

MINUTES
NATURAL RESOURCES COMMISSION MEETING
July 11, 2019
MSU Veterinary Diagnostic Laboratory
4125 Beaumont Road, Lansing, MI 48910

Present for the Natural Resources Commission

Vicki Pontz, chair
Rex Schlaybaugh
John Walters
Louise Klarr
Keith Creagh
David Nyberg
Chris Tracy

Present for Department Staff

Daniel Bock, legal counsel, Office of the Attorney General
Dan Eichinger, DNR director
Shannon Hanna, deputy director
Trevor VanDyke, DNR legal and legislative director
Brooke Parmalee, DNR legislative assistant
Cheryl Nelson, NRC executive assistant

COMMITTEE OF THE WHOLE

Chair Vicki Pontz called the Natural Resources Commission (commission) meeting to order at 1:00 p.m.

Director's Report

Partner's in Conservation Award

Director Eichinger described the Partner's in Conservation Awards which are employee-nominated and given by the department and commission to individuals, groups, organizations and units of government for their volunteer service. **Steve Wyckoff** was chosen for his lengthy list of achievements to Michigan's natural resources conservation that cover over forty years. **Mr. Wyckoff** has a reputation for volunteering his time to work with partners to find solutions for a variety of complicated issues including habitat conservation, public access, long-term funding of natural resources management and recruitment, retention and reactivation.

Director Eichinger read the white pine plaque expressing the department's and commission's gratitude for his partnership.

Chronic Wasting Disease (CWD) Regulations Update

Wildlife division chief, **Russ Mason** and deer and elk specialist **Chad Stewart** presented the department's responses to the eleven amendments that were requested by various commissioners at the June 13, 2019, commission meeting.

- Amendment request 1: Allow hunters with disabilities a baiting exception for the entire season; the department does not support as stated.
Schlaybaugh asked what impacts would be anticipated on this expanded period of time from the Law Enforcement division (LED). **Chief Hagler** responded that the division would be able to work with this proposed amendment.
Creagh asked if the department has contemplated allowing baiting on specific/special circumstances for a short period of time to reduce potential risk with a specialized permit. **Mason** responded that the department has that capacity. **Pontz** asked for the approximate number of Liberty hunt licenses sold, which was about 30,000 in 2018 and included youth; for the Independence hunt there were about 2,000 licenses sold. This would mean that between 2,000 and 4,000 hunters would be allowed to hunt with bait.
- Amendment request 2: Remove all mandatory antler point restrictions (APRs) from chronic wasting disease (CWD) and APR study area: the department does not support this amendment request.
Eichinger added that this study is being done pursuant to a commission resolution, and to fundamentally alter the design would not allow the department to proceed as they were initially instructed through that resolution. **Schlaybaugh** added that this would not be an appropriate use of limited resources. **Eichinger** and **Schlaybaugh** both stated that it would not be necessary to go through with the study if commissioner **Tracy's** amendment passed. **Commissioner Tracy** said that the commission had asked for a closed-ended study, when they should have asked for an open-ended study. He thought that the commission should have asked the scientists what the department and MSU partners think the commission should be looking at collectively to get the most bang for the buck related to CWD. The department should have come back with suggestions. **Tracy** said that if we go forward with this the department will be utilizing much more finances than first thought. There is still time now to ask the open-ended question to the scientists; what they think would be the best utilization of limited resources. **Tracy** asked **Stewart** and **Mason** if they would have gone on this path had the commission asked an open-ended question in the beginning. **Director Eichinger** added that the department received appropriations from the Legislature and Governor to work on CWD research. There is much work being done by both the department and MSU research to answer the open-ended questions as well. **Schlaybaugh** added that the commission was looking to learn about prevalence and disease but sample size does not let this be achieved. The department can learn about population dynamics that will lead to the commission making better decisions for CWD management. **Tracy** asked if this is the right thing for the department to be doing for the next multi-year period; adding that the department is on record that APRs should not be put in the CWD

area. He said that the department is forced to go in that direction because of what the commission has directed. **Eichinger** also added that the intent of the study is to know what we are working with and if those items will or will not work in the fight against CWD. **Pontz** commented that when the resolution was passed, the commission was looking to learn if certain regulatory structures can help to achieve goals for managing CWD. The commission didn't define the parameters of the study, it was left up to the department in communication with university scientists to design a study to help the commission look at that question. The intention was to gather information to help inform future decisions.

- Amendment request 3: Remove mandatory APRs from Montcalm county in CWD/APR study, the department does not support this amendment.
- Amendment request 4; Flip the CWD/APR treatment and control areas, the department does not support this amendment.

Chair Pontz said that she felt the previous three amendments could be viewed as putting the commission in the position of designing the study; which was not the commission's intent, it was for the department to design the study with input from university researchers. **Tracy** felt that the transparency was lacking in discussing the building of the study, it was not a fully-engaged process.

Minimally, if department scientists attend meetings with other states who attended the 2017 CWD Symposium, they could ask why Michigan would be using APRs in Montcalm county. **Pontz** countered saying it is also possible that other states may say they are glad Michigan is doing this type of study that they have yet to take the risk of doing but will be interested in the findings as well.

Commissioner Creagh added relative to **Tracy's** earlier comment that the scientists should design the study and he appreciates external voices, but it should be designed by the scientists. **Creagh** continued by adding that this is what has been attempted by MSU and the department with the commission setting the broader-based parameters and then let the scientists do it. He asked chief **Mason** about the use of a paired or counterbalanced design in which the treatment and control areas would be flipped after some period of time. **Mason** agreed that a true counterbalanced design would be ideal, but that in the present case, the control townships were too close to the county edges. As a practical matter, if the treatment and control areas were flipped, **Mason** thought it likely that data collected in the flipped control to experiment areas would be confounded or contaminated and thus of little use.

- Amendment request 5: Allow single bite baits in the Upper Peninsula (UP) CWD core zone, the department does not support this amendment.
- Amendment request 6: Remove APRs in deer management unit (DMU) 122, the department does not support this amendment.

Commissioner Tracy asked if DMU 122 could potentially be up for consideration for the regular deer regulations cycle in 2020; **Stewart** indicated that it would depend on the surveillance results in the UP and the preliminary study results in the Lower Peninsula.

- Amendment request 7: Remove APRs from the first tag of the combo license in the UP, except for Drummond Island, the department does not support this amendment.
- Amendment request 8: Establish a sunset on the proposed ban on baiting/feeding ban in the UP CWD core if (1) the department's surveillance goals are met and (2) no additional deer harvested within the core are tested positive for CWD. The department does not support this amendment.

Commissioner Nyberg indicated that he will be offering minor changes to this amendment, specifically related to the condition of the department's surveillance goal within Menominee, Dickinson and Delta counties, which is 2,654 for this hunting season.

- Amendment request 9: Redefining bait to include scented materials, the department supports this amendment.
- Amendment request 10: Establish an antlerless goal for the CWD/APR study to continue, the department does not support this amendment.

Commissioner Schlaybaugh asked about estimated antlerless harvest objectives and how they would be reported, would they be meaningful for a single year or on an average. **Stewart** replied that the department can identify trends and they can also review historical data so they would have an estimate on how to get to that point. **Schlaybaugh** also asked how informal harvest goals would be estimated; **Stewart** said that the department would lean on relationships already in place, i.e., Quality Deer Management Association (QDMA) and the many co-ops throughout the area. These relationships can assist soon if regulations move forward and help make them more understandable for hunter groups. **Schlaybaugh** added that QDMA is interested in having harvest goals and communicating the goals to hunters.

Commissioner Creagh said that this amendment was to remove positive antlerless deer from the landscape to balance risk. Antlerless harvest must be maintained to offset risk of pushing age class for twelve months. **Director Eichinger** noted that as with the Northwest 12 and to be clear about what the commission would like the graph to do; if antlerless opportunity increases, increased antlerless harvest should be expected. Over time, the gross number of antlerless deer harvested would be expected to decline.

- Amendment request 11: Allow late archery crossbow use in UP CWD core, the department is neutral on this amendment.
- Amendment 12: Technical amendment proposed by the department: Allow baiting of deer to begin five days prior to the second Saturday in September, the department supports this amendment. This amendment would only be necessary if the dates of the Liberty hunt are moved to the second Saturday in September. If not approved, this would make any hunter eligible to use bait during that hunt unable to use bait on that first day.

Schlaybaugh asked if the Liberty hunt date change should be held over until the normal regulatory cycle in 2020. **Stewart** said that this change is due to recent commission decisions with regard to the bear hunting season date changes and failure to pass this amendment would create a conflict. **Eichinger** added that

with the Liberty hunt date change, liberty hunters and bear hunters would not be in the woods at the same time. **Ashley Autenrieth**, wildlife division's acting bear specialist, added that in the UP bait hunting begins on a Wednesday and goes for five days; hound hunting begins on a Monday. In the Northern LP, the season begins on a Saturday which allows bait hunters two days with hound hunting beginning on Monday. To avoid conflict with the Liberty hunt, which falls during that same time period, with the Liberty hunt ending on Sunday, hound hunters will not be in the woods at the same time. If the Liberty hunt dates are not moved there will be a hunting overlap.

In response to amendment 8, **Chair Pontz** asked that even if the proposed sunset may not serve any biological purpose, if the sunset serves as an incentive for hunters to participate/cooperate, would there be value in a sunset for that reason. **Chief Mason** referred to **Dr. O'Brien's** earlier statement that removing the baiting ban may create a false sense of security. Baiting and feeding create circumstances that make it more likely that the disease can become established. **Pontz** asked **Mason** to clarify supplemental feeding permit allowance in the UP CWD area; he responded that supplemental feeding permits will not be allowed in the UP CWD area.

Commissioner Schlaybaugh commented that the department's goals were met in the 13-county area where baiting and feeding have already been banned. He believes whether hunters could bait or feed actually did not have an impact on harvest in this area. Although **Mason** did clarify that the UP and the 13-county area are very different. **Schlaybaugh** asked what the commission could face if they provided a pathway by the use of a sunset over the next couple of months for the 16 counties in the CWD area, to which **Mason** shared that there would definitely be concern.

Legislative Report

Director Eichinger noted that the report was located in the commissioners' binders and would be posted on the commission's webpage after the day's meeting. **Eichinger** introduced and welcomed **Kelly Hamilton** as the department's legislative analyst.

Committee Report

Commissioner Schlaybaugh reported they received an update from Fisheries division chief **Dexter** on six of Michigan's lakes in Bassmaster's top 100 lakes and a habitat management unit workshop with other great organizations that focused on the science, purpose and contracts. **Dexter** also brought the committee up to date on the early detection Invasive carp work that is going on in its seventh year of collaboration with the US Fish and Wildlife Service. Wildlife division chief **Mason** reviewed the division's Bang for your Buck program and the committee received an excellent presentation on the guiding principles on CWD management from **Dr. Dan O'Brien**.

PUBLIC APPEARANCES BEFORE THE NRC

(**Stacy Welling-Haughey** read the official timekeeping procedures and guidelines for the meeting's public appearances which began at 2:21 p.m.)

Al Ettenhofer, a member of UP Whitetails- Delta county and UPSA among other groups said that on behalf of these groups they would like baiting and feeding to continue in the UP as a safety and management tool as it has in the past. **Ettenhofer** said that what the commission decides on baiting and feeding in the CWD core area in the UP will have a major impact on the deer population and the public relations between the landowners, hunters and the department. He indicated that landowners could possibly file a suit against the department as was done in Wisconsin due to CWD management issues. They want to work together and learn together with the general public in the UP about CWD that would put the commission and the department in a very positive light and that together more can be accomplished to protect the deer herd.

Dave Johnson, president, UPSA, provided maps to commission indicating where Breitung township is located compared to the core area, which is 9.97 miles. The UPSA would like that township, along with Sagola and Felch townships to be exempt from the baiting and feeding ban

Bernie Shaver thinks APRs in core zone are not sound science and commended **Dr. O'Brien** on his earlier presentation on disease management. **Shaver** said that reducing deer density will not solve the CWD issue in Kent and Montcalm counties. He said that doing what we can do to prevent spread is very sound science. He urged the commission not to approve APRs.

Jim Sweeney from the Concerned Sportsmen of Michigan said his group believes that moving forward with an APR experiment will increase the number of CWD positive deer on the landscape, the commission must base decisions on sound science and there is no sound science provided as a basis for the APR experiment. **Sweeney** urged the commission to vote against the proposed APR experiment.

Erik Schnelle, president, MI QDMA said that focusing on yearling buck dispersal can lead to an effective disease response. He thanked all that have helped to study and craft a Michigan CWD management approach. **Schnelle** shared the MUCC resolution for management in the CWD area and said that the commission and department have the full support of QDMA and MUCC for CWD efforts. **Schnelle** also said that QDMA has been setting public pre-hunting meetings beginning in September at various branches and co-ops throughout the state. They are an advocate for harvest goals and feel that it is important to educate hunters and make them partners in achieving those goals.

George Lindquist, president, MUCC reminded all that the wolf delisting comment deadline was Monday, July 15. He said that citizens' hands are tied with wolf attacks on livestock and pets and is looking forward to the department's comments on this issue.

Lindquist shared a handout with the commissioners that included the MUCC resolutions and encouraged them to review them.

