Chronic Wasting Disease Management in Michigan, the disease in wild deer populations, a look at supplemental feeding and the reasons to lift the ban on Feeding and Baiting

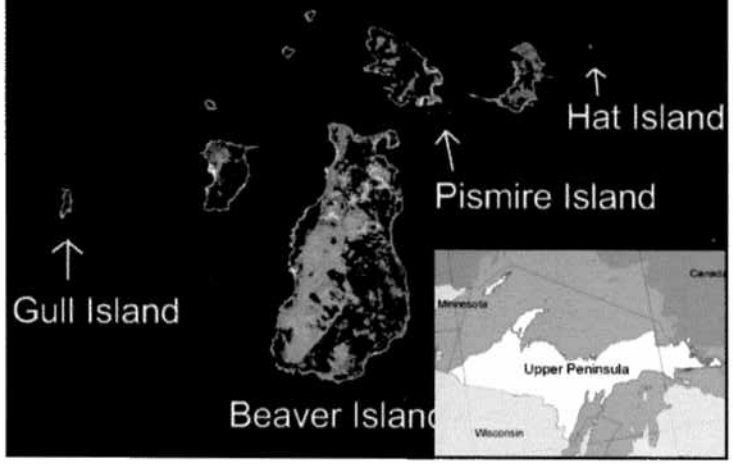
Jeffrey F. Powers D.V.M.
President, Beaver Island Wildlife Club
Beaver Island, Michigan

BI Wildlife Club and the Beaver Island Community's concern over actions of Michigan DNR on this matter

Overwhelming community concern over biologically, politically and economically impact of the DNR Baiting and Feeding Ban on the Beaver Island Deer Management Unit

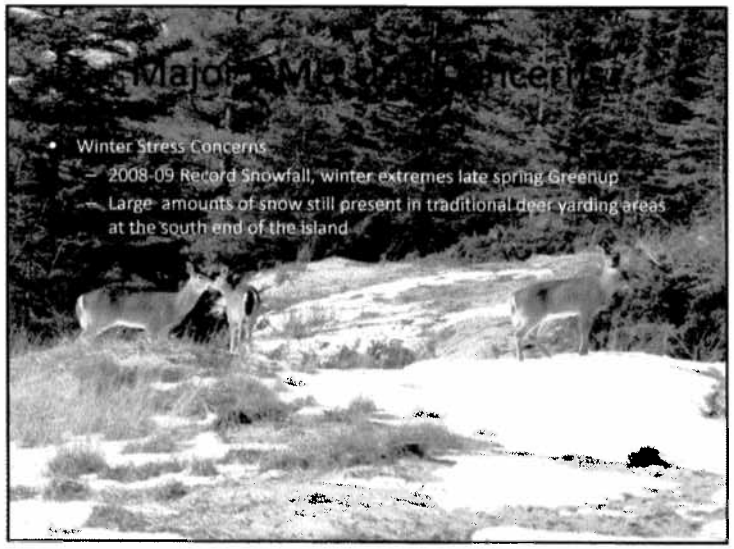
- Lack of scientific justification regarding disease transmission in wild populations
- Lack of concern for our DMU management concerns
  - Less than ideal habitat, winter severity concerns can impact the herd as well as increased predation which has nearly wiped out a herd on Garden Island once a home to trophy white-tails
- Lack of concern for economics of struggling communities as a retired Dean of Education from MSU said "This will be disastrous for many small northern Michigan communities, the hunters just wont come
- Concern over justification for statewide Lower Peninsula Ban and pending Upper Peninsula bans due to the same factors mentioned above

Beaver Island Archipelago



Beaver Island and Upper Peninsula Common Management Concerns

- Rich Deer Hunting Heritage
  - Traditional Hunting Camps since the introduction of White-tailed Deer in the 20's and hunting started on the Island in 1938.
- Habitat Concerns
  - Cedar Swamp, limited quality forage areas
  - Beechnuts, Acorns aid deer populations
  - Supplemental Winter Feeding a common practice

