

**Elk Restoration in Virginia:
The Biological and Socioeconomic Feasibility**



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The North American elk was once common throughout the United States, including the State of Virginia. However, by the mid-1800's, its range had been pushed back and restricted to the Rocky Mountain region and several isolated areas along the Pacific Coast. Beginning in the early 1900's, many attempts were made to reintroduce the North American elk to various portions of its former range in ten different plains states and eight eastern states. Many of these attempts were unsuccessful, including a series of releases in Virginia that resulted in two small herds persisting for just over fifty years (1917 – 1970). However, ongoing successes in Pennsylvania and Michigan, along with their evolving management strategies, have contributed a great deal to the formerly scant knowledge of eastern elk ecology. In addition, recent releases in Arkansas and Kentucky are being closely monitored, and much information has been obtained relevant to the necessary elements of a successful restoration. With this increased knowledge, a new interest has developed in restoring elk to other parts of its extirpated range. In 1997, The [Rocky Mountain Elk Foundation](#) supported a 2-year feasibility study conducted by the Department of Fish and Wildlife Science at Virginia Tech in conjunction with the Conservation Management Institute to examine the potential of a second series of releases in Virginia.

This study was composed of two major elements. The first examined the biological feasibility of restoring elk to Virginia by identifying potentially high quality elk habitat within the Commonwealth where an elk herd could reside. The second part of the study was to perform an in-depth socioeconomic assessment of the state as a whole, and of the areas and communities surrounding potential release sites to determine levels of resident support for elk restoration and to identify and analyze possible conflicts, costs, and benefits that may arise from such a program. The description below reviews our methods and gives brief summaries of the results. For more information, use the contact information.

Biological Feasibility

The first phase of the study (assessing biological feasibility) began with the development of a habitat suitability index (HSI) model based on the guidelines set forth by the U.S. Fish and Wildlife Service. This model defined specific habitat parameters that elk require of "optimal habitat" which included appropriate forest/open land area ratios, close proximity of forest and open lands (for both cover and forage needs), lack of human encroachment (i.e., low road density & fragmentation), and the ready availability of water. The appropriate mix of forest and open lands is important for a healthy elk population: forests for providing cover and with summer/winter forage and grass/shrub lands for providing spring/fall forage and a basis for the breeding season social organization. The availability of water is particularly important during calving and lactation periods, and road densities determine how disturbed the habitat is and how well elk will be able to make good use of the available habitat.

Several data layers were used in implementing the model. Digital land cover and slope maps produced as part of the Virginia Gap Analysis project here at the Conservation

Management Institute were be combined with digital road and hydrographic maps obtained from the U.S. Geological Survey. The final outcome was be a ranking of the analysis areas on a 0.0–1.0 scale with 1.0 representing optimal habitat. Using an average elk density for established re-introduced elk populations in the East, we also were able to estimate the potential population size of an elk herd in each study area. Eight study areas were identified prior to the HSI development, 1 in Southwest Virginia, 4 in the Shenandoah Valley (north-western Virginia), and 3 in the Southern Piedmont (south-central Virginia). Highest biological feasibility was found in Southwestern Virginia and in the central Shenandoah Valley (including the Shenandoah National Park East of I-81 and the counties of Highland, Augusta, and Bath west of I-81 near West.

Socioeconomic Feasibility

Restoration of elk to Virginia has the potential to affect many segments of the Commonwealth's economy. Aside from economic (and potentially political) issues related to restoration, there are other ethical and ecological issues that are value-based and are difficult to assess objectively, yet ones that still are important to people. We examined these issues using a statewide mail survey and targeted regional workshops. Although certain inferences might be extrapolated from our large-scale work to the local community level, a more targeted assessment of impacts at that level was not attempted and will be needed before any reintroduction proceeds.

