

**Project/Activity number:** NC1209

**Project/Activity Title:** North American Interdisciplinary Chronic Wasting Disease Research Consortium

**Period Covered:** October 31<sup>st</sup>, 2020 to November 1<sup>st</sup> 2021

**Date of this report:** November 3<sup>rd</sup>, 2021

**Annual meeting dates:** October 14<sup>th</sup> and 15<sup>th</sup>, 2021

**Participants:** Anne JusticeAllen, Anthony Kincaid, Bryan Richards, Carine Holz, Chad Switzer, Charlie Bahnson, Chris Jennelle, Christine Casey, David Williams, Dr. A. Dan Wilson, Evelyn Merrill, Jennifer R Ballard, Jerry Belant, John Fischer, Jonathan Mawdsley, Joseph Darish, Justin Greenlee, Margaret Wild, Mark Chase, Mary Wood, Megan Friggens, Mike Samuel, Miranda Huang, Noelle Thompson, Tom Hauge, Tracy Nichols, William (Bill) Siemer, Evelyn Merrill, Linda Glaser, John Beck, Neelam Poudyal, Alejandro Banda, Allen Herbst, Daniel Storm, Daniel Grove, Dwayne Etter, Miranda Huang, Tom DeLiberto, Sonja Christensen, Steve Demarias, Qingzhong Kong, Rachel Ruden, David Walter, Scott Wells, Hui Li, Kurt VerCauteren, Debbie McKenzie, Jason Bartz, Lisa Muller, Mark Ruder, Michelle Schultze, Patrice Klein, Joel Pedersen, Becky McPeake, Tiffany Marie Wolf, Amanda Kamps, Neelam Poudyal, Steven Gurney, Bill Siemer, Tyler Harms, Tricia L Hosch Hebdon, Wei Zhang, Daniel Walsh, David MacFarland, Peter Larsen, Shigetoshi Eda, Krysten Schuler, Marc Schwabenlander, Rodrigo Morales, Jennifer Malmberg, Mark Zabel, Tracy Nichols, Russ Mason, Dana Infante, Noelle Thompson, Chris Jennelle

**Brief summary of minutes of annual meeting:** The NC1209 Interdisciplinary CWD Research Consortium held its annual meeting on October 14<sup>th</sup> and 15<sup>th</sup> via zoom due to travel restrictions in place for many of our members due to the ongoing pandemic. The agenda was split into two parts with the first part being open to both NIMSS and non-NIMSS participants and the second part of the meeting that was restricted to NIMSS only members of the Consortium. In the first part of the meeting an overview of the accomplishments of the consortium was presented followed by the leads for the 5 projects provided updates on the progress that each project made in the last year. The first part of the meeting finished with a discussion on the communication styles and frequency from the executive leadership. The second part of the meeting discussed new directions for the projects, potential topics on position statements from the Consortium, and voting of the members on a) a new secretary and b) applications from individuals to become full NIMSS members. A full summary is available at:

<https://sites.google.com/umn.edu/members-cwd-research/home>

**Accomplishments:** In the past year the North American Interdisciplinary Chronic Wasting Disease Research Consortium (hence referred to as The Consortium) has made significant accomplishments in spite of the pandemic. The Consortium has identified five focus areas of CWD biology that require concentrated effort to provide science-based solutions to managing CWD. These five include i) The national CWD tissue and reagents repository, ii) large-scale research facilities for controlled CWD research, iii) CWD diagnostics, iv) evaluating management strategies across state boundaries and v) using social science to inform CWD management. The Consortium has made several accomplishments around these 5 objectives. First, each objective crafted a white paper that summarize the importance of the problem, the

goals and significance of the objective and outcomes and benefits produced from The Consortium related to the specific objective. These white papers were disseminated to our membership and were presented at several venues including the American Fish and Wildlife Association annual meeting. The second main accomplishment of The Consortium that is related to the 5 objectives is facilitating interdisciplinary collaboration. Past meetings, both in person and zoom, have been professionally facilitated allowing for richer interactions between the members that share common interests. These interactions have led to scientific collaborations that would not have been possible without The Consortium. Members of The Consortium have submitted grants to the Michigan Department of Natural Resources, the United States Department of Agriculture, the United States Geological Service and the National Institutes of Health. Additionally, members of The Consortium have co-authored peer-reviewed research on CWD in numerous high-impact journals including mSphere, Journal of Biological Chemistry, Proceedings of the National Academy of Sciences, Frontiers in Veterinary Science, Scientific Reports, PloS Pathogens and Acta Neuropathologica. The third main accomplishment is the outreach and communication activities of The Consortium. Consortium members Deb McKenzie, Byron Caughey, Tracy Nichols, Krysten Schuler and Jason Bartz participated in podcasts on various topics regarding CWD. At the American Fish and Wildlife Association annual meeting Consortium members Krysten Schuler, Dan Walsh, Sonja Christensen and David Williams presented data regarding CWD data management, mapping and surveillance tool systems. The Consortium has built a web page (<https://www.cwd-research.com/home>) that contains a public facing area containing general information regarding CWD, the projects and the white papers and a members-only section of the web page that houses information and notes about past meetings and other information for members.

**Impacts:** The national CWD tissue and reagents repository made significant progress this year that may lead to a lasting impact in the CWD field. The significance of this program is multifold. First, a repository of CWD field isolates from a wide-ranging geographic location in North America will allow, for the first time, the means to begin to assess the distribution and frequency of CWD strains in North America. Since prion strains can differ in pathogenicity and host range, this is essential data for the determination for risk of interspecies prion transmission to humans and to domestic livestock and wildlife. Second, this repository can provide uniform standardized CWD-infected and uninfected sources of tissue for diagnostic development, mitigation testing and for basic research purposes. Finally, the implementation of the repository will facilitate cooperation between the various state agencies that could lead to new collaborative efforts. This year David Walsh received federal funding to build a virtual CWD repository database. Members of The Consortium will join Dr. Walsh in presenting an overview of the database at the wildlife society meeting on November 5<sup>th</sup>. The Consortium on CWD diagnostics also made significant progress in reaching the long-term goal of this objective. Detection of CWD by diagnostic assays is a key tool in controlling CWD both in wild and farmed cervid populations. Officially approved postmortem CWD diagnostic tests include immunohistochemistry (IHC) and ELISA of the medial retropharyngeal lymph nodes and the obex. While postmortem detection is valuable, there are advantages to detecting CWD in live animals. Currently, antemortem (live animal testing) is limited to IHC of rectal and tonsil biopsies. The development of highly sensitive amplification assays, such as real-time quaking-induced conversion (RT-QuIC), has opened up new possibilities for both post and ante mortem CWD diagnostic testing. In the current reporting year members of the Consortium published several ground-breaking papers on the use of RT-QuIC for the diagnosis of CWD infection in live animals from ear punches (Ferreira et al., 2021) and in fecal samples (Tennant et al. 2020; Hwang et al., 2021). Additionally, members of The Consortium have made advances in the large-scale production of recPrPC, the key reagent for RT-QuIC, that is currently being validated by a USDA-funded working group of Consortium members.

## Publications (selected):

Tracy A. Nichols, Eric M. Nicholson, Yihui Liu, Wanyun Tao, Terry R. Spraker, Michael Lavelle, Justin Fischer, Qingzhong Kong, Kurt C. VerCauteren (2021) Detection of Two Dissimilar Chronic Wasting Disease Isolates in Two Captive Rocky Mountain Elk (*Cervus canadensis*) Herds. Accepted for publication. Prion

F. Bravo-Risi , Paulina Soto, Francisca Bravo-Risi, Thomas Eckland, Robert Dittmar, Santiago Ramírez, Celso S. G. Catumbela, Claudio Soto, Mitch Lockwood, Tracy Nichols and Rodrigo Morales (2021) Detection of CWD prions in naturally infected white-tailed deer fetuses and gestational tissues by PMCA. *Sci Rep*, Sept 15;11(1):18385

Bartz, J.C. Environmental and host factors that contribute to prion strain evolution. (2021). *Acta Neuropathologica*. Apr 25;. doi: 10.1007/s00401-021-02310-6. [Epub ahead of print] Review. PMID: 33899132

Ferreira, N. C. , Charco, J. M. , Plagenz, J, Orru, C.D. , Denkers, N. D., Metrick, M. A. II , Hughson, A.G. , Griffin, K.A., Race, B. , Hoover, E. A. , Castilla, J, Nichols, T.A. , Miller, M. W., Caughey, B. (2021). Detection of chronic wasting disease in mule and white-tailed deer by RT-QulC analysis of outer ear. *Sci Rep*, April 8:11(1):7702

Hwang S, Greenlee JJ, Nicholson EM (2021) Real-Time Quaking-Induced Conversion Detection of PrP(Sc) in Fecal Samples From Chronic Wasting Disease Infected White-Tailed Deer Using Bank Vole Substrate. *Front Vet Sci* 8: 643754 Doi 10.3389/fvets.2021.643754

Bloodgood J, Kiupel M, Melotti J, Straka K (2021) Chronic Wasting Disease Diagnostic Discrepancies: The Importance of Testing Both Medial Retropharyngeal Lymph Nodes. *J Wildl Dis* 57: 194-198 Doi 10.7589/JWD-D-20-00007

Schwabenlander MD, Rowden GR, Li M, LaSharr K, Hildebrand EC, Stone S, Seelig DM, Jennelle CS, Cornicelli L, Wolf T Met al (2021) Comparison of Chronic Wasting Disease Detection Methods and Procedures: Implications for Free-Ranging White-Tailed Deer (*Odocoileus virginianus*) Surveillance and Management. *J Wildl Dis*: Doi 10.7589/JWD-D-21-00033

Booth CJ, Lichtenberg SS, Chappell RJ, Pedersen JA (2021) Chemical Inactivation of Prions Is Altered by Binding to the Soil Mineral Montmorillonite. *ACS Infect Dis*: Doi 10.1021/acsinfectdis.0c00860

Tennant JM, Li M, Henderson DM, Tyer ML, Denkers ND, Haley NJ, Mathiason CK, Hoover EA (2020) Shedding and stability of CWD prion seeding activity in cervid feces. *PLoS One* 15: e0227094 Doi 10.1371/journal.pone.0227094

