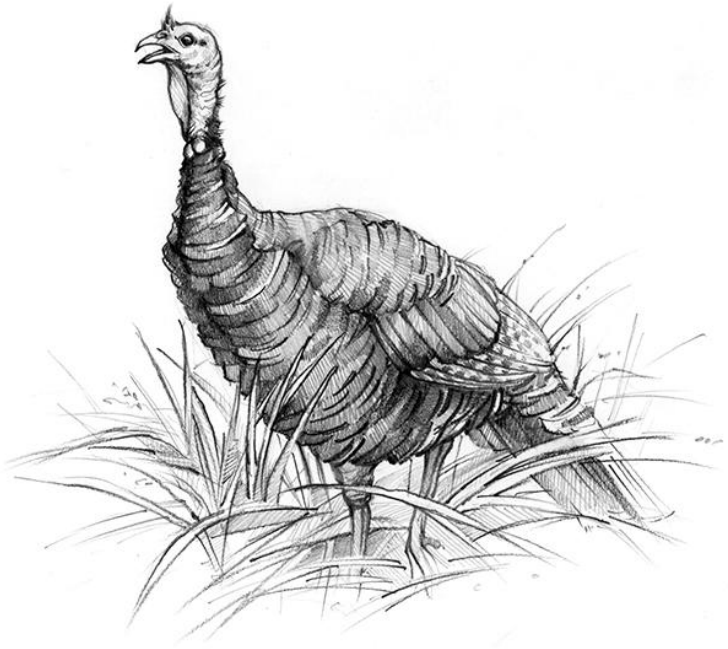
VIRGINIA
WILD TURKEY
MANAGEMENT PLAN
(2013-2022)



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Virginia Department of Game and Inland Fisheries

About the Authors

The Virginia Wild Turkey Management Plan was written by turkey program staff with the Virginia Department of Game & Inland Fisheries (VDGIF) in collaboration with the Stakeholder Advisory Committee (SAC). The SAC represented a diverse cross section of Virginia citizens with an interest in turkey management issues.

Acknowledgements

Appreciation is extended to Virginia citizens for their review and input, to the Department of Fish and Wildlife Conservation in the College of Natural Resources and Environment at Virginia Tech for guidance in the planning process, to other VDGIF professionals for their quality reviews and contributions, and to the VDGIF administration and Board of Directors for support through all aspects of developing the Wild Turkey Management Plan.

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EXECUTIVE SUMMARY

Wild turkeys, once pushed to the brink of extinction, represent one of North America's landmark wildlife management success stories. Today's healthy wild turkey populations provide many benefits for hunters, outdoor recreationists, and the general public, but may also foster concerns about crop damage, vehicle collisions, or neighborhood nuisance. With varied public values and opinions about wild turkeys (even among hunters), turkey management continues to provide challenges for the Virginia Department of Game and Inland Fisheries (VDGIF) to meet its mission of managing "*wildlife…to maintain optimum populations…to serve the needs of the Commonwealth*". Optimum turkey populations will balance positive demands (e.g., hunting, viewing) with negative demands (e.g., agricultural damage, other conflicts).

Embodying the interests of all citizens, the Virginia Wild Turkey Management Plan was developed using a stakeholder involvement process to reflect the values of a diverse public about what should be accomplished with turkey management in Virginia. Public stakeholders interested in turkeys made value choices about turkey management, while wildlife professionals focused on technical and biological aspects. While considering technical background information from VDGIF staff and other public input (e.g., focus group meetings, public meetings, public comments) from throughout Virginia, a citizen Stakeholder Advisory Committee (SAC) met four times to develop the values and goals found in the Virginia Wild Turkey Management Plan. The SAC, initially comprised of 13 individuals from key stakeholder groups, represented various turkey-related interests from all across the state, including public landowners, sporting interests (e.g., fall hunters, spring hunters), private landowners, non-consumptive interests, and agricultural producers.

A Turkey Technical Committee, involving VDGIF staff with technical expertise in turkey management, provided scientific and technical information. In addition to providing technical feedback to the SAC, the Turkey Technical Committee also focused on identifying the objectives and potential strategies to achieve the goals drafted by the SAC.

The Virginia Wild Turkey Management Plan contains two sections: the technical portion (pages 1-48), and the Values, Goals, Objectives, and Strategies portion (pages 49-64). The technical portion describes wild turkey management history, life history and biology, and status (supply and demand) in Virginia. The Virginia Wild Turkey Management Plan includes seven value and goal areas that address populations, recreation, and human-turkey problems. Specific objectives were developed to help guide the attainment of each goal. Potential strategies suggest ways that each objective might be achieved. The specific goals address:

- Turkey Populations (6 objectives, 18 potential strategies, pages 49-54): Manage turkey populations using innovative, flexible, publicly accepted, cost-effective, and technically sound practices that balance the varied needs and expectations of stakeholders statewide and locally (cultural carrying capacity).

- Turkey-Related Recreation (4 objectives, 17 potential strategies, pages 54-56): Manage wild turkey-related recreation (including hunting and non-hunting recreation) to optimize the multiple factors that determine participants' satisfaction. Turkey-related recreational opportunities should not support activities that prevent attainment of turkey population objectives to meet cultural carrying capacity**.**

- Hunting Tradition (2 objectives, 6 potential strategies, pages 56-58): Encourage participation in lawful methods of turkey hunting in both spring and fall in Virginia. Promotion of hunting traditions should not support activities that prevent attainment of turkey population objectives to meet cultural carrying capacity**.**

- Allocation of Fall Harvest (2 objectives, 9 potential strategies, pages 58-60): Provide opportunities for all hunters to harvest turkeys, but with primary emphasis on hunters who specifically pursue wild turkeys, including quality fall hunting opportunity prior to significant disruptions from deer hunting activity (primarily muzzleloading and firearms seasons). Fall harvest allocations and hunting opportunity should not prevent attainment of turkey population objectives to meet cultural carrying capacity.

- Safety (3 objectives, 15 potential strategies, pages 60-61): Promote safety for hunters and non-hunters without diminishing the quality of the hunting experience during both spring and fall.

- Ethics & Compliance with Law (2 objectives, 9 potential strategies, pages 62-63): Demand a culture of high ethical standards among hunters and develop respect for the interests of non-hunters, other hunters, and landowners, while working to reduce poaching and unethical practices.

- Human-Wild Turkey Problems (2 objectives, 8 potential strategies, pages 63-64): Reduce the negative consequences upon affected stakeholders from conflicts caused by wild turkeys through shared public/private responsibility and in a manner consistent with population and recreation objectives.

The Virginia Wild Turkey Management Plan provides a blueprint for future management directions through 2022 of what needs to be done for turkey management, how it should be done, and when it should be done. By clarifying management goals and objectives, the Virginia Wild Turkey Management Plan will help VDGIF Board members, VDGIF administrators, VDGIF staff, and the public to effectively address wild turkey management issues into the future.

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INTRODUCTION

As a symbol of the New World's bounty from the first Thanksgiving, wild turkeys are widely recognized by people throughout North America. After wild turkeys were pushed to the brink of extinction, the restoration of this cultural icon represents one of North America's landmark wildlife management success stories. Today's healthy wild turkey populations provide many benefits for hunters, outdoor recreationists, and the general public. However, abundant populations can also foster concerns about crop damage, vehicle collisions, or neighborhood nuisances. With the varied public values and opinions about wild turkeys (even among hunters), turkey management has created complex and unique challenges for the Virginia Department of Game and Inland Fisheries (VDGIF).

The VDGIF, under the direction of a Governor-appointed Board of Directors, is charged specifically by the General Assembly with the management of the state's wildlife resources. The Code of Virginia expresses many legal mandates for the Board and VDGIF, prominent among which are management of wildlife species (§29.1-103), public education (§29.1-109), law enforcement (§29.1-109), and regulations (§29.1-501). To help clarify and interpret the role of VDGIF in managing wildlife in Virginia, the Board of Directors has adopted the following Agency mission statement:

- To manage Virginia's wildlife and inland fish to maintain optimum populations of all species to serve the needs of the Commonwealth;
- To provide opportunity for all to enjoy wildlife, inland fish, boating and related outdoor recreation and to work diligently to safeguard the rights of the people to hunt, fish and harvest game as provided for in the Constitution of Virginia;
- To promote safety for persons and property in connection with boating, hunting and fishing;
- To provide educational outreach programs and materials that foster an awareness of and appreciation for Virginia's fish and wildlife resources, their habitats, and hunting, fishing, and boating opportunities.

What is the Virginia Wild Turkey Management Plan?

The Virginia Wild Turkey Management Plan is the first comprehensive strategic plan developed for turkeys in Virginia. It summarizes the history of wild turkeys in Virginia, describes the current status of wild turkeys (supply and demand), and provides a blueprint for future management directions. The plan establishes a framework through 2022 of what needs to be done for turkey management, how it should be done, and when it should be done. By clarifying management goals and objectives of the VDGIF relating to turkeys, this plan will help Board members, VDGIF administrators, VDGIF staff, and the public to effectively address wild turkey management issues. As the basis for guiding turkey management activities, decisions, and projects, the plan also will serve to inform the General Assembly and the public of what the VDGIF would intend to accomplish. The Virginia Wild Turkey Management Plan *is a strategic plan* that is only intended to provide overall directions, goals, and objectives for the wild turkey program (e.g., to increase turkey populations in a specific county). As such, *it is not an operational plan* where the specific details of potential strategies to carryout objectives are exactly described (e.g., establishing the specific hunting season dates).

How the Plan was Developed

Following the philosophy that guided the development of Virginia's Deer and Bear Management Plans, the Virginia Wild Turkey Management Plan was publically developed to represent the interests of *all* Virginians. VDGIF collaborated with the Department of Fish and Wildlife Conservation at Virginia Tech to implement the public and technical processes for plan development. During the planning process, public stakeholders focused on the public values regarding wild turkeys, whereas wildlife management professionals focused on the technical aspects of wild turkey management.

To identify important issues in wild turkey management, a series of nine focus group meetings were conducted throughout Virginia to begin the planning process. Approximately 230 Virginians known to have an interest in management of wild turkeys were invited to attend one of the focus groups during April and May 2012. Of those invited, 82 individuals participated in themed focus group meetings to specifically discuss spring hunting, fall hunting, or turkey damage issues. The issues identified by focus group participants provided a starting point for Stakeholder Advisory Committee (SAC) discussions.

The SAC, initially composed of 13 representatives from key stakeholder groups (Appendix A), was tasked with developing draft goals that reflect public values to guide wild turkey management. The SAC members represented various interests from all across the state, including public landowners, sporting interests, non-consumptive interests, and agricultural producers. The SAC met four times between February 2013 and September 2013 to develop the plan. Between meetings, SAC members remained engaged with planning issues via e-mail, extra assignments, and a website designed for maintaining meeting documents.

A Wild Turkey Technical Committee (Technical Committee), composed of VDGIF biologists with expertise on wild turkey management, was formed to provide scientific information and technical feedback to the SAC (Appendix B). Specifically, the Technical Committee drafted and presented the technical background information on wild turkey biology and management in Virginia, documented the SAC input on values and goals, identified the objectives and potential strategies to achieve the SAC's draft goals, and drafted the final plan (e.g., writing, compiling technical sections with SAC input).

The Department of Fish and Wildlife Conservation in the College of Natural Resources and Environment at Virginia Tech provided the overall guidance and administrative support for the planning approach and processes. Fish and Wildlife Conservation faculty and staff organized and facilitated planning meetings (e.g., focus groups, SAC, Technical Committee, regional public input) as well as provided other administrative and logistical support (e.g., created and maintained an informational website, drafted meeting notes, communication and mailings, fiscal needs).

To broaden input and to ensure that the work of the SAC accurately reflected the values of the Commonwealth's citizens, additional opportunities were made available for the public to review and comment on a draft of the Wild Turkey Management Plan. A public comment period extended from July 12 to August 9, 2013 where the draft Virginia Wild Turkey Management Plan was available for review on the VDGIF website. In addition, six public input meetings were also held throughout Virginia in Bedford, Fredericksburg, Hampton, Richmond, Verona, and Wytheville. To stimulate additional public input, news releases, the VDGIF *Outdoor Report*, and media interviews also were made available throughout the state with several articles published in large market and local newspapers.

By the end of the public comment period, 162 individual comments had been received. During the comment period, 62 comments were received on VDGIF's web page, 75 comments were captured on flip charts at public meetings attended by 42 people, and 25 comments were received via e-mail, comment cards, and written letters. At the close of the public review period, the SAC and Technical Committee reviewed all comments and made appropriate changes for final revisions to the draft plan. All of the written individual comments and notes, with the plan-related responses and changes, are provided in Appendix D.

Both the SAC and the Technical Committee prioritized objectives (Appendix E). These priorities will help provide the basis for budget and personnel allocation decisions related to the turkey program in Virginia.

The final draft of the Virginia Wild Turkey Management Plan was presented to the VDGIF Board of Directors for their review and endorsement at the January 28, 2014 Board Meeting. With public values as its foundation, the Wild Turkey Management Plan establishes the framework (i.e., goals and objectives) for addressing Virginia's turkey management issues through 2022.

Plan Format

The Virginia Wild Turkey Management Plan includes sections relating to the life history of wild turkeys, the wild turkey program history in Virginia, and Virginia's wild turkey program status (supply and demand). Within the context of the VDGIF mission statement, the Stakeholder Advisory Committee developed seven turkey program goals in the broad context of populations, recreation, and problems that specifically address desirable population levels, turkey-related recreational opportunities, hunting traditions, allocation of fall harvest, safety, ethics, and human-turkey problems. Specific objectives have been established to help guide the attainment of these goals, with potential strategies clarifying how each objective might be achieved.

Interim Changes to the Plan

The Virginia Wild Turkey Management Plan is designed to provide guidance and priorities to help manage Virginia's turkey program through 2022. A plan life of 10 years was chosen because goals and public values should remain relatively constant over that time. With substantial public investments in time and ideas to produce the Virginia Wild Turkey Management Plan, changes in overall goal direction would not be expected and rarely warranted. However, a plan should be a dynamic and flexible tool that remains responsive to changing social, environmental, technical, and administrative conditions. To keep the Virginia Wild Turkey Management Plan relevant and responsive to the programmatic goal directions provided by the public, specific objectives and strategies may be added, deleted, or amended by VDGIF as new circumstances demand. As adaptive changes in management approaches (i.e., objectives) are necessary, VDGIF will submit interim updates to the SAC for review before implementing changes; updated objectives will be provided as addenda to the Plan on the VDGIF website.

Acknowledgements

The thoughtful involvement of many Virginia stakeholders at focus group meetings, at public input meetings, and from written comments was crucial to the successful representation of the turkey-related interests and public values of all citizens. The major commitment of time and expense, unselfish dedication, and enthusiasm provided by the Stakeholder Advisory Committee (Appendix A) not only made a substantial difference in the quality of the final plan, but also enriched the process throughout; we greatly appreciate their effort and dedication. While also grasping technical realities of turkey management, it was no small task to conscientiously struggle with balancing the varied public desires.

Appreciation is extended for the work of the Technical Committee (Appendix B) for summarizing and reviewing technical information about Virginia's turkey management program. Technical research and writing for the Virginia Wild Turkey Management Plan primarily was provided by David Steffen (VDGIF), Gary Norman (VDGIF), Holly Morris (Virginia Tech), and Megan Kirchgessner (VDGIF).

We also greatly appreciate the planning-process support provided by the Department of Fish and Wildlife Conservation in the College of Natural Resources and Environment at Virginia Tech. Dr. Steve McMullin, Holly Morris, and Dr. Jim Parkhurst all played key roles to ensure the successful and timely completion of the entire planning effort. Through processes that integrate public values with professional technical knowledge, Dr. McMullin's vision has consistently guided all VDGIF deer, bear, and turkey management planning efforts since 1999.

HISTORY

LIFE HISTORY OF WILD TURKEYS

Two species of turkeys occur in North America. The wild turkey (*Meleagris gallopavo*) can be found in 49 states, 6 Canadian provinces, and Mexico. The ocellated turkey (*M. ocellata*) is limited to Belize, Guatemala, and Mexico. Five subspecies of the wild turkey, each with distinct biological characteristics and unique management requirements, are widely distributed across the continent (Fig. 1). The most common subspecies, and the subspecies found in Virginia, is the eastern wild turkey *(M. g. silvestris*). Although population approximations are very speculative, the population of wild turkeys in the United States and Canada has been estimated to be 6.7 million birds.

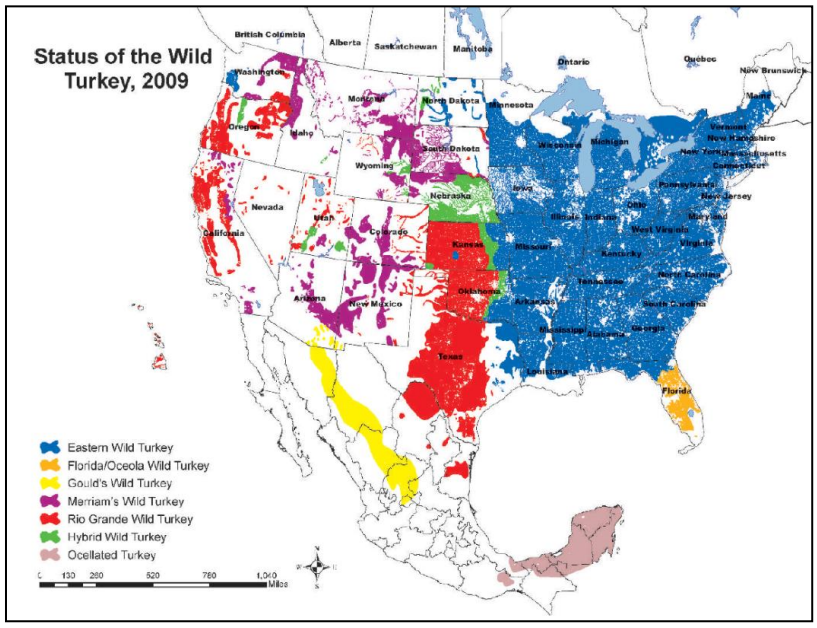

Figure 1. Distribution range of the wild turkey by species and subspecies (from Tapley et al. 2012).

Physical Characteristics

Both genders have iridescent feathers with varying colors of red, green, copper, bronze, and gold. Age and gender can be distinguished by the coloration, shape, and contour of certain feathers. Compared to the chestnut-brown color of female (hen) breast feather tips, male (gobbler) breast feathers are typically black tipped which results in a darker appearance of gobblers compared to hens. Although uncommon, other variations in feather color may result in turkeys that appear black, red, or white. Males generally lack feathers on the head, while females have feathers that extend up to the back of the head. Especially during the mating season, skin on the heads of gobblers can be quite colorful with variable shades of whites, reds, and blues.

A prominent difference between male and female wild turkeys is the presence of a beard in gobblers. The beard is a group of bristles that originate from the center of the breast and grow throughout the bird's life. Beards generally begin to protrude from the breast feathers at 6-7 months of age and are permanently attached, unlike feathers that are periodically replaced. While the beard will grow 3-5 inches per year, the total length is determined by wear and breakage from dragging on the ground and from ice or snow damage. Gobbler beards in the first year are generally less than 6 inches in length, while two-year-old birds typically have beards that are 8-11 inches in length. The record beard length of an eastern wild turkey in Virginia is over 16 inches. Infrequently, turkeys may also have multiple beards; the highest number of beards reported

to the VDGIF has been 7 beards. A small proportion (5-10%) of adult females also possesses beards, but they are typically shorter (6-8 inches) and have fewer strands than gobblers.

Unlike hens, gobblers possess spurs, which are used for fighting. The spur is located on the lower leg just above the foot and is made up of a bony core layered with keratin scales. As birds age, additional keratin scales are added contributing to the length of the spur. As a result, spur length can be used to estimate the age of male turkeys, although it is not a reliable indicator of age beyond 3 years. Birds with spurs less than ½ inches by the spring are juveniles. Birds with spurs between ½ and ¾ of an inch are two-year-old birds; gobblers with spurs longer than ¾ of an inch are typically three or more years old. Spurs over 2 inches are uncommon for the eastern subspecies. Infrequently, gobblers can have 2 spurs on each leg and even hens may rarely possess spurs.

Poults (young turkeys) weigh just a few ounces at hatching, but gain weight quickly. Females generally weigh 4 to 7 pounds in their first year and eventually weigh 8 to 11 pounds as adults. Adult males are heavier, weighing 17 to 21 pounds on average. Gould's and Rio Grande subspecies are typically the heaviest subspecies, with the Florida subspecies weighing the least. The current weight record for Virginia wild turkeys is 27.3 pounds, but historical records from 1648 suggest that some wild turkeys weighed up to 50 or more pounds.

Wild turkeys have a keen sense of vision and they can easily detect movements and likely distinguish colors. With eyes on the sides of their head, wild turkeys have monocular vision that provides a wide field of view but little depth perception. To compensate for their lack of depth perception, turkeys frequently move their heads. Turkeys also have a remarkable ability to hear and locate sounds. Turkeys have a poor sense of taste and smell.

Although wild turkeys typically prefer to walk rather than fly when feeding or traveling, they are capable of rapidly rising and flying short distances when disturbed. They can also travel longer distances in the air when the topography allows them to glide down-slope. Turkeys are estimated to run up to 12 miles per hour and fly up to 50 miles per hour.

Food Habits

Most of a wild turkey's life is spent in search of food. The quantity and availability of food affects condition, behavior, survival, hunting mortality rates, movements, reproduction, and population size. As evidenced by their wide distribution, a very flexible diet has helped the wild turkey adapt to many different habitats. Wild turkeys are opportunistic and omnivorous (eating both plant and animal matter) feeders with a diverse diet that generally reflects available foods. They have been documented to feed on more than 350 different plant species and 87 different insect species. Important plant foods include acorns, grasses, sedge leaves, roots, tubers, stems, buds, and leaves. Other important foods include wild grapes, beechnuts, dogwood berries, and sumac fruits. Acorns are an especially important food for wild turkeys and, when available, are preferred over most other natural foods; smaller acorns are preferred over larger varieties.

Poults (< 2 months of age) subsist on a diet of insects that provide high protein and energy needed for rapid growth of feathers. Important insects include beetles, bugs, grasshoppers, and leafhoppers. The percentage of insects in the diet of young turkeys declines through the summer as their diet changes to more herbaceous leaves, berries, and fruits. Turkeys also will use agricultural areas, row crops, and openings to obtain food.

Especially at the higher elevations of western Virginia, deep snows can limit the availability of wintertime foods. Wild turkeys have the ability to scratch through 12 inches of snow, but snow depths above 4 inches can limit their access to food. Unless snow-covered areas become ice-packed, snow depths less than 4 inches have little impact on turkey feeding. When snow conditions are not favorable, turkeys will move into areas with pines, cedars, or other cover for shelter and foods. As spring approaches, spring seeps

are an important source of early-emerging herbaceous plants. Even during years with mast failures and deep snows, turkeys are able to survive because of their flexible diet, fat reserves, and thermal protection provided by their feathers. Although they may lose up to 40% of their body weight, wild turkeys can still survive 2 weeks without food.

Flocking Behavior

Wild turkeys are social and live in flocks which are usually segregated by family units, age, and sex. During the summer, turkey flocks are composed of brood flocks (i.e., groups of hens and their young poults). These brood flocks will be made up from several different broods and hens, flocks of unsuccessful hens, and flocks of gobblers. During late fall, young males will leave the brood flocks to form their own juvenile male flock. Some birds in these flocks remain together for life. As a result, many flocks of adult wild turkeys are composed of same-sex siblings that were raised together in brood flocks.

The social organization within a flock, called a pecking order, is a linear hierarchy of dominance. The top-ranked bird, or alpha bird, is dominant over all others and the lowest-ranked, or omega bird, is submissive to all others. Within-flock pecking orders are determined by fighting among individuals. Fighting for dominance begins in brood flocks during late summer and progresses into autumn. Once determined, the pecking order is stable and changes only with the death or serious injury of a flock member. Not only do pecking orders occur within flocks, but they also exist among flocks. The pecking order between flocks is usually determined simply by flock size, with smaller flocks yielding to larger ones. Males and females also have separate social orders. During early autumn there can be spectacular displays of fighting when several brood flocks come together.

Home Range and Movements

Home range is defined as the area occupied by an animal over a given period of time. All the life history requirements to reproduce and survive must be provided within a turkey's home range. Reflecting the dynamic nature of turkey habitat use, home range size and shifts in location can be highly variable due to habitat quality, food availability, sex, age, hunting pressure, season, and reproductive status. On an annual basis, individual home range sizes may range from 3 to 13 square miles. With diverse habitats, turkey home range sizes in Virginia also vary widely. Research in the Shenandoah Valley observed home ranges that varied from 2.6 mi^2 to 13.2 mi^2 while turkeys at Fort Eustis in Newport News exhibited home range sizes of about 3 mi^2. Male turkeys usually have larger home ranges than female turkeys. Because turkeys seasonally move to other habitats, the home range used on an annual basis is larger than the home range being used within a specific season.

Marked by significant movements to explore new habitats during the fall and spring, juvenile turkeys typically have larger home range sizes than adults. In a West Virginia study of 315 hen turkeys from 1989-93, the annual home range size of adult hen turkeys (7.0 mi^2) was smaller than the home range for juvenile hens (20.4 mi^2). In general, home range size also tends to be larger during fall and winter than during spring and summer. However during years with abundant acorn crops, the fall and winter home range sizes may be small because of the ease with which food can be found. Likewise, birds that are artificially fed by people have very small home ranges compared to turkeys foraging on natural foods. When acorns are scarce, turkey home range size increases. The greatest long-distance movement observed during Virginia turkey research was an adult female that travelled more than 50 air miles during a fall season with a mast failure.

The home range sizes of hens vary by age of the hen and their reproductive status. In West Virginia, spring home range sizes of adult hens without broods (3.4 mi^2) were smaller than hens with broods (5.3 mi^2). In contrast, spring home range sizes of juvenile hens without broods were larger than those with broods. Seasonal shifts in home range are common, especially between winter and spring seasons, and among juvenile turkeys. Winter-to-spring shifts in locations were smaller for adult females (1.2 miles) than for

juvenile females (2.9 miles). On average, adult hens shifted successive spring home ranges by 0.5 miles, while juvenile shifts were 2.2 miles. Because 45% of adults and 62% of juvenile birds made substantial shifts in spring home range location between years, most hens do not annually use the same nesting location. However, some hens will return to the same general nesting location between years.

Habitat Requirements

The habitat required to support wild turkey populations within their home range must meet all the food, cover, space, and water needs throughout the year for all ages and sexes. The best turkey habitats offer a mosaic of forest patches with a diversity of options for feeding, reproducing, and surviving. In general, many different forest age classes interspersed with openings and/or agricultural lands that comprise 10-50% of the area provide the best turkey habitats. Turkeys take advantage of farming operations where they feed on waste corn and other grains.

A variety of different ages of timber will provide a diversity of foods and other habitat needs for wild turkeys. Timber rotation ages between 80-120 years create timber stands with an assortment of ages. Timber rotation refers to the number of years it takes to grow a tree to maturity. With a rotation age of 100 years, an average of 1% of the forest area would be regenerated each year by harvesting the oldest trees. A timber rotation of 100 years results in 10% of the area being less than 10 years old and 50% would be greater than 50 years old. Older-aged timber stands, particularly those that have trees producing hard mast like acorns, provide important foods for energy and protein that contribute to over-winter survival and condition. Although only briefly available, younger-aged stands (1-5 years old) provide good brood habitat for cover and insects. Young timber stands also provide a variety of soft mast-producing shrubs plants, such as blackberry, that are particularly important during years of mast failures. Substantial hard mast production does not occur until timber stands reach 50 years old. Although a necessary stage of sound forest management, timber stands between 20-50 years of age are of lesser value to wild turkeys.

Especially in northern hardwoods and high elevations in western Virginia, conifer cover (e.g., pines, cedars) provides an important roosting habitat for wintering birds. Turkeys frequently use these areas to provide thermal protection and some fruits and seeds. Spring seeps are another important habitat type when snow covers the ground. Spring seeps are places where ground water comes to the surface. At a constant temperature of about 42 degrees Fahrenheit, ground water in seeps melt away snow which provides feeding areas rich in insects and herbaceous vegetation.

Of particular importance are the habitats that provide adequate nesting and brood-rearing opportunities. Wild turkey hens can nest in almost any forest stand, but nest sites are generally selected in early successional habitats with dense herbaceous and shrub cover at ground level. Hens may select nest sites in recently-cut forest stands, old fields, or pastures. Nests sites often are found close to trails or forest roads. Individual nests are typically protected by some over-head cover of branches, limbs, or vines.

Brood survival depends on habitats that provide cover and insects. Herbaceous vegetation at ground level supports the insect populations necessary for growth and survival of young turkeys while also providing cover from predation. Hens with broods seek openings (e.g., forest clearings, fields, pastures, rights-of-ways, log landings, skid trails, forest savannahs) with abundant herbaceous plants and insects. Forest savannahs are forested areas with sparse tree canopies that provide an herbaceous layer of plants rich in insect production. The overhead cover also available in forest savannahs provides some added protection for broods from avian predators. Good interspersion of open areas with other habitats enables hens to quickly travel from nest sites to brood habitats; minimizing travel distances among brood habitats helps minimize poult mortality.

Except in areas with very little available water or during unusually dry summers, water does not appear to be an important limiting factor for turkeys. Turkeys usually are able to meet their need for water from moisture obtained from dew and by eating green leaves and insects.

Reproduction and Brood Survival

Wild turkey population levels depend on reproductive success. Total reproduction is influenced by a combination of factors that include nesting and renesting rates, nest and hen success, clutch size, fertility rates, hatching success, and poult survival.

Wild turkeys generally breed from late March through mid-April. Renesting efforts may extend into May. Although juvenile gobblers are sexually mature and capable of breeding, adult males do most of the breeding. Because sperm remain viable in female reproductive tracts, eggs may be fertilized for up to 4 weeks after copulation. During the early stages of egg laying, hens may lay an egg every 2-3 days. As egg laying progresses, hens generally lay an egg per day until a full clutch of 10-12 eggs is reached. Hens cover their nest after laying an egg until they begin incubation. Once a full clutch is completed, incubation begins and normally lasts 28 days until hatching occurs. High fertility rates (90-98%) for eastern wild turkeys result in most eggs hatching after 28 days. Peak hatching date in Virginia is about May 5, but may range from late April until mid-May.

The percentage of birds that nest is a critical factor in reproductive success. Nesting rates in western Virginia have been estimated to be about 80% for adult hens and 50% for juvenile females. In other areas, nesting rates may be higher and approach 100%. Hen condition in the spring, due to inclement weather and food availability during the fall and winter, may influence nesting rates and reproductive success.

On average, approximately half of the hens that attempt to nest will successfully hatch a brood. But on an annual basis, hen success may vary widely and range from 33% to 82%. Nest predation is a common reason for failure, with crows and raccoons being common nest predators. Hens disrupted during egg-laying or incubation may abandon the nest. Hens are less likely to abandon the nest if disturbed later in incubation than if they were disturbed early in the nesting period. Hens that abandon their nest may re-nest. However renest rates are low and the number of eggs in second clutches are typically lower (6-8 eggs) than found in first clutches.

Due to inclement weather and predation, poult mortality rate during the first 4-weeks is a critical factor affecting recruitment. Poult mortality rates may average about 50%, but annually can range widely from 21% - 88%. Poults less than 1 week of age are usually able to withstand weather extremes because they still have significant yolk sacs available for energy and the entire brood is able to find shelter underneath the brooding hen. Older poults that have exhausted their yolk sacs and are too large (e.g., quail size) to all fit under the brooding hen have higher mortality rates, especially when cold and wet conditions persist for over 12 hours. Normal weather conditions during May and June (i.e., not too dry or too wet) are considered to be best for good brood survival.

Especially during the first 2 weeks when poults are unable to fly, predation is also an important factor affecting poult survival. Although they readily seek cover when threatened by predators, flightless poults can be easy prey. Females with young broods typically try to distract predators by mimicking a broken wing. Poults are typically able to fly at 8-12 days of age.

Ultimately, production rates represent the product of all the aspects of nesting and brood survival. While production rates vary greatly from year to year, an average of about 1.5 poults (that live to 4 weeks of age) are produced by each hen turkey. Production also varies depending on the age of the hen with adult hens being more productive than juveniles. Research in Virginia found juvenile hens produced 0.5 poults/hen, 2-year old birds produced 1.4 poults/hen, and adults (3+ years old) produced 2.6 poults/hen.

Mortality

During a study from 1989-1994, the annual mortality rate of hen turkeys in Virginia averaged 52% (or a survival rate of 48%), but varied widely among years from a high of 66% mortality to a low of 34%.

Annual mortality of juvenile hens was higher (56%) than adults (48%). Another Virginia study found annual hen mortality rates were 65%. The leading cause of hen mortality in Virginia has been predation (53% of all mortalities) (Fig. 2). Legal hunting harvests only accounted for 12% of all deaths and were exceeded by poaching losses (18%) and other losses (17%) such as accidents, diseases, and crippling.

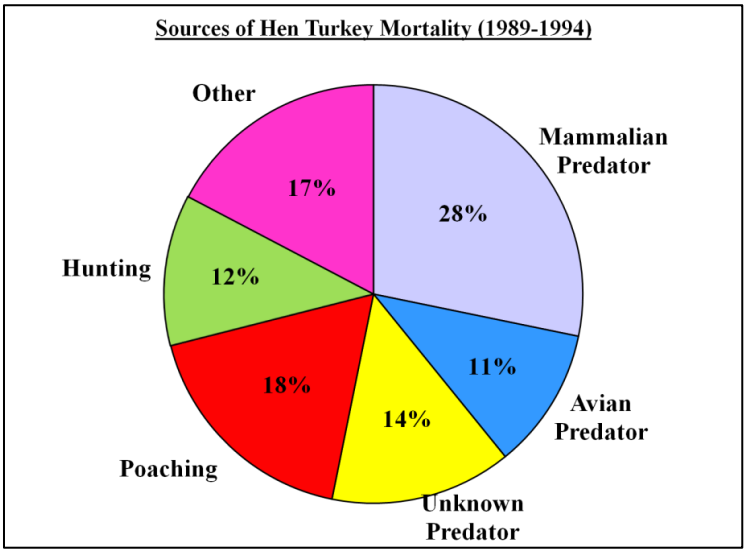

Figure 2. Sources of mortality for hen turkeys in Virginia and West Virginia from 1989-1994 (n=549 deaths).

In Virginia and West Virginia, mammalian predators (primarily bobcats) generally take more turkeys than avian predators (primarily great-horned owls). Predation also tends to increase during spring dispersal as juveniles move into unfamiliar habitats outside their home range.

Legal harvest rates of female turkeys during the fall seasons in Virginia averaged 12% during the 5-year study, but annually ranged from 3% to 20%. Acorn mast production also affects fall harvest rates. Lean mast years result in increased harvest rates as turkeys spend additional time searching for available foods, making them more vulnerable to hunters.

Illegal harvests (either intentional or accidental) also can be a major mortality factor for hens. The annual rate of illegal hen harvest in Virginia averaged at least 5% during the fall hunting seasons and 6% during the spring gobbler season. In fact, illegal harvest levels can exceed legal harvest rates in Virginia and may be an important factor affecting population levels. Similar illegal harvests also were found by studies in Florida, Missouri, and Kentucky. In the Virginia study, the majority of the spring illegal hen mortality took place during the first 2 weeks of the spring gobbler season, suggesting that the timing of spring gobbler hunting may contribute to illegal harvest. However, not all Virginia studies have shown such high illegal harvests of hens. Research on large private land holdings in the Tidewater region showed no illegal kills. Because more hens are active during the egg-laying period before the onset of peak incubation, earlier spring hunting seasons may expose more non-incubating hens to potential illegal harvests than occurs later in the nesting season.

Like hens, gobbler annual mortality rates also vary. Different studies in Virginia have estimated annual mortality of adult gobblers to range from 69% to 46%. Most of the annual mortality for adult gobblers was concentrated in the spring gobbler season when the hunting mortality rate was 25%. In contrast, juvenile (jake) gobbler mortality rates were only 5% during the spring hunting season. Mortality of adult and juvenile gobblers was comparable during the other seasons of the year. Known illegal kills accounted for 5% of the fall male mortalities, but the potential illegal fall mortality rate might have approached 9%. Most poaching losses of male birds took place following the fall turkey season.

