Baiting and Feeding Deer Research

Blanchong, et al, Changes in Artificial Feeding Regulations Impact White-Tailed Deer Fine-Scale Spatial Genetic Structure, Journal of Wildlife Management, 2006.

- Using hunter-harvested deer from two regions of the northeast lower peninsula of Michigan - while artificial feeding was ongoing researchers observed no evidence of spatial genetic structure across either region
- When artificial feeding was banned, found significant genetic differentiation among groups of deer in both regions
- The results illustrate how analyses of the degree to which natural populations are spatially genetically structured can be used to infer the effects of human actions on wildlife movement patterns, breeding behaviors, and disease transmission that are difficult to determine using traditional methods

Brown and Cooper, The Nutritional, Ecological, and Ethical Arguments Against Baiting and Feeding White-Tailed Deer, Wildlife Society Bulletin, 2006.

- The use of food plots, supplemental feeding, and baiting has been a common and legal practice in Texas for many years
- A properly managed deer herd does not need supplementation, and a deer hunter does not need bait. There is a risk to damage the habitat and to deer and other wildlife populations with supplemental feeding.

Cross, et al, Estimating the Phenology of Elk Brucellosis Transmission With Hierarchical Models of Cause-Specific and Baseline Hazards, Journal of Wildlife Management, 2015.

- Understanding the seasonal timing of disease transmission can lead to more effective control strategies, but the seasonality of transmission is often unknown for pathogens transmitted directly
- In western Wyoming, supplemental feeding of elk begins in December. Years with more snow may enhance elk-to-elk transmission on supplemental feeding areas because elk are artificially aggregated for the majority of the transmission season.

Forristal, et al, Effects of Supplemental Feeding and Aggregation on Fecal Glucocorticoid Metabolite Concentrations in Elk, Journal of Wildlife Management, 2012.

- Investigating the effects of supplemental feeding and the aggregation that it induces on behavior.
- Habitat modifications and supplemental feeding artificially aggregate some wildlife populations with potential impacts upon contact and parasite transmission rate.
- The results suggest that increases in aggregation associated with winter feed grounds affects elk physiology.

Georgsson, et al, Infectious agent of sheep scrapie may persist in the environment for at least 16 years, Journal of General Virology, 2006.

- In Iceland, it was confirmed that scrapie prions (scrapie is a CWD-like disease of sheep) remain viable in the environment for a minimum of 16 years.

Hines, et al, Effects of supplemental feeding on gastrointestinal parasite infection in elk, 2007.

- The effects of management practices on the spread and impact of parasites and infectious diseases in wildlife and domestic animals are of increasing concern worldwide, particularly in cases where management of wild species can influence disease spillover into domestic animals.
- Researchers tested the effect of supplemental feeding on gastrointestinal parasite infection in elk.
- The patterns suggest that supplemental feeding may increase exposure of elk to gastrointestinal nematodes.

Johnson, et al, Oral Transmissibility of Prion Disease is enhanced by Binding to Soil Particles, PLoS Pathog, 2007.

- Soil may serve as an environmental reservoir for prion infectivity and contribute to the horizontal transmission of prion diseases.
- This follow-up study confirmed that prions, when bound to soil particles, are nearly 700 times more infectious than the prions are when not bound to soils.

Johnson, et al, Prions Adhere to Soil Minerals & Remain Infectious, PLoS Pathog, 2006.

- An unidentified environmental reservoir of infectivity contributes to the natural transmission of prion diseases.
- Prion infectivity may enter soil environments via shedding from diseased animals and decomposition of infected carcasses.
- A study completed at the University of Wisconsin-Madison and the National Wildlife Health Center conclusively demonstrated that prions bind to some soil particles and remain infectious.

Kjaer, et al, Spatial and Temporal Analysis of Contact Rates in Female White-Tailed Deer, Journal of Wildlife Management, 2008.

