



REGULATORY IMPACT ANALYSIS FOR PROPOSED AMENDMENTS TO PROHIBITED TAKING AND MANNER OF TAKE RULE

Rule Amendments: 15A NCAC 10B .0201 Prohibited Taking and Manner of Take

Agency Contact: Carrie Ruhlman
Policy Analyst
NC Wildlife Resources Commission
1751 Varsity Drive, Raleigh, NC
919-707-0011
carrie.ruhlman@ncwildlife.org

Impact Summary: State Government: Yes
Local Government: Yes
Private Impact: Yes
Substantial Impact: Potentially substantial benefit, but uncertain.

Authority: G.S. 103-2; 113-291.1(a); 113-134; 113-291.2; 113-291.3

Necessity: The proposed permanent amendments to 15A NCAC 10B .0201, Prohibited Taking and Manner of Take, prohibits possession or use of any substance or material that contains or purports to contain any excretion collected from a cervid (species of the deer family), including feces, urine, blood, gland oil, or other bodily fluid for the purposes of taking or attempting to take, attracting, or scouting wildlife. Infectious Chronic Wasting Disease (CWD) prions can unknowingly exist in these excretions, and there is no rapid, cost-effective test to determine whether commercial deer attractants that contain cervid excretions are prion-free. This proposed amendment seeks to reduce the human-related pathways for CWD to contaminate North Carolina's environment, and minimize the risk of CWD infecting wild and captive deer and elk herds by prohibiting the use of cervid excretions to attract wildlife. Synthetic attractants can serve as a viable alternative and are readily available.

I. Summary

The Wildlife Resources Commission (WRC) is tasked with the conservation of the wildlife resources of the State (G.S. 143-239) and has jurisdiction over all activities connected with the conservation and regulation of wildlife resources (113-132(b)). This includes rulemaking

authority to implement the provisions of the statutes found in G.S. 113, Subchapter IV – Conservation of Marine and Estuarine and Wildlife Resource (G.S.113-134).

Chronic Wasting Disease (CWD), a fatal neurological disease affecting the deer family (Cervidae), is an imminent threat to the State's wild and captive white-tailed deer and elk populations. The disease is believed to spread through animal-to-animal contact as well as contact with infected carcasses and contaminated soils and plants. Cervid excrement plays an important role in spreading the disease from both animal-to-animal contact and environmental contamination. Cervid urine, which is marketed as a deer attractant for hunters, is collected at farmed cervid facilities using a grate system that allows mixing of saliva and feces (which contain higher prion levels).

CWD thus far has been detected in 26 states in the country; including eight member states of the Southeastern Association of Fish and Wildlife Agencies (SEAFWA).¹ Many urine collecting facilities are located in CWD-positive states. Specific cervid facility sources tied to individual products are typically unknown and products have no labeling requirements. There is no accurate CWD test of live deer, and there is no rapid, cost-effective test to determine whether commercial deer urines are prion-free. Production, transport, and inter-state sale of urine-based products is unregulated without any enforcement mechanisms in most states. This proposed rule would prohibit possession or use of any substance or material that contains or purports to contain any excretion collected from a live cervid, including feces, urine, blood, gland oil, or other bodily fluid for the purposes of taking or attempting to take, attracting, or scouting wildlife. These limitations seek to reduce the risk of human-related pathways for introduction and substantial costs associated with North Carolina becoming CWD-positive.

II. Introduction and Purpose of Rule Change

CWD is a highly infectious, contagious, fatal neurological disease that affects the Cervidae family, which includes deer, elk, moose, and reindeer/caribou. The source of the disease is an abnormal prion (a form of protein) that collects in the animal's brain cells and produces small lesions. CWD is classified as a transmissible spongiform encephalopathy and is similar to mad cow disease. It is characterized by loss of body condition, behavioral abnormalities, and death. It is believed to spread through animal-to-animal contact, contact with infected carcasses, and contact with contaminated soils and plants. CWD has long incubation periods, which can result in an infected cervid appearing healthy while spreading the disease to other cervids. Additionally, CWD is persistent in the environment, which is the most significant obstacle to eradication once the disease is present in an area. When a state's cervid herd is CWD-positive, on-going monitoring and management efforts require the expenditure of millions of dollars in public resources.

It is unknown if or when CWD will be detected in North Carolina and there are several scenarios in which CWD could be introduced. Based on other states' history with the disease, it is more likely that CWD will be introduced to North Carolina by human transportation than any mode of natural expansion, though the actual probability is unknown. If the proposed amendment to this

Rule is not implemented, this specific pathway of human introduction of prions into the environment will remain a possibility in North Carolina.

CWD prions have been detected in urine, feces, blood and saliva of pre-symptomatic/symptomatic deer and these prions remain infectious when released in the environment. Cervid urine, which is marketed as a deer attractant for hunters, is collected in farmed cervid facilities using a grate system that allows mixing of saliva and feces (which contain higher prion levels). While the risk of CWD spread via urine attractants is likely lower than other pathways of disease spread, e.g., importation of live deer, carcasses, and carcass parts, the risk is direct and cumulative. By the very nature of their intended use, cervid urine products are designed to attract deer for close/direct contact with the potentially infectious disease agent. Deer lick urine, and rutting males inhale urine, and there is no safe dose of prions for deer. As little as 10 ml of urine can contain enough infectious prions to risk lethal infection in 50% of exposed deer. Additionally, urine-based lures are commonly used by many hunters and may be used repeatedly in the same area. Prions persist in the soil and plants of the infected area for >16 years and the risk of CWD transmission from the environment increases over time as prions accumulate.

Urine is collected in captive cervid facilities using a grate system that allows mixing of saliva and feces (which contain higher prion levels). Production, transport, and inter-state sale of urine-based products is unregulated without any enforcement mechanisms in most states. Many urine collecting facilities are located in CWD-positive states. Specific cervid facility sources tied to individual products are typically unknown and products have no labeling requirements. Urine products are not treated chemically or with heat to kill the prions as this would also secondarily destroy the desired scent characteristics. CWD prions may be shed by an infected animal prior to clinical signs of disease, which typically takes several months to years to present itself. There is no accurate CWD test of live deer, and there is no rapid, cost-effective test to determine whether commercial deer urines are prion-free.