Amy Trotter, executive director of MUCC said that they support the baiting and feeding ban in UP as proposed. She addressed Amendment request 1 to expand baiting for persons with disabilities; six days is reasonable; 110 days is excessive. With regard to the technical amendment, she questions the need to have baiting moved up five days prior to the Liberty hunt, which would move baiting up to September 3, Labor day, she would prefer that baiting start the second Saturday, the same day as the start of the hunt. **Trotter** also expressed that MUCC does not support a sunset on baiting regulations.

Mel Smith supports going forward with CWD/APR study in Montcalm county, which would provide facts that it will or will not work. **Smith** also said that it would be good to know by township how many deer the department would like to see harvested.

Mike Taylor, UP Whitetails, Marquette county came before the commission to say that he is opposed to changing the Liberty hunt in the middle of the deer regulations cycle.

Ron Shaver from Mid-Michigan Sportsmen's Alliance asked that the commission not approve, remove or postpone section 3.101(j) from Wildlife Conservation Order Amendment No. 7 of 2019 regarding the study in Montcalm county. **Shaver** believes that this may compound disease numbers during the four-year study. He would prefer a study outside of the CWD area.

Tony Smith representing QDMA, Eaton county, said that he is in full support of the CWD/APR experiment. If there are advantages, he would like to see expansion of APRs into other areas. **Smith** feels that the Liberty hunt would be better addressed in regular deer regulations cycle; because of the different bear/deer hunting zones that are affected. He is committed to help educate hunters in the five-county CWD experiment area, expressing how important it is to harvest antlerless deer. **Smith** would like the four-point APR to be reinstituted on combo tag.

Chauncey Moran came to address the transfer of jurisdiction of the Craig lake state park in the Baraga management unit. He objected to this transfer and asked that it stay with the Parks and Recreation division because of a section that is washed out wetland that would have no advantage for timber production. **Moran** asked that the director hold this transaction over.

Greg Peter came before the commission to ask if the CWD/APR study be called the APR study within the CWD zone. **Peter** said that there are three possible outcomes of the study that will come out in the data; that it will help, it does nothing or it could hurt. **Peter** encouraged the commission to keep open mind on data and would like to see as presented, not as construed.

Chair Vicki Pontz adjourned the public appearances portion of the meeting at 3:32 p.m. and called to order the regular meeting of the commission at 3:45 p.m. She noted that all commissioners who were present at the Committee of the Whole were present for the regular meeting.

REGULAR MEETING OF THE NATURAL RESOURCES COMMISSION

NATURAL RESOURCES COMMISSION – ACTION

Approval of Minutes, June 13, 2019, Natural Resources Commission Meeting

Commissioner Tracy made a motion that the minutes of the June 13, 2019, NRC meeting be approved. **Commissioner Walters** supported the motion. **Pontz** called for discussion, there being none, a vote was taken and the motion carried unanimously.

Chronic Wasting Disease Regulations, Wildlife Conservation Order Amendment No. 7 of 2019

Commissioner Tracy made a motion that Wildlife Conservation Order Amendment No. 7 of 2019, Chronic Wasting Disease Regulations be adopted. **Commissioner Nyberg** seconded the motion. **Pontz** called for discussion;

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to allow the “hunters with disabilities” baiting exception to apply to the full deer season, therefore allowing those hunters to use the single bite bait during all deer seasons and to eliminate “beet pulp” from the definition of single bite bait. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only. **Tracy** thinks the opportunity for hunters with disabilities that would be very low risk. **Pontz** asked about beet pulp section of amendment; **Tracy** responded that it is a clean-up so that this material cannot be used, it is more of a mass of material, not a single-bite. **Creagh** said that there is some concern from department relative as to the amount of time of bait being on the ground. Is there a way to limit the time. He asked if it could be tied more directly to when someone is hunting, or a day or two to either side of Liberty hunt. **Tracy** is comfortable to changing the dates to September 29 through November 30. **Schlaybaugh** added that baiting and feeding are high risk, he is comfortable with six days, but the longer the bait is on the ground the more risk there is for transmission. He has not seen any requests on this and will not support. **Pontz** called for a vote on this amendment only as written, as requested by **Pontz**, a roll call was taken by **Brooke Parmalee**: **Creagh** no; **Klarr** no; **Nyberg** no; **Tracy** yes; **Pontz** yes, **Schlaybaugh** no and **Walters** no. The motion to amend failed.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to allow the “hunters with disabilities” baiting exception to

apply to the hunting dates of October 1 through November 30, bait on the ground from September 29 through December 2, therefore allowing those hunters to use the single bite bait during all deer seasons and to eliminate "beet pulp" from the definition of single bite bait. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only. **Creagh** spoke about the need for input from department's disability committee. **Walters** said that including Liberty hunt would be 70 days of baiting, **Tracy** added that it would be for 2,000-4,000 hunters. **Pontz** called for additional discussion, there being none, a vote was taken. **Parmalee** took a roll call vote: **Creagh** no, **Klarr** no, **Nyberg** no, **Pontz** yes, **Schlaybaugh** no, **Tracy** yes, and **Walters** no. The motion to amend failed.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to remove all mandatory APRs from the CWD/APR study area. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only. There being none, **Pontz** called for a vote on the amendment only, **Parmalee** followed through with a roll call vote: **Creagh** no, **Klarr** no, **Nyberg** no, **Pontz** no, **Schlaybaugh** no, **Tracy** yes, and **Walters** no. The motion to amend failed.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to remove all APRs from the Montcalm county CWD/APR study area. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only. **Pontz** called for a vote on the amendment only, **Parmalee** followed through with a roll call vote: **Creagh** no, **Klarr** no, **Nyberg** no, **Pontz** yes, **Schlaybaugh** no, **Tracy** yes, and **Walters** no. The motion to amend failed.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to flip the area being considered for mandatory APRs in the CWD/APR study from deer management units (DMUs) 034, 054, and 059 (Ionia, Mecosta and Montcalm counties) to DMUs 041 and 062 (Kent and Newaygo). **Commissioner Walters** seconded the motion to amend. **Pontz** called for a vote on the amendment only, **Parmalee** followed through with a roll call vote: **Creagh** yes, **Klarr** no, **Nyberg** no, **Pontz** no, **Schlaybaugh** no, **Tracy** yes, and **Walters** no. The motion to amend failed.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to allow the use of single bite bait in the UP core CWD surveillance area with appropriate parameters and conditions as set forth by the department. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only. There being none, **Pontz** called for a vote on the amendment only, **Parmalee** followed through with a roll call vote: **Creagh** no, **Klarr** no, **Nyberg** no, **Pontz** yes, **Schlaybaugh** no, **Tracy** yes, and **Walters** no. The motion to amend failed.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to remove the APRs in DMU 122. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only, **Schlaybaugh** clarified that this is the DMU within the core and asked why **Tracy** is only asking for the DMU and not the core. **Tracy** responded that the purpose is to simplify the regulations to be consistent with previous CWD responses. **Creagh** clarified that this is where the index case was found. **Schlaybaugh** asked **Eichinger** for the department's APR management response for Meridian township when it was a surveillance zone. **Eichinger** responded that the department's preference is to await the outcome from the APR/CWD experiment prior to making any changes to APRs in response to CWD management. **Schlaybaugh** stated his preference for consistency regarding APRs in CWD management when new cases are found. **Eichinger** said that the department is in surveillance posture in Dickinson county, trying to understand and learn at this time. **Pontz** asked for clarification; in the past has the commission removed APRs when a new positive is detected. **Eichinger** responded that in 2018 the commission removed APRs in all 16 CWD management counties. **Pontz** called for additional discussion on the amendment only, there being none, a vote was taken, **Parmalee** followed through with a roll call vote: **Creagh** yes, **Klarr** no, **Nyberg** no, **Pontz** yes, **Schlaybaugh** no, **Tracy** yes, **Walters** no. The motion to amend failed.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to remove the APRs in the UP core CWD area. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only, there being none, a vote was taken, **Parmalee** followed through with a roll call vote: **Creagh** yes, **Klarr** no, **Nyberg** yes, **Pontz** yes, **Schlaybaugh** no, **Tracy** yes, **Walters** no. The motion to amend passed.

Commissioner Tracy withdrew his proposed motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to remove APRs on the regular deer combination license for the entire UP, except for Drummond Island (DMU 117) until the regular deer regulations cycle period.

Commissioner Nyberg proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 subsection section 3.100(5) by adding the following: "(c) It shall not be unlawful for a person to make use of bait to aid in the taking of a deer within the core CWD surveillance area in Dickinson, Menominee, and Delta Counties if each of the following conditions are met: (1) The Department-established surveillance goal that achieves a 0.1% detection level (i.e., the prevalence at which CWD can be detected at a 95% confidence through the corresponding sample size) in Dickinson, Menominee, and Delta Counties is met; and (2) No deer taken from Dickinson, Menominee, Iron, or Delta Counties are tested positive for chronic wasting disease. **Nyberg** noted that the 0.1% detection level for the 2019 hunting season is 2,645, as indicated during the Committee on Wildlife and Fisheries by DNR Wildlife veterinarian Dr. O'Brien.

Commissioner Walters seconded the motion to amend. **Pontz** called for discussion on the amendment only, **Nyberg** said primary purpose with this amendment is the importance of maintaining a partnership with the hunting public in achieving a sufficient surveillance sample size within the CWD Core Area, which is critical to understanding the rate of prevalence and spread of CWD in this area. This amendment would be an incentive for hunters to have tremendous participation in assisting the department and commission in achieving surveillance goals. **Nyberg** mentioned the possible outcomes if this amendment is adopted. If surveillance goals are achieved and no additional deer are tested positive for CWD, the commission and department have achieved a key objective of understanding prevalence and spread within this area. If surveillance goals are not achieved or an additional deer harvested within the core area is tested positive for CWD, the commission will maintain a ban on baiting and feeding and continue to follow the CWD regulatory protocols as a measure to limit spread. **Nyberg** further said that it is important for the commission and department to incentivize good partnerships with the hunting public. **Creagh** added that social acceptance for regulations are important for them to be effective but expressed concern about basing regulations on testing results. **Creagh** noted that it makes sense to evaluate the risk factors along with the test results regarding removal of a sunset, it warrants more review on an annual basis. **Walters** mentioned that he agreed with commissioner **Creagh**. **Eichinger** talked about operational difficulties with linking harvest goals with a given prevalence rate knowing that a prevalence rate is fluid in time; how could a goal be aligned with a given prevalence rate. **Nyberg** responded that this is why he altered the amendment from a number certain, as originally contemplated, to a 0.1% detection level, which came at the recommendation of staff in order to have flexibility, per the director's point.

Schlaybaugh is worried about what a sunset and formulation for sunset and implications and how the commission would respond to the Lower Peninsula (LP) and why it is not the same for the LP. He said that this needs to be thought through and that it would create more work for the department. He doesn't know enough about sunsets, or revisiting, but would be willing to look at this with the department to make certain of what the commission needs to look at before they reconsider. Also, all scientists have said that there is more that we don't know than what we know about the disease, therefore we are going to be learning on the job and to use a trigger without leaving room for what we need to know builds expectations. **Schlaybaugh** added that earlier **Dr. O'Brien** said it would be better to ban baiting and feeding altogether if we do not want to see CWD established. He would be supportive if the commission evaluates this on an annual basis with new knowledge learned over the course of that year. **Pontz** called for additional discussion, there being none, a vote was taken, **Parmalee** followed through with a roll call vote: **Creagh** no, **Klarr** no, **Nyberg** yes, **Pontz** yes, **Schlaybaugh** no, **Tracy** no, **Walters** no. The motion to amend failed.

Commissioner Schlaybaugh proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 by redefining bait to include the intent for contact in addition to the intent for consumption. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only, **Schlaybaugh** said that this was a technical amendment and this language tightens up intent and has his support. **Pontz**

asked for further discussion on this amendment only, there being none, a vote was taken, the motion to amend passed unanimously.

Commissioner Creagh proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to add a provision that if APRs are to continue in the study area, the department must establish an antlerless harvest goal that shall be achieved or provide information gathered by the study that management objectives for antlerless deer are achieved. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only; **Schlaybaugh** asked if **Creagh** could see these goals coming back to the commission for review, approval or endorsement. What role would he see the commission in the goals to be established. **Creagh** responded that in transparency it would be nice for the department to bring them back to the commission, but he would like everyone to know that there are some recognized risks with APRs and there should be some reduction of risk on the antlerless side. **Pontz** asked for further discussion on this amendment only, there being none, a vote was taken, **Parmalee** followed through with a roll call vote: **Creagh** yes, **Klarr** no, **Nyberg** yes, **Pontz** yes, **Schlaybaugh** yes, **Tracy** yes, **Walters** yes. The motion to amend passed.

Commissioner Walters proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to allow the use of crossbows in the late archery season in the UP core CWD surveillance area. **Commissioner Tracy** seconded the motion to amend. **Pontz** called for discussion on the amendment only. **Creagh** added the purpose is for the opportunity to take additional deer in the late season in the core area. **Schlaybaugh** added, last year they approved using all weapon types in the late season moving out of the surveillance into management mode in the LP, why aren't we authorizing rifles in the UP. **Pontz** asked how we are defining surveillance mode, **Eichinger** responded that typically this is a three-year timeframe. **Pontz** asked for further discussion on this amendment only, there being none, a vote was taken, the motion to amend passed unanimously.