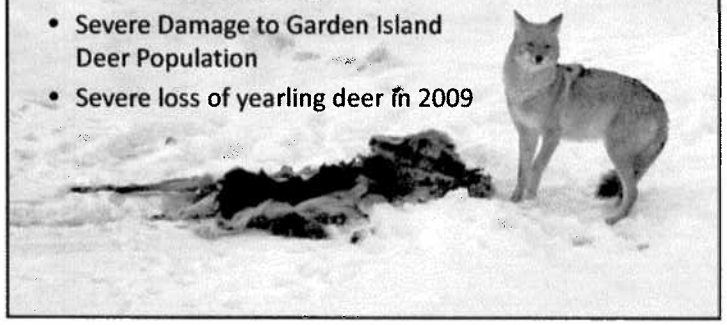


Predation Concerns

Large coyote population, determined by DNR in 1960's to have some wild dog genetics mixed in increasing animal size

Concern over minimal fawn observations by hunters and wildlife enthusiasts in 2008

- Numerous deer kills evident all winter and this spring
- Severe Damage to Garden Island Deer Population
- Severe loss of yearling deer in 2009



2009 Beaver Island Deer Management Summary

DNR actions based on 2002 Management Plan

This management plan treated this disease as if it was going to spread through the state at potentially catastrophic proportions do to a computer modeling of the disease based on a researchers theory and has not taken into consideration key stakeholder issues

-Damage to the heritage of hunting by abruptly eliminating baiting methods commonly used by a majority of Michigan's hunters.

-Disregarding the interests of recreational feeders who are adversely affected by the states aggressive management policy.

DNR Action Plan concerns

- Continue to base their plans on a model that has been highly criticized and proven to be inaccurate when you look at this disease statistically in wild populations
  - Schauber & Woolf questioned that this model is a frequency-dependent and must be missing key elements
  - Paul James-Prepared for Canadian Wildlife Federation

    Even in jurisdictions with longer histories of relatively high CWD prevalence rates, such as Wyoming and Colorado, deer populations and hunter participation are healthy
    - **there are far greater known risks to our wildlife in North America, most notably continuing habitat loss and the impacts of certain invasive species.**

Wisconsin CWD History

- Wisconsin DNR information has shown that in spite of finding the disease in 1172 out of 152040 (<1%) the WDNR has only documented 61 animals ill with CWD in the ten years that the disease has been KNOWN to present.
  - So is the disease always 100% fatal? Or as many have theorized natural resistance exists to this disease similar to what has been known to occur in prion diseases in many other species. A research opportunity in Wisconsin to challenge this hypothesis has yet to be tested.
  - CWD Advisory Group member Dr. Tony Grabski lives 3 miles from the first known found deer. In ten years he and 100 other neighbors and hunters have yet to find or even see a sick deer on the hoof, due to a hunter kill or even via hundreds of trail cameras yet many deer in that area test positive for Chronic Wasting Disease
  - It is the belief of many in Wisconsin that the management of CWD by the WDNR has caused far more damage than CWD ever would or could

Wisconsin CWD Advisory Group report January 21, 2009- A few of their points include:

- "The baiting and feeding hypocrisy is shameful"
- "You need only look at what happened after the discovery of CWD in Michigan in September 2008 to see the consequence of futuristic off-the-shelf planning.
  - "- A direct comment to the enactment of a plan developed in 2002 and immediately implemented in 2008 without any second guessing or further analysis
- "Indications of diseased deer and death loss in Wisconsin have not met the drastic forecasts or disease models"
- Herd eradication and reduction efforts throughout North America have NEVER affected the prevalence or spread of the disease
  - "As a rule, democratic nations simply cannot afford to chase after every potential or perceived risk"

