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EFB 390 Wildlife Ecology and Management

Game Farm Final Paper

The existence of game farms is a highly debated and controversial subject; although game farms are greatly stigmatized, proponents argue that they hold historic and economic value. In the U.S., captive white-tailed deer farms are distributed throughout the country. The role of game farms in the U.S. does involve a multitude of risks and concerns, but there is evidence that game farms also provide several benefits. The ecological impact of deer farms is one of the most important factors to consider. In addition to historically contributing to the spread of diseases such as chronic wasting disease, deer farms also negatively impact the environment through factors like overgrazing. However, it is often argued that game farms are valuable for the economic benefits they provide, such as the selling of a variety of products and offering private hunting experiences; many experts cite deer farms as having the potential to become a strong industry with multiple economic benefits. Altogether, there are multiple factors to consider regarding the management of deer farms.

A primary ecological concern of white-tailed deer farms is the spread of disease. As with farming domesticated livestock, transmission of disease is facilitated by putting animals in closer proximity through practices such as feeding troughs. Further, controlling disease is complicated by the difficulty of diagnosing and treating captive cervids, which is less reliable than that of domesticated livestock. For instance, certain cervid species tend to mask early signs of disease, and vaccines for certain diseases are either not available or as reliable for captive cervids (Lupi and Schulz 2001). Because of the heightened risk of disease transmission, monitoring and management is important especially when considering diseases like chronic wasting disease.

Chronic wasting disease, or CWD, has become a great concern since its detection in the late 1960s, where it was first identified in a Colorado research facility (CDC 2021). CWD is a fatal prion disease effecting deer, elk, and moose that causes spongy deterioration of the brain. Infected animals experience changes in behavior and appearance as the disease progresses over a period of weeks or months, including dramatic weight loss, altered stance, stumbling, hyperexcitability and eventual death (Saunders et al. 2012). In game farms, management options are limited, as no treatment or vaccination options are available (Williams et al. 2002). If initial prevention of CWD fails, the only real option is a complete cull of the farmed animals. Transmission of the CWD prions occurs either through bodily fluids or through environmental contamination of soil, food, or water (CDC 2021). The environment can become contaminated through both shedding from diseased animals and the death of diseased animals; scavenger and predator species can easily further spread the disease as well (Saunders et al. 2012). Additionally, the disease is highly persistent. In an experimental study examining the environmental sources of prion transmission in mule deer, it was documented that CWD can persist in contaminated environments for a period of greater than two years, which can greatly increase the risk of transmission (Miller et al. 2004). Although there have been no reported cases of infection in humans and indications of low zoonotic potential, there is still a concern over human exposure to CWD through handling or consumption of cervid material (Saunders et al. 2012). Certain primates, specifically squirrel monkeys, have been found to be orally susceptible to CWD; it is concerning that any primate is susceptible to CWD, although other primates like the Cynomolgus macaque were found to be resistant (Saunders et al. 2012). As CWD becomes more prevalent, any zoonotic potential becomes a greater concern.

There is evidence that game farms have played a critical role in the continued spread of chronic wasting disease. Although CWD was originally thought to be limited and slow in its rate of expansion, it is now acknowledged that its spread has been exacerbated by the market-driven movement of infected animals (Williams et al. 2002). The movement of captive cervids is the most widely accepted explanation for the arrival of CWD in Canada and in Wisconsin, for example (Evans et al. 2014). One case that exemplifies the relationship between the spread of CWD and game farms is Pennsylvania’s growing game farm industry and the arrival of CWD. In 2002, Pennsylvania ranked second in the number of commercial deer and elk farms, following only Texas; further, game farms were recognized as a rapidly growing industry in Pennsylvania as of 2007, with 134 farms created within a span of a year and deer farms present in 60 of 67 Pennsylvanian counties (Shepstone Management Company 2007). However, Pennsylvania detected its first case of CWD in 2012 in a captive farmed deer (Evans et al. 2014). Since then, the state has implemented restrictions in attempts to curb the spread of CWD, and the number of game farms dropped from 1,200 in 2014 to 700 in 2021 (Hayes 2022). Looking at the distribution of chronic wasting disease in North America, there is continues to be a hotspot of CWD in the captive facilities of Pennsylvania as of 2022 (National Wildlife Health Center 2022). Despite the evidence that CWD often occurs in pockets around game farms, the connection is often refuted by individuals benefitting from the industry; for instance, Josh Newton, the president of the Pennsylvania Deer Farmers Association, states that the connection between deer farms and CWD is a false narrative that has been pushed for years and banning deer movement will not have an effect on the prevalence of CWD (Hayes 2022).

Deer farms also have an ecological impact through overgrazing. Deer can disrupt ecosystem processes through a number of behaviors including trampling, defecation, urination and especially browsing; as selective browsers, they will unequally consume preferred vegetation with a higher nutrient content and lower level of structural and chemical defenses (Mysterud 2006). Selective browsing has a number of consequences on the ecosystem. For instance, it has been found that deer can contribute to differences in understory and overstory vegetation. Browse tolerant species are allowed to proliferate at the expense of preferred browse species (Long et al. 2007). Further, this unequal browse also often contributes to the success of invasive weeds at the cost of native species (Koh et al. 1996). Deer browsing can also have other indirect effects, including its effects on stream ecosystems. Overgrazing affects the ability of understory vegetation to retain nitrogen and mitigate soil runoff; understory degradation as a result of excess deer herbivory was found to directly relate to increased exports of nitrate and suspended sediments from hillslopes to streams (Sakai et al. 2022).