Mortality of adult birds due to starvation is uncommon in Virginia. However, extended periods of packed snow and ice can affect survival rates by making limited food supplies unavailable.

Diseases

Mortality from diseases and parasites can also occur, but typically these effects are localized and pose little large-scale threat to turkey populations or humans. A variety of pathogens have been reported in wild turkeys, including avian pox virus, lymphoproliferative disease virus (LPDV), avian cholera (*Pasturella multocida*), *Mycoplasma* sp., sarcocystosis (*Sarcocystis* sp.), toxoplasmosis (*Toxoplasma gondii*), blackhead disease (*Histomonas meleagridis*), *Haemoproteus meleagridis*, *Leucocytozoon smithi*, and tracheal worms (*Syngamus trachea*). Fortunately, two of the most commonly diagnosed diseases, avian pox virus and blackhead disease, do not pose a risk to public health. A third disease, LPDV, is a pathogen that was diagnosed for the first time in wild North American turkeys in 2009 and is not believed to pose a threat to humans.

Avian pox is a highly contagious condition that typically affects wild turkeys during warmer months. While many infected turkeys do not show any visible signs of disease, clinically affected birds display lesions consisting of nodules that eventually scab over. The nodules are usually restricted to the unfeathered portions of the head and legs or in the mouth. Affected turkeys may develop vision impairment and breathing problems due to obstructions from nodules, significant weight loss, and/or weakness. Blood-feeding insects, especially mosquitoes, are the main mode of avian pox virus transmission. Avian pox formerly posed a significant problem when diseased pen-reared turkeys were released for population restoration (see section on "Restocking Efforts").

Blackhead disease, caused by a protozoan parasite *Histomonas meleagridis*, often induces non-descript clinical signs in affected birds, including listlessness, droopy wings, and ruffled feathers. Infected turkeys usually have lesions in the gastrointestinal tract and the liver. Earthworms play a role in parasite transmission by storing eggs from parasites after ingestion of droppings from infected birds. Uninfected birds may be exposed to the parasite after eating earthworms harboring the parasites. Turkeys are particularly susceptible to *H. meleagridis*, and severe disease and high mortality may be observed. Infection rates among wild turkeys are unknown, but mortality rate usually exceeds 75 percent among infected birds.

Lymphoproliferative disease virus (LPDV) had previously only been known to occur in domestic turkeys in the United Kingdom and Middle East, but the first North American case was diagnosed in 2009. Harvested wild turkeys have been recently diagnosed from Virginia and many other states (Arkansas, Georgia, Maine, Missouri, New Jersey, North Carolina, Pennsylvania, and West Virginia). Many infected turkeys do not show any visible effects of disease, but clinically affected birds often look very similar to birds infected with avian pox virus. However pox virus lesions are typically localized to the head in turkeys, while LPDV-affected turkeys exhibit these same lesions on the feet, legs, and head. The potential effects of LPDV on wild turkey populations are unclear at this time. Current research suggests that the virus is geographically widespread, but likely accounts for a small percentage of disease-related mortality in wild turkeys.

Research shows that the majority of domestic poultry diseases are spread from farm to farm via contaminated humans, poultry equipment, and farm vehicles. Humans, equipment, or vehicles that come into direct contact with diseased wild turkeys do have the potential to transmit infectious agents to domestic poultry. With opportunities for direct contact with wild turkeys, operations with compromised biosecurity practices (i.e., poor traffic control, isolation, or sanitation) or free-ranging domestic poultry (including both backyard flocks and large commercial flocks) have the potential to be exposed to diseases carried by wild birds. While direct contact with contaminated feces, uric acid droppings, nasal discharge, or saliva from sick wild birds may result in disease transmission to domestic poultry, airborne transmission of infectious agents over large distances is not considered to be a significant mode of disease transmission.

Supplemental feeding of turkeys and other wildlife may lead to aflatoxin exposure. Aflatoxins are poisons produced by fungi in spoiled grains and have been linked to wild turkey mortality. Aflatoxins may be found in contaminated corn and other small grains that are often used to feed wildlife. Aflatoxin levels are closely monitored in grains intended for livestock, but when levels are too high for safe use by domestic animals, these grains are often sold as "wildlife corn". One study showed that over 50% of corn samples from North Carolina and South Carolina contained aflatoxins. Turkeys that feed on grains with toxic amounts of aflatoxin may exhibit weight loss, reduced liver function, decreased reproduction, and suppression of the immune system.

In addition to potential aflatoxin exposure, supplemental feeding of turkeys also congregates birds and may increase the transmission of other diseases from sick to healthy birds. Debilitated birds are more likely to feed from a convenient source, such as a feed pile, rather than find food on their own. Consequently, they may expose healthy turkeys to infectious agents either through direct contact with other birds or indirectly via contamination of the feed from infected feces, saliva, nasal discharge, or urates. In addition to the disease concerns, feeding-related concentration of turkeys may also increase predation and poaching losses.

Population Dynamics

The combined effects of reproduction and mortality on population size and growth determine the dynamics of a wild turkey population. With the wide variation that sometimes occurs in reproduction (e.g., nesting success, poult mortality) and survival (e.g., predation rates, hunting harvests), wild turkey populations may also experience large year-to-year changes (± 50%).

When turkey population densities are low, weather is favorable, and resources are abundant, unhunted wild turkey populations can maximize population growth because reproduction and survival are both optimal. Under such favorable circumstances, turkey population size could double every 1-2 years. The maximum population growth for turkeys has been observed to be about 68% per year (after reintroductions in Iowa). Actual growth rates are highly variable and are usually much less than the maximum because population growth is influenced by a variety of factors such as available food, weather conditions, habitat quality, number of females, population size, predation, and hunting harvests.

Turkey populations cannot grow indefinitely. Similar to deer population dynamics, increasing turkey densities also inhibit recruitment and slow population growth rates. Turkey population growth and density will become limited as habitat resources (e.g., food supplies, brood habitat, nesting sites) become limiting. Eventually the biological carrying capacity (BCC), which is the maximum number of turkeys an area can support over an extended period of time, will be reached. The BCC for wild turkeys is unknown for Virginia and other areas in North America, but turkey populations have been documented to reach densities as high as 32 turkeys/mi^2 in Alabama, 25 (or more) birds/mi^2 in New York, and 20 turkeys/mi^2 in Iowa.

Population modeling for Virginia wild turkeys has found that population growth rates were most strongly influenced by the fall hunting mortality of hens than by reproductive factors. Research in Virginia has shown that fall hunting mortality on hens during long hunting seasons, that also overlapped deer season, is an additive loss to the population (that is, hunting losses add to the existing natural mortality). Because this additive mortality results in reduced survival and population growth, regulating the fall harvest of hens is the primary option for managing turkey population levels.

While managing the harvest of hens is the most effective population management tool to influence turkey population levels (like regulating the harvest of does to manage deer populations), harvest losses (both legal and illegal) are still only a relatively small component of the overall turkey mortality (Fig. 2). Unlike other big game species, where legal hunting is the primary form of mortality (e.g., bear, deer), the combined influence of many other sources of mortality (e.g., predation, weather, poaching) and reproduction may often overwhelm the anticipated impact that changes in hunting seasons might have on

turkey population levels. As well, hunting mortality can vary from year to year due to weather factors, mast abundance, and influence of other hunting seasons. With all the background variation that occurs in both reproduction and mortality, yearly changes in turkey populations can be very unpredictable. As a result, the annual impact of population management strategies cannot be precisely predicted. Population modeling suggests fall harvest hen mortality rates of 10% or less still permit long-term population growth, while populations would generally stabilize at a maximum fall hunting mortality rate of 15%. Gobbler hunting mortality in both the spring and fall is generally considered to have minimal population impact.

PROGRAM HISTORY OF WILD TURKEYS

The history of the wild turkey in Virginia and across the United States is a story of abuse to the brink of extinction, followed by restoration, and management. By the end of the 19th century, turkey populations had been extirpated (i.e., eliminated) throughout most of Virginia and only survived in the most inaccessible areas. As one of the landmark wildlife management success stories, wild turkey populations have been reestablished in record numbers across the continent, even beyond their historic range.

Pre-colonial / Colonial Period

As an abundant and easy prey, Native Americans commonly used wild turkeys for food, clothing, blankets, tools, weapons, and ceremonies. The Spanish Conquistador, Cortés, may have been the first European to give accounts of the wild turkey in 1519, in Mexico. Probably originally domesticated by the Aztecs, Cortés sent Mexican turkeys back to Spain, where they quickly spread across Europe and to the British Isles. Various strains of these domesticated Mexican birds were shipped to Jamestown, Virginia for the early colonists around 1607; additional turkeys were delivered to Boston in 1629. These early birds from Mexico (via England) became the original source of today's commercial turkey industry.

The first description of wild turkeys in the mid-Atlantic region came from the Roanoke Island Colony of North Carolina about 1585. There were no credible estimates of wild turkey populations in Virginia when Jamestown was settled in 1607, but many journals noted that wild turkeys were very abundant. Many reports and landmark names reflect the abundance of turkeys in Virginia into the 1700s. Despite being hunted and trapped year round in the early 1700s, wild turkeys continued to survive the early pressures of habitat changes and market hunting. There is no doubt that the wild turkey played an important role for early settlers as a source of food and income from game markets.

Population Declines

As human populations expanded and cities grew throughout the country and in Virginia, habitat destruction, combined with increasing demand for wild turkeys and other wild game, began to take a toll on turkey and other wildlife populations. Much of the demand for popular foods like wild turkey was met by professional market hunters. These commercial hunters were very effective with stories of hundreds of wild turkey carcasses being shipped on trains destined for large cities. In 1872, wild turkeys sold for $1 each.

Agricultural practices during the late 1800s and early 1900s further reduced habitat for turkeys. These practices involved extensive deforestation, burning, grazing, and cultivation. The lowest point for turkey populations likely occurred during the period 1890-1920. By 1916, turkey populations in Virginia had been extirpated from 2/3 of the state. By 1941, there was serious doubt that the wild turkey would remain a game species in Virginia and throughout the United States.

Population Recovery

The agricultural practices of the late 1800s and early 1900s reduced soil fertility and limited productivity. Once productivity declined, farmlands were abandoned and farmers migrated to cities for

industrial jobs. These reverting farmlands enabled all wildlife, including wild turkeys, to reoccupy newly forested habitats.

Congressional approval of the Weeks Act in 1911, made it possible to purchase and protect deforested land in Virginia and begin forest restoration on what later became national forest lands. The first land purchase in Virginia occurred during 1911 and contained 13,450 acres in the Mt. Rogers area. Established in 1916, the Natural Bridge National Forest became Virginia's first national forest. Subsequent purchases and name changes have resulted in the current 1.7 million acres of the George Washington and Jefferson National Forests in Virginia, assuring large forested areas for turkey habitat. In 1938, the Virginia Game Commission and the U.S. Forest Service executed a formal agreement (the oldest of its kind in the United States) to fund additional wildlife habitat and management work on national forests within the state. The creation of the 200,000-acre Shenandoah National Park in 1936, also provided additional protection for wild turkeys and their habitat. In the 1930s, the Civilian Conservation Corps (CCC) provided funds and manpower to create and manage brood range on these public lands.

Concurrent with improving habitats, early efforts to reverse the population decline of wild turkeys included the creation of laws to protect turkeys. In order to limit market hunting, hunting methods and sales restrictions were established in 1912. The growing conservation ethic and awareness for the welfare of wild turkeys and other wildlife also led the General Assembly to pass the "Robin Bill" in 1912, which prohibited the sale of wild turkeys and other wildlife.

Even though there were laws in place to limit the methods and numbers of turkeys that could be taken, enforcement was ineffective. The lack of enforcement to halt market hunting spurred the creation of the Department of Game in 1916. The Department of Game hired game wardens to protect the wildlife species of Virginia. From 1916 to 1929, the Department of Game added regulations and enforcement for game protection. The Pittman-Robertson Act in 1938 provided significant additional financial support for wildlife management and research programs in Virginia and throughout the country. With the added funding for the Department of Game, came renewed efforts for game management activities. Not only was considerable attention given to the wild turkey, elk were reintroduced, deer populations were restored, and predators were controlled.

Restocking Efforts

To speed the recovery of wild turkeys, the Commission of Game and Inland Fisheries began an exhaustive program to restock turkeys across Virginia in 1929. The restocking effort was started by purchasing 150 birds at a cost of $5.00 each. Initially, the practice of releasing game-farm birds was considered a success and birds continued to be purchased at market prices.

An intensive program to raise and release pen-reared wild turkeys was initiated with the hopes of reestablishing new populations. After disappointments with the progress of releasing game-farm birds, a graduate student, Wayne Bailey, was charged in 1933 to investigate different release methods for successfully establishing birds. In 1935, the Virginia Cooperative Wildlife Research Unit at Virginia Tech was created with a principal charge to support this artificial propagation program and Henry Mosby was chosen to lead the restoration program. Both Wayne Bailey and Dr. Mosby went on to become early pioneers and renowned biologists for wild turkey management in North America.

Despite diligent efforts to produce "genuine" wild turkeys at 7 different game farms around the state, the release of 21,865 pen-reared birds between 1929 and 1960 (Fig. 3) had virtually no success at reestablishing populations. These pen-raised birds failed to reproduce and survive because they never learned survival skills as young turkeys raised by a wild hen, they were impacted by diseases common to confined conditions, and lacked the genetic quality of wild turkeys. Most of the game-farm releases occurred between 1948 and 1960, with the most birds (2,809) being released in 1952.

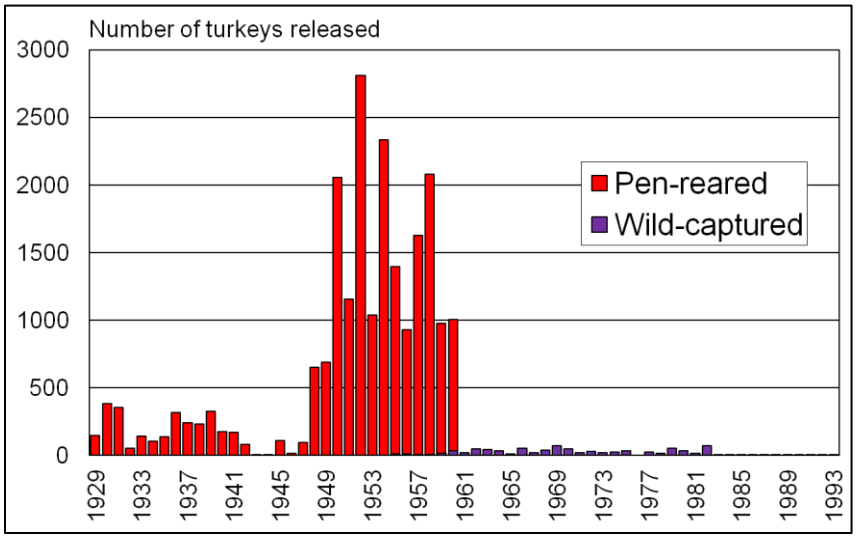

Figure 3. Turkeys released in Virginia for population restoration (1929-1993).

Although game farm operations could produce thousands of birds with the hope of accelerating the pace of restoration, biologists began to suspect that trapping and releasing free ranging wild turkeys would be a more effective approach for successfully establishing new populations. The problem of capturing large numbers of wild turkeys was solved in 1951 in South Carolina when turkeys were first trapped by using a cannon net technique that was originally developed for capturing waterfowl.

In 1955, the Virginia Game Commission began its own trap-and-transfer release program. In the coming years, the trap-and-release program was so successful that the Commission's pen-rearing operations were closed after 1960. During the period 1955-1993, and primarily from the Gathright WMA, the Game Department trapped and released 917 wild turkeys. These wild-trapped birds were released in 22 different counties, primarily in southwest Virginia, the Northern Neck, and the Eastern Shore. The restoration of the wild turkey in Virginia was completed in 1993 with the release of two Gathright WMA birds in Accomack County on the Eastern Shore (Fig. 4). Although overshadowed by the great volume of pen-reared turkeys that were released prior to 1960 (Fig. 3), the trap and transfer program represented a significant effort that produced one of the Commission's greatest conservation achievements. Through the combined benefits of hunting regulation controls, reforestation, public land purchases, effective law enforcement, restocking, and management-based research, turkey populations grew and expanded their range in Virginia (Fig. 5, Fig. 6). Today, turkeys are distributed across every county in the state.

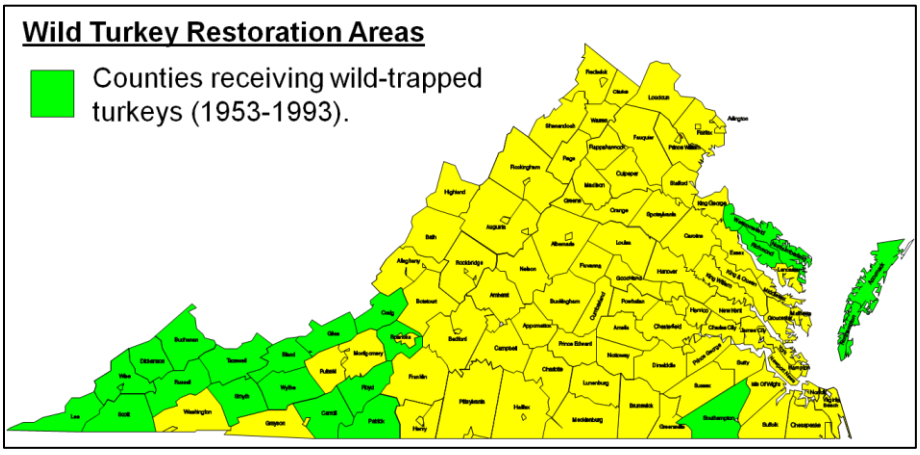

Figure 4. Virginia counties receiving 917 wild-trapped turkeys for population restoration (1955-1993).

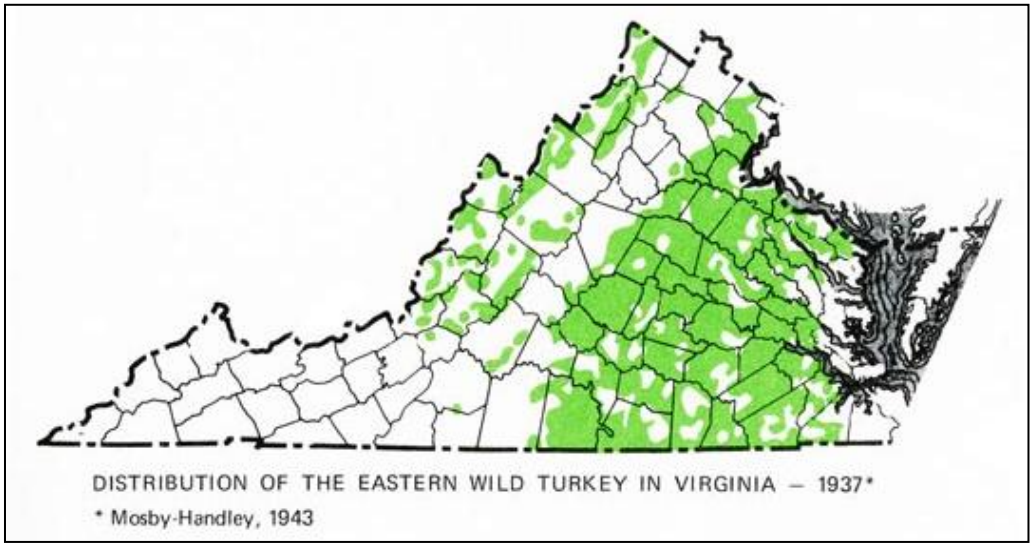

Figure 5. Distribution of wild turkeys in Virginia in 1937.

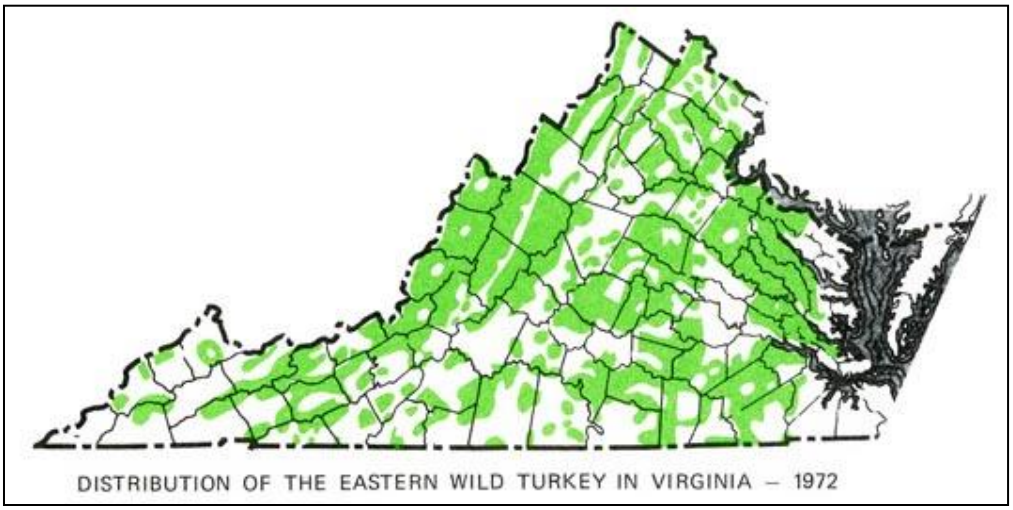

Figure 6. Distribution of wild turkeys in Virginia in 1972.

Hunting Regulation Changes

The first regulation restricting wild turkey hunting came in 1885, when the General Assembly set seasons for areas east and west of the Blue Ridge Mountains. The season east of the Blue Ridge Mountains was from October 1 through January 15. In counties west of the Blue Ridge the fall turkey season was longer, from September 15 through mid-February. These earlier fall/winter seasons likely helped to establish fall hunting as the traditional time of year to hunt wild turkeys in Virginia. This law also prohibited the buying and selling of wild turkeys. In 1904, the General Assembly further restricted the shooting of wild turkeys at night and the capture of wild turkeys with traps or nets. The legislature made it illegal to bait wild turkeys in 1922.

Fall Hunting Seasons

1940s -1971. Between the 1940s and 1971, fall hunting season dates in Virginia were highly variable, with counties sometimes exhibiting large annual changes in turkey season structure (liberal, conservative, closed).

- As one of the more extreme examples of county variations, Hanover County had fall turkey seasons that changed from November 19 – January 15, to closed, to December 15 – January 15, and back to closed during the 4-year period of 1962 through 1965.
- In general, season closures were most prevalent in southwestern Virginia with the longer seasons (up to almost 9 weeks long) in the southern Piedmont and northern mountain counties.
- Unless otherwise closed, seasons prior to 1958 tended to be longer in counties east of the Blue Ridge (EBR), than in counties west of the Blue Ridge (WBR).
- After 1962 the opposite was more normal, with a tendency for longer seasons WBR than EBR.
- Prior to 1972, the earliest opening date was November 1 and the latest closing date was January 20.

1972-1988.

- 1972: The regular long hunting season dates were standardized to a 7-week season (approximately) in all counties EBR and WBR. The standard fall turkey season ran from the 2nd Monday in November through December 31. As necessary, some counties remained closed or only had 2-week seasons during this period.
- 1981: The fall hunting season was extended to an 8-week season by opening one week earlier; the new standard season dates became the 1st Monday in November through December 31.
- 1987: The fall hunting season was extended to nearly a 9-week season by closing about one week later. The new standard season dates became the 1st Monday in November through the 1st Saturday in January.

1989-2010. This period is characterized by many changes to create more fall turkey hunting opportunity in previously closed counties or counties with conservative seasons (primarily in eastern Virginia). Due to the increase in deer hunting opportunities (e.g., longer seasons, muzzleloader seasons) and associated impacts on turkey mortality, many changes were also made in the most liberal areas to shorten fall turkey seasons and minimize overlap with deer hunting. The net result was a reduction in fall turkey season length from about 9 weeks to 6 weeks in many counties. Some key changes included:

- 1989: In 11 Shenandoah Valley counties, the 9-week season was shortened by one week when turkey season was closed during the opening week of the firearms deer season. This resulted in a split turkey season: two weeks before the opening of firearms deer season, closed for the opening week of firearms deer hunting, and then resuming in the second week of the firearms deer season.
- 1991: The shortened split turkey season was expanded to 45 counties.
- 1995: Additional changes included:
    - The shortened split turkey season was expanded to 71 counties, all the remaining counties with a long season.
    - The early 2-week split in the season was moved to start one week earlier.
    - The second season also started later during the first or second week of December.
- 1999: Turkey hunting was permitted on Thanksgiving Day in counties with a fall season.
- 2003: The 3-week fall seasons structure were replaced by 4 week seasons.
- 2006: Opening day for turkey hunting was changed from Mondays to Saturdays. Season lengths were unchanged.
- 2008: The season was split between EBR and WBR. The starting and ending dates of the second segment of the EBR season were shifted 1 week earlier. There was no net change in season length.
- 2008: Accomack County, Northampton County, and the City of Suffolk were opened to fall hunting. With the exception of the heavily populated cities around Norfolk and Virginia Beach, all of Virginia had fall turkey hunting for the first time since the early part of the 1900s.

2011-13. Hunting season changes were made to help stimulate population growth and provide additional fall turkey hunting opportunities.

- 2011: Reducing the open fall season to two weeks, the December portion of the fall turkey was eliminated in 11 northern mountain counties WBR.
- 2011: Two additional weeks of late January turkey hunting (after the deer seasons) were added in counties with a standard 6-week fall season, creating an 8-week season.

Legal turkeys. In general since 1951, it has been legal to harvest turkeys of either sex during fall hunting seasons, but with the following exceptions:

- East of the Blue Ridge
  - 1968-78: Bearded birds / Gobblers only
  - 1979-82: Only one hen was permitted
- West of the Blue Ridge
  - 1971, 1976-82: Only one hen was permitted
  - 1971-74: Bearded birds / Gobblers only in southwestern counties

Spring Hunting Seasons

Spring hunting for bearded turkeys started in Virginia during 1961 as an experimental 6-day season (April 24-29) on three public hunting areas (Gathright WMA, Fort A.P. Hill, and Camp Pickett) and resulted in the harvest of 34 gobblers (24 at Camp Pickett, 5 at Fort A.P. Hill, and 5 at Gathright WMA). During 1962, the experimental 6-day season (April 23-28) was expanded to include four entire counties with predominately private ownerships (Amelia, Chesterfield, Nottoway, and Powhatan) and additional public areas (Gathright WMA, Goshen WMA, Little North Mountain WMA, Fort A.P. Hill, Camp Pickett, Camp Peary, Ft. Eustis, Naval Weapons Station, and Cheatham Annex); 129 birds were killed, including one bearded hen. The 6-day spring season was again expanded in 1963 to include 43 counties. Through the 1960s and 1970s, spring hunting continued to be opened in a growing number of counties. The first statewide spring turkey season occurred in 1977, with Lee County included as the last county to be opened for spring gobbler hunting.

Spring season length. Season lengths gradually increased through the 1960s, 1970s, and 1980s. Season length changes for spring gobbler hunting in Virginia include:

- 1961: First 6-day spring season.
- 1965: Season length extended to 7 hunting days, including 2 Saturdays.
- 1966: Season length extended to 12 hunting days, still including 2 Saturdays.
- 1967: Season length extended to 13 hunting days, including 3 Saturdays.
- 1968: Season length extended to 18 hunting days, still including 3 Saturdays.
- 1969: Season length extended to 19 hunting days, including 4 Saturdays.
- 1973: Season length extended to 25 hunting days, including 5 Saturdays.
- 1988: Season length extended to 31 hunting days, including 6 Saturdays.

Spring season timing. Spring gobbler seasons in Virginia have traditionally been set to open around the time of peak incubation because nesting hens may be less vulnerable to illegal kills as they spend more time on the nest. Some milestones for spring gobbler season opening dates in Virginia include:

- 1961-1972: Opening dates varied between April 17 and April 29.
- 1973-1989: Opening dates were either the 2nd Saturday in April (12 years) or the 3rd Saturday in April (5 years) and varied between April 8 and April 17.
- 1990-1999: Opening dates occurred on the Saturday closest to April 15 and varied between April 12 and April 18.
- 2000-2013: Opening dates occurred on the 2nd Saturday in April and varied between April 8 and April 14.

Spring hunting hours. Beginning at one-half hour before sunrise, morning-only hunting has been designed to help minimize nest disturbance and potential poaching of hens. Changing closing times for spring gobbler hunting hours in Virginia include:

- 1961: Hunting hours for the first experimental season ended at 12:00 noon.
- 1962: Hunting hours were shortened to end at 10:00 a.m.
- 1970: Hunting hours were extended until 11:00 a.m.
- 1990: Hunting hours for spring gobbler hunting were extended until 12:00 noon.
- 2003: Hunting hours during the last 12 days of the season were extended from 12:00 noon until sunset.

Bag Limits

- 1940s: The general state law in 1940 was 2 birds per day and 4 per season, with the exception of 2 birds per day and 2 birds per season in most northern counties WBR.
- 1951-1987: The bag limit was generally 1 per day, 2 per year with the following exceptions:
    - 1971-74: 3 birds per year statewide, all of which may be taken in the spring gobbler season
    - 1975: 3 birds per year EBR, all of which may be taken in the spring gobbler season
- 1987-1999: Beginning with the 1987-88 hunting seasons, the statewide bag limit was 1 per day, 3 per year, no more than 2 of which could be taken in the fall or spring.
- 1999-2013: Beginning with the 1999-2000 hunting seasons, the statewide bag limit remained 1 per day, 3 per year, but no more than 2 of which may be taken in the fall which means all 3 could be taken in the spring.

Youth Hunting Days

- 2004: Youth spring gobbler day established on the 1st Saturday in April for hunters 15 years old and younger.
- 2008: Youth fall turkey hunting day established on the 3rd Saturday in October for hunters 15 years old and younger.
- 2009: Hunting hours for the youth spring gobbler day were extended from 12:00 to sunset.

Population Monitoring Programs

No simple methods exist for estimating key wild turkey population characteristics (e.g., recruitment rates, mortality rates, population growth rates, density) at a scale useful for management. The best estimates of these parameters can only be obtained through expensive and site-specific research. To assess wild turkey population status over large areas, Virginia has used a combination of indices derived from harvest, observations of age and sex structure, and hunter surveys.

Hunting harvest data are a principal source of information for monitoring turkey population status in Virginia. Turkey harvest information has been collected since 1927. From 1927-1950, turkey harvest numbers were estimated by county game wardens. Beginning in 1951, mandatory checking of turkeys was required at official big game check stations. Through the years, as many as 1,500 check stations across the state have provided annual harvest information on black bears, white-tailed deer, and wild turkey. In contrast to many states that estimate their annual turkey harvest, Virginia turkey harvest figures represent an actual known minimum count.

Beginning in 2005, successful spring gobbler hunters had the option to check turkeys through a new telephone checking system (1-866-GOT-GAME) or at a traditional check station. In 2010, spring-harvested turkeys could not be checked at check stations; instead, they were required to be checked electronically (via

telephone or internet). For the 2011-12 hunting season, fall turkey hunters were provided the option to also use the electronic checking system.

While harvest data from the big game checking system are a major source of population-related information, other programs provide important supplementary data:

- *Fall-feather collections*. Between 1958 and 2010, 53 years of turkey productivity information had been collected at big game check stations from fall-harvested birds. Feather samples from birds provided valuable recruitment information from the sex and age composition of the fall harvest. These collections were discontinued in 2011 due to hunter use of electronic checking and declining fall harvests (with associated feather samples).
- *Brood surveys*. With the decrease of the fall-feather collections to monitor productivity, a new system for reporting turkey broods was implemented in 2007. VDGIF staff provides observations of turkey broods, hens, and gobblers they see in August.
- *Spring gobbler hunter survey*. The VDGIF conducts an annual survey of spring gobbler hunters to monitor harvest age ratios, gobbling chronology, hen observations, and spring hunter satisfactions. Hunters in every county annually provide information on some 3,500 hunts and 12,000 hours of hunting.
- *Bowhunter survey*. Archery deer hunters provide observations on many wildlife species during their fall hunting trips. Among many questions about the wildlife they see, hunters are asked to provide observations of wild turkeys. Thousands of hours of observations are collected annually that provide population indices on turkeys and many other wildlife species.
- *Hunter surveys*. A periodic mail survey of a sample of hunters provides information on effort, harvest, and opinions related to all game species. Fall and spring turkey hunters are well represented in the 2% sample of residence license holders.
- *Turkey gobbling surveys*. Each spring VDGIF and US Forest Service staff conduct surveys over 50 10-mile routes and count the number of turkeys gobbling (and grouse drumming). The survey routes are run twice each year; once during the week before the spring gobbler season and once during the first week of the spring gobbler season.

Important Wild Turkey Research in Virginia

Contributing to the wealth of knowledge about wild turkeys in the Commonwealth, Virginia has been fortunate to have many important research studies conducted on wild turkeys within the state. Results of these studies have been published in the scientific literature and have made significant contributions to the knowledge of wild turkey management throughout the United States. These studies have resulted from collaborative efforts among the Virginia Department of Game and Inland Fisheries, Department of Fish and Wildlife Conservation at Virginia Tech, the Virginia Cooperative Fish and Wildlife Research Unit, U.S. Forest Service, West Virginia Division of Natural Resources, National Wild Turkey Federation, Department of Statistics at North Carolina State University, and Department of Fishery and Wildlife Biology at Colorado State University. Some of the key Virginia studies have been:

(1) 1935-41: As one of the seminal early studies ever conducted on wild turkeys, this study investigated almost every aspect of turkey biology, management, and restoration. Results are summarized in a landmark book, The Wild Turkey in Virginia: Its Status, Life History, and Management, by Mosby and Handley (1943).

(2) 1983-1985: A study was conducted to evaluate wild turkey responses to the conversion of mature forests to short rotation, even-aged pine stands in the Piedmont Region of Virginia.

(3) 1985-1987: A study of road impacts on turkey survival and habitat use was conducted on George Washington National Forest.

(4) 1989-1991: A study was conducted on the economics of spring turkey hunting in Virginia.

(5) 1989-1994: This was a 5-year study of the survival and reproductive ecology of wild turkey hens in western Virginia and West Virginia. The primary goals were to determine the impact of fall hunting on turkey populations, understand reproductive ecology, and model population dynamics. With 1,032 radio-tagged females over the 5-year study, this research was the largest study of wild turkeys ever conducted.

(6) 1989-1996: A banding study of 473 gobblers was cooperatively conducted in Virginia and West Virginia to determine gobbler survival rates.

(7) 1995: A study of 92 radioed hens explored age-related nesting success and habitat use.

(8) 2000: A study of the reproductive ecology of wild turkeys in the Tidewater region was conducted to determine the timing of incubation, predation, and illegal kill of 31 radio-marked hens.

(9) 2000-2002: New insights about acorn use by wild turkeys resulted in a chapter called "Turkeys, Acorns, and Oaks" in the book, Oak Forest Ecosystems: Ecology and Management for Wildlife.

(10) 2003: Evaluated the relationship between long-term (1973-2002) recruitment, turkey harvest, and acorn production.

(11) 2004: Effects of environmental parameters on turkey recruitment were studied.

(12) 2003- 2006: Combining results of past research and other studies, wild turkey population models were developed to evaluate density-dependent population growth and the associated harvest yields for management (both spring and fall).

(13) 2004- 2006: A cooperative study with the West Virginia Division of Natural Resources was conducted to investigate differences in gobbler survival by age, year, location, and hunting season structure.

Other Management Programs

National Wild Turkey Federation Super Fund programs. The Virginia State Chapter of the National Wild Turkey Federation has nearly 7,000 members in about 60 local chapters throughout Virginia. In partnership with the Virginia Department of Game & Inland Fisheries, the State NWTF Hunting Heritage Super Fund is used for wild turkey projects that support habitat management, education, research, and other conservation projects within Virginia. Since 1985, over $2 million has been raised and spent by Virginia chapters on wild turkey conservation projects within Virginia.

