Current Projects

Project Title – Developing Wildlife Management Cooperatives
Principal Investigator(s) – Kip Adams, Matt Ross, Brian Murphy
Institution/Organization – QDMA
Study Site – To be determined
QDMA Contribution – $49,298

Project Description – Wildlife management cooperatives (WMC) are groups of neighboring landowners or property lessees working together to improve wildlife and/or habitat management programs. One of the largest WMCs in the southern United States is the Greater Noxubee Wildlife Management Cooperative. Using the Greater Noxubee WMC as a model, we propose to create three additional WMCs surrounding National Wildlife Refuges in the Northeast, Midwest and West. This will result in WMCs being strategically located in four regions of the United States, which can serve as models for additional WMC formations, possibly having a WMC in each of the Fish and Wildlife Service’s 21 Landscape Conservation Cooperatives. The QDMA will work with Fish and Wildlife Service staff to select National Wildlife Refuges in the above regions with the best potential for developing successful cooperative relationships with neighboring landowners and/or property lessees. The QDMA will identify and contact potential WMC members, conduct educational meetings, and establish three WMCs. The QDMA will oversee each WMC during the first year of establishment to ensure continued success. After 18 months, QDMA will remain involved as a member and turn oversight of the WMCs over to the respective National Wildlife Refuge managers or appointed designees.

Project Summary – current project

Published – n/a

Project Title – White-tailed Deer and the National Wildlife Refuge (NWR) System – Impacts of Urbanization and Fragmentation in Minnesota
Principal Investigator(s) – Marrett Grund, Dr. Joel Helmer, Matthew Ross, Levi Shinn, Anne Sittauer and Larry Williams
Institution/Organization – U.S. Fish and Wildlife Service, QDMA, Minnesota Department of Natural Resources and Concordia University-Nebraska
Study Site – Sherburne NWR - Minnesota
QDMA Contribution – $31,995

Project Description – Few data exist regarding the impacts of urbanization and fragmentation on deer hunting and management – factors important to whitetail managers both on and off NWRs. This project will be a landscape-level study to assess those impacts around an existing NWR. Researchers will utilize existing deer harvest, hunter effort and geo-spatial (GIS) human density and land composition/change data to analyze and assess potential impacts. Further, they will also examine and compare spatial and temporal changes of urbanization and land fragmentation on and around the Sherburne NWR in southwestern Minnesota with historical deer harvest data provided by MDNR.

Project Summary – current project
Published – n/a

---

Project Title – Reproductive Ecology of Male White-tailed Deer
Principal Investigator(s) – Kevin Monteith and Dr. Jonathan Jenks
Institution/Organization – South Dakota State University
Study Site – Wildlife and Fisheries Science Research Facilities at South Dakota State University
QDMA Contribution – $21,200

Project Description – Evaluation of the hypotheses regarding the effects of mature males on the timing and degree of reproductive effort of young males. Researchers will concurrently investigate the timing of reproductive effort in males relative to estrus in female white-tailed deer and quantify reproductive effort of male deer to test whether mature males suppress reproductive exertion by young males. Researchers will also quantify reproductive effort for both adult and yearling males by monitoring changes in nutritional condition, body mass, and forage and fluid intake. Additionally, researchers will monitor plasma testosterone and cortisol to determine their relationship with reproductive effort and presence of prime-aged males.

Project Summary – current project
Published – n/a

Project Title – Effects of Seasonality of Fire in Mixed Upland Hardwoods
Principal Investigator(s) – Dr. Craig Harper
Institution/Organization – University of Tennessee
Study Site – Eastern Tennessee
QDMA Contribution – $26,000

Project Description – This project will determine the long-term and seasonal effects of prescribed fire on white-tailed deer habitat (deer forage and fawning cover) in mixed hardwood forests in eastern Tennessee. Researchers will document the effects of early growing-season fire and late growing-season fire in upland mixed-oak forests. Forage for white-tailed deer and soft mast availability will be measured. Data collected will relate to both wildlife habitat quality (food and cover) and regeneration potential within upland hardwood systems.