Carlos Kramm , Paulina Soto, Tracy A Nichols , Rodrigo Morales (2020) Chronic wasting disease (CWD) prion detection in blood from pre-symptomatic white-tailed deer harboring PRNP polymorphic variants *Sci Rep*, Nov 13 2020 10(1):19763

Kondru N, Manne S, Kokemuller R, Greenlee J, Greenlee MHW, Nichols T, Kong Q, Anantharam V, Kanthasamy A, Halbur P, Kanthasamy AG. (2020) An ex vivo brain slice culture model of chronic wasting disease: implications for disease pathogenesis and therapeutic development. *Sci Rep*. May 6;10(1):7640

## **CWD Consortium annual meeting – 2021**

### **Join Zoom Meeting**

<https://msu.zoom.us/j/99046171539>

**CWD Research Consortium Oct. 14, 8:30 am - 12:15 pm CT  
Oct 14, 2021 08:30 AM Central Time (US and Canada)**

**Meeting ID: 990 4617 1539**

**Passcode: 891190**

One tap mobile

+13017158592,,99046171539# US (Washington DC)

+13126266799,,99046171539# US (Chicago)

Join by SIP: 99046171539@zoomcrc.com

### **October 14<sup>th</sup>**

Attendees:

<https://docs.google.com/spreadsheets/d/1SIMRC9wyY77LCJmWfPVnTjuDeADJAK03UN0EaDS5Uk/edit?resourcekey#gid=1408984236>  
<https://docs.google.com/spreadsheets/d/10I5caQzPeoncn7obdIHMMAYJ7ahLIXPpAXb4sGV16NM/edit#gid=749417275>

8:30 CST – Welcome – Dr. Dana Infante (MSU), Dr. Russ Mason (MSU)

- Russ Mason - compliments on the consortium activities; importance for wildlife management with cooperative frameworks; thought to consider - use this consortium as a model for other challenging diseases (e.g. ASF)
- Dana Infante - introduction as the admin advisor; highly valued work - funding, white papers, multistate effort; advice - keep the communication going between researchers and agencies

8:50 – Overview – Dr. Jason Bartz

- Why are we here - multistate research program, enable research diversity to address CWD - science, ID the most pressing needs through collaboration
- White papers - 5 consortium objectives; focused the purpose for the objectives; communication with stakeholders
- Publications in high impact journals through collaboration
- Grants - submitted and received funding through multiple sources
- Communications - meetings and podcasts (e.g. AFWA, CIDRAP podcasts)
- Overview of the upcoming meeting
  - Refine objectives and process, future position statements
  - Data from each group - grants submitted/landed, papers, talks/presentations, collaborations established

9:10 – Membership - Sonja leading

- Background on the Consortium, establishment in July 2020

- Process of becoming an official member through NIMSS and also those who are just interested in the Consortium happenings
- Governance document - new members must petition the existing members and voted upon by membership; shared the application form; a focus on researchers; those who are interested can fill out the application and it will be voted on this afternoon for participation in the remainder of the meeting
- Some government employees can't use Google forms?
  - Choice of objective is in reference to strategic planning discussion
- Form information provided in the Chat, to send to schwa239@umn.edu
- Sonja provided and overview of the NIMSS website

Commented [1]: @schwa239@umn.edu  
Assigned to Marc Schwabenlander\_

9:40 – Progress reports on Objectives 1-3 from team leads

- Disease transmission and pathogenesis (Bartz/Walter)
  - Repository update - genetics focus at this point
    - USGS funding for FY22-23
    - National tissue (multiple species) and reagents virtual repository
    - Collaborations with DOE in TN
    - Physical repository could be at NWRC in CO?
    - Voluntary, data agreements and control, standard metadata
    - Host?
      - CWD Alliance
      - SOP4CWD Collaboration
    - Panel discussion at TWS conference Nov 5, 2021
    - Standards - methods, reference material, reagents, etc.
  - Learn from Natural History Collections?
    - <http://portal.vertnet.org/publishers>
  - NSF funding?
  - Could the repository be aligned for cervids in general, not CWD-specific (funding sources)?
    - Pathogen surveillance - <https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1009583>
- Development of large-scale research facilities (Hewitt/Demarais)
  - Some potential sites - MS (farmed site, between CWD positive detections), TN (ground zero for free-ranging outbreak), WI farm, MI (George Reserve fenced area)
  - Will provide contact information for each site.
- Improving diagnostic testing for CWD (Nichols/Schuler)
  - RT-QuIC diagnostic evaluation (USDA) - Nichols
    - Collaborative effort - initiated through the consortium
      - UMN and USGS substrate performing equally
    - Comparison of sensitivity? - Yes
    - Standardized protocol
      - Equipment - not at this point
      - Is there a difference in plate readers?

- Rectal biopsy - completed, data review in progress
  - ~95% specificity
- Tonsil biopsy - In progress
- MRPLN - starting in the next week
- RT-QuIC ring test - Schuler
  - Labs in WI, MN, NY, MO, PA, MO
  - MRPLN validation - standardized protocol, substrate, samples

10:10 – Break

10:45 – Progress reports on Objectives 4 and 5 from team leads

- Evaluating management strategies across state boundaries (MacFarland/Walsh)
  - Collaboration - USGS, UWI and several Midwest agencies - harvest numbers in reference to regulation changes (i.e., more tags, more harvests?); adaptive management on a regional scale
  - USGS, UMI, MN DNR - adaptive management
  - Camera trap - population estimates
  - Dan Grove (TN) - VA, management with CWD regionally
  - USGS, UWI, TN - RT-QuIC environmental investigation at hot spots
  - SOP4CWD - surveillance information dashboard; data warehouse; habitat risk; ultimately an optimization model given the budget and goals; <https://cwhl.vet.cornell.edu/project/sop4cwd>
  - USGS, MIDNR, ISU, UW-Milwaukee - genetic tools
  - Several projects on deer movement at a regional level
- Enhancing coordination, understanding, and communication of social science as it relates to CWD research and management. (Lauber/Wolf) - Bill Siemer
  - Several meetings - looking for funding for joint multistate work
    - AFWA and USDA - neither were accepted
  - Sept. human dimensions conference was pushed to Spring 2022
  - Many individual projects happening at state/U level
    - NY, MN, AR, CO, WI, MS
    - NY - messaging research
    - TN - broad economic impacts of CWD (partner with MSU); hunter behavior
    - MS - animated videos for understanding CWD; importance; education; agency management principles
    - MI - economic impacts of CWD (Cornell, NDA); “duck stamp” model
    - MN - educational tools; underrepresented communities, community understanding of CWD
  - What pieces of information inform behavior?
    - Does the function of prion and pathogenesis really change anything?

11:30 – Effectiveness of executive leadership feedback

- Communication - what is ideal?

- <https://www.cwd-research.com/home> - can this be used for broad communication
  - Jason's summary was good
  - Newsletters are important. Direct email is better than website (multiple comments). Quarterly is ideal. Include list of members and non-members.
  - Information is reliant on members providing the updates. (website, newsletters)
    - Is there a framework that works best to report the information?
    - Upload pubs and information to a database? Free.
  - Social media?
  - Grants - support the meetings, etc.
  - Otherwise, need free options.
- Reminder of membership application.
  - Executive leadership update; information on change over

12:15 – Lunch

**NIMSS Participant Zoom Link:**

***CWD Research Consortium Multistate Project - NIMSS Participants (Oct. 14 - 15).  
Oct 14, 2021 12:30 PM Central Time (US and Canada)***

**Join Zoom Meeting**

<https://msu.zoom.us/j/97411195297>

**Meeting ID: 974 1119 5297**

**Passcode: 241846**

One tap mobile

+16468769923,,97411195297# US (New York)

+13017158592,,97411195297# US (Washington DC)

Join by SIP: [97411195297@zoomcrc.com](mailto:97411195297@zoomcrc.com)

1:00 – Re-welcome, member introductions meeting guidelines, vote on membership

- Vote on membership
  - Bryan Richards, USGS
  - Neelam Poudyal, U TN
  - Evelyn Merrill, U Alberta
  - Noelle Thompson, KY DFWR
  - Chris Jennelle, MN DNR
  - Miranda Huang, MS State U
  - David Williams, Mich St U
- All 7 voted in - link sent to them to attend the remainder of the meeting (motion - KS, MS)
- Introductions led by John Beck

1:15 – Breakout groups (assigned affinity group) – What is working and what is not working?

Objective 1: Disease transmission and pathogenesis

- Overview
  - What is working
    - evolution of the idea, has become more refined and feasible
    - funding
  - What isn't working
    - How to share samples
      - oversight
    - Long-term funding needed. stable. where?
    - What tissues are collected.
      - Difference between farmed and wild.
      - Wild - state level; Farmed - federal level
    - Zoonotic transmission

Objective 2: Development of large-scale research facilities

- Overview
  - What is working
    - Potential study sites are identified - 5
      - Pros and cons for each site
  - What isn't working
    - There isn't consortium work happening at these sites
      - Research happening, but not through collaboration in the consortium
      - Put together a summary of the 5 sites where specific questions could be asked

Objective 3: Improving diagnostic testing for CWD

- Last meeting July 2020
- What is working
  - USDA is evaluating RT-QuIC - Tracy gave a quick overview
  - 6 lab ring test - Krysten gave a quick overview
  - Many groups are using RT-QuIC for research
    - UTX-Houston is evaluating over 1000 samples RT-QuIC/IHC/ELISA/PMCA
  - Substrate - MN can mass produce; may solve that problem (research, diagnostic?)
- What is not working
  - USDA timelines - for wildlife management
  - Communication between researchers on evaluation of diagnostics
  - Ring-test usefulness to the USDA?
    - It was funded through WS not VS.
    - RAMALT was evaluated before MRPLN
      - priority of farmed cervid stakeholders
      - wild animal stakeholders wanted MRPLN to be evaluated
    - RT-QuIC variability
      - standardization of protocol, substrate, equipment, stats, etc.