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WILD TURKEY PROGRAM SUPPLY AND DEMAND

SUPPLY

Wild Turkey Habitat Supply

Habitat Components

There are six ecoregions (Middle Atlantic Coastal Plain, Southern Appalachian Piedmont, Blue Ridge Mountains, Northern Ridge and Valley, and Northern Cumberland Mountains, and Southern Cumberland Mountains) representing 2 major landscape units (Atlantic Coastal Plain and Appalachian Highlands) in Virginia (Fig. 7). These different landscapes create a diversity of habitat types and forest communities. Northern hardwoods or oak/hickory/pine forest types characterize mountainous areas. Oak/hickory forests are the typical climax forests in the Piedmont. Coastal Plain habitats include coastal marshes along with pine, pine/oak, and bottomland/hardwood forests.

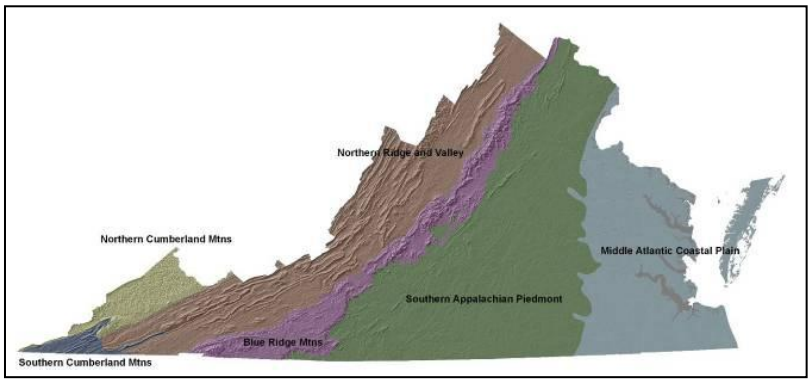

Figure 7. Virginia's ecoregions.

Turkey habitat quality depends on the fertility of the underlying soils. Soils along narrow ridges and steep slopes in the Cumberland Mountains and Ridge and Valley provinces are usually shallow and low in fertility. Valley soils, derived from shale and limestone, are relatively fertile. Blue Ridge soils tend to be deeper and more fertile than Ridge and Valley and Cumberland Mountain soils. Piedmont soils are characterized by sandy loam soils with red clay subsoil. They are generally acidic and low in organic material, phosphorus, and nitrogen. Coastal Plain soils are typically sandy and low in fertility.

Forests (24,688 mi^2) represent 62% of Virginia's land area (Fig. 8). Agricultural lands constitute 32% (13,281 mi^2) of the Commonwealth (Fig. 9). Wetlands (Fig. 9) and urban areas (Fig. 10) primarily represent the balance of land covers in Virginia.

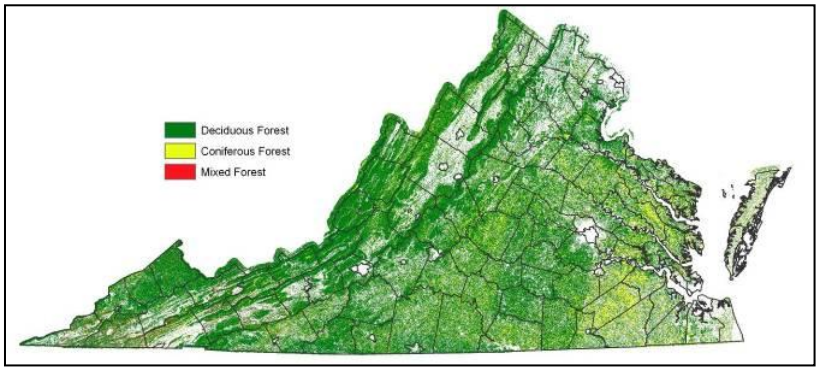

Figure 8. Land cover of Virginia: Forested areas by type.

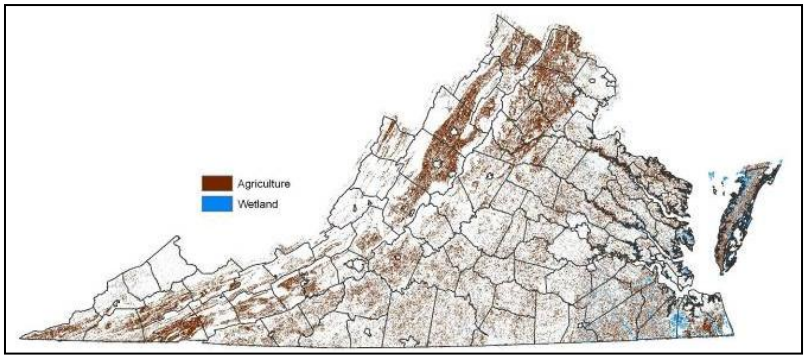

Figure 9. Land cover of Virginia: Agriculture and wetlands.

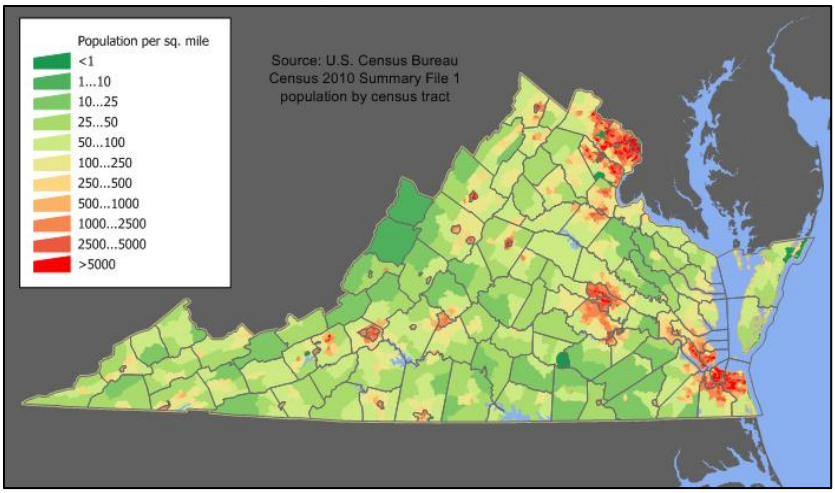

Figure 10. Virginia population densities, 2011.

Changes in diversity of dominant tree species within a stand and interspersion of different stands may also have positive or negative impacts on future turkey populations in some areas. In 1940, hardwood forests made up only 57% of forestland across the state compared to 78% in 2009; softwoods (e.g., pines, cedars) made up 43% and 22% of forested lands in 1940 and 2009, respectively. Decreased timber harvesting during the last 20 years on national forest lands has likely reduced forest habitat diversity on public lands in western Virginia. In eastern Virginia, habitat quality for turkeys may be decreasing with land-use changes that include the conversion of hardwood stands to loblolly pine and forested wetlands to agriculture.

Despite reversions from other land uses to forestlands through the 20th century, there have been more recent net losses of forested acres statewide. Between 1992 and 2009, over 961 mi^2 of forested land have been lost to other land-use changes; the majority (62%) was cleared for urban development, followed by losses for agricultural use (37%) and conversion to water impoundments (1%). If the recent trend continues, there could be a net loss of 1 million forested acres (nearly 1,600 mi^2) in the next 25 years.

The distribution (Fig. 10) and growth (Fig. 11) of human populations in Virginia plays a major role influencing habitat and land use changes. Primary population centers include areas around Richmond, Norfolk, and northern Virginia (Fig. 10). Growing at a rate of 1.4% each year since 1960, the estimated population in Virginia now exceeds 8 million people (Fig. 11). However, the rapidly growing human

population is not uniform across the state (Fig. 12). While tremendous growth has been concentrated in urban and suburban areas, some rural areas in the southern Piedmont and in the western mountains have actually been losing people. Development and population expansion of suburban areas typically results in fragmentation of farms and large parcels of land, which generally translates to losses in turkey habitat.

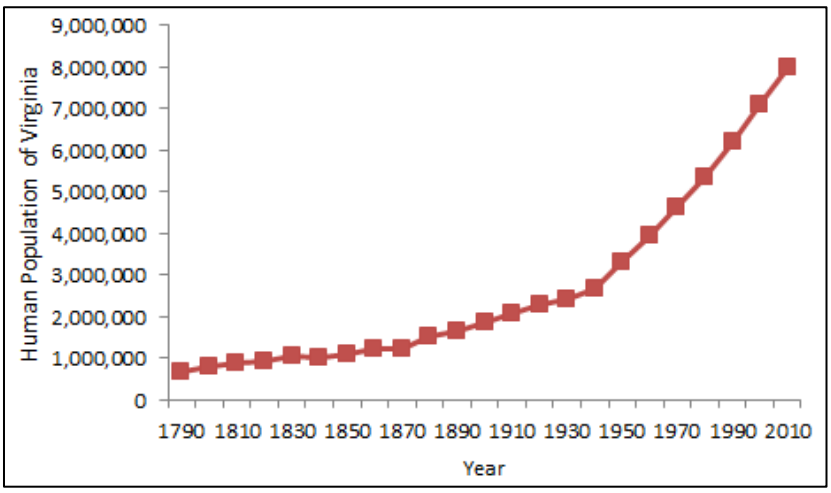

Figure 11. Human population size in Virginia based on US Census data.

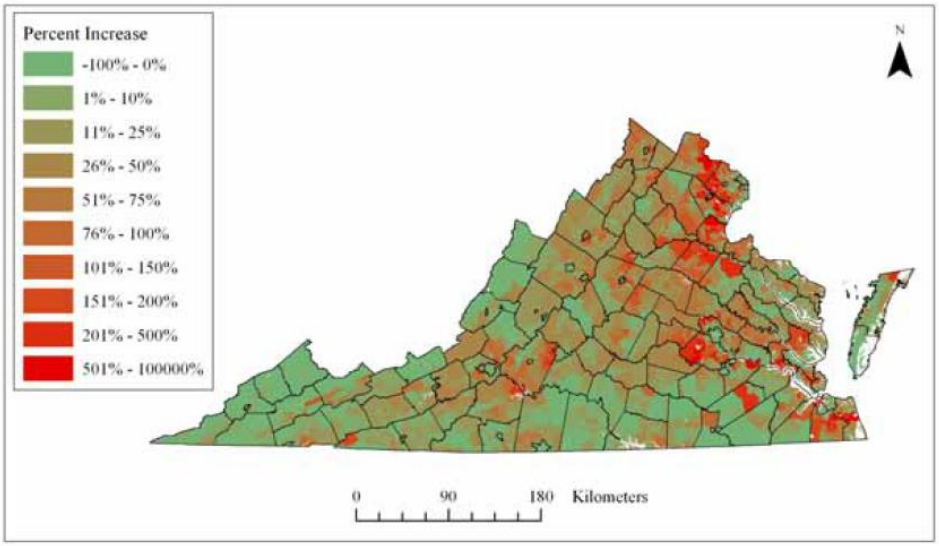

Figure 12. Human population changes as percentages from 1980 to 2000. Data from GeoLytics (2005).

Habitat Suitability

With extensive forested areas and a variety of habitat types in all ecoregions, most of Virginia can be considered potential turkey habitat. Only a few areas in Virginia with landscapes composed of very intensive agriculture (Fig. 9) or high human density from urbanization (Fig. 10) would be considered unsuitable for turkeys.

A landscape-perspective habitat suitability index (HSI) model was developed based on the forest, open land, and edge composition to provide a relative measure of turkey habitat quality in Virginia (Morris 2014). An optimum mixing of diverse forests, interspersed with openings and agriculture, will characterize the better turkey habitats. Less diversity of land cover and land use will generally be associated with lower

quality turkey habitats. Cover types, from the most recent National Land Cover Database (2006), to include in the model were guided by turkey life history needs. For suitable turkey habitats, the HSI index could potentially range between 0 for the poorest turkey habitats and 1 for the best habitats. Suitable habitat for turkeys does not include unsuitable areas such as open water, barren land, herbaceous wetlands, and heavy human development.

The average county HSI value was 0.77 across all Virginia counties, and ranged from a county high of 0.96 (Halifax) to a low of 0.51 (Alleghany) (Appendix C). The HSI model indicates that the better turkey habitats in Virginia are generally found in the southern Piedmont counties, while the poorer turkey habitats occur in the mountainous areas of western Virginia and the highly urbanized areas (Fig. 13). The southern Piedmont has a high diversity of farmlands and forested stands that offer better turkey habitat than is found in the more continuous forest cover with little interspersion of openings in the western counties.

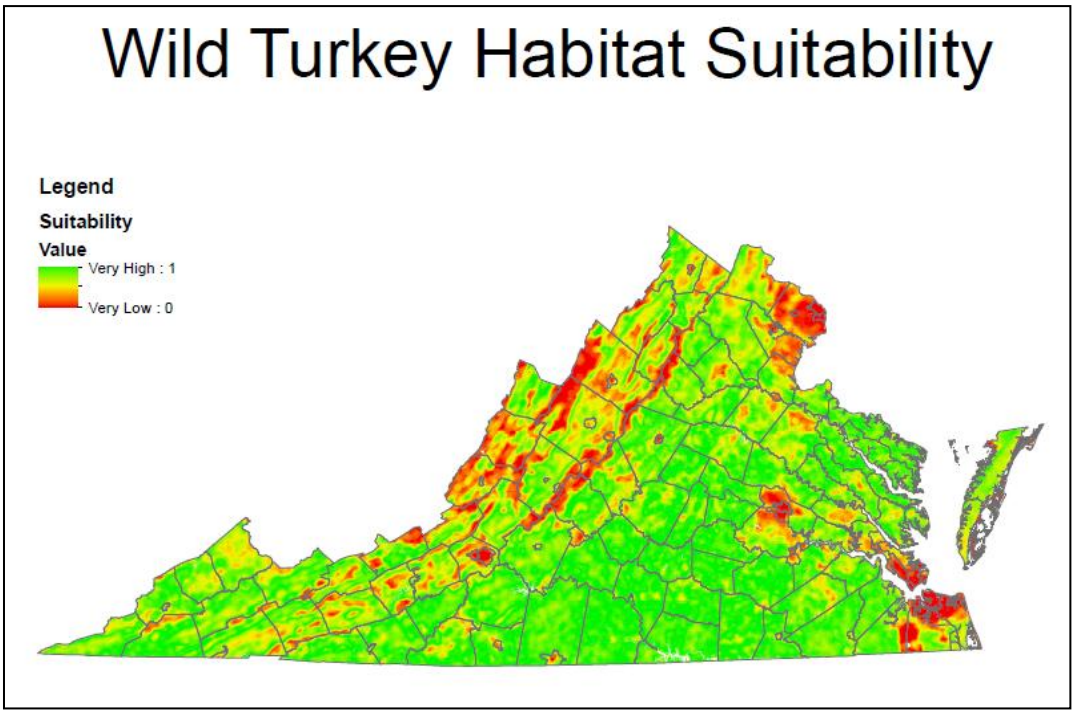

Figure 13. Habitat suitability for turkeys in Virginia (Morris 2014).

Public Land Habitats

Private ownerships represent most (88%) of the suitable habitat for turkeys across Virginia, with 12% of the suitable habitats in public ownership. On a statewide basis, the largest public land owner is the U.S. Forest Service (USFS) with 2,569 mi^2 of suitable turkey habitat on National Forest lands; the USFS contains 65% of all public land that is suitable for turkeys in Virginia. The next largest public land ownerships include the U.S. National Park Service (NPS) (437 mi^2, 11% of all public land), U.S. Department of Defense (DOD) (418 mi^2, 11% of all public land), Virginia Department of Game and Inland Fisheries (VDGIF) (275 mi^2, 7% of all public land), U.S. Fish & Wildlife Service (USFWS) (159 mi^2, 4% of all public land), and other Virginia state lands (STATE) (105 mi^2, 3% of all public land).

On average, turkey habitat quality on private ownerships (HSI = 0.85) is much higher than found on public properties (HSI = 0.53) across the state. Although public lands are managed for a variety of different public objectives, all public agencies have below average turkey habitats that are of poorer quality than

turkey habitats found on private properties. The agency-specific HSI values are: STATE=0.73, DOD=0.68, VDGIF=0.61, USFS=0.49, NPS=0.49, USFWS=0.44.

With ownership restricted to the western part of Virginia, U.S. Forest Service lands are an especially important source of turkey-related public land recreation and habitat west of Blue Ridge Mountains. On average, National Forest lands represent 20% of the total suitable turkey habitat in the 30 counties that contain USFS properties. Three counties have more than half of the suitable turkey habitat located on public land: Craig County (57%), Alleghany County (52%), and Bath County (52%). USFS properties also account for 84% of all suitable public land and over 90% of the huntable public land west of the Blue Ridge.

Because of the importance of public land in western Virginia (and USFS properties in particular), habitat quality on public lands has become a source of controversy for citizens interested in the management of turkeys and other wildlife species. Most publically owned properties in western Virginia, including USFS, VDGIF, and NPS lands, are found on side slopes and ridge tops which generally have poorer soil types than the more fertile privately owned valley lands. With predominately poor soils and steep slopes, public land turkey habitat quality is unlikely to ever be as good as the habitat quality found on the neighboring private lands. Average HSI values confirm the poorer turkey habitat quality of public lands west of the Blue Ridge (2006 HSI = 0.50) compared to private properties (2006 HSI = 0.78). Compounding concerns about public land habitat quality has been the apparent long-term decline in public land turkey habitat conditions (1992 HSI = 0.55) compared to private land which has remained unchanged (1992 HSI = 0.78).

The long-term deterioration of turkey habitat conditions on National Forests (and other public lands) likely has multiple causes, including changes in land management practices and reduced support of specific wildlife habitat management efforts (e.g., fewer VDGIF staff directly working on USFS properties). Forest maturation is a consequence of reduced timber harvests (Fig. 14) that decreases habitat diversity and the abundance of early successional habitats. Characterized by the growth of grasses, forbs, and young woody vegetation, early successional habitats are especially important for brood-rearing areas and nest sites.

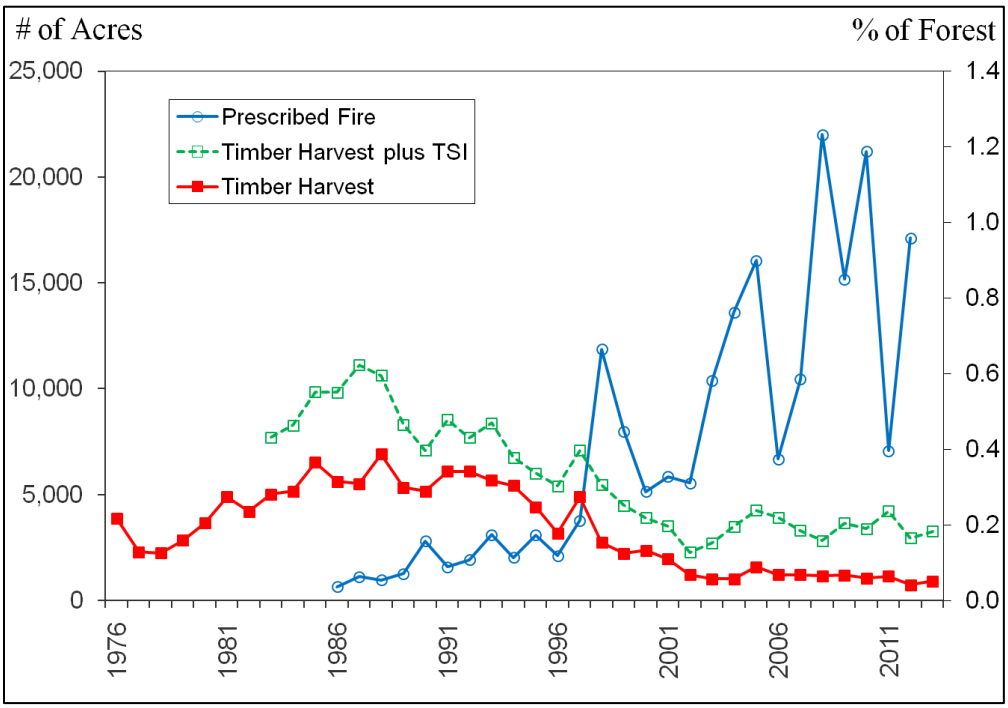

Figure 14. George Washington and Jefferson National Forests timber harvest, timber stand improvement (TSI), and prescribed fire management history, 1976-2013 (data provided by the USFS).

Over the last 5 years (2008-12), timber harvests (e.g., clearcuts, shelterwood cuts, group selection cuts, commercial thins, salvage cuts) were annually conducted on an average of 0.06% (1,060 acres) of USFS lands (Fig. 14). In addition to timber harvests, timber stand improvements (TSI) (e.g., pre-commercial thins, removal of cull trees) were annually conducted on another 0.13% (2,350 acres) of USFS lands. Prescribed fires (0.92%) involved a much greater acreage (16,514 acres) than either timber harvests or TSI. Overall, an annual average of 1.11% (19,924 acres) of USFS lands received some form of silvicultural (forestry) treatment.

Although timber harvests on National Forest lands have declined substantially since the peak 5-year period (1985-89) when 5,983 acres (0.33%) were harvested annually, the use of prescribed fire has also significantly increased (Fig. 14). Prescribed fires increase the abundance of succulent plants and soft mass. Longer-term brood habitat benefits may also be provided by prescribed fires that result in canopy thinning so sunlight reaches the forest floor for more sustainable ground-level herbaceous cover. The ultimate success of prescribed fire for improving turkey habitat will depend on many factors including site quality, stand condition, and fire intensity.

Permanent openings and roadside corridors also occur on USFS lands and provide potential value for turkeys, especially as brood habitat. Permanent openings (e.g., grasslands, right-of-ways, old farm areas, hay fields) have been annually maintained on 20,089 acres (1.12%) during 2008-12. Another 59,016 acres (3.28%) of roadside corridors occur throughout the George Washington and Jefferson National Forests. Because these roadside corridors include all classes of roads (e.g., seasonally closed roads, open USFS roads, state highways) with varying amounts of permanent openings, herbaceous cover, and traffic volume, their associated value as habitat for turkeys and broods will also be mixed.

Habitat management practices, impacts, and trends on Virginia Department of Game and Inland Fisheries Wildlife Management Areas (WMA) west of the Blue Ridge are similar to those observed on USFS properties. Over the last 5 years (2008-1012), an annual average of 0.24% of WMA lands received a timber harvest, with 0.29% receiving a prescribed burn. Permanent openings are also maintained on 1.00% of WMA properties.

Wild Turkey Population Supply

Population Densities

As with most wildlife species, no economically practical methods exist to accurately estimate actual turkey populations in Virginia. Research has shown that spring gobbler harvests and success by hunters are the best indices of turkey population trends and abundance. The primary sources of information about spring harvests and hunter success come from mandatory harvest checking and periodic hunter surveys. Data from additional surveys of bow hunters and spring gobbler hunters are also used to monitor turkey population abundance.

The number of spring gobblers killed per square mile of suitable habitat is used as a relative index to turkey population density. Suitable habitat for turkeys is defined as all areas except for locations considered barren land, herbaceous wetlands, and areas under human development as defined by the National Land Cover Database (NLCD). On average from the 2011 and 2012 spring hunting seasons, the statewide population density index was 0.44 spring gobblers killed/ mi^2 of suitable habitat. By region (Fig. 15), the highest turkey densities occur in Tidewater (region 1, 0.62 gobblers/mi^2), followed by the South Piedmont (region 2, 0.49 gobblers/mi^2), Southwest Mountains (region 3, 0.47 gobblers/mi^2), and North Piedmont (region 5, 0.31 gobblers/mi^2). The North Mountain region (region 4) may have the lowest densities with the fewest birds killed per square mile of suitable range (0.26 gobblers/mi^2). Densities also vary among counties within regions (Fig. 16, Appendix C). With more than one gobbler killed per mi^2 of suitable habitat during 2011 and 2012, Richmond and Westmoreland Counties may have some of the highest turkey densities in the state.

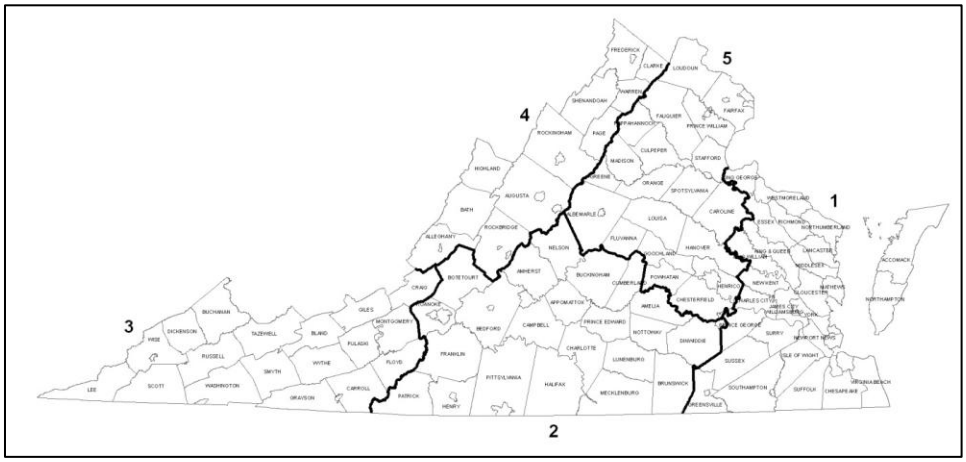

Figure 15. Virginia turkey management regions.

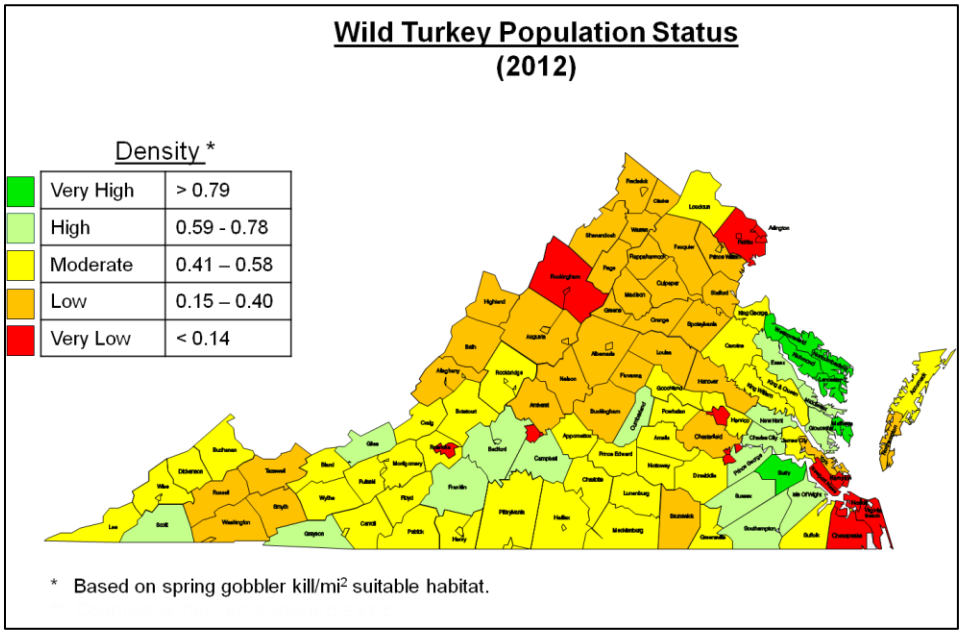

Figure 16. Relative densities of wild turkeys in Virginia, 2012.

Population Trends

Population trends are evaluated by estimating the annual rate of change in spring gobbler harvest over time (Appendix C). The population index of spring gobbler harvest showed steady and rapid growth from 1961through about 2002, with an average growth rate of 10% annually (Fig. 17). However, the population has stabilized over the last 10 years (from 2003-2012) with an average annual spring harvest of about 15,000 gobblers. Based on hunter survey information, the average daily kill for spring gobbler hunters also confirms the trend in total spring harvest (Fig. 18). Compared to the early 1990s, when the daily spring hunter success was about 0.04 gobblers killed per day (which equals an average of about 25 days of hunting effort to kill a gobbler), daily hunter success was about 63% higher by 2011 (0.065 gobblers killed per day; 15 days of hunting to kill a gobbler). During the mid-1980s, when populations were much lower, it took an average of 40 days of hunting to kill a gobbler when hunter success was about 0.025 gobblers killed per day.

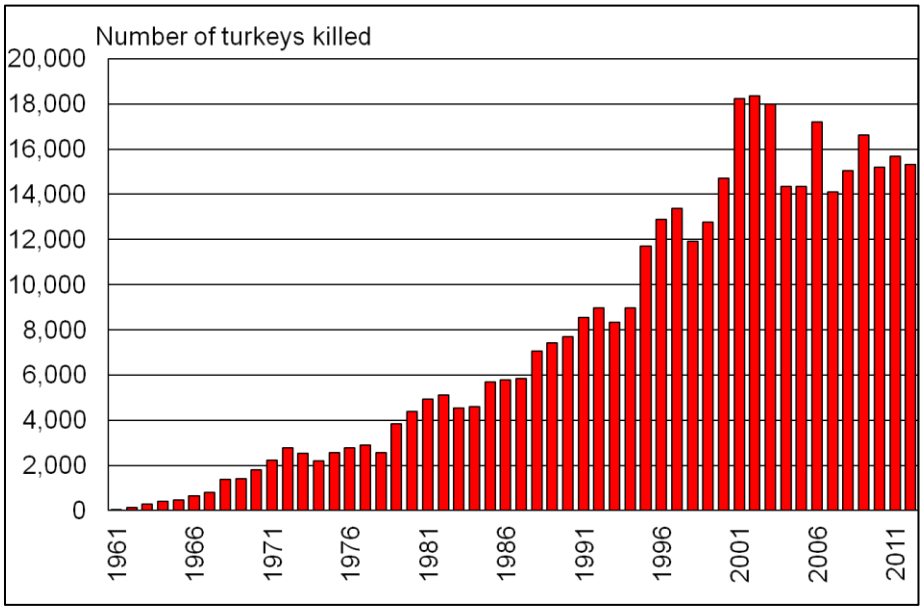

Figure 17. Virginia spring gobbler harvest 1961-2012.

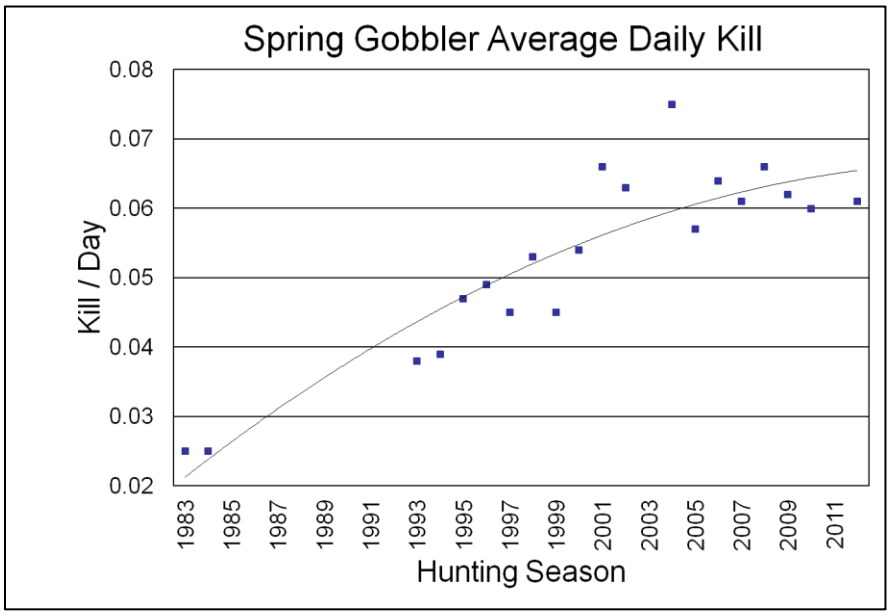

Figure 18. Population trends of wild turkeys in Virginia, 1983-2012, based on average daily kill.

Although the statewide turkey population growth rate has stabilized, population trends are variable by region and by county (Appendix C). Turkey populations have stabilized in the Tidewater (region 1), South Piedmont (region 2), North Piedmont (region 5), and Southwest Mountain (region 3) portions of the state (Fig. 15). However, the North Mountain area (region 4) has experienced significant decreases in the spring gobbler harvest (i.e., the population index) over the last 10 years, declining at a -3.25% annual rate. Within regions, county-level trends also are variable (Fig. 19, Appendix C). Most of the decreasing counties are in the western part of the state; increasing counties are largely in the east.

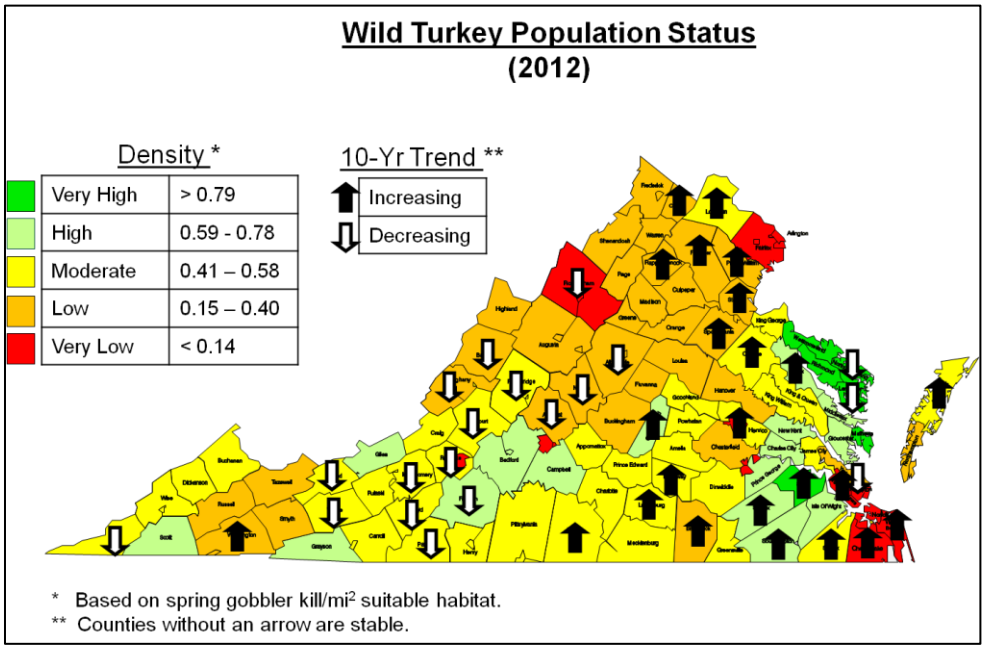

Figure 19. Population trends and relative densities of wild turkeys in Virginia, 2003-2012.

Public Land Populations

Likely due to differences in habitat quality (see section on "Public Land Habitats"), turkey population densities and trends also vary between public and private lands. On a statewide basis, spring gobbler hunters heard an average of 0.56 gobblers/hour on private lands compared to 0.40 gobblers/hour on public lands. Fall bowhunters also observed more turkeys on private lands (0.27 birds/hour) than on public lands (0.14 birds/hour).

Population status differences between private and public lands west of the Blue Ridge Mountains also reflect the observed habitat differences. Population indices for public land (i.e., annual spring gobbler kill/ mi^2 of suitable habitat) include all public lands west of the Blue Ridge, combining the harvests from National Forests, VDGIF Wildlife Management Areas, Department of Forestry lands, State Parks, and Department of Defense properties. However, public land harvests and population status are dominated by data from National Forests that contain some 92% of the public lands available for hunting west of the Blue Ridge; 7% of the hunted public lands west of the Blue Ridge are found in VDGIF Wildlife Management Areas.

As would be expected, the public land population density index west of the Blue Ridge was lower (0.38 spring gobblers killed/ mi^2 of suitable habitat) than on private lands (0.45 spring gobblers killed/ mi^2 of suitable habitat). However, the overall public land density difference was primarily a function of low densities on northern mountain public lands associated with the George Washington National Forest (0.34 spring gobblers killed/ mi^2). Southern areas associated with the Jefferson National Forest had an identical density index to neighboring private lands (0.45 spring gobblers killed/ mi^2).

Similar differences between private and public lands west of the Blue Ridge were also observed in the 17-year population trend, 1996-2012. The private land turkey population index increased slightly at an average annual rate of 1.2% per year, while public land populations around the Jefferson National Forest remained essentially stable over the same time period. However, turkey densities on public lands around the George Washington National Forest declined by nearly 50% over the 17-year period (i.e., with a -3.6% annual rate of decrease). Public land turkey population issues west of the Blue Ridge are primarily linked to low densities and declining trends around the George Washington National Forest. Relatively stable turkey

population densities on public lands associated with the Jefferson National Forest have been similar to the surrounding private ownerships. Population density and trend dissimilarities between the George Washington and Jefferson National Forests might be due to several factors including meaningful differences in habitat quality, public/private land ownership patterns, hunting impacts, and/or predator populations.