Project Summary – current project

Published – n/a

Completed Projects

Project Title – Effects of Population Structure and Dispersal on CWD Efforts
Principal Investigator(s) – Dr. Randy DeYoung and Dr. Jim Crum
Institution/Organization – Texas A&M University-Kingsville and West Virginia Division of Natural Resources
Study Site – West Virginia
QDMA Contribution – $38,000

Project Description – Genetic study of white-tailed deer to provide essential knowledge to guide chronic wasting disease management efforts. Researchers will determine population structure and spatial scale of deer populations, and then assess dispersal and connectivity among those deer herds. They will also assess the role of habitat and landscape features in animal movements and dispersal patterns.
Project Summary – We observed positive autocorrelation in females at spatial scale <1 km; the positive values probably reflect the presence of female relatives in close geographic proximity. We observed no positive autocorrelation in males at proximate distances, though sporadic positive values at distance classes >1 km may reflect dispersers. We observed some pairs of CWD-positive females related at R=0.25 (half-sibs, aunt-niece) up to 10 km apart, but male-male pairs at R=0.25 up to 30 km apart. Therefore, dispersing males are likely agents of CWD transmission over larger spatial distances, while females likely transmit the disease through local contact. Females had positive F\textsubscript{IS} values, probably due to the presence of social groups composed of female relatives, and the philopatric nature of females. Male F\textsubscript{IS} fluctuated during 2006-2011, and in some years had positive F\textsubscript{IS}, as well as the expected F\textsubscript{IS} of 0 or negative for groups of unrelated deer. Changes in F\textsubscript{IS} may reflect differences in dispersal among years, such as dispersal imbalance in response to harvest. The autocorrelation values for pairs of females within 500m increased during 2006-2011, coincident with changes in female age structure due to harvest. We observed increased autocorrelation as doe ages in harvest became younger, suggesting fewer generations of female relatives. Spread of CWD is likely influenced by differing behavior of males and females. Harvest affected fine-scale structure, but the effects were subtle.

Published – n/a

Project Title – Evaluation of the Severinghaus Technique for Aging White-tailed Deer

Principal Investigator(s) – Jeremy Meares and Dr. Karl Miller
Institution/Organization – QDMA and University of Georgia
Study Site – Georgia
QDMA Contribution – $26,000

Project Description – Study the accuracy of the Severinghaus (tooth wear and replacement) technique for estimating deer age, and look for potential new methods that could improve the ease and accuracy of aging deer using their teeth. Researchers used ArcView GIS software and digital photography to objectively measure dentine and enamel widths on molars of wild, known-aged deer to quantify tooth wear and minimize observer bias.
The ArcView results were highly variable when compared to human estimates using the Severinghaus technique, and also showed significant overlap among age classes 1.5-4.5 years. Based on this analysis, it appears that observer subjectivity may actually increase the predictability of the wear and replacement technique. The objective tooth wear measurements taken using digital photographs and ArcView show that the tooth wear and replacement technique, when practiced using the original guidelines, is a poor predictor of deer age. Until there is a more reliable method for estimating deer age, managers should use caution when placing confidence in specific ages beyond fawn, yearling and adult.


Establishment of food plots is an increasingly important tool for managing white-tailed deer (*Odocoileus virginianus*) habitat in the eastern United States. However, little is known about their impacts on non-game species. During 2008 and 2009, we evaluated songbird and small mammal responses to food plots planted with perennial clovers (*Trifolium* spp.) on 20 northern sites (New York and Pennsylvania) and 20 southern sites (Georgia and Tennessee). We completed a total of 1400 breeding bird counts (BBC) on all sites and an additional 500 winter bird counts (WBC) on 10 sites in North Georgia. We compared songbird detections within the food plot, at the food plot edge, and 125 meters into the adjacent forest. For the northern BBC, the number of songbirds detected and the species richness did not differ among 3 treatments. For the southern BBC, species richness (P < 0.0001), and abundance indices (P < 0.0001) were greater at the food plot edges than within the plot or in the adjacent forest. During the WBC, species richness was greater (P = 0.0038) along the edges, but abundance indices did not differ (P = 0.2552). I surveyed small mammal relative abundance using snap traps over 15,000 trap nights on the northern (May-July) and southern (May-June) food plots in the same treatments. At the northern sites, there was a significant difference of the treatment (P < 0.0001, richness), (P < 0.0001, abundance). At the southern sites there was no difference among treatment (P = 0.4169, richness), (P = 0.144, relative abundance). Food plots within closed canopy hardwood forests did not negatively impact the non-game wildlife species we surveyed, but rather the plot edges enhanced habitat conditions for several avian and small mammal species. The creation of food plots may provide habitat for some non-game species in hardwood landscapes where early successional habitat is limited.