Commissioner Tracy proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 as a technical amendment to allow baiting of deer to begin five days prior to the second Saturday in September so that hunters participating in the Liberty hunt can use bait where it is legal. **Commissioner Walters** seconded the motion to amend. **Pontz** called for discussion on the amendment only. **Eichinger** asked **Ashley Autenrieth** to remind the commission why this amendment is being offered; she said that in the UP bait hunting for bear begins on a Wednesday and goes for five days; hound hunting begins on a Monday. In the Northern LP, the season begins on a Saturday which allows bait hunters two days with hound hunting beginning on Monday. To avoid conflict with the Liberty hunt, which falls during that same time period, with the Liberty hunt ending on Sunday, hound hunters will not be in the woods at the same time. If the Liberty hunt dates are not moved there will be a hunting overlap. **Walters** inquired as to how many bear hunters are actively hunting bear at that time, **Autenrieth's** response was approximately 5,000, about 80 percent are bait

hunters and 20 percent are hound hunters, so there are roughly 1,000 running dogs. **Walters** also asked the number of youth hunters hunting deer during the Liberty hunt, which is an estimated 30,000. **Walters** questioned the rationale why we would change the Liberty hunt dates, to accommodate 1,000 hunters. **Tracy** added because of the potential of the Liberty hunt to go to September 14-15, rather than September 21-22; the way it is currently written it is illegal to bait prior to September 15, this five days would allow baiting to begin September 9 instead of September 15. **Schlaybaugh** added that the change of season is already in order before the commission. **Eichinger** added that this conversation about these dates was explicitly discussed a few months prior during the bear regulation cycle, a component was explicitly moving the dates of the Liberty hunt and the other issue was moving Liberty hunt off of same weekend as youth waterfowl season. **Walters** does not feel numbers of hunters were adequately pointed out earlier and if they had been, he would have voted differently. **Pontz** asked for further discussion on this amendment only, there being none, a vote was taken, **Parmalee** followed through with a roll call vote: **Creagh** yes, **Klarr** yes, **Nyberg** yes, **Pontz** yes, **Schlaybaugh** yes, **Tracy** no, **Walters** no. The motion to amend passed.

Commissioner Walters proposed a motion to amend Wildlife Conservation Order Amendment No. 7 of 2019 to move the Liberty hunt back to third weekend in September, or September 21-22, 2019. **Commissioner Tracy** seconded the motion to amend. **Pontz** asked for further discussion on this amendment only, there being none, a vote was taken, **Parmalee** followed through with a roll call vote: **Creagh** no, **Klarr** no, **Nyberg** no, **Pontz** no, **Schlaybaugh** yes, **Tracy** yes, **Walters** yes. The motion to amend failed.

Pontz called for additional amendments, there being none, she asked for a motion on Wildlife Conservation Order Amendment No. 7 as amended with the following amendments:

- Remove the APRs in the UP core CWD area
- Redefine bait to include the intent for contact in addition to the intent for consumption
- Add a provision that if APRs are to continue in the study area, the department must establish an antlerless harvest goal that shall be achieved or provide information gathered by the study that management objectives for antlerless deer are achieved
- Allow the use of crossbows in the late archery season in the UP core CWD surveillance area
- A technical amendment to allow baiting of deer to begin five days prior to the second Saturday in September so that hunters participating in the Liberty hunt can use bait where it is legal

Commissioner Schlaybaugh moved that Wildlife Conservation Order Amendment No. 7 of 2019, Chronic Wasting Disease Regulations be adopted as amended.

Commissioner Walters seconded the motion. **Pontz** called for discussion, there being none, a vote was taken and the motion carried unanimously.

Commissioner Schlaybaugh asked that the documents: Chronic Wasting Disease-Biological Information, Briefing Information, May, 2018 and 2019 CWD Deer Regulations June NRC Meeting Amendment Requests be added as appendixes to the July 11, 2019 NRC meeting minutes. **Pontz** asked for any objections from the remainder of the commission, hearing none, the documents will be added to the approved minutes.

DIRECTOR – ACTION

Pontz listed the action items on the agenda, director **Eichinger** indicated that he would approve all items with the exception of the Transfer of Jurisdiction Craig Lake State Park, which will be brought back in August after conversation with **Mr. Moran**.

COMMISSIONER REPORTS

Commissioner Schlaybaugh: spent some time fishing the Au Sable. He attended a Ruffed Grouse Society meeting in Emmet county. He also attended an interesting program at the University of Michigan on climate change and ecology and its effect on our natural resources.

Commissioner Walters: attended the TB meeting where they discussed the wildlife aspect and moving forward on eradication. **Chair Pontz** thanked commissioner **Walters** for representing the NRC on the TB Advisory Committee and for reporting to the full commission after each meeting. The previous day he met with **Drs. Straka** and **O'Brien** to discuss this topic.

Commissioner Klarr: gave a presentation on riparian areas at Western Washington University and the history of for-profit organizations and how they are stewards of the land.

Commissioner Nyberg: thanked the hunting public for their time and passion on the subject of CWD management.

Commissioner Creagh: attended former deputy director **O'Neill's** retirement party in Gaylord. He will be heading to Wilderness State Park this weekend. He also did some walleye fishing on the St. Clair river.

Commissioner Tracy: thanked all for the spirited discussion and asked that all stay engaged. He was in the UP this past weekend and noted how great the skyline was. **Tracy** also said that he has been successful in receiving a cow elk license in Unit G in December after twenty years of applying.

Director Eichinger: has been fishing successfully-his son caught a master angler bass, which made a great breakfast. He said that there is good work happening on our efforts to keeping Asian carp from getting into the Great Lakes. The council of Governors and

Premiers all unanimously supported a resolution supporting project at Brandon Road Lock and Dam; much work to do but moving forward. He also talked about the budget process that continues to unfold, of note on general fund cuts were a \$1.1 million cut to LED officers; we currently have historic numbers of officers and customer service. This is serious and the department will be working hard to restore that funding. He encouraged the public to engage in helping the department keep the needed funding.

Chair Pontz: met with the AG's office in preparation for appearing before the court in Newaygo county regarding a case on a baiting and feeding ticket issued in a CWD zone. She later testified to the court via telephone.

Chair Pontz requested a closed meeting at the August 8 commission meeting with the announcement:


Back in April the commission received a written memo providing legal guidance from the Attorney General that outlined the commission's authorities. Since then, the commission has been very busy making important decisions for the 2019 CWD deer regulations. Now that those regulations have concluded, I would like to request the opportunity for the commission to have a closed meeting session with Assistant Attorney General **Peter Manning** during the August commission meeting to discuss the legal guidance memo received back in April 2019.

Chair Pontz announced that the next meeting of the NRC is scheduled for Thursday, August 8, 2019, at MSU's Veterinary Diagnostic Laboratory, 4125 Beaumont Road, Lansing.

The committees meeting that day will be the Michigan State Parks Advisory Committee and the NRC Policy Committee on Wildlife and Fisheries.

Adjournment

Commissioner Tracy made a motion to adjourn. **Commissioner Creagh** supported the motion and the meeting was adjourned at 4:48 p.m.



Vicki J. Pontz, Chair



Daniel Eichinger, Director

DATE: 8-8-2019

2019 CWD Deer Regulations June NRC Meeting Amendment Requests

1. Allow the “hunters with disabilities” baiting exception to apply to the full deer season (not just the Liberty and Independence Hunts). (Tracy)

DNR Response: This represents an increase in risk on the landscape, though the magnitude of that risk is unquantifiable. There are several comments that have been received stating the baiting ban should be applied to everyone, regardless of disability status. The Department does not have any data on the success rate for hunters with disabilities when hunting over bait vs. not hunting over bait. Allowing baiting to occur in known disease areas, even for hunters with disabilities, and allowing that bait to be present throughout the year, is generally not consistent with sound disease management ideals.

Currently, the baiting exception for qualifying hunters with disabilities who are participating in the Liberty or Independence Hunts allows the use of any type of bait except in the CWD Management Zone, Core CWD Area, or the counties of Alcona, Alpena, Montmorency, and Oscoda.

Qualifying hunters with disabilities who are participating in the Liberty or Independence Hunts may currently only use single-bite baits in the CWD Management Zone, Core CWD Area, or the counties of Alcona, Alpena, Montmorency, and Oscoda. The current order proposes allowing for the use of single-bite bait by these same qualifying hunters during the Liberty and Independence Hunts in the UP core CWD surveillance area. The following are allowable single-bite bait: shelled corn, nuts, beet pulp, deer feed or pellets, or wheat or other grain.

Combined, the Liberty Hunt and Independence Hunt are a total of six days.

The relationship between baiting, feeding, and CWD transmission is in the risks associated with congregating wildlife.^{1,2,3,4,5,6} While natural food sources also congregate wildlife, human activities such as supplemental feeding or baiting do so at rates above natural sources and therefore increase the risks of transmitting disease⁷. That is, disease transmission due to human activities is additive—over and above transmission due to natural sources of congregation. The risks of congregating animals around supplemental feed and bait are manifold: it increases the probability of direct contact between infected and noninfected animals, and it also increases the risk of contaminating the food source itself or the surrounding environment⁸. There are no available data that indicates single-bite baits generate less additive-risk than other baits. The Department does not support this amendment.

1. Bollinger, T., Caley, P. Merrill, E., Messier, F., Miller, M.W., Samuel, M.D., & Vanopdenbosch, E. (2004). Chronic wasting disease in Canadian wildlife: An expert opinion on the epidemiology and risks to wild deer. Saskatoon, Canada: Canadian Cooperative Wildlife Health Centre, Western College of Veterinary Medicine.
2. Conner, M.M. & Miller, M.W. (2004). Movement patterns and spatial epidemiology of a prion disease in mule deer population units. *Ecological Applications*, 14(6), 1870-1881
3. Kjaer, L.J., Schaubert, E.M., & Nielsen, C.K. (2008). Spatial and temporal analysis of contact rates in female white-tailed deer. *Journal of Wildlife Management*, 72(8), 1819-1825.
4. Silbernagel, E.R., et al. (2001). Interaction among deer in a chronic wasting disease endemic zone. *Journal of Wildlife Management*, 75(6), 1453-1461.
5. VerCauteren, K.C., et al. (2007). Elk use of wallows and potential chronic wasting disease transmission. *Journal of Wildlife Diseases*, 43(4), 784-788.
6. Williams, E.S., Kirkwood, J.K., & Miller, M.W. (2001). Transmissible spongiform encephalopathies. In E.S. Williams & I.K. Barker (Eds.), *Infectious diseases of wild mammals 3rd edition* (pp. 292-301). Ames, IA: Iowa State University Press.
7. Becker, D.J. & Hall, R.J. (2014). Too much of a good thing: Resource provisioning alters infectious disease dynamics in wildlife. *Biology Letters*, 10(7).
8. Sorensen, A., van Beest, F. M., & Brook, R. K. (2014). Impacts of wildlife baiting and supplemental feeding on infectious disease transmission risk: A synthesis of knowledge. *Preventive Veterinary Medicine*, 113(4), 356–363.

2. Remove all mandatory APRs from the CWD/APR study area (Tracy)

DNR Response: The current study was designed to evaluate the impacts of APRs. Removing APRs would still provide “data” in terms of what is being measured, but the cause-effect relationship that the study is designed to test would no longer be applicable. Furthermore, the information coming from cameras would not necessarily be applicable to the entire study area, as the sites were selected to compare between townships with similar landscape characteristics, not as a representation of the entire five-county core area. The Department does not support this amendment.

3. Remove mandatory APRs from Montcalm County in CWD/APR study (Tracy)

DNR Response: This would cause the researchers to select additional townships after the Montcalm townships are removed, which would impact data collection time frame. The project would likely be delayed for at least a year. In addition, permission has been gained to conduct research activities on 36 properties in Montcalm County and cameras are presently being deployed. The Department does not support this amendment.

4. Switch the area being considered for mandatory APRs in the CWD/APR study from the MAPR area to the control area. (Tracy)

DNR Response: The original design was selected because of the orientation of the townships. Many of the treatment (APR) townships are located within the interior of the county, while many of the townships in the control (non-APR) areas are on the edge. In evaluating the impacts of the APRs, the researchers wanted to apply townships that are more centralized to potentially limit the impact of any border counties with different regulations from having an impact on herd dynamics in the APR area. The Department does not support this amendment.

5. Allow single bite baits in UP Core CWD surveillance zone with appropriate parameters and conditions provided by the DNR. (Tracy)

DNR Response: There are no data that support that single bite bait use results in less risk than multi-bite baits. The act of repeated placement of bait at the same area negates the overall impact, as deer are continually coming to a small area, depositing saliva, urine, and feces which may carry the prion. This increases the potential for indirect transmission from one animal to another. Enacting a baiting ban in the UP Core CWD surveillance zone is consistent with the type of baiting ban that was enacted in the Lower Peninsula after the first CWD positive deer was found.

The Department found no exceptions for the use of single-bite bait in other states or provinces. Regulations were reviewed in:

Alberta, Arkansas, Colorado, Illinois, Iowa, Kansas, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, North Dakota, Pennsylvania, Saskatchewan, South Dakota, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming.