- NAHLN labs run the RT-QuIC assay - Yes
        - e.g., labs use the IDEXX CWD test
      - What about OIE validation? not equivalent to USDA validation
    - Is the USDA evaluating PCMA to use for strain purposes? secondary test?
    - What about other diagnostic test development for research?

Objective 4: Evaluating management strategies across state boundaries

- What is working
  - Lots of collaboration in this area
  - Understanding of what is happening across research groups
- What is not working
  - The group is not meeting and working outside of the annual discussion
  - Mountain of political processes to work across jurisdictions
    - Use other examples (flyway council, etc.)
    - Build a framework for regional deer management

Objective 5: Enhancing coordination, understanding, and communication of social science as it relates to CWD research and management

- What is working
  - Have had some meeting throughout the year
  - There is a variety of individual HD projects happening
- What is not working
  - It's a broad focus
  - Need better communication about what the members are doing in HD
  - The focused CWD HD funding is just not there
    - Could HD pieces be added to existing or future CWD research projects
  - Continued push to leaders why CWD matters
  - Implementation science - how do we make the science actionable; how to change behavior
  - CWD messaging consistency - it's needed
  - What happens as zoonotic transmission potential information increases (macaque paper)?
    - Consortium position statement
    - Put studies into context

2:00 – Report

2:45 – Break

3:15 - Breakout groups – What are new directions (within the 5 objectives)?

Objective 1: Disease transmission and pathogenesis

- Standards
  - different tissues; positive controls, inactivation studies
- Environmental samples
  - soil, water, plants
  - temporal samples
  - shared among researchers

- Coordinated with Obj. 2
  - Criteria for use
    - putting samples back into the repository if you are going to get samples?
- Objective 2: Development of large-scale research facilities
- Information on the sites to be shared
  - Could the process of obtaining the sites be shared with the Consortium?  
Cookbook/workshop of how to obtain permissions, get through regulatory concerns
- Objective 3: Improving diagnostic testing for CWD
- Position statement of current science - test development, sampling
    - Carcass-side, pen-side testing
      - Moving closer to that stage - years away
      - Taking steps to get closer to the animal
        - Time, validation
      - Demand is growing; separate line of testing tools for hunters that is outside of regulatory testing
    - Field station testing
    - Different sample types - RT-QuIC
      - Ear notch
        - What's next - ear punch system research (USDA, RML); codon variability
      - Blood -
        - PMCA
          - 96% in late stage, asymptomatic
          - 50% early, asymptomatic
            - Detection is more limited in the less susceptible PRNP
        - RT-QuIC
          - Poor, unpublished lab results from Ames lab
          - Early CSU work on blood showed good results but hasn't been reproducible
    - More meetings
  - Sharing protocols, standardized equipment, etc.
    - Including environmental samples, fecal samples, fomites, cleaning and disinfection protocols
- Objective 4: Evaluating management strategies across state boundaries
- Becoming more active as a group - more meetings
    - Identifying one key problem to discuss - methods, resources, etc. needed
      - Risk of introductions
      - Consistency of definitions
      - Common ways of calculations (prevalence, etc.)
    - Information sharing between farmed and wild management - mutual problems on each side of the fence
- Objective 5: Enhancing coordination, understanding, and communication of social science as it relates to CWD research and management
- Top priority - build relationships within the group

- Communicating within the consortium about what HD work is happening
- identifying HD and management connections
- Put projects that are funded on the website and internal sharing to identify collaborations
- New researchers. Who to recruit to the consortium?!
  - Economists
  - Implementation scientists
  - Communications
- Rework and resubmit proposals
- Leading the zoonotic position statement
- Does corporate America care about funding this research (Cabelas, Federal, etc.)?

Add a 6th objective - CWD zoonotics?

4:00 - Report

4:45 – Nominations for secretary

5:00 – Adjourn

### **October 15<sup>th</sup>**

8:30 CST – Reconnect / Overview / Voting for secretary

- Secretary - Debbie McKenzie nominated, motion moved to vote her in (KS, SD)

9:00 - Reflecting on objectives - moving forward

- Position statements - easily digestible information on recent scientific advances
  - Who is the audience? agencies, public?
    - There is a relatively uninformed public who are sponges of information (framed objectively or not), and there are people with advanced degrees who use published information to advance ideas and hypotheses that are geared towards personal or political agendas.
  - Should we be doing this or leaving it to others doing outreach?
    - How do we direct this information to agency/organization communicators? - feed to AFWA, NDA, CWD Alliance...
      - It may not be well received by all.
    - Reactive vs proactive
    - Statements ready to distribute to agencies, etc.
  - Needs to be continually updated! Annually, semi-annually?
    - New Objective?
    - On the website or “in our pockets”?
  - “Position” vs “Fact/Information Sheets” vs “CWD Scientific Consensus/Perspective” vs “State of the Science”

- Cannot “should” statements
  - Need to have some summarized opinion of the science
    - Add updates with new manuscripts. Adjusting the audience that was not intended in the manuscript.
  - Review papers in each areas?
  - Potential areas for statements
    - Combating misinformation (Political realm?)
      - How to ID CWD misinformation
      - Where are reliable sources of CWD information
      - Strategy to direct people to the correct information
      - Scientific process
      - EHD vs CWD
      - Media relations - how to better communicate with media
      - Sonja has an outline/manuscript with 2 other colleagues on this subject. Ready to reinvigorate.
    - Prion diagnostics and detection
      - Diagnostic vs food safety test (FDA) vs. how the public uses the results?
      - What diagnostics exists and when should they be used?
        - Carcass side test - what does that mean
        - Antemortem tests
        - What is the state of art?
        - What is the current research?
        - What do the current diagnostic methods/pipelines mean for the public?
      - What does it take for a test to get validated?
        - How are they used?
        - Regulatory vs research
      - Sensitivity vs specificity
        - True vs comparative
    - Environmental CWD contamination - Could be several.
      - What evidence exists to suggest CWD is present in the environment?
        - Plants, soils, water
          - Prion loading in the environment, Survival? How is that transmissible to animals? Bioavailability?
        - What tests are used to determine this?
          - PMCA and RT-QuIC
          - Mass spec testing?
          - Development of new test or protocols.
          - Sampling methods and errors
      - What are the consequences of CWD in the environment?
        - Big ag. - risk to commodities?; how might that affect wildlife management in the future?

- Movement through animals, people, and env (water, soil, plants)
  - Mitigation/remediation/decontamination processes
  - Carcass disposal/management; water treatment; landfill biosecurity
- Zoonotic potential of CWD
  - What evidence for direct transmission of CWD humans
    - Research potential evidence
      - non-human primates
      - transgenic mice
      - In vitro modeling - PMCA
    - Epidemiology - potential vs association vs causation (Hill-Evans criteria); Koch's postulate?
    - What does risk look like?
      - Testing needs to be incorporated as people make decisions of risk based on current testing results - CDC recommendation
      - Lab transmission risk?
    - Links in human CJD patients - current investigations
      - Bring in CDC group for input
      - Wildlife (Ag too?) agencies cannot legally make statements on human health - take leads from CDC (Dan Grove)
    - Reverse science that was used in BSE
  - What about transmission via an intermediate host?
  - What about environmental exposure?

10:15 - Break

10:30 – Moving forward– What do we need from each other and from others?

- Objective 1
  - TWS meeting for feedback
  - Fleshing out the plan of a virtual repository
  - Identifying groups who will donate samples
  - Reviewing requests process
  - Metadata is fed back into the system
  - Timeline goal - accomplished by 2022 annual meeting
- Objective 2
  - Distribute information on 5 sites
  - Future - stay open for:
    - What about the investigation of new sites?
    - What about changes to existing sites?
    - Funding to purchase sites?
  - Timeline goal - To be distributed soon.
- Objective 3
  - Meeting throughout the year

- Short term
  - Standardizing protocols, equipment, etc. in labs conduction RT-QuIC
  - Working with the USDA on validation
- Longer term
  - Current state of the science review
  - What about the increase in testing demand?
  - Substrate - what is/will be the demand?
  - 3rd generation testing
- Objective 4
  - Meeting throughout the year
  - Identify key problems that can be addressed on an annual cycle
    - Joint research with the farmed cervid community
  - Political foundation support for cross-jurisdictional management of CWD
- Objective 5
  - Communication within the groups and in the Consortium - build relationships for research
  - Document with a running tally of what projects are being worked on
  - Submit proposals
- Potential new objectives.
  - Can we just add objectives in the NIMSS?
    - Milestones are laid out over 5 years. Makes it difficult to add objectives.
    - Check with Dana Infante
    - Subcommittees could be added to address these vs new objective.
  - Targeting knowledge gaps, areas of importance (environment discussion)
  - Keeping "State of Science" statements up to date and relevant
    - Should be under current Objectives as subcommittee
  - Zoonotics
    - Add to HD group?
- Influence to/from others
  - Lobbying group?
- Membership - Who is missing from the group?
  - Multistate is research based. Encourage those not involved to apply.
  - Broader group can get updates. Who should manage that?
  - Use the listserv to broadly disseminate information/questions.
  - Do we need to hire someone to help?
  - Individuals
    - Send an application to colleagues who may be interested.
  - Groups
    - Ag agency researchers - Obj 4?
- Closing statements
  - request for publications, funding, etc.
    - Indicate what may or may not be used publicly (Website)

- Thank you
  - John for facilitation
  - Executive committee
  - Membership for attending and the work throughout the year

11:30 - Adjourn

#### Executive team meeting

- Executive turnover
  - After the annual meeting and report
  - Duties of the secretary
    - Create for Debbie
- Funding
  - Executive committee meeting
  - Undergrad for some of the web, communication aspects?
- Next meeting Nov 19, 2021
  - Spending the funding
  - Outreach communication - subcommittee
  - Milestones





# North American Interdisciplinary Chronic Wasting Disease Research Consortium

## Multistate Project NC1209 - Overview (Content Provided by Team Leads)

### Research Priorities and Progress - March 2021 White Paper Series

Executive Board: Chair – Dr. Jason Bartz, Vice-chair – Dr. Dan Walsh, Secretary – Marc Schwabenlander, Past chairs – Drs. Sonja Christensen and Joel Pedersen

---

**Importance of the problem.** Chronic wasting disease (CWD) of cervids (e.g., deer, elk, moose) was first identified in the 1970s in Colorado and Wyoming and has subsequently been identified in captive and free-ranging cervids in 26 US States, 3 Canadian provinces, the Republic of South Korea, and Scandinavia. The geographic distribution of CWD continues to expand and the prevalence of CWD within certain cervid populations can approach 50%. Prions can persist in the environment for years, facilitating facile transmission between cervids, further complicating mitigation strategies. Overall, these combined factors have resulted in CWD having detrimental effects on cervid populations. CWD belongs to a group of diseases that are caused by prions, infectious proteins, that infect a wide range of species including humans, are inevitably fatal, and have no known therapies or cures. It is known that prions from one species can infect new species (e.g., transmission of mad cow disease to humans), however, the species host-range of CWD is unknown. There are 11.4 million deer hunters in the USA and it is estimated that up to 15,000 CWD-infected cervids are consumed annually. Additionally, the geographic range of CWD overlaps with other species that may be susceptible to CWD via contact with cervids or CWD contaminated environments (e.g. feral swine). If left unabated, CWD poses a threat to cervid populations, poses risk to human and animal health and threatens long-standing hunting traditions and the economic benefits that come with it to both private citizens and government agencies.