Published –


**Project Title –** Evaluation of an Urban Deer Educational Module  
**Principal Investigator(s) –** Jessica Tegt and Dr. Ben West  
**Institution/Organization –** Mississippi State University  
**Study Site –** CT, GA, MI, MN, MO, MS, NJ, NY, SC, PA, VA, TX, WI  
**QDMA Contribution –** $25,000  

**Project Description –** Teachers in 13 states throughout the East and Midwest areas of the United States are implementing QDMA’s *Living with White-tailed Deer* educational program in their classrooms. *Living with White-tailed Deer* introduces students to the complex issues surrounding white-tailed deer management, particularly in urban areas where human and deer populations are increasing. Researchers will survey the students twice, once immediately before, and once immediately after the program to assess differences in knowledge and attitudes toward white-tailed deer and management of the species. Demographic variables will also be analyzed in conjunction with the attitude and knowledge assessments to gauge the effect of situational influences on feelings toward white-tailed deer management. The teachers will also complete an extensive evaluation of the program based upon the North American Association of Environmental Education Guidelines for Excellence program development principles. The teacher evaluation will gain insight into the usability and applicability of the educational components within the program. To date, this is the most extensive research performed on minors to evaluate attitudes and knowledge toward an urban wildlife species.  

**Project Summary –** Teacher return packets are still arriving, analysis is underway, all results will be available summer 2010.  

**Published –** The following peer-reviewed journal articles will be submitted for review by December 2010:  

**Title:** Using the NAAEE Guidelines for Excellence to evaluate LWWTD program effectiveness  
**Synopsis:** Using the teacher evaluations and data from the knowledge pre- and post tests, I will assess whether the LWWTD program is deemed effective. I will compare the teacher evaluations to the guideline objectives and will measure the overall increase in knowledge following program implementation. I will discuss the implications of teacher variability on program
effectiveness and will briefly discuss the application of the
guidelines for evaluation of EE programs.

**Title:** Demographic factors influencing the attitudes and knowledge of high school students on white-tailed deer issues

**Synopsis:** Following the analysis of knowledge and attitude questionnaires, I will compare the effects of several demographic factors and their influence on the questionnaire scores. I specifically am interested in assessing age, gender, race, location of residence (rural/urban), and income. Further, I will see if previous experience in the outdoors or hunting had an influence on their knowledge or attitudes. Lastly, I will discuss whether or not demographic factors can be overcome with an interactive EE program such as LWWTD.

**Title:** The knowledge and attitudes of high school students toward white-tailed deer issues

**Synopsis:** I will report the overall attitudes and knowledge of high school students toward white-tailed deer in their communities. I will discuss the implications of the LWWTD program on their knowledge and attitudes. I will also discuss several of the demographic factors that showed influence on their knowledge and attitudes. The effect of EE programs on wildlife management will also be incorporated.

**Title:** Commentary---Adolescent attitudes regarding white-tailed deer management; what the future holds for wildlife managers and environmental educators.

*Human-Wildlife Conflicts Journal*

**Project Title –** Spatial Ecology of Adult Male White-tailed Deer

**Principal Investigator(s) –** Dr. Stephen Ditchkoff

**Institution/Organization –** Auburn University

**Study Site –** Oklahoma

**QDMA Contribution –** $5,000

**Project Description –** Examine the manner with which adult, male deer utilize the landscape with regard to home range, 24-hour movements, and landscape characteristics.

**Project Summary –** Data suggest that there are considerable differences with regard to how older and younger bucks move
during 24-hour periods during the breeding season. Additionally, there are no age-related differences with regard to annual shifts in home ranges of adult male deer: on average, there is approximately 40% overlap between home ranges from year to year.