Productivity

Fall feather collections of hunter-harvested turkeys suggest a significant, long-term decline since about 1979 in the number of young turkeys per adult female in the fall harvest (Fig. 20). Prior to the decline, the productivity index averaged about 3.5-4 poults per hen. In the last 30 years, the average productivity has decreased to less than 2 poults per hen. This trend has been consistent in all regions of the state and may help explain the lack of turkey population growth in Virginia over the last 10 years. The reasons for this decline are unknown, but may suggest some density-dependent basis for slowing population growth as populations increased over time. Density-dependent population changes occur when the growth of a population slows as the population size gets larger. The variability in this index of recruitment also verifies the large year-to-year changes (i.e., ± 50% around anticipated averages) that would be expected from the large annual variations in reproductive success known to occur in turkeys.

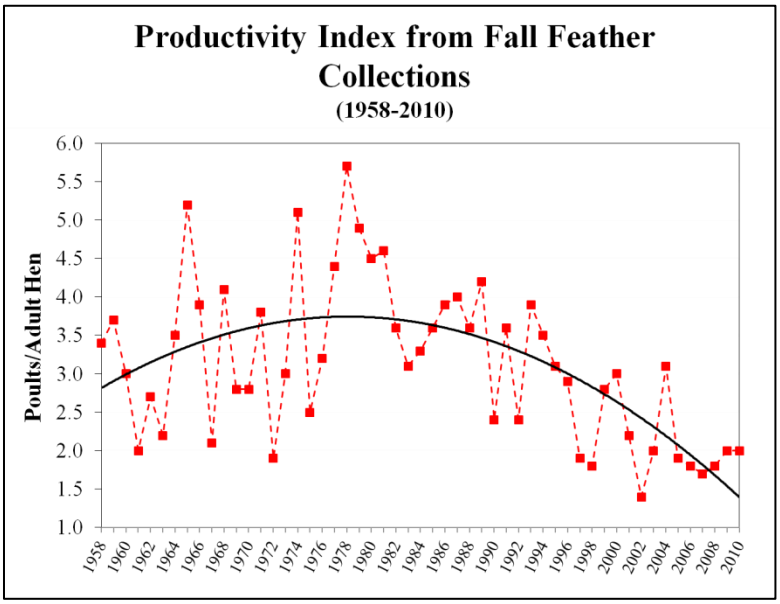

Figure 20. Productivity and fall recruitment indices (poults per adult in the harvest) from feather collections of fall-harvested turkeys (1958-2010).

Not unlike what has happened in Virginia, turkey populations in many southeastern states have experienced unexplained decreases in recruitment, stable populations, or even population declines. While the supply of turkeys has been restored to record levels, new challenges exist to better understand and manage turkeys in the face of changes and future uncertainties.

DEMAND

Turkey Hunting Demands

Today, turkey hunting is an extremely popular form of hunting in Virginia and second only to white-tailed deer hunting. During the 2011-12 hunting seasons (fall and spring seasons combined), 38% of all hunters were turkey hunters, compared to 86% that were deer hunters and 26% that were squirrel hunters. An estimated 72,975 hunters spent 515,309 man-days turkey hunting during 2011-12.

According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Virginia hunters spend more total days turkey hunting than are spent in every other state except Texas, Pennsylvania, and Missouri. Virginia also ranks 6th below those 3 states plus New York and Wisconsin in the total number of turkey hunters.

Hunters generally pursue turkeys using four different firearms approaches: (1) gobbler-only hunting during the spring and/or either-sex hunting during the fall that includes (2) hunters who specifically pursue turkeys without the use of dogs, (3) hunters who specifically pursue turkeys with the use of dogs, or (4) hunters who take turkeys while pursuing other species. When asked about how important different forms of hunting were to them, 2011-12 hunters felt that deer hunting was most important, with spring turkey hunting and fall turkey hunting rating 2nd and 3rd most important, respectively. Squirrel hunting was 4th most important to hunters.

Especially in a state like Virginia, with high turkey hunting interests, turkey hunting is also very important to the economy. The 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation estimated that $88.5 million were directly spent by turkey hunters for travel and equipment, which generated an economic multiplier effect of $146.3 million in total economic output; corrected for inflation, these economic values would represent $100.8 million and $166.6 million in 2012, respectively. An estimated $23.5 million in state and federal tax revenue would have been generated from turkey hunting activities.

Fall Turkey Hunting Demands.

Fall hunting effort and harvest. In 1938, fall turkey hunting was the most popular form of hunting in Virginia, followed by grouse and bear hunting. By 2011, the interest in fall turkey hunting had fallen behind deer, squirrel, spring turkey, rabbit, and groundhog hunting (in decreasing order).

During the 2011 fall hunting seasons, 22% of all hunters were fall turkey hunters. An estimated 41,591hunters spent 178,193 man-days turkey hunting during fall 2011. Because fall turkey hunting opportunities overlap with many other hunting seasons in Virginia, it is often difficult to distinguish among the different types of fall turkey hunter (i.e., those who target turkeys without dogs, target turkeys with dogs, or take the opportunity to kill a turkey while hunting other species). A slight majority (56%) of fall turkey hunters surveyed after the 2009 hunting season said they considered themselves either a casual (40%), serious (10%), or avid (6%) fall turkey hunter. The rest of the fall turkey hunters (44%) during 2009 considered themselves to be opportunistic fall turkey hunters not specifically hunting for turkeys, but willing to take turkeys while hunting other species.

About 3% of all fall hunters used dogs to hunt turkeys during 2011 and would probably be classified as serious or avid fall hunters. Fall hunting turkeys with dogs has a long history in Virginia and early turkey dog breeding efforts can be traced to Virginia hunters.

Based on a 2009 survey of fall hunters, most (68%) normally used a shotgun to hunt fall turkeys. Less common normally used weapons by fall hunters were rifles (19%), archery equipment (8%), and muzzleloaders (5%). During the 2012 fall hunting season, most birds were harvested with shotguns (43%), followed by rifles (28%), muzzleloaders (20%), bows (5%), and crossbows (5%).

Despite increasing turkey populations, the number of fall turkey hunters (Fig. 21) and man-days of effort (Fig. 22) have been declining since the early 1990s. Separating the fall turkey season from the deer firearms season between 1989 and 1995 decreased the opportunistic harvest of turkeys and may also have contributed to the initial decline of fall turkey hunters. Concurrent with the declining hunter interest has been a decline in the harvests of fall turkeys, even after reaching a record high kill of 16,861 birds in 1990 (Fig. 23).

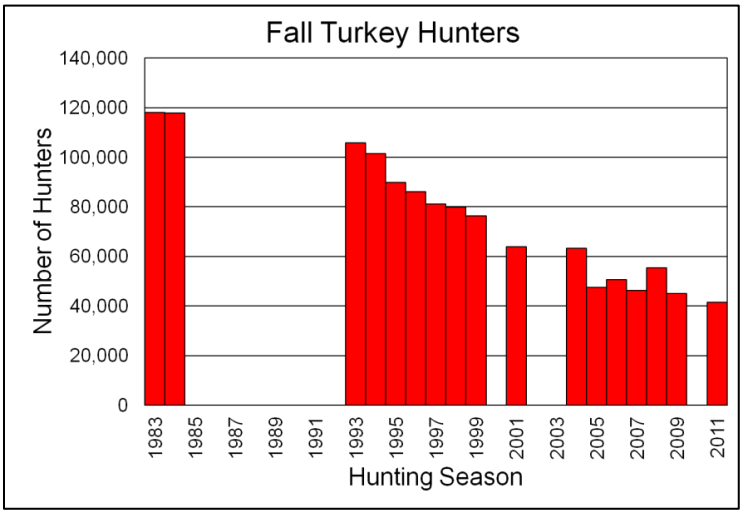

Figure 21. Number of fall turkey hunters in Virginia from hunter surveys, 1983-2011.

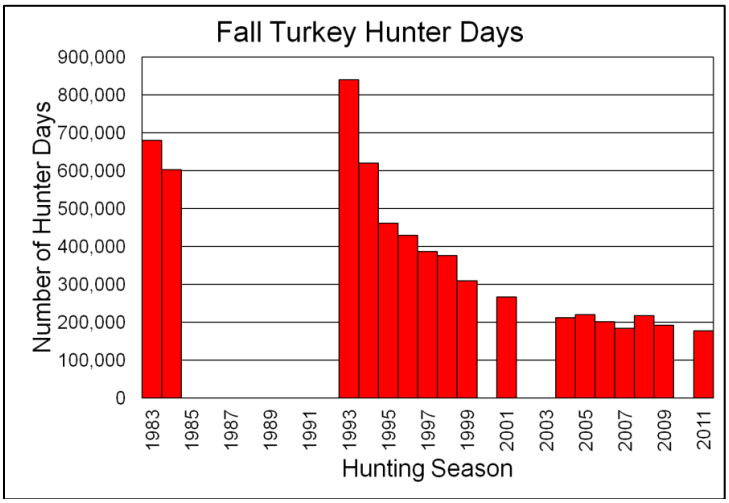

Figure 22. Number of man-days spent fall turkey hunting in Virginia from hunter surveys, 1983-2011.

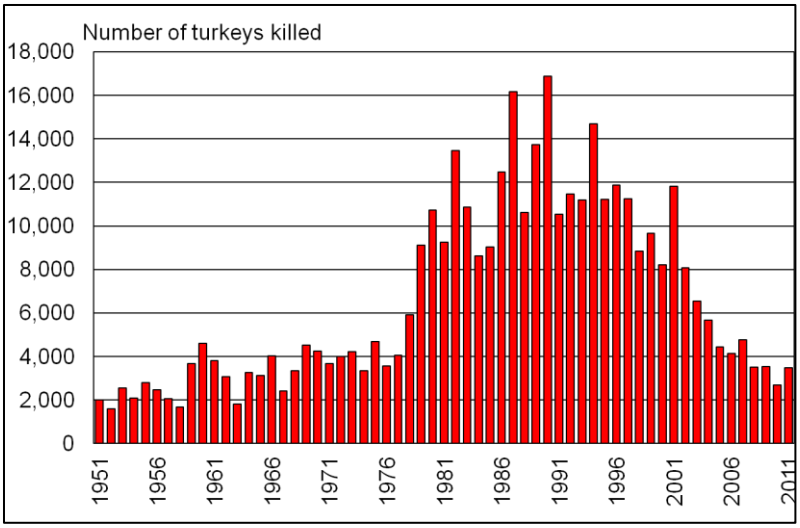

Figure 23. Virginia fall turkey harvest, 1951-2011.

A 2009 survey of former fall turkey hunters showed overwhelming agreement (72%) that decreasing interest in fall turkey hunting was related to increased interest in deer hunting. Although motives to switch from fall turkey hunting to deer hunting involved many aspects of deer hunting, the most common reasons were interest in new muzzleloader seasons and the higher deer populations. Reasons of lesser importance for leaving fall hunting were that the fall turkey season was too short (37%), there was nowhere to hunt (29%), and hunters were saving turkey tags for spring gobbler hunting (29%).

Fall hunting satisfactions. Hunter satisfactions are often assumed to be highest when harvest and/or the number of days spent hunting are maximized. However, recreational satisfaction is more complex and includes many other elements of the hunting experience that extend beyond success and effort. As an aggregate measure of the multiple components of satisfactions, a hunter satisfaction index has monitored the quality of fall turkey hunting experiences since 1993. Periodic hunter surveys have posed the question, "*overall, how do you rate the quality of your [current year] fall turkey season?*", with responses on a 7-point scale where 1= poor, 4=adequate, and 7= excellent. Average hunter satisfactions with fall hunting quality have declined since 1993 when quality was nearly adequate (3.93) to a low (3.39) after the 2009 fall season (Fig. 24).

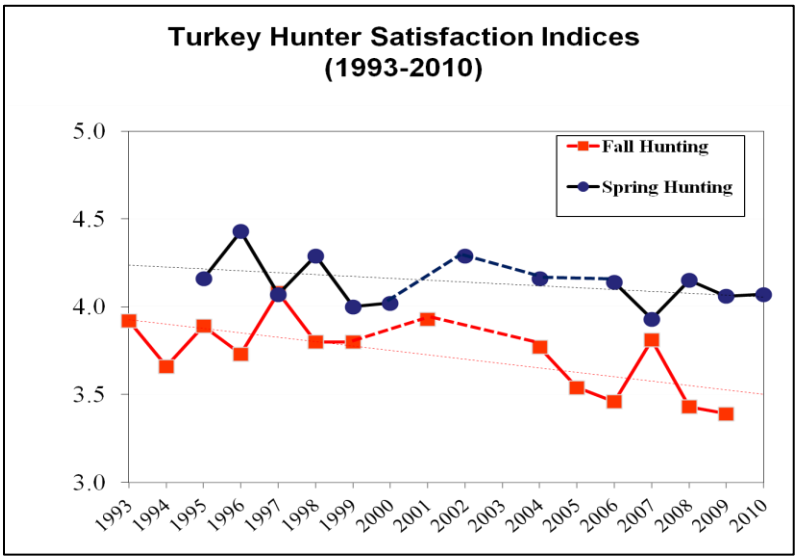

Figure 24. Statewide trends in Virginia turkey hunter satisfaction indices for spring and fall seasons, 1993-2010.

To determine the specific satisfaction factors that are important to fall turkey hunters in Virginia, fall turkey hunters sampled in the 2009-10 hunter survey were asked to evaluate 15 different components of satisfaction from 2 perspectives: (1) what constitutes an ideal hunting season and (2) their actual experience during the hunting season just completed.

In an ideal season, Virginia fall turkey hunters ranked feeling safe in the field as the most important satisfaction component, followed by having a good place to hunt, being close to nature, and seeing few other hunters (Fig. 25). Of least importance for an ideal season was actually getting a shot and scouting. The highest ratings for what fall hunters actually experienced during the season came from being close to nature, feeling safe, and getting away from problems. The lowest ratings for actual experiences came from getting a shot, teaching someone else, and seeing turkeys.

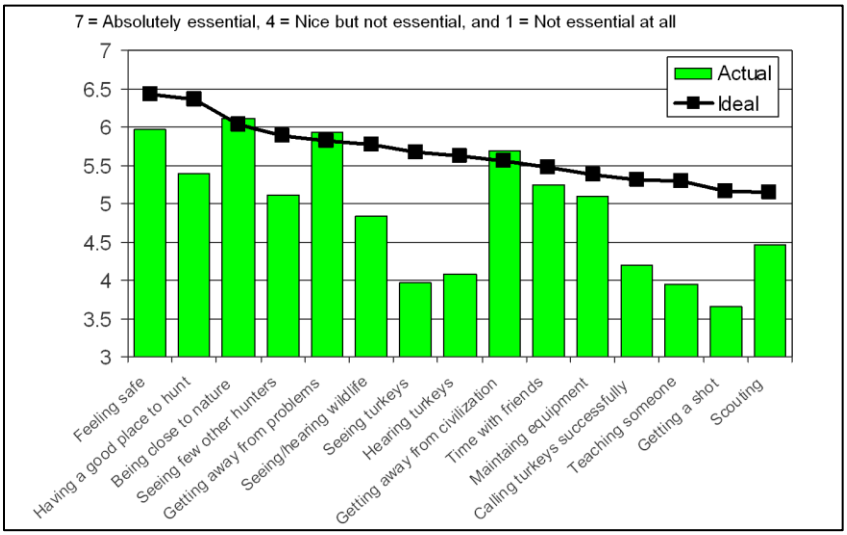

Figure 25. 2009 Virginia fall turkey hunter satisfactions, ideal versus actual.

The difference between the ideal and the actual rating is a relative measure of the fulfillment of satisfaction for that factor. The largest gaps in satisfaction came from getting a shot, seeing turkeys, and hearing turkeys. Satisfactions were most achieved by getting away from civilization, getting away from problems, and being close to nature.

These results agree with other studies that killing a turkey (i.e., getting a shot) is not as important as other attributes of the hunting experience. Also as found in other research, the important gaps in satisfaction are directly related to attributes of encounters with turkeys, such as seeing or hearing them. Other aspects of fall turkey hunting, for example to get away and be close to nature seem relatively fulfilled.

A 2010 survey also explored options to improve the satisfactions of fall turkey hunters (Fig. 26). The greatest number of hunters agreed that getting more hunting time or a longer season would improve their fall hunting satisfactions. Also preferred by most hunters was a desire to see, hear, or call more turkeys and if more days of turkey season overlapped with deer season. A minority of fall hunters felt that killing more turkeys, having less overlap with deer hunting, and having more tags would improve their hunting satisfactions.

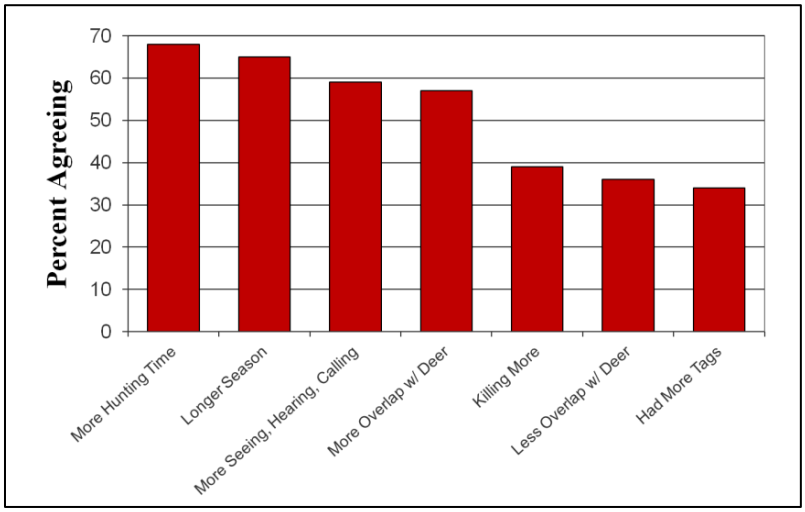

Figure 26. 2010 Virginia fall turkey hunter agreement with ways to improve fall hunting satisfactions.

Spring Turkey Hunting Demands

Spring hunting effort and harvest. During the 2012 spring gobbler hunting season, 29% of all licensed hunters participated as spring turkey hunters. An estimated 56,186 hunters spent 337,116 man-days turkey hunting during spring 2012. Most birds were harvested with shotguns (86%). Rifles accounted for 7% of the harvest with the balance from bows, pistols, and muzzleloaders. Based on a 2010 survey of spring hunters, most hunters (90%) normally used a shotgun to hunt spring gobblers. Less common weapons normally used by spring hunters were rifles (6%), archery equipment (2%), muzzleloaders (1%), and other (1%). A large majority (82%) of the 2010 spring hunters also indicated they "typically pass up killing a young or jake" gobbler.

The numbers of spring turkey hunters (Fig. 27) and man-days of effort (Fig. 28) have remained relatively stable since the early 1980s. About half (49%) of spring turkey hunters surveyed after the 2010 hunting season considered themselves as casual spring gobbler hunters who hunted less than 5 times. The rest of the spring turkey hunters were about equally divided between considering themselves as either serious (27% who hunted 5-10 times) or avid (24% who hunted more than 10 days) hunters. Spring harvest totals have increased significantly since the early 1980s, but have remained relatively constant over the last 10 years (Fig. 17).

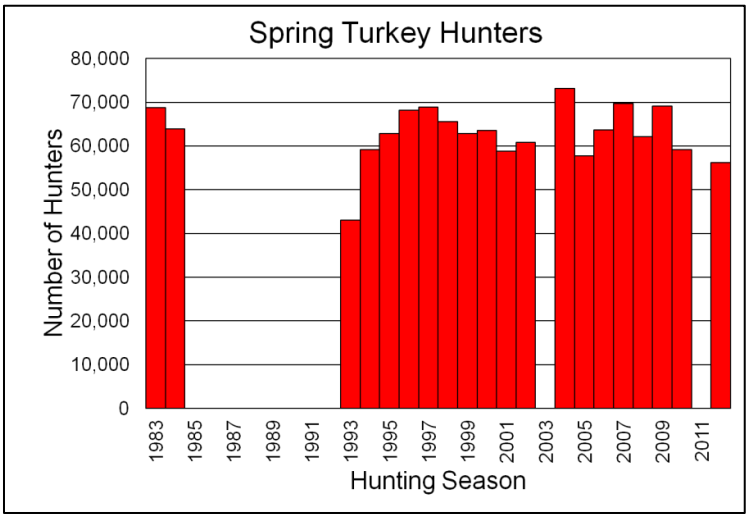

Figure 27. Number of spring turkey hunters in Virginia from hunter surveys, 1983-2012.

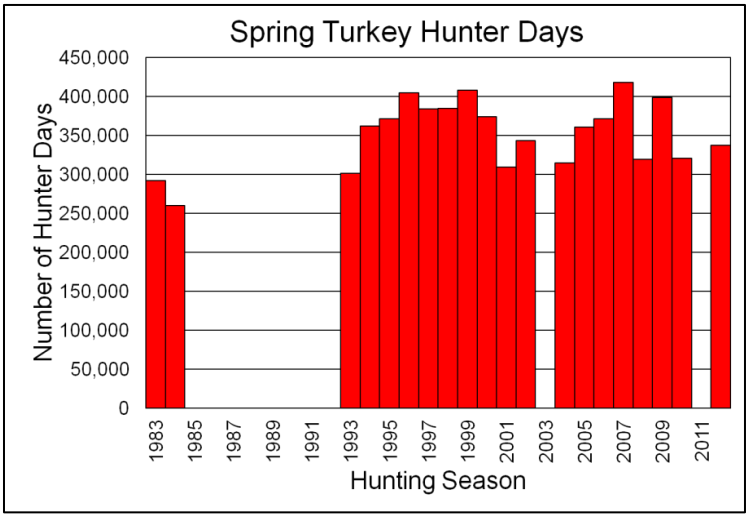

Figure 28. Number of man-days spent spring turkey hunting in Virginia from hunter surveys, 1983-2012.

Beginning in 2003, all-day spring gobbler hunting was permitted during the last 2 weeks of the season. Based on survey responses from 2007 spring gobbler hunters, many hunters (37%) participated in afternoon hunting, but the majority (77%) still chose to hunt in the morning hours during the last 2 weeks of the season. On a daily basis during the last 2 weeks of the 2007 season, hunter success in the morning (0.045 birds killed/morning) was greater than 2 times higher than success during the afternoon (0.020 birds killed/afternoon). A similar difference in hunter success was also reported by spring gobbler hunters in 2004 when morning hunters were 2.04 times more likely to kill a bird than afternoon hunters.

Spring hunting satisfactions. As measured for fall hunting, an aggregate index of hunter satisfactions has monitored the quality of spring gobbler hunting experiences since 1995. Periodic hunter surveys have posed the question, "*overall, how do you rate the quality of your [current year] spring turkey season?*", with responses on a 7-point scale where 1= poor, 4=adequate, and 7= excellent. Average hunter satisfactions with spring hunting quality have been consistently above adequate, been higher than those experienced by fall hunters, and have remained relatively stable since 1995 (Fig. 24).

To determine satisfaction factors, spring turkey hunters during 1996 were surveyed to evaluate 16 different components of satisfaction from 2 perspectives: (1) what constitutes an ideal hunting season and (2) their actual experience during the hunting season just completed. In an ideal season, spring turkey hunters ranked calling turkeys successfully as the most important satisfaction component, followed by feeling safe in the field, the challenge, hearing turkeys, and seeing sign (Fig. 29). Of least importance for an ideal season was teaching someone, time with friends, getting a shot, and maintaining equipment.

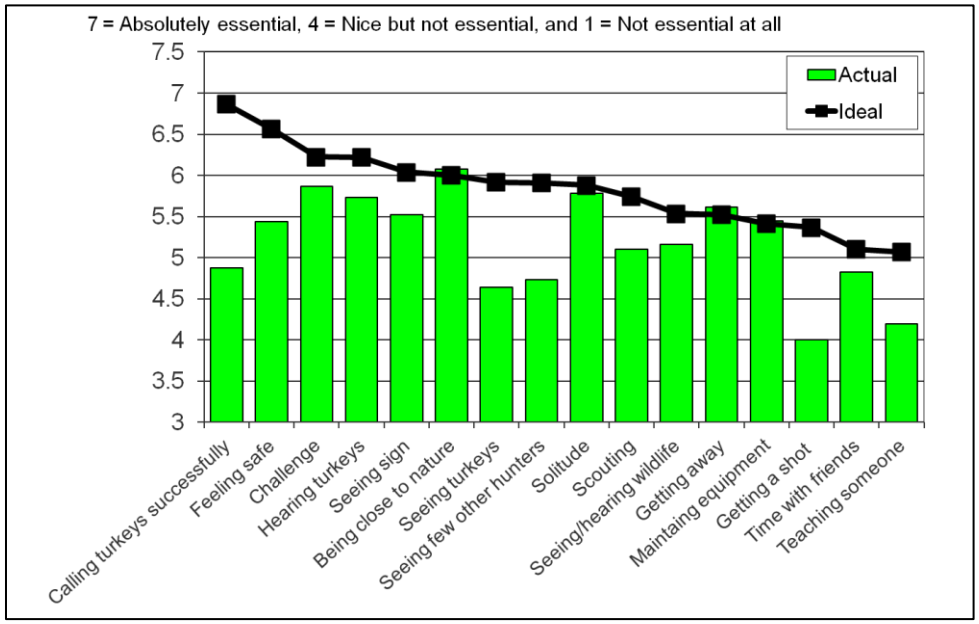

Figure 29. 1996 Virginia spring turkey hunter satisfactions, ideal versus actual.

The highest ratings for what spring hunters actually experienced during the season came from being close to nature, challenge, solitude, and hearing turkeys. The lowest ratings for actual experiences were identical to fall hunters and involved getting a shot, teaching someone else, and seeing turkeys.

The difference between the ideal and the actual rating is a relative measure of the fulfillment of satisfaction for that factor. The largest gaps in satisfaction came from calling turkeys successfully, getting a shot, seeing turkeys, and seeing few hunters. Satisfactions were most achieved by getting away, being close to nature, maintaining equipment, and solitude.

These results agree with other studies and fall satisfactions that killing a turkey (i.e., getting a shot) is not as important as other attributes of the hunting experience. Also as found in other research, the important gaps in satisfaction were related to calling turkeys, seeing turkeys, and hunting without interference from other hunters.

An additional survey also explored options to improve the satisfactions of spring turkey hunters during 2011 (Fig. 30). Seeing, hearing, and calling more turkeys was the only option that a majority of spring hunters agreed would improve their hunting satisfactions. For all the other options (e.g., longer season, killing more, killing a trophy, feeling safer, more tags), less than half of the spring hunters felt they would improve their hunting satisfactions.

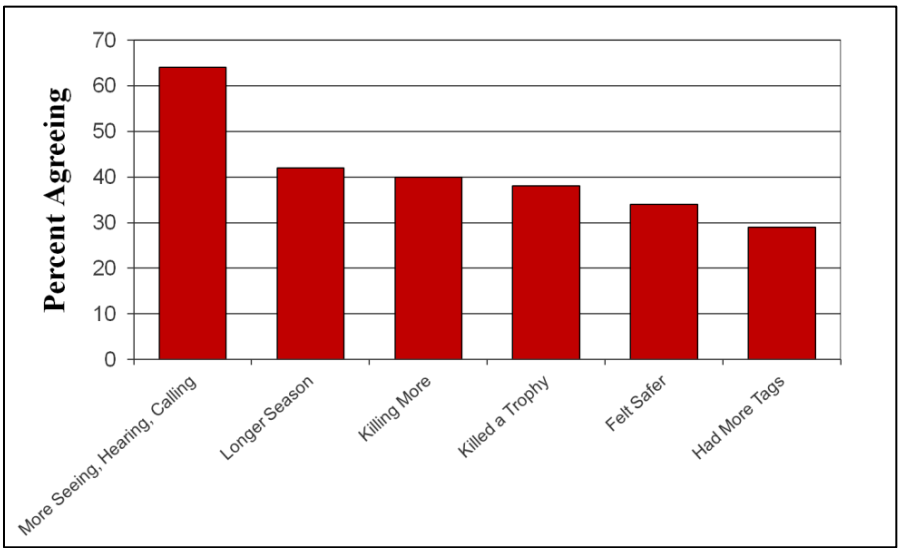

Figure 30. 2011 Virginia spring turkey hunter agreement with ways to improve spring hunting satisfactions.

For various reasons, spring gobbler hunters sometimes suggest other alternatives for the timing of the spring gobbler season. When posed with the question about spring gobbler season timing, the majority of 2011 spring turkey hunters (70%) felt the season was timed just right; 24% felt it was too late with only 6% thinking it was too early.

Hunting Safety Concerns

Hunting safety is a concern associated with all hunting, but especially for turkey hunters, who typically wear camouflage and mimic the sounds of wild turkeys. Over the 46-year period from 1967-2012, a total of 197 spring turkey hunting incidents, including 21 fatalities, have been documented in Virginia. Almost all spring turkey hunting incidents in Virginia have involved a victim other than the shooter; only 4% of the 197 incidents were self-inflicted. With many overlapping hunting seasons during the fall, hunters often share hunting areas with hunters of other species and pursue multiple species at the same time. As a result, it is difficult to accurately determine hunting incidents specifically associated with turkey hunting during the fall.

The average annual rate of spring turkey hunting incidents has changed significantly since spring seasons were initiated in the 1960s (Fig. 31). As the popularity of spring turkey hunting increased between the 1960s and the 1980s, so did the annual rate of spring hunting incidents. The spring turkey hunting incident rate peaked during the mid-1990s with an average of 6.4 incidents every year. Since then, the incident rate has significantly decreased to an average of less than 2 incidents per year and equivalent to the earliest years when few relatively few hunters pursued spring turkeys. With stable hunter numbers since the mid-1990s (Fig. 27), the decrease in spring hunting incidents is undoubtedly related to the 1988 initiation of

mandatory hunter education requirements for all new Virginia hunters and other prominent safety-awareness programs from the VDGIF and sportsmen groups (e.g., NWTF).

When hunting incidents were at their peak, spring turkey hunters after the 1996 season ranked feeling safe as the second most important factor for a satisfying turkey season and, compared to most other components of satisfaction, failed to experience their safety ideal (Fig. 29). However by 2011, feeling safer was ranked relatively low among ways to improve spring turkey hunting satisfactions (Fig. 30). While feeling safe was the most important factor for fall turkey hunters after the 2009 season, they also seemed to have fulfilled their safety expectations compared to most other satisfaction components (Fig. 25).

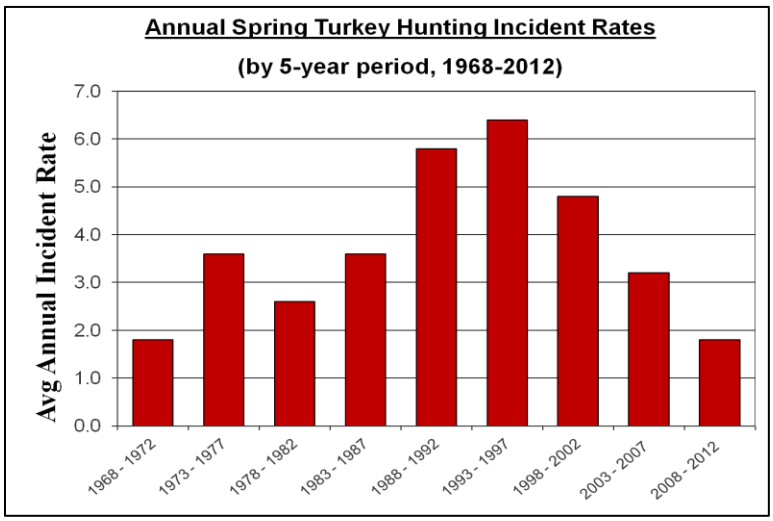

Figure 31. Trend in the rate of spring turkey hunting incidents in Virginia, 1968-2012.

Rifle-related safety issues. Perceived as a safety issue by some hunters (especially for spring hunting), hunters often raise concerns about the use of rifles for turkey hunting. Presumably for safety considerations, many eastern Virginia counties had local ordinances during 2012 that already restrict the use of rifles for turkey hunting (Fig. 32). Only Sussex County specifically prohibits rifles for turkey hunting. Restrictions in most counties impose limits such as "no rifles for big game", "no rifles for hunting", or a maximum size of .22 caliber for rifles. Six counties also allow the use of rifles larger than .22 caliber, as long as they are used from an elevated stand.

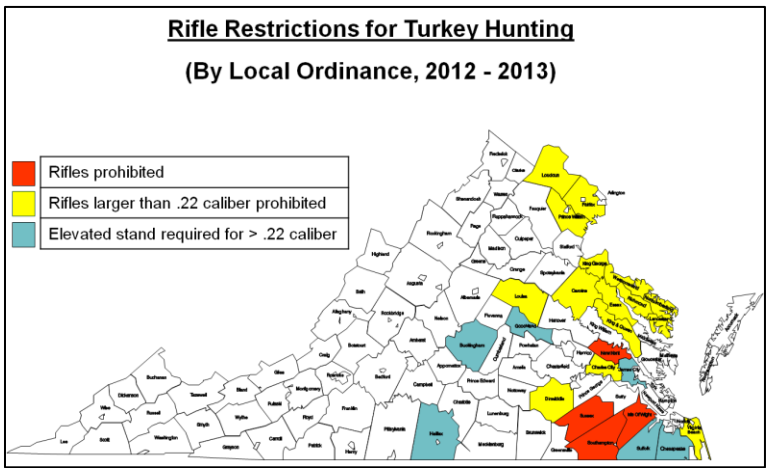

Figure 32. Counties with local firearms ordinances that restrict the use of rifles for turkey hunting during the 2012-13 hunting seasons.

Questions about the use of rifles were posed to turkey hunters after the 2011-12 hunting seasons. Most turkey hunters (57%) supported the use of rifles for turkey hunting during the fall, with 29% opposing rifle use and 15% having no opinion. However, opinions about rifle use for spring gobbler hunting was mixed, with identical support for prohibiting rifles (43%) and allowing rifles (43%); 14% of the hunters had no opinion.

Since 1967, 8.6% of the spring hunting incidents in Virginia (17 out of 197 incidents) have involved the use of a rifle. Over the last 10-year period (2003-2012), there has been a 4.0% incident rate from rifles (1 out of 25 incidents). However, the 47% fatality rate from rifle hunting incidents (8 deaths out of 17 rifle incidents) is much higher than the 7% fatality rate when shotguns are involved (13 deaths out of 180 shotgun incidents).

Wild Turkey Damage Demands

Agricultural Damage

Growing populations and visibility of wild turkeys across the United States and in Virginia have led to increased concerns about agricultural crop damage caused by turkeys. These concerns about turkey impacts on agriculture have motivated crop depredation studies in many states including California, Connecticut, Illinois, Iowa, New York, Ohio, Pennsylvania, Virginia, and Wisconsin, as well as a national survey about turkey-related damage.

Turkey damage has been confirmed in many different agricultural crops including corn, wheat, grapes, soybeans, oats, tobacco, rye, ginseng, strawberries, tomatoes, apples, gardens, peanuts, ornamentals, barley, alfalfa, blueberries, and milo. Corn (silage, standing, and spring plantings) is the crop most often reported to be damaged by wild turkeys. Most confirmed reports and specific studies of turkey damage conclude that the losses are minimal for most producers. In only a few instances (especially in silage corn, grapes, ginseng, apples, and wheat) has damage been considered to be moderate or heavy.

Assuming that turkeys strip grapes from clusters (i.e., consume several grapes from the same part of a cluster, rather than plucking or pecking individual grapes), California vineyard losses of stripped grapes averaged 1.0% in the Napa Valley (range, 0 - 5.3%) and 1.6% in the Sierra Foothills (range, 0 - 4.5%). However, other animals may exhibit a stripping damage pattern of grapes and also contributed to this type of damage. Other field studies in Iowa estimated that 1.5% of corn ears (at most) may have been damaged by turkeys. Similar research in Illinois did not document any damage to ear corn, corn sprouts, or soybean sprouts. While corn may sometimes be a significant component of the diet for turkeys, the primary source is from waste corn.

