordinate small group events and partnerships in urban areas, including through social media.
3. **Develop communications materials that foster positive engagement between human communities and wildlife in urban areas.**
    a. Use social media or create educational materials to promote and highlight positive human encounters with wildlife in urban areas.

Objective 3: Increase awareness of wildlife and opportunities for participating in wildlife viewing among youth and families.

1. **Develop educational materials targeting families, with an emphasis on wildlife viewing, conservation of natural resources, and outdoor activities that can be done together.**
    a. Develop resources for parents, guardians, and caregivers to help them recognize and cultivate youth interest in wildlife viewing.
    b. Determine if a list of nature camps in Virginia currently exists (for example, compiled by Virginia Tourism) and promote it by sharing links on DWR's website.
2. **Create and aid the development of activities that can be used or distributed by schools, partner organizations, libraries, and others to encourage wildlife viewing.**
    a. Help schools and other organizations connect youth to viewing by developing curriculum or program kits about birding and viewing (such as Idaho's Bird by Bird Program).
    b. Develop an easy to follow schoolyard habitat program with curriculum kits and planting guides for teachers.
    c. Develop video guides and kits or boxes available through local libraries for engaging kids in establishing backyard habitat.

    d. Explore how to gradually build programs for loaning or renting viewing equipment (e.g., binoculars, field guides, tents, etc.) or support grant programs that could increase equipment purchases and loaning programs by partner organizations. *(Also addresses Goal 1, Objective 4)*

3. **Incorporate additional focus on Virginia's wildlife and ways to get involved in wildlife viewing and conservation into current agency-sponsored school programs.**
    a. Enhance the connection between DWR and Project Wild by including content specific to DWR and Virginia's wildlife in Project Wild programming, which is a national curriculum and not state-specific. *(Also addresses Goal 4, Objective 1)*
4. **Offer agency programs that engage youth and families in wildlife viewing or habitat conservation or establishment.**
    a. Increase direct agency interaction with schools through DWR-specific programs in schools or supporting field activities (e.g. taking school groups to WMAs).
    b. Collaborate with other organizations on "train the trainer" programs to train (and possibly certify) wildlife recreationists to work with youth.
    c. Develop and expand current programs that encourage youth and families to participate in wildlife viewing, including competitions and games (for example, bio blitzes utilizing iNaturalist/ Wildlife Mapping, Kids in the Woods Day, 4-H, and youth programs hosted by Virginia Master Naturalist volunteers).
    d. Develop short weekend programs for kids like those offered by Home Depot to build youth interest in wildlife and habitats.
    e. Bring wildlife viewing opportunities to non-nature camps, and provide youth something tangible to take home from the experience.
    f. Determine where families usually go when they participate in outdoor activities, and develop methods to bring wildlife viewing opportunities to those locations.

Objective 4: Develop resources to help viewers with little or no experience progress through the Outdoor Recreation Adoption Model from awareness to avid viewer.

1. **Create introductory resources, activities, and programs to help new and inexperienced wildlife viewers get started.**
    a. Provide information on wildlife viewing activities at a very introductory level, including how to view common wildlife species in backyards and local parks.
    b. Expand opportunities for introductory birding/wildlife viewing classes beyond the festival circuit.
    c. Conduct research to inform better marketing of good places to go wildlife viewing for amateur viewers; while more experienced viewers may be interested in sites with more diversity and/or higher probability of viewing rare species, beginners might be more interested in sites with a high probability of seeing more common species.
2. **Feature viewers with a variety of specialization levels in DWR media and communications.**
    a. Offer diverse mechanisms for viewers to share their experiences, especially how they were introduced to wildlife viewing, and promote these stories through social media and DWR's other communication channels.
    b. Represent a spectrum of specialization levels, including amateur viewers, in agency media and messaging, and tailor current agency messaging and programming to be welcoming to first-time/amateur viewers.