**Goal and significance of the program.** Combating this burgeoning disease requires the cooperation of individuals and groups with wide-ranging scientific and management expertise from across many jurisdictions. The overall goals of this Consortium is to leverage the combined knowledge of an interdisciplinary group of CWD experts to serve as a scientific resource for wildlife management agencies, policy makers and the public, and to advance the scientific understanding of the etiology and management of CWD through collaborative research. The Consortium will initially accomplish these goals by focusing research efforts to develop novel means of CWD diagnostics, treatment, and mitigation; effective public communication; and coordination of management strategies across agencies. The significance of these efforts is multifold. First, as described above, CWD is a once-in-a-lifetime challenge for wildlife conservation that has the potential threat of transmission to other species, including humans. Second, the Consortium is the largest organized group of CWD experts who are working together towards a better understanding of CWD to aid in solving this problem. Lastly, there is a pressing need for an organized science-based response to CWD, which the Consortium is facilitating.

**Outcomes and benefits.** The long-term goal of this Consortium is the reduction of CWD in North America. A step towards this goal is to identify top research priorities, craft strategic plans around them and work towards implementation of the plans. Measurable outcomes from this program will include publications, grant submissions, inter-institutional collaboration, and science-based policy and management decisions. Benefits of the Consortium are the communication, development of ideas, and collaboration between the members that would not have been possible without the Consortium. These efforts build a foundation for science-driven advances in the fight against CWD in North American and throughout the world.

**NC1209 Multistate CWD Research Consortium**  
**Research Priority 1: National CWD Tissue and Reagents Repository**

**Importance of the problem.** Chronic wasting disease (CWD) of cervids (deer, elk, moose) was first identified in the 1970s in Colorado and Wyoming and has subsequently been identified in captive and free-ranging cervids in 26 US States, 3 Canadian provinces, the Republic of South Korea, and Scandinavia. The prevalence of CWD within cervid populations can approach 50% and, since CWD is always fatal, CWD can have detrimental effects on cervid populations. CWD belongs to a group of diseases that are caused by prions, infectious proteins that can infect new species (e.g. transmission of mad cow disease to humans). There are 11.4 million deer hunters in the USA and it is currently estimated that up to 15,000 CWD-infected cervids are consumed annually. In part, due to the increase in the prevalence of CWD this may increase 20% per year indicating that CWD will constitute an mounting risk to humans and sympatric animal species. Compounding this problem is the identification of distinct strains of CWD. Since prion strains can differ in the ability to cause disease in cervids and the potential to infect a new species, a understanding of the distribution and prevalence of CWD strains is needed to manage CWD and to assess risk of zoonotic transmission. Unfortunately, a centralized collection of CWD tissues is not currently available for research addressing these issues.

**Goal and significance of the program.** The overall goal of this program is to establish a national CWD tissue and reagents repository. The significance of this program is multifold. First, a repository of CWD field isolates from a wide-ranging geographic location in North America will allow, for the first time, the means to begin to assess the distribution and frequency of CWD strains in North America. Since prion strains can differ in pathogenicity and host range, this is essential data for the determination for risk of interspecies prion transmission to humans and to domestic livestock and wildlife. Second, this repository can provide uniform standardized CWD-infected and uninfected sources of tissue for diagnostic development, mitigation testing and for basic research purposes. Finally, the implementation of the repository will facilitate cooperation between the various state agencies that could lead to new collaborative efforts.

**Outcomes and benefits.** Outcomes from this program will include a survey of CWD strains over a wide geographical region. Additionally, polymorphisms of the host prion protein can be determined. This data will be useful in combination with environmental and weather patterns in determining factors that may influence the distribution of prion strains, how changes in long-term weather patterns may alter this distribution. This data may be used to better predict what population of cervids and in what environments that CWD may more likely spread to that can be used to focus surveillance resources. Strain distribution, in conjunction with studies on how strains of CWD affect zoonotic potential, can be used to address areas where zoonotic potential of CWD is the greatest to focus mitigation resources. Monitoring these data over time will provide important information regarding CWD strain dynamics and will allow for identification of novel emerging strains that may have altered pathogenicity and/or zoonotic potential compared to currently circulating CWD strains.

**NC1209 Multistate CWD Research Consortium**  
**Research Priority 2: Large-Scale Research Facilities for Controlled CWD**  
**Research**

***Importance of the problem.*** Most chronic wasting disease research occurs in highly controlled but artificial circumstances, like laboratories or small pens, or in large, natural deer populations without adequate controls. While each of these research approaches has value, testing CWD management strategies and understanding transmission in free-ranging deer are two examples of research questions that are difficult to address in the lab or in free-ranging deer populations. To advance several important research objectives, scientists need facilities that bridge the scale from small pens to replicated field studies in fenced enclosures at larger scales, where animal behavior and important ecological processes operate naturally.

***Goal and significance of the program.*** This program seeks to identify research facilities where scientists can study CWD transmission in controlled and spatially replicated studies. This approach will produce results more directly applicable to natural conditions and provide wildlife managers with the information needed to make informed decisions on effective management and mitigation. Applied research into these topics requires deer in a research environment where their natural behavior can manifest and important ecological process operate.

***Outcomes and benefits.*** This research group has identified 5 facilities or properties where CWD could be studied at a meaningful ecological scale and in natural conditions. These sites are in Tennessee, Mississippi, Michigan, Wisconsin, and Texas. Some sites could host studies soon and others will require additional resources and approvals. Most sites have deer that have tested positive for CWD and could begin studies that require CWD-positive animals. Deer are not allowed on one site but this small facility could be used to evaluate mitigation strategies for soil and fomites. CWD has not been detected in deer on one site but the disease has been detected in the area and so this facility could be valuable to track changes in a deer population as CWD becomes established. We will assess each of these facilities to determine the types of research projects they can support and share this information with CWD scientists. These efforts will benefit CWD management efforts by providing the research infrastructure necessary to test and develop methods to address CWD in free-ranging deer.

## **NC1209 Multistate CWD Research Consortium**

### **Research Priority 3: CWD Diagnostics**

Detection of CWD by diagnostic assays is a key tool in controlling CWD both in wild and farmed cervid populations. Postmortem detection in wild cervid populations helps identify the distribution of CWD on the landscape well as develop prevalence estimates, and in farmed cervids determines a herd's status and ability to move animals. Officially approved postmortem CWD diagnostic tests include immunohistochemistry (IHC) and ELISA of the medial retropharyngeal lymph nodes and the obex. These tests are highly specific, but like all diagnostic assays, have minimum detection levels that might miss early CWD cases. While postmortem detection is valuable, there are advantages to detecting CWD in live animals. Currently, antemortem (live animal testing) is limited to IHC of rectal and tonsil biopsies. The USDA has approved the use of antemortem rectal biopsy IHC under select circumstances for farmed white-tailed deer herds under quarantine due to potential exposure to a CWD positive animal. (This type of testing is not approved to reduce or remove quarantine from a known CWD positive herd.) The development of highly sensitive amplification assays, such as protein misfolding cyclic amplification (PMCA) and real-time quaking-induced conversion (RT-QuIC), has opened up new possibilities for both post and ante mortem CWD diagnostic testing. These assays have been shown to detect minute levels of CWD that are undetectable by conventional methods such as IHC and ELISA. With the advancement of PMCA and RT-QuIC, the type of samples that could be used for testing has expanded into novel CWD sample types like feces, saliva, and skin. There is a great deal of interest in the use of the RT-QuIC assay, but before a diagnostic assay can be approved for official use by the USDA controlled tests must be conducted for each sample of interest.

The USDA Veterinary Services Cervid Health Program has partnered with the USDA Agricultural Research Service, the USGS National Wildlife Health Center, and the NIH Rocky Mountain Laboratory to develop a standardized RT-QuIC protocol and is in the process of assessing the sensitivity and specificity of RT-QuIC for potential use as an official CWD diagnostic assay for antemortem rectal biopsy and tonsil biopsy samples as well as postmortem medial retropharyngeal lymph node samples. The USDA Veterinary Services Cervid Health Program has also partnered with the NIH Rocky Mountain Laboratory to expand upon their recent preliminary findings which indicate that deer ear skin could be a novel sample tissue for RT-QuIC antemortem CWD testing.

Novel diagnostic tests and sample types could greatly improve our ability to detect CWD earlier, allowing a more rapid response to CWD cases by wildlife and agriculture agencies.

**NC1209 Multistate CWD Research Consortium**  
**Research Priority 4: Evaluating Management Strategies across State Boundaries**

**Importance of the problem:** Management of chronic wasting disease (CWD) is one of the most significant challenges facing many wildlife agencies in North America. One of the difficulties in managing this disease is that CWD-affected species range across jurisdictional boundaries; yet currently there is little communication or coordination among management agencies regarding CWD response. Additionally, although scientific approaches are used to inform management decisions, science is less commonly factored into the evaluation of the impacts of management actions. Unified efforts to evaluate the effectiveness of the suite of management actions that agencies have applied for disease control are lacking. This consortium objective is aimed at filling these gaps by leveraging historical information maintained by state agencies to evaluate impacts of CWD management activities on population and disease dynamics and establishing a framework that will improve coordination and information exchange. This framework will serve as the basis for the creation of an adaptive management strategy for CWD mitigation among state and federal, wildlife management agencies.