Recently, the potential for CWD to be spread by cervid urine through marketed deer urine hunting products has come to the forefront of additional measures to combat the spread of CWD. Twelve states, including VA, TN, and SC, currently prohibit the use of natural deer urine (or other bodily fluids) products in some fashion. Michigan allows the use of Archery Trade Association (ATA) approved products only, while Montana bans urine only from CWD positive states if they do not meet ATA's Deer Protection Program. South Carolina allows the use of substances collected by a hunter from deer legally harvested within the state; however, this exception still has the potential to spread CWD. The remaining nine states have a complete ban on the use of natural deer urine products. This proposed rule would prohibit possession or use of cervid excrement for the purposes of taking or attempting to take, attracting, or scouting wildlife as an additional measure to minimize the risk of introduction and substantial costs associated with North Carolina becoming CWD-positive.

III. Cost

State

State-level costs are anticipated to be minimal due to proposed changes in the Prohibited Taking and Manner of Take Rule.

The agency uses several methods to inform the public and its constituency about changes to regulations. To inform hunters of the proposed rule changes for the 2020-021 hunting season, the agency plans to employ an aggressive and targeted outreach campaign. In addition to current outreach, which includes press releases, email blasts, and posts on social media, this may include YouTube videos, targeted social media outreach, and correspondence with retailers throughout the State. Social media marketing can cost anywhere from a \$500 to \$5,000 per month, depending on the users that the agency wants to reach and over what period of time. The estimated cost for in-house video production is approximately \$5,140 (\$4,803 NPV adjusted) per video for specific content related to CWD. The estimated cost for targeted social media outreach is a one-time cost of approximately \$15,000 (\$2,500 per month x 6 months = \$15,000; \$14,019NPV adjusted). A breakdown of costs for education and outreach efforts can be found in Appendix C.²

Decreased sales tax generated from sale of urine-based products would likely be offset by increased sales of synthetic lures that are readily available on the market.

Local

No specific local costs are anticipated due to proposed changes in the Prohibited Taking and Manner of Take Rule.

Private

We are unaware of any studies addressing the economic impact of a natural cervid urine ban. There are no farmed cervid facilities in North Carolina that collect deer urine for the urine-based lure market. Decreased sales of urine-based products would likely be offset by increased sales of synthetic lures that are readily available on the market. Impacts to retailers can be minimized by providing notice of the rule change in advance of pre-hunting season inventory orders through the agency outreach methods outlined in section III.

Deer hunter success and individuals that depend on deer hunter success (processors, taxidermists, outfitters) will likely not be affected by this proposed rule. Synthetic attractants are readily available and are likely as effective or ineffective as natural urine-based products. Koerth et al. 2000 documented deer readily visited all treatments of natural and mock scrapes regardless of attractant used, including rutting buck urine, estrous doe urine, and "new car" scent.

IV. Benefits – Reduced Risk of CWD Introduction

It is unknown if or when CWD will be detected in North Carolina and there are several scenarios in which CWD could be introduced, including use of cervid excrement with infectious prions. Based on other states' history with the disease, it is more likely that CWD will be introduced to North Carolina by human transportation than any mode of natural expansion, though the actual probability is unknown. Additionally, it is fairly certain that once CWD is introduced, it is virtually impossible to eradicate after it contaminates the environment and the wild cervid population. The long-term impacts to the state would be significant. Amendments proposed for the Rule seek to reduce the human-related pathways for introduction of CWD.

The probability of CWD being spread to North Carolina through natural movement of infected deer is also uncertain. Due to extensive incubation periods, the lack of a live test for the disease, and the movement behavior (dispersal and shifts of home-range) of wild cervids, there is a fair amount of uncertainty about where the disease is on the landscape. The closest known infected wild deer populations are in northwestern Virginia / northeastern West Virginia and western Tennessee / northern Mississippi, about 150 and 250 miles straight line distance from North Carolina respectively. The disease has not been contained in those areas and, despite efforts to slow the spread, it will likely continue to spread outward from the infected zone. The risk of wild deer transmitting the disease to neighboring wild deer is extremely high and continues to occur in most areas where CWD has been detected. Eventually it may occur across the entire continent through natural transmission, but states are doing what is within their means to slow the spread and keep it from “jumping” from herd to herd.

CWD could also be brought into North Carolina from human transport of live cervids. The disease has spread vast distances between known points of occurrence. While unproven, speculation exists that movement of live captive deer is the way CWD has appeared so quickly across the US. The WRC worked extensively to minimize this threat (bought out stock from facilities and euthanized animals to decrease the number of facilities, increased/strengthened rules, etc.) before the captive cervid program was transferred to the NC Department of Agriculture and Consumer Services (NCDA) in 2015. Current statutes governing captive cervids make it illegal to import CWD susceptible cervids until a live test is available.

Infectious CWD prions can also be transmitted through carcasses, particularly parts of the carcass that have nervous and lymphatic tissue. The probability of North Carolina’s deer population becoming infected from CWD-positive carcass parts being imported and disposed on the landscape is unknown; it depends on the prevalence of CWD in the area where the out-of-state deer is killed (which nobody knows for certain except in well defined “hot zones”), and the likelihood of a North Carolina deer coming in contact with the prions that remain in the soil and possibly vegetation after decomposition. In 2006, the WRC adopted the Importation of Animal Parts Rule (15A NCAC 10B .0124) which banned the importation of whole cervid carcasses from states known to be CWD positive and limited importation of cervid parts from these states to specifically identified meat and other low risk body parts. There were 11 CWD-positive states when the Importation of Animal Parts rule was adopted. Since 2007, there has been an increase in reported cases of CWD across the United States and internationally. There are currently 26 CWD-positive states (see map in Appendix A). Eight SEAFWA states are among these, three of which (Arkansas, Mississippi and Tennessee) confirmed their first case of CWD within the past three years. During this same time, CWD has appeared in free-ranging reindeer and moose in Norway and Finland. Three Canadian provinces are also CWD-positive. Due to the accelerated rate and great distances by which CWD has been transferred across the continent (15 additional CWD-positive states since 2006), North Carolina amended the Importation of Animal Parts Rule (15A NCAC 10B .0124) to include all states through temporary rule in 2018, and permanent rule in 2019. Currently, 15 states prohibit the importation of cervid carcasses and carcass parts that originate from outside their borders (see map in Appendix B). The 2019 amendment to the Importation of Parts Rule (15A NCAC 10B .0124) minimizes this risk to the greatest extent possible, by expanding the parts transport limitations to *any* out-of-state cervid, and requiring all meat to be fully de-boned, deer parts brought into the state should be consumed

or used as a trophy and not discarded on the landscape.