3. **Provide training or guidance for partner organizations on introducing people to wildlife viewing and fostering continued participation through viewing opportunities and social support.**
    a. Include information on the DWR website that directs people to birding and viewing clubs in Virginia, in order to connect first-time/amateur viewers to existing social support systems.
    b. Provide training or guidelines for birding/viewing guides on how to support viewers with less experience at festivals.

Objective 5: Raise awareness of wildlife viewing among groups that participate in other forms of outdoor recreation, in order to enrich their outdoor experience and introduce a new and related activity.

1. **Partner with organizations and events that broadly promote engagement with nature and the outdoors in order to reach outdoor recreationists and introduce viewing as a companion activity.**
    a. Collaborate with current programs that encourage broad participation in wildlife viewing or outdoor recreation (e.g., The City-Nature Challenge; The River Rock Festival in Richmond, GO Outside Festival in Roanoke, VA).
    b. Conduct agency tabling or programming at major outdoor events and festivals (e.g., GoFest, Virginia State Fair).

2. **Develop informational and communications materials that promote the DWR, VBWT, and wildlife viewing to specific outdoor recreationists (for example, paddlers, trail runners, mountain bikers, or campers).**
    a. Develop a search or filter function for the VBWT section of the DWR website that allows people to search sites by available facilities (such as trails, kayak/canoe rentals and launches, campsites, etc.) and a plan for maintaining the website.
    b. Increase awareness and use of VBWT sites by people who are paddling, hiking, and camping by developing targeted ads for the VBWT in appropriate publications.
    c. Communicate with hunters, anglers, and non-wildlife recreationists (including trail runners, hikers, and paddlers) about the connections between their current recreation activities and wildlife viewing (for example, share birding guides with hunters and anglers or develop blog posts about wildlife that can be seen while hiking).
    d. Work with partner organizations to provide materials about wildlife viewing and the VBWT (for example, brochures, videos, or presentations) to outdoor recreation clubs and retailers. *(Also addresses Goal 2, Objective 3)*
    e. Develop informational materials geared toward running/hiking/biking communities on best practices for minimizing their impact on wildlife and habitats while recreating.

GOAL 2: Provide a variety of wildlife viewing opportunities accessible to all in the Commonwealth

Objective 1: Encourage increased wildlife viewing on agency lands and waters through habitat management and messaging about these properties.

1. **Continue to conduct holistic habitat management on DWR properties that includes all wildlife and is consistent with the DWR Wildlife Action Plan.**

    a. Consider a wider breadth of wildlife in habitat management.
    b. Promote management practices that foster diverse habitat assemblages that support native wildlife communities.
    c. Continue to incorporate habitat enhancement during the planning phase for WMA management strategies.
    d. Develop metrics for measuring progress towards and achievement of management goals.
2. **Develop communications that clarify the purpose of agency properties and the ability of these lands and waters to support multiple forms of wildlife recreation.**
    a. Work on messaging in order to raise the profile of WMAs among wildlife viewers and clarify their unique mission and management.
    b. Consider ways to highlight the ability of WMAs to support both hunting and viewing activities, especially through infrastructure and information about usage.
    c. Address perceived safety issues and interference associated with a multi-use approach to recreation on WMAs.
    d. Encourage use of WMAs by viewers on Sundays, when hunting (mostly) does not occur.
3. **Create simple, user-friendly communications about wildlife viewing opportunities on various DWR properties, specific rules and restrictions for each property, amenities and accessibility, and appropriate safety information.**
    a. Develop and publicize an online resource that provides clarity about when various management and recreation activities are happening on WMAs, since these activities vary across WMAs, counties, and months.
    b. Ensure that all WMAs are listed as part of the VBWT, have VBWT signage, and that WMA webpages connect to the detailed wildlife viewing info provided in the VBWT online guide for each site.
    c. Advertise the "Find Wildlife App" to a wider audience.
    d. Promote wildlife habitat management/conservation and viewing opportunities on WMAs through on-site signage accessible to WMA visitors (such as what has been done for Red-cockaded Woodpeckers at Big Woods WMA).
    e. Develop an interactive, online resource to show the location, available resources, and differences in facilities at WMAs across Virginia (e.g., online GIS map or app), including images, so viewers know what to expect when visiting these properties.
4. **Ensure on-site signage is effective, with accurate, up-to-date information about access and clearly marked entry points and parking areas.**
    a. Ensure that entry points for public lands are easily located; update maps online and on paper to include newer public land designations.
    b. Ensure parking areas are clearly labelled, especially when they are on the side of the road, and make clear, easy-to-find parking maps available online.
    c. Provide signage that indicates when and why public lands are closed, and make this information easily accessible online.
    d. Provide more information on-site at public lands about license and fee requirements, including signs detailing options for paying via kiosks, online, or through the app.