Financial losses of crops due to turkeys are difficult to assess. A national survey of authorities concluded that the annual statewide dollar value of turkey crop damage was relatively small in most states, with 91% of states reporting <$10,000 in annual damage caused by wild turkeys. Appraised damage caused by wild turkeys in Wisconsin annually averaged $22,996 for participants in the Wildlife Damage Abatement and Claims Program during 2011 and 2012. By comparison, the appraised damage in Wisconsin from deer and bears annually averaged $1,392,534 and $342,144, respectively. Stripped grape damage during 2007 and 2008 in California vineyards (assumed to be the result of turkey depredation, as well as other species) averaged from $35 - $143 per acre.

While most agricultural producers generally consider the damage to be minimal, the actual damage caused by wild turkeys was still less than the amount perceived by farmers in states where on-site examinations have been conducted. Because of their high visibility due to population numbers, body size, flocking behaviors, daytime activity, and habitat preferences, wild turkeys may often be disproportionately

credited with crop damage. Specific studies of damage attributed to turkeys in crops (e.g., corn, soybeans, alfalfa, oats) have often shown the primary cause to be from other wildlife, principally deer and raccoons.

The National Wild Turkey Federation (NWTF) monitored the wildlife species eating grapes in vineyards during three unpublished studies conducted in California (2002-03), in New York / Connecticut (2004), and in Floyd County, Virginia (2005). Motion-sensing still cameras (n=117) photographed 1,933 animals (primarily represented by 8 species) at 15 vineyard sites across all these studies. Detected in 43% of the photographs, turkeys were the most common species observed, followed by deer (23%) and raccoons (12%). Despite the abundance of turkeys observed, a consistently low percentage of them (4%; range, 2 - 6%) was documented to be eating grapes across the studies. By comparison, 34% of the photographed raccoons (range, 0 – 79%) and 21% of the deer (range, 17 – 31%) were actively consuming grapes. Wild turkeys did consume grapes, but they also appear to be spending most of their time in vineyards engaged in other behaviors such as feeding on bugs, eating other seeds, consuming herbaceous matter, or loafing.

The NWTF vineyard studies also highlighted how variable grape depredations can be among locations and species. The three most common species (deer, raccoons, turkeys) also accounted for an average of 89% of all the instances of grape damage in these studies. While the large majority of turkeys were not observed to be actively consuming grapes, they still represented 21% (range, 3 – 50%) of all the observed grape-eating instances across all studies; only deer (44%; range, 15 – 65%) and raccoons (24%; range, 0 - 40%) accounted for more occurrences of grape consumption than observed for turkeys.

While the NWTF vineyard results are still preliminary and do not assess the overall amount of economic losses, they do provide some insight into the species responsible for damage and the depredation variation among sites. At some locations, turkeys might represent a large proportion of the grape depredations. Compared to the other studies, the overall damage at the Virginia site was relatively small with only 3% of the turkeys observed to be eating grapes (compared to 31% of the deer). Although the damage extent may have been comparatively small, turkeys still accounted for 50% of the observed grape losses; deer were responsible for the other 50%. In contrast, turkey consumption of grapes was a relatively minor part of the overall depredations in New York/Connecticut and California with 3% and 9% of the losses, respectively.

Although wild turkeys do cause damage to agricultural crops, most studies suggest that the damage is usually not significant. However under some circumstances, turkeys can represent a major portion of the total depredations (as observed in the Virginia vineyard study). Especially with the acreage of grapes increasing in Virginia (which nearly doubled between the late 1990s and the mid 2000s), concerns about turkey damage in vineyards will likely increase. A better understanding of the role of wild turkeys in crop depredation and economic losses will help managers and producers to resolve these conflicts.

Other Turkey-human Conflicts

With the increased wild turkey and human populations and the turkey's adaptability to many environments, increased conflicts with people in urban/suburban areas are not surprising. Wild turkey-vehicle collisions become more of a concern with expanding turkey populations and increased volume of traffic. Although road-killed turkeys and associated accidents are difficult to document, the incidence seems to be increasing.

The occurrence of turkeys at airports can be a major issue for public safety. Per §29.1-529 of the Code of Virginia, being a hazard to aircraft is the only reason a "kill permit" can ever be issued for wild turkeys. Between 1996 and 2010, at least one kill permit was written for wild turkeys in Virginia (for the Lynchburg Regional Airport in 2010). Dulles International Airport annually receives a Wildlife Population Control Permit authorizing the removal of wild turkeys. During 2010, 16 turkeys were removed from Dulles. From national statistics between 1990 and 2006, the Federal Aviation Administration also

documented two instances of aircraft striking wild turkeys on runways that resulted in $76,000 and $200,000 of damage to aircraft.

Wild turkeys, and associated complaints, are now commonly observed in more suburban and exurban (i.e., semi-rural lands just beyond the suburbs) areas around cities and towns. Complaints include damage to landscape plantings, turkey droppings, aggressive birds around people, scratching motor vehicles, and roosting on roof tops. Adult male birds typically are the source of the aggressive interactions, which more frequently occur in spring during the breeding season.

Turkey Watching Demands

Non-hunting wildlife recreation (e.g., wildlife viewing) has increased significantly over the last several decades. Although the extent of turkey-specific wildlife watching is unknown, viewing activities (e.g., observing, feeding, photographing) of all wildlife are important to Virginians. Wildlife watching participants made up 81% of all wildlife-associated recreation in Virginia followed by fishing (30%) and hunting (14%). Some 2,212,000 Virginia residents (36% of the population) participated in some type of wildlife watching activity in 2011. Expenditures in Virginia by both residents and nonresidents for wildlife watching activities during 2011 were nearly one billion dollars ($958,608,000). A 2010 survey (Responsive Management 2010) found that 73% of Virginians have participated in wildlife watching activities within a mile of their homes, including 57% of residents who feed birds on their property.

Turkey Population Demands

The most recent survey that assessed the statewide and regional (Fig. 15) turkey hunter desires for population size was conducted after the 1998-99 hunting seasons. From a statewide perspective, the opinions about desired changes in turkey population size were similar between fall (Table 1) and spring (Table 2) turkey hunters. While very few hunters (6%) actually wanted turkey populations to decrease, the balance of hunters slightly tended to want more turkeys than see the population stabilized.

Table 1. Fall hunter opinions from the 1998-99 hunter survey when asked the question "What advice would you give the Department regarding how to manage turkey populations?"

Fall Hunter Opinions	State (%)	Region 1 (%)	Region 2 (%)	Region 3 (%)	Region 4 (%)	Region 5 (%)
Increase	43.0	37.9	37.4	42.9	46.0	48.7
Remain the same	41.5	34.8	46.0	45.8	38.9	39.3
Decrease	5.6	10.6	8.6	1.2	2.7	3.4
Don't know/neutral	10.0	16.7	8.1	10.1	12.4	8.5

Table 2. Spring hunter opinions from the 1998-99 hunter survey when asked the question "What advice would you give the Department regarding how to manage turkey populations?"

Spring Hunter Opinions	State (%)	Region 1 (%)	Region 2 (%)	Region 3 (%)	Region 4 (%)	Region 5 (%)
Increase	46.1	35.1	45.3	49.6	43.5	54.1
Remain the same	40.3	44.7	41.0	41.8	41.2	33.7
Decrease	6.1	10.6	8.7	1.4	3.5	4.1
Don't know/neutral	7.6	9.6	5.0	7.1	11.8	8.2

Opinions about the desirable turkey population size varied among regions. Fall hunters in regions 4 and 5 were much more likely to want more turkeys than hunters in the other regions. Fall hunters in region 2

leaned toward stabilizing the population. From the spring hunters' perspective, relatively strong desires for population increases came from regions 2, 3, and 5 while region 1 hunters preferred to stabilize the population. The locally different opinions from fall and spring turkey hunters probably reflect different regional turkey population sizes, as well as different values and traditions associated with fall and spring turkey hunting.

Cultural Carrying Capacity

The joint impact of all the demands for wild turkeys (both negative and positive demands) results in the cultural carrying capacity (CCC). Sometimes called the wildlife stakeholder acceptance capacity, the cultural carrying capacity is the maximum number of turkeys in an area that is acceptable to the human population. The CCC is a function of the human tolerance of turkeys and the benefits derived from turkeys by all citizens. It is different for each constituency, location, and point in time. The actual CCC is subjective and involves a combination of social, economic, political, and biological perspectives. For example, a farmer experiencing crop damage from turkeys may have exceeded his tolerance and desire fewer turkeys. On the other hand, a wildlife enthusiast hoping to see lots of wild turkeys will likely want higher turkey populations. The CCC is ultimately a balancing act that involves trade-offs among the variety of public demands.

Somewhat unique to managing turkey populations for a CCC balance, will be harvest trade-offs between spring gobbler hunters and fall either-sex hunters. Based on modeling work at Virginia Tech (Fig. 33), spring gobbler harvests will be maximized at higher population sizes that approach the biological carrying capacity (BCC). However because fall either-sex harvests are an additive form of mortality that control population levels, the highest turkey populations (and highest spring gobbler kills) will require minimal fall hunting opportunity and harvest. On the other hand, sustained fall harvests would be maximized at a much lower population level (in theory, at 40% of BCC) where spring gobbler harvests would also be lower. While neither spring nor fall harvests would be at a maximum, the combined total harvest would be maximized at a population level of about 55% of BCC. Among other public considerations for desired turkey population size, these fall hunting and spring hunting trade-offs will need to be resolved.

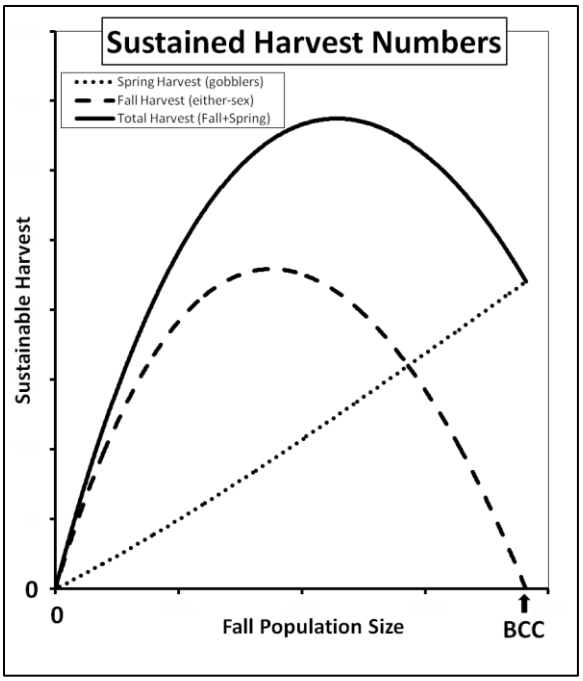

Figure 33. Sustained spring, fall, and total harvest relationships at different population levels. Adapted from McGhee et al. (2008).

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VALUES, GOALS, OBJECTIVES, AND POTENTIAL STRATEGIES

The Stakeholder Advisory Committee Members (Appendix A), with technical assistance and feedback from VDGIF staff (Appendix B), drafted seven goals addressing wild turkey populations, turkey-related recreation, and human-turkey problems. These goals reflect the values of a diverse public and are broad statements of principles and ideals about what should be accomplished with turkey management in Virginia. As the underpinning for the direction of wild turkey management, these guiding public values should be relatively stable for the period of the plan.

Specific objectives follow each set of value and goal statements. Based on the goals identified by the Stakeholder Advisory Committee, the Turkey Technical Committee established specific objectives to help guide the attainment of each goal. Objectives are the technical expression of the public vision found in the goal statements. Objectives are generally more specific, quantifiable, and have milestones for achievement.

Potential strategies clarify how each objective might be achieved. As with objectives, technical management decisions about specific operational strategies to achieve public values are largely the realm of wildlife professionals. Implemented strategies will be based on the best available science, anticipated efficacy, public acceptability, and expected costs. While this is not an operational plan detailing all the specific steps, actions, or costs to achieve objectives, these strategies represent some of the approaches, techniques, and programs that will be considered to accomplish objectives.

TURKEY POPULATIONS

The VDGIF mission to manage "wildlife…to maintain optimum populations…to serve the needs of the Commonwealth" requires knowledge about the public desires for an optimal turkey population size. Different stakeholders may have dissimilar values for acceptable population sizes. The combination of these different public values is often considered in terms of cultural carrying capacity (CCC). CCC is the maximum number of turkeys in an area that is acceptable to the human population. The CCC is a function of the human tolerance to turkeys and the benefits people derive from turkeys. It is different for each constituency, location, and point in time. Ultimately, CCC involves a combination of social, economic, political, and biological perspectives. At CCC, the turkey population is a balance of positive demands (e.g., recreation) with the negative demands (e.g., damage) for turkeys. Because different turkey population sizes have different implications for sustained yields (Fig. 33), recreation, animal health, and nuisance concerns, the desirable CCC population level for turkeys may not occur at the biological carrying capacity (BCC); BCC is the maximum number of turkeys that a habitat can sustain over time.

Value Statement

Healthy wild turkey populations should be managed to meet cultural carrying capacity (CCC). In general, CCC will be at the population level that provides nearly maximum sustainable harvest while minimizing negative impacts on private property (Fig. 34). By manipulating factors that limit the attainment of desired population levels, management to attain CCC should be done on a local/regional basis. While lawful hunting and habitat management should be the primary population management tools, other factors such as illegal mortality, predation, or diseases may also require management.

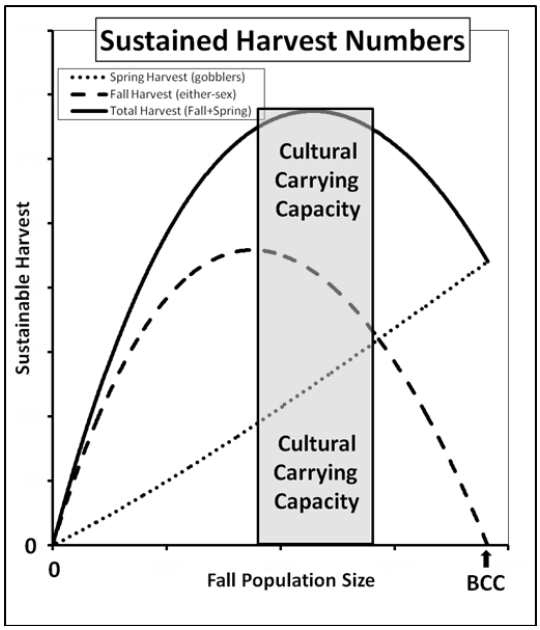

Figure 34. Approximate population size (shaded in grey) for CCC objectives relative to BCC and expected sustained yields. Adapted from McGhee et al. (2008).

Goal Statement

Manage turkey populations using innovative, flexible, publicly accepted, cost-effective, and technically sound practices that balance the varied needs and expectations of stakeholders statewide and locally (cultural carrying capacity).

Objectives

1. To meet and maintain turkey population objectives at cultural carrying capacity (CCC) in each county management unit through 12/31/2022 (Fig. 35).

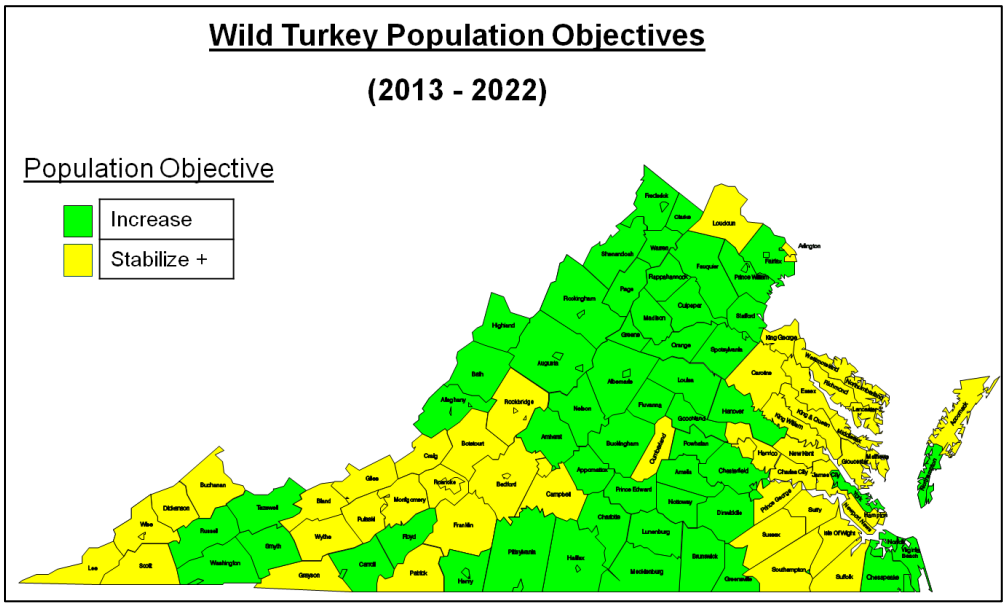

Figure 35. Wild turkey population objectives by county management unit in Virginia, 2013-2022.

Turkey management to achieve CCC population levels should be done over the smallest landscape area that is practical. In Virginia, counties and major cities (Chesapeake, Suffolk, and Virginia Beach) have been the basic management units for monitoring wild turkey harvest and population trends (Appendix C). These 97 county management units average 404 mi^2 in size (range, 86 mi^2 - 978 mi^2). Wild turkey population objectives in each county management unit are set relative to the expected CCC. From a practical perspective, population objectives are simply set to increase, stabilize, or decrease the existing turkey population levels to meet the public values expressed by the CCC.

As an aid for determining the size of the current population compared to the desired CCC population level, the disparity between relative population density and the relative quality of suitable habitat in each county (Appendix C, Fig. 13) was considered. In general, all county management units with relatively low or very low population densities were assumed to have underachieving population levels and had corresponding objectives to increase population abundance.. County management units with moderate population densities in the highest quality habitats, also had objectives to increase population levels (Amelia, Appomattox, Carroll, Charlotte, Dinwiddie, Floyd, Goochland, Greensville, Halifax, Henry, Lunenburg, Mecklenburg, Nottoway, Pittsylvania, Powhatan, and Prince Edward). Although the balance of the county management units had objectives to stabilize the turkey population, population increases would also be acceptable unless CCC was obviously being exceeded ("stabilize+" in Fig. 35). No county management unit was considered to have surpassed CCC (i.e., there were no objectives to decrease population levels).

While the CCC will provide targets for county-wide population objectives, attainment of the population objectives likely will not be uniform across entire counties. Local site-specific needs for unique management concerns (e.g., damage issues near abundant vineyards, watchable wildlife areas) might also result in locally different population objectives and management approaches compared to the rest of the county management unit. However, attainment of the county-wide CCC objective will be based on population monitoring indices from across the entire county.

<u>Potential strategies:</u>

- Directly manage population size to achieve population objectives by:
    - controlling hunting mortality via:
        - bag limits / tag allocation.
        - season structure (e.g., length, timing).
        - hunting methods.
        - sex composition of fall harvest.
    - controlling predation and other potential negative impacts from other species (e.g., habitat alteration from feral hogs).
    - supplementing populations with translocations of wild turkeys.
    - manipulate other factors (such as diseases, supplemental feeding) that may limit attainment of population objectives.
- Manage habitat to meet population objectives. Approaches might include:
    - partner with the Virginia Department of Forestry, federal agencies, non-governmental organizations, and private landowners to provide active management.
    - educate land managers about specific turkey habitat needs to meet population objectives (e.g., nesting, brood, escape) and associated values for other wildlife.
    - identify and discourage land management practices that may inhibit attainment of population objectives.
    - promote the value of habitat and timber management on national forests and private land to achieve population objectives.
    - education to promote wild turkey habitat management through publications, the media, workshops, and the internet.

    - provide incentives for management of private land habitats.
- Manage illegal mortalities such as poaching to achieve population objectives, for example:
    - reward programs.
    - hunter education.
    - increase enforcement and severity of penalties.
    - consistent judicial application of penalties.

2. To determine factors that may be limiting the attainment of turkey population objectives through 12/31/2022.

Management programs designed to attain population objectives depend on the proper identification of the factors that may be limiting current population management. Potential limiting factors for turkey population management may be associated with human-related mortality (e.g., legal hunting, poaching), natural mortality factors, recruitment rates, habitat abundance and quality, and environmental influences. Describing, evaluating, and prioritizing these specific factors will be essential for designing management strategies to address population objectives. With the wide range of habitats, land use, and human values found across Virginia, these limiting factors for population management will also vary from area to area.

Potential strategies:

- Identify management units with unique population management problems (e.g., inexplicably low populations, marginal habitats).
- Evaluate potential habitat issues as limiting factors on public lands west of the Blue Ridge, with an emphasis on regional differences.
- Consider current and emerging population concerns:
    - Includes professional involvement with turkey managers in other states.
    - Review scientific research.
- Conduct specific research into potential limiting factors (e.g., predators, fall harvest, illegal mortality, habitat quality, diseases).

3. To biennially assess and update turkey population CCC objectives in each county management unit through 12/31/2022.

A challenge with establishing future population management objectives is balancing the dynamic changes that may occur over time in both turkey populations and social demands. As turkey populations, land use, human populations, and public values change, so will the public acceptance of turkeys. Because the CCC may be constantly changing over time within any county management area, the CCC objectives need to be periodically revisited to ensure that population management programs respond to changes in public demands for turkeys. Methods/processes used to determine CCC's should consider all turkey stakeholders in each county management unit.

Potential strategies:

- Employ surveys and other public input methods (e.g., the biennial regulation-setting process) to establish CCC by management unit.
- Evaluate and implement (as appropriate) alternative procedures to determine CCC.
- Develop and implement an adaptive procedure for balancing CCC and future considerations for a changing CCC in setting turkey population management objectives.
- Validate that maximum sustained yield (MSY) is an appropriate population point for CCC.

4. To annually assess and update turkey population status in each county management unit through 12/31/2022.

In order to monitor progress toward meeting population objectives, an annual assessment of population status is necessary. Unfortunately, no economically practical methods exist to accurately estimate turkey population size across all county management units in Virginia. Currently, spring gobbler harvests and success by hunters are the best indices of turkey population trends and abundance. Data from additional surveys of bow hunters and spring gobbler hunters (as well as other hunter surveys) are also used to validate the population indications from harvest results. Annual monitoring of other environmental variables such as weather and mast conditions also help explain the variations observed in monitoring information.

Potential strategies:

- Monitor harvest data (especially spring gobbler harvest) as an index of population status.
- Monitor other population data to provide multiple indices of population parameters (e.g., brood surveys, recruitment, mortality, gobbler call counts, etc.).
- Monitor environmental parameters that impact populations and interpretation of population monitoring indices (e.g., mast conditions, weather, predators).
- Evaluate management-based indices of relative population size and habitat quality for biases and inaccurate results.

5. To develop and/or continue site-specific population management programs within county management units through 12/31/2022.

CCC at the county management unit scale only targets county-wide population objectives. Even when a county-wide population objective is met, attainment will likely not be met uniformly in all areas of the county management unit. As well, site-specific management needs for unique concerns (e.g., nuisance issues around vineyards) might result in locally different population objectives and management programs. For example county-wide hunting seasons are purposefully designed at a relatively large scale to be as simple and uniform as possible among counties. Because habitats, turkey densities, hunting pressure, turkey issues, and public demands (CCC) vary even within counties, broader population management approaches might sometimes be too conservative or too liberal at specific sites within county management units. Unique management needs in local areas might require alternative site-specific management approaches. Site-specific management might be needed in urban areas, refuges, parks and other public lands, planned communities, airports, or agricultural areas.

Potential strategies:

- For local turkey population control or enhancement management programs:
    - supplemental harvest opportunities (e.g., harvest permits, special seasons) or restrictions.
    - habitat alteration programs (e.g., habitat management programs on national forest lands and WMAs, private land habitat management incentive programs).
    - Provide public education about turkey population management options.

6. To validate and test sustained yield population models for turkeys and to determine practical methods for identifying maximum sustained yield (MSY) for fall and spring harvests by 12/31/2020.

Because providing an approximately maximum sustained harvest of turkeys is an important underlying value for determining CCC (Fig. 34), it is critical that the science behind sustained-yield concepts be accurately applied to turkey management. Although well understood for other species

of wildlife (e.g., deer), the theoretical relationships developed by McGhee et al. (2008) between turkey population size and the sustained yields of spring and fall harvests (Fig. 33) still need validation through management applications and specific research. Applying these models to achieve CCC population objectives will require additional understanding about how the harvest-population relationships might need modification and/or be different under varying habitat conditions. In addition, managers will need cost-effect approaches for implementing and monitoring turkey population management for sustained-yield objectives.

Potential strategies:

- Conduct research designed to validate the theoretical relationships between population size, spring harvests, and fall harvests under a variety of habitats.
- Apply adaptive harvest management approaches to validate or improve model predictions.

TURKEY-RELATED RECREATION

Wild turkeys provide a popular source of recreation for wildlife watchers, hunters, and the general public. Second only to deer hunters, more people hunt turkeys than any other species in Virginia. Both spring and fall turkey hunting provide a variety of different satisfactions and experiences. Although the extent of turkey-specific wildlife watching is unknown, viewing activities (e.g., observing, feeding, photographing) of all wildlife are also very important to the two million Virginians who annually participate in some form of wildlife watching. Recreational interests in turkey hunting and wildlife watching activities also generate significant economic contributions for Virginia businesses.

Value Statement

Numerous factors determine satisfactions with turkey-related recreational experiences (both hunting and non-consumptive recreation), such as observing turkeys, hearing birds gobble, and experiencing minimal competition from hunters and other users. Biologically sound wild turkey-related recreation should be managed to address the factors that contribute to satisfaction for participants and opportunities to enjoy and appreciate wild turkeys. Various forms of recreational opportunities should be promoted.

Goal Statement

Manage wild turkey-related recreation (including hunting and non-hunting recreation) to optimize the multiple factors that determine participants' satisfaction. Turkey-related recreational opportunities should not support activities that prevent attainment of turkey population objectives to meet cultural carrying capacity**.**

Objectives

1. To update knowledge of turkey hunter satisfactions and constraints to hunting participation in Virginia by 1/1/2016.

   Individuals hunt for many reasons that make up a set of distinct satisfactions (e.g., enjoying companionship, observing turkeys, hearing turkeys, being close to nature, testing hunting skills, obtaining meat, working with dogs), but information on turkey hunter satisfactions needs to be updated in Virginia, especially for spring gobbler hunting. Surveys of hunter satisfactions for spring gobbler hunting and fall either-sex hunting were last conducted in Virginia following the 1996 and 2009 seasons, respectively. Enhanced management of hunting opportunities to maximize recreational benefits would be guided by an improved understanding of important hunter satisfactions. A better understanding of constraints (e.g., access, free time, cost) could help explain changes in hunter effort and limitations to satisfactions.

Potential strategies:

- Hunter surveys.
- Determine the relative importance of desirable attributes for quality spring and fall turkey hunting experiences (e.g., hunter density, access needs, etc.). Attributes to consider include:
    - season timing and length.
    - peak gobbling (for spring).
    - successful harvest.
    - access to hunting lands.
    - interference with other hunters.
    - nature experiences.
    - quality of turkeys harvested.
    - hunter comfort and health.

2. To improve fall and spring turkey hunter satisfactions, as measured by the 2011 hunter survey, by 12/31/2022.

Average hunter satisfactions with fall hunting quality have been below adequate and declining since 1993, while spring hunting quality has been stable and slightly above adequate (Fig. 24). Spring and fall hunter satisfactions involve multiple components of the hunting experience that include many factors such as seeing turkeys and turkey sign, being close to nature, solitude, being safe, seeing trophies, and calling turkeys (Fig. 25, Fig. 29). Managing for specific components of hunting satisfaction can enhance the overall recreational experience. Favorable hunter satisfactions will enhance the recreational value of turkey hunting as well as help to retain interest traditional hunting values.

Potential strategies:

- Annually monitor spring and fall turkey hunter satisfactions via hunter surveys.
- Provide diverse turkey hunting experiences and opportunities to satisfy varied demands by turkey hunters.
- Recognize regional differences in hunting traditions and satisfactions.
- Implement appropriate management changes to improve specific dimensions of satisfaction:
    - season dates, structure, length, hunting hours, tag allocations.
    - allocation of opportunity and harvest (bag limits / tag management).
    - access improvements.
    - educational programs (e.g., hunting techniques, places to hunt).

3. To determine non-hunting turkey recreation demands, desires, and satisfactions by 1/1/2017.

Non-hunting recreational demands and desires for wild turkeys are poorly understood. As with most species of wildlife, the public benefits from viewing turkeys may be high, but effective approaches to providing these viewing opportunities are unknown. Improved understanding of satisfactions related to non-hunting use of turkeys will help tailor programs to provide the most important non-hunting public benefits.

Potential strategies:

- Survey Virginia citizens regarding non-hunting recreational satisfactions and demands.
- Considered recreational demands should include watching opportunities, access to information and education, existence values, and photography.
- Evaluate constraints to participation in non-hunting recreation.

4. Establish programs to meet demands and satisfactions for non-hunting recreational opportunities through 2022.

Once non-hunting turkey recreation demands, desires, and satisfactions have been determined, results will help guide the creation of specific operational programs. Specific non-hunting recreational programs should be promoted and have measureable outcomes that target the highest priority demands to produce the greatest public benefits.

Potential strategies:

- Develop quantifiable objectives for non-hunting turkey-related recreation.
- Monitor changing levels of non-hunting recreation satisfactions, awareness about turkeys, and impact of non-hunting recreational programs.
- Prioritize programs based on demands expressed by Virginia citizens.
- Inform and educate the public about non-hunting turkey-related recreational opportunities, including:
    - inform and educate the public about turkey biology, turkey sign, management, and behavior in Virginia via wildlife viewing guides, birding trails, and other outreach approaches.
    - photographic and turkey watching opportunities where people can enjoy turkeys in their natural habitats.
- Educational approaches may include a variety of approaches and coordination with other organizations (non-governmental organizations, public agencies). Public dissemination of information through:
    - brochures, DVDs, slide programs, media releases.
    - computer and web-based approaches devoted to turkeys (e.g., VDGIF website, Virginia Chapter of NWTF, webcams).
    - school programs consistent with the Standards of Learning.
    - NWTF JAKES events.
    - Virginia Wildlife magazine.
- Provide accessible viewing opportunities:
    - habitat management – brood strips for ease of viewing.
    - roads / pullovers.
    - birding trails.
- Non-hunting turkey-related recreational opportunities and activities should:
    - encourage land stewardship and proper management of natural resources.
    - ensure that viewing and photography activities do not facilitate human-turkey conflicts.
    - discourage feeding of turkeys.
    - be consistent with wild turkey population and turkey-human conflict goals.
- Maximize recreational opportunities when feasible and acceptable.

HUNTING TRADITION

Hunting, including turkey hunting, provides numerous public and personal benefits, including recreation, links to heritage, food from sustainable harvests, control of nuisance animals, and economic impacts. Historical connections to hunting offer hunters social identities tied to natural systems that also provide opportunities to embrace conservation principles. These values and benefits may extend to family, friends, and the community.

Corresponding to the downward trend in hunting participation across the United States, the number of hunters in Virginia has also declined. Since 1995, when 265,000 resident licenses were sold, the number

of resident big game license sales has decreased at an annual rate of 1.6% per year with 194,000 big game licenses sold during FY13. Participation in fall turkey hunting in Virginia has declined at a much more rapid rate (nearly 5% per year) than big game hunting. Compared to 1995, when there were 90,000 fall turkey hunters, only about 42,000 fall hunters remained in 2011 (Fig. 21). Despite the rapidly declining trend in fall participation, the number of spring turkey hunters has remained relatively constant since the mid-1990s; about 56,000 participants hunted during the 2012 spring gobbler season (Fig. 27).

Changes in hunter participation are the result of a complex array of factors involving satisfaction with the hunting experience, societal values, demographics, economics, leisure time available, and other competing recreational opportunities. Surveys indicate that an increased interest in deer hunting and deer hunting opportunities may be a significant reason for the loss of fall hunters.

Value Statement

Turkey hunting is an important part of maintaining the tradition of hunting in Virginia because it provides excellent opportunities for experienced turkey hunters to mentor youth and other first-time hunters while fostering family values through challenging and positive experiences in natural settings. Future management of wild turkeys in Virginia should strive to provide opportunities and access to areas where hunters can enjoy spring and fall turkey hunting while striving to minimize conflicts with other citizens.

Goal Statement

Encourage participation in lawful methods of turkey hunting in both spring and fall in Virginia. Promotion of hunting traditions should not support activities that prevent attainment of turkey population objectives to meet cultural carrying capacity**.**

Objectives

1. To have at least 55,000 fall hunters (i.e., a 30% growth from 2011) and 55,000 spring gobbler hunters (i.e., maintaining 2012 levels) annually participating in turkey hunting by 12/31/2022.

   Although still lower than historically higher numbers of fall hunters, attainment of 55,000 hunters would require a reversal in the declining trend of fall hunter numbers and a 30% increase over the 2011 level. A target of 55,000 spring hunters would maintain approximately the same participation levels as spring 2012 (which has been stable since the mid-1990s).

   Potential strategies:

   - Strategies should be technically sound and effective at attaining objectives. Some specific strategies might consider:
     - Promote the availability of diverse and unique types of turkey hunting (e.g., use of dogs).
     - Educational programs (e.g., teaching hunting methods, highlighting that turkey hunting is safe).
     - Provide additional youth opportunities.
     - Provide assistance to hunters with access and places to hunt.
     - Remove participation constraints due to season structure.
   - Especially promote fall turkey hunting.
   - Programs to recruit and retain turkey hunters should target:
     - Young new hunters.
     - Other citizens who have never hunted (new/apprentice).
     - Lapsed hunters (i.e., former hunters who have discontinued hunting).
     - Hunters of other species.

- Current turkey hunters.

2. To determine limiting factors for participation in fall turkey hunting and make programmatic recommendations to preserve fall turkey hunting traditions and participation by 1/1/2018.

Individuals chose to participate in fall hunting for many reasons (e.g., companionship, seeing turkeys, being close to nature, for the challenge, exercise). However constraints that limit participation (e.g., economics, lack of free time, insufficient satisfactions, prefer to hunt other species) may negate potential benefits. A better understanding of satisfactions and constraints would help explain the decreases in fall hunting participation. Information about limiting factors will be useful to design programs and recommendations to increase participation in fall hunting.

Potential strategies:

- Review literature for results of studies about hunter recruitment and retention.
- Conduct specific research on fall turkey hunting constraints in Virginia (e.g., hunter surveys, other surveys, focus groups).
- Identify preferred alternatives and implement management actions for eliminating constraints.

ALLOCATION OF FALL HARVEST

At any turkey population size, a prescribed level of fall either-sex harvest will be necessary to meet and maintain population objectives (Fig.33). However, allocation of this harvest among types of hunters has been a source of debate for turkey hunters. Diverse and sometimes conflicting values, satisfactions, and season desires are often associated with different methods of hunting. Although biologically inconsequential, differences in opinion about the fair allocation of fall harvests and harvest opportunities have been expressed by different types of fall turkey hunters. The major allocation issues are between hunters who primarily target turkeys and other hunters who were primarily hunting other species (e.g., deer) at the time they had the opportunity to harvest a turkey. With Virginia's long tradition of liberal fall hunting opportunities, both types of hunters have historically participated in the harvest of fall turkeys. A publically acceptable balance in fall turkey harvest among groups of hunters will help ensure optimal hunting recreation satisfactions.

Value Statement

Although allocation of harvest should focus on hunters who specifically pursue wild turkeys, it is important to maintain opportunities for other hunters (especially deer hunters) to take a turkey.

Goal Statement

Provide opportunities for all hunters to harvest turkeys, but with primary emphasis on hunters who specifically pursue wild turkeys, including quality fall hunting opportunity prior to significant disruptions from deer hunting activity (primarily muzzleloading and firearms seasons). Fall harvest allocations and hunting opportunity should not prevent attainment of turkey population objectives to meet cultural carrying capacity**.**

Objectives

1. To manage turkey harvests during the peak deer hunting periods (during the first 2 weeks of early muzzleloading deer season and during the first 2 weeks of general firearms deer season) to be approximately 50% (between 40-60%) of the total annual fall turkey harvest through the 2022-23 hunting seasons, while also providing quality turkey hunting opportunity prior to these peak deer hunting periods.

