

**Wisconsin Department of Natural Resources
Natural Resources Board Agenda Item**

Item No. 2.B.1.

SUBJECT: Deer Research Update

FOR: October 2013 Board meeting

TO BE PRESENTED BY: Karl Martin Wildlife and Forestry Research Section Chief

SUMMARY:

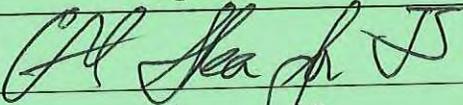
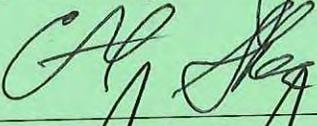
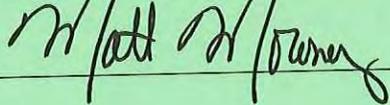
Information will be shared with the Natural Resources Board (via handout and a PowerPoint presentation) on new and ongoing deer research along with a few ideas for future research projects on White-tailed Deer in Wisconsin. Research projects will cover five broad themes including population dynamics and management, ecology, human dimensions, herd health, and surveys. Ongoing projects include the buck and fawn mortality projects, CWD monitoring, hunter surveys and wildlife observations data collection, ecological assessment of deer populations, and deer-vehicle collision assessment. New projects developed in response to the Kroll report include the continuation of several of the ongoing projects with some modifications as well as developing new projects to assess herd health using car-killed deer, an evaluation of both predators and deer utilizing a statewide citizen science trail camera project, and human dimensions research to inform deer baiting and feeding policy and deer management goals and strategies. Proposed future projects include a continuation of the buck and fawn mortality studies in new areas of the state, several new human dimensions projects from the Kroll report aimed at evaluating attitudes regarding various aspects of deer management in Wisconsin.

RECOMMENDATION: Information only

LIST OF ATTACHED MATERIALS (check all that are applicable):

- Background memo
- WDNR Deer Research Update

- Type name of attachment or type N/A if not applicable
- Type name of attachment or type N/A if not applicable

Approved by	Signature	Date
Jack Sullivan, Bureau Director		10/15/13
Al Shea, Administrator		10/15/13
Cathy Stepp, Secretary		10/15/13

SUMMARY

Listed below are brief summaries of white-tailed deer research in Wisconsin based on two broad categories – 'Deer Research' and 'CWD Research'. Under each of these broad categories we have current research, past research, new research, and proposed research projects.

Deer Research

Current Research

Impact of predation, winter weather, and habitat on white-tailed deer fawn recruitment in Wisconsin

Project description: This study was designed to examine several possible causes for variable deer population goals in northern and eastern Wisconsin by focusing on deer fawn survival and recruitment as impacted by species-specific predation, winter weather, and habitat conditions. Additionally, estimates of black bear, coyote, and wolf predation on white-tailed deer fawns in the northern forest and eastern farmland deer management regions will be obtained. Understanding impacts of various predators on fawn survival is important for formulating appropriate harvest recommendations for deer populations throughout northern Wisconsin.

During May 2011, the Department initiated fawn deer capture operations across northern and eastcentral Wisconsin. External partners played a critical role in assisting Department researchers with coordinating/planning/ implementing daily fawn capture events, microhabitat data collection activities, data entry, and equipment purchase/construction.

Lead scientists: Dan Storm, Robert Rolley, Mike Watt, and Karl Martin

Collaborators: Dr. Timothy Van Deelen, UW-Madison; Dr. Shelli Dubay, UW-Stevens Point; Jim Klatt, AFL-CIO/Union Sportsmen's Alliance; Whitetails Unlimited; William Moritz, Safari Club International; Mike Riggle, Wisconsin Conservation Congress

Customer programs: WDNR Bureau of Wildlife Management

Project timeline: 2011 – 2013

Estimating survival and cause-specific mortality of adult male white-tailed deer in Wisconsin

Project description: This study was designed to provide rigorous estimates of the buck recovery rate or its components (buck survival and cause-specific mortality), and hence increased accuracy of SAK population estimates. Additionally, this study will enhance our understanding of the effects and magnitude of hunter bias on estimates of cause- and age-specific mortality rates on male deer, and a greater understanding of spatial and temporal effects on variation in mortality of male deer across Wisconsin.

During 2010, the Department initiated adult deer capture operations across northern and eastcentral Wisconsin. External partners played a critical role in assisting Department researchers with study design, equipment purchase/construction, deer trapping activities, and providing logistical support during winter 2011.