The risk of CWD being introduced to North Carolina through cervid excretions is likely low relative to other risk (movement of live deer and high-risk carcass parts). But given the source and method of collecting urine-based attractants, the lack of oversight and inability to test these products, the occurrence of prions in excretions of pre-symptomatic/symptomatic infected cervids, persistence of prions in the environment for a decade or more, and the intent to attract deer to come in contact with these products, the risk is not zero, and is likely cumulative. The proposed amendment to the Prohibited Taking and Manner of Take Rule seeks to minimize this risk to the greatest extent possible by prohibiting the use of natural cervid excretions for taking or attracting wildlife.

State

The proposed amendments to the Importation of Parts Rule are expected to have substantial benefits to the state by way of avoided costs.

CWD Response

CWD would no doubt have significant biological, economic, and sociological ramifications if detected in North Carolina. As such, the WRC has a Chronic Wasting Disease Response Plan (hereafter CWD Response Plan)⁹. The goal of the CWD Response Plan is to contain the disease, to the extent possible, to protect North Carolina's wild white-tailed deer and elk herds.

If CWD were to be detected in North Carolina, the agency's CWD Response Plan would be immediately enacted. Based on this plan, once a CWD-positive cervid is identified, an extensive series of events would commence, including: confirmation testing, notification of authorities, establishment of WRC response teams, and creation of CWD surveillance areas (Primary Surveillance Area – 5 mile radius around the detection; Secondary Surveillance Area – 30 mile radius around the detection), all in an immediate effort to collect prevalence and distribution information. Additionally, specific regulations would be established for the surveillance areas, including: a prohibition on fawn rehabilitation, additional regulation for supplemental feeding and baiting, mandatory CWD check stations, harvested deer testing, changes to season lengths and bag limits, and an increased wildlife law enforcement presence. However, many variables would impact the level of response to a CWD detection. These include location of initial detection; disease prevalence at time of detection; size of the CWD management area and containment potential; agency ability to fully implement the Plan; required duration and effort; and hunter response.

Because CWD has not yet been detected in North Carolina, several assumptions must be made when quantifying costs associated with an outbreak. Assuming a single CWD detection with one Primary and one Secondary CWD Surveillance Area, the short-term (year one) costs associated with implementing the CWD Response Plan are estimated at \$110,307 (\$103,085 for staff time + \$15,700 in mileage = \$118,785; \$111,014 NPV adjusted).¹⁰ Personnel expenses include: staff to work WRC check stations, collect and submit tissue samples for testing, implement deer sampling and population reduction strategies, and conduct law enforcement activities. Additionally, supplies for herd management and surveillance would be needed. The annual cost of supplies is

estimated at \$46,755 (\$43,696 NPV adjusted), making the total cost of short-term management \$165,539 (\$154,710 NPV adjusted)7,062. If the outbreak remained localized and no additional areas became CWD positive, the estimated personnel and supplies cost over 5 years would be approximately \$558,504 (\$465,704 NPV adjusted). A breakdown of costs can be found in Appendix D.

If the outbreak of CWD is widespread, all costs would increase. However, the agency has no way to accurately quantify this increase without making unreasonable assumptions. A breakdown of the estimated agency costs for implementing the CWD Response Plan can be found in Appendix D.

Hunting & License Sales

Hunting is a popular activity in North Carolina. In 2006, 277,357 resident hunters spent an estimated \$488 million on retail purchases, generating \$818 million in economic output.¹¹ These

⁹ North Carolina Wildlife Resources Commission. 2015. Chronic Wasting Disease Response Plan. Division of Wildlife Management, Raleigh, N.C., USA

¹⁰ Division of Wildlife Management (2016). Chronic Wasting Disease Response Plan. Wildlife Resources Commission, Raleigh, NC, USA.

¹¹ U.S. Fish and Wildlife Service (2006) National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

hunting related expenditures supported 8,332 jobs and contributed \$46 million in state tax revenue. Resident deer hunters (197,220 of the 277,357) spent \$187 million on retail purchases, generating \$322 million in economic output. Expenditures by deer hunters supported 3,408 jobs and contributed to \$20 million in state tax revenue. Deer hunters also spent \$50 million on travel-related expenses¹². More recently, in 2011, approximately 259,000 residents and 23,000 non-residents hunted in North Carolina¹³. An analysis of this data indicated that 83% of the 259,000 were deer hunters, but expenditures of these individuals were not estimated¹⁴.

Research indicates that hunter behavior toward CWD depends on prevalence of the disease and human health consequences. Surveys have shown that up to 49% of hunters would stop hunting deer and elk if the prevalence of CWD increased. The decline was even greater (65%) if the high prevalence was combined with any threat to human health. Though resident hunters are likely to continue deer hunting in their state despite the presence of CWD, nonresidents are more likely to hunt in another state where CWD is not present. And as prevalence increases, the likelihood of hunters becoming non-hunters increases.¹⁵

After Wisconsin became CWD-positive in 2001, the state experienced an 11% decline in hunting license sales.¹⁶ Approximately 26% of WRC funding comes from the sale of hunting and fishing licenses annually. Hunting and sportsman licenses specifically make up 15% of that. The WRC averages \$12 million in sportsman and hunting license sales each year.¹⁷ If hunting license sales were to decline 11%, the agency could reasonably expect to lose up to \$1.3 million annually (\$12M annually x 11% = \$1.3 annually). If North Carolina experiences a significant decline in license sales, it may affect the agency's ability to obtain certain federal funding that requires matching funds. For example, funding from the Pittman-Robertson (P-R) Act (also known as the Federal Aid in Wildlife Restoration Act) requires a 25% match from the agency.

Additionally, approximately 23% of agency funding is provided from P-R funds (\$18.5 million).¹⁸ Because of the way that P-R funds are distributed, if the number of North Carolina license holders decreases substantially compared to license holders in other states, WRC would receive less federal funding. However, due to annual fluctuations in funding, the agency is unable to quantify this potential loss.

Herd Management

Some CWD-positive states such as Colorado and Wyoming have seen cervid populations decline due to CWD. One study described a 10% annual decrease among deer in an area with a CWD prevalence of 33%. Another study in southeastern Wyoming (where there are significant declines in mule deer herds) hypothesized that the herd they were studying could be extinct within 41 years.¹⁹ Not only would this eliminate hunter opportunities long-term, but the agency would also likely see commensurate declines in hunting license sales over time. If there are no deer, there are no deer hunters. By implementing the proposed changes to the Importation of Animal Part

¹² NCWRC Division of Wildlife Management. 2011. Chronic Wasting Disease and the Holding of Deer in Captivity. North Carolina Wildlife Resources Commission, Raleigh, NC, USA.