Objective 2: Increase use of VBWT sites for wildlife viewing activities.

1. **Expand promotion of the VBWT to improve awareness and understanding of the VBWT among wildlife viewers.**

a. Promote WMA and VBWT sites through multiple media channels (e.g., email communications and newsletters, social media, podcasts).
b. Work with partners (for example, tourism entities, nature centers, and outdoor retailers) to increase marketing of and distribution of materials about the VBWT.
c. Improve online information to address widespread lack of understanding about what VBWT sites are, where they are located, what can be expected on the sites, and the fact that they encompass a diverse array of both public and private lands, managed by diverse entities; clarify that the VBWT resource compiles all the best lands for birding and wildlife viewing in one place.
d. Assess issues associated with VBWT signage, and address these challenges as resources allow.
e. Continue to update the design of and content about the VBWT on the DWR website.
f. Continue to maintain ads for the VBWT in internal and external print materials and social media platforms (e.g., Virginia Wildlife Magazine).
g. Expand the series of regional VBWT brochures to include more parts of the Commonwealth and make these available in DWR's regional offices.
h. Train DWR staff on the opportunities provided by the VBWT for wildlife viewers and available VBWT promotional materials

2. **Strengthen communication with the owners or managers of VBWT sites and trail users to support the continued accessibility of these sites for wildlife viewing and to promote opportunities for public engagement in wildlife viewing, habitat management, or other activities on VBWT sites.**
    a. Develop a mechanism for collecting information about events happening at VBWT sites so that DWR can help communicate these events or partner in hosting them.
    b. Develop programs that incentivize or reward wildlife viewing on public lands (for example, visiting VBWT sites or loops within the state).
    c. Work closely with VBWT site owners or managers and DWR land managers to promote opportunities for public engagement in wildlife viewing, habitat management, or other activities on VBWT sites.
    d. Establish mechanisms for providing feedback on VBWT sites, including suggesting the addition or removal of sites, and communicate with viewers about these opportunities.
    e. Continue to provide small grants to localities seeking funding for wildlife viewing amenities on their public lands.
3. **Expand partnerships with counties, friend groups, wildlife viewing organizations, and other volunteers to support routine maintenance and reporting on VBWT sites.**
    a. Connect with local bird clubs and other recreation groups to investigate whether they know about and use the VBWT and reintroduce them, if necessary.
    b. Strengthen partnerships with counties, friend groups, and volunteers to help reduce the costs and maintenance burden of facilities on public lands.
    c. Seek creative solutions to waste management on public lands.
    d. Promote the Adopt-a-Trail program to wildlife viewing organizations to increase awareness of VBWT.
    e. Work with current citizen science participants (such as VABBA2) to promote viewing opportunities on public land to others.
4. **Increase the accessibility of VBWT sites, including DWR properties, for viewers with physical disabilities.**
    a. Improve the accessibility of information about the availability and locations of barrier-free and accessible trails at WMAs.

b. Where financially feasible, increase the number of barrier-free and ADA-compliant facilities on DWR properties.
c. Expand existing DWR grant programs to localities to include providing infrastructure or amenities, such as trails and viewing platforms, that improve the accessibility of VBWT sites for wildlife viewing.

Objective 3: Increase access to wildlife viewing opportunities from or close to home.