Lead scientists: Dan Storm, Robert Rolley, Mike Watt, and Karl Martin

Collaborators: Dr. Timothy Van Deelen, University of Wisconsin-Madison; Dr. Shelli Dubay, University of Wisconsin-Stevens Point, Whitetails Unlimited; Safari Club International; Mike Riggle, Wisconsin Conservation Congress

Customer programs: WDNR Bureau of Wildlife Management

Project timeline: 2010 – 2015

Evaluating relationships between deer population growth, deer density, and environmental factors throughout Wisconsin

Project description: The objective of this research is to use a rigorous quantitative analysis of deer population growth with respect to the spatial configuration of a natural landscape classification to quantify the relationship between (deer population) growth and variation in the human-caused and ecological features of Wisconsin's landscape. Year-specific populations will be based on SAK calculations using combined input data from deer management units that are aggregated by ecological landscape to increase sample sizes and therefore precision of the input parameters. In addition to increasing precision of SAK population estimates, aggregating data by landscape ties yearly population levels explicitly to unique combinations of soil, geography, vegetation, and land-use across Wisconsin; this analysis will enable research managers to better predict sustainability thresholds across Wisconsin and to better tailor harvest management to local human values.

Lead scientists: Dan Storm and Robert Rolley

Collaborator: Timothy R. Van Deelen, University of Wisconsin-Madison

Customer programs: WDNR Bureau of Wildlife Management

An ecological assessment of varying deer densities and forest habitat

Project description: This study was designed to evaluate the impact of varying densities of deer on forest ecosystems. Results from this research will be used to provide information on the ecological carrying capacity of deer in Wisconsin's forest. Information gathered from this project will be used to help managers and policymakers institute management actions that increase, decrease, or maintain current deer densities.

Starting in 2012 scientists from WDNR and UW-Madison have been evaluating potential sites on which to build deer enclosures in hardwood forested systems in northern Wisconsin. Pretreatment data collection is planned for 2014 with enclosures being implemented in 2015.

Lead scientists: Dustin Bronson and Karl Martin

Collaborators: Dr. Eric Kruger, UW-Madison; Dr. Alex Royo, US Forest Service Northern Research Station; Dr. Susan Paskewitz, UW-Madison

Customer programs: WDNR Bureau of Wildlife Management, WDNR Division of Forestry

Project timeline: 2013 – 2023

Evaluation of Wisconsin's deer population monitoring and management system

Project description: The objective of this research is to quantify the accuracy of sex-age-kill (SAK) population estimates and harvest predictions including evaluating impacts by input variables and explore other population models to determine their effectiveness to estimate deer populations. This study is expected to increase the understanding of factors affecting the harvest of white-tailed deer and rate of population increase which will lead to a better understanding of the accuracy and precision of the current deer population monitoring and harvest management system. This information is needed to increase the public's confidence in the Department's deer management program and willingness to harvest the number of antlerless deer required to maintain populations at goal levels.

Lead scientists: Dan Storm and Robert Rolley

Collaborators: Dr. Timothy Van Deelen, University of Wisconsin

Customer programs: WDNR Bureau of Wildlife Management

Project timeline: 1995 - ongoing

An evaluation of the usefulness of deer-vehicle collision data as indices to deer population abundance.

Project description: Monitoring deer populations is crucial for harvest management. Recent research has suggested limitations to current monitoring techniques (i.e. audit of the SAK model), and they remain controversial with the public. Additional, independent sources of information on population trends of deer are desirable, and deer-vehicle collision data has been suggested as potentially useful for that purpose. This research project was intended to identify sources of deer-vehicle collision data, understand data collection procedures, and evaluate potential usefulness of such data for monitoring deer populations.

Lead scientists: Dan Storm and Robert Rolley

Collaborators: Tim Van Deelen, University of Wisconsin

Customer programs: WDNR Bureau of Wildlife Management

Project timeline: 2011 - 2013

Wildlife surveys and databases

Project description: Through this effort, we examine registered harvest, estimate population levels, set hunter permit levels and season lengths, and disseminate harvest and population information for most hunted and trapped species in Wisconsin. We also investigate Wisconsin hunter attitudes to season frame works, proposed legislative initiatives, Conservation Congress proposals, and monitor hunter participation trends. Finally, we establish protocol, data standards, and review data dissemination systems for most wildlife survey and harvest information to the public and other wildlife agencies.