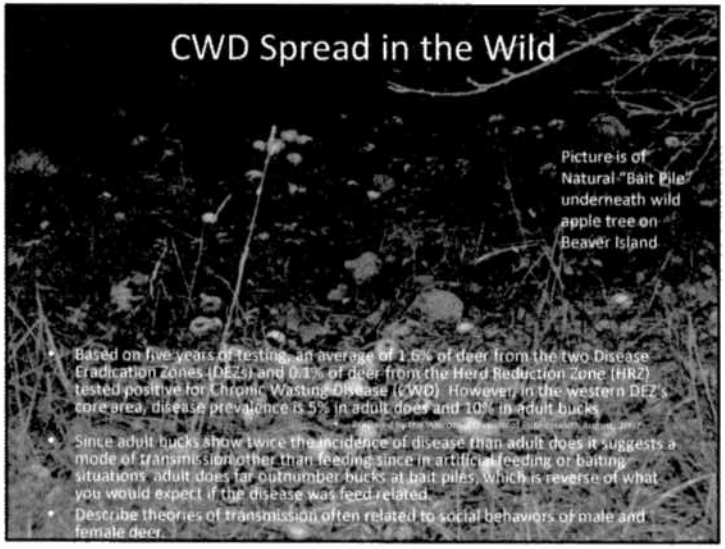
Chronic Wasting Disease across the nation is relatively rare

- CWD is relatively rare. In Colorado, CWD infects about 1-7 percent of the deer and 0-3 percent of the wild elk in a small core area where the disease has been present for more than two decades.
- The disease is predominantly found through testing of hunter submitted or surveillance collected samples and never been found to be the cause of massive die offs as diseases like EHD (Epizootic Hemorrhagic Disease) commonly do.

What causes Chronic Wasting Disease?

- **First Diagnosed at a research facility in Colorado in the 60's may have mutated from Scrapie in Sheep**
- **In the family of TSE's with Scrapie, BSE and vCJD possibly caused by prions**
- **Other theories, Dr. Frank Bastian LSU, may be caused by a Spiro plasma bacteria, possibly transmitted externally by external parasites**
- **Genetic Issues**
  - Colorado has stopped massive culling as many now believe that killing healthy non-infected animals may actually kill those that have natural resistance to the disease
  - Also thinning herds may cause infected bucks to range further, thus potentially spreading the disease
  - The theory behind culling was fairly straightforward: Deer communicate the disease to one another, so thinning the population of herds should keep the disease from spreading. The affliction, similar to mad cow disease, creates sponge-like holes in the animals' brains that cause them to lose weight, act strangely and then die."
  - **But Fred Quartertone, the Division of Wildlife field coordinator for chronic-wasting disease, said there's just one problem with the theory: It doesn't appear to hold up in the field.**
- **Nutritional Concerns**
  - Copper Deficiency
  - Manganese in Soils may actually destroy once was thought to be indestructible prions, recent studies in Wisconsin have shown.

CWD Spread in the Wild

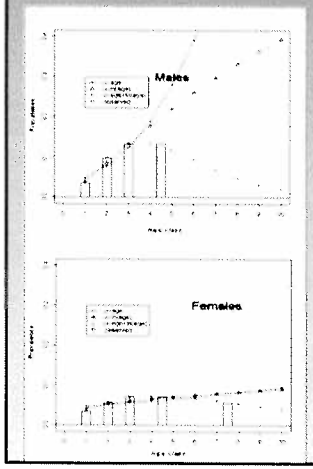


Picture is of Natural "Bait Pile" underneath wild apple tree on Beaver Island

- Based on five years of testing, an average of 1.6% of deer from the two Disease Eradication Zones (DEZs) and 0.1% of deer from the Herd Reduction Zone (HRZ) tested positive for Chronic Wasting Disease (CWD). However, in the western DEZ's core area, disease prevalence is 5% in adult does and 10% in adult bucks.
- Since adult bucks show twice the incidence of disease than adult does it suggests a mode of transmission other than feeding since in artificial feeding or baiting situations, adult does far outnumber bucks at bait piles, which is reverse of what you would expect if the disease was feed related.
- Describe theories of transmission often related to social behaviors of male and female deer.