The greatest participation in deer hunting occurs during the first 2 weeks of the early muzzleloading deer season and the first 2 weeks of general firearms deer season. As a consequence, the harvest of fall turkeys by deer hunters would be most significant and of greatest interest during these time periods. Late-season deer hunting pressure and harvests are comparatively small.

During the 2012 hunting seasons, 36% of the total fall turkey harvest occurred during the first 2 weeks of muzzleloader deer season and the first 2 weeks of regular firearms season. The muzzleloader portion (that contained 6 days of open turkey season) accounted for 24% of the total harvest, with the general firearms season accounting for 12% (from a single day of overlapping turkey season, Thanksgiving day). While most of these turkeys where harvested by hunters primarily targeting deer (likely about 69%), an estimated 31% of the turkeys were taken by non-deer hunters and presumably by hunters specifically targeting turkeys. Therefore hunters primarily targeting deer would have accounted for approximately 25% (=0. 36 x 0.69) of the total fall turkey kill during the peak deer hunting periods of 2012.

A 50:50 allocation of the fall turkey harvest between the peak deer hunting periods (i.e., during the first 2 weeks of muzzleloading season and the first 2 weeks of general firearms season) and other hunting periods would likely result in about 35% (= 0.50 x 0.69) of the fall harvest coming from deer hunters. This allocation would accommodate increased opportunities to turkey hunt during overlapping deer seasons while still focusing on turkey hunters who specifically pursue turkeys. Hunters who specifically pursue turkeys will have the primary access for 50% of the harvest, while still being able to harvest turkeys during the overlapping deer seasons. Because the consequences of hunting season changes that target a 50:50 allocation cannot be accurately predicted, 40-60% result will be an acceptable approximation.

The high levels of deer hunter participation during the first 2 weeks of muzzleloading and general firearms deer seasons may also impact turkey behavior, flock integrity, and hunting methods. Therefore, concurrent with these harvest allocation targets, quality hunting opportunities prior to this peak deer hunting will also ensure primary emphasis on hunters who specifically pursue turkeys.

Potential strategies:

- Provide adequate quality opportunities for fall turkey harvests during periods which are less subject to conflict and disturbance from other hunters. For example:
    - prior to heavy deer hunting disturbances (muzzleloading, firearms) that disrupt turkey behaviors.
    - when deer-hunting disturbance is relatively low.
    - before modern firearms deer and bear seasons.
    - After modern firearms deer seasons.
- Provide opportunities for fall turkey harvests during deer seasons.
- Monitor daily fall harvests from mandatory checking systems.
- Manipulate harvests with hunting regulations that may manage:
    - season dates.
    - legal weapons and shot size.
    - bag limit / tag allocations.

2. To refine appropriate allocation of fall turkey hunting opportunities and harvests by 1/1/2015.

The 50:50 distribution of fall turkey harvest between peak deer hunting periods and other hunting periods represents an initial attempt to address the values and goals regarding allocation of fall harvests. A more comprehensive and objective consideration of the appropriate allocation of

harvest and/or opportunity between turkey hunters who specifically pursue turkeys and other hunters would provide further refinements of the expressed values . Additional allocation concerns could address allocations between muzzleloading and general firearms deer seasons as well as season timing.

Potential strategies:

- Reconsider the allocation of in-deer season turkey hunting to out-of-deer season turkey hunting.
- Consider the allocation of turkey hunting during early muzzleloader deer season to turkey hunting during general firearms deer seasons.
- Consider aspects of fall season timing.
- Solicit hunter input about the 50:50 allocation and other options from:
    - hunter surveys.
    - stakeholder meetings.
    - other forms of public input (regulation advertisements, internet).
- Consider potential benefits for allocation of harvest by separating deer and turkey licenses.

SAFETY

Hunting safety is a concern for all hunting activities, but especially for turkey hunters. Although the incident rates associated with spring gobbler hunting have dropped significantly since the mid-1990s and are at the lowest level in 35 years (Fig. 31), hunting safety should be an ongoing concern for turkey hunters. Not only will a safe hunting experience provide greater satisfaction for turkey hunters, but a safe image of hunting will also alleviate many safety concerns that other outdoor users may have during turkey hunting seasons.

Value Statement

Spring and fall turkey hunting should be safe for hunters, their dogs, and other citizens.

Goal Statement

Promote safety for hunters and non-hunters without diminishing the quality of the hunting experience during both spring and fall.

Objectives

1. Compared to the 10-year period (2003-12) when 25 spring hunting incidents occurred, reduce turkey hunting-related incidents by 25% (by 6 incidents) for the period 2013- 2022.

    Despite historically low incident rates during spring hunting seasons, in recent years, continued improvements in safety for hunters would be desirable and possible. The existing successful hunter safety programs may be enhanced to provide even more improvements for a safe hunting environment.

    Potential strategies:

    - Promote mandatory hunter education to emphasize the importance of safety, particularly for turkey hunting.
    - Evaluate current hunter education programs.
    - Continuing education of turkey hunters.

- Cooperate with other agencies and organizations to deliver consistent hunter safety information.
- Implement proven laws and hunting season changes that reduce hunting incidents or fatalities, which may include:
    - structuring seasons and participation to reduce crowding.
    - weapon/shot restrictions.
    - appropriate use of blaze orange.
- Increase penalties for unsafe conduct.
- Review safety programs from other states.
- Monitor annual incident rates.
- Targeted education programs that:
    - emphasize safe participation.
    - provide weapon safety instruction.
    - provide an additional turkey hunter safety class/training.

2. To annually inform hunters and the general public about open turkey hunting seasons and associated safety considerations through 12/31/2022.

    To help highlight safety issues for hunters and non-hunters alike, ongoing safety concerns will need continued reinforcement. This would be especially true during open turkey hunting seasons. Not only will hunters personally benefit from reminders about hunter safety, but other wildland users also will know the facts about turkey hunting safety and that turkey seasons are open. Alleviating safety concerns for the non-hunting public may also help promote a positive image for turkey hunting, which can play a role in the recruitment of future hunters.

    Potential strategies:

    - Inform the public and hunters about when turkey hunting seasons occur (e.g., information signs at WMA parking lots).
    - Provide factual information to hunters and the public about safety considerations associated with turkey hunting seasons.
    - Provide information via multiple outlets (e.g., news releases; public service announcements, VDGIF web site; newsletter/web submissions to other organizations such as Audubon, Nature Conservancy, Appalachian Trail Council; media contacts).

3. To develop and implement a system to annually monitor safety incidents related to fall turkey hunting by 12/31/2015.

    Feeling safe has been shown to be the most important satisfaction factor for fall turkey hunters. However it has been difficult to accurately determine hunting incidents specifically associated with fall turkey hunting in Virginia because of many overlapping fall hunting seasons and hunters often pursuing multiple species at the same time. In order to adequately monitor the safety issues and trends associated with fall turkey hunting, accurate information about safety incidents will be needed.

    Potential strategies:

    - Collaborate with VDGIF Law Enforcement staff to modify information collected from hunting accident investigations for more meaningful monitoring.
    - Collaborate with VDGIF Information Management System staff to database and access hunting accident information.
    - Produce periodic summary results of fall turkey hunting-related incidents.

ETHICS & COMPLIANCE WITH LAW

Turkey hunting activities may create conflicts with landowners, other hunters, other outdoor recreationists, and other citizens. Perhaps some of the most contentious issues occur among turkey hunters themselves, who have different values about alternative approaches to turkey hunting. While illegal actions by hunters should never be tolerated by sportsmen, other hunting behaviors sometimes invoke disagreements about acceptable ethics, sportsmanship and fair chase. Concerns from other citizens (e.g., outdoor recreationists, landowners, general public) may involve disturbance from hunting activities, the use of technology, or perceptions about safety. The future of turkey hunting for optimum recreational benefits, population management, and damage control depends on its compatibility with Virginia's citizens and other hunters.

Value Statement

Ethical hunting embodies the concepts of abiding with established law, fair chase, sportsmanship, humane take, and respect for the rights of property owners and citizens of Virginia. Hunters, landowners, and non-consumptive users should respect each other and the wild turkey resource. Unethical practices, poaching, and wanton waste should never be tolerated. Mutual respect for hunting and non-consumptive activities should be a shared responsibility for all user groups.

Goal Statement

Demand a culture of high ethical standards among hunters and develop respect for the interests of non-hunters, other hunters, and landowners, while working to reduce poaching and unethical practices.

Objectives

1. To describe ethical principles for turkey hunting by 1/1/2016.

   The future of turkey hunting will be affected by the public perception of turkey hunters and turkey hunting activities. Hunter agreement with ethical principles also will help maximize turkey hunting recreational benefits. Based on a variety of input, the principles of acceptable fair and sportsmanlike hunting behaviors need to be clearly described.

   Potential strategies:

   - Consider a variety of sources to describe fair, sportsmanlike, humane, and ethical turkey hunting methods.
   - Develop principles that define specific criteria and guidelines for fair, sportsmanlike, humane, and ethical turkey hunting.
   - Evaluate sociological implications of hunting strategies that generate negative public perceptions.
   - Use a variety of techniques (e.g. focus groups, surveys, task forces, public meetings) to balance fair, sportsmanlike, humane, and ethical values with the population management values associated with turkey hunting.

2. To implement strategies that ensure compliance with these standards by 1/1/2018.

   Multiple approaches (e.g., regulations, guidelines, educational programs) will be necessary to foster compliance with accepted principles of ethical turkey hunting. Implementation of strategies to address fair and sportsmanlike hunting methods should not unnecessarily limit the value of hunting as a source of recreation and population management tool. Efforts should be made to ensure hunter compliance, while protecting hunting activities that conform to accepted principles.

Potential strategies:

- Using a variety of techniques (e.g., hunter education programs, workshops, brochures, popular articles, videos) inform and educate turkey hunters, other hunters, and the general public about fair, sportsmanlike, humane, ethical turkey hunting standards that ensure turkey hunter compliance with behavior criteria and protect hunting activities that conform to these standards.
- Collaborate with other Agencies and sportsmen groups in cooperative initiatives to promote ethics and sportsmanship.
- Enforce laws that govern turkey hunting activities (e.g., trespass, bag limits, methods, illegal kills).
- As necessary, make regulation and law changes to ensure the future of turkey hunting in Virginia that follows fair, sportsmanlike, humane, and ethical methods. These might include:
    - weapon/shot restrictions.
    - hunting techniques.
- Use education, peer pressure, and increased funding for rewards (perhaps through NWTF and other organizations) to reduce poaching and illegal kills.

HUMAN-WILD TURKEY PROBLEMS

Turkey management goals are not limited to achieving population objectives or providing hunting and non-hunting recreational benefits for Virginia's citizens. Although generally of much less concern than other wildlife species (e.g., deer, bears), wild turkeys may still create problems for agricultural crops, people in residential areas, vehicle collisions, and airport safety. With rural and urban environments in close proximity to turkeys and turkey habitat, wild turkey problems can occur almost anywhere in Virginia. Human-turkey concerns need to be considered in conjunction with other population and recreation objectives.

Value Statement

Negative agricultural, residential, and other human conflicts with wild turkeys should be minimized to preserve the profitability and safety of citizens and to prevent the degradation of the value of the wild turkey.

Goal Statement

Reduce the negative consequences upon affected stakeholders from conflicts caused by wild turkeys through shared public/private responsibility and in a manner consistent with population and recreation objectives.

Objectives

1. To quantify and assess agricultural and other negative turkey impacts by 1/1/2018.

    Because turkey-related problems are a relatively new concern for citizens, no specific information about the amount of damage caused by turkeys is available in Virginia. Reliable estimates of wild turkey damage to Virginia's agricultural producers are nonexistent. Objective information about vehicle collisions, urban conflicts, and other nuisance situations also are lacking. Monitoring changes in human-turkey conflicts (e.g., economic losses, public complaints) and public tolerances will help direct management options throughout Virginia. This information would be essential for prioritizing and designing cost-effective responses.

Potential strategies:

- Conduct surveys to monitor turkey damage and problem levels for agriculture and other citizens. Some specific areas of focus would include:
    - Studies specific to turkey damage in vineyards. Preliminary indications suggest that turkeys might be a significant source of grape losses in Virginia.
    - Studies should also evaluate the biosecurity hazards to Virginia's domestic poultry industry.
- Determine acceptable levels of human tolerance to turkey problems.
- Partner with agricultural producers and non-governmental organizations.

2. To develop and implement cost-effective response policies/guidelines for managing wild turkey problems by 1/1/2015.

Standard, but flexible, nuisance response policies are necessary to clarify public and agency responsibilities for human-wild turkey problems. Because the options for managing turkey problems are poorly understood by the public, education should be an important component of human-turkey problem management policies. In addition to support from VDGIF, citizens, communities, local governments, and other agencies should share responsibility for managing problems associated with turkeys. Response policies should minimize economic losses in a manner that is consistent with other population and recreation objectives of the wild turkey program.

Potential strategies:

- The policy/guidelines should be developed by considering:
    - input from affected individuals, municipalities, agricultural producers, private organizations, and government organizations (VDACS, USDA).
    - programs developed and implemented in other states.
    - balanced and cost-effective responses.
- The policy/guidelines should:
    - include a consistent, shared public / agency responsibility for problems.
    - cover circumstances for lethal (including hunting) and non-lethal management applications.
    - be flexible to allow affected individuals, landowners, and municipalities a range of choices in resolving conflict situations.
    - accommodate site-specific management options for unique nuisance turkey management situations.
    - provide timely responses.
    - consider land and habitat management options to reduce turkey impacts on susceptible crops and communities.
    - ensure public safety.
    - educate agricultural producers and others about the wild turkey and on methods to control wild turkey damage.
    - provide information for accurate identification of wild turkey nuisance issues.
    - be communicated to the public, agricultural producers, municipalities, and other agencies.
- Provide additional education and technical assistance about techniques for preventing negative human-turkey interactions.
- Determine efficacy of guidelines for solving turkey nuisance concerns.
- Monitor satisfactions with nuisance guidelines of individuals, landowners, and municipalities who are having negative human-turkey interactions.

Appendix A. Stakeholder Advisory Committee members.

Name	Interest/Organization	County/City
Daune Angell	Hunter, birder, landowner	Floyd
Carol Croy	US Forest Service	Roanoke
Steve Fritton	Hunter, landowner	Hanover
Gratten Hepler	hunter, landowner	Alleghany
Clint Keller *	hunter	Warren
Cully McCurdy	National Wild Turkey Federation	Pocahontas Co., WV **
Richard Pauley	hunter, landowner	Botetourt
Frederick Payne	hunter	Albemarle
Earl Sechrist	hunter	Fauquier
Wilmer Stoneman	Virginia Farm Bureau	Richmond City
Dick Thomas	Virginia Vineyards Association	Amherst
Chip Watkins	hunter, landowner	King William
---------- ***	Virginia Society of Ornithology	

* Due to time constraints, could not complete the process.
** Regional NWTF Biologist for both VA and WV.
*** Although initially committed, nobody was able to participate.

Appendix B. VDGIF Wild Turkey Technical Committee members.

Name	Agency Position
Al Bourgeois	Region 4 District Biologist
Jim Bowman	Region 2 Terrestrial Wildlife Manager
Mike Dye	Region 4 District Biologist
Todd Engelmeyer	Region 1 District Biologist
Jay Jeffreys	Terrestrial Science Team Coordinator
Neil Kester	Senior Conservation Police Officer
Megan Kirchgessner	Wildlife Veterinarian
Dan Lovelace	Region 2 District Biologist
Katie Martin	Region 2 District Biologist
Brian Moyer	Recreation Science Team Lead
Gary Norman	Forest Game Bird Project Leader
David Steffen	Terrestrial Science Team Coordinator
Johnny Wills	Region 3 District Biologist

Appendix C. Relative densities, population trends, and habitat quality for wild turkeys in Virginia counties, 2012.

County	Land Area (mi^2)		Density Index		Population Growth			Habitat Quality	
	Total	Suitable Habitat [1]	Spring Harvest (kill/mi^2) [2]	Relative Density [3]	Annual Growth (%) [4]	P-Value [5]	Trend Status [6]	HSI [7]	Relative Quality [8]
Accomack	460	295	0.43	Moderate	4.2	0.036	Increasing	0.84	High
Albemarle	726	651	0.20	Low	-4.3	0.034	Decreasing	0.85	High
Alleghany	448	420	0.36	Low	-4.4	0.000	Decreasing	0.51	Very Low
Amelia	359	344	0.57	Moderate	0.1	0.971	Stable	0.94	Very High
Amherst	479	437	0.36	Low	-5.8	0.005	Decreasing	0.74	Moderate
Appomattox	335	320	0.46	Moderate	0.5	0.875	Stable	0.94	Very High
Augusta	971	883	0.23	Low	-1.7	0.452	Stable	0.60	Low
Bath	534	510	0.25	Low	-6.4	0.012	Decreasing	0.53	Very Low
Bedford	769	693	0.71	High	-1.4	0.356	Stable	0.85	High
Bland	358	346	0.44	Moderate	-3.3	0.080	Decreasing	0.76	Moderate
Botetourt	546	498	0.49	Moderate	-4.1	0.030	Decreasing	0.68	Moderate
Brunswick	570	535	0.36	Low	4.9	0.098	Increasing	0.93	Very High
Buchanan	504	465	0.41	Moderate	-1.3	0.510	Stable	0.73	Moderate
Buckingham	584	561	0.28	Low	-2.4	0.299	Stable	0.87	High
Campbell	507	468	0.65	High	2.2	0.211	Stable	0.95	Very High
Caroline	537	495	0.52	Moderate	6.4	0.040	Increasing	0.75	Moderate
Carroll	477	441	0.51	Moderate	-1.4	0.177	Stable	0.90	Very High
Charles City	184	170	0.69	High	-2.2	0.322	Stable	0.78	Moderate
Charlotte	478	458	0.47	Moderate	-0.6	0.765	Stable	0.95	Very High
Chesapeake	348	260	0.07	Very Low	34.8	0.000	Increasing	0.62	Low
Chesterfield	434	299	0.29	Low	-2.0	0.560	Stable	0.79	Moderate
Clarke	178	164	0.32	Low	5.1	0.081	Increasing	0.63	Low
Craig	330	318	0.56	Moderate	-0.2	0.909	Stable	0.63	Low
Culpeper	383	356	0.24	Low	0.1	0.947	Stable	0.82	High
Cumberland	300	289	0.62	High	2.9	0.099	Increasing	0.92	Very High
Dickenson	334	306	0.53	Moderate	0.3	0.926	Stable	0.80	Moderate
Dinwiddie	508	474	0.49	Moderate	2.4	0.260	Stable	0.93	Very High
Essex	260	239	0.65	High	7.6	0.011	Increasing	0.91	Very High
Fairfax	397	171	0.05	Very Low	2.3	0.761	Stable	0.53	Very Low
Fauquier	652	603	0.31	Low	4.6	0.017	Increasing	0.83	High

Appendix C. Relative densities, population trends, and habitat quality for wild turkeys in Virginia counties, 2012.

County	Land Area (mi^2)		Density Index		Population Growth			Habitat Quality	
	Total	Suitable Habitat [1]	Spring Harvest (kill/mi^2) [2]	Relative Density [3]	Annual Growth (%) [4]	P-Value [5]	Trend Status [6]	HSI [7]	Relative Quality [8]
Floyd	381	361	0.47	Moderate	-6.4	0.000	Decreasing	0.92	Very High
Fluvanna	290	274	0.38	Low	-1.8	0.384	Stable	0.92	Very High
Franklin	711	661	0.62	High	-3.9	0.009	Decreasing	0.90	Very High
Frederick	416	366	0.34	Low	-2.3	0.237	Stable	0.78	Moderate
Giles	361	341	0.64	High	-0.1	0.954	Stable	0.72	Moderate
Gloucester	220	187	0.65	High	-2.4	0.218	Stable	0.82	High
Goochland	290	264	0.54	Moderate	2.0	0.320	Stable	0.92	Very High
Grayson	446	421	0.62	High	-1.4	0.345	Stable	0.88	High
Greene	157	143	0.16	Low	11.6	0.162	Stable	0.73	Moderate
Greensville	297	278	0.53	Moderate	3.5	0.035	Increasing	0.94	Very High
Halifax	830	773	0.51	Moderate	3.4	0.061	Increasing	0.96	Very High
Hanover	475	421	0.29	Low	-1.0	0.529	Stable	0.90	Very High
Henrico	239	134	0.43	Moderate	4.5	0.073	Increasing	0.80	Moderate
Henry	384	347	0.52	Moderate	-0.1	0.922	Stable	0.92	Very High
Highland	416	400	0.19	Low	-3.7	0.220	Stable	0.69	Moderate
Isle of Wight	320	280	0.75	High	1.4	0.260	Stable	0.93	Very High
James City	144	105	0.55	Moderate	-2.6	0.208	Stable	0.70	Moderate
King and Queen	318	299	0.53	Moderate	3.5	0.171	Stable	0.86	High
King George	181	161	0.54	Moderate	1.8	0.381	Stable	0.84	High
King William	277	254	0.51	Moderate	1.2	0.675	Stable	0.86	High
Lancaster	134	119	0.92	Very High	-2.9	0.064	Decreasing	0.90	Very High
Lee	437	403	0.43	Moderate	-3.9	0.047	Decreasing	0.85	High
Loudoun	522	416	0.41	Moderate	6.0	0.008	Increasing	0.76	Moderate
Louisa	511	473	0.34	Low	0.8	0.702	Stable	0.87	High
Lunenburg	433	415	0.47	Moderate	4.3	0.050	Increasing	0.93	Very High
Madison	322	303	0.19	Low	-1.6	0.447	Stable	0.73	Moderate
Mathews	86	73	0.83	Very High	-0.6	0.855	Stable	0.85	High
Mecklenburg	680	595	0.41	Moderate	1.2	0.481	Stable	0.95	Very High
Middlesex	131	119	0.62	High	-2.1	0.211	Stable	0.91	Very High
Montgomery	389	338	0.47	Moderate	-3.3	0.005	Decreasing	0.74	Moderate
Nelson	474	440	0.29	Low	-3.3	0.068	Decreasing	0.70	Moderate

Appendix C. Relative densities, population trends, and habitat quality for wild turkeys in Virginia counties, 2012.

County	Land Area (mi^2)		Density Index		Population Growth			Habitat Quality	
	Total	Suitable Habitat [1]	Spring Harvest ($kill/mi^2$) [2]	Relative Density [3]	Annual Growth (%) [4]	P-Value [5]	Trend Status [6]	HSI [7]	Relative Quality [8]
New Kent	213	185	0.63	High	0.6	0.759	Stable	0.70	Moderate
Northampton	210	131	0.39	Low	-2.1	0.334	Stable	0.76	Moderate
Northumberland	194	175	0.81	Very High	-4.9	0.005	Decreasing	0.91	Very High
Nottoway	316	295	0.54	Moderate	5.5	0.011	Increasing	0.95	Very High
Orange	344	319	0.21	Low	-0.5	0.833	Stable	0.86	High
Page	314	284	0.21	Low	-3.8	0.150	Stable	0.64	Low
Patrick	486	460	0.47	Moderate	-5.1	0.001	Decreasing	0.84	High
Pittsylvania	978	907	0.48	Moderate	-2.3	0.119	Stable	0.94	Very High
Powhatan	263	250	0.48	Moderate	-0.3	0.864	Stable	0.92	Very High
Prince Edward	354	334	0.50	Moderate	1.8	0.287	Stable	0.95	Very High
Prince George	267	240	0.60	High	-1.2	0.431	Stable	0.84	High
Prince William	350	234	0.29	Low	6.6	0.011	Increasing	0.68	Moderate
Pulaski	329	292	0.53	Moderate	0.3	0.826	Stable	0.71	Moderate
Rappahannock	267	253	0.25	Low	4.0	0.091	Increasing	0.79	Moderate
Richmond	193	177	1.16	Very High	-0.1	0.968	Stable	0.90	Very High
Roanoke	251	199	0.42	Moderate	-4.5	0.021	Decreasing	0.69	Moderate
Rockbridge	601	554	0.42	Moderate	-3.2	0.016	Decreasing	0.71	Moderate
Rockingham	853	791	0.11	Very Low	-7.7	0.000	Decreasing	0.57	Low
Russell	477	440	0.38	Low	2.0	0.218	Stable	0.87	High
Scott	538	509	0.60	High	-2.3	0.101	Stable	0.87	High
Shenandoah	513	472	0.31	Low	-1.7	0.440	Stable	0.70	Moderate
Smyth	452	428	0.32	Low	-0.3	0.845	Stable	0.76	Moderate
Southampton	604	563	0.70	High	4.3	0.019	Increasing	0.91	Very High
Spotsylvania	413	354	0.22	Low	6.1	0.032	Increasing	0.78	Moderate
Stafford	273	222	0.36	Low	5.7	0.050	Increasing	0.72	Moderate
Suffolk	407	346	0.48	Moderate	5.3	0.005	Increasing	0.83	High
Surry	281	261	0.98	Very High	3.5	0.026	Increasing	0.85	High
Sussex	494	463	0.67	High	5.7	0.009	Increasing	0.84	High
Tazewell	520	476	0.32	Low	-0.2	0.928	Stable	0.82	High
Virginia Beach	254	113	0.13	Very Low	57.4	0.020	Increasing	0.72	Moderate
Warren	216	187	0.32	Low	1.4	0.515	Stable	0.78	Moderate

Appendix C. Relative densities, population trends, and habitat quality for wild turkeys in Virginia counties, 2012.

County	Land Area (mi^2)		Density Index		Population Growth			Habitat Quality	
	Total	Suitable Habitat [1]	Spring Harvest (kill/mi^2) [2]	Relative Density [3]	Annual Growth (%) [4]	P-Value [5]	Trend Status [6]	HSI [7]	Relative Quality [8]
Washington	566	527	0.35	Low	6.3	0.000	Increasing	0.80	Moderate
Westmoreland	231	211	1.00	Very High	-1.3	0.580	Stable	0.91	Very High
Wise	405	351	0.53	Moderate	3.1	0.206	Stable	0.85	High
Wythe	464	434	0.47	Moderate	-3.2	0.054	Decreasing	0.74	Moderate
York	108	71	0.20	Low	-8.8	0.065	Decreasing	0.59	Low

[1] Suitable habitat is the total land area in each county minus locations considered barren land, herbaceous wetlands, and under human development.

[2] Spring gobbler kill/mi^2 of suitable habitat is the index of relative density based on the 2-year average from the 2011 and 2012 spring harvests in each county.

[3] Based on cluster analysis, relative density (gobbler kill/mi^2) status range from very low to very high where:

- Very high > 0.79
- High = 0.59 – 0.78
- Moderate = 0.41 – 0.58
- Low = 0.15 – 0.40
- Very Low < 0.14

[4] Based on the 10-year (2003-2012) exponential regression, $N_{10} = N_0 * \lambda^{10}$; where N_{10} = spring gobbler kill in 2012, N_0 = spring gobbler kill in 2003, and λ = finite population rate of change. The average annual growth rate (R) is, $R = 100*(\lambda-1)$.

[5] Probability that the growth trend was not significant.

[6] Trends that were either not significant (P > 0.1) or had annual growth between -2.0% and 2.0% were considered stable. Counties with significant trends (P < 0.1) and rates that exceeded 2.0% growth were considered increasing. Decreasing counties had significant growth rates less than -2.0%.

[7] Average habitat suitability index (HSI) from suitable habitat only (Morris 2014).

[8] Based on cluster analysis, relative habitat quality status (HSI) range from very low to very high where:

- Very high > 0.89
- High = 0.81 – 0.89
- Moderate = 0.66 – 0.81
- Low = 0.55 – 0.66
- Very Low < 0.55

Appendix D. Comments received during open public comment period (July 12 – August 9, 2013) and changes made to the Virginia Turkey Management Plan.

County of Residence	Comment (as written)	Value Summary of Comment	Area of Plan		Changes to Plan and/or Response	#
			Value / Goal Area	Objective #		
VDGIF Web Comments						
Greensville	Hi. I have been a part of Tenpoint Hunt Club for the past 16 years. Turkey season used to be real popular up there in Brunswick and Greensville county. As the years have passed and the number of turkeys in our area have been declining there hasn't been a lot of people going to hunt turkey. I used to see flocks of turkey up to 25 at one time and see several different flocks all over the property. Now if i see a flock of 10 in the area i am doing good. Normally will see 1 or 2 at a time, but hardly ever more than 10 per day while i am in the woods. There has been an increase in coyote around the are there and it may have something to do with this. According to the guuys that actually hunted spring gobbler this last spring. They didn't see any toms at all on the property or even here the gobbles. They seen a few Jakes and a few hens but that was it. They were so depressed this last season on the decline of turkeys they have been seeing. It has steadily been going down each year in our area. Not sure why. Any information you may be able to send to me on this would be helpful for the success of turkey hunting in our area.	Desire for increased population levels in Greensville and Brunswick Counties	Turkey Populations	1	No goal, objective, or strategy change is necessary. Population increases are objectives for these counties.	1
		Concern about a population limiting factor (coyotes)	Turkey Populations	2	No goal, objective, or strategy change is necessary. Determining population limiting factors is an existing objective. Determining impact of predators is an existing potential strategy.	2
Stafford	After reading the plan I have to say that I agree with the majority of the guidance. I have only been a hunter for about 5 years now, but I have never seen a turkey in the woods or fields that I hunt. I have lived in Stafford County since 1991 (with the exception of some time spent in other states for the military) and I have only seen a wild turkey once (crossing Ramoth Church Road). I am interested in having more wildlife around where I live, and I have called the wildlife biologist a few times with questions, but I have never received a return call. I am interested in what I can do on my small farm to make the land better for wildlife while I am improving it for my animals. I would be extremely happy to see more wildlife in the woods or on my property than dead on the side of the road. If there is anything that I can do to assist with bringing up the turkey population or if there is anything that I can do to assist the Department of Game and Inland Fisheries please let me know.	Desire for increased population level in Stafford County	Turkey Populations	1	No goal, objective, or strategy change is necessary. Population increase is an objective for this county.	3
City of Radford	Hi, I would like to see the option to be able to harvest all {3} turkeys in the Fall/Winter season. We already have the option to harvest all {3} birds in the Spring, if the hunter selects to do so. Even if a "new" regulation stating, " only two Fall/Winter harvested turkeys may be hens, and the third bird, must be a male" turkey. This would benefit the Fall hunter. I hunt nearly everyday in the Fall season, {minus heavy rains or deep snow}. Some years, I harvest no birds, other years, I may harvest one bird. And some years, I have harvested a bird the first day of the Fall season {Saturday}, and hunt a different location the following Monday, and harvest the second bird. This ends my turkey hunting until Spring. Often times I do not harvest the second bird, fearing this ends my Fall hunting experience. I would much rather hunt turkeys in the Fall/Winter season than the Spring season. I hunt only National Forest Lands. In the Spring season, it is real tough to find birds, work the gobbler for a shot, and be back at the vehicle before noon. Spring season on Public Lands is set up to fail the hunter for success of a Spring turkey. More than 99% of the time, during Spring season, I run out of time, while working a gobbler, and must head back to the vehicle, usually a several mile walk at a fast pace, to beat the noon deadline. The last two weeks during the Spring season, {all day hunting}, by this time, the mosquitos and biting flies are too bad to even be in the woods. USING 40% DEET WILL NOT REPEL THESE #@%*%$. This is the reason I prefer Fall hunting, it's enjoyable ! Thanks for the opportunity to comment.	Concerned that fall satisfaction and opportunity are limited by available tags.	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Tag management is included as a potential strategy for improving hunter satisfactions.	4

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Albemarle	Thank you for preparing this plan. We are all concerned with low population densities of wild turkey in several mountain and piedmont counties. While we do not like having the December season closed in Bath and Highland Counties for four consecutive years, I do have one proposal: The report indicates that as far as hunter turkey kills, most damage to flocks in the fall occur because of hen kills. It may be a good idea to limit fall hunting to bearded turkeys (gobblers) only. First, we can all tell the difference between a hen and a gobbler. Second, the fall hunters I know will never kill a hen, even though it is legal to do so. I do not hunt in the spring and my fall hunting party has killed dozens of fall gobblers over the decades, never a hen. I (we) would rather have a December season in Bath County but be limited to gobblers only in the fall. This should really help with the fall hen mortality rate. These birds are killed inside of thirty yards; we can tell the difference. Thank you	Desire for increased populations in mountain (i.e., Bath & Highland) and piedmont counties	Turkey Populations	1	No goal or objective change is necessary. Population increase is an objective for Bath and Highland Counties and many piedmont counties. Managing sex composition of harvest was added as a potential strategy for population management	5
Roanoke	I was very excited to see the DGIF take a huge step forward in the management of the wild turkey in Virginia. I am however now extremely disappointed to see that the DGIF is, in my mind, taking a huge step backwards to increase the fall kill in our state. By opening up the fall turkey season during the two weeks of early muzzloader and the two weeks of the general firearms season you'll get the increase in kill numbers and "fall turkey hunters" that you are looking for but all you are doing is creating the opportunity for a man sitting in a treestand who hasn't seen a deer all day to say "Look, some turkeys! Their about 100 yards away but I can get a shot at one with my 30-06 from here!" Kit Shaffer is rolling in his grave right now. It seems to me that the "computer model" from the 90's that projected huge numbers in the turkey population has been a burr in someones saddle for along time. I remember the excitement back in 1994 when I learned that the fall season was being removed from the general firearms deer season, now my heart hangs heavy that we are coming full circle all in the name of "getting more fall turkey hunters in the woods" because Hogwash! I know some of the stakeholders, no names named, have been pushing to see this happen for a long time and it looks like this individual may finally get his way, but at what cost? How many dads are really going to take their sons/daughters into the fall woods and teach them how to use their woodsmanship and calling to get a gang of turkeys into SHOTGUN range? In my opinion very few, the state where the NWTF was born and a state so steeped in a rich fall turkey hunting tradition is now sacrificing heritage to acheive a false positive in my mind. What about opening the fall season starting the first Sat. in October to shotgun hunting? You can shoot a turkey with a bow/crossbow but not a shotgun? Would there really be that much interference with archery deer hunters by doing this? No! We "turkey hunters" relish in the fact that right now we don't have to worry about moving in the woods because there is not someone in a tree with a high powered rifle that saw something move, you know the rest. I know my comments will probably fall on deaf ears but I hope that someone will understand that this recommendation will in reality only look good on paper and not benefit the wild turkey in anyway.	Concerned about the ethics of deer hunters harvesting turkeys	Ethics and Compliance with Law	1	No goal, objective, or strategy change is necessary. Describing ethical practices is an objective.	6
		Population concerns if turkey season overlaps deer season to achieve fall turkey hunter numbers.	Hunting Tradition	1	Based on additional SAC discussion, the hunting tradition value / goal was modified so that CCC population objectives would not be compromised to attain hunting tradition objectives.	7
		Concerned about the impact on fall hunting satisfactions during open deer seasons.	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Managing interference with other hunters is a potential strategy for improving satisfactions.	8
		Concern over allocation of fall harvest	Allocation of Fall Harvest	1, 2	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	9
Botetourt	Would it be possible to have a fall turkey season open in October (early to mid) and run until the opening of rifle season (for deer). In my opinion, this would show a more positive number of hunters that actually go to the woods for turkey pursuit, instead of having hunters pursuing deer, shoot a turkey just because it was available. Being raised in Alleghany County by my grandparents, I often heard about the original restocking efforts from my grandfather whom raised me as a hunter. He would have been proud to see what the turkey has done in the time he has been gone, but there is also a need to accept that predation has become a problem, and we did not see that until the late 90's. I appreciate your time.	Desire for fall turkey hunter growth is for people specifically hunting turkeys rather than from hunters pursuing deer.	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	10
Carroll	Why did I get notice in the mail today if the meeting in Wytheville was LAST Night?	Comment unrelated to Plan content			No goal, objective, or strategy change is necessary. Concern was about tardy notification about public meeting in Wytheville.	11