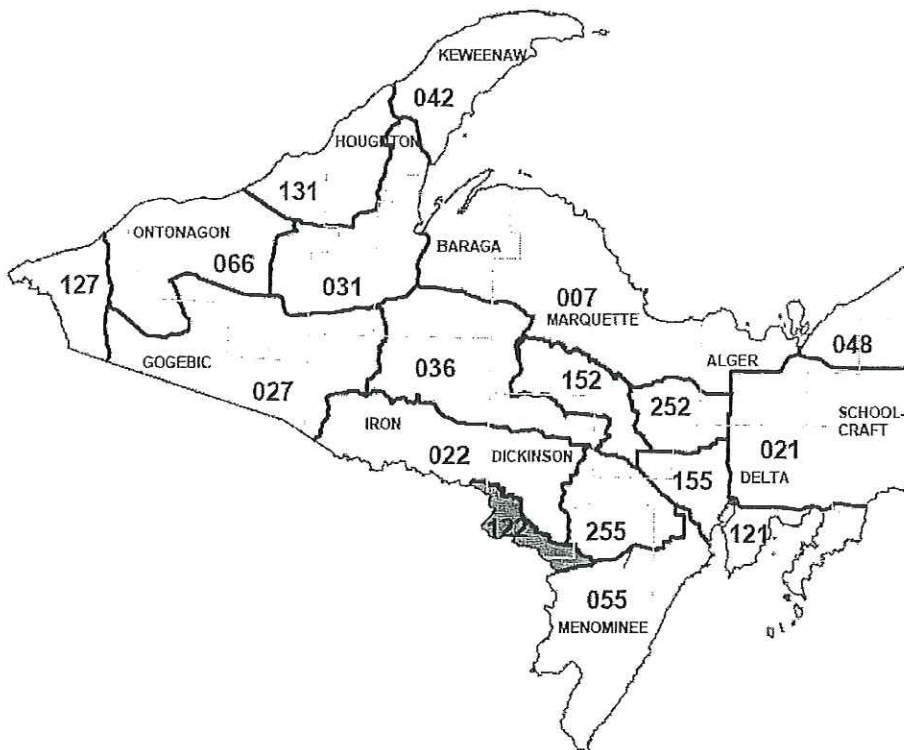
The relationship between baiting, feeding, and CWD transmission is in the risks associated with congregating wildlife.^{1,2,3,4,5,6} While natural food sources also congregate wildlife, human activities such as supplemental feeding or baiting do so at rates above natural sources and therefore increase the risks of transmitting disease⁷. That is, disease transmission due to human activities is additive—over and above transmission due to natural sources of congregation. The risks of congregating animals around supplemental feed and bait are manifold: it increases the probability of direct contact between infected and noninfected animals, and it also increases the risk of contaminating the food source itself or the

surrounding environment⁸. There are no available data that indicates single-bite baits generate less additive-risk than other baits. The Department does not support this amendment.

1. Bollinger, T., Caley, P. Merrill, E., Messier, F., Miller, M.W., Samuel, M.D., & Vanopdenbosch, E. (2004). Chronic wasting disease in Canadian wildlife: An expert opinion on the epidemiology and risks to wild deer. Saskatoon, Canada: Canadian Cooperative Wildlife Health Centre, Western College of Veterinary Medicine.
2. Conner, M.M. & Miller, M.W. (2004). Movement patterns and spatial epidemiology of a prion disease in mule deer population units. *Ecological Applications*, 14(6), 1870-1881
3. Kjaer, L.J, Schaubert, E.M., & Nielsen, C.K. (2008). Spatial and temporal analysis of contact rates in female white-tailed deer. *Journal of Wildlife Management*, 72(8), 1819-1825.
4. Silbernagel, E.R., et al. (2001). Interaction among deer in a chronic wasting disease endemic zone. *Journal of Wildlife Management*, 75(6), 1453-1461.
5. VerCauteren, K.C., et al. (2007). Elk use of wallows and potential chronic wasting disease transmission. *Journal of Wildlife Diseases*, 43(4), 784-788.
6. Williams, E.S., Kirkwood, J.K., & Miller, M.W. (2001). Transmissible spongiform encephalopathies. In E.S. Williams & I.K. Barker (Eds.), *Infectious diseases of wild mammals 3rd edition* (pp. 292-301). Ames, IA: Iowa State University Press.
7. Becker, D.J. & Hall, R.J. (2014). Too much of a good thing: Resource provisioning alters infectious disease dynamics in wildlife. *Biology Letters*, 10(7).
8. Sorensen, A., van Beest, F. M., & Brook, R. K. (2014). Impacts of wildlife baiting and supplemental feeding on infectious disease transmission risk: A synthesis of knowledge. *Preventive Veterinary Medicine*, 113(4), 356-363.

6. Remove APRs in DMU 122 (Tracy)

DNR Response: Removing APRs was discussed as part of a first response to finding a CWD positive deer in the UP. Ultimately, with the other regulations currently proposed, this was viewed as not needed at this time given our current understanding of CWD in the UP. With the current impacts of APRs being researched in the LP, the DNR recommends holding off on changes to APRs as a response to CWD management until the 3 year APR/CWD study is concluded and more accurate information is available. The study will look at the effects of mandatory APRs on deer numbers, antlerless harvest, and the sex and age composition of the deer herd. The Department does not support this amendment.



7. Remove APRs on the first tag in the entire UP, except Drummond Island. (Tracy)

DNR Response: With the other regulations currently proposed, this was viewed as not needed at this time given our current understanding of CWD in the UP. With the current impacts of APRs being researched in the LP, the DNR recommends holding off on changes to APRs as a response to CWD management until the 3 year APR/CWD study is concluded and more accurate information is available. The study will look at the effects of mandatory APRs on deer numbers, antlerless harvest, and the sex and age composition of the deer herd. In addition, this eliminates hunter's choice which has been in effect for about a decade. The DNR has survey data that supports hunter's choice. In 2015, the DNR asked UP hunters whether they supported maintaining an APR on the combination tag in the UP (3 points on the regular tag and 4 points on the restricted tag). About 64% of UP hunters supported the restrictions. The Department does not support this amendment.

Table 14. Level of support and opposition for the antler point restrictions in the Upper Peninsula among Michigan deer hunters, 2014-2015.

| Preferred hunt area | Hunters supporting (%) ^a | | | | Hunters opposing (%) ^b | | | |
|---------------------|-------------------------------------|------|---------------------|----------------------------------|-----------------------------------|------|---------------------|----------------------------------|
| | 2014 | 2015 | 95% CL ^c | Difference from 2014 to 2015 (%) | 2014 | 2015 | 95% CL ^c | Difference from 2014 to 2015 (%) |
| West UP | 64 | 64 | 2 | 0 | 27 | 27 | 2 | 0 |
| East UP | 60 | 63 | 4 | 2 | 31 | 27 | 4 | -4 |
| NE LP | 54 | 61 | 2 | 7* | 22 | 16 | 1 | -6* |
| NW LP | 57 | 62 | 1 | 4* | 20 | 15 | 1 | -5* |
| Sag. Bay | 55 | 62 | 2 | 8* | 19 | 14 | 1 | -5* |
| SW LP | 60 | 62 | 2 | 2 | 15 | 12 | 1 | -3* |
| SC LP | 56 | 62 | 2 | 6* | 16 | 12 | 1 | -5* |
| SE LP | 60 | 65 | 2 | 5* | 17 | 11 | 2 | -6* |
| UP | 63 | 64 | 2 | 1 | 28 | 27 | 2 | -1 |
| NLP | 56 | 61 | 1 | 6* | 21 | 16 | 1 | -5* |
| SLP | 58 | 63 | 1 | 5* | 17 | 12 | 1 | -5* |
| Statewide | 57 | 62 | 1 | 5* | 20 | 15 | 0 | -4* |

^aIncluded hunters who "strongly supported" or "supported" antler point restrictions in the UP.

^bIncluded hunters who "opposed" or "strongly opposed" antler point restrictions in the UP.

^c95% confidence limit for the 2015 estimate.

*P<0.005.

10. Antler point restrictions were adopted in 2008 for taking antlered deer (bucks) in the Upper Peninsula (UP). The regular buck tag of a combination deer license could only be used to tag a buck with at least three antler points on one side. The restricted tag could only be used on a buck with at least four points on one side. Hunters who chose not to purchase the combination tag were restricted to one buck (with no additional point restrictions) in the UP, all seasons combined. How strongly do you support or oppose these restrictions for the UP?

¹ ☐ Strongly Support ² ☐ Support ³ ☐ Oppose ⁴ ☐ Strongly Oppose ⁵ ☐ Not Sure

8. Amendment to section 3.100 (5) to add a contingency for ban on baiting to create a 1yr sunset period for the surveillance area that would be tied to a surveillance goal determined by the Wildlife Division. If that goal is achieved and if there were no additional CWD positives confirmed, the ban would sunset. And if any CWD additional positives were found, we would follow the CWD plan. (reinstitute the 10-mile radius to implement regulatory changes under the plan). (Nyberg)

DNR Response: There is always an opportunity to revisit CWD regulations at a future date. This can include any of the regulations that have previously been brought forward. Generally speaking, removing a regulation that only lasts one year presents enforcement challenges, and surveillance is generally needed for multiple years before confidence can be increased on the status of the disease in the area. Banning baiting and feeding throughout the LP as a proactive measure in areas where CWD is not identified, and

retroactively removing a ban in an area where CWD has been identified presents communication challenges.

The Department reviewed baiting regulations in Alberta, Arkansas, Colorado, Illinois, Iowa, Kansas, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Mexico, New York, North Dakota, Pennsylvania, Saskatchewan, South Dakota, Tennessee, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming. There is one state and one province with sunset provisions on baiting and feeding regulations.

In Alberta, all wildlife regulations, including baiting and feeding, will expire June 30, 2020 for the purpose of review.

In 2017, Wisconsin Act 41 limited the time during which the baiting and feeding of deer may be prohibited following a positive test for CWD or TB. Baiting and feeding is prohibited in any county that tests positive for CWD or Bovine TB in any captive or free-ranging domestic or wild animal. The baiting and feeding ban sunsets where 36 months have passed since any confirmed positive test for CWD or TB. It also prohibits baiting and feeding for a county in which the county or a portion of the county is within a 10-mile radius of the confirmed case of CWD or Bovine TB. This ban sunsets where 24 months have passed since any confirmed positive test of CWD or TB. The Department does not support this amendment.

9. Asked the division to move forward with their definition of redefining bait to include scented materials (intent for consumption and contact). (Schlaybaugh)

DNR Response: Adding "inaccessible for contact" to "inaccessible for consumption" provides more clarification, eliminates the need for height restrictions, and eliminates the concern for attractants that can be consumed. The Department supports this amendment.

10. In order for APR's to be approved in the APR/CWD study zone, the DNR must establish an antlerless harvest goal and that goal must be achieved. (Creagh)

DNR Response: An antlerless harvest goal is not necessary to achieve the results of the APR/CWD study. However, the Department was asked during the June 2019 NRC meeting to determine an antlerless harvest goal for consideration. In order to achieve a population decline, the Department estimates the need for a 90% antlerless harvest increase which is equal to about 18,000 deer from the three-county area. This translates as an additional 2 or 3 deer per square mile or an additional .6 deer per hunter. From about 2009 – 2011, antlerless harvest was within this range. However, in 2012, about 15,000 deer were reported dead in the southern Lower Peninsula as the result of epizootic hemorrhagic disease (EHD) with overall estimated deaths likely much higher. Accordingly, antlerless license quotas were decreased in much of southwest Michigan along with counties open to early and late antlerless firearm seasons. This resulted in fewer hunters harvesting antlerless deer. Now that the population has recovered, the area can sustain a dramatic increase in antlerless harvest. The Department does not support this amendment.

11. Allow the use of crossbow during late archery season in the CORE (Walters)

DNR Response: Crossbows are currently allowed in the early season in the UP, where much of the archery harvest is believed to occur. When regulatory changes were made to crossbow use in 2009, the issue was considered at Natural Resources Commission meetings for four months allowing for public engagement and feedback. The Department is neutral on this amendment.

(Technical Amendment) A technical change is needed to allow baiting of deer to begin five days prior to the second Saturday in September, so that people participating in the Liberty Hunt can use bait where it is legal.

DNR Response: The order proposes changing the Liberty Hunt to the second weekend in September in order to reduce potential conflict between hound bear hunters and youth deer hunters. In 2019, the dates of the Liberty Hunt would be September 14 and 15. Currently, it is illegal to bait deer before September 15. Baiting for the Liberty Hunt is currently legal in the UP, except for the proposed ban in the core CWD surveillance area. In addition, baiting is legal for hunters with disabilities during the Liberty Hunt in the entire state. The Department supports this amendment.

Michigan Department of Natural Resources
Chronic Wasting Disease – Biological Information
Briefing Information
May 2018

Deer Ecology

Deer ecology may play a role in the maintenance and spread of Chronic Wasting Disease (CWD)). As deer move around the landscape they encounter other deer or contaminated areas, which can spread disease from infected to uninfected individuals. Some key characteristics of deer populations that inform harvest and culling strategies are survival and cause-specific mortality, reproduction, and movements (localized and dispersals). Through extensive research of white-tailed deer across their range, there are generalizable differences in ecological variables in different habitats. This section focuses on deer ecology in three different habitat types common to Michigan: rural/agricultural dominated, northern forested and urban-suburban.

Note: Throughout this paper four important age classes of deer are mentioned: newborn fawns = 0-7 months of age; fawns ≥ 8 months and < 1 -year-old; yearlings > 1 and < 2 -years-old; and, adults ≥ 2 -years-old.