**Proposed Research Plan:** Recognizing that harvest management of white-tailed deer populations is the main tool available for agencies to control both deer population sizes and CWD and how it is applied varies widely across state agencies, we will first begin by investigating the impacts of harvest regulations on the realized harvest within and between states (other management actions will be investigated subsequently). Specifically, regulation-driven changes in the size and age/sex structure of the harvest will be the focus of the initial work. The next step will be to tie the estimated realized harvest of the various harvest management approaches to CWD dynamics. We will employ stochastic compartmental disease models to simulate CWD burden and introduce harvest regulations and associated harvest rates into the system and measure the potential effects of harvest regulations on disease processes and outcomes. This will permit us to make recommendations on the harvest regulations most likely to have the desired outcome for managing CWD. Lastly, we will work with the participating state agencies to initiate the harvest regulations in their CWD-affected areas that the results of the models indicate are the most effective using an adaptive management framework. Thus, the over-arching goal of this research is to capitalize on the breadth of management responses that agencies have made after CWD introduction, to assess the impact of management on deer and CWD dynamics, and to coordinate a unified effort to initiate adaptive CWD management among wildlife management agencies.

**Expected Outcomes:** The expected outcome of this objective will be an improved ability to manage CWD. This will be accomplished by providing managers with critical information regarding the efficacy of various management tools for this disease, fostering multi-jurisdictional collaboration, and initiate an adaptive management strategy that will lead to regional disease response efforts. Secondary outcomes will include: 1) a standardized dataset related to deer harvest rates and regulations that will encompass information from wildlife management agencies across the Midwest; 2) mathematical models that will be used to forecast the most efficacious regulations for CWD management; 3) a platform for enhanced communication and coordination among wildlife management agencies; and 4) coordination to initiate an adaptive management strategy for CWD and deer management that is multi-jurisdictional.

**NC1209 Multistate CWD Research Consortium**  
**Research Priority 5: Using Social Science to Inform CWD Management**

**Importance of the problem.** Chronic wasting disease (CWD) is a fatal prion disease affecting species in the deer family (e.g., deer, moose, elk). It has been reported in free-ranging deer, elk and/or moose in at least 26 states and four Canadian provinces. CWD is always fatal in infected hosts. When the disease becomes established in a population, it can drive down the population size and reduce hunting opportunities and participation. The potential effects of consumption of infected hosts on human health are as of yet unclear. Prions are shed from infected animals (including carcasses) and can be transmitted directly or indirectly to other cervids. Because prions are hard to inactivate and may persist in the environment for a long time, it is important to handle infectious material in a way that does not allow for further transmission. For that reason, agencies have adopted regulations and recommendations aimed at hunters and agricultural operations to reduce the risk of the introduction and spread of CWD in new areas. Little is known, however, about the range of approaches taken by state, provincial, federal, and tribal governments to obtain behavioral support for CWD management and whether and how key stakeholder groups respond to these approaches. While social science researchers have conducted some research on how key stakeholders respond to CWD in specific locations, there has been little coordination of that research across states and provinces. Collaborative research across multiple management, demographic, and cultural contexts is needed to inform communication campaigns aimed at promoting risk minimization by hunters and agricultural operations. Research can help tailor communication for jurisdictions with different socioecological contexts and approaches to managing CWD.

**Research plan.** The goal of this research program is to improve understanding of stakeholder groups whose behavioral support is needed in CWD management efforts through coordinated, collaborative research. Our specific research objectives are to:

- Characterize the range of management approaches to CWD in selected jurisdictions with varying levels of CWD prevalence and characterize the ecological contexts in those areas.
- Characterize the range of approaches to stakeholder engagement and building behavioral support for CWD management and assess the consistency of these efforts.
- Assess key stakeholder groups' CWD-related attitudes, risk perceptions and behaviors and determine how they vary with cultural, ecological and management contexts.
- Identify factors that encourage or inhibit practice of CWD risk-minimization behaviors by key stakeholder groups and determine how they vary with ecological and management contexts.
- Test risk communication to determine how it influences intentions to take specific CWD risk-minimization actions.

**Outcomes and benefits.** This research will contribute to more consistent approaches to CWD management, communication, and data collection. By comparing approaches to management and stakeholder engagement across different ecological and management contexts, and assessing the outcomes of those approaches, we will be able to offer recommendations about how to tailor stakeholder engagement efforts to different contexts. State, provincial, federal, and tribal agencies will be able to use these recommendations to improve their ability to enlist behavioral support from key stakeholder groups.

## Large-Scale Research Facilities for Controlled CWD Research

14 October 2021

### 1. Site Name: Holly Springs Experiment Station, MS

Basic Site Description:

Location: Marshal County, MS, about 3 miles NW of Holly Springs, MS

Size: 508 acres, see aerial photo

Ownership: Mississippi State University, Agricultural Experiment Station

Vegetation cover types: Pine plantations, natural woodlands,

Agricultural fields: Several fallow fields, grass pastures

Soils: Upper thin loess soil resource region

Topography: Flat to gently rolling. No major drainages

Number of captive deer: no deer fencing, deer population unknown, free-ranging

CWD status; # and frequency of deer tested: No deer tested on site, but positive deer collected within 3 miles in two directions.

Climate: Average precipitation ~50 in. Hot, humid summers and mild, wet winters

Present deer management (e.g., none, hunting, selective culling): None

Data on free-ranging deer: Do not have density or sex/age composition.

Description of Current Research Facilities: No deer facilities on property. No current agricultural uses on property.

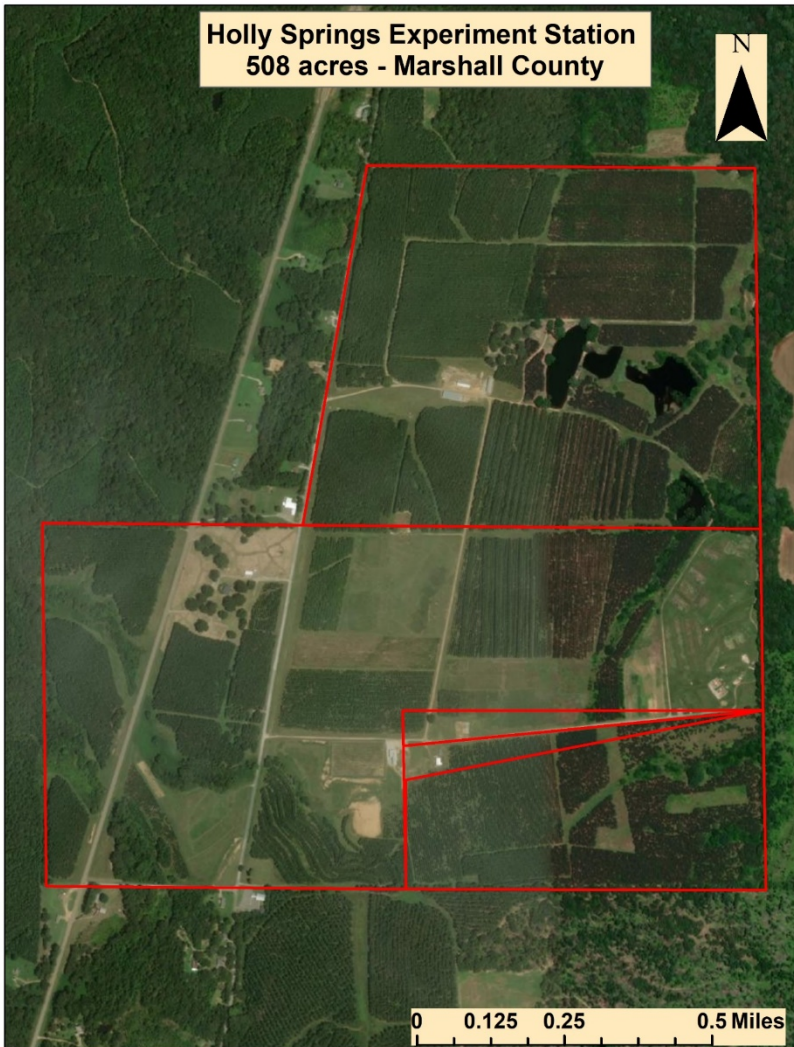
Proposed Source of Research Animals: Animals free-ranging on the property.

Regulatory Issues: State wildlife agency supportive, as is MAFES administration.

Currently available for research? Yes.

Description of Research Topics which could be addressed at the facility: Deer population presumed positive. Land management options open for consideration.

Contact person: Steve Demarais, [steve.demarais@msstate.edu](mailto:steve.demarais@msstate.edu), 662-418-2285



## 2. Site Name: Central Texas Hill Country Research Site

### Basic Site Description:

Location: Medina County, TX (about 45 miles west of San Antonio, TX)

Size: 1,400 acres

Ownership: Private ownership

Vegetation cover types: Live oak woodlands, some grass fields,

Agricultural fields: 2 irrigation pivots

Soils: mostly shallow, stony, or gravelly, dark alkaline clays and clay loams underlain by limestone. Two major types: well drained, moderately slowly permeable soils that are



very shallow to shallow over indurated limestone bedrock; very deep, moderately well drained, very slowly permeable soils that formed in clayey alluvium.

Topography: Rolling. No major drainages

Number of captive deer: about 600 (1-2 years ago)

CWD status; # and frequency of deer tested: 2016 – 2019 22 positive in pens; 3 positive outside pens. Post-mortem tests 580 from pens and 541 from harvested deer. Ante-mortem tests 1,126.

Climate: semi-arid. Average precipitation 29 in. Average high temp 90-95 F during summer and 65 F during winter.

Present deer management (e.g., none, hunting, selective culling): Hunting released deer and naturally produced deer

Data on free-ranging deer (e.g., density/abundance, sex/age composition, hunted?, CWD status): Do not have density or sex/age composition. Free-ranging deer are hunted. 3 positives by March 2019.