"Demographic Patterns and Harvest Vulnerability of Chronic Wasting Disease Infected White-Tailed Deer in Wisconsin"

Greer, Samuel, Longenberg and Keane, The Journal of Wildlife Management 70(2)



We found that CWD prevalence was 3–4% for yearling males and females, but increased to peak prevalence in 3-year-olds of both genders. However, peak prevalence in 3-year-old males (13%) was nearly twice that for females (7%), illustrating the dramatic increase in risk of infection for males after the yearling class.

We believe these infection patterns reflect heterogeneous rates and/or pathways of disease transmission in Wisconsin based on the social behavior of white-tailed deer. Miller and Conner (2005) observed similar age and sex patterns in a separate CWD epidemic in Colorado mule deer, and O'Brien et al. (2002) observed similar epidemiology in Michigan in white-tailed deer infected with bovine tuberculosis (TB: a chronic bacterial infection). Both studies hypothesized that social behavior is a strong explanation for these infection patterns.

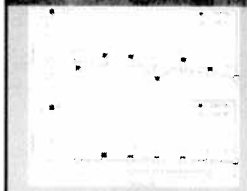
We suggest a strategy that focuses on removing CWD-positive animals, along with density reduction, in situations where controlling CWD is the goal. Adult bucks with larger home ranges are much more likely to be infected than either young dispersing bucks or adult does, and thus create the greatest potential for local disease spread as well as the highest probability for removal of infected animals.

Surveillance, with the goal of detecting geographic spread of CWD from an infected area, should focus on yearling and adult bucks, as these animals are the most likely to disperse the disease by natural means.

Social Aspects of Wildlife Diseases

TB-infected deer are more closely related than non-infected deer

Julie A Blanchong,[1] Kim T Scribner,[1,2] Alexandra N Kravchenko,[3] and Scott R Winterstein[1] July 28, 2006*



"Complex behaviors and social systems play important roles in pathogen transmission (Altizer *et al.* 2003). Failure to account for life-history characteristics related to transmission can impede control efforts (Hutchings & White 2000; Woodroffe *et al.* 2006). Understanding factors responsible for TB transmission among white-tailed deer in Michigan is a high priority in order to control the disease, protect human and domestic animal health and alleviate economic loss."

Synthesizing these results with those of other ongoing investigations, we hypothesize a two-stage model of disease transmission where "TB is maintained at very low prevalence in matriarchal groups, with primary dissemination of the disease attributable to the dispersal and movements of bucks" from a recent Michigan DNR study

CWD In the Wild continued

Dr. Charles Southwick, May 16, 2002 testifying at US House of Representatives on "Eleven Primary Considerations for Chronic Wasting Disease Management"

- 1. Present and recent control strategies of mass culling do not seem to be working. The disease has spread despite extensive slaughter of both captive and wild deer and elk.
  - The Michigan CWD Task Force was relying on Dr. Miller's model of what the disease will do in a wild "population and that has been proven to be the incorrect model for the disease in "**Chronic wasting disease in deer and elk: a critique of current models and their application" by *Eric M. Schauber and Alan Woolf***
  - "However, the apparent concordance reported by Miller et al. (2000) between observed and predicted CWD prevalence across age–sex classes is in error. As the model is described by Miller et al. (2000), it is incapable of producing a pattern in which infection prevalence differs across age classes >4 years old or between sexes (Appendix B). This contrasts with their field data and their purported model output (Miller et al. 2000: figure 4). The empirical age–prevalence relationship of CWD in free-living mule deer, particularly its rarity in older male deer, cannot be explained by the model and indicates that some important biological processes are missing from the model."
  - "Given that the assumption of strict frequency dependent transmission is both critically important and untested, it seems prudent to consider what management options might be appropriate if this assumption is untrue."
  - "However, the fact that all wildlife diseases are not intensively managed implies that managers implicitly weigh the costs of various actions against the risks of inaction. For CWD, models are the best available tools for estimating the risks of inaction and therefore the appropriate magnitude of response."
  - **From Wisconsin's justification for its ban on baiting and feeding "Reduction of contact through a ban on baiting and feeding is likely very important to eradicating or containing a CWD outbreak.** Epidemiological models fit to real-world data on CWD outbreaks in mule deer predict that local extinction of infected deer populations is likely (Gross and Miller 2001).