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Franklin	I have reviewed the draft plan and I felt that it is pretty much spot on for all issues covered. One issue that I did not see mentioned is what effect does increasing coyote population have on wild turkey. Are there any significant negative impacts on the turkey population? And if so what can landowners do to reduce these negative impacts other than the obvious efforts to decrease coyote populations. Additionally what methods prove most effective for driving coyotes away or negatively influencing coyote habitat.	Concerned about the effects of coyote populations on wild turkey populations.	Turkey Populations	1, 2	No goal or objective change is necessary. Determining population limiting factors is an existing objective. Managing predators and other limiting factors was added as a potential strategy for population management	12
Floyd	After reading the management plan, it would appear that much hard work went into the process. Congrats to the team who worked hard on putting this together. That would include the private citizens, organization members and employees of VDGIF. My main comment would pertain to the section that covered the fall hunting strategies. There has been a decline in the fall participation of turkey hunting and that is identified in the plan. From information in the plan, it would seem that fall hunters were canvassed to some extent as to the reason. There seem to be varying reasons for the decline. I do not see how a declining degree of satisfaction could be a major influence on the fall hunters. Some hunters may have followed the same course that I followed. At the point we could harvest all three tags in the spring, we decided not to fill any more tags in the fall and to save all three tags for the spring. I believe there are many and varying reasons why fall hunting has declined. I remember Dr. Norman's proposals and the subsequent change in fall hunting dates in an attempt to increase turkey populations statewide. There was a fairly serious decrease in fall hunting opportunities in an attempt to reduce harvest of young and fairly vulnerable poults in the fall season. The thinking was good I believe but weather for several springs seemed to negate any positive poult survival realized by decreasing fall hunting harvest of these poults. Where I'm heading with this is that if one of the objectives and goals of this management plan is to increase populations in the identified counties, why then would you want to increase fall hunting? The other factor in this would be the safety concerns that you identified. While the rifle incidents were fairly small, the result of rifle incidents were much more serious and had a much greater potential for lethal or mortal wounds. Increased harvest opportunities in the fall will only serve to increase the opportunity for rifle incidents. The regular deer season may be the only exception due to blaze orange requirements but outside of the regular deer season, the blaze orange requirements are not in place. Therefore, based on the information in this management plan, it would seem to indicate that hunting incidents will increase during increased fall hunting for turkeys. My point here is that perhaps some hunters quit fall hunting for a reason other than satisfaction and therefore will not start fall hunting again if they are able to utilize all three turkey tags during the spring season. Also, why would you want to encourage more fall hunting if research and technical expertise have indicated that a reduction in or less fall harvest may mean more turkeys in the recruitment pool overall and a safer hunting experience? To increase any counties turkey population, I would think you would want to encourage the retention of hens to nest. Fall hunters are free to harvest either hen or gobbler due to most hunters not being able to detect the difference in the sexes of young poults. A combined effort of retaining hens in the recruitment pool, increase in habitat improvement, especially on public land, increased knowledge by both hunters and non-hunters of turkey needs and biology, would seem to be a good plan of management for the wild turkey in Virginia. I think the plan is a good step in that direction. As stated, it will have to be a fluid document that changes with conditions. Congratulations to all that worked on the process. It was a large commitment of time and energy by all.	Concerned that desire to increase fall hunting is inconsistent with desire to increase populations in counties?	Hunting Tradition	1, 2	Based on additional SAC discussion, the hunting tradition value / goal was modified so that CCC population objectives would not be compromised to attain hunting tradition objectives. Note: Declining hunter satisfactions may not be the only reason for decrease in fall hunting. Current objectives identify a need to determine any constraints to hunting participation.	13
		Added safety concern during the fall (especially due to rifles) with additional fall hunter numbers and opportunities.	Safety	1, 2	Current objectives in the plan address the need to inform hunters and others regarding turkey hunting seasons and associated safety concerns. Based on additional SAC discussions, the safety value was clarified to specifically include both spring and fall hunting safety. A new objective was added that addresses fall safety concerns.	14

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County of Residence	Comment (as written)	Value Summary of Comment	Area of Plan		Changes to Plan and/or Response	#
			Value / Goal Area	Objective #		
Augusta	"Comments on the Draft Wild Turkey Management Plan 1. Comment: This plan will be a great tool for planning the future management of the Wild Turkey in Virginia. The drafters did an amazing amount of work to bring all this information together into one document. The VA NWTF will be able to see where our habitat work is most needed. 2. Comment: Recommend changing the title "Virginia Wild Turkey Management Plan" to identify that it applies to Virginia. Page 37 Agricultural damage "When available, as much as 75% of a turkey's diet might include corn." 3. Comment: This should be changed "waste corn on the ground" or the sentence deleted in its entirety. It has not been shown, and is highly unlikely, that turkeys eat standing corn. Page 37 Agricultural damage "One study found that turkey losses to vineyards average about $35 per acre." 4. Comment: If the study below [Coates, R.W. et al. 2010. Evaluation of damage by vertebrate pests in California vineyards and control of wild turkeys by bioacoustics. Human–Wildlife Interactions 4(1):130–144] is the study referred, then I take issue with citing it. Their own abstract states that they "assumed that all observed damage was caused by vertebrate pests and that most of this damage was caused by birds." They had no basis for this assumption and thought for the purpose of their study that it did not matter since their study was just studying the effects of deterrents. 5. Comment: The study tested the deterent calls and determined the calls were effective on turkeys. The study "randomly selected 3 vineyards in each area for treatment with broadcast calls (wild turkey alarm, domestic turkey alarm, crow distress)". The study found "there was no difference in mean stripped damage between treated and untreated vineyards in 2008, indicating that broadcast calls had no effect." Since they deployed the deterrent in vineyards and there was no change in stripped damage, I would contend the study actually shows that turkeys were not doing the damage. 6. Comment: The study states, "Motion-activated video recordings showed a variety of animals present in the vineyards. Those specifically identified from video or during site visits included American robins, California quail (Callipepla californica), mule deer, European starlings, gray foxes (Urocyon cinereoargenteus), house fi nches, humans, pileated woodpeckers (Dryocopus pileatus), black-tailed jackrabbits (Lepus canifornicus), raccoons, and wild turkeys. Passerines, gray foxes, pileated woodpeckers, raccoons, and wild turkeys (Figure 5) were recorded eating grapes. Due to the limited number of cameras and frequent incidents of motion-triggering from blowing vines, we consider these results as anecdotal." Therefore, this data concerning turkeys should not be cited.7. Comment: Page 44. Since turkeys do not cause any significant damage or problems, the CCC should be closer to the BCC, not ½ of the BCC. The population level should be set at the population level that allows the largest harvestable surplus. 8. Comment: Page 45. The map should be deleted and a statement saying the population objective is the population with the maximum sustained yield as long as there is not significant demonstrable turkey damage or problems. 9. Comment: I understand you are getting comments that there should be more Fall turkey seasons. I	CCC should be closer to the BCC, not ½ of the BCC. Population level should be set at the largest harvestable surplus.	Turkey Populations	1	No goal, objective, or strategy change is necessary. Note: Population objectives are set to approximately provide the largest sustainable harvest; this occurs at about ½ of BCC and not at BCC. The map of population objectives reflects this on a county basis.	15
		Concerned that promotion of fall hunting will negatively impact populations.	Hunting Tradition	1	Based on additional SAC discussion, the hunting tradition value / goal was modified so that CCC population objectives would not be compromised to attain hunting tradition objectives.	16
		Technical comments not related to public values in plan.	Human-Wild Turkey Problems		The technical portion of the plan addressing agricultural damage was rewritten with additional literature referenced.	17

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	am not in favor of a longer or concurrent with early muzzleloader and rifle deer season, if it will negatively impact the turkey population. Maybe consider a gobbler only fall season.					
Alleghany	Overall I am very happy with the plan. The only part I feel needs to be changed would be the "allocation of fall harvest". The goal statement says that there will be a primary emphasis on hunters who specifcally pursue wild turkeys. While I feel that it is necessary that some opportunities are given to the deer hunter to harvest a turkey I do not feel that the precentage should be aimed at 50%. I believe that there is a big difference in "hunting" and "shooting" wild turkeys. Turkeys killed during a rifle or muzzleloading deer season are opportunistic in nature and 99% of the birds killed will be "shot" with high powered rifles and muzzleloaders. Many of these birds will be rendered unusable for table fare once they have been shot with these guns. I beleive that the hunter specifically pursuing wild turkeys should be given a much higher percentage of the overall kill and coulld be obtained by bringing the season in much earlier in October as is the case in many other states such as West Virginia. In my opinion, we are not preserving the fall turkey hunting tradition by allowing turkeys to be shot by deer hunters on a deer stand.	Agrees that deer hunters should have opportunities, but hunters specifically pursuing turkeys should be given >50%	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	18
Botetourt	"In response to the area of the draft plan that relates to the overall population of the Wild Turkey, I have the following comments. I have been Spring Gobbler hunting in Virginia every year since 1988. Most of the hunting that I do is on National Forest in Bath and Alleghany Counties. Prior to that I lived in WV where I hunted Spring Gobblers. I have also hunted Spring Gobblers in Nebraska, and Kansas. There are 2 areas that I have seen that can dramatically reduce the population of the Wild Turkey in this state. 1. Pre Season Poaching - The way the season normally falls in the western part of the state, gobblers usually have already gathered their hens by the time the season comes in making it more difficult to call and harvest a gobbler. As I have been out scouting during the preseason I have heard gun shots regularly. If it was possible to increase the level of monitoring and enforcement during the 2 weeks leading up to the season opening of youth day, it might help to catch and deter this illegal activity. 2. Even more frustrating to me than the issue of poaching is when the Forest Service performs a prescribed burn of the national forest during the nesting time for the wild turkey. This has been witnessed by me more times than I wish to count and destroys any confidence that I have in the ability of this state to manage the population of the Wild Turkey. 3. When it comes to habitat management, the state of VA should look to the western states for examples of potential improvements. In Kansas for example, vast areas of crops are planted for wildlife on their public hunting grounds. I do not know how they manage this, but as an out of state hunter it is very refreshing to go to a public hunting area and see food plots and wild game in abundance. it is a sure guarantee that I will return."	Desire increased enforcement to reduce poaching, especially before spring season.	Ethics and Compliance with Law	2	No goal, objective, or strategy change is necessary. Potential strategies include enforcing laws that govern turkey hunting activities.	19
		Concerned about agency management activities that impact turkey populations (for both good and bad)	Turkey Populations	2, 5	No goal or objective change is necessary. Habitat management is listed as potential strategies to achieve population objectives. While identification of limiting factors is an objective which would include undesirable management practices (such as burning at the wrong time of year), avoiding negative management practices was also added as a potential strategy.	20
Scott	Why is all meetings being held in the east and none int the west. We also hunt in the western countys. All hunters can not travel to go to these meetings. All public meeting should be held in all areas of the state so hunters does not have to travel 200 miles or miss work to go to these meetings. Scott county is one of the top ten counties in turkey kills each year. A meeting should have held in Scott. Thanks!	Comment unrelated to Plan content			No goal, objective, or strategy change is necessary. Public input meetings were held at 2 western Virginia sites (Wytheville, Verona).	21

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Bath	I certainly appreciate the effort and detail contained in this plan. I am pleased to see my Game Department put this much effort into turkeys, my favorite game animal. I will keep this brief with two comments. 1) lengthen the Fall season for the western mountains. Yes turkey populations are down and have been for a long time. The few hens that will be killed in the Fall by extending a season after the deer rifle season are not what will hold down population expansion. Look to aging habitat and high predator numbers for that. Deer populations are down as well so at least drop one week of early muzzleloader season so that there can be two weeks of decent Fall turkey hunting without conflict with a deer season. 2)Advocate for timber cutting in the National Forests for the benefit of all game and non-game species alike. I know the well funded, vocal groups who make emotional appeals against all types of cutting on public lands. I understand that politically it becomes difficult to oppose, but your agency understands the truth about management of these forests and need to be a voice of reason. Thanks you for this chance to comment. - Boiling Springs Rod and Gun Club	Desire more fall turkey hunting in western mountains without conflicts from deer hunters	Turkey-Related Recreation	1	No goal or objective change is necessary. Improving satisfactions by managing interference with other hunters is a potential strategy. Adjusting season length added to potential strategies.	22
		Enhance National Forest populations with increased timber harvest.	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	23
Pittsylvania	I have hunted in Virginia for 40 years and this policy strikes a balance between hunter and game animal. I support it 100%.	Approval of plan.			No changes necessary.	24
Washington	I would like to see the spring turkey season open at least a week earlier. Being an avid turkey hunter I feel that one week will not affect the breeding season. A few miles across the state line, TN has no isssues. Please take this into consideration. Thanks!	Desire to open spring turkey season earlier.	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction. Added rationale for spring season timing to the technical portion of the plan.	25
City of Radford	Hello, I would like to see initiated , the option to be allowed , to harvest all {3} turkeys in the Fall/Winter season. We enjoy this option currently for the Spring season. As previously stated by the DGIF, "We are looking for ways to increase Fall Turkey hunting interest". This option will allow hunters to spend more time afield in the Fall season, thus increasing hunter interest ; an objective of the Department. thanks	Increase fall hunter interest and time hunting with a 3-bird bag limit.	Hunting Tradition	2	No goal or objective change is necessary. Tag management added as a potential strategy to increase fall hunter participation.	26
Roanoke	I read with interest. I hunt in Carroll County and have noticed a decline in the numbers. I recognize that predation is the most probable reason in the area I hunt. I am encouraged that an objective is to study what the impact of predation has on the population. I would also encourage education and incentives in the hunting of mammalian predators. I have noticed very limited free information on hunting and the techniques of hunting predators such as coyote and bobcats. Thank you	Concerns about turkey population in Carroll County and the effects of predators.	Turkey Populations	1, 2	No goal, objective, or strategy change is necessary. An objective to increase the population in Carroll County has been established. Investigating population limiting factors (including predators) also is an existing objective.	27
City of Chesapeake	Special attention needs be taken with regards to spring gobbler season dates.. - There is in increase with insect related illness which increase with temperature. - Suggestion: EARLY Spring gobbler season east of I-95 March 15- April 15 o West if I-95 spring Gobbler season remains the same. - This would get hunters in the woods earlier before ticks and other insects become unbearable. It would hunters a longer and healthier hunting season in Virginia. - The temps in end of April and May have been getting warmer and warmer. - This earlier season would put less stress on hunters due to high temps and reduce exposure to Lyme disease.	Desire earlier spring season east of I-95 to reduce hunter exposure to high temperatures, insects, and Lyme disease.	Turkey-Related Recreation	1	No goal or objective change is necessary. Objective in the plan addresses investigating and updating the satisfactions and constraints of hunters. Hunter health and comfort added as a satisfaction attribute to consider.	28

Appendix D. Comments received during open public comment period (July 12 – August 9, 2013) and changes made to the Virginia Turkey Management Plan.

County of Residence	Comment (as written)	Value Summary of Comment	Area of Plan		Changes to Plan and/or Response	#
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WI	I've learned a lot from the Virginia turkey dog hunters and offer these comments: P. 29 Fall Turkey Hunting Demands. Regarding the declining harvest and the number of hunters: So often the primary turkey population growth is in urban areas. There aren't sufficient natural predators to adversely affect urban turkeys living in parks, they only have unnatural predators, like automobiles. Since we have less hunters every year, having less places to hunt, we might consider selling permits to interested (licensed) city hunters, allowing the use of snares, the basic old wooden handle - bent wire chicken foot catcher, or since they're not afraid of people, we might capture them with net guns. Or some new method yet to be devised, that would be safe in urban areas. I'm very surprised only 3% of fall turkey hunters use dogs. I can see from the number of hunters interested in dogs nationwide, Virginia is definitely the #1 state. I'm also surprised more people don't take up the sport, since there are more turkeys than grouse, you don't have to pay to hunt them (like game farm pheasants or quail), and we get free access to private lands, as the farmers are happy to see us in the fall. I always think, with enough promotion, turkey dogs are one aspect of hunting that could see a big increase in participants. Upland hunters should be eager to do it - the main reason they don't is, they never heard of it. Despite all my efforts on the internet and in the magazines, newspapers, radio and TV in Wisconsin (for the 5 years that I was trying to get it allowed), most hunters I meet still never heard of it. We advertise nationwide, but still so few know of it. I believe hunters only read what they're interested in; deer hunters read deer stories, fishermen read about fishing... We'd need to work fall turkey hunting with a dog into the stories about deer archery, to get them to read it. Deer archery is definitely the #1 hunting sport today. And the #1 competitor to someone investing the time and expense in training and hunting a turkey dog. While we don't have conflicts in the field (archers are out at dawn and dusk, turkey doggers can hunt 8AM to 3PM and never conflict with each other), I speculate there's not many archers who'll make the investment it takes for a bird dog, when they already have such an investment in archery equipment. The market we could address is the casual	Consider hunting and management opportunities in city limits to promote hunting.	Turkey Populations	5	No goal, objective, or strategy change is necessary. Site-specific management opportunities are already an objective.	29
		Attract new fall turkey hunters by promoting dog hunting.	Hunting Tradition	1	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and focusing on hunters of other species. Potential strategies to increase interest amended to promote diverse fall hunting opportunities (including dogs).	30

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	upland hunter, by teaching them about turkey hunting with a dog they already have. I'm familiar with the conflicts with the deer season, and running deer dogs, etc. but I'm not qualified to provide anything helpful. What I do think is, the interest in turkey dogs is slowly growing. It could and should be a growth industry nationwide. Maybe with more promotion from the Fish & Game Departments, it would get better press, more credibility, and grow faster. It's another opportunity for hunters most are not aware of. Turkey dog hunting doesn't take a big investment in a dog or equipment. The main investment is in time. It takes a commitment, to raise and train any good hunting dog. It's more like the small game hunting we knew as kids; take a stroll in the fall woods, then sit for a while (and call to the turkeys, instead of watch for squirrels). Fall turkey hunting with a dog is a good pastime for young and old. --- P. 49 SATISFACTION All I have to offer is that it takes a lot of promotion to do anything these days. Perhaps you might accomplish this together with P. 51 Declining Number of Hunters and P. 56 Ethical Principles (below). --- P. 51 DECLINING NUMBER OF HUNTERS Corresponding to the downward trend in hunting participation across the United States, the number of hunters in Virginia has also declined... --- P. 56 ETHICAL PRINCIPLES To describe ethical principles for turkey hunting by 1/1/2016. Engage a celebrity (who hunts) as a Radio, TV, Web and Print spokesman (such as a NASCAR driver, or professional ball player the kids especially look up to.) Perhaps you might find someone to do it as a public service. Hope this helps. American Wild Turkey Hunting Dog Association http://www.turkeydog.org/	Promote the ethical principles of hunting.	Ethics and Compliance with Law	2	No goal, objective, or strategy change is necessary. Potential strategies to ensure compliance with ethical standards include using a variety of techniques to educate the public.	31
Botetourt	I support adoption of the management plan as it is written as long as two strategies remain intact and are actually implemented: 1 - managing illegal mortality through tougher penalties and education of the hunting and non-hunting public about the consequences poaching has on being able to manage and have a sustainable population; and poaching's influence on support for hunting by the non-hunting public. 2 - Greater access to the resource during the fall hunting seasons. "	Manage poaching for population management and support from non-hunters	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	32
		Desire greater access to the resource in the fall hunting season (presumably for hunting satisfactions?)	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Access to hunting lands is an existing potential strategy to improve hunting satisfaction.	33
NC	As a non-resident, life-time license holder, I hope my comments are accepted. I enjoy both fall and spring turkey hunting in VA, and am more concerned with the population density goals of the management plan than some of the other goals relating to hunter involvement. In other words, I like to see the turkey's long-term well-being as the highest priority.	Ensure the turkey's well-being is the highest priority.	Turkey Populations	1	Based on additional SAC discussion, health was added as a turkey population value / goal	34

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	With that in mind, the goal of a 50:50 fall harvest during the muzzleloader and first two week's of the gun season for deer is something I would not like to see happen. Rather than increasing the number of hens killed incidentally by deer hunters, I'd prefer to see an effort to reduce that percentage of the harvest. Otherwise, the plan is very impressive, and bodes well for turkey hunters in the great state of Virginia. Thanks for listening!	Concerned about hens killed by deer hunters with a 50:50 harvest allocation. (for population impacts?)	Allocation of Fall Harvest	1	No goal, objective, or strategy change is necessary. Existing direction is that allocation of harvest should not impact population objectives.	35
Washington	I think spring gobbler should open at least one week earlier. Tennessee opens about two weeks earlier than we do and they seen to have as large of Turkey population as Virginia.	Unclear value associated with a desire for earlier spring opening (improved hunter satisfactions?)	Turkey-related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction. Added rationale for spring season timing to the technical portion of the plan.	36
Bedford	I have been a turkey hunter for 30 some years, both spring and fall. As a fall hunter that uses dogs I personally don't like the idea of the fall turkey season overlapping with any part of the deer season as I am very much opposed to the use of rifles in taking a turkey. To encourage more people to participate in the fall season I would suggest a "fall only" turkey tag seeing as many spring hunters refuse to use a tag during the fall. This would greatly enhance your objective of an "increased fall kill" that you are looking for. Thanks for taking the time to read my comments, - NWTF James River Chapter	Objects to fall (dog) hunting overlapping deer season because opposed to using rifles to harvest turkeys. [value unclear]				37
		Provide a fall-only tag to increase fall turkey participation and harvest.	Hunting Tradition	1	No goal or objective change is necessary. Tag management added as a potential strategy to increase fall hunter participation.	38
City of Chesapeake	"1) Increase turkey population by eliminating the fall season or have a separate fall season which is outside the muzzleloading and general deer firearms season with only (1) female bird to be harvested. This would reflect a more accurate account of the number of turkeys killed in a fall turkey hunting season only. 2) Bag limits should stay the same. 3) Shot size for fall turkey season should be the same as spring. 4) No rifles for killing turkeys fall and spring. 5) Require blaze orange use for fall and spring while moving around once you set up you can remove. 6) During spring season only gobblers with a 6 inch beard or longer can be harvested. 7) Spring turkey season should open (1) week earlier and close (1) week earlier on even or odd years. This would be used as a measure on the positive or negative effects on turkey populations by such a change. 8) Allow all day turkey hunting in the spring. This should take place on opposite years when the spring turkey season does not coincide with the spring season starting and ending (1) week earlier. This too would be used as a measure on the positive or negative effects on turkey populations. 9) Sunday hunting-are two words that will be the savior of the hunting sport here in Virginia or its slow demise. If all Virginia hunters don't stand up and demand from their legislators the repeal of this discriminatory blue law then you will see more and more hunters redirect their financial priorities toward saving there households. Over the last several years I have talked with people who have dropped out of hunt clubs that they had been associated with for years. Some explained to me that they were working six days a week now. They also mentioned that they could not afford to keep their dogs anymore or their full size gas guzzling trucks and sadly quit buying hunting licenses. These folks were die hard hunters. Sad!	Desire to increase turkey populations	Turkey Populations	1	No goal, objective, or strategy change is necessary. Population increase is an objective for Chesapeake. Managing bag limits, season structure, and fall harvests are included as potential strategies for population management	39
		Promote safety measures	Safety	1	No goal, objective, or strategy change is necessary. Shot size restrictions, weapon restrictions, and blaze orange are existing potential strategies to reduce hunting-related incidents.	40
		Improve spring hunting satisfactions	Turkey-Related Recreation	1, 2	No goal or objective change is necessary. Manipulating season dates and hunting hours are existing potential strategies to improve hunting satisfaction. Managing for quality turkeys (e.g., 6" beard restrictions) added as a potential strategy to improve satisfactions.	41
		Retain hunters	Hunting Tradition	1, 2	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and determining limiting factors. Additional potential strategies have been included.	42

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Alleghany	"The biggest change I have seen in the quality of turkey hunting is the encroachment of deer hunting on the time spent hunting other game. In the time period before all of the deer hunting a hunter could go into the woods without disturbing a deer hunter and hunt small game and turkeys in their own seasons. I used this time not only to harvest small game and pursue turkeys but also to scout for deer hunting opportunities. With so much added deer season as well as the removal of turkey hunting during the normal two week western deer season there is literally no time to specifically target turkeys until late December and early January when weather conditions can be very difficult. I hunt Virginia and West Virginia. Since 1984 I have hunted mainly two areas, public land in Virginia and Private in West Virginia. Both areas have good turkey populations, other than an occasional down or up season turkey populations are stable in these two areas. The common denominators in both areas are less hunting pressure, coyotes and food supply. In the W VA area the mast crop over the period from 1984 to now has been very spotty. In the VA area it has been less sporadic but still not great. In times of spotty mast crops the turkeys in both areas are tougher to pinpoint, in the VA area if there is good mast production I can typically make contact by making about a one mile loop. If the turkeys are on that side of the mountain I will find them. The W VA area is much tougher if there is good mast due to topography. In my experience turkey hunting I found the fall seasons to be much better the way they were in the late 70's to early 80's. Talking to people I know that hunt spring turkeys heavily and what I've observed in the woods the last couple of years the spring season should maybe be brought in a week or two earlier because turkey activity has been much higher the last couple of years from early to mid march thru mid April. In the fall hunters need time to hunt exclusively small game and turkeys without interfering with deer hunting of some type. "	Desire for targeted turkey hunting opportunities without overlapping deer season at times during favorable weather.	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Improving satisfactions by managing interference with other hunters and season timing are potential strategies.	43
		Desire to open the spring season earlier to increase hunter satisfaction with high turkey activity	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction. Added rationale for spring season timing to the technical portion of the plan.	44
Amherst	I would say that those that worked on the draft did an excellent job. I am 71 years old and have hunted turkeys for many many years and I learned a lot from reading the draft. I had hoped that more emphasis would have been put on the management of our National Forest and how the hunters can get involved to see that better management practices are followed. At one time , I hunted a lot in our National Forest but now I dont because the game is no longer there like it once was. Our game has moved out due to the lack of suitable habitat. The game is now on private land and lots of time in an urban area which causes problems for the hunters and property owners. The time is fast approaching when this private land will be developed into sub-division, shopping malls, and etc. which will drive the turkeys and deer out. Now is the time to start better management of "our" National Forest before it is too late. In my opinion, more "clear cutting" needs to be done. When there was clear cutting being done in the Snowden area of the G W National Forest, we had lots of deer , turkey and some grouse in that area. Today you would be hard pressed to find any in that area. The clear cutting results in excellent feed patches for the game but hey, you all already know this, lets do whatever is necessary to get the appropriate action on this.	Concerned about low populations on National Forest lands due to poor habitats from lack of timber management.	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	45
Roanoke	We need more opportunities in the fall for turkey hunting; more liberal seasons and an extra fall specific tag. There is no sound basis for eliminating rifle hunting for turkeys. This can be done safely. Any plans for public lands should include clear cutting/logging to allow for successional growth which will benefit game and non-game species.	Desire more opportunities to fall turkey hunt.	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates and tag management are existing potential strategies to improve hunting satisfaction.	46
		Feels rifles can be used safely for turkey hunting.	Safety	1	No goal, objective, or strategy change is necessary. Existing potential strategies to reduce hunting-related incidents require proven methods.	47

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	Thank You	Desire to benefit population on public lands via early successional habitat management.	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	48
City of Virginia Beach	Shorten the spring season by a week if you have to, BUT OPEN THE SPRING SEASON UP FOR THE WHOLE DAMNED DAY FROM THE FIRST DAY TO THE END. There is no reason, whatsoever, to not have it full day. You are wasting time afield, especially on Saturdays. No one is busting hens off of nests, no one is killing hens accidentally like you are saying to the numbers you are saying, and if it is such a problem, why the heck do you have the late winter season on turkeys???? Ridiculous. Open it up.	Desire to hunt all-day during entire spring turkey season to improve hunter satisfaction.	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating hunting hours is an existing potential strategy to improve hunting satisfaction. Added rationale for spring season half-day hunting to the technical portion of the plan.	49
City of Chesapeake	I would just like to say over the past few years in Chesapeake, I have watched the turkey population explode! I have many images of multiple hens, with 4+ chicks. Today, the 6th of August I glassed 4 birds, three chicks each graze through my pasture. Along with that, are the gobblers, there is a very good population of gobblers in the rural part of the city (Hickory area).	Good population in Chesapeake.	Turkey Populations	1	No goal, objective, or strategy change is necessary.	50
Chesterfield	I do not agree that you need to try and increase fall hunting for turkey hunting. The decrease is for a reason, and the real turkey hunters who only hunt in the spring for gobblers remaining constant bears that to be true. There is also too much chance of killing a hen in the fall. I propose the reason for the increase in populations is due to less fall hunters killing hens Let them go and have babies- highly recommend ONLY spring gobbler season and close fall season except Thanksgiving day.	Disagrees that fall hunting participation should increase (assuming will have a negative population impact).	Hunting Tradition	1	Based on additional SAC discussion, the hunting tradition value / goal was modified so that CCC population objectives would not be compromised to attain hunting tradition objectives.	51
		Wants continued high populations	Turkey Populations	1	No goal, objective, or strategy change is necessary. All counties have an increase or stabilize population objective.	52
City of Bristol	Good research, but it does not directly address several issues which impact turkey hunting. While there are several "seasons", the broken open-closed periods prevent a hunter from a primary focus on turkeys in the fall. The Sunday hunting problem is also significant and I did not see any analysis of this in the report. There are several issues about the spring season. In southwest Virginia the mid April opener seems too late to catch the prime gobbling time. Tennessee, for example opens around April 1st. The noon cutoff for the early season was not addressed or supported by the research. Why restrict hunting opportunities and ultimately narrow the hunting base? Finally, rifle hunting in the spring scares the hell out of me with foliage and lack of blaze orange. My friends and I would appreciate your taking these comments into account. Thanks again for your work.	Multiple seasons prevent fall hunters from focusing on turkeys.	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	53
		Identified "Sunday hunting problem", but value/concern unclear?				54
		Spring season opens too late in southwest Virginia	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction. Added rationale for spring season timing to the technical portion of the plan.	55
		Disapproves of half-day hunting during spring turkey season	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating hunting hours is an existing potential strategy to improve hunting satisfaction. Added rationale for spring season half-day hunting to the technical portion of the plan.	56
		Concerned about rifle use during spring	Safety	1	No goal, objective, or strategy change is necessary. Weapon restrictions are existing potential strategies to reduce hunting-related incidents.	57
Essex	I think we should get 4 turkey tags with one being fall only. thanks	Wants an additional fall tag	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Tag management is an existing potential strategy to improve hunting satisfaction.	58

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Roanoke	I would like to see the plan place more emphasis on habitat improvement as a means to build the turkey population. This especially should be directed toward the national forests where early succession habitat is needed for turkeys, as well as deer, bear, grouse, woodcock and songbird species. Hunting interests have stood back and let the environmentalists eat our lunch on this issue, even when we have had science on our side. The need for new growth habitat should get more attention in the plan with some specifics on how this can be accomplished. Also, I would like to see poaching addressed in stronger terms. The fact that poachers take more hen turkeys than do legal hunters is both amazing and unacceptable. In 1995, when new turkey regulations were established, word was that poaching would be dealt with, yet the illegal kill figures remain high. I would recommend that the plan call for law enforcement and sportsmen groups to come together to deal with this issue.	Desire for increased emphasis on habitat improvement (especially on National Forests) to enhance turkey populations	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	59
		Need to address poaching in stronger terms.	Ethics and Compliance with Law	2	No goal or objective change is necessary. Potential strategies include enforcing laws and other strategies. Additional potential strategy for cooperative Agency and sportsmen initiatives has been included.	60
Shenandoah	Take out rifles and make it shotgun ONLY OR ARCHERY. SAVE SOMEONE'S LIFE!! Have all turkeys checked in at a game check station asap!	Desire to eliminate rifles.	Safety	1	No goal, objective, or strategy change is necessary. Weapon restrictions are existing potential strategies to reduce hunting-related incidents.	61
City of Virginia Beach	We need to be able to hunt full day during the spring season from day 1. There is no viable argument to keep this in place. If you're worried about hen mortality, then get rid of the stupid late winter season in January where you're shooting hens right before they getting ready to mate and nest...that's just dumb.	Desire to hunt all-day during entire spring turkey season.	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating hunting hours is an existing potential strategy to improve hunting satisfaction. Added rationale for spring season half-day hunting to the technical portion of the plan.	62
Public Meeting Comments (flip chart notes)						
	Use of rifles - turkey hunting is not a rifle sport…Amen!	Turkey hunting not for rifles	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	63
	Not ethical to ruin meat with a rifle	Wanton waste using rifles	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	64
	Fall hunters reluctant to burn tag…want to save tags for spring	Hunters saving fall tags for spring gobbler season	Hunting Tradition	2	No goal or objective change is necessary. Tag management added as a potential strategy to increase fall hunter participation.	65
	Have separate fall tag	Desire for separate fall tag	Hunting Tradition	2	No goal or objective change is necessary. Tag management added as a potential strategy to increase fall hunter participation.	66
	Give fall turkey hunters same number of tags as spring hunters ((x3))	Desire to have the same bag limit during spring and fall turkey seasons	Turkey-Related Recreation	2	No change necessary. Modifying bag limits and tag management are current potential strategies to improving hunter satisfaction.	67
	Fall hunting declined when option to save tag occurred	Hunters saving fall tags for spring gobbler season	Hunting Tradition	2	No goal or objective change is necessary. Tag management added as a potential strategy to increase fall hunter participation.	68
	Fall turkey hunting hasn't been treated as a priority (2nd to deer)	Concern that fall hunting is less important than deer hunting.	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	69
	Fall hunting could be expanded - but with shot restrictions (same as spring)	Concern about fall impact from deer hunters?	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	70

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	Hunting needs to maintain respect for the "King of Game Birds" - So It shouldn't be as easy as squirrel hunting - consider technology (e.g., enclosed blinds, feathered decoys, rifles 'right' to use)	Concern about technology making turkey hunting too easy	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	71
	Why Thanksgiving Day? If you want the bird for Thanksgiving you want to kill it earlier	Thanksgiving Day too late for T'giving dinner	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction.	72
	Agree with primary emphasis on "turkey hunters"	Fall emphasis should be on 'turkey hunters'	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	73
	Don't alienate deer and turkey hunters	Concern that exclusive fall opportunity alienates hunter groups	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	74
	Looking for fall opportunities that doesn't affect deer hunting	Desire fall turkey hunting without deer hunter competition	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Managing interference with other hunters is a potential strategy for improving satisfactions.	75
	Fall dog hunters - concern during deer season	Fall turkey dog hunting concerns with concurrent deer seasons	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Managing interference with other hunters is a potential strategy for improving satisfactions.	76
	Separate fall tag (only fall) to encourage fall hunting	Desire for fall-only turkey tag for added fall hunters	Hunting Tradition	2	No goal or objective change is necessary. Tag management added as a potential strategy to increase fall hunter participation.	77
	Tag management to achieve harvests?	Use tags to achieve population objectives	Turkey Populations	1	No goal, objective, or strategy change is necessary. Managing tags and bag limits is a potential strategy to achieving population objectives.	78
	Under harvesting in the fall?	Concern that turkey population is underutilized (not enough fall harvest)	Turkey-Related Recreation	1, 2	No goal, objective, or strategy change is necessary. Managing success is a potential strategy for improving satisfactions.	79
	Seasons for turkey hunters - Jan.	Desire for fall turkey hunting without conflicts from other hunters (deer, bear) - January.	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Managing interference with other hunters is a potential strategy for improving satisfactions.	80
	Create openings and food plots on state parks and national forest to improve habitat & increase turkey populations	Need for habitat mgt (especially on National Forest) to increase turkey populations.	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	81
	Encourage cooperation with NWTF and DGIF for habitat work (superfund money available)	Do habitat work.via cooperation with NWTF	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives.	82
	Lease land from farmers to provide hunter access and require that 1/3 of the crop grown must stay standing to provide wildlife food	Land leases to improve habitat for population mgt	Turkey Populations	1, 2	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives.	83
	Change Botetourt Couty from 'stable +' to 'increase' population objective - coyotes and bears may be a limiting factor	Change Botetourt population objective to 'increase' from	Turkey Populations	1	Proposed CCC population objectives remained unchanged after additional SAC discussions.	84