#### Description of Current Research Facilities:

Deer pens: 80 pens (various sizes and configuration)

Deer working facilities: Yes, excellent deer working facilities

Labs: A good space for a moderate lab

Housing: Multi-bedroom lodge and 8 trailers (mix of single and double wide)

Border and interior fences: 8-foot high exterior fence. Internal fences make 3 pastures ranging from 243 to 850 acres.

Current CWD biosecurity: Only external fence that would need to be reinforced and probably double fenced.

Proposed Source of Research Animals: Animals in the pens and free-ranging on the ranch

Regulatory Issues: State wildlife agency supportive with proper safeguards. State Animal Health Commission uncertain and might require additional safeguards.

Currently available for research? Yes, for projects that will not disrupt current options. If purchased, could be turned into full-fledged research site.

Description of Research Topics which could be addressed at the facility: Various projects from those that could be conducted in 0.25 acre to 1 acre pens to larger scale studies in research pastures of several hundred acres.

Contact person: Dave Hewitt, [david.hewitt@tamuk.edu](mailto:david.hewitt@tamuk.edu), 361-522-0186

### 3. Site Name: Almond Farm

#### Basic Site Description:

Location: Almond, WI

Size: 70 acres

Ownership: State of Wisconsin

Vegetation cover types: grassland, brush, red pine plantation

Agricultural fields: none

Soils: loamy sand, excessively drained

Topography: 0-6% slope

Number of captive deer: 0

CWD status; # and frequency of deer tested

Climate: humid continental climate – warm summer subtype. Mean annual precipitation: 31 to 33 inches, Mean annual air temperature: 43 to 46 degrees F

Present deer management (e.g., none, hunting, selective culling): No deer

Data on free-ranging deer (e.g., density/abundance, sex/age composition, hunted?, CWD status): No deer (unless you mean outside the fence)

#### Description of Current Research Facilities:

Deer pens: 8 pens, all between 0.4 and 0.8 acres, totaling ~5.5 acres. Balance of the space is 1 large area.

Deer working facilities: none

Labs: none. There is a 40' by 80' pole barn, with plumbing, that straddles the facility fence.

Housing: none (there is a house on premises, but it is currently being rented out.)

Border and interior fences: the exterior perimeter fence is double fenced, woven wire 8'-10' height. Interior fences are single.

Current CWD biosecurity: see Emergency Action Plan and Property Management Plan

Proposed Source of Research Animals: Not likely for live animal research to occur here.

Regulatory Issues: Not sure. it is state-owned and access is highly restricted.

Currently available for research? Yes, currently hosting composting research.

#### Description of Research Topics which could be addressed at the facility:

Generally speaking, research that does not require live deer and that seeks to take advantage of the highly-contaminated environment

- Prion decontamination/site remediation
- Source of infected material for assay development
- Environmental persistence/distribution in soils and vegetation.

Contact Person: Dan Storm, [danielj.storm@wisconsin.gov](mailto:danielj.storm@wisconsin.gov) , 715-401-2715

#### 4. Site Name: Edwin S. George Reserve

##### Basic Site Description:

Location: 42.457710, -84.007249; 5650 Doyle Rd, Pinkney, MI 48169

Size: 464 ha

Ownership: University of Michigan

Vegetation cover types: Hardwood forest (~50%); remainder in grasslands, Tamarack swamp/bog/marshes, and pine plantation.

Agricultural fields: none

Soils: Sandy/gravelly

Topography: Strong influence of glaciation for southern Michigan. Steep to gentle slopes including marsh/bog kettle holes.

Number of captive deer: Rough estimate of 100 deer on site.

CWD status; # and frequency of deer tested: 12 deer tested in winter 2020; no CWD positives .

Climate: Hot, humid summers and moderately cold winters. ~94 cm precipitation annually (~150 cm snowfall).

Present deer management (e.g., none, hunting, selective culling): Culling every few years.

Data on free-ranging deer (e.g., density/abundance, sex/age composition, hunted?, CWD status): Free-ranging positive deer detected within 40 km (25 miles); not enough hunter harvested samples tested in proximity to facility to confirm free-ranging deer CWD status.

##### Description of Current Research Facilities:

Deer pens: No

Deer working facilities: No

Labs: Yes

Housing: Yes

Border and interior fences: Single 3.5 m chain link fence; rigorously inspected.

Current CWD biosecurity: None presently but may be possibility to apply in future.

Proposed Source of Research Animals: White-tailed deer exist onsite.

Regulatory Issues: This facility is a registered Privately Owned Cervidae Facility permitted by Michigan DNR & DARD.

Currently available for research?

Site Director is receptive to projects outlined below. This is a research facility for University of Michigan and there would need to be an evaluation of our proposed deer projects relative to other ongoing projects. All projects require involvement of an UM affiliated researcher. We have several UM researchers identified. All research projects are required to apply to the Director for approval (see <https://sites.lsa.umich.edu/esgr/>).

Description of Research Topics which could be addressed at the facility (as identified by Large-Scale CWD Research Facility Subgroup)

- I. The role of habitat manipulation practices in CWD transmission:
  - a. Efficacy of high fences as a deterrent to spread of CWD (b/c)
- II. Harvest strategies
  - a. Deer density reduction (c)
  - b. Preferentially harvesting bucks to reduce the percent of mature bucks in the population (c)
  - c. Effects of antler size/point restrictions on harvest and CWD prevalence (c)
  - d. Timing of harvest—early season vs late season (c)
- III. Deer Management Practices
  - e. The effect of supplemental feeding on CWD transmission and prevalence (c)
  - f. The net effect of feeding on population persistence and growth in the presence of CWD (c)
  - g. The effect of baiting on CWD transmission and prevalence (c)
  - h. The effect of lures on CWD transmission and prevalence (a/b/c)
- II. Basic science questions that will inform management
  - a. Density dependent vs contact dependent transmission of CWD (b/c)
  - b. The role of deer social interactions in CWD transmission
    - i. Scrapes and rubs (a/b/c)
    - ii. Breeding behavior (bucks checking estrus, copulation) (b/c)
    - iii. Fawn consumption of soil and fecal material (a)
    - iv. Direct contact social interactions (e.g., nose to nose, grooming) (a/b)
    - v. Seasonal segregation of sexes
  - c. Cofactors that might affect infection
    - i. Nutrition (a/b/c)

Contact Person: Dwayne Etter, [etterd@michigan.gov](mailto:etterd@michigan.gov)

## 5. Site Name: Ames Plantation, TN

### Basic Site Description:

Location: West Tennessee; Fayette/Hardeman Counties; About 50 miles east of Memphis

Size: 18,400 acres

### Ownership:

Hobart Ames Foundation; Functioning as a Research and Education Center of the University of Tennessee

### Vegetation cover types:

~ 10,500 acres Upland and Bottomland Hardwoods; 3,500 acres loblolly pine plantations; remaining: agricultural crops, early successional forbs/grass to support quail habitat roads in turn to support the National Field Trial for all-age Bird Dogs; pasture, ponds, and roads

Agricultural fields:

~ 2,500 acres agricultural (primarily rotation: soybeans, corn, cotton, grain sorghum and wheat), 750 acres fescue pastures, 1,000 acres early successional forb grass mix

Soils: Coastal Plain with overlay of silt/loess deposits

Uplands: deep loams of Vicksburg/Memphis soil series ranging, by dept of silt loam, to Smithdale/Ruston series consisting of sandy, eroded soils on steeper slopes;

Bottomlands Waverly/Falaya/Collins series, ranging from poorly to moderately well drained.

Topography: Rolling

Number of captive deer: None

CWD status; # and frequency of deer tested:

From 2019/20 fall hunting season and a small 2020 winter collection (~18 deer) - approximate numbers: bucks 3-years-and-older 66%; does 33% (may be higher and might include 2-year-old-bucks). Testing during the regular deer season.

Climate:

Long hot summers and regularly muggy with high humidity; Winters can be cold, wet, and windy; it is partly cloudy regularly throughout the year; temperature generally ranges from 32 degrees to 92 degrees and uncommonly ranging below 15 and above 97 degrees; rain averages 52 inches and is most prevalent winter/spring; average total snowfall less than 6 inches.

Present deer management (e.g., none, hunting, selective culling):

The past 15 years: a heavily documented QDM program (data included: age, weight, sex, lactation; location of kill to the nearest 100-acres -additionally- all hours afield per hunter documented regarding deer sightings by sex and recorded on a 100-acre grid, generally 6,000-to-9,000 hours of hunter observation; QDM based on aggressive doe harvest and protection of 1-and-2-year-old bucks

Present and beginning this year: aggressive doe harvest; no protection of bucks

Data on free-ranging deer (e.g., density/abundance, sex/age composition, hunted?, CWD status)

Data related to hunter sightings; no formal census or aerial survey

Description of Current Research Facilities:

- Deer pens
- Deer working facilities
- Labs
- Housing
- Border and interior fences
- Current CWD biosecurity

No pens or working facilities.

Potential “labs” would be out-building, closed sheds or facilities created to support former research projects

Ames has housing in several locations, available on a scheduled basis

No deer-proof fencing

Proposed Source of Research Animals: Likely free-ranging

Regulatory Issues:

Subject to Tennessee State regulations for capture or kill; University of Tennessee Animal Care; however, with Ames being privately held, freedom for internal herd management is internal

Currently available for research? Yes

Ames is a research facility and has a long history of forestry and wildlife projects, many long-term. Ames also has a long history of agricultural, cattle, forage and water quality research. Currently there are over 40 work plans active, most devoted to forestry and wildlife research.

Wildlife projects include work with, in part: Quail, Coopers hawks, beaver, deer, mesopredators, and small mammals

Description of Research Topics which could be addressed at the facility:

Unique opportunity to address any topic needing a large facility on a recently and locally developed (beginning circa 2010) “hot-zone.” Large-scale, contiguous, diverse habitat available, and could potentially be fenced, if funding is located: perhaps as much as 1,500-to-2,000 acres

Therefore, large, fenced areas with controlled herds inside and comparisons made with free-ranging herds outside. Could look at density or sex ratio combinations and spread rate or feeder presence/absence and spread rate.