Despite ecological concerns, deer farms are often endorsed because of their potential to produce economic benefits. For example, deer farms offer a wide array of products to be sold. This includes major products such as breeding stock, meat (venison), and hunt bucks as well as minor products such as hard antlers, velvet antler, urine, hides, tails, sinew, and antler buttons (Lupi and Schulz 2001). Velvet antler is marketed as a dietary supplement, although most of this market consists of velvet antler from elk and not deer. Although white-tailed deer do produce velvet antler, they do not produce as much as elk, and the handling of deer is more difficult than of elk (Lupi and Schulz 2001). Hard antler is often sold as a decorative piece or for furniture, while products like urine are used as hunting aids. Another possible source of revenue is venison, which is sold to wholesalers or to specialty markets for a greater profit. Paid private hunting is an additional profitable aspect of owning a game farm. Mike Sheppard, a former game farm owner, profited mainly from selling animals, but also made a large percentage of his revenue from selling meat and holding hunts on his farm (Sheppard pers. comm. 2022). He held several hunts with sportsmen clubs, where up to 100 people would archery hunt in a day, in addition to daily hunts with individual hunters, although he did not lodge the hunters like other game farms often do for greater profit (Sheppard pers. comm. 2022).

Proponents of game farms often promote deer farms for their potential to be a strong industry that provides economic benefits and employment opportunities. For instance, Pennsylvania was experiencing a growth in its game farm industry in the 2000’s before restrictions due to CWD went into effect. In 2007, it was determined in a survey of deer and elk farmers that game farms in Pennsylvania represented a $103 million industry at minimum and generated a total of nearly 3,500 jobs either directly or indirectly (Shepstone Management Company 2007). Further, they predicted the industry would continue experiencing growth, with predicted sales in 2010 projected to increase by 150% from sales in 2001 (Shepstone Management Company 2007). This survey of Pennsylvanian deer and elk farmers also reported that game farms put a large portion of their income back into the economy and especially within state; for instance, not including spending on land, buildings, fencing or equipment, deer and elk farms spent an estimated $37.2 million annually on operations, with 88% of this spent within the state (Shepstone Management Company 2007).

There are several factors to consider from a management perspective regarding deer farms. In the U.S., deer farms are regulated by the United States Department of Agriculture and the U.S. Fish and Wildlife Service, and owning a white-tailed deer farm in New York State requires a commercial license authorized by the New York State Department of Environmental Conservation (NYSDEC 2022). A commercial license from the NYSDEC costs $200 and allows individuals to purchase captive-bred deer from other commercial license holders, breed and transport captive-bred deer for personal use, and sell dead or alive captive-bred deer to other licensed white-tailed deer breeders (NYSDEC 2022). A $40 personal use license is also available but does not authorize the selling of captive-bred deer (NYSDEC 2022).

An important aspect in the management of cervid game farms is the design of the farms itself. For instance, the type of fencing and the layout of fencing according to the site’s topography is critical in preventing both the escape of captive animals and native wildlife entering captive facilities. Strict fencing regulations exist in states such as Colorado to prevent escapes and ingress (Lupi and Schulz 2001). To be effective, fencing must be tall enough and of a fine mesh to prevent the movement of animals and strong enough to withstand animal impacts (Lupi and Schulz 2001). For instance, in Michigan and some other states, the minimum height requirement for captive deer facilities is 10 feet (Lupi and Schulz 2001). The topography of the farm also needs to be brought into consideration; in hilly areas, it might be necessary to reinforce fencing or bury fencing, and animals may be able to use hillslopes to jump over fencing downslope (Lupi and Schulz 2001). The eight documented methods of escape by captive cervids all concern fencing failures: poor fence maintenance; inadequate fence height; environmental factors like floods or fallen trees damaging fences; vandalism; animals destroying fences; animals crawling under fences; snow creating bridges; and poor fence construction (Lupi and Schulz 2001). However, the need for substantial fencing can hurt game farmers such as Mike Sheppard, who pointed to fencing as a major economic cost; with an over 200-acre farm, 10 to 12 foot fencing priced at $89 in addition to $29 barbed wire is a significant expense (Sheppard pers. comm. 2022). Even with adequate fencing, there is still a great risk of animals escaping, and the movement of escaped captive cervids is a serious issue regarding the management of captive cervids especially when considering the ecological damage they can cause.

With the dangers and risks that accompany game farms for cervids, the debate over their existence is understandable. Deer farms can contribute to ecological destruction through the spread of diseases like CWD and through their preferential grazing behavior. Even weighing any possible economic benefits, the risks and negative components of keeping captive deer farms are too great. This is especially true when considering the extent of overpopulation of deer in the U.S.; why should so many captive deer farms be allowed to exist when they contribute to and worsen the problems already caused by the large populations of wild deer? Some may argue that we should instead reconsider legislation regarding the sale of materials from wild hunted game, rather than continue to operate game farms. It would be worthwhile to consider different options or to move away from deer farms entirely.

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