1. **Ensure that DWR's Habitat for Wildlife resources are easily accessible, up-to-date, and widely promoted and distributed.**
    a. Ensure that backyard habitat and home-based viewing materials on the DWR website are easily accessible, up-to-date, and promoted and advertised.
    b. Partner with Master Naturalists, Master Gardeners, Native Plant Partnership, and other groups (Audubon, Virginia Native Plant Society) to offer online and in-person resources for establishing backyard habitat. Ensure that this information is accessible for beginners and relevant for people with limited financial means and varying acreage.
    c. Connect people to the grass-roots "Homegrown National Park" ideas of Doug Tallamy by sharing links to his books and recorded presentations in backyard habitat materials and on the DWR website.
    d. Update and maintain a list of available programming for backyard habitat certification through partner organizations (such as the National Wildlife Federation).
    e. Partner with nurseries to ensure people can find native plants that are in limited supply.
    f. Work with DWR's private lands biologists to connect wildlife viewers to information about Farm Bill programs for habitat conservation on private land and develop management plans for their properties.
    g. Provide training opportunities for private landowners and public lands volunteers involving habitat management practices and tools.
    h. Expand and promote DWR's Habitat Partners Program to engage businesses, private landowners, and schools in wildlife viewing, wildlife conservation, and DWR programs.
2. **Create and promote DWR and partnered resources, programs, and events that support wildlife viewing from or close to home.**
    a. Use web-based platforms (for example, Zoom and Facebook Live) to host virtual wildlife viewing programming for people at home.
    b. Communicate to broader audiences about DWR's wildlife cameras.
    c. Provide information on bird feeders, bird baths, and nest boxes as introductory ways that people can interact with wildlife in their yards.
3. **Increase outreach for wildlife viewing opportunities external to the agency that viewers can participate in from or close to home.**
    a. Increase outreach for wildlife-oriented programs that do not require travel (for example, programs like Birding Bingo and North Carolina's Candid Critter Program).
    b. Promote wildlife mapping projects that allow viewers to share what they see in their backyards.

GOAL 3: Promote wildlife and habitat conservation through wildlife viewing

Objective 1: Increase volunteer engagement by connecting wildlife viewers to conservation opportunities.

1. **Develop resources that communicate avenues for wildlife viewers to engage in volunteer conservation activities, such as citizen science, habitat stewardship, outreach, and advocacy.**
    a. Develop resources for adults and youth that provide guidance on how to get involved in volunteer opportunities.
    b. Add messaging on how to do outreach related to wildlife viewing and on viewing ethics to existing DWR resources, including the agency website and resources being developed by the Watchable Wildlife Program.
    c. Provide educational materials on wildlife viewing, ethics, conservation, etc. to county and local government nature centers and other nonformal environmental education organizations. Consider connecting with some of these centers through the Virginia Association for Environmental Education.
    d. Communicate the importance of voting and advocacy as conservation behaviors to wildlife viewers.
2. **Provide opportunities for volunteers to assist with habitat stewardship on DWR lands to accomplish management goals.**
    a. Organize and host a DWR volunteer event that would appeal to multiple kinds of recreationists (e.g. an event focused on habitat restoration on a WMA). *(Also addresses Goal 2, Objective 3)*
    b. Work with public lands staff to identify needs for volunteer help with public lands maintenance and, with oversight from DWR staff, use volunteers to help with low-risk opportunities for habitat stewardship. Learn from the successes of other habitat stewardship volunteer programs, including the Appalachian Trail Conservancy's habitat restoration efforts, DCR's Natural Area Stewards, and similar programs in The Nature Conservancy.
    c. Consider how to provide oversight and coordination of volunteers for habitat management, including through the engagement of regional coordinators.
    d. Consider "Friends of [ ] WMA" groups as a useful structure for organizing and garnering support and volunteer labor for select WMA sites. Ensure that these groups have strong staff involvement and include multiple user groups.
    e. Develop stewardship committees for certain public lands; these volunteers could check trails, report downed trees, vandalism, or illegal behavior, control weeds, etc.
3. **Develop and promote citizen science projects that are aligned with DWR's management and conservation goals, and mechanisms for incorporating data generated by citizen scientists in DWR decision-making processes.**
    a. Work with DWR biologists to identify data needs that could be fulfilled through volunteer engagement and determine the best way to meet these needs.
    b. Align the existing Wildlife Mapping Program (which uses iNaturalist) to targeted wildlife or habitat goals to make use of the wealth of data generated by this program.
    c. Continue to work with the DWR Environmental Services staff to ensure that data collected by volunteers can be integrated with Virginia Fish and Wildlife Information Service (VaFWIS).
    d. Move from paper-based to digital data collection for the Adopt-a-Trail program, so data can be more easily submitted by volunteers and processed by staff. Consider using the Collector for ArcGIS app which integrates with ArcGIS to support decision-making and can collect data offline when there is no internet/cellular connectivity.
    e. Conduct a virtual DWR bioblitz challenge (e.g., using iNaturalist) in order to collect data and potentially build regional networks for wildlife viewing.
    f. Consider use of Chronolog, a useful tool for volunteers to track plant community