Lead scientist: Brian Dhuey

Collaborators: University of Wisconsin, U.S. Fish and Wildlife Service, U.S. Forest Service, and Great Lakes Indian Fish and Wildlife Commission

Customer program: WDNR Bureau of Wildlife Management

Project timeline: 1930 - ongoing

Past Research

Evaluating hunter bias in radio-telemetry survival studies of white-tailed deer in Wisconsin

Project description: Radio-telemetry studies of hunted big game populations may be subject to a unique and complex bias associated with hunter reaction to the presence of a radio-transmitter package and associated markings. Elements of this potential bias include the probability that a hunter observes the mark –and conditional on observing the mark, the probability that the hunter decides to shoot. The objective of this research is to evaluate the potential bias associated with hunters reacting to the presence of a radiocollared animal and to subsequently quantify effects of hunter bias on survival (or its compliment, mortality) rates of deer in Wisconsin. Pilot study completed in November 2008; full study to launch during November 2009.

Lead scientist: Christopher Jacques

Collaborators: Timothy Van Deelen, University of Wisconsin-Madison; Kurt VerCauteren, National Wildlife Research Center, and U.S. Department of Agriculture Animal and Plant Health Inspection Service

Customer programs: WDNR Bureau of Wildlife Management

A survey of landowners in Wisconsin: opinions of deer management on private lands

Project description: The objective of this research is to enhance our understanding of private landowners and their opinions about deer hunting/management and their reasons for owning land. Specifically, this survey was designed to collect empirical data to better understand potential reasons for land ownership, landowners' opinions of deer and deer on their land, their perceptions of the deer herd and DNR management of deer, and landowners' opinions/philosophies regarding deer hunting on their land. A better understanding of these factors will enable agencies like the Wisconsin DNR to better structure communication and public involvement with private landowners, thereby improving agency credibility among the constituents we currently serve and increased support for our deer management program.

Lead scientists: Jordan Petchenik, Robert Rolley, and Keith Warnke

Customer programs: WDNR Bureau of Wildlife Management

Human Dimensions Studies

- Gun Deer Hunting
- Deer Population Believability (SAK study)
- Credibility Study
- Private Landowners
- Gun Deer Season Alternatives
- Declining Deer Hunters
- Deer Hunter Drop Out

Additional past research areas

- Biology of Southern Wisconsin Deer
- Buck Recovery Rates

- Deer Aging Techniques
- Deer Distance Sampling
- Deer Forage Production in Aspen Stands
- Deer Inventories on Sandhill Wildlife Area
- Deer Management Research Project
- Deer Population and Range Changes Following Herd Removal at the Sandhill Wildlife Area
- Deer Population Measurements and Harvest Recommendations in Management Units
- Deer Population Mechanics on Management Units
- Deer Population Model
- Deer Survey Improvement
- Development of Deer Habitat Recommendations
- Experimental Reduction of the Sandhill Deer Herd through Controlled Hunting
- Fawn per Doe Survey
- Relation of Forest Cover Types to Deer Population
- Relationship Between Pine Management and Deer Densities on the Brule Pines Study Area
- Statewide Deer Reproduction Study
- Validation Of Deer Population Estimation Techniques
- Winter Deer Range Evaluation/Checks

New Deer Research (initiated in 2013)

Using Citizen Outreach and Trail Cameras to Assess the Distribution and Relative Abundance of Predators and Relative Density and Reproduction Rates of White-tailed Deer in Wisconsin

Project description: The Department plans to develop a standardized statewide citizen trail camera research and monitoring project. In addition to predator information, the cameras would provide a measure of fawn recruitment rates, estimates of buck densities, and age structure. Citizen participants would submit all observations and photos of predators and unique animals via the Department's website. The research scientist will annually conduct regional workshops and develop training materials for the citizen volunteers, oversee team members in responding to volunteer inquiries and coordination of cameras and training materials, develop and implement web applications and statistical packages to determine animal abundance and distribution through an interactive website, secure external funding to support research activities and collaborate with field managers and other researchers. In addition, the research scientist would be responsible for developing a comprehensive reporting system to inform volunteers, interested citizens, DNR managers and administrators of results on a semi-annual basis and conducting presentations to citizen groups and professional organizations and producing peer-reviewed publications.

