36th Annual Meeting of the
Southeast Deer Study Group
Challenges in Deer Research and Management in 2013

sedsg.com

February 24-26, 2013
Hyatt Regency Greenville
Greenville, South Carolina

Hosted by the South Carolina Department of Natural Resources

WELCOME

The South Carolina Department of Natural Resources welcomes you to the 36th Annual Southeast Deer Study Group Meeting in Greenville, South Carolina.

We would like to thank the Florida Fish and Wildlife Conservation Commission who hosted last year's meeting, as well as the following sponsors and donors for their generous contributions to this meeting:

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Outdoor Roots

2013 Southeast Deer Study Group Meeting
Hosted by the South Carolina Department of Natural Resources

COMMITTEES

MEETING ORGANIZER
Charles Ruth

DISPLAY and EXHIBITS – Richard Morton (Chair), Will Carlisle, Cory Drennan

FUNDRAISING – Charles Ruth (Chair), Tim Ivey, Derrell Shipes

PAPER/POSTER SELECTION – Charles Ruth (Chair), Tim Ivey, Derrell Shipes

PROGRAM and AGENDA – Jessica Shealy (Chair), Jay Butfiloski

REGISTRATION – Patty Castine (Chair), Jessica Shealy, April Atkinson

SITE COORDINATION – Charles Ruth (Chair)

THE SOUTHEAST DEER STUDY GROUP

The Southeast Deer Study Group was formed as a subcommittee of the Forest Game Committee of the Southeastern Section of The Wildlife Society. The Southeast Deer Study Group Meeting is hosted with the support of the directors of the Southeastern Association of Fish and Wildlife Agencies. The first meeting was held as a joint Northeast-Southeast Meeting at Fort Pickett, Virginia, on September 6-8, 1977. Appreciating the economic, aesthetic, and biological value of the white-tailed deer in the southeastern United States, the desirability of conducting an annual Southeast Deer Study Group Meeting was recognized and urged by the participants. Since February 1979, these meetings have been held annually for the purpose of bringing together managers, researchers, administrators, and users of this vitally important renewable natural resource. A list of the meetings, their location, and theme are listed below. These meetings provide an important forum for the sharing of research results, management strategies, and discussions that can facilitate the timely identification of, and solutions to, problems relative to the management of white-tailed deer in our region. The Deer Subcommittee was given full committee status in November 1985 at the Southeastern Section of The Wildlife Society's annual business meeting. In 2006, Delaware was approved as a member.

TWS PROFESSIONAL DEVELOPMENT

The 36th Annual Southeast Deer Study Group meeting can be counted as contact hours for Professional Development/Certification. Each hour of actual meeting time counts as one credit hour (no social time credit). For more information about professional development, visit The Wildlife Society web site, www.wildlife.org.

QUALIFYING STATEMENT

Abstracts in the Proceedings and presentations at the Southeast Deer Study Group meeting often contain preliminary data and conclusions that have not undergone the peer-review process. This information is provided to foster communication and interaction among researchers, biologists and deer managers. Commercial use of any of the information presented in conjunction with the Southeast Deer Study Group Annual Meeting is prohibited without written consent of the author(s).

Participation of any vendor/donor/exhibitor with the Southeast Deer Study Group Annual Meeting does not constitute nor imply endorsement by the Southeast Deer Study Group, the SE Section of The Wildlife Society Deer Committee, the host state, or meeting participants.

SOUTHEAST DEER STUDY GROUP MEETINGS

Year	Location	Meeting Theme
1977	Fort Pickett, VA	none
1979	Mississippi State, MS	none
1980	Nacogdoches, TX	none
1981	Panama City, FL	Antlerless Deer Harvest Strategies
1982	Charleston, SC	none
1983	Athens, GA	Deer Damage Control
1984	Little Rock, AR	Dog-Deer Relationships in the Southeast
1985	Wilmington, NC	Socio-Economic Considerations in Managing White-tailed Deer
1986	Gatlinburg, TN	Harvest Strategies in Managing White-tailed Deer
1987	Gulf Shores, AL	Management: Past, Present, and Future
1988	Paducah, KY	Now That We Got Em, What Are We Going To Do With Em?
1989	Oklahoma City, OK	Management of Deer on Private Lands
1990	Pipestem, WV	Addressing the Impact of Increasing Deer Populations
1991	Baton Rouge, LA	Antlerless Deer Harvest Strategies: How Well Are They Working?
1992	Annapolis, MD	Deer Versus People
1993	Jackson, MS	Deer Management: How We Affect Public Perception and Reception
1994	Charlottesville, VA	Deer Management in the Year 2004
1995	San Antonio, TX	The Art and Science of Deer Management: Putting the Pieces Together
1996	Orlando, FL	Deer Management Philosophies: Bridging the Gap Between the Public and Biologists.

1997	Charleston, SC	Obstacles to Sound Deer Management
1998	Jekyll Island, GA	Factors Affecting the Future of Deer Hunting
1999	Fayetteville, AR	QDM- What, How, Why, and Where?
2000	Wilmington, NC	Managing Deer in Tomorrow‘s Forests: Reality vs. Illusion
2001	St. Louis, MO	From Lewis & Clark to the New Millennium- The Changing Face of Deer Management
2002	Mobile, AL	Modern Deer Management- Balancing Biology, Politics, and Tradition
2003	Chattanooga, TN	Into the Future of Deer Management: Where Are We Heading?
2004	Lexington, KY	Today‘s Deer Hunting Culture: Asset or Liability?
2005	Shepherdstown, WV	The Impact of Today‘s Choices on Tomorrow‘s Deer Hunters
2006	Baton Rouge, LA	Managing Habitats, Herds, Harvest, and Hunters in the 21st Century Landscape. Will 20th Century Tools Work?
2007	Ocean City, MD	Deer and Their Influence on Ecosystems
2008	Tunica, MS	Recruitment of Deer Biologists and Hunters: Are Hook and Bullet Professionals Vanishing?
2009	Roanoke, VA	Herds Without Hunters: The Future of Deer Management?
2010	San Antonio, TX	QDM to IDM: The Next Step or the Last Straw?
2011	Oklahoma City, OK	All Dressed Up With No Place to Go: The Issue of Access.
2012	Sandestin, FL	Shifting Paradigms: Are Predators Changing the Dynamics of Managing Deer in the Southeast?
2013	Greenville, SC	Challenges in Deer Research and Management in 2013

MEMBERS OF THE DEER COMMITTEE:
SOUTHEASTERN SECTION OF THE WILDLIFE SOCIETY

STATE	NAME	EMPLOYER
Alabama	Chris Cook	Alabama Department of Conservation & Natural Resources
Arkansas	Dick Baxter	Arkansas Game & Fish Commission
	Cory Gray	Arkansas Game & Fish Commission
Delaware	Joe Rogerson	Delaware Division of Fish & Wildlife
Florida	Cory R. Morea	Florida Fish and Wildlife Conservation Commission
	Steve M. Shea	Florida Fish and Wildlife Conservation Commission
Georgia	Charlie Killmaster	Georgia Department of Natural Resources
	Karl V. Miller	University of Georgia
Kentucky	Tina Brunjes	Kentucky Department of Fish & Wildlife Resources
Louisiana	Emile LeBlanc	Louisiana Department of Wildlife & Fisheries
	Scott Durham	Louisiana Department of Wildlife & Fisheries
Maryland	Brian Eyler	Maryland Department of Natural Resources
	George Timko	Maryland Department of Natural Resources
Mississippi	Chad Dacus	Mississippi Department of Wildlife, Fisheries, & Parks
	Steve Demarais (Ch)	Mississippi State University
Missouri	Lonnie Hansen	Missouri Department of Conservation
	Jason Sumners	Missouri Department of Conservation
North Carolina	David Sawyer	North Carolina Wildlife Resources Commission
	Evin Stanford	North Carolina Wildlife Resources Commission
Oklahoma	Kenneth L. Gee	The Noble Foundation
	Erik Bartholomew	Oklahoma Department of Wildlife & Conservation
South Carolina	Charles Ruth	South Carolina Department of Natural Resources
Tennessee	Chuck Yoest	Tennessee Wildlife Resource Agency
	Ben Layton	Tennessee Wildlife Resource Agency
	Craig Harper	University of Tennessee
Texas	Alan Cain	Texas Parks & Wildlife Department
	Bob Zaiglin	Southwest Texas Junior College
Virginia	Matt Knox	Virginia Department of Game & Inland Fisheries
	Nelson Lafon	Virginia Department of Game & Inland Fisheries
West Virginia	Jim Krum	West Virginia Division of Natural Resources

SOUTHEAST DEER STUDY GROUP AWARDS

Career Achievement Award

1996 – Richard F. Harlow
1997 – Larry Marchinton
1998 – Harry Jacobson
1999 – David C. Guynn, Jr.
2000 – Joe Hamilton
2002 – Robert L. Downing
2004 – Charles DeYoung
2005 – Kent E. Kammermeyer
2006 – William E. "Bill" Armstrong
2007 – Jack Gwynn
2008 – (none)
2009 – David E. Samuel
2010 – Bob K. Carroll
2011 – Quality Deer Management Association
2012 – Bob Zaiglin

Outstanding Student Oral Presentation Award

1996 – Billy C. Lambert, Jr. (Texas Tech University)
1997 – Jennifer A. Schwartz (University of Georgia)
1998 – Karen Dasher (University of Georgia)
1999 – Roel R. Lopez (Texas A&M University)
2000 – Karen Dasher (University of Georgia)
2001 – Roel R. Lopez (Texas A&M University)
2002 – Randy DeYoung (Mississippi State University)
2003 – Bronson Strickland (Mississippi State University)
2004 – Randy DeYoung (Mississippi State University)
2005 – Eric Long (Penn State University)
2006 – Gino D'Angelo (University of Georgia)
2007 – Sharon A. Valitzski (University of Georgia)
2008 – Cory L. Van Gilder (University of Georgia)
2009 – Michelle Rosen (University of Tennessee)
2010 – Jeremy Flinn (Mississippi State University)
2011 – Kamen Campbell (Mississippi State University)
2012 – Brad Cohen (University of Georgia)

Outstanding Student Poster Presentation Award

2010 – Emily Flinn (Mississippi State University)
2011 – Melissa Miller (University of Delaware)
2012 – Brandi Crider (Texas A&M University)

SCHEDULE OF EVENTS

Sunday, February 24, 2013

1:00 p.m. – 6:00 p.m.	Registration	Prefunction Area
1:00 p.m. – 6:00 p.m.	Poster & Vendor Set-up	Continental Ballroom
3:00 p.m.	Deer Committee Meeting	Regency D, E
6:00 p.m. – 9:00 p.m.	Social/Welcome Reception	Regency Ballroom A, B, B2, C, C2