progression over time, using photos tied to date/waypoint.

4. **Work with partner organizations to create and coordinate volunteer opportunities for wildlife viewers and to recruit volunteers.**
    a. Grow existing relationships (e.g., with Ducks Unlimited, Virginia Master Naturalists) and form new partnerships to build volunteer capacity.
    b. Promote volunteer opportunities across the email list-servs of partner organizations.
    c. Ensure adequate staff capacity for coordination of volunteer opportunities created within the agency so that volunteers can be connected to opportunities that match their interests and needs.
    d. Develop or coordinate "train the trainer" programs in partnership with other volunteer organizations to develop recruiters/ambassadors. People who engage in citizen science become great ambassadors for wildlife, as well as generate valuable data.
    e. To work within DWR's limited staff capacity, partner with wildlife viewing organizations to increase education/outreach efforts related to wildlife viewing through DWR-trained volunteers.
    f. Engage with organizations that are already connected to a large number of diverse members (for example, The Wildlife Society, American Fisheries Society, and Trout Unlimited) in order to expand connections to stakeholders that could be mobilized to support conservation or the agency through advocacy or voting.
5. **Implement best practices across volunteer programs to promote volunteer satisfaction and retention; this includes following through on promised deliverables and maintaining communication about outcomes.**
    a. Implement best practices across DWR citizen science programs, including ensuring that collected data are used and shared and their application is communicated to volunteers.
    b. Ensure adequate funding for the final products of the 2nd Virginia Breeding Bird Atlas (VABBA2) (a book, interactive website, or both) in order to see this project to its conclusion and meet the expectations of the over 1,400 volunteers who have participated in the Atlas.
    c. Continue communicating with VABBA2 volunteers and the general public on the progress that DWR is making toward the final Atlas product.
    d. Continue to create additional, discrete opportunities for citizen science, including engaging with VABBA2 volunteers by building upon the success of the Atlas and creating new volunteer opportunities for this existing network.

Objective 2: Foster a culture of responsible wildlife viewing.

1. **Emphasize responsible wildlife viewing, including stewardship, ethics, and safety, in new and existing DWR communication materials, signage, and programs.**
    a. Increase ethics-focused language in DWR materials (e.g. publications, signs on public lands managed by DWR, and the DWR website) and events.
    b. Promote a culture of responsible wildlife viewing (stewardship, ethics, and safety) among wildlife viewers through education, including information about current rules related to handling and impacting wildlife on public lands.
    c. Develop and use consistent agency messaging and guidelines for feeding birds and other wildlife.
    d. Maintain awareness among DWR staff of the unintended consequences of education initiatives, including the potential for generating malicious activity or enabling poaching (by making specific wildlife locations known).

e. Emphasize tangible lessons over general statements in responsible viewing materials. For example, start with a specific problem (e.g. snake fungus), then zoom out to stewardship best practices that address that problem (e.g. disinfecting equipment).