Lead scientist: Karl Martin

Collaborators: Dr.'s Ben Zuckerberg, Timothy Van Deelen, and Phil Townsend, University of Wisconsin-Madison

Customer program: WDNR Bureau of Wildlife Management

Deer reproduction and nutritional condition in Wisconsin

Project description: Information on deer recruitment is critical in estimating population size and harvest potential. Better information regarding the factors that influence recruitment would allow better projection of pre-hunt population size and prediction of how forest management and climate change are likely to impact deer population dynamics. This study will assess spatio-temporal patterns and drivers of deer fecundity and nutritional condition and their contribution to variation in recruitment rates (fawn:doe ratio) and population change. Results will provide a more comprehensive understanding of the drivers of population change, and allow consideration of how forest management and climate change are likely to affect deer populations. Additionally, the Deer Trustee Report emphasized the importance of collecting data on herd health and productivity, and reproduction and condition data are the most relevant measures of herd health available.

Lead scientists: Dan Storm and Karl Martin

Collaborators: Dr. Timothy Van Deelen, University of Wisconsin-Madison, Lindsey Long, WDNR Wildlife Health

Customer program: WDNR Bureau of Wildlife Management

Human dimensions research to inform deer baiting and feeding policy

Project description: The practice of baiting and feeding has been an on-going issue related to deer management for some time. The practice of baiting and feeding is currently prohibited in 32 counties. This research project will develop and implement a study on the

human dimensions (public opinion) surrounding baiting and feeding deer through the use of focus groups with current and past bait-using hunters as well as those who have never used bait, for the purpose of developing policy. Following the focus groups, we will conduct a statewide survey to quantify the behaviors behind bait use. Survey results will be used to inform management and stakeholders if the potential for a statewide ban on baiting degenerates into a controversial issue in the legislative arena. While a statewide survey would not allow us to provide legislators with specific, district-level information, a sampling frame could be developed to permit DNR region-level analyses. We will conduct post-survey focus groups to verify survey data interpretation and implications for policy.

Lead scientists: Bob Holsman or Jordan Petchenik

Collaborators: Robert Rolley and Dan Storm

Customer program: WDNR Bureau of Wildlife Management

Citizen Wildlife Observational Surveys

Project description: Expansion of the Department's Operation Deer Watch (ODW) program and Deer Hunter Wildlife Survey program by developing journals to capture data. Through ODW, citizens record deer sightings during the summer months to monitor Wisconsin's deer reproduction. The goal of ODW is to gauge the number of fawns produced. This assists deer managers in making deer population estimates. Through the Deer Hunter Wildlife Survey program, deer hunters provide wildlife data used to monitor the relative abundance and distribution of deer and other mammalian/avian wildlife species in Wisconsin including deer, raccoon, skunk, porcupine, red and gray fox, turkey, ruffed grouse, coyote, bear, otter, fisher, bobcat, house cat, badger, wolf, opossum, and elk. Because hunters often spend many quiet observation hours in the woods, they can provide valuable information about species that is often difficult to measure.

Lead scientist: Brian Dhuey

Customer program: WDNR Bureau of Wildlife Management

Human dimensions research to inform deer management goals and strategies

Project description: The success of Wisconsin's deer management program relies heavily on the participation and commitment of interested constituents – landowners, hunters, and department personnel. A successful program therefore requires that the department understand and respond to the value and belief systems of these constituents. We will use a combination of qualitative (e.g., in-depth personal interviews, focus groups, etc.) and quantitative (e.g., surveys) social science research techniques to address these information needs. Study results will enable the department to better understand constituent beliefs, attitudes, preferences, and behaviors related to various deer management goals and strategies. In order to address the highest management priorities, we will focus initial efforts on current management approaches and proposals. In the first two years, we will conduct research with CWD-zone hunters to inform fee structure proposals for CWD deer tags (previously issued for free), as well as research to both guide and evaluate the department's first Deer Management Assistance Program (DMAP). Topics addressed in following years will focus on emerging priority issues yet to be identified in consultation with the Bureau of Wildlife Management and agency administration.