"This has been proven to be untrue, Wisconsin DNR has had to employ sharpshooters hunting over baitpiles as they continue unsuccessfully to bring the deer numbers down in their target areas and the disease in spite of the fact that no baiting or feeding occurrs in that area continues to exist at a low"

Dr. Southwick in Congress(cont)

- 2. In several cases, the spread of the disease has been associated with increased culling. Large-scale killing may contribute to spread by: (a) increasing movements and dispersal of deer and elk, (b) massive destruction of healthy stock (often 99% of those killed), some of which probably hold the key to genetic resistance that can lead us up and out of this costly and dangerous epizootic.
- 5. In our own study area of mule deer just west of Boulder, Colorado, the Colorado Division of Wildlife tested a dead deer 6 years ago which was CWD +. (They did not inform us until March of 2002). Nonetheless, this deer population has thrived in the six years since then. Fawn production has been very good, fawn survival and winter survival have been excellent. This indicates either very low transmission in natural habitats (as opposed to captivity), or else it indicates individuals or herds with natural genetic resistance.
- 6. There are acute shortages of research on such basic topics as transmission and infectivity rates in natural populations, genetic resistance in individuals in the PrP gene locus, and in cross-species infectivity.

CWD Cases in Close Proximity to Michigan

- Buckhorn Flats Deer farm in Almond, Wisconsin; had 21 positive captive deer , with an open fence 100 miles from the Michigan border.
- Wisconsin set up a 19 square mile zone around this farm and did extensive testing but has never found the disease in wild deer inspite of the fact that the farm had a hole in the fence that included a well used trail, 40 deer had escaped and the facility, yet the disease spread rapidly over a large area in southern Wisconsin, leading you to believe that other factors such as nutritional factors(Cu?), resistance factors(demonstrated in elk, sheep and humans) and soil types,(prions binding to clay soils) may be at play.
- 2003 when Michigan Task Force made its decision to enact the contingency plan, since the 2005 Michigan CWD brochure said their was no difference in prevalence in bucks or does which is clearly incorrect, the Task Force did not have the information it needed to make a judgement that other factors tied to social interactions during breeding play a critical role; It also said that the disease is rarely transmitted between does and fawns yet in 2006 Wisconsin data on wild deer found twice the rate of infection in adult bucks and also a statistically significant infection rate in related deer, i.e. does and their female offspring.
- As the Wisconsin Analysis said "Look at Michigan and the consequences of futuristic off the shelf planning"

Michigan Deer Dietary Statistics

- (1.8 M Deer)x(4lbs/day)x(365days)=1.32 Million tons of food consumed by deer in the state of Michigan
- Michigan Farm Bureau estimates the Deer Feeding Industry is a $40Million dollar business@$170/ton=235,000 tons of feed artificially feed or about 1.7% of the total food consumption of Deer in Michigan
- The remaining 98+% of the feed deer consume is from other sources and in agricultural areas up to 80% of what deer consume is from farmers crops
- So by controlling the less than 2% of feeding behavior a small portion of their overall social behavior(deer spend only 16%of their time feeding) of deer we will prevent the spread of CWD in Michigan even though that hasn't been shown ANYWHERE in the wild because you are managing only 0.2% of the social interaction time for deer.
- In doing this we will remove the number one tool the average hunter has to harvest a deer you are going to control a disease that statistically shows is more likely spread by social interactions involving adult bucks

Crop Damage By Deer

"Exposure assessment of interactions between Whitetailed Deer and Cattle in Northern Minnesota."