Movements and Home-range

Rural/Agricultural Dominated Landscape

A common theme among studies of deer movements from agricultural regions of the Midwest is that available forest cover likely influences frequency of movements and distance moved. Generally, more deer (males and females) display dispersal and migratory (primarily females) behavior and move farther distances when forest cover is reduced^{22, 2, 29}

Dispersal rates for yearling males are consistently high in agricultural areas, ranging from 49% to 71%.^{22, 2, 29} Yearling males disperse in both spring and fall, but spring dispersal distances are usually greater. Mean dispersal distances vary by state and range from 3.1 to 23.6 miles.^{22, 2, 29} Maximum distance moved was 20.2, 75.0 and 99.9 miles for Wisconsin, Nebraska and Illinois, respectively. Dispersal of females is also common in agricultural areas, 39% of females from three sites in Illinois dispersed.²²

Migratory behavior by males (yearling and adults) is uncommon in agricultural regions of the Midwest.^{22, 2, 29} Migratory behavior is more common for females. Female migration behavior averaged 9.4%, 14.6% and 21.5% for study sites in rural west-central, northern and east-central Illinois, respectively.²² The migratory behavior observed in females may have been an attempt to find limited fawning cover in agricultural dominated landscapes.

Female home ranges, both seasonal and annual, appear similar across the Midwest (Illinois, Iowa, Wisconsin and Michigan).³⁸ Summer home ranges for yearling and adult females in southern Michigan averaged 499 and 191 acres, respectively. Winter home ranges of yearling and adult females in the same area were similar, averaging 388 and 346 acres, respectively.¹³ Few studies of male white-tailed deer home-ranges in the agricultural dominated Midwest states are available but in rural Illinois, summer and winter home ranges of adult males averaged 494 and 667 acres, respectively.²²

Urban-Suburban Landscapes

Movements of deer in urban-suburban landscapes are likely limited by development including roads.¹⁰ Etter et al. (2002) examined movements of 148 females and 60 male deer from Chicago, IL. Seven-percent of female fawns and 6% of yearling and adult does dispersed. For males, 50% of fawns and 7% of yearling and adult bucks

dispersed. Nearly all deer dispersed in spring and all dispersals were less than 5.6 miles except one adult doe dispersed 21 miles. Etter et al. (2002) also documented that 5% of female fawns and adults, and 14% of female yearlings migrated; however, no bucks migrated in the Chicago region.

Home-ranges of female urban-suburban deer are smaller than those reported from agricultural and northern regions.^{10, 12, 31} In Chicago, IL, home-ranges averaged 126, 64 and 79 acres for winter, summer and fall, respectively.¹⁰ In Bloomington, MN, home-ranges averaged 355, 124 and 247 acres for winter, summer and fall, respectively.¹² As is typical for female white-tailed deer, home-ranges were smallest in summer and larger in winter.^{10, 12, 31}

Northern Forest Dominated Landscapes

In the Upper Peninsula of Michigan, deep and persistent snow cover importantly influences white-tailed deer movement ecology.^{21, 34} Estimates suggest that in northern regions of Minnesota and Michigan, 60-90% of deer are migratory.^{19,33} Mean migration distances in the Upper Peninsula range from 2 to 25 miles depending on wintering complex, with individual animals moving up to 50 miles.^{36, 5}

Migratory deer occupy different home ranges in the summer and winter. Median summer home ranges in the central Upper Peninsula calculated across all sex and age classes varied among years and ranged from 420 acres to 1212 acres and winter home ranges varied from 479 acres to 524 acres.³³

In northern Wisconsin, 30.7% of yearling males dispersed. Median dispersal distances in the spring and fall were 4.3 and 3.1 miles, respectively. The longest dispersal distance occurred in the spring and was 22.2 miles. Dispersal movements were non-directional, but rivers acted as a semipermeable barrier.²⁹

Excursions

White-tailed deer sometimes make short excursions outside of their home ranges; however, past technology made it difficult to document these movements effectively.^{14, 8} Holzenbein and Marchinton (1992) and Etter et al. (1995) documented spring excursions of young deer. This behavior was associated with family breakup when pregnant does are establishing fawning sites.²³ Recent deployments of GPS collars are just now making quantitative assessments of the frequency and distance of these movements possible. The early results suggest that males are more likely to make excursions than females. Movements outside of home ranges can occur anytime, but the breeding season appears to be a peak period.^{17, 16, 28, 15}

Survival and Cause Specific Mortality

Rural/Agricultural Dominated Landscape

Survival of deer from rural/agricultural dominated landscapes tends to be high outside of hunting seasons for all sex and age classes. In eastern Illinois, Nixon (1991) determined that survival outside of hunting season exceeded 85% for all sex and age classes, except yearling male survival was 63% in winter. Survival through hunting seasons (gun and archery) was 58% and 67% for yearling males and females, respectively. Eighty-four percent of adult females survived through hunting seasons, compared to only 48% of adult males. One-hundred percent of 17 newborn fawns survived to the beginning of hunting season in eastern Illinois. Hiller and Campa (2008) estimated survival for 42 female deer captured in south-central Michigan. Annual survival was 94% and 56% for yearlings and adults, respectively. Vehicle-collision and hunting were the primary causes of mortality. Only 67% of 32 newborn fawns survived to six months of age. Canid predation and vehicle-collisions were the primary cause of death. Burroughs et al. 2006 examined survival of newborn fawns through their first year in southwestern Michigan and determined that 90% survived until hunting season. Annual survival (through hunting season) was 75% and primary causes of mortality were vehicle-collisions and hunting.

Urban-Suburban Landscapes

Most studies of urban-suburban deer are conducted in areas that have limited hunting or are closed to hunting; thus, this mortality factor is not comparable to northern and agricultural regions. Additionally, deer in these landscapes are typically overabundant and thus research tends to be associated with intensive culling to reduce deer densities. Annual survivorship varies among mortality studies of urban-suburban deer.³² Etter et al. (2002) reported 82% annual survival for yearling and adult females from Chicago, IL. Although samples were small (N=13). Etter et al. (2002) also reported 83% annual survival for adult males. The primary cause of death in mortality studies of urban-suburban deer is vehicle-collisions.^{1, 10, 31} Other sources include accidents (e.g., drowning in swimming pool), poaching and minimal hunting mortalities.

Northern Forest Dominated Landscapes

Survival rates of deer in the northern forest vary by sex, age class, and year. Important factors affecting survival include harvest levels, habitat, predation, and weather, especially winter weather. In the south central Upper Peninsula annual survival rates were: 77% for adult females, 89% for yearling females, 25% for yearling males, and 22% for adult males.³⁵ Overall, non-hunting mortality rates were 19% for adult females, 0% for yearling females, 0% for adult males and 16% for yearling males. Hunting mortality was 4% for adult females, 12% for yearling females 72% for adult males, and 47% for yearling males. Winter conditions during the study were relatively mild.

In an ongoing study in the western Upper Peninsula, researchers estimated survival rates and cause-specific mortality of adult does and fawns for three years in a low-snowfall zone (<50 inches per year) and three years in a mid-snowfall zone (50-100 inches per year) study areas. In the low-snowfall zone, adult female survival ranged from 82 to 89% and averaged 85%. Survival estimates of adult females in the mid-snowfall zone were more variable, ranging from 32 to 91%, averaging 63%. Two severe winters played an important role in reducing survival in this area. Annual survival of fawns in the low-snowfall zone were good, ranging from 34 to 59%, and averaged 44%. Like the pattern of survival in adult females, survival rates of fawns in the mid-snowfall zone were more variable, ranging from 0 to 42%, and averaged 18%. Severe winter conditions also reduced the survival of fawns in this study area. Overall, predation accounted for 70 to 75% of adult female mortality and 80% of fawn mortality each year; however, the severity (e.g., depth of snow) and length of each winter influenced the level of survival (e.g., adult females-32 vs 91%; fawns 0-42%).

Reproduction

In this section, reproduction refers to pregnancy rates and fecundity (fetuses per doe). Recruitment refers to the number of offspring surviving to breeding age or the first hunting season, but this will not be discussed here. There are some generalities in reproduction among white-tailed deer from all regions. Reproduction is linked with nutrition; pregnancy rates and fecundity tend to be highest in areas with abundant food resources. Additionally, reproduction in white-tailed deer is density-dependent,¹⁸ that is, reproduction varies in relation to the deer density.

Rural/Agricultural Dominated Landscape

Agricultural dominated landscapes of the Midwest have abundant deer food resources and thus reproduction from this region is some of the highest reported for white-tailed deer.²⁵ Nixon et al. (1988) determined that 85% of fawns from western Illinois bred and usually produced a single fetus. One-hundred percent of yearlings and adults also bred and usually produced twins. Verme (1991) examined pregnancy rate in fawns from southern Michigan from 1952-1982. Fifty-one percent of fawns bred and produced an average of 1.24 fawns per doe. Fawn pregnancy rate declined from 69 to 47% over the three decades examined, but the adult doe pregnancy rate increased from 90 to 97% during the same period. Adults produced 1.98 fetuses per doe.

Urban-Suburban Landscapes

In urban-suburban landscapes, most reproductive studies are the result of samples collected during culling or controlled hunts. These harvests are designed to reduce deer populations, some of which exceed 100 deer per square mile.⁴ Because of this density-dependent relationship and because most study populations are being intentionally reduced, reported reproduction is highly variable in urban-suburban studies of deer. Etter (2001) examined reproductive tracts of 1,683 females culled from forest preserves in the Chicago, Illinois region. Although most preserves had high deer densities when culling began, reproduction exceeded that of deer from northern forests and at reduced densities equaled that of deer from agricultural regions. Seventeen percent of fawns bred, averaging slightly more than 1 fetuses per fawn. In one intensively managed preserve, the pregnancy rate of fawns increased from 7% to 63% as the population was reduced 4-fold. Nearly 97% of yearlings and 98% of adults from the Chicago region bred and produced an average of 1.6 and 1.9 fetuses, respectively. At lowered densities, reproduction in yearlings matched that of adults. Fawns produced 73% male fetuses, compared to 53 to 54% for yearlings and adults. No reproductive senescence was detected from sample of 75 females ≥ 9 years-of-age.

Northern Forest Dominated Landscapes

Historically (1952-1985), DNR personnel conducted fetus counts from road-killed deer in the Upper Peninsula during spring. These counts demonstrated high mean annual pregnancy rates (94%; range = 85-100%) and fecundity (range = 1.25-1.81 fetuses/doe) for adult females ≥ 2 years old. An ongoing study confirmed the high pregnancy rates in adult females (mean=97%) observed decades ago.⁶ Pregnancy rates are greater for adult females ≥ 2 years old than yearling females and fawns in the northern forests rarely become pregnant.³ In the ongoing study in the Upper Peninsula, adult females maintained consistently high pregnancy rates (91-100%) across a range of fall-based female to male ratios (adults; 3 females/male to 8 females/male [J. Belant, unpublished data]). The nutritional condition of dams (mothers) strongly influences the annual recruitment of fawns in the northern forest.^{6, 7}

Deer Regulations

Season Structure and Length

Michigan has a unique structure to their deer hunting season, which is highlighted by its November 15 start date. Most states (if not all) have their firearm opener specific to a day. These days vary from state to state, but Michigan's is unique to a start date. The remainder of the seasons are predicated by the day that firearm season opens. For instance, muzzleloader start date is defined as the first Friday in December. On years where November 15 falls on a Wednesday (with a subsequent ending 15 days later on November 30, which is a Thursday), the muzzleloader season begins on the following day (December 1). On years when November 15 falls on a Thursday (with subsequent ending 15 days on November 30, a Friday), the muzzleloader season begins a week later on December 7. This has cascading impacts on the late antlerless season, defined as the first Monday following the third Saturday in December. The late antlerless period can range from 10 to 16 days, depending on how the calendar falls. These changes can provide year to year variability between seasons. Furthermore, when November 15 occurs on a Saturday, six full weekend days are included in the 16-day window. When November 15 occurs on a Monday thru Thursday, only four weekend days are included in Firearms season. Still, regardless of this variability, Michigan hunters strongly favor November 15 start dates relative to other options. In the 2016 Deer Harvest Survey, 85% of hunters supported the traditional November 15 start date compared to the next closest option, opening the firearms season on the Saturday nearest November 15 (36% support).

Harvest trends that occur with different start dates showed patterns over 10 years ago with antlerless harvests seemingly increased on years with weekend openers. That trend has seemingly been reduced in recent years. Michigan is losing hunters at about 1 to 2% each year, and each 5 to 7-year cycle continually brings forward reduced antlerless harvest, likely resulting from long term, reduced hunters on the landscape. One explanation for the loss of a trend in harvest associated with antlerless harvest may be the higher proportion of individuals hunting in the archery season in recent years. Since 2000, Michigan has lost about 200,000 firearms hunters (from 700,000 to 500,000) yet have maintained a stable number of archers (~320,000). This retention in archery season likely has muted the influence of firearms season start date some in recent years.

Despite the decreasing number of participants in firearms season, that season makes up a majority of the total harvest. In 2016, 55% of all bucks harvested and 40% of all antlerless deer harvested came from the 16-day firearms season. Invariably, most of that harvest occurred within the first week, and likely within the first few days of the season. Michigan hunters are currently harvesting around 320-340,000 deer per year, which is tops in the Midwest and usually top 3rd to 4th in the country. However, the ratio of what is harvested is different than many other midwestern states. Since 2000, Michigan has only seen antlerless harvest exceed antlered harvest in one year (2009). Antlerless harvest didn't change dramatically that year compared to previous years; the change was more a function of drop in number of bucks harvested. The winters of 2007-2008 were especially hard on northern deer and may have contributed to drops in the overall populations, thus decreasing deer harvest up north while maintaining traditional antlerless harvest down south. Most midwestern states harvest more antlerless deer than antlered deer year after year.