Lead scientists: Jordan Petchenik or Bob Holsman

Collaborators: Dan Storm and Robert Rolley

Customer program: WDNR Bureau of Wildlife Management

Proposed Future Deer Research

Impact of predation, winter weather, and habitat on white-tailed deer fawn recruitment in the central forest and southwestern farmland regions of Wisconsin

Project description: This would be a continuation of ongoing research in Winter and Shiocton to evaluate causes of mortality, but the geographic area would change to the Central Forest Region and South Central Region in the CWD Management zone. Like the original study this study is designed to examine several possible causes for variable deer population goals in central and southern Wisconsin by focusing on deer fawn survival and recruitment as impacted by species-specific predation, winter weather, and habitat conditions. Additionally, estimates of black bear, coyote, and wolf predation on white-tailed deer fawns in the two regions will be obtained. Understanding impacts of various predators on fawn survival is important for formulating appropriate harvest recommendations for deer populations and understanding the role of CWD on fawn survival and recruitment is important for both disease and population management..

Lead scientists: Dan Storm, Robert Rolley, and Karl Martin

Customer programs: WDNR Bureau of Wildlife Management

Estimating survival and cause-specific mortality of adult male white-tailed deer in the central forest and southwestern farmland regions of Wisconsin

Project description: Much like the ongoing buck and fawn mortality projects this study is designed to provide rigorous estimates of the buck recovery rate or its components (buck survival and cause-specific mortality), and hence increased accuracy of SAK population estimates. Additionally, this study will enhance our understanding of the effects and magnitude of hunter bias on estimates of cause- and age-specific mortality rates on male deer, and a greater understanding of spatial and temporal effects on variation in mortality of male deer across Wisconsin.

This project would focus on two areas of interest in the state the central forest and the south western farmland regions of the state with the added component of assessing the role of CWD on buck survival rates in the CWD management zone.

Lead scientists: Dan Storm, Robert Rolley, and Karl Martin

Customer program: WDNR Bureau of Wildlife Management

Research to implement deer Telecheck (eRegistration)

Project description: There is support from some constituents to transition from in-person deer registration to electronic registration. Under the current system approximately 25,000 deer are aged annually during the registration process, but this change will require development of alternate methods for the collection of age data and estimates of registration compliance. Accurate estimates of deer harvest and sex and age structure are critical for population estimation, assessment of harvest effects, population assessment and harvest management planning. Implementation of telecheck was a recommendation of the Whitetail Deer Trustee.

Lead scientists: Bob Holsman, Brian Dhuey, Dan Storm, Robert Rolley, and Kevin Wallenfang

Customer programs: WDNR Bureau of Wildlife Management

Long-term human dimensions research agenda that takes a proactive approach

Project description: This proposal is not a single research project. Rather, it is an umbrella that covers numerous human dimensions projects. In response to the Deer Trustee report, four general areas where human dimensions research should be called upon include:

1. Resource management and planning
2. Regulatory process and fee structures
3. Evaluations of training and program initiatives
4. Support (toolkit approach) for local biologists

What follows are examples of specific human dimensions projects which address these four areas:

- A. Social acceptance – balancing landowner/hunter preferences with ecological sustainability
- B. Evaluate hunter assessment of reduced Deer Management Units
- C. Research on crop damage abatement program
- D. Fee increase concept and social acceptance
- E. October hunt evaluation
- F. Human dimensions support for local biologists
- G. Evaluations

Lead scientists: Bob Holsman and Jordan Petchenik

Customer programs: WDNR Bureau of Wildlife Management

Research to develop, collect, and implement new metrics for deer management

Project description: The Deer Trustee Report recommends the development of new metrics to supplement current deer population metrics (doe-fawn ratios, deer population modeling, harvest data, etc.). New deer population metrics include unbiased assessments of herd health, agricultural impacts, forest regeneration, car vehicle collisions, ecological impacts, human dimensions, hunter surveys, etc. Research is needed to further develop, implement and evaluate these metrics so they can be incorporated into deer management decision-making.

Lead scientists: Dan Storm, Dustin Bronson, Robert Rolley, Brian Dhuey, Jordan Petchenik, Bob Holsman and Karl Martin

Customer programs: WDNR Bureau of Wildlife Management

CWD Research

Current Research

Relationships of deer ecology, disease ecology, and hunter behavior to manage chronic wasting disease (CWD) in Wisconsin

Project description: The objectives of this study is to provide the science needed to manage CWD in Wisconsin, use an adaptive management approach to evaluate the effectiveness of an aggressive CWD eradication program, and provide new scientific information upon which to base future decisions. This study will document deer movements and behavior in the CWD affected area of southwestern Wisconsin. It will determine the geographic distribution and prevalence of CWD, its transmission rates and its spread, relative to age, sex and genotype. Perceptions of human risk factors, attitudes of hunters, landowners, and the public and economic effects from CWD will be assessed. Size of the deer population in the CWD affected area will be determined and monitored.