2. **Work with partner organizations to incorporate stewardship, ethics, and safety into new and existing programs and events.**
    a. Incorporate content on wildlife viewing, as well as DWR conservation and ethics priorities, into Virginia Master Naturalist volunteer training so they can teach others when they do outreach.
    b. Partner with Virginia Master Naturalists and others who host booths at community events to coordinate on booth messaging, materials, and content.
    c. Work with partner organizations to encourage inclusion of ethics components and modeling of ethical viewing behavior during existing events.
    d. Work with partner organizations to host workshops on responsible wildlife viewing, ideally as joint efforts between different types of wildlife viewing groups (e.g. ornithological and herpetological groups) to promote cross-pollination and the sharing of ideas.
    e. Use education on responsibly and safely handling wildlife (e.g., lessons on how to safely move turtles out of the road) as a tool for engaging people with wildlife in the first place.

GOAL 4: Connect broad constituencies to the Virginia Department of Wildlife Resources through wildlife viewing

Objective 1: Increase awareness of the scope of DWR's mission and its relevance to wildlife viewing.

1. **Develop a communication strategy to share the DWR mission, the role of DWR in conservation and outdoor recreation, and the agency's commitment to diverse constituencies, including wildlife viewers.**
    a. Communicate about the role of DWR in wildlife viewing and recent changes within the agency that reflect its commitment to broader constituencies.
    b. Further improve the visibility and user-friendliness of the DWR website, and consider the use of software to increase the relevance of DWR's website to browser search hits.
    c. Analyze DWR's social media output and user responses as part of a broader evaluation of DWR communication related to wildlife viewing; modify messaging as needed in order to increase viewership and reach of wildlife viewing communications.
    d. Promote existing documents developed by other organizations that describe the role of state agencies and outline policy actions that can support DWR's work. For example, NABCI's 2019 State of the Birds report contains data on the role of state agencies in recovering U.S. bird populations and a supplemental insert detailing the importance of the Recovering America's Wildlife Act (RAWA) for supporting this conservation work.
2. **Sponsor, participate in, and organize events (virtual and in-person) that generate interest in wildlife viewing and engage the public with DWR staff and programs.**
    a. Expand social media outreach through social media-based challenges (e.g., try to visit every VBWT site and post a picture to prove you were there) and advertisement of day events, especially those that relate to citizen science.
    b. Increase communication/branding related to existing education programs in schools that are sponsored by DWR to increase awareness among parents of DWR's role in youth programming.

c. Promote better relationships between wildlife recreationists and conservation officers.
d. Consider how to generate more public interaction with DWR staff beyond law enforcement and regulations to increase awareness of the agency's broader mission and activities.

Objective 2. Increase dialogue and recognition between the agency and wildlife viewers to cultivate improved relationships.

1. **Train DWR staff about the importance of wildlife viewing to DWR's mission, agency programs that support wildlife viewing, and ways in which viewers support the agency.**
    a. Learn from the engagement strategies being used by other agencies (such as State Parks).
2. **Establish and communicate mechanisms through which wildlife viewers can provide input to the agency.**
    a. Get a schedule of agency Board meetings and announcements about scoping meetings to viewing clubs and organizations so they can share these meetings with their membership and promote attendance.
    b. Sponsor and participate in wildlife and outdoor festivals in order to connect with and hear from new and diverse audiences.
3. **Expand the scope of the Executive Director's advisory group to include regular communication and opportunities for feedback on issues relevant to wildlife viewing organizations.**
    a. Build beyond the Director's Advisory Group to establish a consistent way to meet and talk with partner organizations about issues that are relevant to the viewing community. Consider whether it would be useful to have a separate meeting with just birding and viewing groups, or whether they could be a specialist subset within the Advisory Group.
4. **Highlight the relevance of DWR's work to wildlife viewers through content published in partner and DWR communication channels.**
    a. Publicize DWR's partnerships related to wildlife viewing, in order to highlight the agency's relationships with groups that viewers already identify with.
    b. Actively solicit and encourage articles from partner organizations for the monthly e-newsletter *Notes from the Field* to increase content that viewers would be interested in.
    c. Utilize the Facebook and social media pages of wildlife viewing organizations to reach wildlife viewers who aren't tied to DWR communications in other ways; post a question about agency activities related to viewing that DWR wants feedback on
5. **Train agency volunteers to become "ambassadors" that can serve as a conduit for communication between DWR and the wildlife viewing community.**
    a. Explore potential connections to Wildlife Ambassadors; these volunteers could be involved in sharing agency messages, but also hearing from the viewing and birding communities and then bringing needs and interests back to the agency.
6. **Foster ongoing engagement with agency volunteers and recognition of their contributions.**
    a. Build upon the goodwill and communication infrastructure generated through VABBA2 to continue engaging with project volunteers as the Atlas transitions from field data collection to data analysis and review and to publication over the next 4-5 years.
    b. Maximize distribution of this Wildlife Viewing Plan and information about the public comment period to give the birding and viewing communities an opportunity to weigh in and to demonstrate interest from the agency in connecting with these stakeholders.
    c. Publicize viewer contributions to agency conservation (for example, Master Naturalist hours monetized), in order to address sentiments (among traditional constituents or