There are several options for altering season structure or length as it pertains to CWD management. The first option is changing around the most impactful season – firearms season. The first opportunity for change would be to change the start date. This is likely to only have minor impact on harvest given the reasons previously mentioned and would likely need to be a statewide change to avoid confusion from a different opening day for CWD affected areas. The other option would be to delay the timing of the firearms season. In the SLP, a high percentage of standing corn can have an inverse impact on deer harvest. On average by November 15, ~75% of the statewide corn is typically harvested. Postponing the firearms opener 2 weeks would increase, on average, the amount of standing corn harvested by about 10%, allowing a little more time for corn to be harvested in wet falls. However, this opening date would be very late for other parts of the state, like the UP, where many deer are already moving to deer yards. Given the challenges associated with each change, and the likely minimal impact, it is generally not believed to be a worthwhile change.

A second option is to expand opportunity in existing seasons in CWD affected areas. One item that has been suggested and perhaps worth consideration is opening opportunities to more hunters in muzzleloader season by allowing firearms, thus making a second firearms season. This would almost certainly increase participation, as in 2016 only ~150,000 participated in muzzleloader season, harvesting about 23,000 deer. Contrast that with late antlerless season, which saw 60,000 hunters (and not opened statewide) yet harvested 18,000 deer. Success rate for 2016 muzzleloader hunters was 14.9%, the lowest of any season, while success rate for firearms season and late antlerless season (two seasons sandwiching muzzleloader season) were 30.1% and 27.8% respectively. Though participation would certainly increase, it is unknown whether harvest would increase, or whether antlerless harvest would simply be delayed by affording hunters additional opportunities. Muzzleloader also maintains a small yet vocal following and losing the exclusivity of that season would likely upset that segment of hunters greatly, which are all things to consider.

Another option using existing seasons would be to capitalize on the dates currently established for the Independence Hunt, designed for hunters with qualifying disabilities. This 4-day season has limited participation statewide (~1,900 hunters in 2016) and harvest (~400). There is an opportunity to open this up to all hunters on

private land in CWD affected areas as a second early antlerless opportunity. Qualified hunters with disabilities could still receive an allowance to harvest an antlered deer, maintaining an advantage consistent with the original intent of the season. However, sharing this season and opening hunting pressure may not be received well with those previously hunting in the season, as well as archers who are likely to have their quiet period disrupted by more firearms hunters in the woods.

Expansion of weapon use, including high powered rifles, has been thought to improve harvest or harvest pressure on deer herds. This approach was recently tried by Indiana, who allowed select common high-powered rifles into their firearms season because of legislation passed earlier in the year. This change resulted in no significant change in harvest, only hunters shifting their weapon of choice from shotguns and muzzleloaders to rifles. Notably, no safety concerns were observed due to this change.

A final option would be the addition of late season disease hunts, an approach done in other states such as Illinois. These late seasons provide one last opportunity for hunters to harvest deer. This was experimented within 14 townships in Ionia and Montcalm counties this past year and translated to about 300 deer taken and submitted for testing. Of note, about 74% of the individuals submitted for testing were female, a stark contrast to earlier in the year. Expansion of seasons typically yields diminishing returns in terms of harvest (i.e. fewer animals per day due to lack of interest/participation). However, harvests are likely to be minimally additive, especially if decisions are made to add seasons after the traditional hunting seasons have begun (viewed as bonus opportunities to use a license) rather than established seasons (potentially viewed as a “safety net” that delays harvest in other seasons).

Special Licenses and Discounts

Michigan has a history of responding to deer diseases with discounted licenses and allowance of free disease control permits (DCPs). This practice was started in bovine Tuberculosis (TB) affected areas back in the 1990’s and has been adopted in our CWD affected areas downstate in recent years.

Discounted licenses were sold in response to TB in area 452 (\$3.50 per antlerless license in 1997-2001). Early on, expanded seasons and unlimited antlerless quotas were helpful in initially reducing the deer herd, though participation and willingness to take antlerless deer waned over the years as the noted population declined. From 1998 to 1999, antlerless licenses sold in DMU 452 dropped 28%, though antlerless deer made up 56% of the harvest (compared to 53% in 1998). A survey in 2002 of lapsed license buyers indicated they no longer purchase antlerless licenses because they hunt elsewhere (28%) or deer numbers were too low for an enjoyable hunt (26%). The reduced cost of a license did not appear to motivate hunters to continually take additional deer, especially when populations appeared to be reduced. In 2015, MDNR began reducing costs of antlerless licenses per director’s order by 40% (from \$20 down to \$12) in CWD affected areas. Impacts of these are difficult to measure, generally because other changes usually accompany a license discount, but the agency has not been successful at increasing antlerless harvest due to this and other opportunities.

The original intent of DCPs was to specifically issue to farmers who owned cattle and nearby landowners in TB affected areas to reduce the risk of deer coming into close contact with livestock in the TB endemic area. These permits, which are good throughout the hunting season, are generally still issued this way. In 2015, these free permits were issued in the original nine-township CWD core and have expanded since that time to the new Montcalm County core as well. In analyzing the use, harvest, and license purchase patterns of those receiving DCPs, a pattern is emerging. Approximately 88% of the deer submitted on DCPs during 2017 were harvested during the traditional hunting season months (October-December). This leads us to question whether DCPs are resulting in an additive take of deer, or whether it is compensatory (replacement) harvest of deer that would otherwise be taken on traditional licenses. Of 1,089 landowners receiving DCPs last year, only ~25% purchased

antlerless licenses (on average, ~50% of individuals purchase antlerless licenses in a year), with 92% of these individuals purchasing antlerless licenses in 2015 and 2016. Of the 75% that did not purchase antlerless licenses, ~55% previously did purchase antlerless licenses in 2015-2016. There is strong support that hunters are not necessarily taking additional antlerless deer with DCPs (additive harvest), but simply using DCPs as a no-cost alternative to a purchased antlerless licenses (compensatory). It should be noted that only data is available for landowners who were issued DCPs, not the shooters on DCPs. The true effect of DCPs on antlerless harvest is unknown, and there could certainly be a minor “additive” component to DCPs, but it is likely minimal, and as CWD affected areas continue to expand, this added shift from using DCPs from antlerless licenses may not only have a negative effect on antlerless harvest, but also license purchasing behavior. There is no evidence that DCPs are contributing to decreased populations of deer currently in CWD or TB affected areas.

One unique approach that was tried by Ohio was to issue time sensitive antlerless licenses. The licenses are purchased prior to the season beginning, and expire part way through the season, thus shifting antlerless harvest earlier in the season. According to Ohio, “the reduced price resulted in the hunter choosing to purchase the license, the expiration date resulted in the hunter choosing to harvest a deer earlier”. Ohio tracks their harvest throughout the season, and typically sees antlerless deer dominated in harvest early in the year, followed by a shift to taking bucks in late October through mid-November, before ultimately finishing with a focus on antlerless deer to end the season. With expiring licenses, the focus on antlerless deer increased earlier in the year, and the window of focusing on bucks was reduced in magnitude and duration. Ohio increased their antlerless harvest by 38% the following year. Though additional changes were made, much of this is attributed to these expiring licenses. Similar trends have been seen in Michigan. Looking at check station data from 2016, hunters in Michigan tend to focus on bucks at the beginning of the year, with that focus intensifying during early and mid-November. It is not until about the second week of firearms season when antlerless deer overtake bucks in terms of total harvest, at which point 85% of the harvest is finished. Note that this is not a direct comparison with Ohio (harvest estimates vs. checked deer), but our harvest estimates and proportions tend to validate these comparisons.

Harvest Incentives/Bag Limits

It is unquestioned that the method for controlling deer growth is the harvest of antlerless deer. However, there are many misperceptions about how antlerless harvest is controlled by hunters. Understanding the relationship between hunter effort and deer density helps. Most people would agree that with reduced deer populations, more effort is required to harvest a deer, relative to less time with higher deer populations. Data from real world scenarios supports this. However, many people envision a linear relationship between these two points, when in fact it is exponential. In many cases, data suggests that deer densities can be reduced without affecting effort, until it gets to a critically low point, when effort increases exponentially. This can lead to hunter perceptions of unrealistically reduced deer herds. It’s generally accepted that most dramatic shifts occur in deer management when going from a conservative model to a more liberalized approach, and vice versa. Little effect is seen when going from a liberalized approach to a “more liberalized” approach (diminishing returns). For example, DMU 487 has long had high antlerless licenses, which far exceeds demand in that DMU. Changing the quota higher, or lower, is irrelevant because the hunters are already saturated with available licenses. These “unlimited” antlerless licenses have led to a stable antlerless harvest the past 7 year but also have led to trends that indicate increasing population size. In short, having unlimited licenses is not going to guarantee a declining population.

Most changes focused on increasing antlerless harvest applies to restrictions surrounding antlered deer with the thought being that hunters will turn to antlerless harvest given the additional challenges of harvesting antlered deer. Antler point restrictions will not be covered in this section, as they were considered their own separate topic. One restriction that can be applied is limiting the number of bucks that can be harvested. Indiana went

from a two-buck limit prior to 2002 to a one buck limit in that year. This was largely a hunter driven change. That first year, slightly fewer antlered deer were harvested, but since that time, far more antlered deer are harvested under a one-buck rule than the previous two-buck rule. It should be noted that prior to the one-buck rule being implemented, the two bucks had to be separated by season. Specifically, only one buck could be harvested in archery season, with the second buck being harvested in firearms or muzzleloader season. This means that the impact of the change was limited to multi-season hunters. Overall harvest in Indiana has declined (generally accepted as a reduction in population size) in recent years, but that is likely due to additional changes, including increased seasons, increased antlerless quotas, and changes in licensing. In Michigan, only 4% of hunters' report harvesting two bucks per year, so the impact on buck harvest going from two bucks to one bucks is likely to be minimal. What is not quantified, however, is how many does are passed in pursuit of a second buck. The increased selectivity that accompanies a one buck limit may also have impacts on increasing age structure of bucks. Indiana saw this over time, but this trend was also occurring prior to the one buck rule being implemented.

Earn-a-buck (EAB) is another method that has been used before to rapidly reduce deer herds. EAB is defined as requiring hunters to take one antlerless deer prior to harvesting an antlered deer. This technique has been applied in several states, but the most commonly cited approach was Wisconsin working to reduce their deer population. Wisconsin's EAB was adopted in 1996 to control deer in agricultural areas where deer numbers were growing quickly. The EAB approach was adopted in their CWD Eradication Zone by 2003. By all accounts, EAB was successful at reducing deer populations. The problem was it worked too well in reducing deer numbers, and many sportsmen pushed back on the regulation, which resulted in the Governor of Wisconsin signing a bill that took the ability away from the WDNR to implement EAB forever. Virginia is currently experimenting with what they deem "EAB light" or earn a second buck. The initial restriction to harvest an antlerless deer prior to harvesting a first buck is foregone, but a hunter must harvest an antlerless deer prior to harvesting their second buck. This approach has been widely accepted (and successful) in many Virginia counties. In many of these counties, the proportion of females in the harvest (NOT antlerless) is more than 60%. Virginia deer biologists have noted that many hunters treat this as an EAB, choosing to harvest the first antlerless deer they see, so they have no restrictions moving forward on their buck harvests. Many of these counties have removed their EAB status due to the success in reducing the deer population.

However, department authority to establish conditions on licenses is limited. The department has the authority to issue an antlerless deer license, deer license, or second deer license (MCL 324.43527a). The department may issue orders under MCL 324.40107 designating the kind of deer that may be taken and the geographic area in which any license issued is valid. However, the department does not have the authority to establish conditions on these licenses, such as sequential use. Thus, EAB and Earn a second buck options are currently not allowed under our current statute.