Monday, February 25, 2013

7:00 a.m. – 12:00 p.m.	Registration	Prefunction Area
7:00 a.m. – 8:00 a.m.	Poster & Vendor Set-up	Continental Ballroom
8:00 a.m. – 5:00 p.m.	Posters/Exhibitors/Vendors	Continental Ballroom
8:00 a.m. – 9:55 a.m.	Technical Session I	Regency Ballroom A, B, B2, C, C2
9:55 a.m. – 10:15 a.m.	Break	Continental Ballroom
10:15 a.m. – 10:25 a.m.	Announcements/Door Prizes	Regency Ballroom A, B, B2, C, C2
10:25 a.m. – 11:55 p.m.	Technical Session II	Regency Ballroom A, B, B2, C, C2
11:55 p.m. – 1:30 p.m.	Lunch	On Your Own
1:30 p.m. – 1:40 p.m.	Announcements/Door Prizes	Regency Ballroom A, B, B2, C, C2
1:40 p.m. – 3:00 p.m.	Technical Session III	Regency Ballroom A, B, B2, C, C2
3:00 p.m. – 3:20 p.m.	Break	Continental Ballroom
3:20 p.m. – 3:30 p.m.	Announcements/Door Prizes	Regency Ballroom A, B, B2, C, C2
3:30 p.m. – 5:00 p.m.	Technical Session IV	Regency Ballroom A, B, B2, C, C2
5:00 p.m.	Dinner	On Your Own
6:30 p.m. – 7:00 p.m.	Social	Regency Ballroom A, B, B2, C, C2
7:00 p.m.	Shoot From The Hip	Regency Ballroom A, B, B2, C, C2

Tuesday, February 26, 2013

8:00 a.m. – 5:00 p.m.	Posters/Exhibitors/Vendors	Continental Ballroom
8:00 a.m. – 8:10 a.m.	Announcements/Door Prizes	Regency Ballroom A, B, B2, C, C2
8:15 a.m. – 10:05 a.m.	Technical Session V	Regency Ballroom A, B, B2, C, C2
10:05 a.m. – 10:25 a.m.	Break	Continental Ballroom
10:25 a.m. – 10:35 a.m.	Announcements/Door Prizes	Regency Ballroom A, B, B2, C, C2
10:35 a.m. – 11:55 p.m.	Technical Session VI	Regency Ballroom A, B, B2, C, C2
11:55 p.m. – 1:30 p.m.	Lunch	On Your Own
1:30 p.m. – 1:40 p.m.	Announcements/Door Prizes	Regency Ballroom A, B, B2, C, C2
1:40 p.m. – 3:00 p.m.	Technical Session VII	Regency Ballroom A, B, B2, C, C2
3:00 p.m. – 3:20 p.m.	Break	Continental Ballroom
3:20 p.m. – 3:30 p.m.	Announcements/Door Prizes	Regency Ballroom A, B, B2, C, C2
3:30 p.m. – 4:10 p.m.	Technical Session VIII	Regency Ballroom A, B, B2, C, C2
4:20 p.m. – 5:00 p.m.	Business Meeting	Regency Ballroom A, B, B2, C, C2
6:15 p.m. – 7:00 p.m.	Social	Prefunction Area
7:00 p.m.	Awards Banquet	Regency Ballroom

Wednesday, February 27, 2013

Check-out. No events or exhibits.

MONDAY, FEBRUARY 25, 2013

TECHNICAL SESSION I
REGENCY BALLROOM A, B, B2, C, C2
MODERATOR: CHARLES RUTH – SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

8:00 **WELCOME**
Emily Cope, Deputy Director of Wildlife & Freshwater Fisheries – South Carolina Department of Natural Resources

8:15 * **CHARACTERISTICS OF FAWN BIRTH AND BED-SITES**
Asa S. Wilson, Charles A. DeYoung, David G. Hewitt, Timothy E. Fulbright, Kim N. Echols – Caesar Kleberg Wildlife Research Institute; Don A Draeger – Comanche Ranch

8:35 * **OBSERVATIONS OF REPRODUCTIVE SUCCESS IN RELATION TO HERD DEMOGRAPHICS**
Timothy J. Neuman, Peter Acker, Chad Newbolt, Stephen Ditchkoff – Auburn University

8:55 * **THE EFFECT OF MATERNAL INVESTMENT ON SUBSEQUENT MATERNAL CONDITION AND REPRODUCTIVE PATTERNS**
Jake Oates, Steve Demarais, Bronson Strickland – Mississippi State University; William McKinley – Mississippi Department of Wildlife, Fisheries, & Parks

9:15 * **BED-SITE SELECTION BY WHITE-TAILED DEER FAWNS IN A LONGLEAF PINE ECOSYSTEM**
Melinda A. Nelson, Michael J. Cherry, Robert J. Warren – University of Georgia; L. Mike Conner – The Joseph W. Jones Ecological Research Center

9:35 **CHARACTERISTICS OF WHITE-TAILED DEER PARTURITION AND POST-PARTUM BEHAVIOR: IMPLICATIONS FOR FAWN CAPTURE**
John C. Kilgo, Mark Vukovich – USDA Forest Service Southern Research Station; H. Scott Ray – USDA Forest Service; Charles Ruth – South Carolina Department of Natural Resources

9:55 **BREAK**

TECHNICAL SESSION II
REGENCY BALLROOM A, B, B2, C, C2
MODERATOR: DERRELL SHIPES – SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

10:15 **ANNOUNCEMENTS & DOOR PRIZES**

10:25 **WHITE-TAILED DEER BUCK BREEDING STRATEGIES: ROLE OF FAT RESERVES**
David G. Hewitt, Aaron M. Foley, Randy W. DeYoung – Caesar Kleberg Wildlife Research Institute; Mickey W. Hellickson – Orion Wildlife Management Services;

* Student Presenter

Karl V. Miller – University of Georgia; Ken Gee – Samuel Roberts Noble Foundation; Mitch Lockwood – Texas Parks and Wildlife Department

10:45 * **FACTORS INFLUENCING REPRODUCTIVE SUCCESS OF MALE WHITE-TAILED DEER**
Peter K. Acker, Stephen S. Ditchkoff, Chad H. Newbolt, Todd D. Steury, Timothy J. Neuman – Auburn University

11:05 * **BREEDING SEASON MOVEMENTS OF MALE WHITE-TAILED DEER: DO YEARLINGS EMPLOY AN ALTERNATIVE STRATEGY?**
Clint McCoy, Gabriel R. Karns, Stephen S. Ditchkoff, Todd D. Steury – Auburn University; Bret A. Collier – Institute of Renewable Natural Resources; Joshua B. Raglin – Norfolk Southern Railway; Charles Ruth – South Carolina Department of Natural Resources

11:35 * **RUTTING BEHAVIOR OF WHITE-TAILED DEER IN MIDDLE TENNESSEE**
Peyton S. Basinger, Craig Harper, Joe Clark, Lisa Muller – University of Tennessee

11:55 **LUNCH:** ON YOUR OWN

TECHNICAL SESSION III
REGENCY BALLROOM A, B, B2, C, C2
MODERATOR: JOE HAMILTON – QUALITY DEER MANAGEMENT ASSOCIATION

1:30 **ANNOUNCEMENTS & DOOR PRIZES**

1:40 * **PATTERNS OF ANTLER GROWTH IN WHITE-TAILED DEER**
Dawson W. Lilly, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols, David B. Wester – Caesar Kleberg Wildlife Research Institute; Don A Draeger – Comanche Ranch

2:00 * **PREVALENCE OF *TRUEPERELLA PYOGENES* IN GEORGIA'S DEER HERD AS A CAUSE OF INTRACRANIAL ABSCESSATION**
Emily H. Belser, Bradley S. Cohen, Karl V. Miller – University of Georgia; Shamus P. Keeler – Southeastern Cooperative Wildlife Disease Study; Kevin M. Keel – UC Davis School of Veterinary Medicine; Charlie Killmaster, John Bowers – Georgia Department of Natural Resources

2:20 * **TRAUMA-INDUCED MALFORMED ANTLER DEVELOPMENT IN MALE WHITE-TAILED DEER**
Gabriel R. Karns, Stephen S. Ditchkoff – Auburn University

2:40 **ESTIMATING BOONE AND CROCKETT SCORES FOR WHITE-TAILED DEER FROM SIMPLE ANTLER MEASUREMENTS**
Bronson K. Strickland, Stephan Demarais, Harry Jacobson – Mississippi State University; Chad M. Dacus – Mississippi Department of Wildlife, Fisheries, and Parks; Jocephus R. Dillard – U.S. Forestry Service; Phillip D. Jones – University of Wisconsin-Madison

* Student Presenter

3:00 **BREAK**

TECHNICAL SESSION IV **REGENCY BALLROOM A, B, B2, C, C2** **MODERATOR: STEVE SHEA – FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION**

3:20 **ANNOUNCEMENTS & DOOR PRIZES**

3:30 * **VARIABLE EFFECTIVENESS OF COYOTE REMOVAL PROGRAMS AT INCREASING FAWN RECRUITMENT IN GEORGIA**
William D. Gulsby, Karl V. Miller – University of Georgia; James D. Kelly – Florida Fish and Wildlife Conservation Commission; John W. Bowers – Georgia Department of Natural Resources

3:50 **PRESENCE OF WILD PIGS AFFECTS OCCUPANCY AND DETECTION RATES OF WHITE-TAILED DEER**
Chad H. Newbolt, Stephen S. Ditchkoff – Auburn University; Robert W. Holtfreter – Connors State College

4:10 * **COYOTE DIETARY SHIFTS RELATIVE TO WHITE-TAILED DEER ABUNDANCE**
Kelsey L. Turner, Michael J. Cherry, Robert J. Warren – University of Georgia; M. Brent Howze – Georgia Department of Natural Resources; L. Mike Conner – Joseph W. Jones Ecological Research Center

4:20 **DEVELOPING A COOPERATIVE FRAMEWORK TO STUDY INFLUENCES OF COYOTES ON WHITE-TAILED DEER POPULATIONS IN THE SOUTHEASTERN UNITED STATES**
Michael J. Chamberlain, William D. Gulsby, Karl V. Miller – University of Georgia

4:40 **CAPTIVE WHITETAIL INDUSTRY – CURRENT STATUS AND GROWING THREAT**
Kip P. Adams, Brian Murphy, Matt Ross – Quality Deer Management Association (QDMA)

5:00 **DINNER:** On Your Own

SHOOT FROM THE HIP SESSION **REGENCY BALLROOM A, B, B2, C, C2** **MODERATOR: JOHN KILGO – USDA FOREST SERVICE SOUTHERN RESEARCH STATION**

6:30 **SOCIAL**

7:00 **CHALLENGES IN DEER RESEARCH AND MANAGEMENT IN 2013**
Brian Murphy – Quality Deer Management Association
David Guynn – Clemson University
Steve Ditchkoff – Auburn University
Nils Peterson – North Carolina State University

* Student Presenter

TUESDAY, FEBRUARY 26, 2013

TECHNICAL SESSION V
REGENCY BALLROOM A, B, B2, C, C2
MODERATOR: TIM IVEY– SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

8:15 **ANNOUNCEMENTS & DOOR PRIZES**

8:25 * **VARIABILITY IN FIRE PRESCRIPTIONS: WILL ANY PRESCRIPTIONS DO?**
Marcus A. Lashley, M. Colter Chitwood, Christopher S DePerno, Christopher E. Moorman – North Carolina State University; Craig A. Harper – University of Tennessee