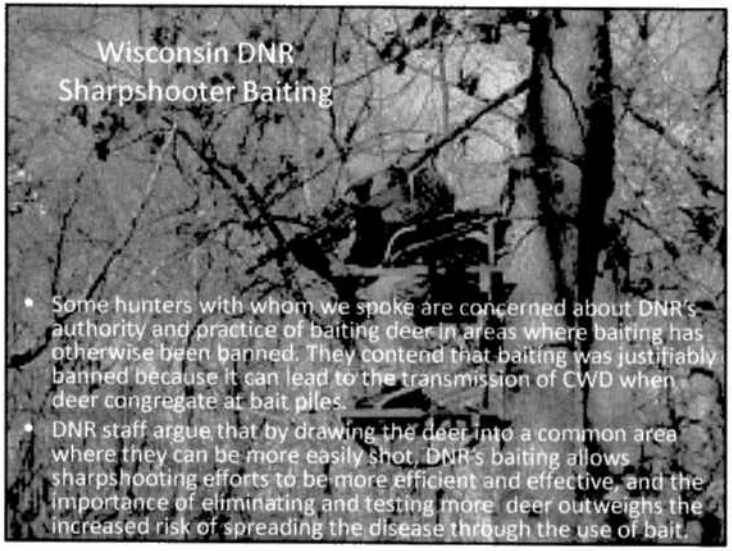
Dr. Scott Wells (UMN) Presented this year at Michigan's 2008 Bovine TB Scientific Meeting

Measured the percent of herds with deer damage in stored feeds

HAY 52% DAMAGE
SILAGE 85% DAMAGE
GRAIN 51% DAMAGE
BEET PULP 52% DAMAGE

OVERALL 21% OF FARMERS REPORTED SEVERE DAMAGE TO THEIR CROPS STORED ON THE FARM!

Wisconsin DNR Sharpshooter Baiting



- Some hunters with whom we spoke are concerned about DNR's authority and practice of baiting deer in areas where baiting has otherwise been banned. They contend that baiting was justifiably banned because it can lead to the transmission of CWD when deer congregate at bait piles.
- DNR staff argue that by drawing the deer into a common area where they can be more easily shot, DNR's baiting allows sharpshooting efforts to be more efficient and effective, and the importance of eliminating and testing more deer outweighs the increased risk of spreading the disease through the use of bait.

Advantages of baiting

- **Gives hunter greater safety**
  - Not moving as much, hunters can define shooting lanes
- Baiting Study from Michigan DNR, DMU 452 Indicate social benefits of allowing limited baiting
  - Indicate over 61% of hunters baited in 2001
- **More time to selectively choose deer to harvest**
  - QDM, # of points, does vs. doe fawns, etc.
- **Gives more hunters the opportunity to see more deer and successfully hunt**
  - This point is critical in today's fast pace society, where like it or not we do not share the luxury of being away from work and family commitments to spend weeks in the woods hunting deer
  - Properly managed baiting and feeding methods are helpful in non agricultural areas to attract deer in close range to allow harvesting
- **Able to actually increase harvest in areas where you want to reduce population**
  - Wisconsin DNR Sharpshooters over baitpiles
  - A management tool to increase harvest in areas with deer overpopulation

Supplemental Feeding

- Is clearly indicated to offset winter severity stress and has been practiced for years even in the states that are endemic with CWD
- The abrupt cessation of supplemental feeding of Deer in Michigan has at times INCREASED and not DECREASED livestock/wildlife interactions and in a winter like 2008-09 may have led to an increase in wildlife death loss
- The concept that supplemental feeding greatly influences the overpopulation of deer in certain areas needs to be correctly weighted with the fact that agricultural production in Michigan is far and away the number one reason for artificially elevated deer populations in certain areas of our state