¹³ U.S. Fish and Wildlife Service (2011) National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

¹⁴ U.S. Fish & Wildlife Service (2011) Deer Hunting in the United States: Demographics and Trends.

¹⁵ Lyon, K.M. and Vaske, J.J. (2010) *Predicting hunting participation in response to chronic wasting disease in four states*, *Human Dimensions of Wildlife*, 15:3, 208-220

¹⁶ Vaske, J.J. (2010) *Lessons learned from human dimensions of chronic wasting disease research*, *Human Dimensions of Wildlife*, 15:3, 165-179

¹⁷ Based on two-year license sale average.

¹⁸ Based on three-year average P-R funds awarded to the WRC.

¹⁹ Cima, G. (2017) *Chronic wasting disease continues to spread*, *American Journal of Veterinary Research*, 78:9 1004-1005

Rule, the WRC anticipates that the North Carolina deer herd will be better protected from declining populations.

Due to the nature of CWD, the potential for long-term effects on resident cervid populations exist. Therefore, WRC management efforts would be ongoing once CWD is detected. Unfortunately, depending on the magnitude of the outbreak, this may negatively impact the agency's ability to maintain or implement other programs over time. Because of the uncertainty associated with a detection and the vast array of possible scenarios, long-term effects to the State cannot be accurately predicted.

Initial discovery of CWD in North Carolina could occur in either the State's wild or farmed cervid herds; with the additional possibility of one infecting the other.²⁰ Discovery of CWD within a captive facility would result in that facility becoming quarantined and possibly depopulated. Deer from an infected facility could not be moved to other facilities for breeding/stocking or hunting purposes; therefore they would have little, if any, value. The value lost depends on the species, genetics, and/or phenotypic characteristics of the animal and number of animals in the facility. Because of the array of potential scenarios surrounding a CWD detection in the State's captive cervid population, the effects of CWD on these deer, their owners, and the agency that regulates them cannot be quantified.

Local

The proposed amendments to the Prohibited Taking and Manner of Take are expected to have substantial local benefits by way of avoided costs.

Unfortunately, there is no accurate method for estimating the cost that a CWD detection would have on localized areas in North Carolina, and no data exist on hunter/hunting expenditures at that scale. However, as previously noted, approximately \$525 million was spent in-state on trip-related expenses, equipment, and other hunting-related expenditures in North Carolina in 2006.²¹ In 2013, Maryland (a CWD-positive state) surveyed three counties with varying proximities to the CWD Management Area of the State (similar to North Carolina's Surveillance areas). The county where Maryland's CWD management area was located reported a 7% reduction in deer harvest.²² While a change in deer harvest is not a perfect measure of the extent of change in hunting activity in an area, this reduction in harvest could reflect the magnitude of a reduction in hunters in the area and a likely reduction in hunter expenditures in the area.

The agency anticipates that the proposed amendments to further restrict importation and transportation from anywhere out-of-state could lead, at least initially, to an increase in the number of citations issued, especially for residents hunting in neighboring CWD-negative states. The fine for a rule violation includes \$180 local court costs. Unfortunately, there is no mechanism to estimate this anticipated increase.

²⁰ Farmed cervid is defined in G.S. 106-549.97 and is regulated by the NC Department of Agriculture and Consumer Services.

²¹ U.S. Fish and Wildlife Service (2011) National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

²² Haus, J.M., Eyler, T.B., Duda, M.D., and Bowman, Jacob, J.L. (2017) *Hunter perceptions toward chronic wasting disease: Implications for harvest and management*, Wildlife Society Bulletin, 41:2, 294-301

Elk hunting is not currently permitted in North Carolina, but according to a 2014 RTI study, elk viewing is a popular activity with associated tourism benefits in western counties of the state where the herd currently resides. Economic benefits were estimated for areas where elk currently reside (three counties) and two potential restoration areas, assuming continuous natural expansion of the elk population over 25 years and no major change in elk demographic parameters. Visitation for elk viewing was projected to be 7,220 to 36,100 visitors per year in 2019 in the study areas and was projected to remain relatively steady at that level into the future, so long as the herd remained stable or increased. However, it was also determined that if the elk population declined to low levels (15 animals or less), tourism to view elk would likely stop. RTI projected that the potential net benefit of elk-viewing tourism in future years in the five study areas evaluated could be anywhere from \$0.6 to over \$5 million annually, assuming viewing visits lasted 3 days each.²³ North Carolina residents would lose these expected benefits, should the elk population decline significantly from CWD.

Private

The proposed amendments to the Prohibited Taking and Manner of Take Rule are expected to have substantial private benefits by way of avoided costs.

If CWD were detected in North Carolina, a large and noticeable impact would occur at the local level. Based on the agency's CWD Response Plan, once detected, the area within a 5-mile radius of the infected deer would become the Primary CWD Surveillance Area, and the area with a 5 to 30-mile radius would become the Secondary CWD Surveillance Area. Specific regulations would be established for these areas that would impact hunters, including: regulating the exportation of cervid carcasses or carcass parts, a prohibition on fawn rehabilitation, additional regulation for supplemental feeding and baiting, mandatory CWD testing, changes to season lengths and bag limits, and an increased wildlife enforcement presence. While some restrictions may actually reduce hunter expenditures (i.e. not purchasing supplemental feed because baiting is no longer permitted), the loss would likely be transferred to local retailers and/or farmers.²⁵

In a 2010 fiscal note prepared by the WRC, it was estimated that hunters would incur a collective cost of approximately \$1,008 to transport deer to agency check stations within a 5-mile radius CWD management zone should the CWD Response Plan be enacted. Restrictions on the removal of certain deer carcass parts from the CWD management zone could result in collective costs to hunters of \$6,300 annually in meat processing and carcass disposal. These expenses would increase proportionally as new CWD-positive cervids were detected, resulting in an increase in the size of the CWD management zone²⁴. The 2010 Fiscal Note can be found in Appendix D.

Based on WRC Hunter Harvest Survey data, approximately 234,677 licensed hunters went deer hunting in North Carolina during the 2017-2018 season. With the detection and spread of CWD, fewer hunters may deer hunt and will therefore experience a loss of the recreational benefits

²³ RTI International. 2014. Evaluation and Feasibility of Establishing a Hunttable Elk Population in North Carolina.