8:45 * **ESTIMATING A NUTRITIONAL CARRYING CAPACITY FOR WHITE-TAILED DEER WITHIN 9 PRIMARY HABITATS ACROSS LOUISIANA**
Levi B. Horrell, Michael J. Chamberlain – University of Georgia; Scott Durham – Louisiana Department of Wildlife and Fisheries

9:05 **DEER DENSITY AND SUPPLEMENTAL FEED EFFECTS ON WHITE-TAILED DEER SPACE USE**
Kim N. Echols, David G. Hewitt, Charles A. DeYoung, Timothy E. Fulbright – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

9:25 * **INFLUENCE OF WHITE-TAILED DEER DENSITY AND NUTRITIONAL SUPPLEMENTATION ON A SOUTH TEXAS VEGETATION COMMUNITY**
Whitney J. Priesmeyer, Timothy E. Fulbright, David D. Hewitt, Charles A. DeYoung, Kim N. Echols – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

9:45 **EFFECTS OF NUTRITION AND DEER DENSITY ON FAWN RECRUITMENT IN SEMI-ARID RANGELANDS**
Randy W. DeYoung, Aaron M. Foley, David G. Hewitt, Tim E. Fulbright, Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

10:05 **BREAK**

TECHNICAL SESSION VI
REGENCY BALLROOM A, B, B2, C, C2
MODERATOR: BOB ZAIGLIN – SOUTHWEST TEXAS JUNIOR COLLEGE

10:25 **ANNOUNCEMENTS & DOOR PRIZES**

10:35 * **SPATIAL ASSESSMENT OF DEER BROWSE AND ITS EFFECTS ON A FOREST COMMUNITY IN SOUTHEASTERN TENNESSEE**
Meg M. Armistead, Jonathan Evans –The University of the South

* Student Presenter

10:55 * **EFFECT OF REDUCING CAMERA SURVEY EFFORTS ON ACCURACY OF DENSITY ESTIMATION FOR WHITE-TAILED DEER**
Allison C. Keever, Stephen S. Ditchkoff, Peter K. Acker, Chad H. Newbolt – Auburn University; James B. Grand, Conor P. McGowan – U.S.G.S. Alabama Cooperative Fish and Wildlife Research Unit, Auburn University

11:15 * **COMPARISON OF DROP NETS VERSUS HELICOPTER NET-GUN CAPTURE FOR WHITE-TAILED DEER IN AN AREA WITH VARIOUS LAND USES**
Jared T. Beaver, Roel Lopez, Chad Grantham, Brian Pierce – Texas A&M University; Lucas Cooksey – Joint Base San Antionio-Fort Sam Houston/Camp Bullis

11:35 * **TEMPERATURE OR LIGHT ACTIVATED VAGINAL IMPLANT TRANSMITTERS: PREDICTING IMPROVED PERFORMANCE ACROSS A CLIMATIC RANGE**
Michael J. Cherry, Melinda A. Nelson, Robert J. Warren – University of Georgia; L. Mike Conner – Joseph W. Jones Ecological Research Center

11:55 **LUNCH:** On Your Own

TECHNICAL SESSION VII
REGENCY BALLROOM A, B, B2, C, C2
MODERATOR: CHARLIE KILLMASTER – GEORGIA DEPARTMENT OF NATURAL RESOURCES

1:30 **ANNOUNCEMENTS & DOOR PRIZES**

1:40 **SPOTLIGHT SURVEYS FOR WHITE-TAILED DEER: MONITORING PANACEA OR EXERCISE IN FUTILITY?**
Stephen S. Ditchkoff – Auburn University; Bret A. Collier – Texas A&M University; Charles R. Ruth – South Carolina Department of Natural Resources; Joshua B. Raglin – Norfolk Southern Railway

2:00 **EXURBAN DEVELOPMENT ASSOCIATED WITH A NATIONAL WILDLIFE REFUGE – IMPLICATIONS FOR DEER HUNTING AND MANAGEMENT**
Matthew D. Ross – Quality Deer Management Association (QDMA); Marrett Grund – Minnesota Department of Natural Resources; Larry Williams – U.S. Fish and Wildlife Service; Levi Shinn, Joel W. Helmer, PhD – Concordia University; Anne Sittauer – Sherburne National Wildlife Refuge

2:20 * **DOG HUNTING AND IDENTITY IN COASTAL NORTH CAROLINA**
M. Colter Chitwood, M. Nils Peterson, Christopher S. DePerno, Marcus A. Lashley, Christopher E. Moorman – North Carolina State University

2:40 **DEER MOVEMENTS BEFORE, DURING, AND AFTER A FLOODING EVENT IN THE MISSISSIPPI RIVER DELTA**
Don White, Jr., Christopher L. Watt – University of Arkansas; M. Cory Gray, Brad Miller – Arkansas Game and Fish Commission

3:00 **BREAK**

* Student Presenter

TECHNICAL SESSION VIII
REGENCY BALLROOM A, B, B2, C, C2
MODERATOR: CHARLES RUTH – SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

3:20 **ANNOUNCEMENTS & DOOR PRIZES**

3:30 **EFFECTS OF POPULATION STRUCTURE AND DISPERSAL ON MANAGEMENT EFFORTS FOR CHRONIC WASTING DISEASE IN WEST VIRGINIA**
Randy W. DeYoung, Aaron M. Foley, David G. Hewitt – Caesar Kleberg Wildlife Research Institute; James M. Crum – West Virginia Division of Natural Resources; Kip P. Adams – Quality Deer Management Association

3:50 **TRACKING A BOONER UNDER THE BAYOU STATE MOON**
David W. Moreland – Outdoor Roots

4:20 **BUSINESS MEETING**

6:15 **SOCIAL**

7:00 **BANQUET**

* Student Presenter

POSTER SESSION
CONTINENTAL BALLROOM

* **A SURVEY OF THE BACTERIAL FAUNA ASSOCIATED WITH THE FOREHEAD, LINGUAL AND NASAL AREAS OF WHITE-TAILED DEER**
Emily H. Belser, Bradley S. Cohen, Scott M. Russell, Karl V. Miller – University of Georgia; Charlie Killmaster, John Bowers – Georgia Department of Natural Resources

* **A SPATIALLY AND TEMPORALLY CONCURRENT COMPARISON OF POPULAR DEER POPULATION ESTIMATORS**
Jacob M. Haus, Jacob L. Bowman – University of Delaware; Brian Eyler – Maryland DNR

* **FIXED KERNEL HOME RANGE ESTIMATES OF URBAN DEER IN FAIR OAKS RANCH, TEXAS**
Kara B. Campbell, Charles A. DeYoung, Randall W. DeYoung, David G. Hewitt – Texas A&M University; Jessica Alderson, Ryan Schoeneberg, Richard Heilbrun – Texas Parks and Wildlife Department

* **EFFECTS OF PREY SPECIES ABUNDANCE ON DIET OF COYOTES IN WESTERN VIRGINIA**
David M. Montague, Marcella J. Kelly – Virginia Tech

* **COST EFFICIENCY AND EFFECTIVENESS OF VARIOUS BAITS TO ESTIMATE WHITE-TAILED DEER DENSITY USING CAMERA TRAPS**
Michael T. Biggerstaff, Marcus A. Lashley, M. Colter Chitwood, Christopher E. Moorman – North Carolina State University

* **PATTERNS OF SUPPLEMENTAL FEED USE BY WHITE-TAILED DEER**
Dawson W. Lilly, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols, David B. Wester – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

* **FORAGING ECOLOGY AND POPULATION PARAMETERS OF UNMANAGED WHITE-TAILED DEER IN SOUTHERN TEXAS**
Kory R. Gann, David G. Hewitt, Timothy E. Fulbright, J. Alfonso Ortega-S., Thomas W. Boutton- Texas A&M University; Alfonso Ortega-S., Jr. – East Wildlife Foundation

* **RESPONSE OF TWO PREFERRED BROWSE SPECIES TO INCREASING WHITE-TAILED DEER DENSITY AND NUTRITION ENHANCEMENT**
Whitney J. Priesmeyer, Timothy E. Fulbright, Eric D. Grahmann, David D. Hewitt, Charles A. DeYoung, Kim N. Echols – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

* **SEASONAL SPATIAL ECOLOGY OF MATURE MALE WHITE-TAILED DEER IN NORTH-CENTRAL PENNSYLVANIA: PRELIMINARY RESULTS**
Andrew K. Olson, William D. Gulsby, Karl V. Miller, David A. Osborn, Bradley S. Cohen – University of Georgia

* Student Presenter

* **PRACTICALITY OF BUD CAPS AND SEEDLING GUARDING TO MITIGATE WHITE-TAILED DEER BROWSE DAMAGE**

Jordan S. Nanney, Marcus A. Lashley, M. Colter Chitwood, Christopher E. Moorman – North Carolina State University

* Student Presenter

Monday, 8:15 am

Characteristics of Fawn Birth and Bed-Sites

Asa S. Wilson, Charles A. DeYoung, David G. Hewitt, Timothy E. Fulbright, Kim N. Echols – Caesar Kleberg Wildlife Research Institute; Don A Draeger – Comanche Ranch

Young white-tailed deer (*Odocoileus virginianus*) fawns are "hiders" and may select concealed bed sites. Our objective was to determine characteristics of birth and bed-sites so managers could increase fawn habitat. Our study was replicated on 2 ranches in south Texas with 2 low-density (0.05 deer/ac) unfed, 2 high-density (0.2 deer/ac) fed, and 2 high-density (0.2 deer/ac) unfed enclosures. Each enclosure was 200 ac in size. Fawns were captured with the aid of vaginal implant transmitters expelled by does giving birth, fitted with expandable mortality collars, and monitored daily. We captured 19 and 27 fawns in summers 2011 and 2012, respectively. Bed-site characteristics were evaluated at birth-sites, as well as fawns 7 and 14 days of age. We sampled 146 sites across both years. Sampling included canopy cover, daytime site temperature, hiding cover (7.87 X 15.75 in. board with 50-1.57 X 1.57 in. squares), and distance to the nearest shrub in each cardinal direction. A random site was paired with each bed-site sampled. Hiding cover averaged 81% (3.7 SE) for bedsites compared to 65% (5.4 SE) for random sites. Site temperature and distance to nearest shrub averaged 91 degrees F (1.5 SE) and 3.1 ft (0.4 SE) for bedsites, respectively. Corresponding values for random sites averaged 96 degrees F (1.9 SE) and 4.3 ft (0.7 SE), respectively. Our results suggest fawns select areas with high hiding cover and near a shrub, which may make them less conspicuous to predators and protect them from high temperatures common in southern Texas during summer.