Baiting and Feeding

Bait is a *substance composed of grains, minerals, salt, fruits, vegetables, hay or other food materials, whether natural or manufactured, which to lure, entice, or attract deer as an aid in the taking of a deer* (Wildlife Conservation Order 3.1000). Feed is a *substance composed of grain, mineral, salt, fruit, vegetable, hay, or any other food material or combination of these materials, whether natural or manufactured, that may attract white-tailed deer or elk* (MCL 324.40102). Feed does not include plantings for wildlife, standing farm crops, or agricultural commodities scattered through normal agricultural practices (MCL 324.40102). Baiting is generally practiced to enhance hunter harvest, but is also used for capturing wildlife for research, treatment, managing overabundance, or animal relocation.^{26, 28} Supplemental feeding is commonly considered a broader activity meant to augment natural food sources and is done to improve the physical condition of wildlife, provide food in emergency situations, or divert wildlife for the sake of mitigating human health and safety concerns or

agricultural damage.^{26, 28} Habitat management practices, agricultural practices, home gardens, and natural food sources are generally not considered feeding or baiting activities.^{16, 21, 26, 28}

Baiting is a popular practice among Michigan hunters, and its popularity has generally risen over the last few decades.^{16, 21, 32, 6} In 1983, only 29% of hunters reported using bait, which rose to 48% in 1999.^{16, 6} As of 2016, 71% of hunters approve of using bait.¹⁰ Baiting is more common in the Upper Peninsula than in the rest of the state (70% of hunters in the UP reported using bait in 1999), and it is more common among bowhunters than firearm hunters.^{21, 6} In a 1993 survey, Michigan hunters reported their reasons for baiting: 72% indicated baiting makes hunting more exciting because they can watch more deer, and 63% reported they believe baiting increases their chances to harvest a deer.²¹

Despite the belief among many hunters that baiting increases their chances to harvest a deer, there is little evidence that baiting positively affects overall hunter harvest. Studies conducted in Michigan have found the impact of baiting on overall harvest to be negligible.^{16, 32, 32} Although bowhunters tend to be more successful over bait than not, when assessed most recently during the 2001 season the difference was not statistically significant.^{7, 23} A study in Wisconsin conducted after the implementation of the 2003 baiting ban found similar results.³⁰ The 2003 baiting ban resulted in .1 deer/km² fewer deer killed by archers, with a similar increase in harvest by firearms hunters, therefore the net impact of the ban on overall harvest was negligible.³⁰ In comparison, the study examined a 2003 supplemental antlerless season which resulted in a harvest increase of 1.2 antlerless deer/km².³⁰ Data from South Carolina suggested a negative relationship between baiting and hunter harvest.²⁴ Baiting is allowed in the Coastal Plain and banned in the Piedmont region. In comparing harvest between the two regions over the span of seven years, South Carolina's Department of Natural Resources found that where baiting is banned there was a 28% higher overall harvest, 33.9% higher doe harvest, 22.4% higher buck harvest, 9.3% fewer deer-vehicle collisions, and 1.6% lower man days/deer harvested than in the Coastal Plain where baiting is allowed.²⁴ One study in Greenwich, Connecticut did find a positive relationship between baiting and hunter harvest, although the study was limited to bowhunters in a single suburban community, hunting to control the urban deer population. This study was conducted to assess bowhunting harvest with and without bait.¹⁴ In this context, hunters using bait were more successful and harvested more deer than hunters not using bait (4.2 deer harvested/hunter vs. .83 deer harvest/hunter).¹⁴ A total of 78% of the deer harvested between September to December 2003 in Greenwich were taken over bait, although there was no difference in hours hunted or days spent hunting between bait and no bait bowhunters.¹⁴ While research does not support a link between baiting and higher overall hunter harvest, it is important to recognize that research suggests once CWD is established, its transmission may not be halted through increased hunter harvest. Only intensive culling with sharpshooters has been found to control CWD prevalence.¹⁷

The relationship between baiting, feeding, and CWD transmission is in the risks associated with congregating wildlife.^{34, 3, 25, 15, 4, 31} While natural food sources also congregate wildlife, human activities such as supplemental feeding or baiting do so at rates above natural sources and therefore increase the risks of transmitting disease¹. That is, disease transmission due to human activities is additive—over and above transmission due to natural sources of congregation. The risks of congregating animals around supplemental feed and bait are manifold: it increases the probability of direct contact between infected and noninfected animals, and it also increases the risk of contaminating the food source itself or the surrounding environment²⁶. In a review of 29 studies investigating the relationship between supplemental feeding and diseases transmitted through close or direct contact of animals, 95% of studies reported that supplemental feeding increased the risk of disease transmission.²² In addition, the longer food is on the landscape, the greater the likelihood in increasing disease transmission.⁵ CWD can be transmitted directly (e.g., saliva, urine, and feces) and indirectly (contaminated environment) among deer. Higher deer densities can lead to higher transmission rates, and contaminated environments can remain a source of infection for at least two years.^{19, 20, 36} While it has been hypothesized that disease immunity may be

higher with supplemental feeding, studies have found that management practices aimed at increasing carrying capacity—such as baiting and supplemental feeding—cause diseases to persist and spread,^{22, 26, 38} and therefore is expected to do so in the case of CWD.

In Michigan, while approval of baiting as a practice among hunters has steadily risen since the mid-1980s, most hunters do support baiting restrictions when the health of the herd is in jeopardy¹⁰—as was also the case when hunters were surveyed in 1999 in the wake of the baiting regulations to address TB.⁶ At that time, 50% of hunters indicated they would support regulations if it protected the herd, and 55% of statewide hunters supported the bait ban in the TB area.⁶ Other studies have found that hunter support for management actions to address CWD, including baiting bans, is predicated on the perceived efficacy of those actions¹³. It is therefore worth noting that some research suggests a lack of agreement among beliefs of hunters with respect to the link between baiting and CWD. A study in Alberta, Canada found that 19% believed baiting contributed to the spread of CWD, 32% believed it did not, and 46% were uncertain.³⁵ Surveys from other midwestern states do indicate support for baiting bans to control CWD. A survey of residents within CWD positive or adjacent counties in Illinois found that 87% of hunters and 85% of nonhunters supported a ban on baiting and feeding to manage CWD within the CWD-affected area.⁴⁰ Similarly, a survey of gun hunters in Wisconsin found 52 to 64% hunter support for a statewide ban on deer baiting;⁴¹ however, additional research from Wisconsin noted that recreational feeders, landowners, and hunters were not involved in the decision-making process that determined the management response—as a result, despite potential public support for actions such as a baiting ban, the ultimate outcome was legislative overturn of the ban.^{12, 13} These findings underscore the importance of stakeholder engagement prior to decision making. In addition, studies have found that hunter acceptance of management activities increases as prevalence increases and as perception of risk increases^{39, 42}. Studies have also examined hunter behavior changes in response to baiting bans. In Michigan, after the implementation of baiting regulations in the northeast Lower Peninsula due to TB, 50% of bowhunters and 31% of firearm hunters in the area reported hunting less because of the baiting ban, and 22% stopped hunting in the area altogether.⁷ However, declines in antlerless harvest and firearm season participation in the TB area following the ban were very similar to declines statewide.^{8, 9, 23} In a survey of hunters who purchased antlerless licenses in the TB area in 1998 but did not in 2001 after the ban was established, only 20% reported that the baiting ban contributed that decision (other factors included lack of time or believing the deer population was too low to enjoy hunting).^{7, 23}

Management options that have been suggested to address baiting and feeding in Michigan include: (1) maintaining the status quo; (2) implementing the CWD Working Group recommendations (i.e., statewide ban on baiting and feeding deer, with consideration of a statewide ban on the sale of bait); (3) only allowing single bite bait (e.g., food such as corn instead of multiple bite foods such as turnips); or (4) expanding the baiting ban zone. While research has not examined these management options specifically, given that CWD is often present in areas long before it is discovered,³⁷ elimination of baiting and feeding statewide or an expansion of the baiting ban zone may be a strategy to lessen the spread of the disease should it be introduced in new areas. However, there may be social reasons to consider alternative management options, as decision managers may need to balance the biological risks of allowing baiting against the social risks of alienating hunters who bait and thus undermining broader support for disease management.²³ With respect to single bite bait, alternative methods of provisioning food or limits on food amounts do not eliminate the risk of potential disease transmission. A 2008 study looked at varying quantities and methods of feeding to determine the potential for directly and indirectly transmitting disease among deer.²⁷ They varied quantity of feed (rationed 8.8L or variable amounts of up to 44L shelled corn) and method (raised feeding troughs, spreading feed, or feed piles), and observed control sites (natural feeding areas). Results indicated deer use was more highly concentrated in human-placed feed sites, and that deer spent more time at the pile and spread conditions than at control sites. The researchers concluded that “no feeding strategy (including restrictive feeding) appears to reduce the potential for disease transmission

substantially.”²⁷ In a study of TB prevalence among white-tailed deer and supplemental feeding, researchers found that risks for disease transmission increase with the number of deer fed per year, number of feed sites spreading grain, and quantity of grains, fruits, and vegetables.¹⁸ While the researchers had hypothesized that spreading grain would decrease opportunities for direct contact and therefore disease prevalence, they concluded that spreading was less important than the density of feed provided.¹⁸

There are both biological and social considerations to make regarding baiting and supplemental feeding. Baiting is a highly popular activity among Michigan hunters. Baiting and feeding also have economic value as a market for agricultural products, especially those that are slightly damaged or generally not desired for other markets³³. Evidence suggests that supplemental feeding and baiting increases both the congregation of deer and the risk of disease transmission through increasing probability of contact, probability of food source contamination, and probability of environmental contamination. The majority of disease ecology studies recommend eliminating baiting and feeding as a reasonable management response to control disease. In addition, there is little evidence that baiting increases overall hunter harvest. While studies suggest there may be public support for baiting regulations if they are perceived to effectively reduce transmission of a disease and if the public has been involved in decision making, studies also suggest that hunter activity may shift in response to those bans. Finally, it is important to recognize that baiting bans may affect hunter populations differently as baiting is more common in the Upper Peninsula and among bowhunters than firearm hunters.

Deer Culling

Since 2015, USDA-Wildlife Services has intensively culled deer near the initial detection of a CWD positive free-ranging deer found in Ingham County, Meridian Township. Samples collected through sharpshooting and hunting continued to detect CWD positive deer in Ingham and southern Clinton counties through 2016, and through genetic tests some of these deer were linked to the original positive doe. No CWD positive deer were detected in Ingham or Clinton counties in 2017, suggesting that intensive culling near the original detection may have limited the spread of CWD.

Although not conclusive in all areas, increasing localized deer harvest (and in effect reducing deer densities) can be effective at reducing prevalence of CWD.^{8, 6, 12} Simulated models have also demonstrated that reducing prevalence of CWD can be achieved through harvesting specific sex and age classes of deer.^{6, 12} Controlled hunting can be effective at reducing localized deer densities;^{14, 7} however, recreational hunting alone typically is not effective at reducing and maintaining low deer densities over time.^{1, 10, 13, 14}

Extensive research supports that culling can be effective at reducing and maintaining localized deer populations at lower densities.^{2, 4, 3} Many variables can influence vulnerability of different sex and age classes of deer to hunter harvest including: hunter density, hunter selectivity, habitat, land ownership, weather, agricultural operations (e.g., corn harvest), deer abundance and hunting regulations.⁵ Culling is generally more effective than hunting at targeting specific sex and age classes of deer.^{2, 14} As deer densities are reduced, recreational hunters may lose interest, but professional cullers will continue to harvest deer even at low densities.^{13, 14}

It is important to note that culling may be limited by access (geographical barriers and property ownership) and sometimes is not acceptable to hunters and other stakeholders. Culling is generally more financially costly than hunter harvest.^{4, 5, 14} However, in some areas (including Michigan), samples collected by culling have proven more effective than hunter harvested samples for detecting CWD positive deer.

From 2003-2007, both Illinois and Wisconsin harvested deer from core CWD areas using hunters and professional cullers. During this time, prevalence of CWD remained at about 1% in both areas. In 2008, Wisconsin suspended culling and all harvests after were limited to hunters, while at the same time Illinois

continued to harvest deer using hunting and culling. From 2008-12, CWD prevalence steadily increased from 1 to 5% in Wisconsin while prevalence remained at 1% in Illinois. Furthermore, hunter harvest continued to increase in the core CWD area in Illinois even while culling was ongoing. In an additional Illinois study, it was noted that removing only a moderate number of deer from an area had a stronger association of maintaining low CWD prevalence than removing a larger number of deer. They also found that continued sharpshooting intervention that removes at least a moderate number of deer is necessary to control CWD in free-ranging deer.⁹ Conversely, Tosa et al. (2017) found that remnant juvenile deer not removed when the rest of a social group is removed, tend to respond with greater shifts in space use and appeared to join neighboring groups. These findings highlight the importance of social disruption in disease dynamics and lend support for the complete removal of social groups, when possible.

Surveillance

Surveillance can be defined as the testing of animals to determine the amount and locations of a disease. With a complex disease such as CWD, a surveillance strategy must be designed to detect the disease as early as possible, when prevalence rates are low and environmental contamination is minimal.^{5, 7, 11} Unfortunately, this is not without its challenges. For diseases that are only present in a small percentage of a population, like CWD, extremely large numbers of animals need to be tested to have any confidence in disease status. This surveillance can put a significant strain on field and diagnostic resources. Methods of surveillance are also important; relying only on hunter-harvested cervids may not reach sufficient sample sizes to detect CWD until after it has been in a population for an extended time. Similarly, “targeted” sampling of clinical suspects alone is unlikely to detect CWD at levels low enough for management strategies to be successful because disease prevalence is likely >1% once these animals are seen on the landscape.⁹

A successful surveillance strategy must therefore be adaptive and incorporate multiple known risk factors. For CWD, spatial risk factors are particularly important because the disease is not distributed randomly across the landscape. Proximity to known disease occurrences, environmental attributes of the landscape, population level deer characteristics, and anthropogenic factors may point to areas or populations at higher risk.^{12, 11} Deer demographics should also be considered; older deer are more likely to be infected than younger deer, and males tend to have higher prevalence of disease than females.^{8, 4, 10, 6}

While surveillance targets populations to detect disease presence or absence, monitoring focuses on known infected populations to detect spatial and temporal trends.³ Assuming adequate sample sizes, surveillance datasets may be used to monitor the impacts of given management actions. It is very important, however, to realize that *surveillance and/or monitoring is not management*. That is, simply looking for the disease will have no impact on its spread. Testing is a means to an end, not a long-term strategy for preventing or controlling an outbreak.