²⁴ NCWRC Division of Wildlife Management. 2011. Chronic Wasting Disease and the Holding of Deer in Captivity. North Carolina Wildlife Resources Commission, Raleigh, NC, USA.

associated with hunting. Should CWD be detected in North Carolina, the quality of the deer hunting experience would likely decline and hunters may be advised against eating harvested venison. The lost social and recreational value of deer hunting, beyond what hunters spend to participate, could be in the tens of millions depending upon the extent of the disease.²⁵ But these potential nonmarket losses are highly uncertain because the potential extent of the disease in North Carolina is unknown, the agency lacks State-specific estimates of how much hunters value the hunting experience today, and the WRC is not aware of any studies that have been conducted to date to estimate how much that value would decline if North Carolina was CWD-positive.

Hunter behavioral changes can be reasonably expected because of CWD. However, these cannot be accurately estimated or predicted. As previously mentioned, participation in hunting has been shown to decrease as CWD prevalence increases. In addition to reductions in cervid populations, the perceived human health risks associated with CWD contribute to changes in hunter behavior. Although there are no current reported cases of natural CWD infection in humans, the Centers for Disease Control and Prevention (CDC) advises against eating the meat from CWD-positive animals. If hunters refrain from consuming deer meat because of CWD, they may incur additional costs for the purchase of alternative sources of meat.²⁶ Based on survey data from the 2015 WRC deer forums, most hunters in attendance indicated that the primary reason they hunt is for the venison. It is possible that some hunters will consume less venison because they are deterred by CWD and therefore will need to spend additional money on commercially available meat.²⁷

As shown by the Tennessee Department of Agriculture Economics' economic impact report, the total economic losses associated with CWD detection were estimated at \$98 million and 1,459 jobs. These estimates include private sectors such as service stations, retail, hotels and other lodging places, restaurants, real estate, food stores, and wholesale trade. These effects would stem from less travel (both within and into the State), food expenditures, lodging, equipment and supply purchases, fewer licenses, and other spillover effects. Other losses to note would be cervid farms and deer and elk viewing opportunities. However, due to lack of North Carolina specific data, these costs are unquantifiable.²⁸

Individuals that partake in wildlife viewing could lose recreational benefits associated with this activity from the presence of CWD in the state. While the economic impacts associated with the loss of white-tailed deer viewing are expected to be relatively insignificant should CWD be detected, the impacts from loss of elk viewing would likely be substantial.²⁹ As discussed in the previous section, a 2014 study conducted by RTI projected that the potential net benefit of elk-viewing tourism in future years in the five study areas evaluated could be anywhere from \$0.6 to

²⁵ Assumptions and methodology from Bishop, 2002 applied to the current number of licensed hunters in NC. Bishop, R.C. 2002. The Economic Effects in 2002 of Chronic Wasting Disease (CWD) in Wisconsin. University of Wisconsin-Madison, Agricultural and Applied Economics. Staff Paper No. 450. 2002.

²⁶ NCWRC Division of Wildlife Management. 2011. Chronic Wasting Disease and the Holding of Deer in Captivity. North Carolina Wildlife Resources Commission, Raleigh, NC, USA.

²⁷ NCWRC Division of Wildlife Management. 2016. Deer Hunting and Management Survey. North Carolina Wildlife Resources Commission, Raleigh, NC, USA.

²⁸ Menard, J., Jensen, K., and English, B.C. (2003) *Projected economic impacts of a Chronic Wasting Disease (CWD) outbreak in Tennessee*, Agri-Industry Modeling & Analysis Group Industry Brief.

²⁹ NCWRC Division of Wildlife Management. 2011. Chronic Wasting Disease and the Holding of Deer in Captivity. North Carolina Wildlife Resources Commission, Raleigh, NC, USA.

over \$5 million annually, assuming viewing visits lasted 3 days each.³⁰ North Carolina residents would lose these expected benefits, should the elk population decline significantly from CWD.

Individuals that partake in wildlife viewing could also lose the aesthetic and existence values associated with wild cervids. While both of these are non-economic values and are difficult to assess and measure, the impacts associated with the loss of these benefits would be significant.

VI. Alternatives

To address the increasing risk of CWD being introduced into North Carolina by use of cervid excrement, the WRC evaluated several options, one being to allow only products under the Archery Trade Association's (ATA) voluntary "Deer Protection Program", and the other to ban the use of products originating or produced in states known to be CWD positive.

The ATA Deer Protection Program seeks to lower the risks of CWD associated with the use of deer urine or urine-based products by hunters and allows participants products to carry the ATA seal after meeting program guidelines. The voluntary ATA Program uses the USDA's Herd Certification Program as a foundational structure, but also seeks to limit importation of live cervids into facilities and seeks to ensure testing of all cervids upon their death. ATA's Deer Protection Program also provides for additional inspections beyond those required by the USDA's Herd Certification Program. According to the ATA, 11 facilities participating in the Deer Protection Program account for 95% of the commercial deer urine.

Due to concerns over the ATA Deer Protection Program, the WRC dismissed this alternative in favor of a more protective rule that prohibits the use of all cervid excrement to attract deer. The ATA's program uses the current USDA Herd Certification Program as its foundation. Even facilities that participate in herd certification programs could still pose a risk. Many professional wildlife biologists consider surveillance requirements under the USDA Herd Certification Program as lacking. Poor record keeping by captive cervid farms and lack of enforcement for the program raise questions as to how effective the USDA program is at keeping herds CWD-free. In the past year, 6 of 15 captive herds where CWD was detected were considered low risk by USDA Herd Certification Program Standards (J. R. Fischer, Southeastern Cooperative Wildlife Disease Study, personal communication). The ATA program is a voluntary program and it is questionable whether the ATA's standards can be enforced. The ATA program could be considered similar to the USDA program in this regard. Details regarding the inspection process and its underlying legal authority are unclear. The ATA program appears to seek compliance by peer pressure and anticipated market forces. The ATA program is a voluntary program; therefore, even if the Deer Protection Program works as intended (notwithstanding mentioned concerns), there will always be the likelihood of CWD-infected urine entering the scent market. Producers violating the Deer Protection Program guidelines do not lose their ability to keep producing urine unless they are required to close. There do not appear to be any standards or requirements that would prevent the mixing of urine, saliva and feces in collection facilities. While the ATA should be commended for developing a program to address this issue, the agency believes such a program lacks any true enforcement mechanism and until such time that an effective and efficient screening test can be developed to identify prions in urine, the ATA's Deer Protection Program can't be expected to

render the cervid urine market as CWD free.