***Student Presenter**

NOTES

Monday, 8:35 am

Observations of Reproductive Success in Relation to Herd Demographics

Timothy J. Neuman, Peter Acker, Chad Newbolt, Stephen Ditchkoff – Auburn University

Mate choice based on age is poorly understood among Cervids. We used genetic-based parentage assignments from a white-tailed deer (*Odocoileus virginianus*) population to evaluate age differences between breeding pairs under differing herd demographics. Our study population consisted of native deer enclosed in a 430-acre captive facility in east-central Alabama. Tissue samples were collected beginning in 2007, and microsatellite DNA analysis was used to build a pedigree. Analysis of parentage revealed 37 breeding pairs with 95% confidence. From 2008-09, the population had a 1:2 buck:doe ratio with an immature male age structure ($\bar{x}$ = 2.28 years) which was typical of a heavily hunted population. By 2012, the population had a 1.5:1 buck:doe ratio with a more mature male age structure ($\bar{x}$ = 3.69 years) which was typical of a herd managed for quality. We combined years into 2 periods by male age structure (2007-2009, 'immature'; 2010-2012, 'mature') and found that mean age difference (doe age minus buck age) within breeding pairs was dissimilar ($P = 0.04$) when compared between the two periods. Chi-square tests indicated mating with respect to age was not random ($P < 0.05$). Mean conception dates occurred one week sooner when more mature males were present. The effects of age differences between breeding individuals, combined with earlier conception, illustrate how changes in population demographics can affect the timing of the breeding season. The result is less late born fawns with more mature males present, and a compression of gestation dates which could help mitigate impacts of neonatal predation.

***Student Presenter**

NOTES

Monday, 8:55 am

The Effect of Maternal Investment on Subsequent Maternal Condition and Reproductive Patterns

Jake Oates, Steve Demarais, Bronson Strickland – Mississippi State University; William McKinley – Mississippi Department of Wildlife, Fisheries, & Parks

Pregnancy and lactation are the most energetically demanding life events for female white-tailed deer. However, there are conflicting results concerning maternal investment in reproduction and its effect on female body condition and subsequent reproductive patterns. This study evaluated the effect of reproduction on captive white-tailed deer provided a full ration 20% protein diet. We evaluated litter size and composition, total birth weight, and cumulative investment in lactation per day to determine their effects on subsequent birth weights, litter composition, parturition dates, and percent change in body mass. Percent change in body mass was used as a surrogate for reproduction's effect on body condition. Primiparity occurred at 2 years of age, with an average fecundity of 1.53 fawns per doe. Females $\geq$ 3 years old were analyzed together and averaged 1.92 fawns per doe. Even with unlimited nutrition available, white-tailed deer females still incurred a cost of maternal investment. In primiparous individuals, subsequent weight gain was affected by number of fawns birthed and total fawn birth weight. In mature females, despite no change in body mass due to reproductive patterns, recovery from pregnancy and lactation from raising 2 fawns until weaning compared to 2 fawns removed at birth caused an 8 day delay in parturition dates the following year. We expect that maternal investment impacts will be amplified in most wild populations where nutrition is limited.

***Student Presenter**

NOTES

Monday, 9:15 am

Bed-Site Selection by White-Tailed Deer Fawns in a Longleaf Pine Ecosystem

Melinda A. Nelson, Michael J. Cherry, Robert J. Warren – University of Georgia; L. Mike Conner – The Joseph W. Jones Ecological Research Center

Neonatal white-tailed deer (*Odocoileus virginianus*) exhibit a hiding strategy during the first few weeks of their life where they rely on vegetation characteristics at selected bed-sites to influence thermal protection and concealment from predators. Although previous studies have described fawn bed-site selection in the mid-western United States, there has only been one prior study investigating bed-site selection in the Southeast. During the summer of 2012 we identified and sampled fawn bed-sites at the Joseph W. Jones Ecological Research Center at Ichauway, which is a 29,000 acre longleaf pine plantation. We radio-collared 12 newborn fawns captured through the aid of vaginal implant transmitters in pregnant females and opportunistic sightings. Using radio-telemetry and visual observation from a distance, we located fawn bed-sites daily beginning on the day after capture until each fawn was about 2 weeks old. We then returned at a later date and measured microhabitat variables at all bed-sites and paired random sites generated within individual fawn home ranges. We then used logistic regression and an information theoretic approach to preliminarily assess the influence of these variables on the probability of a site being used as a bed-site. Of these variables, basal area, canopy closure, vertical height of vegetation, and percent cover up to 3.3 feet were positively related to probability of use as a bed-site. For further analyses, we plan to include landscape attributes as predictor variables. The results of this analysis will provide the basis for habitat management recommendations designed to increase fawn recruitment in heterogeneous landscapes.

***Student Presenter**

NOTES

Monday, 9:35 am

Characteristics of White-tailed Deer Parturition and Post-partum Behavior: Implications for Fawn Capture

John C. Kilgo, Mark Vukovich – USDA Forest Service Southern Research Station; H. Scott Ray – USDA Forest Service; Charles Ruth – South Carolina Department of Natural Resources

Research involving the capture of fawns, particularly as aided by vaginal implant transmitters (VITs), has expanded as concerns over reduced recruitment in some populations have grown. In this context, information on characteristics of parturition and post-partum behavior can be helpful. From 2006-2012, we implanted 179 adult does with VITs at the U. S. Department of Energy's Savannah River Site in South Carolina. After subtracting capture-related deaths, deer that died of other causes prior to parturition, premature expulsion of VITs, failed VITs, and deer with which we lost contact, our sample of monitored does entering the parturition period was 147. We monitored VITs every eight hours throughout the fawning season and initiated fawn searches upon detection of expelled VITs. Four does (3%) were not pregnant. We captured at least one fawn from 132 of 143 (92%) parturition events. Mean date of parturition was 17 May and ranged from 1 Apr to 12 Aug, with 71% occurring between 29 Apr and 9 Jun. Parturition was concentrated during afternoon and early evening hours, with 63% occurring between 13:00 and 21:59. Distance moved by fawns from the birth site in their first 10 hours generally increased as a function of time since parturition: 90% of fawns located within three hours post-partum were at their birth sites compared with 0% of fawns located 10 hours post-partum. Thus, rapid detection of parturition and initiation of search efforts is essential. Other factors potentially influencing distance moved by fawns (e.g., size, sex) will be discussed.

NOTES

Monday, 10:25 am

White-Tailed Deer Buck Breeding Strategies: Role of Fat Reserves

David G. Hewitt, Aaron M. Foley, Randy W. DeYoung – Caesar Kleberg Wildlife Research Institute; Mickey W. Hellickson – Orion Wildlife Management Services; Karl V. Miller – University of Georgia; Ken Gee – Samuel Roberts Noble Foundation; Mitch Lockwood – Texas Parks and Wildlife Department

In most portions of the species' range, male white-tailed deer accumulate large fat reserves during autumn which they use during the rut. Because movement rate increases during rut, fat may be used to fuel breeding movements. Alternatively, males may use fat reserves to reduce time spent feeding, thereby increasing time available to find, court, and breed females. To understand the role of fat reserves in white-tailed deer breeding, we used movement rates of male deer fitted with GPS collars in southern Texas to calculate energy necessary for rut-based movement. Using rump-fat thickness in mature bucks during a year with high precipitation and good forage, we determined male deer have 25% body fat which, for a buck weighing 175 pounds, translates to 44 pounds of body fat pre-rut. Increased movement during rut requires 173 kcal/day of energy in addition to the 4,280 kcal/day normally expended. Losing 20% body mass during rut releases >110,000 kcal (depending on percent body fat post-rut), which during a six-week rut provides >2,640 kcal/day. Most energy derived from body reserves during rut appears to be used to reduce feeding time, thereby enabling males to devote more time to breeding. Energy from body reserves reduces a male deer's foraging time by >59% over a six-week rut, or more if reserves are used primarily during 2-3 weeks of peak rut. We predict male deer that acquire large fat reserves before rut are more likely to breed because those reserves relieve foraging constraints for a longer period.

NOTES

Monday, 10:45 am

Factors Influencing Reproductive Success of Male White-Tailed Deer

Peter K. Acker, Stephen S. Ditchkoff, Chad H. Newbolt, Todd D. Steury, Timothy J. Neuman – Auburn University

White-tailed deer (*Odocoileus virginianus*) herds have a social order of male dominance, which are theorized to be associated with reproductive success, and tradition holds that more dominant males are more successful breeders. However, recent research has begun to shed light on the fact that younger, smaller, subdominant males also participate in breeding to a greater degree than was originally believed. Through genetic herd reconstruction, we examined factors that influenced reproduction in a white-tailed deer herd enclosed in a 430-acre high fence research facility. Between August 2007 and September 2012, we captured a total of 190 individual deer and used microsatellite analysis to assign paternities. We assigned 89 paternities at the 95% confidence level and an additional 30 at 80% confidence with program CERVUS. Using a Poisson regression model, we found that antler size, antler characteristics, and body size characteristics were all associated positively with male breeding success; however, certain body measurements proved to be better predictors of breeding success than the other factors tested. We also found that impact of age on male breeding success was a factor of male age structure, where the relative importance of an increase in sire age decreased as male age structure increased. These data illustrate a multitude of variables that can influence male breeding success, and broaden our comprehension of the species' reproductive ecology.

***Student Presenter**

NOTES

Monday, 11:05 am

Breeding Season Movements of Male White-Tailed Deer: Do Yearlings Employ an Alternative Strategy?

Clint McCoy, Gabriel R. Karns, Stephen S. Ditchkoff, Todd D. Steury – Auburn University; Bret A. Collier – Texas A&M University; Joshua B. Raglin – Norfolk Southern Railway; Charles Ruth – South Carolina Department of Natural Resources

With the advent of GPS collars to track fine-scale movements of white-tailed deer, our knowledge of movement characteristics continues to improve. However, our understanding of strategies employed by males during the breeding season is still lacking. Though they should be excluded from breeding, research has shown that yearlings successfully breed even in the presence of mature males, hinting that yearlings may employ an alternative breeding strategy. In order to address this question, we captured and GPS-collared 37 males across 3 years in the Lowcountry of South Carolina. Collars recorded locations every 30 minutes from late August through November to encompass the entire breeding season. We offer a new, less abstract technique (compared to more commonly used fractal dimensions) to describe movement paths that incorporate the total length of a 24-hr path and the amount of area covered, resulting in a measure of meters/hectare. A large value for this metric indicates a highly focused search, where individuals cover a relatively small area for a given path length, whereas smaller values would signify an animal covering a larger area less intensively. Using this metric, we found that yearlings displayed greater search intensity values than adult males throughout all phases of the breeding season. Though age classes were similar in regards to movement rate in each phase of the breeding season, it appears that yearlings concentrate movements within smaller areas than adult males. We hypothesize that yearlings may employ somewhat of a sneaking strategy, where they remain in close contact with female groups.