The importance of partnerships for effective disease surveillance extends beyond hunters. Collaboration with Michigan Department of Agriculture and Rural Development provides additional resources and is critical to understanding the distribution of CWD within our borders. Privately-owned cervids should be sampled for CWD testing at time of death, and any antemortem (live animal) surveillance of privately-owned cervids can be considered an adjunct surveillance strategy. Sampling efficiency in the free-ranging herd can be increased by working with taxidermists, meat processors, landowners, and hunting associations (AFWA, *in progress*). Since a majority of the deer they handle are adult males, taxidermists in particular can be important partners for disease surveillance. In 2016, taxidermists in the Montcalm County area were trained by DNR Wildlife Health

Section staff to collect tissue samples for CWD surveillance; this program is under consideration for expansion in future surveillance seasons.

The decision to make disease surveillance mandatory in certain areas depends on several factors; namely, the goals of the surveillance and the capacity of field and diagnostic resources. In areas with adequate historical surveillance, or a higher prevalence of disease, more samples will not necessarily inform management decisions. However, it is important to realize that continued surveillance at some level is necessary to assess the impacts of any management actions taken. Mandatory sampling may also be needed if voluntary sampling is unlikely to reach desired sampling levels.

CWD was first found in Michigan's wild deer herd in 2015, and the State has placed increasing resources on responding to this disease. To meet our management objectives in Michigan, an adaptive, long-term surveillance strategy, coupled with publicly-supported preventative and targeted management actions is required.

Deer Processing, Carcass Disposal & Movement

The handling, transportation, and disposal of deer carcasses by hunters, taxidermists, and commercial processors is an important consideration for transmission of CWD, due to the risk of environmental contamination from prions in tissues such as the brain, spinal cord, lymph nodes, and spleen⁴. CWD prions from infected carcasses may remain in the soil and retain the capacity to infect animals for many years, therefore considering proper disposal and movement to avoid environmental contamination is important for reducing CWD spread and prevalence^{7, 8, 10, 11, 16}.

Currently, the DNR does not know how carcasses are disposed of by hunters and processors in Michigan. But, the DNR does know that for the 2016 season 46% of deer harvested in Michigan were handled by commercial processors, meaning 54% of hunters processed deer in an unknown manner⁵. For the 2016 hunting season, it is estimated that 468 registered processors processed upwards of 150,648 deer brought by 125,694 hunters⁵. Current guidelines for hunters recommend that the hide, brain, spinal cord, eyes, spleen, tonsils, bones, and head be disposed of in an approved landfill. DNR also provides dumpsters at deer check stations. Current transportation restrictions require if a hunters harvests a cervid in any other state, they may only bring back the following cervid parts into Michigan: hides, deboned meat, quarters or other parts of the cervid that do not have any part of the spinal column or head attached, finished taxidermy products, cleaned teeth, antlers, or antlers attached to a skullcap cleaned of brain and muscle tissue. If hunters kill a deer in a CWD area, they must report to a designated check station in the CWD area within 72 hours and submit materials requested by DNR before they move out of the CWD area. More detailed transportation restrictions may be found in the Wildlife Conservation Order.

Human-assisted movement of deceased cervids is an important route of transmission and geographic spread for CWD, as it may potentially spread the disease beyond what would be expected to occur naturally¹³. However, there is generally thought to be less risk in transporting carcasses than in transporting live cervids^{6, 14}. With respect to environmental contamination, experimental studies of mule deer found that deer may become infected with CWD in paddocks where infected deer carcasses had decomposed nearly two years earlier¹⁰. It is important to recognize that the capacity for cervids to become infected from field-dressed carcasses of healthy-appearing infected animals is still unknown⁶. As for carcass disposal, the EPA recommends incineration of carcasses at 1800F in an EPA-approved incinerator or alkaline hydrolysis (i.e., flameless cremation)³. However, given the impracticality of these practices for public use, other states recommend bagging and disposing of carcasses in an approved landfill^{3, 15}. In addition, a risk assessment conducted in Wisconsin concluded that

landfills provided reasonable containment of CWD prions, stating that “the risk of spreading CWD among Wisconsin’s free-ranging deer population by landfill disposal of infected carcasses is quite small¹⁵.” There are risks related to carcass processing and disposal that are amplified for taxidermists and commercial processors. Risks among taxidermists include the volume of older bucks that have a higher risk for contracting CWD^{17, 18}, as well as contact with heads for mounting which therefore requires the disposal of potentially-infected high risk materials such as brain, eyes, lymph nodes, and spinal cords^{4, 12}. Additional risk in commercial processing is the high volume of infected materials, potentially concentrated in one location^{1, 9, 12}. Surveillance of commercial processors in New York found that only 50% of carcasses handled by processors were disposed of properly (i.e., in a landfill), with the other half disposed of through unapproved methods such as rendering services (25%), compost or left on the landscape (15%), and a variety of other disposal methods (10%)¹³. We do not have data on hunter, taxidermist, or commercial processor knowledge or awareness of proper disposal methods.

With nearly half of all harvested deer taken to a commercial processor in Michigan, understanding what happens to the butchering waste produced by those processors would be important for understanding the risk of CWD environmental contamination, but the DNR currently does not have data on post-processing carcass disposal for either commercial processors or hunters. While using an EPA-approved conventional incinerator may be the best practice for carcass disposal, landfill disposal remains an acceptable practice. With respect to landfill disposal, it may be important to consider how access to landfills differ across the state, the challenges for those requiring the disposal of many carcasses (such as commercial processors), and the contamination risks associated with moving carcasses to an appropriate disposal site. With respect to carcass transportation restrictions, it may be important to recognize that carcass transportation rules differentially impact those who hunt out-of-state. In-state carcass transportation restrictions might be considered as a proactive measure to reduce the risk of introducing CWD into new areas, but it may be important to recognize that those restrictions differentially impact those who hunt outside of their DMU of residence. Taxidermists in Pennsylvania report that a substantial portion of the deer they receive are from out of state, and since restrictions on importation of out-of-state deer were implemented they believe they are receiving fewer deer; processors also report receiving fewer whole deer². However, this data is anecdotal and not the result of systematic inquiry.

Live animal movement

Geographic movement of infected live animals without symptoms is frequently the most efficient way to establish infections in new areas because they can both transmit to uninfected animals and contaminate the environment. With respect to CWD, the primary human-caused factor identified in its geographic spread is human-assisted movement of live animals,¹ and to date is the only confirmed contributing activity linked to spread to distant locations². Because there is currently no reliably sensitive and logistically feasible live animal test for CWD,³⁻¹⁰ routine testing of animals prior to movement is not practical.

Both captive and wild cervids are moved^{1, 11, 12}, predominantly for commerce (captives) [13] or species recovery, translocation or rehabilitation (wild).^{2, 14, 15} Evidence from other states indicate that more than three-quarters of rehabilitated fawns do not survive.^{14, 15}

Given the inability to reliably test live cervids for CWD, movement of both captive and wild cervids will inevitably involve some risk of introducing the disease into new areas. Whether such risk is unacceptable is a policy judgment, not a scientific one.

Given adequate enforcement, an option is prohibiting live cervid movement, which will likely control the highest risk of distributing CWD into previously uninfected areas.² New York and other northeastern states have banned deer rehabilitation as part of their CWD containment regulations.¹⁶ However, prohibiting movement of captive cervids can affect the ability of deer farmers to do business. And, prohibiting movement of wild cervids could

affect translocation projects desirable to sportspeople (e.g. elk reintroduction into new areas) or limit deer rehabilitation, which could be unpopular.

Biosecurity and handling of hazardous materials

In CWD-infected cervids, infectious prions are present throughout the body and its fluids, in varying amounts.¹⁷⁻¹⁹ Nervous system tissues (brain, spinal cord, nerves) and lymphatic tissues (lymph nodes, spleen) have the highest infectivity.²⁰⁻²² Infectious prions are present in blood,²³ feces,²⁴ and urine.²⁵⁻²⁸ Tissues from infected animals can contaminate the environment, where the CWD prions they contain bind to soil and are taken up by at least some plants, and likely remain infectious for many years.²⁹⁻³¹ Other species that eat infected tissues (crows, coyotes, and probably others) can sometimes transport prions and contaminate new areas with infectious feces,^{32, 33} even though they aren't infected themselves.^{34, 35}

Once harvested, wild cervids become the property of the hunter, who dictates how remains are disposed of. DNR can regulate the movement of wild cervid carcasses out of assumed CWD infected areas, perform outreach to teach proper disposal, and provide opportunity for safe disposal (e.g. dumpsters, lab incineration of CWD-positives). MDARD has regulatory authority over disposal of dead livestock, including captive cervids, and biosecurity on livestock facilities.³⁶

Landfilling can contain CWD prions, but they remain infectious. Only high-temperature incineration and alkaline digestion destroy prion infectivity. Treatments (e.g., some disinfectants, composting, controlled burns) can reduce, but not eliminate, infectivity.²⁹ While transport hosts can contaminate the environment with CWD prions, they likely present a comparatively lower risk than cervids and their carcasses.²⁹ Captive cervid-derived products (e.g. urine, velvet) are likely to be infectious if taken from infected asymptomatic deer, and so could contaminate the environment if placed there by humans. For example, urine could create a substantial environmental reservoir,³⁷ and as little as 10 ml of urine contained enough infectious CWD prion to risk lethal infection in 50% of exposed deer.

Teaching hunters and providing opportunities for proper disposal may facilitate cooperation. Current testing protocols (shipment of cervid heads and carcasses of symptomatic cervids to the MDNR Wildlife Disease Lab for disposal) minimize opportunity for high risk tissues (e.g. brain) to be disposed of improperly. Another option to minimize risk may be eliminating the use of deer urine lures and velvet, although it is unclear how much. Nevertheless, the State of Maine considers the risk posed by natural deer urine lures to be “undeniable” [39], and other states (e.g. Arkansas, Maine, Virginia) have banned their use. However, providing opportunity doesn't guarantee compliance, and strict enforcement of movement restrictions is difficult. Incinerator capacity and incineration costs for high-risk tissues could become prohibitive as the CWD-infected area expands. And, regulating distribution and use of urine and velvet could affect the business of captive cervid producers.

Privately Owned Cervids

The practice of keeping deer behind fences has been documented in Michigan for as long as natural resources have been managed by the DNR/Department of Conservation. For decades, people were able to fence their land and purchase deer from the State of Michigan for private hunting or personal enjoyment. It wasn't until the late 70's when Michigan really saw the first formal deer farms – deer that were being bred behind fences, for genetics, sale of offspring, and other various products. From that timeframe until the late 90's, deer farming began to grow substantially in Michigan. At its peak, there were over 815 registered facilities located in Michigan around the year 2000. Prior to that time, there were not many regulations regarding the deer farming industry in Michigan, including the importation of deer into Michigan from out of state, a practice that was very common for a long time resulting in thousands of animals being delivered into the State of Michigan. The early 2000's saw the first regulatory changes to the program with the establishment of the Privately Owned Cervidae

Producers Marketing Act 190 of 2000, as well as the Operational Standards that coincide with that statute. In addition, captive deer became classified as livestock under the Animal Industry Act, which then lead to the program being co-managed by both the DNR and Michigan Department of Agriculture and Rural Development.

In the mid 2000's, Michigan mandated that all deer fences shall be 10 feet tall, increasing from 8 feet, and to this day is the only state that has this requirement. The practice of fencing in wild deer has not been allowed in over 20 years and all animals behind fences currently are classified as livestock raised deer. When a facility registers with the state, the DNR works with the landowner before any fencing occurs to ensure an appropriate plan is in place for driving the wild deer outside of the fence while it is being constructed. Once verified empty, they become registered and are able to place livestock raised deer in the facility.

Fees were raised in the mid-2000's from \$45 to \$750 to cover program costs and inspections; these are paid every three years to the DNR. With tighter regulations and an increase in oversight from both agencies, there started to be a decline of farms starting in 2004 and continues to decrease with a present-day number of 330 farms. Michigan currently ranks #3 in terms of deer farming industries in the country and certainly has some of the most stringent rules and regulations of any state. In 2017, the Michigan deer industry conducted an economic study and it was determined that deer farming contributes approximately 20 million dollars to Michigan's economy each year.

The DNR has the regulatory authority for issuing registrations, inspections, fencing, record keeping, and ensuring that all standards under Act 190 are being met by the deer farming industry. MDARD oversees the CWD testing program for captive cervids, as well as testing for bovine tuberculosis, as well as movement requirements, tagging, and importation of cervids into the state. Together, both agencies work together on a weekly, if not daily basis, to ensure that both agencies are aware of any issues with noncompliance, new trends in the industry, legal issues with farms, and to be sure that both sides of the fences are protected to the best of our abilities. The DNR Wildlife Division conducts audits every three years on facilities where fences are inspected, records are checked, and a questionnaire is conducted with the facility representative. These inspections are typically conducted by DNR Wildlife Division staff, with approximately 110 audits being held each year. In cases of noncompliance, the DNR Law Enforcement Division are involved. In cases where law enforcement action does not resolve compliance issues, the state Attorney General's office are included in conversations and appropriate actions are taken to bring the facility into compliance with the state's standards. The DNR also frequently works with the Department of Environmental Quality, as from time to time fencing projects may affect their rules and regulations regarding fencing in sensitive areas, such as wetlands, lakes, rivers, or floodplains.

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