- Researchers assessed habitats in which contacts occur to test whether direct contact rates among female white-tailed deer in different social groups differs among land-cover types.
- Contact rates during the gestation season were greater than expected from random use in forest and grassland cover, whereas contact rates during the fawning period were greater in agricultural fields than in other land-cover types. Contact rates were greatest during the rut and lowest in summer.
- Both spatial and temporal analyses suggest that contact between female deer in different social groups occurs mainly during feeding, which highlights the potential impact of food distribution and habitat on contact rates among deer

Mathiason, et al, Infectious Prions in Pre-Clinical Deer and Transmission of Chronic Wasting Disease Solely by Environmental Exposure, PLoS ONE, 2009.

- The researchers previously reported that saliva and blood from CWD-infected deer contain sufficient infectious prions to transmit disease upon passage into naıve deer.
- Healthy deer were kept in an indoor pen with feeders, troughs, & bedding taken from another pen where CWD-positive deer were housed - these deer, which never had contact with sick deer, but only with contaminated materials, developed CWD.

Miller, et al, Environmental Sources of Prion Transmission in Mule Deer, Emerging Infectious Diseases, 2004.

- In a Colorado study, pens previously containing CWD-positive deer were left fallow for over two years.
- When healthy deer were placed in these pens, some of them contracted CWD, presumably from the environment.

Milner, et al, To Feed or not to Feed? Evidence of the Intended and Unintended Effects of Feeding Wild Ungulates, Journal of Wildlife Management, 2014.

- Researchers examined whether any potential unintended consequences of feeding occur and under what conditions.
- The unintended effects of feeding are typically complex, involving changes to demography, behavior, and vegetation with consequent cascading effects on other trophic levels, as well as exacerbated risks of disease transmission.
- Increased ungulate density is the primary driver behind these unintended effects, the consequences of which tend to increase with longevity of feeding and affect a range of stakeholders.

Orams, Feeding wildlife as a tourism attraction: a review of issues and impacts, Tourism Management, 2002.

- The feeding of wildlife has become a popular means by which tourists and tourism operators can facilitate close observation and interaction with wildlife in the wild.
- Deliberate and long-term provision of food to wildlife has been shown to alter natural behavior patterns and population levels. It has resulted in the dependency of animals on the human provided food and their habituation to human contact.
- There are important health implications arising from artificial food sources where injury and disease have resulted.
- The great majority of cases show negative impacts arose from supplemental feeding of wildlife. In a limited number of cases, the wildlife can be shown to have benefited as well.

Ramsey, et al, Forecasting Eradication of Bovine Tuberculosis in Michigan White-Tailed Deer, Journal of Wildlife Management, 2014.

- The Michigan Department of Natural Resources is faced with managing a protracted Bovine tuberculosis outbreak with shrinking economic resources, its initial control strategies approaching, or having reached the limits of their effectiveness.
- Simulations indicated that current MDNR management strategies are unlikely to eradicate bTB from the core outbreak area's deer population within the next 30 years.
- Simulations indicated that if bTB was eradicated from the core outbreak area, a single infected deer introduced into the area would be 8 times more likely to re-establish bTB if baiting was occurring.
- Spatial models are ideally suited to investigating spatial heterogeneity of disease transmission, and how transmission is influenced by aggregating factors such as baiting or supplemental feeding.

Rudolph, et al, Regulating Hunter Baiting for White-Tailed Deer in Michigan: Biological and Social Considerations, Wildlife Society Bulletin, 2010.

- Researchers reviewed the process used to evaluate a strategy for regulating bait use by hunters in Michigan.
- This review included an assessment of five factors: statewide spatial analysis of apparent TB prevalence, deer intraspecific interactions at bait sites, effects of bait on hunter harvest rates, impacts of disease presence and practice of eradication efforts on hunting participation in the infected area, and input from law enforcement personnel.
- The analysis suggested that restricting baiting to a limited, consistent region incurred less biological risk than allowing bait to be used statewide and less political risk than a statewide ban.