***Student Presenter**

NOTES

Monday, 11:35 am

Rutting Behavior of White-Tailed Deer in Middle Tennessee

Peyton S. Basinger, Craig Harper, Joe Clark, Lisa Muller – University of Tennessee;

It is important to look at movements of bucks and does during the rut to further our understanding of breeding ecology. We equipped 20 white-tailed deer (10 does, 10 mature bucks) with GPS collars programmed to record locations every 3 hours in middle Tennessee (2010-2011). We calculated fixed kernel home ranges (50% and 90%) for each deer during the fall/winter season. We partitioned the breeding season into pre- (10/30-11/17), peak- (11/18-12/6), and post-rut (12/7-12/25) periods based on conception dates from a special spring doe harvest (2011). Excursions were defined as 2 consecutive locations outside of the 90% home range extending beyond a mean 3-hour movement. During the rut, 4 bucks totaled 7 excursions during pre- (1), peak- (4), and post-rut (2) periods and 6 does totaled 11 excursions during pre-(2), peak- (5), and post-rut (4) periods. One adjacent buck and doe interacted at least 12 hrs during the peak-rut at a site beyond their home ranges. Compared to fall/winter averages, overall movement rates for bucks changed during pre- (+12%), peak- (+44%), and post-rut (+33%) while doe movement rates changed during pre- (+10%), peak- (+2%), and post-rut (-6%). Buck use of core areas averaged 51% during pre-rut, dropped to 32% during the peak-rut, and rose back to 59% during the post-rut. Doe use of core areas remained constant (pre- (62%), peak-(64%), and post-rut (63%)). Our data provides insight on buck and doe behavior and interactions during the rut which is beneficial to managers and hunters.

***Student Presenter**

NOTES

Monday, 1:40 pm

Patterns of Antler Growth in White-Tailed Deer

Dawson W. Lilly, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols, David B. Wester – Caesar Kleberg Wildlife Research Institute; Don A Draeger – Comanche Ranch

Effects of nutritional quality and deer density may influence antler growth in white-tailed deer, particularly during periods of inadequate rainfall and poor range conditions. In semi-arid regions of southern Texas, nutrition is likely a limiting factor on antler size. Our objective was to evaluate effects of nutrition and deer density on antler growth in mature bucks. Antler growth was evaluated between 2005 and 2011 on 2 ranches in south Texas using 12, 200-acre high-fenced enclosures. One enclosure per ranch had a low (32 deer/sq. mi), a medium (80 deer/sq. mi), and a high (128 deer/sq. mi) target deer density in which natural forage served as a treatment and remaining enclosures of corresponding target density included a pelleted feed treatment. Gross Boone and Crockett antler score was measured for captured deer or estimated from photographs for deer not captured using the BuckScore program. Preliminary analyses of antler size of mature bucks suggested that mean antler size in enclosures with pelleted feed was approximately 18 inches greater than enclosures with only natural forage ($P=0.0277$). Mean antler size tended to be similar within each density (2005 to 2008 and 2010), and tended to be lower during drought conditions (2009 and 2011) for both nutritional treatments. Antler size decreased during drought even with pelleted feed, thus maintaining quality natural forage remains valuable and cannot be replaced by supplement.

***Student Presenter**

NOTES

Monday, 2:00 pm

Prevalence of *Trueperella pyogenes* in Georgia's Deer Herd as a Cause of Intracranial Abscessation

Emily H. Belser, Bradley S. Cohen, Karl V. Miller – University of Georgia; Shamus P. Keeler – Southeastern Cooperative Wildlife Disease Study; Kevin M. Keel – UC Davis School of Veterinary Medicine; Charlie Killmaster, John Bowers – Georgia Department of Natural Resources

Intracranial abscessation (IA) is a reported cause of natural mortality, particularly for mature, male white-tailed deer (*Odocoileus virginianus*). Most cases of IA are associated with infection by the opportunistic bacterium *Trueperella pyogenes* (formerly *Arcanobacterium pyogenes*). To date, it is unclear if this species of bacteria is a commensal bacterium on healthy deer. Only one published study has documented *T. pyogenes* presence on healthy deer (Maryland), and no studies have been conducted on a large scale. During Fall 2011, we obtained samples from 462 hunter-killed deer on 13 public lands and 10 private properties across all physiographic provinces in Georgia. Study sites were selected to include differing herd demographics, management styles (Quality Deer Management vs. Traditional Deer Management), and habitats. We sampled the forehead, nose, and tongue of each deer. We used Polymerase Chain Reaction (PCR) to determine presence or absence of *T. pyogenes* . *T. pyogenes* was found on the epidermal linings of deer throughout the state with a mean prevalence of 47.83 percent. Public properties had a mean prevalence of 85.12 percent, whereas private properties had a mean prevalence of 45 percent. We discuss causative factors associated with the prevalence of *T. pyogenes* and its implications for the occurrence of intracranial abscesses.

***Student Presenter**

NOTES

Monday, 2:20 pm

Trauma-Induced Malformed Antler Development in Male White-Tailed Deer

Gabriel R. Karns, Stephen S. Ditchkoff – Auburn University

Though normal antlers are branched and bilaterally symmetrical, male white-tailed deer (*Odocoileus virginianus*) sometimes develop malformed antlers due to various reasons. As management for antler quality has grown more popular in recent years, spike-on-one-side (SOOS) antler configurations have been repeatedly blamed on inferior genetics by some wildlife managers and much of the general public. We hypothesized that the majority of SOOS antlers are the artifact of injuries to the antlerogenic periosteum region. In a causal investigation of SOOS antler development in male white-tailed deer, we collected 71 SOOS specimens over 2 hunting seasons (2010-2011 and 2011-2012) in Alabama and identified probable cause for malformed antler development. We confidently assigned cause to 62% of specimens, and frequency of skull/pedicle trauma increased with age classes (yearling, 2.5 year old, and $\geq$3.5 year old males). It was difficult to determine why yearling males developed SOOS antler traits (30%), but ease of prescription increased with male age (76% for $\geq$3.5 year old males). Based on the physiology of skull/pedicle versus skeletal injuries, we recommended different culling strategies for yearling versus adult male white-tailed deer according to management objectives.

***Student Presenter**

NOTES

Monday, 2:40 pm

Estimating Boone and Crockett Scores for White-Tailed Deer from Simple Antler Measurements

Bronson K. Strickland, Stephan Demarais, Harry Jacobson – Mississippi State University; Phillip D. Jones – University of Wisconsin-Madison; Chad M. Dacus – Mississippi Department of Wildlife, Fisheries, and Parks; Jocephus R. Dillard – U.S. Forest Service

Antler characteristics are a measure of phenotypic quality and are used by wildlife managers and hunters to assess herd characteristics of white-tailed deer (*Odocoileus virginianus*). A single metric for antler quality would benefit scientists, wildlife managers, and the hunting public by providing a common gauge. Total antler volume or mass may be the most accurate measure of antler development, but is not practical to obtain from most hunter-harvested animals. The most accepted single measure of antler size is Boone and Crockett (B&C) score. We confirmed the efficacy of gross B&C scores as a predictor of antler mass (ounces) using antler measurements from 467 captive deer. Gross B&C score explained 78% of variation in antler mass and was the best 1-variable predictive model. However, calculation of B&C score may require ≥11 measurements for most harvested adult males. To test the possibility of deriving a simple model to predict gross B&C score from a reduced number of measurements, we used data from 3,532 deer in the Mississippi Magnolia Records Program to examine regression models using inside spread, number of antler points, basal circumference, and main beam length as explanatory variables, as these are the most common antler measurements recorded by wildlife managers. A simple model using total number of points ≥1 inch and length of main beams explained 77% of variability in gross B&C scores. This model should enable hunters to provide accurate information to biologists regarding antler development in adult age classes, and its relative simplicity may encourage use.

NOTES

Monday, 3:30 pm

Variable Effectiveness of Coyote Removal Programs at Increasing Fawn Recruitment in Georgia

William D. Gulsby, Karl V. Miller – University of Georgia; James D. Kelly – Florida Fish and Wildlife Conservation Commission; Charlie H. Killmaster, John W. Bowers – Georgia Department of Natural Resources

With evidence mounting that coyotes (*Canis latrans*) can significantly decrease white-tailed deer (*Odocoileus virginianus*) fawn recruitment, many managers are implementing coyote removal programs on sites where problems exist. Although a few studies have demonstrated the effectiveness of such programs, we are aware of none which have replicated coyote removal on 2 sites under contrasting habitat and deer management strategies within close spatial proximity. In 2009 we began monitoring fawn recruitment each fall and winter using baited camera surveys on B.F. Grant (BFG) and Cedar Creek (CC) Wildlife Management Areas, separated by only 5 miles, in central Georgia. Camera survey estimates were augmented by 40 years of historical population reconstruction data. Approximately 25% of BFG and less than 10% of CC was comprised of early successional forest or agricultural-type habitat. Camera surveys indicated deer density on BFG (55 deer/mi^2) was roughly twice that of CC (22 deer/mi^2). From March – June 2011, professional trappers removed 15 and 9 coyotes from BFG and CC, respectively. Following the removal, fawn recruitment went from approximately 0.5 fawns/doe (pre-removal) to 0.9 fawns/doe (post-removal) on BFG while fawn recruitment on CC did not differ pre- or post- removal (0.7 fawns/doe). We believe that increased availability of fawns, making them a more profitable food source, coupled with an increased intensity of use by coyotes on the site, resulted in the observed change in recruitment following the coyote removal on BFG. Our findings highlight the need for managers to closely monitor fawn recruitment to ensure coyote removal, a costly management action, is justified prior to taking action. Additionally, we caution that intensive coyote removal programs may not have a positive effect on fawn recruitment on all sites.

***Student Presenter**

NOTES

Monday, 3:50 pm

Presence of Wild Pigs Affects Occupancy and Detection Rates of White-Tailed Deer

Chad H. Newbolt, Stephen S. Ditchkoff – Auburn University; Robert W. Holtfreter – Connors State College

Wild pigs (*Sus scrofa*) have expanded their range to encompass much of the range of white-tailed deer (*Odocoileus virginianus*), and this expansion has led to important issues of concern for white-tailed deer management. We used a two-species occupancy model to investigate whether there was evidence of competitive exclusion between the two species at 896 baited camera sites in Georgia, USA. We simultaneously estimated detection probabilities for both species and determined if the presence of one influenced the detection of the other species. Occupancy interaction estimates provided strong evidence that the two species co-occurred less often than expected under an independence assumption ($\hat{\varphi} = 0.905$ (SE = 0.017). Model selection results and associated parameter estimates indicated wild pigs excluded white-tailed deer from sampled sites, as occupancy rates for white-tailed deer were 49% less when pigs were present ($\hat{\psi}_{BA} = 0.353$, SE = 0.071; $\hat{\psi}_{Ba} = 0.694$, SE = 0.047). Independent detection probabilities were similar for the two species ($\hat{p}_{PIGS} = 0.710$, SE = 0.008; $\hat{p}_{DEER} = 0.697$, SE = 0.025); however, detection probabilities for pigs were reduced by 18% when deer were present ($\hat{p}_{PIGS} = 0.582$, SE = 0.013), and were 25% less for deer when pigs were present ($\hat{p}_{DEER} = 0.523$, SE = 0.016). Our results show that wild pigs exclude white-tailed deer from food sources where the species co-occur, and suggest analyses related to dynamics of deer populations need to address the likelihood that detection probabilities will be biased where wild pigs are present.