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		'stabilize'				
	Change Bedford County from 'stable +' to 'increase' population objective	Change Bedford population objective to 'increase' from 'stabilize'	Turkey Populations	1	Proposed CCC population objectives remained unchanged after additional SAC discussions.	85
	What are the effects of farming practices (e.g., hay cutting) on hen survival and recruitment?	Determine impact of farming practices on hen survival and recruitment.	Turkey Populations	2	No goal or objective change is necessary. While identification of limiting factors is an objective which would include undesirable management practices (such as negative farming impacts), avoiding negative management practices was also added as a potential strategy.	86
	Consider trap and transfer and habitat management on public lands with poor habitat suitabilities (e.g., surrounding Roanoke Valley)…this would increase the turkey population on public land, which in turn would solve the number of low fall turkey hunters	Improve populations on public land (esp around Roanoke) – via trap and transfer	Turkey Populations	1,2	No goal or objective change is necessary. While identification of limiting factors is an objective, supplementing populations was also added as a potential strategy.	87
	Emphasize the existing safety of sport first (before scaring people)	Emphasize how safe it is to help encourage new hunters.	Hunting Tradition	2	No change necessary. Potential strategies in the plan include informing hunters and the public about safety considerations.	88
	Concerns about safety relate more to dogs used in turkey hunting than for hunters	Concern for turkey dog safety with overlapping deer seasons.	Safety	2	Based on additional SAC discussions, hunting dog safety was included among the safety values.	89
	concern about call-in reporting enhancing unreported harvest	Concern that hunters are not calling in to check in their harvest.	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	90
	loss of biological/populations data with loss of mandatory checking	Not a value issue –a technical staff concern				91
	Need more opportunities for: hands on experiences, education, mentorship, going beyond the basics	Strategy suggestions to recruit new hunters	Hunting Tradition	1, 2	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and determining limiting factors. Additional potential strategies have been included.	92
	youth days - need more than 1 day to offer true opportunity	Need more youth days	Hunting Tradition	1, 2	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and determining limiting factors. Additional potential strategies have been included.	93
	Sunday hunting	Desire to hunt on Sunday	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Manipulating season dates and structure is an existing potential strategy to improve hunting satisfaction.	94
	Need to reduce amount of opportunistic kill (x3)	Wants opportunistic kill reduced	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	95
	No rifles - safety concern (dogs & hunters)	Rifles are a safety issue for both dogs and hunters	Safety	1	No goal, objective, or strategy change is necessary. Weapon restrictions are existing potential strategies to reduce hunting-related incidents. Based on additional SAC discussions, hunting dog safety was included among the safety values.	96
	Afraid to take dog during muzzleloader season (x3)	Concerned about turkey dog safety	Safety	1	Based on additional SAC discussions, hunting dog safety was included among the safety values.	97

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		during muzzleloader season				
	Others like to carry combination weapon (shotgun/rifle)	Provide opportunities to hunt turkeys during deer seasons	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	98
	Interested in expanding late season hunting (x2)	Desire for additional opportunities for late fall turkey season.	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction.	99
	Desire to reduce harvest during deer season (including muzzleloader season) (not 50%) - maybe 25%, <50%	Desire to reduce turkey harvest during deer to <50%	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	100
	Maintaining some overlap in seasons helps promote hunter recruitment - if we are worried about the number of hunters	Continue to provide overlap with deer and turkey season to promote recruitment and retention of hunters	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	101
	road hunting	Concerns regarding road hunting (with rifles?)	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with laws.	102
	shorten spring season	Desire to shorten spring gobbler season.	Turkey-Related Recreation	2	No change necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction.	103
	open spring season earlier	Desire to open spring gobbler season earlier.	Turkey-Related Recreation	2	No change necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction.	104
	Want to ensure adequate hunting opportunities for turkey hunters outside of deer seasons	Provide turkey hunting opportunities separate from deer season	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Managing interference with other hunters is a potential strategy for improving satisfactions.	105
	Manage turkey population for maximum spring harvest - no fall harvest	Wants population objective to maximize spring harvest – no fall harvest.	Turkey Populations	1	Proposed CCC population objectives remained unchanged after additional SAC discussions.	106
	timber harvest needed on NF lands to create habitat diveristy (x3)	Desire for timber harvest on national forest	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	107
	Concerns of fracking on habitat?	Concerned regarding the effects of fracking on turkey habitat	Turkey Populations	2	No goal or objective change is necessary. While identification of limiting factors is an objective which would include undesirable management practices (such as fracking impacts), avoiding negative management practices was also added as a potential strategy.	108
	Manage population total harvest on left side of peak to prevent population reduction during harsh winters/poor spring recruitment	Manage population at less than maximum sustained harvest where populations might be less variable	Turkey Populations	1	Proposed CCC population objectives remained unchanged after additional SAC discussions.	109

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	Manage population to provide maximum fall harvest	Manage population to provide maximum fall harvest	Turkey Populations	1	Proposed CCC population objectives remained unchanged after additional SAC discussions.	110
	All counties should have 'increase' population objectives except for those at BCC	Desire for all counties to have an 'increase' population objective, unless already at BCC	Turkey Populations	1	Proposed CCC population objectives remained unchanged after additional SAC discussions.	111
	Provide 2 weeks prior to muzzleloader season for shotgun turkey hunters (especially those using dogs)…particularly in Augusta Co.	Provide 2 weeks of fall turkey hunting prior to muzzleloader season	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction.	112
	earlier spring season opening for east - earlier gobbling/nesting? earlier springs?	Desire for earlier spring gobbler season EBR due to earlier green-up	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Manipulating season dates is an existing potential strategy to improve hunting satisfaction.	113
	want to harvest some hens	Desire to harvest hens	Turkey-Related Recreation	2	No change necessary. Manipulating season structures and tag management is an existing potential strategy to improve hunting satisfaction.	114
	65/35 allocation is ok	Change allocation from 50:50 allocation to 65:35 for more harvest for 'turkey hunters'	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	115
	is use of buckshot for turkeys safe? (why different shot regulations for spring vs. fall?	Concerns about buckshot safety	Safety	1	No change necessary. Modifying weapon restrictions is an existing potential strategy to reducing hunting-related incidents.	116
	more wounding with buckshot?	Concerns regarding wounding turkeys when using buckshot	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	117
	also concerned about rifles - safety issue	Safety concerns with rifle use.	Safety	1	No goal, objective, or strategy change is necessary. Weapon restrictions are existing potential strategies to reduce hunting-related incidents.	118
	increase fines for shooting accidents	Increase penalty for shooting accidents.	Safety	1	No goal or objective change is necessary. While implementing laws to promote safety is a potential strategy, increasing penalties was added as a potential strategy.	119
	don't hunt over somebody else	It is unethical to hunt when other hunters are known to be.	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	120
	taking "youths" is not really hunting - some kids are too young to hunt, thus parents are doing the hunting	Concerns that some people take advantage of youth day to hunt for themselves.	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with laws.	121
	illegal kills	Concerned about the effects of illegal kills	Turkey Populations	1	No change necessary. Managing illegal mortalities is a potential strategy to achieve population objectives.	122
	wounding (buckshot)	Concerned about the legal use of buckshot for turkeys and wounding	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	123
	poor economy - people can't afford hunt clubs	Concerned hunters cannot afford places to hunt.	Hunting Tradition	1, 2	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and determining	124

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					limiting factors. Additional potential strategies have been included.	
	tag management - provide a fall only tag	Provide a fall-only turkey tag to encourage participation	Hunting Tradition	2	No goal or objective change is necessary. Tag management added as a potential strategy to increase fall hunter participation.	125
	youth hunting opportunity the entire gun season (deer gun season???)	To encourage youth, let them hunt turkeys all deer season.	Hunting Tradition	1, 2	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and determining limiting factors. Additional potential strategies have been included.	126
	Limited places to hunt…hunt clubs are expensive	Concerned hunters cannot afford places to hunt.	Hunting Tradition	1, 2	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and determining limiting factors. Additional potential strategies have been included.	127
	economy - people can't afford hunt clubs	Concerned hunters cannot afford places to hunt.	Hunting Tradition	1, 2	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include promoting fall hunting and determining limiting factors. Additional potential strategies have been included.	128
	concern about shortening seasons to reduce fall hunting impacts	Concern reducing fall hunting opportunities to achieve population objectives	Turkey-Related Recreation	1	Based on additional SAC discussion, the turkey-related recreation value / goal was modified so that CCC population objectives would not be compromised to attain hunting tradition objectives.	129
	is it realistic to try for 50% harvest by turkey hunters?	Concerned about the ability of 'turkey hunters' to harvest 50% of the fall kill.	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	130
	all hunters are entitled to take turkeys	Desire to provide all hunters an opportunity to harvest a turkey.	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	131
	proposed allocation is ok, as long as 'turkey season' doesn't get cut back	Approval of 50:50 harvest, as long as hunting opportunities during 'turkey season' are not reduced to achieve the 50:50	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	132
	better habitat on public land will help populations of turkeys & provide places to hunt	Desire to provide better habitat on public land to promote turkey populations and provide places to hunt.	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	133
	need to utilize partnerships and education to achieve habitat requirements	Desire to utilize partnerships and education to achieve habitat needs and (assumed) increase turkey populations.	Turkey Populations	1	No goal, objective, or strategy change is necessary. Utilizing partnerships to for habitat management is a potential strategy to achieve population objectives.	134

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	use hunter education to promote habitat needs - cutting timber is okay	Utilize hunter education to help promote timber harvest is necessary to provide habitat for turkeys	Turkey Populations	1	No goal, objective, or strategy change is necessary. Education to promote wild turkey habitat management is a potential strategy to achieve population objectives.	135
	promote a variety of uses (e.g., hunting, wildlife viewing), as this will create new partnerships for habitat work	Promote multiple uses of habitat to create partnerships for mgt	Turkey Populations	1	No goal, objective, or strategy change is necessary. Utilizing partnerships to for habitat management is a potential strategy to achieve population objectives.	136
	manage openings for wildlife on WMAs and national forest lands more intensively	Desire to intensively manage openings on WMAs and national forest lands	Turkey Populations	1	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	137
Other Comments (comment cards, e-mails, and letters)						
	Safety issue in fall turkey hunting (or spring for that matter). In particular, rifle hunting. If you miss the target, where does the bullet go. Everyone knows that rifle bullets travel farther than shotgun pellets. Where does the bullet go?	Concerned about safety when rifles are used in spring or fall.	Safety	1	No goal, objective, or strategy change is necessary. Weapon restrictions are existing potential strategies to reduce hunting-related incidents.	138
	"~ Fall turkey hunting does not mix with deer and bear. The styles/methods are not complimentary ~Dogs come to gobblers, doesn't it stand to reason coyotes do as well? ~Feds need to harvest more timber to diversity for all…deer, bear, & turkey. ~Spring season should start earlier. ~Hunter education has already reduced overall instructor to student time. Turkey ID used to be part of the instruction! ~Hunter education is not allowed in schools in many locations. The correlation between that and the number of young hunter should/MUST be obvious...right? Fix at state level! ~Big goal overall - more safe hunters for turkey, deer, and bear."	Fall turkey hunting doesn't mix with deer and bear hunting.	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Managing interference with other hunters is a potential strategy for improving satisfactions.	139
		Concern regarding the effects of predators (on turkey populations?)	Turkey Populations	2	No goal, objective, or strategy change is necessary. Investigating population limiting factors (including predators) also is an existing objective.	140
		Desire to increase timber harvest on national forest land (for turkey populations?)	Turkey Populations	2	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	141
		More turkey ID needs to be taught in hunter education. (for target ID?)	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need for hunter education to ensure compliance with ethical and legal standards.	142
		Desire to start spring season earlier.	Turkey-Related Recreation	2	No goal, objective, or strategy change is necessary. Season timing is an existing potential strategy to improve hunting satisfaction.	143
		To increase young hunters need hunter education in schools	Hunting Tradition	1	No goal or objective strategy change is necessary. Programs focusing on recruiting and retaining young new hunters are a potential strategy to achieving more turkey hunters. Additional potential strategies have been included.	144
		Need more focus on safe turkey hunters	Safety	1	No goal, objective, or strategy change is necessary. Reducing turkey hunting-related incidents by 25% is an objective.	145
	For sure you have done a lot of work for this management plan. Last night was really great, only wish more real turkey hunters had been present. Many of the objectives now proposed I have fought for, for years- with Gary. Maybe this time. Thanks	Commending work on the plan.			No changes necessary.	146

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	In reading the previous summary I noticed that there were negative comments about hunting turkeys with rifles. While I do not use rifles for turkeys, I think it would be a big mistake to try to change the law to eliminate rifle use. First, there are very few turkey hunting accidents involving rifles, so safety is not really an issue. Second, for some people hunting is all about getting close enough to game for a well-placed rifle shot. To them, shotguns are for people who cannot hit anything with a rifle. It is certainly challenging to call a turkey into range for a .22 Hornet or .222, so what we are really talking about is a matter of preference, not ethics. To outlaw rifle use would alienate a substantial minority of turkey hunters and further split the hunting community. With diminishing hunter numbers, those who are left definitely need to stick together to protect hunting. Some people have said that turkeys are illegally shot from the road by those using rifles. Since it is already illegal to shoot from the road, adding another law for poachers to violate would not make any difference. It is true that a poor hit with a deer rifle will ruin most of the meat on a turkey. Still, a hunter who restricts shots to the head or neck will not damage the meat. If absolutely necessary, we could prohibit the shooting of turkeys with any rifle which is legal for deer and bear. However, I still think the best option is to leave this issue alone.	To keep from losing more hunters and split the hunting community, should not eliminate rifles	Hunting Tradition	1	No goal or objective change is necessary. Potential strategies to increase turkey hunting participation include determining limiting factors.	147
		Rifle use does not necessarily equal unethical or illegal practices	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	148
		Rifles are not a safety issue with few hunting accidents	Safety	1	No goal, objective, or strategy change is necessary. Weapon restrictions are existing potential strategies to reduce hunting-related incidents.	149
	I've read the attached documents for the Turkey Management Plan on the DGIF site, lot of great work there, thanks for you and your teams hard work so far. Only thing I saw was that the Executive Summary was a bit long (18 pages). Normally an Exec Sum is one to three pages, summarizing the project, not so much the exact question asked of the groups, so it was long read. Maybe take out the data and questions and add them to the development and data plan background/research portion of the plan itself. But a lot of great questions and I think the correct questions were asked of the Focus Groups	Complimented plan with technical comments about the Executive Summary length.			No changes necessary.	150
	I read the management plan comments and statements thus far and was intrigued by some of the information. I have been very skeptical all along about turkey damage to crops but if photographic evidence supports these claims, then I suppose we must accept these claims as real and honest. I would still like to have VDGIF personnel verify such damage (CPOs or biologists make a visit to the affected site) prior to the issuance of a kill permit if that permit ever became a reality. I know there is much exaggeration in the kill permits for deer and now bear and some folks are using these tools merely as a means to extend their hunting seasons and bag limits. As much of a waste as I think it would be, perhaps if any kill permits were issued, all turkeys shot with a permit would have to be examined by the VDGIF and then destroyed, no saving a beard, spurs, or using the meat. This is a complete waste of the bird but maybe it would discourage someone from merely using the permit to kill more turkeys because they want to do so. I believe this may be already the case with at least bear killed under the permit system. No trophies for indiscriminate hunters at least! I was almost amused by the wild turkey attack scenario, however, I do know of a couple of such instances that have actually occurred and so I do believe it was possible. I have had close encounters with live bear, deer, rattlesnakes, copperheads and a host of other wild critters while working as a Park Ranger in the National Park and as a hunter and almost find it amusing that someone felt severely threatened by a gobbler. Having said that, I have a couple of scars on my hands from stupidly picking up gobblers not quite dead yet or at least not through with their flopping death throes and then getting the worst end of a sharp spur. I also know of turkeys attacking their reflections from shiny automobiles, (watched it happen at the Blue Ridge Parkway Headquarters in Asheville NC) and actually confronting and chasing people. All of these cases occurred in places where the turkeys were not hunted and really didn't seem to show any fear of humans. Hmm, sort of reminds me of cougar attacks and bear attacks in some of the western states where those types of hunting became illegal! I visited several state parks in California year before last along the Pacific Coast and in almost every one of them were warning signs about cougar attacks, especially on children and pets. Those attacks don't seem to be a problem in areas that still allow cougar hunting. There was one very intriguing comment about revenue generated by hunting on some farms on a pay	Concerns that damage responses are for real turkey damage with suggested strategies for landowners (e.g., kill permits, land leasing)	Human-Wild Turkey Problems	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies establish the need to assess the impacts of turkeys on agricultural operations and to develop cost-effective policies/guidelines to manage complaints.	151

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	as you go basis similar to some areas in Texas. I would like to know more about that and what the possibilities would be. If a farm experienced damage from turkeys(or deer or bear for that matter) then a pay as you go hunting plan could be set up that would allow the landowner to control the number of hunters(don't need unlimited access for safety reasons) and the proceeds could go to reimburse relevant and certified crop damage for that landowner. VDGIF should also be a beneficiary of these funds for enforcement and management activities. It's just a thought and maybe far fetched but I believe South Dakota has implemented a similar program and I know several western states are paying landowners for hunter access rights. This has opened up a whole new amount of hunting lands in areas where huntable land was becoming hard to find. With our extremely fractured landscape in the East, this may never become a large scale thing but could help alleviate some of these damage complaints at least. I also think that every landowner who requests and receives a kill permit should have to allow some form of hunting for that specie on his/her land. It could be controlled hunting for friends and family members or pay as you go or hunting with permission but some form of hunting should be allowed. These animals are there for a reason and typically it's because of vast habitat improvement, either food or shelter. These critters will probably not be huntable on other properties because the improved habitat is where they want to be. Hunting there will help disperse them and help alleviate the damage done. This brings up the next point of improved habitat on public lands, especially National Forests. I've recently looked at several Commonwealth public areas such as state forests and wildlife management areas and must say that I was fairly impressed with the habitat improvement going on. The North American Hunter magazine actually listed Virginia as one of the more progressive states for habitat improvement on their state public lands. It's the National Forests that are suffering now due to "tree hugger" influence in the last couple of decades. Some of that movement has subsided now and perhaps this is a good time for agencies to try to educate the public and restart some habitat management, including timber sales. It would certainly behoove these agencies to educate the public about what habitat management can do for game. I have spoken to several people(two at the last AHED training the other week) who hunt or used to hunt in the National Forest up around Harrisonburg. Deer are almost non-existent there now. VDGIF has verified that deer numbers are down in these areas. I still believe it is habitat and nothing more. The same habitat improvement that benefit deer will benefit the turkey population. More turkeys and more turkeys nesting will cancel out increased pressure by predators like coyotes. I think we just need better habitat.	Desire to improve habitat on National Forest lands to improve turkey populations	Turkey Populations	1, 2	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Additional public land information was added to the technical portion of the plan.	152
	Good afternoon, Mr. Norman. I have recently obtained a copy of the 2013 Wild Turkey Management Plan, which I am currently reading, and which is extremely interesting even though I am not a turkey hunter, but hunt upland game with my dog. I congratulate you and your department on what you are doing and greatly appreciate your efforts to increase the turkey population and its habitat. This is especially true for me, because your efforts mean that you are very aware of the need to actively manage the forest that not only helps turkeys thrive, but also helps with increasing habitat for other upland game birds. So my comments are only to thank you and your staff. Please keep up the good work.	Encouraging the agency to actively manage forests to promote habitat for turkeys and other upland game birds	Turkey Populations	1, 2	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives.	153
Giles	are we trying to fix something not broken? appalled at the noise being made about expansion of fall hunting perhaps simultaneous with deer rifle season? disturbing that [someone] thinks this is a way to bring in new hunters	Seems to be concerned about expanding fall hunting if it means being simultaneous with deer hunting. - nothing is broken	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	154
	poppy cock - toughest hunting there is - small game hooks a new hunter best	There are plenty of turkeys. Why do we	Turkey Populations	1	No goal, objective, or strategy change may be necessary. Population stabilization is an objective	155

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			Value / Goal Area	Objective #		
	let's face it, hunting is a very tough sell this age of instant gratification - a hunt from sunrise until twilight and miles of walking and climbing without seeing game for several days is not for the novice is there going be a time of gathering public input? plenty of turkeys - very subjective terminology - how many is plenty of turkeys- why do we need a plan to kill more - conserve and respect enough rant for now!!	need to kill more?			for Giles. Proposed CCC population objectives remained unchanged after additional SAC discussions.	
Louisa	I AM A MEMBER OF THE SHENANDOAH VALLEY CHAPTER, ROCKY MOUNTAIN ELK FOUNDATION (RMEF) AND ALSO SERVE ON, AND SPEAK FOR, THE RMEF VIRGINIA STATE LEADERSHIP TEAM IN SUPPORT OF DGIF'S DRAFT VIRGINIA WLD TURKEY MANAGEMENT PLAN. RMEF EXISTS TO ENSURE TNE FUTURE OF ELK, OTHER WILDLIFE, THEIR HABITAT AND OUR HUNTING HERITAGE. ALL OUR VIRGINIA CHAPTERS WORK TO SUPPORT RMEF'S PARTNERSHIP WITH DGIF TO RE-INTRODUCE ELK IN BUCHANAN COUNTY, VIRGINIA. OUR STATE LEADERSHIP TEAM IS NOW DEVELOPING A ROLE TO FOCUS ON HABITAT - PARTICULARILY TO ASSIST OUR VIRGINIA CHAPTERS IN LEARNING ABOUT AND TAKING ACTION ON PUBLIC FOREST MANAGEMENT PLANS AND PROJECTS. I AM HAPI'Y TO HELP INSTITUTE THAT ROLE TONIGHT. PLEASE ACCEPT THIS COMMENT TONIGHT ON VIRGINIA'S DRAFT WILD TURKEY MANAGEMENT PLAN TO HIGHLIGHT FIVE (5) FEATURES OF THE DRAFT PLAN WHICH CLEARLY DEMONSTRATE THAT THE SCIENCE OF GAME MANAGEMENT HAS FAR EXCEEDED SIMPLE LICENSURE, SEASON AND BAG LIMIT REQUIREIMENTS. AND, IN SHORT, <u>WELL DONE</u>! <u>(1) HABITAT REQUIREMENTS</u> FOR WILD TURKEY (THOSE SAME REQUIREMENTS SUPPORT MANY OTHER GAME AND NON-GAME SPECIES) MAY BE THE BEST PART OF THE DRAFT PLAN. THE DRAFT FOCUS ON A FOREST MOSAIC, ROTATIONAL TIMBER HARVESTS, YOUNG FORESTS AND EARLY SUCCESSIONAL GROWTH PRESENTS MAJOR STRENGTHS. <u>(2) ADVOCATE FOR ACTIVE FOREST MANAGEMENT ON PUBLIC LAND.</u> LOSS OF FORESTED ACRES DUE TO URBAN DEVELOPMENT/AGRICULTURE AS NOTED IN THE PLAN IS A LOSS OF <u>*HABITAT*</u> NOT SIMPLY FORESTS - THEREFORE, IT IS VERY IMPORTANT TO ADVOCATE FOR ACTIVE FOREST MANAGEMENT ON NATIONAL FORESTS (the largest public land holder in Virginia at 1.6 M acres) AND OTHER VIRGINIA PUBLIC LANDS. DGIF ACTIVELY MANAGES FORESTS IN THE HIGHLAND WMA AND DEMONSTRATES <u>WHY</u> AND <u>HOW</u> TO ACTIVELY MANAGE LAND - TO INCLUDE EFVEN-AGE TIMBER HARVESTS. DGIF AND THE FOREST SERVICE ALSO CAN IMPROVE HABITAT BY INCREASED MANAGEMENT (E.G., PRESCRIBED BURNS) OF EXISTING WILDLIFE OPENINGS ON PUBLIC LAND. <u>(3) PARTNERSHIPS.</u> IT IS VERY GOOD TO SEE STRATEGIES IN THE DRAFT PLAN TO ADDRESS PARTNERSHIPS -THESE ARE PROVING CRITICAL TO DGIF IN MEETING ITS MISSION AND IN IMPROVING HABITAT ON PUBLIC AND PRIVATE LAND (E.G., QUAIL RESTORATION). PLEASE CONTINUE TO CONSIDER, ENCOURAGE AND EXPAND A WIDE RANGE OF PARTNERSHTPS AMONG THE HUNTING/CONSERVATION ORGANIZATIONS IN VIRGINIA. NWTF IS KEY TO THIS PLAN; CONSIDER OTHERS. THE <u>DEPARTMENT DESERVES HIGH PRAISE FOR CURRENT PARTNERSHIPS</u>! <u>(4) DGIF PUBLIC EDUCATION</u> ON THE IMPORTANCE OF YOUNG FORESTS MUST INCLUDE SCHOOLBASED AND HUNTER EDUCATION ON THE VALUE OF TIMBERING AND CLEAR CUTS - RESULTING IN YOUNG FOREST OR EARLY SUCCESSIONAL HABITAT, ESPECIALLY ON PUBLIC LANDS (E.G., NFs). <u>(5) ATTENTION TO A VARIETY OF WILDLIFE CONSTITUENTS</u>, VERY NICE TO SEE IN THE PLAN, IN ADDITION TO HUNTERS. WILDLIFE VIEWING IS A PAST-TIME PERHAPS BEST TYPIFIED BY BIRDING AND WILDLIFE PHOTOGRAPHY. THESE USERS CAN MAKE STRONG ALLIES TO ADVOCATE FOR A PRODUCTIVE LANDCAPE MOSAIC. I ALSO HUNT RUFFED GROUSE AND WOODCOCK OVER POINTING DOGS IN VIRGINIA AND BELIEVE THAT	Desire to improve habitat (esp. on National Forest and other public lands) to improve turkey and wildlife populations	Turkey Populations	1, 2	No goal, objective, or strategy change is necessary. Habitat management is a potential strategy to achieve desired population objectives. Partnerships and education are suggested potential strategies. Additional public land information was added to the technical portion of the plan.	156

Appendix D. Comments received during open public comment period (July 12 – August 9, 2013) and changes made to the Virginia Turkey Management Plan.

County of Residence	Comment (as written)	Value Summary of Comment	Area of Plan		Changes to Plan and/or Response	#
			Value / Goal Area	Objective #		
	IMPLEMENTING THIS VIRGINIA DRAFT WILD TURKEY MANAGEMENT PLAN WLLL ADD TO MY GERMAN SHORTHAIR HUNTING SATISFACTION (MINE, TOO!). - Rocky Mountain Elk Foundation					
Rockingham	I would first like to thank the VDGIF for the opportunity to voice my opinion on the Wild Turkey Management Plan. I consider the wild turkey to be one of Virginia's greatest game birds and want nothing more than to see it thrive and not go the way of the quail, which was once abundant here in Virginia. I harvested my first turkey in my home state of Virginia while fall turkey hunting with my dad in 1965. This is one hunt that remains as clear in my memory as if it were yesterday. My love and passion continues to grow each year I am fortunate enough to enter the turkey woods. In the past, I have been on the State Board of the NWTF and served as the State coordinator for the Jakes program for the youth here in Virginia. I was honored to be inducted into the Virginia Wild Turkey Conservationist Hall of Fame. I write these things to show my commitment and passion for the wild turkey with hopes it will flourish in Virginia for years to come. My following comments and suggestions are from the heart and with a lot of thought. The first thing we need to do, in my humble opinion, is to decide if we are trying to manage the wild turkey or manage hunters. Common sense tells me that the wild turkey is too valuable a resource to waste by an opportunistic harvest. On page 46 of the Wild Turkey Management Plan under "Potential Strategies" (1) A, the length of our season here in Virginia is more than generous, although in my home county of Rockingham, it has been reduced to a 2-week season. I would like to propose that you keep the fall season the same as it was in the past, (a 6-week split season), with two exceptions: 1. Have the first part of the fall season set back one week, taking it out of the first week of muzzleloader season; and 2. Totally take away "Turkey Day" (Thanksgiving Day). Look at your records from the past and see just how many birds were taken on that one day. There are too many hunters in the woods on Thanksgiving. It is a joke to think a hunter can leave his home on Thanksgiving morning and legally harvest a turkey, get it home, clean it and get it cooked in time for the Thanksgiving meal. Not only that, but most deer hunters that harvest a turkey are going to blow up half the breast with that high powered rifle. I wonder just how many birds are simply left for the scavengers after the hunter sees the mess he made of his kill and walks away. Please take away the rifle and muzzleloader as a means for harvesting a wild turkey. Make Virginia a "shotgun only" state. If you check your past records you can see just how many birds would have survived the season if you limit hunting to shotgun only. Tom Kelley, the Dean of Turkey Hunting authors, said it best when he was giving his daughter advice on what type of man NOT to marry. Included in his list was "Never marry a man who turkey hunts with a rifle." I wonder if Mr. Kelley was implying that shooting a turkey with a rifle was cheating or was he simply implying that that type of hunter had no respect for the game bird and this was therefore a testament to his all-around character. On page 54, the plan states, "Turkey hunting should be safe for hunters and other citizens." I am a fall hunter and I refuse to enter the woods to turkey hunt when there are hunters, many first timers with little experience, with rifles and muzzleloaders watching for something to move. For this reason, my fall season in Rockingham County is now reduced to five days.	Expressed concerns that a valuable turkey resource is wasted by opportunistic harvesting.	Allocation of Fall Harvest	1	Based on additional SAC discussions, the allocation of fall harvest value / goal was modified.	157
		Concerned that harvesting with a muzzle loader or rifle is not ethical and is wanton waste.	Ethics and Compliance with Law	1, 2	No goal, objective, or strategy change is necessary. Current objectives and strategies address the need to ensure compliance with ethical standards.	158
		Worried about turkey hunting safety when season overlaps with other seasons – also when rifles and muzzleloaders are being used.	Safety	1	No goal, objective, or strategy change is necessary. Reducing turkey hunting-related incidents by 25% is an objective.	159
		Concerned about short 2-week season; wants longer season back. Concerned about overlapping muzzleloader season.	Turkey-Related Recreation	1	No goal, objective, or strategy change is necessary. Manipulating season dates and structure is an existing potential strategy to improve hunting satisfaction.	160

Appendix D. Comments received during open public comment period (July 12 – August 9, 2013) and changes made to the Virginia Turkey Management Plan.

County of Residence	Comment (as written)	Value Summary of Comment	Area of Plan		Changes to Plan and/or Response	#
			Value / Goal Area	Objective #		
	Having attended the public meeting in Verona regarding the Wild Turkey Management Plan, I was pleased to hear the report on how many great biologists we have working here in Virginia. When you have a nationally recognized biologist that has won major awards on the conservation of the wild turkey, you are certainly blessed. However, I was appalled when I heard that our biologists don't really have a say in the "allocation of the fall harvest." That is decided by the State Board. I just wonder how those Board members know more about the conservation of the wild turkey than our paid biologists. I do not want to sound disrespectful of the Board, but am simply saying that we pay the biologists to do their job. Why not listen and implement their ideas? Finally, I currently hunt turkeys in three different states, Virginia, West Virginia and New York. Virginia is the only state that has the turkey lumped into a big game license. If I wish to harvest a turkey in New York or West Virginia, I have to buy a separate tag to do so. This issue is nonexistent in your proposed plan, but something you may want lo include. If you want to see just how many true turkey hunters there are in Virginia, take the turkey out of the "big game license" and make it law that hunters must possess a separate and specific tag to hunt turkeys. If we include common sense into the proposed plan, our greatest game bird, the wild turkey, should rebound and thrive tor many generations to come. Thank you for the opportunity to voice my opinion. I appreciate your consideration on these issues and your efforts in preserving this great game bird.					
	Agriculture Damage (pg. 37) The second paragraph should be removed. There has been no scientifically designed and conducted research supporting such a statement for the state of Virginia. The third paragraph should be removed because it represents speculation not information based on scientifically developed data and conclusions. The fifth paragraph should be changed as follows: second sentence: insert word" preliminary" before research by National Wild turkey Federation. Strike next two sentences beginning with "Wild turkey fed on….." and "Wild turkeys in Virginia…" and replace with a sentence that scientifically designed and conducted studies of turkey depredation on nearly ripe grapes are needed before any conclusions can be reached on turkey impact on the grape industry. I have briefly discussed the appropriateness of conducting studies of turkey depredation on semi-ripe and ripe grape grapes in Virginia with Jim Parkhurst. Such a sturdy could be scientifically designed and conducted by the VPI Wildlife Management Department in conjunction with the Virginia Department of Game and Inland Fisheries with potential funding through a grant from the Virginia Wine Board. Further discussions with Dr. Parkhurst are needed on the feasibility of VPI designing and conducting such a study prior to the next SAC meeting in September.	Technical comments not related to public values in plan.	Human-Wild Turkey Problems		The technical portion of the plan addressing agricultural damage was rewritten with additional literature referenced.	161
	I finally had a chance to review the draft plan. I am very impressed; you and your team have done an outstanding job with this. The Plan is full of interesting and valuable information to the Virginia turkey hunter. We are so lucky to have folks like you that are committed to this wonderful resource. Have you had a big turnout at the public comment meetings - I am thinking about attending the one in Fredericksburg on the 29th. Thank you for all your effort in this very important project.	Complimented plan.			No changes necessary.	162

Appendix E. Priority rankings of the Virginia Wild Turkey Management Plan objectives by the Stakeholder Advisory Committee (SAC) and the VDGIF Wild Turkey Technical Committee (WTTC). A rank of 1 means most important, 2 means next most important, etc. Some ranks are tied and averaged.

Ranking		Wild Turkey Management Plan Objectives
WTTC	SAC	
		TURKEY POPULATIONS
1.5	2.5	To meet and maintain turkey population objectives at cultural carrying capacity (CCC) in each county management unit through 12/31/2022 (Fig. 35).
1.5	4.5	To determine factors that may be limiting the attainment of turkey population objectives through 12/31/2022.
11	9.5	To biennially assess and update turkey population CCC objectives in each county management unit through 12/31/2022.
7	6.5	To annually assess and update turkey population status in each county management unit through 12/31/2022.
18	9.5	To develop and/or continue site-specific population management programs within county management units through 12/31/2022.
16	15	To validate and test sustained yield population models for turkeys and to determine practical methods for identifying maximum sustained yield (MSY) for fall and spring harvests by 12/31/2020.
		TURKEY-RELATED RECREATION
3	6.5	To update knowledge of turkey hunter satisfactions and constraints to hunting participation in Virginia by 1/1/2016.
8.5	15	To improve fall and spring turkey hunter satisfactions, as measured by the 2011 hunter survey, by 12/31/2022.
20.5	19.5	To determine non-hunting turkey recreation demands, desires, and satisfactions by 1/1/2017.
20.5	19.5	Establish programs to meet demands and satisfactions for non-hunting recreational opportunities through 2022.
		HUNTING TRADITION
13.5	17.5	To have at least 55,000 fall hunters (i.e., a 30% growth from 2011) and 55,000 spring gobbler hunters (i.e., maintaining 2012 levels) annually participating in turkey hunting by 12/31/2022.
8.5	2.5	To determine limiting factors for participation in fall turkey hunting and make programmatic recommendations to preserve fall turkey hunting traditions and participation by 1/1/2018.
		ALLOCATION OF FALL HARVEST
4	15	To manage turkey harvests during the peak deer hunting periods (during the first 2 weeks of early muzzleloading deer season and during the first 2 weeks of general firearms deer season) to be approximately 50% (between 40-60%) of the total annual fall turkey harvest through the 2022-23 hunting seasons, while also providing quality turkey hunting opportunity prior to these peak deer hunting periods.
6	1	To refine appropriate allocation of fall turkey hunting opportunities and harvests by 1/1/2015.
		SAFETY
5	9.5	Compared to the 10-year period (2003-12) when 25 spring hunting incidents occurred, reduce turkey hunting-related incidents by 25% (by 6 incidents) for the period 2013- 2022.
11	12.5	To annually inform hunters and the general public about open turkey hunting seasons and associated safety considerations through 12/31/2022.
16	-- [1]	To develop and implement a system to annually monitor safety incidents related to fall turkey hunting by 12/31/2015.
		ETHICS & COMPLIANCE WITH LAW
16	12.5	To describe ethical principles for turkey hunting by 1/1/2016.
19	17.5	To implement strategies that ensure compliance with these standards by 1/1/2018.
		HUMAN-WILD TURKEY PROBLEMS
13.5	4.5	To quantify and assess agricultural and other negative turkey impacts by 1/1/2018.
11	9.5	To develop and implement cost-effective response policies/guidelines for managing wild turkey problems by 1/1/2015.

[1] This objective was not included in the SAC rankings.

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