Genetic flow and “disease pedigrees;” effectiveness of precision harvest; presence of the CWD in the human food chain via agricultural crops; prion stability/presence in salt/mineral lick stations

Contact Person: Allan Houston, [ahouston@amesplantation.org](mailto:ahouston@amesplantation.org), 901-878-1067

North American Interdisciplinary Chronic Wasting Disease Research Consortium  
United States Department of Agriculture NC1209  
Summary of CWD Consortium annual meeting. October 14<sup>th</sup> and 15<sup>th</sup>, 2021

### **Executive summary**

The NC1209 Interdisciplinary CWD Research Consortium held its annual meeting on October 14<sup>th</sup> and 15<sup>th</sup> via zoom due to travel restrictions in place for many of our members due to the ongoing pandemic. The agenda was split into two parts with the first part being open to both NIMSS and non-NIMSS participants and the second part of the meeting that was restricted to NIMSS only members of the Consortium. In the first part of the meeting the leads for the 5 projects provided updates on the progress that each project accomplished in the last year. The second part of the meeting discussed new directions for the projects, potential topics on position statements from the Consortium, and voting of the members on a) a new secretary and b) applications from individuals to become full NIMSS members.

### **Detailed overview of meeting**

#### Day one – October 14<sup>th</sup>.

Introductions from Drs. Russ Mason and Dana Infante welcomed the group to the meeting and stressed the importance of CWD research and the impact that the CWD the NC1209 Interdisciplinary CWD Research Consortium (hence referred to as “The Consortium”) has on the future of CWD research and as a resource of science-based decisions on the management of CWD.

A summary of accomplishments was provided by the current Chair, Dr. Jason Bartz. The summary highlighted the publication, funding and outreach activities that have been provided because of The Consortium as follows:

#### White papers

1. National CWD tissue and reagents repository
2. Large-scale research facilities for controlled CWD research
3. CWD diagnostics
4. Evaluating management strategies across state boundaries
5. Using social science to inform CWD management

Publications – mSphere, JBC, PNAS, Frontiers in Veterinary Science, Scientific reports, PloS Pathogens; Acta Neuropathologica.

Grants – Submitted and funded by Michigan DNR, USDA, USGS, NIH

Meetings – AFWA – Krysten Schuler, Dan Walsh, Sonja Christensen and David Williams talked about CWD data management, mapping and surveillance tool systems.

Podcasts – Deb McKenzie, Byron Caughey, Tracy Nichols, Krysten Schuler.

Collaborations – Research collaborations have been established between Federal agencies, State agencies and Academic institutions.

An overview of the history of The Consortium and the requirement for NIMSS membership and the process for obtaining membership in The Consortium was provided by Dr. Sonja Christensen.

Overviews of the accomplishments of the 5 projects was presented by the leads for each project.

Progress reports on Objectives 1-3 from team leads.

Project 1. Disease transmission and pathogenesis (Bartz/Walter).

- Repository update - genetics focus at this point
  - USGS funding for FY22-23
  - National tissue (multiple species) and reagents virtual repository
  - Collaborations with DOE in TN
  - Physical repository could be at NWRC in CO?
  - Voluntary, data agreements and control, standard metadata
  - Host?
    - CWD Alliance
    - SOP4CWD Collaboration
  - Panel discussion at TWS conference Nov 5, 2021
  - Standards - methods, reference material, reagents, etc.
- Learn from Natural History Collections?  
<http://portal.vertnet.org/publishers>
- NSF funding?
- Could the repository be aligned for cervids in general, not CWD-specific (funding sources)?
  - Pathogen surveillance -  
<https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1009583>

Project 2. Development of large-scale research facilities (Hewitt/Demarais).

- Some potential sites - MS (farmed site, between CWD positive detections), TN (ground zero for free-ranging outbreak), WI farm, MI (George Reserve fenced area)
- Will provide contact information for each site.

Project 3. Improving diagnostic testing for CWD (Nichols/Schuler).

- RT-QuIC diagnostic evaluation (USDA) - Nichols
  - Collaborative effort - initiated through the consortium
    - UMN and USGS substrate performing equally
  - Comparison of sensitivity? - Yes
  - Standardized protocol
    - Equipment - not at this point



- Is there a difference in plate readers?
  - Rectal biopsy - completed, data review in progress
    - ~95% specificity
  - Tonsil biopsy - In progress
  - MRPLN - starting in the next week
- RT-QuIC ring test - Schuler
  - Labs in WI, MN, NY, MO, PA, MO
  - MRPLN validation - standardized protocol, substrate, samples

Project 4. Evaluating management strategies across state boundaries (MacFarland/Walsh).

- Collaboration - USGS, UWI and several Midwest agencies - harvest numbers in reference to regulation changes (i.e., more tags, more harvests?); adaptive management on a regional scale
- USGS, UMI, MN DNR - adaptive management
- Camera trap - population estimates
- Dan Grove (TN) - VA, management with CWD regionally
- USGS, UWI, TN - RT-QuIC environmental investigation at hot spots
- SOP4CWD - surveillance information dashboard; data warehouse; habitat risk; ultimately an optimization model given the budget and goals; <https://cwhl.vet.cornell.edu/project/sop4cwd>
- USGS, MIDNR, ISU, UW-Milwaukee - genetic tools
- Several projects on deer movement at a regional level

Project 5. Enhancing coordination, understanding, and communication of social science as it relates to CWD research and management. (Lauber/Wolf).

- Several meetings - looking for funding for joint multistate work
  - AFWA and USDA - neither were accepted
- Sept. human dimensions conference was pushed to Spring 2022
- Many individual projects happening at state/U level
  - NY, MN, AR, CO, WI, MS
  - NY - messaging research
  - TN - broad economic impacts of CWD (partner with MSU); hunter behavior
  - MS - animated videos for understanding CWD; importance; education; agency management principles
  - MI - economic impacts of CWD (Cornell, NDA); “duck stamp” model
  - MN - educational tools; underrepresented communities, community understanding of CWD
- What pieces of information inform behavior?
  - Does the function of prion and pathogenesis really change anything?

The final topic of the first part of the meeting was a discussion on the effectiveness of executive leadership feedback. This discussion focused on communication styles and frequency of the executive leadership with the membership. The consensus was that e-

mail communication was the most effective means for communication of new material and that the members-only portion of The Consortium is useful for archiving information.

The second half of the first day of the meeting was attended by the NIMSS members of the Consortium. The first order of business was to vote on individuals who were interested in joining The Consortium as full NIMSS members. The following individuals submitted applications.

Evelyn Merrill  
Noelle Thompson  
Chris Jennelle  
Miranda Huang  
David Williams  
Brian Richards  
Neelam Poudyal

All applicants were approved for membership by a unanimous voice vote.

This next part of the meeting was facilitated by John Beck. The members broke into breakout group zoom rooms based on the objectives to discuss what was working and not working within each objective and to provide a report to the larger group.

#### Objective 1: Disease transmission and pathogenesis

- What is working
  - evolution of the idea, has become more refined and feasible
  - funding
- What isn't working
  - How to share samples
    - oversight
  - Long-term funding needed. stable. where?
  - What tissues are collected.
    - Difference between farmed and wild.
    - Wild - state level; Farmed - federal level
  - Zoonotic transmission

#### Objective 2: Development of large-scale research facilities

- What is working
  - Potential study sites are identified - 5
    - Pros and cons for each site
- What isn't working
  - There isn't consortium work happening at these sites
    - Research happening, but not through collaboration in the consortium
  - Put together a summary of the 5 sites where specific questions could be asked.
    - This is done and is an attachment to the report

### Objective 3: Improving diagnostic testing for CWD

- What is working
  - USDA is evaluating RT-QuIC - Tracy gave a quick overview
  - 6 lab ring test - Krysten gave a quick overview
  - Many groups are using RT-QuIC for research
    - UTX-Houston is evaluating over 1000 samples RT-QuIC/IHC/ELISA/PMCA
  - Substrate - MN can mass produce; may solve that problem (research, diagnostic?)
- What is not working
  - USDA timelines - for wildlife management
  - Communication between researchers on evaluation of diagnostics
  - Ring-test usefulness to the USDA?
    - It was funded through WS not VS.
    - RAMALT was evaluated before MRPLN
      - priority of farmed cervid stakeholders
      - wild animal stakeholders wanted MRPLN to be evaluated
    - RT-QuIC variability
      - standardization of protocol, substrate, equipment, stats, etc.
    - NAHLN labs run the RT-QuIC assay - Yes
      - e.g., labs use the IDEXX CWD test
- Other questions
  - What about OIE validation? not equivalent to USDA validation
  - Is the USDA evaluating PCMA to use for strain purposes? secondary test?
  - What about other diagnostic test development for research?

### Objective 4: Evaluating management strategies across state boundaries

- What is working
  - Lots of collaboration in this area
  - Understanding of what is happening across research groups
- What is not working
  - The group is not meeting and working outside of the annual discussion
  - Mountain of political processes to work across jurisdictions
    - Use other examples (flyway council, etc.)
    - Build a framework for regional deer management

### Objective 5: Enhancing coordination, understanding, and communication of social science as it relates to CWD research and management

- What is working
  - Have had some meeting throughout the year
  - There is a variety of individual HD projects happening
- What is not working
  - It's a broad focus
  - Need better communication about what the members are doing in HD
  - The focused CWD HD funding is just not there

- Could HD pieces be added to existing or future CWD research projects
- Continued push to leaders why CWD matters
- Implementation science - how do we make the science actionable; how to change behavior
- CWD messaging consistency - it's needed
- What happens as zoonotic transmission potential information increases (macaque paper)?
  - Consortium position statement
  - Put studies into context

The breakout group zoom rooms were next used to discuss new directions for the objectives and to report the findings to the entire group.

#### Objective 1: Disease transmission and pathogenesis

- Standards
  - different tissues; positive controls, inactivation studies
- Environmental samples
  - soil, water, plants
  - temporal samples
  - shared among researchers
  - Coordinated with Obj. 2
- Criteria for use
  - putting samples back into the repository if you are going to get samples?