agency staff) that the viewing community does not contribute to conservation.

d. Consider how to use public reporting of certain wildlife species (through photos especially) as a good way to begin conversations with viewers (like the Flora and Fauna part of the Run for the Wild event).

Objective 3: Increase monetary contributions of wildlife viewers to support DWR's work with wildlife and habitat conservation.

1. **Increase internal training and awareness among DWR staff of the ways in which wildlife viewers financially support DWR.**
    a. Increase internal training on the funding mechanisms through which viewers support DWR, including HB38 funds, Virginia Wildlife license plates, the Non-Game Fund, the Access Permit, and Restore the Wild.
2. **Streamline and expand external promotion of existing funding mechanisms through which wildlife viewers can support DWR.**
    a. Communicate about current funding mechanisms that viewers can and already participate in to support the agency (e.g., communicating the role of HB 38 funds to birders and viewers).
    b. Promote ways in which constituents can financially support DWR conservation efforts in all DWR communications (i.e., 'How You Can Help').
    c. Promote purchase of a Virginia Wildlife license plate as a mechanism for contributing to the agency and wildlife conservation.
    d. Streamline and expand promotion of Restore the Wild memberships to communicate the value of this program for wildlife viewers.
    e. Clarify the purpose and goals of the Restore the Wild Program in order to refine the program's target communities and desired outcomes.
    f. Shift dialogue around Restore the Wild memberships from a focus on generating more money for the agency to highlighting the habitat and wildlife services provided by the agency for diverse constituencies, and provide a variety of mechanisms through which constituents can support DWR, from volunteering to donating.
    g. Develop a set of standardized materials (e.g., logos, presentation slides, hand outs) to advertise the Restore the Wild program by the agency and partner organizations.
    h. Provide clear information about the Restore the Wild membership on DWR's website and as a regular part of DWR social media outreach.
    i. Work to further push advertisement and communication of the Restore the Wild Membership to broader, non-traditional audiences (e.g., through concert venues, breweries, etc.).
    j. Provide opportunities for the public to choose and/or provide artwork for the focal species used for each year's Restore the Wild campaign. Ensure that the focal species are diverse and rotating, and include species that generally receive less attention.
    k. Consider how to capitalize on what has been created with Restore the Wild to also increase monies for the separate Non-Game Fund (funds SGCN research projects and wildlife viewing projects) in order to streamline the call to action for the public.
    l. Consider a rebranding of the Non-Game Fund (new name, updated graphics, improved webpage) and put some marketing behind it, as has been done with Restore the Wild. Reintroduce what it is to wildlife viewers, its purpose, and its relevance to wildlife viewers.

3. **Implement DWR-sponsored events in which registration fees support wildlife or habitat conservation.**
    a. Implement more DWR-sponsored events in which registration fees support habitat projects or Restore the Wild (such as Run for the Wild).
4. **Explore opportunities to work with corporate or retail partners to generate funding for wildlife conservation and viewing-related programming.**
    a. Consider ways to partner with industry to garner funding for wildlife conservation and viewing-related programming.