Influence of Deer Harvest Regulations on Antlerless Harvest, Abundance, and Sex and Age Composition: Implications for Managing Deer in the Face of Chronic Wasting Disease

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Deer hunting is culturally and economically important throughout Michigan and the United States, but it is also a critical tool for wildlife management. White-tailed deer population management and disease management are highly dependent on hunting regulations and hunter harvest. This is especially true as it relates to managing chronic wasting disease (CWD), a fatal disease that infects deer. Currently, CWD is jeopardizing the health of deer populations and undermining conservation across the nation—and Michigan is no exception.

Deer behave differently among sex and age classes, and as a result, CWD prevalence rates differ among sex and age classes. States often alter deer harvest regulations to change the sex and age composition of harvests with the expectation that this will result in population-level changes in deer abundance and composition. For example, mandatory antler point restrictions (APRs) that limit harvest of younger antlered bucks can increase the average age of bucks. APR regulations may also shift harvest pressure to antlerless deer, resulting in a reduction in deer abundance. It is worth noting that this shift and reduction has not been observed in all places with APRs. Overall, natural resource agencies have limited information on how, and to what degree, deer harvest regulations affect the true population. This limitation is relevant because CWD transmission rates are related to the deer's sex and age, thus different harvest regulations could have different implications for CWD transmission. The APR Study is attempting to fill these knowledge gaps.

The idea for the APR study was originally brought forth by The Natural Resource Commission (NRC), a 7-member public body whose members are appointed by the Governor of Michigan. The NRC plays a key role in wildlife management because they have authority to regulate the taking of game, such as white-tailed deer. In 2019, The NRC implemented APRs in a core CWD area and requested that the Department of Natural Resources (DNR) assess the impacts of this regulation change. So, researchers from the DNR and Michigan State University (MSU) teamed up to tackle the study—supported by a portion of the funding provided by Public Act 207 of 2018 to the Department of Natural Resources and Michigan State University. The APR Study aims to evaluate if there are impacts of APRs on antlerless deer harvest, population abundance, and the sex and age composition of the deer population. One unique feature of the APR Study is that scientists were able to couple a harvest regulation change with the research process from the very beginning—and opportunities to do this are few and far between.

To address the research question, the research team implemented an extensive and statistically valid experiment in the 5-county Core CWD Area in western Michigan. For this field study, the Core CWD Area was divided into two regions. In the eastern APR Zone (Mecosta, Montcalm, and Ionia counties), hunters may harvest only those bucks with at least four points on a single antler. In the western Non-APR Zone (Newaygo and Kent counties), hunters may harvest any buck with at least one antler 3 inches or longer. For the study sites, the researchers identified 4 pairs of APR and Non-APR townships with similar landscape characteristics. The pairing allows researchers to compare deer populations under different harvest regulations over time. Eighteen infrared cameras are randomly distributed across each of the townships to get a clear, unbiased snapshot of the deer populations. The cameras were deployed in the summer months before the first hunting season under APR regulations and will be deployed for 3 summers following the regulation change (2019 – 2022). Because the cameras produced enormous numbers of photographs (>1 million photos) in the first two field seasons, the researchers are using artificial intelligence software to filter out all photos without animals. Analyses are ongoing and likely to produce a unique data set valuable to Michigan and across the Midwest.

The ongoing APR Study will not (and was not designed to) measure CWD prevalence and spread directly. Instead, the study will produce estimates on deer abundance and sex and age composition, factors that are likely to contribute to CWD spread and prevalence. These estimates can then be fed into computer simulation models developed to investigate CWD prevalence and spread. These state-of-the-art models will allow the DNR to ‘test drive’ various combinations of regulations and evaluate their potential impacts on CWD. This process will better inform disease management and harvest guidelines both in Michigan and on a national scale.

While CWD presents substantial challenges to hunters and to conservation, new and better techniques and management regimes are being developed to assure that deer populations remain healthy, and that deer hunting remains a vibrant part of Michigan’s outdoor heritage and traditions for decades to come.