Statewide Survey

Residents of Virginia (2,400 individuals contacted, 630 responded; 30% return rate) were surveyed via a 60-item mail questionnaire to assess:

1. levels of knowledge and interest among Virginia residents regarding elk and elk restoration,
2. levels of support/opposition that exists among Virginia residents toward elk restoration and various elk management options, and
3. motivating factors underlying their decisions to support/oppose elk restoration

Sixty-one percent of respondents agreed that “Reintroducing elk into Virginia is a good idea,” 14% disagreed, and 25% were undecided. Supporters of elk restoration based their decision primarily on ethical and ecological factors (i.e. valued-based). Four of the top 5 reasons given for supporting elk restoration were unrelated to any desire for direct personal benefit (e.g., restoration of Virginia's natural history, return of elk to historical native range, increase Virginia's biodiversity). Direct personal gains (e.g., recreational opportunities, economic benefits) were less important. Interestingly, the opportunity to hunt elk was least important reason given for supporting elk restoration. In contrast, elk restoration opponents identified primarily need-based motivations such as those based on safety (e.g., automobile accidents, disease transmission) or economic (e.g., agricultural crop damage) issues. Value-based motivations ranked low among these respondents.

Regional Stakeholder Meetings

To further understand the attitudes and concerns of people living within the regions where elk restoration was deemed biologically feasible, we held a series of regional meetings. Thus, within each of the regions we examined (see Biological Feasibility), we sought to 1) obtain specific information about the benefits and conflicts anticipated by local residents, 2) identify possible opportunities for reconciling conflicts, and 3) help affected stakeholders hear and understand each others' interests. We held 4 one-day workshops, one each in Abingdon (SW VA), Verona (southern Shenandoah), Winchester (northern Shenandoah), and Martinsville (Piedmont). Stakeholders (~20-25 at each meeting) representing the regional interests were invited to participate in each meeting, and included representatives from 3 major groups: agricultural producers, government & land management agents, and user (recreational & conservationist) groups.

Important benefits of elk restoration identified by workshop participants differed from those of mail survey respondents. Workshop participants targeted economic returns (e.g., tourism) whereas the general public focused on less tangible benefits (e.g., fostering biodiversity). When addressing the potential detriments of elk restoration, this difference in motivations between survey respondents and meeting participants was not evident. People were concerned with direct negative consequences (e.g., public safety, property damage) rather than value-based consequences (e.g., ecological degradation) regardless of where they lived or the types of benefits they anticipated. Although value-based concerns were discussed by workshop participants, most stated that residents would not be able to experience or appreciate any benefits unless economic and safety issues are first addressed.

Workshop participants were primarily concerned with the equitable distribution of costs and benefits, particularly among agricultural stakeholders. Agricultural producers believed that the burden of providing habitat (i.e., forage) for a restored elk herd would rest on them, thereby concentrating costs on a few landowners who operate within the elk's range. However, benefits would spread over a much larger group of people, and agricultural producers fear they would experience few, if any, of these benefits. Participants viewed this as 1) a property rights infringement in that private landowners would be expected to provide a public good, and 2) a demoralization of the agricultural community in that the interests of others would take precedence over the needs of farmers.

Summary

These value vs. needs disputes and equity issues require a special effort at involving the public in the final decision-making process (i.e., whether to restore elk to VA or not). We detected that a level of mistrust exists between those who wish to experience the potential benefits and those who fear the costs. Public involvement must be open, informative, and noncompetitive to foster productive discussions and bring opposing groups together. Opportunities for groups to exchange ideas openly and without judgment or hostility must be afforded. By encouraging individuals to recognize that all interests are equally valid and that the purpose of discussion is to learn about those interests and create mutually agreeable solutions rather than to demoralize or defeat the opposing side, animosity can be reduced, and consent, if not consensus, on a decision should be attainable.

Current Status

We delivered our final report to the Rocky Mountain Elk Foundation, who passed it on to the Virginia Department of Game and Inland Fisheries (VDGIF). It is the responsibility of the VDGIF to make the final decision as to whether elk should or should not be restored to Virginia. They are seeking additional public involvement in the decision-making process, and are awaiting the outcomes of the restoration efforts of several neighboring states, including Kentucky, Tennessee, and North Carolina. The outcomes of this study are helping the VDGIF decide the future of elk in Virginia and will be instrumental to the development of the growing knowledge bases of eastern elk ecology, habitat modeling, and GIS applications in wildlife management.

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