Publication titles to date resulting from this research project:

- Long-distance movement of a white-tailed deer away from a chronic wasting disease area.
- White-tailed deer movements in a chronic wasting disease area in south-central Wisconsin.
- Survival of white-tailed deer in Wisconsin's chronic wasting disease zone.
- Evaluating spatial overlap and relatedness of white-tailed deer in a chronic wasting disease management zone.
- Demographic patterns and harvest vulnerability of chronic wasting disease infected white-tailed deer in Wisconsin.
- White-tailed deer harvest from the chronic wasting disease eradication zone in south-central Wisconsin.
- Influence of genetic relatedness and spatial proximity on chronic wasting disease infection among female white-tailed deer.
- Spatial and temporal patterns of an emerging wildlife epidemic: fine scale mapping of chronic wasting disease in Wisconsin.
- Spatial epidemiology of chronic wasting disease in Wisconsin white-tailed deer.
- The walk is never random: subtle landscape effects shape gene flow in a continuous white-tailed deer population in the Midwestern United States.
- Influences on hunter support for deer herd reduction as a chronic wasting disease (CWD) management strategy.
- CWD after "the Fire": Six Reasons Why Hunters Resisted Wisconsin's Eradication Effort.
- Five years into the CWD eradication effort: which parts do hunters support?
- Predicting deer hunter harvest in Wisconsin's Chronic Wasting Disease Eradication Zone.
- Tracking DEZ deer hunters: A report of the hunter effort and attitudes for the 2005 deer hunting season with relevant three-year trends.
- Untangling the relationship between effort and hunter harvest: Results from 2004 (year 2) study of deer hunters in Wisconsin's chronic wasting disease eradication zone.

- A preliminary report on hunter effort and attitudes in Wisconsin's chronic wasting disease eradication zone: Results from the 2003 extended deer season.
- Landowner responses to harvest incentives in Wisconsin's southwest chronic wasting disease eradication zone.
- Landowner response to CWD and its management in Wisconsin's southwestern disease eradication zone.
- Chronic wasting disease in Wisconsin: Gun deer hunters' first response.
- Chronic wasting disease in Wisconsin: Hunter behavior, perceived risk, and agency trust.

Lead scientists: Robert Rolley and Jordan Petchenik

Collaborators: Timothy R. Van Deelen, University of Wisconsin; and Michael Samuel, Cooperative Wildlife Research Unit

Customer program: WDNR Bureau of Wildlife Management

Project timeline: 2002 – ongoing

Past CWD Research

Evaluation of error rates in white-tailed deer age estimates by the molar tooth wear-and-replacement method

Project description: Natural resource agencies often estimate ages of harvested deer or assign individual deer to age classes which may vary ≥ 1 year by comparing patterns of tooth wear and replacement of harvested individuals to a set of reference patterns (i.e., 'field method'). However, age misclassification rates associated with the field method often exceed 50% whereas an alternative technique known as the cementum annuli method is substantially more accurate (15% misclassification rate) than the field method. There is growing concern that the misclassification of deer age classes could result in biased age-specific CWD prevalence estimates, thus, this study was initiated to examine misclassification rates between known (and widely used) deer aging techniques.

Lead scientist: Dan Storm

Collaborators: Mike Samuel, University of Wisconsin

Customer programs: WDNR Bureau of Wildlife Management

Proposed Future CWD Research

Effect of Chronic Wasting Disease on Survival and Reproduction of White-tailed Deer in Southern Wisconsin

Project description – This project would involve the collaring of both fawns and adult deer to assess the causes and rate of mortality. This would be very similar to the ongoing deer mortality projects in Shiocton and Winter, Wisconsin, but would involve a new geographic area and add a new component of disease management. The direct effect of CWD on deer reproduction and vulnerability to harvest, predation, motor-vehicles and other forms of mortality has not been assessed. This research would also aid in population estimation in the CWD Management Zone. A better understanding of the effect of CWD on deer reproduction and survival would help refine predictions of the impacts of CWD on deer populations. Documenting impacts of CWD on deer populations is important for building public support of disease management.

Lead scientists: Dan Storm, Robert Rolley, and Karl Martin

Potential Collaborators: Tim Van Deelen, Mike Samuel, Kevin Wallenfang, Tami Ryan, and Lindsey Long

Customer program: WDNR Bureau of Wildlife Management