Because there is no definitive diagnostic test for CWD in live cervids or official test for detecting prions in urine based products, there is no way for hunters or the WRC to be certain that the product a hunter has purchased is not carrying infectious prions. Additionally, because the labels on the products don't typically identify where the urine was produced or originated (with the exception of some that say "Made in the U.S.A." or small companies identifying their location on their website), the hunter and the WRC would have no easy way to ensure that the product is not from a captive herd in a CWD-positive state.

The possibility also exists that more captive cervid herds are positive but have not been identified as such. The hunting scent industry is largely unregulated. If a hunter were to use an attractant produced in a CWD negative state, that would not necessarily mean that the urine used for the production of the attractant didn't come from somewhere else. Or that the captive herd where the urine originated had not been identified as CWD-positive because none of the deer in the facility exhibited clinical signs of the disease yet or none of the deer had been tested for CWD. Thus, because of the variety of uncertainties existing around this alternative, it was also rejected.

VII. Economic Impact Summary

CWD, a fatal neurological disease affecting the deer family (Cervidae), is an imminent threat to the State's wild and captive white-tailed deer and elk populations. It is unknown if or when CWD will be detected in North Carolina. Fortunately, based on results of continuous testing, the disease has not been detected to date. With the proposed changes to the Prohibited Taking and Manner of Take Rule, the probability of human introduction of the disease into North Carolina's cervid herds through use of cervid excrement is anticipated to be greatly reduced. Although many of the costs are quantifiable, the agency is unable to estimate the magnitude of costs and benefits due to uncertainty about the probability of CWD's introduction to North Carolina from natural and/or human modes of transmission and how effective the proposed rules will be at mitigating that risk. However, the WRC believes that the biological, economical, and sociological benefits of the proposed changes to reduce the human-related pathways for introduction of CWD far outweigh the costs.

In calculating costs associated with the proposed changes, a discounting rate of 7% was applied to the first year and every year after (for 5 years). For one-time costs in a single year, the amount was adjusted by the 7% discount. Formula:

$$NPV = \frac{FV1}{(1+R)^1} + \frac{FV2}{(1+R)^2} + \frac{FV3}{(1+R)^3} + \frac{FV4}{(1+R)^4} + \frac{FV5}{(1+R)^5}$$

Where 1,2,3,4,5 represents future years

FV = Cash flows for a given year

R = Discount Rate (.07)

³⁰ RTI International. 2014. Evaluation and Feasibility of Establishing a Hunttable Elk Population in North Carolina.

Benefits from reduced risk of CWD introduction:

CWD can be spread by natural movements of wild cervids or by human transportation of live cervids, cervid carcasses and carcass parts, and cervid excrement. While the spread of CWD cannot be entirely prevented through regulatory action, the WRC can reduce the risk from use of cervid excrement on the landscape, reducing the likelihood of incurring associated costs.

Should CWD be detected, hunters, wildlife recreators, the recreational industry, and the state are likely to incur significant costs. The WRC would implement more restrictive management strategies to contain the disease, and hunting activity would likely decline in CWD affected areas over time, either due to reduced cervid populations or concern about the human health risks of consuming potentially infected venison.

- The WRC could incur costs of up to \$558,504 (\$465,704 NPV adjusted) in the first five years of an outbreak for management interventions in a single CWD management area, and loss of up to \$7.8M in license sales during that same time. Costs would increase with the addition of surveillance areas if CWD spread, but the effect on license sales is unknown. This cost would increase by 75% if these funds are not available for use as match (25%) to obtain federal operating grants.
- Hunters who continue to hunt in CWD-positive jurisdictions would incur additional costs for taking deer to WRC check stations and additional processing and disposal costs, estimated at \$7,300 annually for a single CWD management area. In addition, the WRC would impose prohibitions and restrictions on fawn rehabilitation, feeding and bating of deer, mandatory CWD testing, and changes to season lengths and limits. Costs would vary depending on the size of the management area.
- Captive cervid owners and the NCDACS would also incur costs for disease management in the captive cervid population.
- Over time, the wild and captive cervid populations could be substantially reduced or eliminated.
- Lost recreational benefits from hunting could be in the tens of millions annually depending upon the extent of the disease, but these potential nonmarket losses are highly uncertain. The potential loss of elk-viewing tourism in future years could be anywhere from approximately \$0.6 to over \$5 million annually.
- The loss of the aesthetic and existence values of wild cervids is unknown.

Direct Impacts from Proposed Rules:

State:

- Additional communication, education, and outreach to in-state and out-of-state hunters and retailers about the new regulations are estimated to have a one-time annual cost of approximately \$20,140(\$18,822 NPV adjusted).
- An increase in citations for violations of the proposed rule are valued at \$205 each.

Local:

- Fines associated with citations for a rule violation include \$180 in local court costs.

Private:

- Violations of the proposed rule would cost hunters \$205 in citation costs and seizure of their cervid excrement which costs an estimated \$6-\$21.
- The direct impact to hunters that purchase attractants will be negligible. Retail of synthetic attractants (\$8-\$18) is similar to natural urine-based attractants (\$6-\$21).

Proposed Rule Text

15A NCAC 10B .0201 PROHIBITED TAKING AND MANNER OF TAKE

(a) It is unlawful for any person to take, or have in possession, any wild animal or wild bird listed in this Section except during the open seasons and in accordance with the limits herein prescribed, or as prescribed by 15A NCAC 10B .0300 pertaining to trapping or 15A NCAC 10D applicable to game lands managed by the Wildlife Resources Commission, unless otherwise permitted by law. Lawful seasons and bag limits for each species apply beginning with the first day of the listed season and continue through the last day of the listed season, with all dates being included. When any hunting season ends on a January 1 that falls on a Sunday, that season shall be extended to Monday, January 2.

(b) On Sundays, hunting on private lands shall be allowed under the following conditions:

- (1) archery equipment as described in 15A NCAC 10B .0116, falconry, and dogs where and when allowed the other days of the week are lawful methods of take, except as prohibited in G.S. 103-2;
- (2) firearms are lawful methods of take when used as described in G.S. 103-2; and
- (3) migratory game birds may not be taken.

(c) On Sundays, hunting on public lands is allowed with the following restrictions:

- (1) only falconry and dogs used in conjunction with falconry are lawful methods of take; and
- (2) migratory game birds may not be taken.

