Pulling on the Same End of the Rope: Developing a Regional CWD Adaptive Management Framework

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Chronic wasting disease (CWD) in Michigan's white-tailed deer creates severe biological, political and economic impacts that negatively affect the state's citizens. Wildlife management agencies are charged with developing and implementing control measures to slow the growth and spread of the disease; however, this is a monumental task given the lack of proven effective management strategies and the controversial nature of many control efforts. Additionally, examining the effectiveness of disease management actions in Michigan is challenging due to the limited number of management actions that can be evaluated within a state; difficulty in sustaining management policies for a sufficient length of time to achieve desired results because of shifting stakeholder views; and the lack of mechanisms to rigorously evaluate control efforts during implementation.

One solution to overcoming these challenges of CWD management in Michigan, is the development and implementation of a regional adaptive management approach. Adaptive management was identified as a strategic issue in Michigan Department of Natural Resource's Wildlife Division Strategic Plan, as a high priority at the 2019 MSU/UW CWD Research Consortium meeting and is listed as a CWD best management practice by the Association of Fish and Wildlife Agencies (AFWA; Gillin and Mawdsley 2018). First, regional adaptive management leverages the collective responses of multiple agencies permitting the evaluation of multiple CWD management strategies simultaneously. This includes strategies not feasible in Michigan due to various constraints. Second, working across the region also provides broad support for control efforts allowing them to persist for a sufficient length of time to evaluate their impacts on CWD. Coordinating efforts provides Michigan's management agencies with critical support for policymaking by harnessing consistent inter-agency messaging regarding the science and appropriate response efforts. Third, because neither deer nor CWD respect geopolitical boundaries it is necessary to adopt a coordinated disease management strategy that aligns with the movement of deer and spread of CWD across the region. Regional coordination provides Michigan's management agencies with critical support for policymaking by harnessing consistent inter-agency messaging regarding the science and the appropriate response efforts being implemented. Lastly, the appeal of using an adaptive management framework is the ability to employ a learning process that facilitates active management while assessing the efficacy of current CWD management strategies, all while still actively managing the disease. Thus, a regional adaptive management approach to CWD will permit a cost-effective evaluation of the effectiveness of disease control efforts to guide, adapt and ultimately improve current and future CWD management in Michigan and across the region.

A regional CWD adaptive management framework requires a two-phase learning approach. Phase I entails identifying and understanding stakeholder needs surrounding deer and CWD management; developing clear and measurable objectives; identifying alternative CWD management strategies; creating statistical tools/models to measure the consequences of management alternatives; and developing a monitoring plan to gauge deer and CWD response to management. This process would also involve an optimization method to identify disease control solutions that are optimal with respect to the objectives specified by the decision makers.

Phase II leverages the output from the Phase I to identify optimal management alternatives. Following the application of disease control actions, periodic assessments of deer and CWD will be performed to ascertain the impacts of management using models developed as part of this proposal. Finally, an assessment is made regarding the effectiveness of management by comparing model predictions with observations obtained from a targeted monitoring program, and efforts are shifted to the most effective approach.

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