Published – Holtfreter, R.W., S.S. Ditchkoff, R.E. Masters, E.R. Welch, and W.R. Starry. 2007. Movement patterns of male white-tailed deer suggest that juvenile breeding effort is suppressed by mature males. Annual Southeast Deer Study Group Meeting 30:35. Ocean City, MD.

Project Title – Effects of Hunter Activities on White-tailed Deer Movements and Harvest
Principal Investigator(s) – Dr. Duane Diefenbach and Dr. Chris Rosenberry
Institution/Organization – Pennsylvania State University and Pennsylvania Game Commission
Study Site – Pennsylvania
QDMA Contribution – $50,000

Project Description – Researchers will radio-collar female white-tailed deer, estimate survival and harvest rates, and document sources of mortality. They’ll conduct aerial surveys to document deer movements and distribution in response to hunter densities and activities, and then use that information to improve the deer population model used in Pennsylvania.

Project Summary – Hunting was the most common source of mortality for collared deer and most human-related mortalities (other than hunting) were vehicle collisions. Annual survival differed primarily by land ownership (public vs. private) and study area. On the Sproul study area annual survival was 90% on public land and 72% on private land. On the Tuscarora study area annual survival was 60% on public land and 79% on private land. Harvest rates primarily differed between study areas, land ownership, and age class of deer. On the Sproul study area, the harvest rate was 5% on public lands and 18% on private lands. On the Tuscarora study area harvest rates were slightly lower on private land and differed between adults (20%) and juveniles (30%). Other than evidence for greater harvest rates on public land, we found no landscape variables related to the spatial distribution of the harvest on the Tuscarora study area. On the Sproul study area we found greater
harvest rates on private land. Furthermore, on public land, harvest rates declined for deer that lived further from roads and on steeper slopes. On private land, distance from road had little influence on harvest rates but deer that lived on steeper slopes tended to have lower harvest rates. Hunter density was greatest during the first three days of the hunting season (0.5-1 hunter/km²) and then declined. Hunter density was generally <0.1 hunters/km² except on Saturdays. Deer hunting on Sunday is not permitted in Pennsylvania. On the Sproul study area we found that hunters were relatively uniformly distributed on private land. On public land there were large areas with relatively few hunters and most hunters were found on flat slopes near roads. On the Tuscarora study area, hunter density was greater on public lands, but overall there were only a few, small areas with relatively few hunters. The distribution of hunting mortality on public land on the Sproul study area indicated large areas of land that experienced hunting mortality rates of <2% and hunter distribution indicated low hunter density in these same areas. These areas of few hunters and low hunting mortality rates may serve as de facto refugia for deer.

Published – n/a

Presentations –

Adams, K. Anheiser-Busch Partners Meeting, St. Louis, Missouri. 24 May 2007

Adams, K. Quality Deer Management Association National Convention, Chattanooga, Tennessee. 1 June 2007


Rosenberry, C. S. Northeast Deer Technical Committee Meeting, 26 September 2007


Project Title – An Evaluation of Quality Deer Management in Tennessee
Principal Investigator(s) – Dr. Craig Harper
Institution/Organization – University of Tennessee
Study Site – Tennessee
QDMA Contribution – $7,500
Project Description – Quality deer management programs were evaluated on 4 private land clubs (or leases) and 3 state wildlife management areas. Data from deer harvested at each study area were compared with data collected from surrounding counties at check-in stations. Antler restrictions and doe harvest recommendations were also evaluated based on harvest statistics from each
Hunters were surveyed for their knowledge of deer management and satisfaction of quality deer management programs on the study areas. Hunters from the study areas were compared to a random population of statewide sportsman's license holders. Deer forage following prescribed fire and fertilization was monitored for biomass, quality, and preference. Food plot plantings were planted on 3 sites and evaluated for biomass, quality, and deer preference. Mineral supplements were used at 2 sites and evaluated for deer preference.