Key Points on CWD

- Management efforts to control or eradicate CWD have often caused greater disruption to wildlife and traditions of hunting than the disease ever has
- Chronic Wasting Disease has never wiped out any cervid population in the wild in fact populations out west and in Wisconsin have thrived inspite of its presence.
  - The severe epidemic models that many state agencies have followed have been proven to be incorrect and ineffective in preventing the spread of the disease
- The mechanism of transmission in the wild appears to involve complex social, and perhaps genetic and nutritional factors and clearly is not related to feeding as the major mode of transmission
  - CWD has not been found in ANY of the Baiting allowed areas of Wisconsin as of the current year.
  - CWD has spread in certain areas of Wisconsin yet mysteriously not spread in others despite captive cervid wild deer interactions
- Allowing baiting, feeding and mineral supplements actually has minimal overall impacts on deer social interactions and has many benefits , recreationally, socially, economically and even nutritionally for the deer

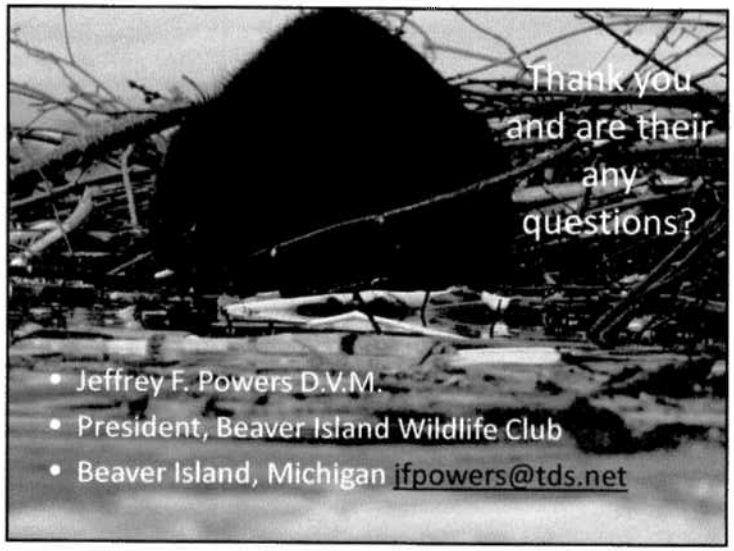
Future Actions

- Continue to monitor the disease near the area of the one positive captive deer
- Revisit the real vs. theoretical factors impacting the management of White-tailed Deer in Michigan's Lower and Upper Peninsula
  - You are going to go a long way to restoring credibility by dealing with the here and know rather than an as of yet unproven theory
- The commitment to habitat restoratation in the UP is a good start, and this effort must be a major focus throughout Michigan's traditional Deer hunting communities such as Beaver Island where local DNR biologists have been unable to free ANY funds for deer habitat management yet DNR enforcement personnel were heavy handed last hunting season despite the obvious lack of any scientific basis for a baiting and feeding ban when it comes to CWD in the Beaver Islands.
- Form better working relationships with organizations such as the UPSA, hunters and wildlife enthusiasts rather than providing dictatorial leadership

Thanks to the Stakeholders Present Today

- Upper Peninsula Sportsmen's Alliance
- Michigan DNR
- Concerned Citizens

Forums like this are needed to bring about solutions that address the diverse needs of all stakeholders surrounding any Natural Resources Issue, in this case Michigan's CWD Management strategy and its impact on Commonly used hunting methods and recreational feeding


Thank you
and are their
any
questions?
• Jeffrey F. Powers D.V.M.
• President, Beaver Island Wildlife Club
• Beaver Island, Michigan jfpowers@tds.net