These restrictions do not apply to military installations under the exclusive jurisdiction of the federal government.

(d) Those animals not classified as game animals in G.S. 113-129(7c), and for which a season is set under this Section, may be taken during the hours and methods authorized for taking game animals.

(e) Where local laws govern hunting, or are in conflict with this Subchapter, the local law shall prevail.

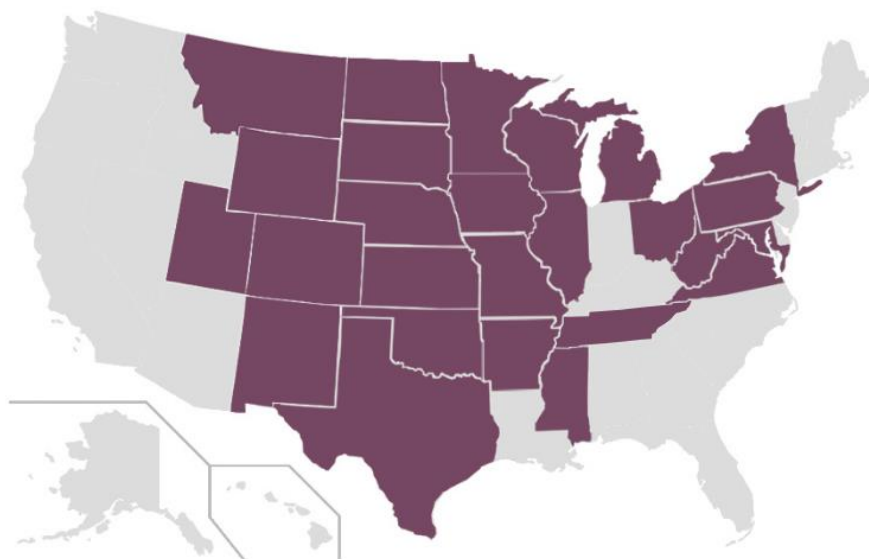
(f) No person shall possess or use any substance or material that contains or purports to contain any excretion collected from a cervid, including feces, urine, blood, gland oil, or other bodily fluid for the purposes of taking or attempting to take, attracting, or scouting wildlife.

*History Note: Authority G.S. 103-2; 113-291.1(a); 113-134; 113-291.2; 113-291.3;
Eff. February 1, 1976;
Amended Eff. May 1, 2016; August 1, 2012; July 10, 2010; July 1, 1996; July 1, 1987.*

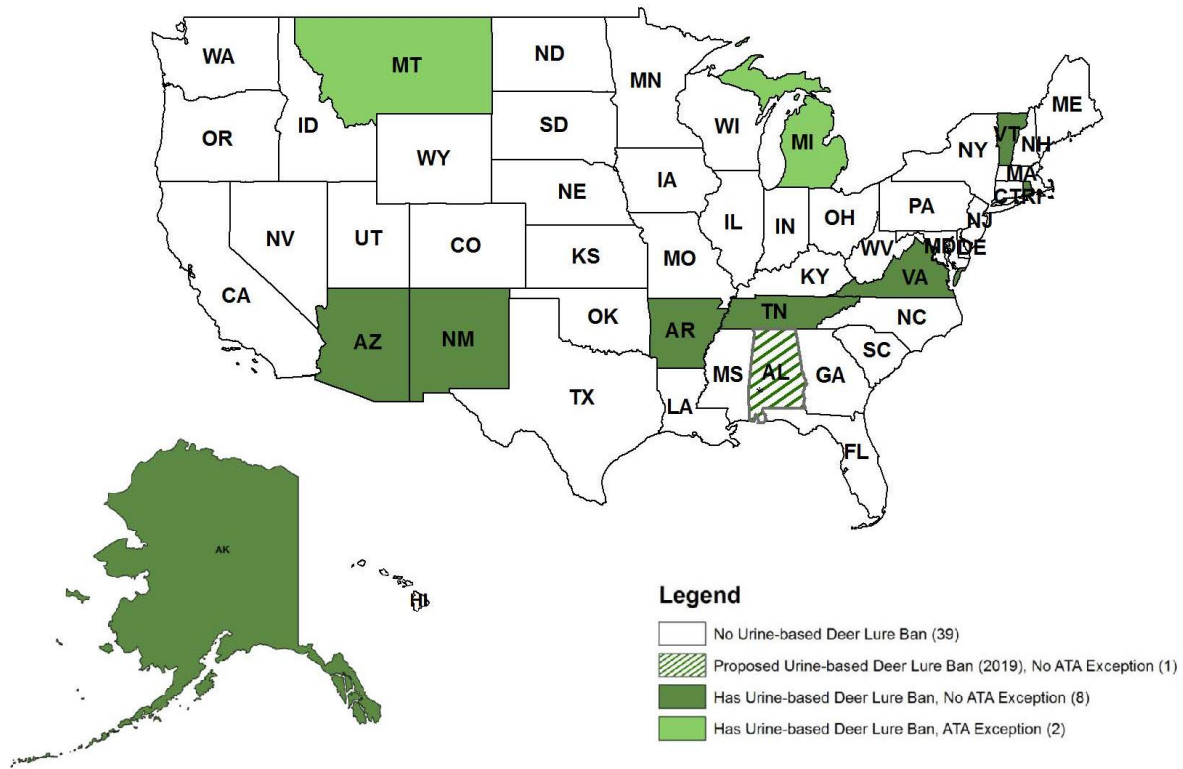
APPENDIX A

States where chronic wasting disease has been detected

United States



APPENDIX B



APPENDIX C

Estimated Cost of In-House Video Production

Position	Duties	Estimated Time (hrs)	Total Hourly Compensation	Total Personnel Cost per Video
Information & Communications Specialist II	Video production; recording footage + editing	56	\$ 38.08	\$ 2,132.33
Information & Communications Specialist II	roduction; recording footage +	32	\$ 38.08	\$ 1,218.48
Information & Communications Specialist III	Video review/editing	8	\$ 43.95	\$ 351.62
Conservation Biologist II	Video production	32	\$ 38.08	\$ 1,218.48
Conservation Management Administrator	Approval and oversight	4	\$ 54.65	\$ 218.60
				\$ 5,139.51
			NPV 7%	\$ 4,803.28
Total compensation based on midpoint salary for Grade and 10 yrs of service.				
NPV calculation: 7% discount rate. Cash flows held constant for each year.				