**Project Summary** – Comparisons of deer data from the study sites with surrounding county data are still being analyzed. Antler restrictions varied among study sites, but the average age of bucks killed increased at all sites following implementation of QDM. The number of mature bucks killed post-QDM exceeded the total number of bucks killed pre-QDM at some sites. The recommended doe harvest was adequate at some sites, but not on at least one WMA site. Hunters at study sites, especially private land sites, were more knowledgeable concerning deer management. Hunters at all sites were satisfied with QDM on those sites. Many differences were detected between private land hunters, public land hunters, and statewide hunters. Prescribed fire and fertilization did not appreciably increase deer forage availability in closed-canopied forest stands. Several differences in forage biomass, quality, and deer preference were detected among food plot plantings. Trace mineral salt was preferred more than 2:1 over various commercial mineral supplements.


**Project Title** – White-tailed Deer Breeding Success and Related Behaviors
**Principal Investigator(s)** – Dr. Randy DeYoung
**Institution/Organization** – Texas A&M University - Kingsville
**Study Site** – Texas
**QDMA Contribution** – $28,000

**Project Description** – Investigate factors affecting white-tailed deer breeding success and movements to assess potential for harvest-induced microevolution in antler size. Researchers will determine physical factors influencing male breeding success in white-tailed deer and how harvest plans/regulations should be designed to ensure population
sustainability and fitness. Researchers will utilize an existing 6-year (and currently ongoing) database of genetic and physical data to investigate the importance of age, antler size, and body size on buck breeding success, especially how tightly these physical characteristics are linked to breeding success. They'll also integrate movements and activity data into an ongoing study of breeding success to determine the geographic scale over which harvest plans/regulations are likely to be effective.

Project Summary – We used GPS radiocollars to collect data on fine-scale movements of bucks during rut and evaluate male search strategies. We captured 114 bucks aged 1.5-7.5+ years during October 2005 to 2009. We obtained GPS locations every 15-20 min spanning 1 mo prior to peak rut until mid-February, 1 mo after rut. Home ranges averaged 2,962 acres, but varied from 332 to 13,648 acres. Some males had unique movements, such as 2 “home ranges,” or long exploratory trips. Daily movement increased as the rut progressed, but did not differ between daytime and nighttime. We characterized movement patterns during pre-rut, peak-rut, and post-rut for young (<3.5 years) and mature bucks (>= 3.5 years). Mature bucks actively searched for does during pre-rut, but became directed movers during peak-rut and made more straight-line movements. In contrast, young bucks searched in a random fashion throughout. During post-rut, mature bucks reverted to pre-rut behavior and searched randomly. Mature bucks sired 70% of offspring and bred throughout all 3 rut phases. Young bucks collectively sired 30% of offspring, mostly during peak rut, when many does are in estrous at the same time, providing more opportunities for all bucks. We have found no association with body size or antler size and reproductive success; successful bucks did not deviate from the population average. We are working to associate movements and breeding success, but have been hampered by a series of dry summers that resulted in lower fawn survival. We will continue to analyze movement strategies and relate body condition to energy expenditure during the rut.


Lockwood, and K. V. Miller. 2008. Survival and movements of translocated white-tailed deer (Odocoileus virginianus) in south Texas. 62nd Annual Meeting of the Southeastern Association of Fish and Wildlife Agencies. Corpus Christi, TX.


DeYoung, R.W. 2008. Managing genetics of free-ranging deer populations. West Texas Deer Study Group. Albany, TX


Project Title – 
Principal Investigator(s) – 
Institution/Organization – University of Georgia
Study Site – Georgia
QDMA Contribution – $5,000
Project Summary – 
Published –

Project Title – 
Principal Investigator(s) – Dr. Michael Chamberlain
Institution/Organization – Louisiana State University
Study Site – Louisiana
QDMA Contribution – $9,900 from the Louisiana State Chapter and South Louisiana Branch of QDMA
Project Summary –  
Published –

QDMA Branch-supported Projects

---

**Research endowment**

**Southeast Deer Study Group sponsor**

---

**Population Characteristics of a White-tailed Deer Herd in Southern Louisiana**

Dr. Michael Chamberlain
Louisiana State University
Louisiana
$9,900 from the Louisiana State Chapter and South Louisiana Branch of QDMA
Project Description – Study the seasonal movement patterns, habitat utilization and home range of a quality-managed deer herd in southern Louisiana.