Smith, Winter Feeding of Elk in Western North America, Journal of Wildlife Management, 2001.

- Winter feeding of elk is a topic that has engendered a great deal of debate among wildlife biologists, policy makers, and the general public.
- Several negative consequences result from feeding elk. These include the monetary costs of feeding, excessive herbivory that alters plant community structure and consequently affects the value of habitats near elk feed grounds to other wildlife species, changes in elk behavior that are of both spatial and philosophical significance, diseases, which are more readily transmitted among densely concentrated animals, threaten the welfare of elk and other species, and shape resource management, and public perceptions that may lead to the devaluing of habitat.
- The researcher suggests proactive alternatives to winter feeding, which may avert conflict situations that precipitate public and political pressures to feed elk.

Sorensen, et al, Impacts of wildlife baiting and supplemental feeding on infectious disease transmission risk: A synthesis of knowledge, Preventive Veterinary Medicine, 2014.

- The researchers provide a comprehensive review of the scientific evidence of baiting and supplemental feeding on disease transmission risk in wildlife, with an emphasis on large herbivores in North America.
- Feeding can lead to increased potential for disease transmission either directly (via direct animal contact) or indirectly (via feed functioning as a fomite, spreading disease into the adjacent environment and to other animals).
- Feeding practices represent a serious risk to the maintenance of biodiversity, ecosystem functioning, human health, and livestock production. Wildlife managers should consider disease transmission as a real and serious concern in their decision to implement or eliminate feeding programs.

Thompson, et al, Alternative feeding strategies and potential disease transmission in Wisconsin white-tailed deer. Journal of Wildlife Management, 2008.

- Researchers conducted experimental feeding using three feeding methods (pile, spread, & trough) and two quantities (rationed and ad libitum) of shelled corn to compare deer activity and behavior with control sites and evaluate potential direct and indirect transmission of infectious disease in white-tailed deer in central Wisconsin.
- Supplemental feeding poses risks for both direct and indirect disease transmission due to higher deer concentration and more intensive use relative to control areas.

- The results indicated that restrictions on feeding quantity would not mitigate the potential for disease transmission.

Van Deelen, et al, Relative Effects of Baiting and Supplemental Antlerless Seasons on Wisconsin's 2003 Deer Harvest, 2003.

- Management for reduced deer populations requires that costs associated with baiting (disease transmission risk) be weighed against benefits (increased hunter efficiency).
- The analysis suggests that creating additional opportunities for hunting antlerless deer with firearms was more effective at achieving herd reduction than baiting.

Van Deelen, Chronic Wasting Disease and the Science in support of the Ban on Baiting and Feeding Deer, Wisconsin DNR Research.

- Reliable science provides support for a ban of baiting and feeding of white-tailed deer to reduce disease risks for CWD.
- Under a baiting and feeding ban, disease outbreaks are more likely to be smaller in scale and more apt to be contained or eliminated.
- With the long CWD incubation period and other factors that make discovery of a new outbreak difficult, an outbreak that is already widespread when detected because of baiting and feeding may not be able to be contained or eliminated.

Warnke and Jacques, Baiting and feeding of deer in Wisconsin (Update 2008).

- Baiting and feeding cause unnatural concentrations of deer and their activity likely increasing the risk of disease infection and spread, and repeated use of feeding and baiting areas poses a long term risk of disease transmission.
- Deer impact forest composition and structure statewide. Artificially high deer populations supported by baiting and feeding magnify the breadth and depth of deer impacts. In some areas, forest regeneration of all but a few species (spruce and fir) cannot be maintained without expensive protection measures.
- From an agricultural perspective, the discovery of Bovine Tuberculosis in the dairy state would result in the dairy and beef industry losing its TB free status. Michigan estimates that TB has cost its producers $121 million over 10 years.