NOTES

Monday, 4:10 pm

Coyote Dietary Shifts Relative to White-Tailed Deer Abundance

Kelsey L. Turner, Michael J. Cherry, Robert J. Warren – University of Georgia; M. Brent Howze – Georgia Department of Natural Resources; L. Mike Conner – Joseph W. Jones Ecological Research Center

Coyotes display spatial and temporal dietary plasticity and are often considered generalists foragers. Recently some wildlife scientists have suggested coyotes in the eastern USA have a significant impact on white-tailed deer populations. A better understanding of coyote foraging behavior would provide insight into the effectiveness of management strategies such as providing early succession habitats and associated diversionary food items to reduce fawn depredation. Therefore, we processed collected coyote scat samples and analyzed prey items by identifying bone and hair remains using macroscopic and microscopic examination. Scat collection occurred during 2 periods—2007-2008 (312 scats) and 2011-2012 (302 scats), representing the estimated least (4.25 deer/km2) and greatest (8.5 deer/km2) deer densities, respectively, in the history of the Joseph W. Jones Ecological Research Center. Additionally, track count indices suggested that coyote abundance was greater during 2007 (1.35 tracks/km) than during 2011 (0.7 tracks/km). Prey items are reported as seasonal percent of occurrence. Seasons are defined based on coyote ecology: pair formation and breeding (1 January –15 March); gestation (16 March–30 May); pup-rearing (1 June–31 August); and dispersal (1 September–31 December). The percent occurrence of deer remains in coyote scats during 2011 and 2012 has been compared to the data from 2007-2008 to evaluate the effect of deer and coyote density on the prevalence of deer in coyote diets.

***Student Presenter**

NOTES

Monday, 4:20 pm

Developing a Cooperative Framework to Study Influences of Coyotes on White-Tailed Deer Populations in the Southeastern United States

Michael J. Chamberlain, William D. Gulsby, Karl V. Miller – University of Georgia

The relatively recent and rapid expansion of coyotes (*Canis latrans*) throughout the southeastern United States has caused concern among managers and biologists alike. Although a wide body of literature exists on coyote ecology and behavior in Midwestern and Western states, similar work is unavailable in the Southeast. This has prompted state agencies, through cooperation with researchers, to initiate research projects designed to assess potential influences of coyotes on white-tailed deer (*Odocoileus virginianus*) populations. Most of this work has, and continues to, focus on predation rates on fawns and potential consequences to deer recruitment. Despite the value of this work, recent research strongly indicates that the behavior and movement ecology of eastern coyotes differ significantly from their western cousins. Therefore, we suggest that an alternate approach which coordinates efforts among stakeholders throughout the region may improve the ability of managers to understand and predict how coyotes influence deer populations. The basis for development of this integrated approach hinges on the willingness to study and understand coyote behavior before placing this behavior in the context of deer populations. In this presentation, we summarize the existing state of knowledge on coyote behavior in the Southeast. Likewise, we identify existing gaps in our knowledge base that hamper our ability to properly understand how coyotes affect deer populations. Finally, we propose a research framework designed to improve the efficiency and effectiveness of research efforts at multiple spatial scales to understand predation pressures that coyotes exert on deer populations.

NOTES

Monday, 4:40 pm

Captive Whitetail Industry – Current Status and Growing Threat

Kip P. Adams, Brian Murphy, Matt Ross – Quality Deer Management Association (QDMA)

In 2012, 10 states debated legislation to introduce or expand captive deer breeding operations. Current estimates suggest more than 10,000 whitetail breeding and/or shooting facilities in the U.S. We surveyed all 37 state wildlife agencies in the Midwest, Northeast and Southeast to determine the scope and intensity of captive operations and state-specific requirements. Twenty of 32 states reported 5 to 1,332 breeding facilities holding over 140,000 whitetails, and 20 of 29 states reported 1 to 150 shooting preserves holding over 25,000 whitetails. Whitetails were classified as wildlife in 12 of 22 states (55 percent), livestock in 8 states (36 percent), and game animals in two states (9 percent). Only five of 21 states (24 percent) had minimum acreage requirements for breeding facilities, but 13 of 20 states (65 percent) did for shooting preserves. Twelve of 16 states (75 percent) had no minimum release time before deer could be shot in a preserve. Fifteen of 21 states (71 percent) had no stocking density requirements, and 19 of 25 states (76 percent) did not have habitat requirements for captive deer facilities. Seventeen of 23 states (74 percent) required external tagging, and 24 of 27 states (89 percent) allowed consumption of whitetails killed in shooting preserves. Not only does the captive deer industry undermine the North American Model of Wildlife Conservation, it threatens the health of wild deer and the public's perception of hunting. A better understanding of this growing industry will help managers safeguard free-ranging whitetail populations and the future of hunting.

NOTES

Tuesday, 8:25 am

Variability in Fire Prescriptions: Will Any Prescriptions Do?

Marcus A. Lashley, M. Colter Chitwood, Christopher S DePerno, Christopher E. Moorman – North Carolina State University; Craig A. Harper – University of Tennessee

Fire prescriptions have shifted to 1-3 year growing-season fire-return intervals for restoration and maintenance of longleaf pine (*Pinus palustris*) ecosystems. Recent literature reported fire regimes in this ecosystem should be focused on frequent early growing-season fires based on reproductive efforts of wiregrass (*Aristida beyrichiana*). However, records from dendrochronology studies suggest fire frequency and seasonality were dominated by frequent growing-season fire but frequencies and seasonality were variable. In the summers of 2011 and 2012, we evaluated the effects of fire seasonality and frequency on deer forage availability and fleshy fruit production of native plants in longleaf pine stands at Fort Bragg Military Installation, North Carolina. Wiregrass production was greatest under early growing-season fire regimes consistent with recent literature. However, in upland sites, the total forage available of other native plants and biomass of selected deer forages was greater following dormant-season fires. Summer soft mast production increased with decreasing wiregrass biomass and was greater after dormant-season fires. Understory soft mast production was nearly absent in burned stands for two years after growing-season fires. The upland hardwood forest type had the greatest understory soft mast abundance in both years of the study, most likely due to less-intact wiregrass, which resulted in a mosaic of burned areas within stands. These data indicate stochastic variability in fire seasonality and frequency is essential to maintenance of key wildlife foods within longleaf ecosystems. Our data suggest managers should integrate variations of fire season and frequencies into fire prescriptions to more accurately represent historical fire regimes.

***Student Presenter**

NOTES

Tuesday, 8:45 am

Estimating a Nutritional Carrying Capacity for White-Tailed Deer within 9 Primary Habitats Across Louisiana

Levi B. Horrell, Michael J. Chamberlain – University of Georgia; Scott Durham – Louisiana Department of Wildlife and Fisheries

White-tailed deer (*Odocoileus virginianus*) are an economically and recreationally important game species. As a result, managers and researchers constantly strive to improve understanding of factors influencing deer populations and ways to better manage habitat for sustainable deer herds. Many states, including Louisiana, are faced with the challenge of managing deer herds across diverse habitat types that vary in quality across physiographic regions. Estimating a nutritional carrying capacity within primary habitat types could provide land managers a tool to assess potential habitat quality. We selected 22 study sites distributed across 9 primary habitats and placed 570 plant sampling exclosures within various forest successional stages across the study sites during January-March 2011. Exclosures were placed based primarily on stand age and disturbance history, such as burning regimes. Plant samples representing consumable plant forage were collected from each exclosure during the summers of 2011 and 2012, dried, and then analyzed for nutritional quality. The growing seasons were drastically different between years, with Louisiana experiencing an historical drought in 2011 and more normal precipitation in 2012. For all samples submitted for nutritional analysis, calculated mean crude protein levels were 7.81 during 2011 and 9.38 during 2012. A nutritional constraints model is currently being constructed to predict deer-days of foraging capacity for each primary habitat. Using forage intake rates and reported diet qualities necessary for lactation and body maintenance, we are evaluating the ability for each habitat type to support sustainable deer populations.

***Student Presenter**

NOTES

Tuesday, 9:05 am

Deer Density and Supplemental Feed Effects on White-Tailed Deer Space Use

Kim N. Echols, David G. Hewitt, Charles A. DeYoung, Timothy E. Fulbright – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

Addition of supplemental feed can help alleviate competition for limited resources, but it can also create additional competition among conspecifics as deer densities increase, altering social structures and thus changing behavior. The resulting deer distributions may affect individual fitness, survival, or reproduction in the presence or absence of feed. We hypothesized that deer in fed enclosures would exhibit larger home ranges than those in unfed enclosures as densities increased because of their reduced energy constraints. We equipped 37 deer on two ranches in Dimmit County, south Texas with Lotek 3300L GPS collars from December 2009 - December 2010. The deer occupied 200-acre enclosures at high (40 deer) and low (10 deer) densities, with and without *ad libitum* feed. We divided the year into five biologically relevant seasons (late rut, winter-spring, late gestation, summer lactation, early rut) to analyze spatial distributions. Kernel estimates (95%) were larger for deer in low density enclosures (125.2 acres) than for deer in high density enclosures (52.1 acres) regardless of access to feed during late gestation, summer lactation and early rut. During the late rut, males occupied larger areas (136.4 acres) than females (94.8 acres) in both fed and unfed enclosures, but males in fed enclosures used larger areas (156.3 acres) than did males in unfed enclosures (113.6 acres). These results support the idea that herd density and availability of feed influence deer social interactions and the way deer distribute themselves across the landscape.

NOTES

Tuesday, 9:25 am

Influence of White-Tailed Deer Density and Nutritional Supplementation on a South Texas Vegetation Community

Whitney J. Priesmeyer, Timothy E. Fulbright, David D. Hewitt, Charles A. DeYoung, Kim N. Echols – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

Overabundant white-tailed deer (*Odocoileus virginianus*) populations may trigger a plant community shift from shrubs and forbs to greater dominance by grasses. Relieving nutritional constraints by providing supplemental feed may promote selective foraging on forbs, triggering a reduction in this forage class. We tested the hypothesis that increasing deer densities and providing supplemental feed in southern Texas results in a reduction in forbs and shrubs relative to grasses. Secondly, providing supplemental feed may result in reduced forbs relative to grasses regardless of deer density. Research was conducted on 2 ranches in Dimmit County, Texas. We constructed 6,200 ac enclosures per ranch, each containing 10, 25, or 40 deer/200 acres. Pelleted feed was provided *ad libitum* to one of each pair of similar densities per ranch. We estimated biomass of herbaceous plant species spring and summer 2004-2012. Data were analyzed using repeated measures ANOVA. The ratio of forbs, and forbs and half shrubs combined, to grasses varied significantly among years in spring and summer ($P<0.001$) because of variation in rainfall. During summer there was a density*feed interaction in which the ratio of forbs to grasses was greater in low density enclosures with supplemental feed ($P=0.054$) than in all other treatments. Feeding appears to alleviate foraging pressure on the forb community during the summer and increase the ratio of forbs to grasses, but only at low deer densities. Access to supplemental feed does not appear to promote selective foraging by deer nor indicate vegetation transition. Precipitation patterns have greater influence on vegetation dynamics.