Project Summary – White-tailed deer are an important economic and recreational resource in Louisiana. A basic understanding of population dynamics is essential to ensure sound management, but baseline information in Louisiana is lacking. Likewise, the notion of Quality Deer Management (QDM) continues to gain momentum in Louisiana. Our objectives were to evaluate space use, survival, and mortality for a deer herd managed under a QDM regime in south Louisiana. We captured 65 deer in West Baton Rouge and Iberville Parishes during 2007 and 2008, radio-marked 37 males and 11 females, and ear-marked an additional 10 males and 7 females. Home ranges (95%) for adult males during spring, summer, and fall were 153.9, 70.4, and 118.0 ha, respectively and were 119% and 68% larger during spring and fall than summer. Female home ranges were 67.3, 53.9, and 25.2 ha during spring, summer, and fall, respectively. Juvenile (1.5 yr-old) males increased space use 169% in spring (231.6 ha) relative to summer (86.1 ha), and maintained 50% larger home ranges than adults in spring. Survival estimates for adult males during spring, summer, and fall were 100, 95, and 55%, respectively. Mean annual survival for adult males was 53%. No mortalities were observed in spring or summer for 1.5 yr-old males, but ear-tag returns and harvest records indicated 1.5 yr-old males were being harvested at a rate approaching 20%. Mean annual mortality rates from harvest (40%) were greater than for non-harvest sources of mortality (16%). Non-hunting mortality included both natural causes (9%) and deer-vehicle-collisions (9%). We observed smaller home ranges than anticipated or seen previously, suggesting that landowners managing small (<300 ha) tracts of property may be able to practice QDM at scales thought to be ineffective at improving herd dynamics. Due to low non-hunting mortality, young males (≤2.5-yr) are likely to survive to the next age class if protected from harvest, but ultimately have a small chance of reaching maturity (5.5+) because males are generally harvested as they approach the antler restriction in place. Managers should seek to increase fall survival for males if management objectives include increasing the frequency of harvesting males ≥3.5 yrs-old.

Published – Thayer, J. W., M. J. Chamberlain, and S. Durham. 2009. Survival and space use of male white-tailed deer in a bottomland forest of
Project Title – Population Dynamics of Female White-tailed Deer in Delaware
Principal Investigator(s) – Dr. Karl Miller
Institution/Organization – University of Georgia
Study Site – Delaware
QDMA Contribution – Assistance from Delaware Branch of QDMA

Project Description – Document the breeding biology, ecology and movements of female white-tailed deer on a forested QDM-managed property.

Project Summary – We used GPS collars to document the movements of 10 female deer during the breeding season at Chesapeake Farms, Maryland and the Great Cypress Swamp, Delaware, that both support high-density herds with nearly equal sex ratios. Peaks in the percentage of points outside of the seasonal home range that we recorded corresponded to brief (x = 24.0 hrs, SD = 18.2 hrs; range 8-68 hrs) excursions from the seasonal home range. Our analysis also revealed variations in movement patterns of female deer that are unexplained by previously reported factors and are suggestive of endogenous rhythms. Finally, we compared the effects of sampling intensity on home range estimates, and error rates.

Published –


Kolodzinski, J. J. 2008. Movements of female white-tailed deer (Odocoileus virginianus) at Chesapeake Farms, Maryland and The
Project Title – Use of Trail Cameras to Determine Regional Deer Population Characteristics
Principal Investigator(s) – Dr. Vicki Jackson and Dr. Lonnie Hansen
Institution/Organization – University of Central Missouri and Missouri Department of Conservation
Study Site – Missouri
QDMA Contribution – $2,000 from the Missouri State Chapter of QDMA

Project Description – Develop a protocol for collecting information generated by public use of trail cameras. Researchers will “test” volunteers’ abilities to identify the sex, age category and number of antler points from trail camera photos. Researchers will determine the kinds of deer demographic information they can expect to obtain accurately from volunteers. Researchers will collect baseline data as part of an effort to determine long-term effects of antler point restrictions on antler characteristics.

Project Summary – The ability of persons who used trail cameras to identify the sex, number of antler points, and age of deer from photographs was determined. Overall participants correctly identified gender, number of antler points, and age (fawn, yearling, adult) 82 %, 79%, and 67% of the time, respectively. Informative websites that pre-train participants were important and may need to be further developed if the use of this procedure becomes operational.