APPENDIX D

Estimated agency costs for implementing the CWD Response Plan

Field Response Team hours and mileage for one CWD Surveillance Area (based on the 2015 Response Plan and the 2013-2014 surveillance effort).								
Position	Duties	Estimated Time ^a	Total Hourly Compensation ^b	Total Personnel Cost Yr 1	Estimated Mileage ^b	Estimated Time Over 5-Years ^c	Total Personnel Cost Over 5-Years	Estimated Mileage Over 5-Years ^d
Private Lands Program Supervisor	Field Response Team Leader; Determine best location for a CWD operations facility; appoint a data coordinator; Secure additional sampling sources; assign personal to operate check	28	\$ 47.25	\$ 1,307.83	401	94	\$ 4,446.61	1,365
District Wildlife Biologist	Determine location of unconfirmed CWD-positive sample; Finalize list of all supplies and material needed; Collect a minimum of 1,500 animals for CWD samples; Develop CWD Monitoring and Mangement Plans.	398	\$ 38.08	\$ 15,151.00	6,048	1,194	\$ 45,453.00	18,144
Regional Engineering		71	\$ 38.08	\$ 2,700.83	1,035	213	\$ 8,102.49	3,104
Lands Management Supervisor		73	\$ 47.25	\$ 3,433.05	711	218	\$ 10,299.14	2,133
Deer Biologist		439	\$ 38.08	\$ 16,731.97	5,048	1,318	\$ 50,195.92	15,144
Wildlife Veterinarian		291	\$ 75.94	\$ 22,072.57	491	872	\$ 66,217.71	1,474
Permits Biologist		69	\$ 38.08	\$ 2,634.96	346	208	\$ 7,904.87	1,038
District Wildlife Enforcement Captain		69	\$ 54.65	\$ 3,781.78	346	208	\$ 11,345.34	1,038
Other Staff (per individual) ^e		78	\$ 38.08	\$ 2,964.33	1,273	234	\$ 8,892.98	3,820
Total				\$ 70,778.31	\$ 15,699.75		\$ 212,858.05	\$ 47,259.79
NPV 7%				\$ 66,147.95	\$ 14,672.66		\$ 178,590.50	\$ 39,649.42
<p>a. Estimated time is based on the average number of hours staff logged during the the 2013-2014 surviellance efforts (per position) plus the difference between collection efforts during the 2013-2014 surveillance and minimum requirements of the 2015 CWD Response Plan.</p> <p>b. Total compensation based on midpoint salary for Grade and 10 yrs of service.</p> <p>c. Estimated milage is based on the average milage staff logged during the the 2013-2014 surviellance efforts (per position) plus the difference between collection efforts during the 2013-2014 surveillance and minimum requirements of the 2015 CWD Response Plan.</p> <p>d. Five year estimates are based on the assumption no additional areas become CWD-positive in North Carolina and certain duties that are required in the first year are removed.</p> <p>e. Number of staff assisting in CWD collections vary among districts. This table assumes one additional staff member will be added to the group during sampling. If more are added, this number will be multiplied by the number of staff assisting.</p> <p>NPV calculation: 7% discount rate. 1st year= full annual amount, remaining four years calculated at 0.50 of first year for each year</p>								

Estimated agency costs for implementing the CWD Response Plan Continued

Logistical Response Team hours for one CWD Surveillance Area (based on the 2015 CWD Response Plan and recent CWD outreach efforts).							
Position	Duties	Estimated Time ^a	Total Hourly Compensation ^b	Logistics Team Personnel Cost Yr 1	Estimated Time Over 5-Years ^c	Logistics Team Personnel Cost 5-yr	
Division Chief	Logistical Response Team Leader	16	\$ 54.65	\$ 874.40	32	\$ 1,748.80	
Wildlife Veterinarian	List appropriate media contacts, draft press release, develop information section on website, identify stakeholders, begin preparations for public meeting; Create contact list of private land owners, captive cervid facilities, and fawn rehabbers; Review and report on General Statutes, Session Laws, and other local laws; Coordinate with a landfill; Identify options for carcass processing and disposal; Coordinate with NCDOT and USDA.	92	\$ 75.94	\$ 6,986.78	184	\$ 13,973.56	
Surveys and Research Program Supervisor		28	\$ 47.25	\$ 1,322.95	56	\$ 2,645.89	
Wildlife Diversity Program Supervisor		28	\$ 47.25	\$ 1,322.95	56	\$ 2,645.89	
Administration and Planning Section Manager		92	\$ 33.04	\$ 3,039.63	184	\$ 6,079.25	
Public Information Officer		163	\$ 38.08	\$ 6,206.62	326	\$ 12,413.23	
Information Technology Representative		155	\$ 38.08	\$ 5,902.00	310	\$ 11,804.00	
Division of Law Enforcement Representative		28	\$ 54.65	\$ 1,530.20	56	\$ 3,060.40	
Raleigh Office Administrative Assistant		155	\$ 33.04	\$ 5,121.11	310	\$ 10,242.22	
Total					\$ 32,306.63		\$ 64,613.25
				NPV 7%	\$ 30,193.11		\$ 55,760.72
a. Estimated time is based on the average number of actual staff hours logged during CWD outreach efforts.				After 1 year		After 5 years	
b. Total compensation based on midpoint salary for Grade and 10 yrs of service.							
c. Five year estimates are based on the assumption that no additional areas become CWD-positive in North Carolina and certain duties required in the first year are unnecessary in subsequent years.							
NPV calculation: 7% discount rate. 1st year=full annual amount, remaining four years calculated at 0.25 of first year for each year.							

Estimated agency costs for implementing the CWD Response Plan Continued

Minimum number of supplies needed for one CWD Surveillance Area for one year of surveillance (based on 2015 CWD Response Plan).				
Item	Price	Quantity	Total 1-YR	Total 5-YR
Extra Large Gloves	\$ 74.90	1 case(s) of 1000	\$ 74.90	\$ 374.50
Large Gloves	\$ 74.90	1 case(s) of 1000	\$ 74.90	\$ 374.50
Formalin	\$ 188.30	5 5 gallons	\$ 941.50	\$ 4,707.50
Sample Container	\$ 165.82	4 case(s) of 400	\$ 663.28	\$ 3,316.40
Testing of Samples	\$ 30.00	1,500 each	\$ 45,000.00	\$ 225,000.00
Total			\$ 46,754.58	\$ 233,772.90
NPV 7%			\$ 43,695.87	\$ 191,703.01