***Student Presenter**

NOTES

Tuesday, 9:45 am

Effects of Nutrition and Deer Density on Fawn Recruitment in Semi-Arid Rangelands

Randy W. DeYoung, Aaron M. Foley, David G. Hewitt, Tim E. Fulbright, Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

The relative importance of nutrition, maternal age, and population density on recruitment has not been quantified in populations of white-tailed deer that live in variable environments. We studied recruitment in 200-ac enclosures populated with wild deer in south Texas during 2004-2009. The experimental design consisted of 12 enclosures on 2 sites. Each site contained 6 enclosures in a factorial design, with 3 levels of deer density and a nutrition treatment. We genotyped 841 individuals sampled in the 12 enclosures at 14 microsatellite DNA loci. Our sample included 488 fetuses, fawns, or yearlings; we assigned maternity for 384 (79%) offspring. Fetal counts revealed that 88-100% of does aged >1 year old conceived, while 31% and 13% of doe fawns conceived in nutritionally enhanced and control enclosures, respectively. Does ≥3 years old recruited most (≥76%) offspring, regardless of treatment. Mature does in nutritionally enhanced enclosures recruited more fawns per year (49% vs. 23% of individuals raised a fawn), more litters of twins (31% vs. 9% of individuals), and had higher fetal counts (1.85 vs. 1.50). Effects of density on recruitment were relatively subtle and may have been masked by annual variation in precipitation. Nutrition is clearly limiting in the semi-arid environment of south Texas, where variable rainfall determines quality and quantity of forage. Maternal experience or social factors that affect access to enhanced nutrition or fawning areas may be important for physically immature does. Our results have implications for harvest management and help to understand the dynamics of populations in variable environments.

NOTES

Tuesday, 10:35 am

Spatial Assessment of Deer Browse and its Effects on a Forest Community in Southeastern Tennessee

Meg M. Armistead, Jonathan Evans –The University of the South

Deer browse effects on forest structure and composition are likely to be distributed in a heterogeneous pattern within a plant community due to such factors as deer movement and habitat fragmentation. However, few studies have examined the spatial pattern of deer browse at the landscape level. Our study used a combination of field assessments and GIS analyses to examine the spatial distribution of browse in a 2300 acre, upland oak-hickory forest on the southern Cumberland Plateau. We hypothesized that browse intensity would vary spatially in association with edge habitat. An additional objective of this study was to examine the association of browse with various plant community metrics across the landscape. The impact of browse on the woody plant community was determined using a series of circular plots nested within transects distributed across the study area in a stratified random design. Four fenced exclosures established in the study area prior to 2000 served as controls. Browse intensity varied within the study area as a function of habitat fragmentation and proximity to deer movement corridors off the plateau. Browse correlated significantly with sapling density, species richness and vegetative cover. Due to its high sensitivity to browse and ease of sampling, we recommend the use of sapling density as a proxy for browse in future assessments. The extreme gradients of browse found within the study area suggest that deer activity is not homogeneously distributed and that population assessments used to guide deer management should take this spatial variation into account.

***Student Presenter**

NOTES

Tuesday, 10:55 am

Effect of Reducing Camera Survey Efforts on Accuracy of Density Estimation for White-Tailed Deer

Allison C. Keever, Stephen S. Ditchkoff, Peter K. Acker, Chad H. Newbolt – Auburn University; James B. Grand, Conor P. McGowan – U.S.G.S. Alabama Cooperative Fish and Wildlife Research Unit, Auburn University

Automated cameras have become increasingly more common for obtaining density estimates for wildlife populations. However, time lapse camera surveys produce large amounts of data and many fail to incorporate detection which will likely bias estimates. The goal of this study was to determine how detection varied temporally and how the reduction of data would affect white-tailed deer density estimates by comparing estimates with a known, marked population. Motion triggered camera surveys were conducted at Auburn University's captive deer facility and data were standardized at 5 minute intervals to mimic a time lapse survey. Density estimates were generated using repeated point counts and compared to the known number of marked deer. There was no significant change in mean detection per survey day though mean deer counted per day increased from 69.5 on Day 1 to 213 on Day 3, then decreased thereafter. Detection was significantly lower during the day and increased from 0.009 with 24 hours surveyed to 0.012 utilizing only data at night. The mean number of deer counted per survey day was 165 for 24 hours and 146 at night. Acceptable density estimates were generated using 24 hours of data and nighttime only. Accuracy of density estimates increased with increasing number of survey days until day 5, and then there was no improvement in density estimates with additional data. This suggests that five day camera surveys conducted at night are sufficient for density estimation and population monitoring in white-tailed deer.

***Student Presenter**

NOTES

Tuesday, 11:15 am

Comparison of Drop Nets Versus Helicopter Net-Gun Capture for White-Tailed Deer in an Area with Various Land Uses

Jared T. Beaver, Roel Lopez, Chad Grantham, Brian Pierce – Texas A&M University; Lucas Cooksey – Joint Base San Antonio-Fort Sam Houston/Camp Bullis

Population growth and land use change has resulted in increased human interaction with white-tailed deer (*Odocoileus virginianus*; deer). The context of these interactions differ and affect the efficacy of traditional methods used for capturing and monitoring deer populations. Advancements in capture and handling methods, focused primarily on minimizing mortality and stress while increasing efficiency, have made both drop net and helicopter with net gun (helicopter) increasingly popular techniques for a variety of management environments. However, there are a surprisingly limited number of publications providing a cost-benefit analysis of capture techniques across the same environment. The objectives of this study were to provide both a brief literature review of the previous studies using drop nets and helicopter capture techniques while providing a cost-benefit analysis of the two techniques using our data. During August 2011–July 2012, we captured 29 deer by drop net and 35 by helicopter on Joint Base San Antonio–Camp Bullis. Each deer was fitted with a GPS-collar that allowed us to monitor survival. We recorded 1 direct capture-related death (3.4%) due to drop nets and none related to helicopter capture. We recorded 3 (10.7%) and 2 (5.7%) post-capture mortalities for drop nets and helicopter capture, respectively. Mean personnel hours and capture related cost were significantly greater for drop nets (44.8 personnel hours/deer) than helicopter (2.2 personnel hours/deer) in this environment. Based on capture-related mortalities and postcapture survival, we found both techniques to be a safe means for deer capture. However, based on cost, maintenance, and personnel hours required we concluded the helicopter technique to be superior for deer capture in an area with various land uses and disturbances.

***Student Presenter**

NOTES

Tuesday, 11:35 am

Temperature or Light Activated Vaginal Implant Transmitters: Predicting Improved Performance Across a Climatic Range

Michael J. Cherry, Melinda A. Nelson, Robert J. Warren – University of Georgia; L. Mike Conner – Joseph W. Jones Ecological Research Center

Vaginal implant transmitters (VITs) are used to obtain spatial and temporal parturition data and to facilitate capture of neonate ungulates with reduced sampling biases. VITs are small radio transmitters implanted in the vaginal canal of adult female ungulates following the breeding season. Immediately prior to parturition, the VIT is expelled and a temperature sensor causes the pulse rate to change from 40 pulses/minute to 80 pulses/minute, thereby indicating a parturition event to researchers. Climatic conditions can affect the performance of VITs, therefore, in collaboration with Advanced Telemetry Systems, we developed and evaluated a VIT equipped with both temperature and photo sensors. We used ambient temperature and photoperiod data during June – August 2011 for 36 sites across the USA to evaluate the predicted improvement in performance achieved by the inclusion of a photo sensor. Mean predicted improvement below the 40^{th} and 35^{th} parallel of latitude is 33% and 43% respectively. Unlike the temperature sensor, the photo sensor activates immediately when ambient light is greater than 0.01 lux, improving the resolution of temporal parturition data. High resolution temporal parturition data provides the opportunity to evaluate fine scale dispersal patterns of fawns, which would assist in developing search protocols. Inclusion of the secondary sensor could increase the geographic range of the effective use of VIT technology. Therefore, to ensure efficient fawn capture by utilization of VITs, we suggest researcher use this improved model in areas that exceed 30 C during the fawning season

***Student Presenter**

NOTES

Tuesday, 1:40 pm

Spotlight Surveys for White-Tailed Deer: Monitoring Panacea or Exercise in Futility?

Stephen S. Ditchkoff – Auburn University; Bret A. Collier – Texas A&M University; Charles R. Ruth – South Carolina Department of Natural Resources; Joshua B. Raglin – Norfolk Southern Railway

Many monitoring programs for white-tailed deer (*Odocoileus virginianus*) on both private and public lands across the United States have long relied on the use of road-based spotlight surveys for monitoring population size and trends. Research has suggested spotlight surveys are ineffective and that road-based surveys for deer are biased because of highly variable detection rates. To evaluate variability in detection rates relative to the assumption that repeated surveys along roads will provide reliable trend data for use in calculating deer density estimates, we collected 5 years of thermal-imager and spotlight survey data using a multiple-observer, closed-capture approach. Using a Huggin's closed capture model, data bootstrapping, and variance components analyses, our results suggest that density estimates for white-tailed deer generated from data collected during road-based spotlight surveys are likely not reflective of the standing deer population. Detection probabilities during individual spotlight surveys ranged from 0.00 to 0.80 (median = 0.45) across all surveys, and differed by observer, survey, management unit, and survey transect replicate. Mean spotlight detection probability (0.41) and process standard deviation (0.12) estimates indicated considerable variability across surveys, observers, transects, and years, which precludes the generation of a correction factor or use of spotlight data to evaluate long-term trends at any scale. Although recommended by many state, federal, and non-governmental agencies, our results suggest that the benefit of spotlight survey data for monitoring deer populations is limited and likely represents a waste of resources with no appreciable management information gained.

NOTES

Tuesday, 2:00 pm

Exurban Development Associated with a National Wildlife Refuge – Implications for Deer Hunting and Management

Matthew D. Ross – Quality Deer Management Association (QDMA); Marrett Grund – Minnesota Department of Natural Resources; Larry Williams – U.S. Fish and Wildlife Service; Levi Shinn, Joel W. Helmer – Concordia University; Anne Sittauer – Sherburne National Wildlife Refuge

Like most other areas in the eastern United States, liberal harvest opportunities throughout much of Minnesota have been made available to hunters over the past 10-20 years. Therefore, the effectiveness of recreational hunting as a deer population management tool depends, in large part, on hunter distribution and density. Our study documents the changing land-use patterns and exurban development adjacent to a National Wildlife Refuge within a 45-minute commute to the Minneapolis metropolitan area. We analyzed geo-spatial data from 1990-2010 that described human population growth rates or landscape factors that changed as a result of exurban development. We also analyzed the harvest distribution and intensity throughout the study area based on plotted harvest locations of harvested deer registered at check stations in 2003. Human population numbers more than doubled in the area adjacent to the Sherburne National Wildlife Refuge and the number of housing units increased by 114 percent between 1990 and 2010. We will describe these and other land-use shifts from a rural to exurban area, the uneven deer harvest distribution that occurred in and around the Wildlife Refuge, and discuss the possible implications for deer ecology and management based on a review of the literature.