#### Objective 2: Development of large-scale research facilities

- Information on the sites to be shared
- Could the process of obtaining the sites be shared with the Consortium?  
Cookbook/workshop of how to obtain permissions, get through regulatory concerns

#### Objective 3: Improving diagnostic testing for CWD

- Position statement of current science - test development, sampling
  - Carcass-side, pen-side testing
    - Moving closer to that stage - years away
    - Taking steps to get closer to the animal
      - Time, validation
    - Demand is growing; separate line of testing tools for hunters that is outside of regulatory testing
  - Field station testing
  - Different sample types - RT-QulC
    - Ear notch
      - What's next - ear punch system research (USDA, RML); codon variability
    - Blood -
      - PMCA

- 96% in late stage, asymptomatic
- 50% early, asymptomatic
  - Detection is more limited in the less susceptible PRNP
- RT-QuIC
  - Poor, unpublished lab results from Ames lab
  - Early CSU work on blood showed good results but hasn't been reproducible
- More meetings
- Sharing protocols, standardized equipment, etc.
  - Including environmental samples, fecal samples, fomites, cleaning and disinfection protocols

#### Objective 4: Evaluating management strategies across state boundaries

- Becoming more active as a group - more meetings
  - Identifying one key problem to discuss - methods, resources, etc. needed
    - Risk of introductions
    - Consistency of definitions
    - Common ways of calculations (prevalence, etc.)
  - Information sharing between farmed and wild management - mutual problems on each side of the fence

#### Objective 5: Enhancing coordination, understanding, and communication of social science as it relates to CWD research and management

- Top priority - build relationships within the group
  - Communicating within the consortium about what HD work is happening
  - identifying HD and management connections
  - Put projects that are funded on the website and internal sharing to identify collaborations
- New researchers. Who to recruit to the consortium?!
  - Economists
  - Implementation scientists
  - Communications
- Rework and resubmit proposals
- Leading the zoonotic position statement
- Does corporate America care about funding this research (Cabelas, Federal, etc.)?

The Consortium also discussed adding a new objective. CWD zoonosis.

The end of the first day concluded with nominations for secretary. Dr. Debbie McKenzie from the University of Alberta was the sole nominee.

Based on the afternoon discussions that were facilitated by Mr. Beck, it became clear that the second day should focus on topics for position papers. Dr. Bartz volunteered to draft a document for potential topics for the subsequent discussion.

## Day two – October 15<sup>th</sup>.

The second day of meeting was a NIMSS-only member meeting. The first order of business was voting on the secretary position. Dr. Debbie McKenzie was elected as the new secretary of The Consortium by unanimous voice vote.

The remainder of the meeting addressed the topics for The Consortium to consider for position statements. During this discussion, Dr. Bartz, shared the screen with word document and edited it based on the discussion and feedback of the group.

- Position statements - easily digestible information on recent scientific advances
  - Who is the audience? agencies, public?
    - There is a relatively uninformed public who are sponges of information (framed objectively or not), and there are people with advanced degrees who use published information to advance ideas and hypotheses that are geared towards personal or political agendas.
  - Should we be doing this or leaving it to others doing outreach?
    - How do we direct this information to agency/organization communicators? - feed to AFWA, NDA, CWD Alliance...
      - It may not be well received by all.
    - Reactive vs proactive
    - Statements ready to distribute to agencies, etc.
  - Needs to be continually updated! Annually, semi-annually?
    - New Objective?
    - On the website or “in our pockets”?
  - “Position” vs “Fact/Information Sheets” vs “CWD Scientific Consensus/Perspective” vs “State of the Science”
    - Cannot “should” statements
  - Need to have some summarized opinion of the science
    - Add updates with new manuscripts. Adjusting the audience that was not intended in the manuscript.
  - Review papers in each areas?
  - Potential areas for statements
    - Combating misinformation (Political realm?)
      - How to ID CWD misinformation
      - Where are reliable sources of CWD information
      - Strategy to direct people to the correct information
      - Scientific process
      - EHD vs CWD
      - Media relations - how to better communicate with media
      - Sonja has an outline/manuscript with 2 other colleagues on this subject. Ready to reinvigorate.
    - Prion diagnostics and detection

- Diagnostic vs food safety test (FDA) vs. how the public uses the results?
- What diagnostics exist and when should they be used?
  - Carcass side test - what does that mean
  - Antemortem tests
  - What is the state of art?
  - What is the current research?
  - What do the current diagnostic methods/pipelines mean for the public?
- What does it take for a test to get validated?
  - How are they used?
  - Regulatory vs research
- Sensitivity vs specificity
  - True vs comparative
- Environmental CWD contamination - Could be several.
  - What evidence exists to suggest CWD is present in the environment?
    - Plants, soils, water
      - Prion loading in the environment, Survival? How is that transmissible to animals? Bioavailability?
    - What tests are used to determine this?
      - PMCA and RT-QuIC
      - Mass spec testing?
      - Development of new test or protocols.
      - Sampling methods and errors
  - What are the consequences of CWD in the environment?
    - Big ag. - risk to commodities?; how might that affect wildlife management in the future?
    - Movement through animals, people, and env (water, soil, plants)
  - Mitigation/remediation/decontamination processes
  - Carcass disposal/management; water treatment; landfill biosecurity
- Zoonotic potential of CWD
  - What evidence for direct transmission of CWD humans
    - Research potential evidence
      - non-human primates
      - transgenic mice
      - In vitro modeling - PMCA
    - Epidemiology - potential vs association vs causation (Hill-Evans criteria); Koch's postulate?
    - What does risk look like?
      - Testing needs to be incorporated as people make decisions of risk based on current testing results - CDC recommendation

- Lab transmission risk?
  - Links in human CJD patients - current investigations
    - Bring in CDC group for input
    - Wildlife (Ag too?) agencies cannot legally make statements on human health - take leads from CDC (Dan Grove)
  - Reverse science that was used in BSE
- What about transmission via an intermediate host?
- What about environmental exposure?

Moving forward– What do we need from each other and from others?

- Objective 1
  - TWS meeting for feedback
  - Fleshing out the plan of a virtual repository
  - Identifying groups who will donate samples
  - Reviewing requests process
  - Metadata is fed back into the system
  - Timeline goal - accomplished by 2022 annual meeting
- Objective 2
  - Distribute information on 5 sites
  - Future - stay open for:
    - What about the investigation of new sites?
    - What about changes to existing sites?
    - Funding to purchase sites?
  - Timeline goal - To be distributed soon.
- Objective 3
  - Meeting throughout the year
  - Short term
    - Standardizing protocols, equipment, etc. in labs conduction RT-QuIC
    - Working with the USDA on validation
  - Longer term
    - Current state of the science review
    - What about the increase in testing demand?
    - Substrate - what is/will be the demand?
    - 3rd generation testing
- Objective 4
  - Meeting throughout the year
  - Identify key problems that can be addressed on an annual cycle
    - Joint research with the farmed cervid community
  - Political foundation support for cross-jurisdictional management of CWD
- Objective 5
  - Communication within the groups and in the Consortium - build relationships for research
  - Document with a running tally of what projects are being worked on
  - Submit proposals



- Potential new objectives.
  - Can we just add objectives in the NIMSS?
    - Milestones are laid out over 5 years. Makes it difficult to add objectives.
    - Check with Dana Infante
    - Subcommittees could be added to address these vs new objective.
  - Targeting knowledge gaps, areas of importance (environment discussion)
  - Keeping “State of Science” statements up to date and relevant
    - Should be under current Objectives as subcommittee
  - Zoonotics

A discussion at the end of the meeting focused around the idea of who to recruit to The Consortium.

- Membership - Who is missing from the group?
  - Multistate is research based. Encourage those not involved to apply.
  - Broader group can get updates. Who should manage that?
  - Use the listserv to broadly disseminate information/questions.
  - Do we need to hire someone to help?
  - Individuals
    - Send an application to colleagues who may be interested.
  - Groups
    - Ag agency researchers - Obj 4?

**Attachments:**

Bartz overview of accomplishments.pdf  
CWD research consortium white papers.pdf  
Large-Scale Res Site Descriptions Oct 14 2021.pdf  
new members.xlsx.pdf  
position statement topics.pdf

## CWD Consortium – Position statement topics

1. Combating misinformation
  - a. How to identify CWD misinformation
  - b. Where are reliable sources of CWD information?
  - c. How to get people to the correct sources of information?
    - i. Central location?
  - d. Scientific process
  - e. EHV vs. CWD
  - f. Media relations – how to better communicate with media
  - g. How to best disseminate this statement?
2. Prion diagnostics and detection
  - a. Diagnostic vs. food safety test
    - i. Better frame the messaging
    - ii. FDA is needed for food safety test nomenclature.
  - b. What diagnostics exists and when should they be used?
  - c. What does it take for a test to get validated?
    - i. Govt. vs. private industry tests
  - d. Sensitivity vs. specificity.
    - i. RT-QuIC – what do they really do?
  - e. What does a carcass side (or live animal) test really mean and/or is useful for? What is state of the art?
  - f. Current research. What is the pathogenic potential of samples that test positive?
3. Environmental CWD contamination
  - a. What evidence exists to suggest CWD is present in the environment?
    - i. Plant, soils, water.
    - ii. What tests are used to determine this?
      1. Development of new tests or protocols?
        - a. Sampling errors
    - iii. Temporal and spatial distribution
      1. Scavengers etc. moving CWD
  - b. What are the consequences of CWD in the environment?
    - i. Big ag. National security issue? Jurisdiction of wildlife?
    - ii. What is required for transmission?
      1. Intra and interspecies transmission
      2. Bioavailability
  - c. Mitigation
    - i. Fire
    - ii. Humic acid
  - d. Carcass disposal
    - i. Statement on landfill biosecurity for CWD.
4. Zoonotic potential of CWD
  - a. What evidence exists for direct transmission of CWD to humans?
    - i. <https://www.who.int/bulletin/volumes/83/10/792.pdf>

## CWD Consortium – Position statement topics

- ii. Non-human primate
  - iii. Transgenic mice
  - iv. In vitro modeling – PMCA
  - v.
- b. What about transmission via an intermediate host?
  - i. Livestock
  - ii. Swine
  - iii.
- c. What about environmental exposure?
  - i. Inhalation in CWD endemic areas