NOTES

Tuesday, 2:20 pm

Dog Hunting and Identity in Coastal North Carolina

M. Colter Chitwood, M. Nils Peterson, Christopher S. DePerno, Marcus A. Lashley, Christopher E. Moorman – North Carolina State University

Hunting with dogs (i.e., dog hunting) presents a unique challenge for wildlife managers in the Southeast. Due to its historical and cultural roots, dog hunting has deep meaning for many of its participants. However, dog hunting can cause conflicts within the hunting community and with the public at large. As wildlife managers grapple with restrictions or bans on pursuing white-tailed deer with dogs, it is crucial that researchers and managers understand how dog hunting contributes to identity in rural communities. We addressed this need with a case study in coastal North Carolina. We conducted 78 informant-directed, open-ended interviews and analyzed data using the theory of narrated identity, which refers to how individuals make sense of themselves through involvement with others. The narrative (i.e., story) that individuals tell unifies actions over time and often includes other people and connections between those people and actions. Thus, the narrative includes a plot that uses individuals as characters who tell and re-tell stories that have shaped their identities. Results from our study demonstrated that dog hunting defined relationships with family, friends, and nature, and was used to integrate others into the community, to cope with major life events, and to distinguish between the dog hunting community and others. Our results indicate dog hunting helps define identity for some rural communities. However, the vulnerability expressed within dog hunter identity suggests an opportunity to regulate dog hunting in ways that promote broad-based social legitimacy for the activity.

***Student Presenter**

NOTES

Tuesday, 2:40 pm

Deer Movements Before, During, and After a Flooding Event in the Mississippi River Delta

Don White, Jr., Christopher L. Watt – University of Arkansas; M. Cory Gray, Brad Miller – Arkansas Game and Fish Commission

Flooding of the Mississippi River in April and May 2011was among the largest and most damaging recorded for the past century. Despite the large amount of research conducted on white-tailed deer movements there are aspects of their movement ecology that remains to be understood. Seasonal flooding, for example, undoubtedly influences deer movements, but it is unclear to what extent flooding affects movements and habitat use. In January and February 2011, we captured 18 bucks: 6 yearlings, 6 2½-years, and 6 ≥3½-years, on the Choctaw Island Wildlife Management Area in Desha County, Arkansas. Bucks were fitted with SirTrack® Argos GPS-equipped radiocollars. Water level data were obtained from the river gauge operated by the U.S. Army Corps of Engineers at Arkansas City, Arkansas. To describe deer movements before, during, and after the flood, we divided the flooding event into 7 time periods of unequal duration. For each time period we modeled water depth and created a unique landcover map reflecting the extent of the flood waters on the study area. Deer location data obtained during each time period were then plotted on the appropriate landcover map. Flooding did not cause long-term displacement of deer from the study area even though some bucks moved several miles away at some point during the flood. Five of our 18 radio-collared bucks died during the flood. All 5 of these bucks remained on the study area during the flood. The other 13 radio-collared bucks left the study area at various times during the flood and survived.

NOTES

Tuesday, 3:30 pm

Effects of Population Structure and Dispersal on Management Efforts for Chronic Wasting Disease in West Virginia

Randy W. DeYoung, Aaron M. Foley, David G. Hewitt – Caesar Kleberg Wildlife Research Institute; James M. Crum – West Virginia Division of Natural Resources; Kip P. Adams – Quality Deer Management Association

ABSTRACT. Chronic wasting disease (CWD) is a transmissible spongiform encephalopathy carried by species of deer, including white-tailed deer. Management efforts for CWD often aim to reduce the density of female deer in the affected area to limit contacts among individuals. We obtained genetic data from 550 white-tailed deer sampled in the CWD focal region in West Virginia during 2006-2011 to determine the effects of harvest on population structure. We observed positive spatial autocorrelation among pairs of females <0.5 mi apart, probably due to the presence of female relatives in close geographic proximity. The autocorrelation values for pairs of females within 0.5 mi increased during 2006-2011, coincident with changes in female age structure due to harvest. Increased autocorrelation as doe age structure decreased suggests fewer generations of female relatives in the sample. Some pairs of CWD-positive females collected within 6 mi of each other were closely related, while CWD-positive male relatives were collected up to 18 mi apart. Females had positive values of F_{IS}, a departure from expected heterozygosity caused by the presence of related individuals within social groups. The F_{IS} for males fluctuated during 2006-2011. Harvest affected fine-scale genetic structure, but the effects were subtle. Changes to substructure of males may reflect delays in timing of dispersal or removal of putative dispersers through harvest. Dispersing males are likely agents of CWD transmission over larger spatial distances, while females likely transmit the disease through local contact. Spread of CWD is thus influenced by the differing behavior of males and females.

NOTES

Tuesday, 3:50 pm

Tracking a Booner Under the Bayou State Moon

David W. Moreland – Outdoor Roots

On a 1200 acre tract of land in Desoto Parish, Louisiana, the feeding activity of a free ranging adult buck was documented using trail cameras at feeding stations. The buck was a 140 class B&C ten point buck in 2010, a 170 class B&C thirteen point buck in 2011 and a 160 class B&C eleven point buck in 2012. This tract of land is not hunted but hunting occurs all around it. In 2011 the buck fed regular at several feeders beginning in mid-October and then disappeared for two weeks, reappeared for a week at the feeders and then disappeared again for three weeks, returning in late December. The effect of the moon on breeding activity of whitetail deer is a controversial subject among southeast deer biologists. The disappearance of the buck appears to coincide with the moon phases; the buck was absent at the feeders from the new moon through the full moon and then back at the feeders for the last quarter. The time it was absent from the feeders coincides with the breeding chronology of deer in northwest LA during 2011. Data for 2012 feeding activity will be presented at the meeting. The range of this buck supports the smaller home ranges for Louisiana deer as determined from recent telemetry studies. There are other lessons that both managers and hunters can glean from the feeding activity of this trophy class buck.

NOTES

Poster Session

A Survey of the Bacterial Fauna Associated with the Forehead, Lingual and Nasal Areas of White-Tailed Deer

Emily H. Belser, Bradley S. Cohen, Scott M. Russell, Karl V. Miller – University of Georgia; Charlie Killmaster, John Bowers – Georgia Department of Natural Resources

Understanding the bacterial fauna associated with the dermal linings of white-tailed deer has important implications for understanding disease issues (such as intracranial abscessation) as well as ensuring human safety. Although descriptions have been conducted on a suite of domestic animals, none has been done with white-tailed deer despite the commonality of human-deer contact. During Fall 2011, we obtained bacterial samples from hunter-killed deer on 2 public lands in Georgia with differing habitats, harvest strategies, and cranial abscess prevalence. We sampled the dermis of the forehead, the mucosal linings of the nose, and the tongue from each deer. We isolated bacteria from 39 deer of both sexes and a range of age classes. Bacteria were plated onto blood agar, incubated for 48 hours, and identified to species using the bioMerieux Vitek 2 system. We identified a total of 97 species of bacteria. Common species were *Dermatophilus congolensis*, *Kocuria kristinae*, *Sphingomonas paucimobilis*, along with a variety of Staphylococcus and Streptococcus species. Some highly pathogenic bacteria were isolated. For example, *Staphylococcus aureus*, which can be very pathogenic when it invades a human host, was isolated from 26 of 39 deer. Overall, the deer's tongue had the highest bacterial species richness, followed by the nose, and then the head. Knowing these bacterial species is important to epidemiologists and medical professionals in determining and treating bacterial infections in humans. Good hygiene is recommended, including wearing gloves when field dressing deer or thorough hand-washing immediately afterwards.

***Student Presenter**

NOTES

Poster Session

A Spatially and Temporally Concurrent Comparison of Popular Deer Population Estimators

Jacob M. Haus, Jacob L. Bowman – University of Delaware; Brian Eyler – Maryland DNR

Obtaining accurate estimates of population demographics is essential to the formation of a sound deer management strategy. Several methods for obtaining population estimates exist, however each method is vulnerable to its own unique biases. Without knowledge of true population demographics, these biases are difficult to detect. The use of multiple estimators, however, allows for a comparison of both point estimates and measures of precision that may expose the limitations of a given method. We obtained demographic estimates using 3 survey methods; motion triggered camera survey and line-transect distance sampling via both spotlight and FLIR surveys. We are currently analyzing a fourth estimator using extracted fecal DNA for a mark recapture study. In order to avoid seasonal behavioral differences and regional variation, we performed all survey methods over a concurrent spatial and temporal scale in Maryland's Green Ridge State Forest. We drove spotlight and FLIR transects on alternating nights and obtained density estimates using software DISTANCE. We arranged cameras in a 247 acre systematic grid and followed Jacobson's individual branch antler method to analyze photographs. Spotlight and FLIR surveys generated similar point estimates, however FLIR produced a tighter confidence interval (11.11-24.58 deer/mi^2) and lower coefficient of variation (17.4%) than did spotlight surveys (9.14-26.44 deer/mi^2 and 26.1%, respectively). The camera survey did not provide measures of precision and resulted in a point estimate (32.30 deer/mi^2) nearly twice as great as distance sampling and well outside the confidence intervals of both methods. We believe a sex bias in the camera survey inflated our density estimate. We recommend line-transect distance sampling using FLIR ground imaging as a reliable population estimator for management decisions.

***Student Presenter**

NOTES

Poster Session

Fixed Kernel Home Range Estimates of Urban Deer in Fair Oaks Ranch, Texas

Kara B. Campbell, Charles A. DeYoung, Randall W. DeYoung, David G. Hewitt – Texas A&M University; Jessica Alderson, Ryan Schoeneberg, Richard Heilbrun – Texas Parks and Wildlife Department

Fair Oaks Ranch, TX, 27 miles north of San Antonio, has an overabundant white-tailed deer (*Odocioleus virginianus*) population. Management of suburban deer is influenced by home range size and movements, but data from urban and suburban areas are lacking. Our objective was to determine the home range size and movement of white-tailed deer throughout the city. Deer were captured from January to April, 2012 using drop-nets placed throughout the city. Captured deer were sexed, aged, and given unique ear-tag combinations. Twenty females were collared with VHF transmitters and 18 males were tagged with a VHF ear transmitter. Deer with VHF transmitters were located weekly using a receiver and portable antenna. The mean 95% fixed kernel home range was 58.1±11.89 acres for males and 39.3±5.51 acres for females. The 50% mean home range for males was 12.0±2.42 acres compared to 8.7±1.37 acres for females. Although these home ranges are from spring and summer locations, they are less than half the size of annual estimates found from urban deer studies in Connecticut (103 acres) and Illinois (153 acres). Supplemental feed, habitat quality, and deer density may influence the size of urban deer home ranges. Small home ranges may allow for effective management to be achieved on small landholdings. However, if localized management is implemented, movement of deer on adjacent properties would need to be understood.

***Student Presenter**

NOTES

Poster Session

Effects of Prey Species Abundance on Diet of Coyotes in Western Virginia.

David M. Montague, Marcella J. Kelly – Virginia Tech

The adaptability of coyotes (*Canis latrans*) makes it difficult to predict their effects on Virginia ecosystems based on coyote research from other regions. Recent data have shown a decline in harvest of white-tailed deer (*Odocoileus virginianus*) in the mountainous habitat in the western part of the state that may indicate a decline in deer population density in this region. Predation by coyotes may be one cause of this observed harvest trend. The availability of alternative prey may have a buffering effect that could reduce the rate of coyote predation on deer and other economically important species, however, this assumes coyotes in this region are selecting prey relative to availability. In May 2011, fieldwork began for the Virginia Appalachian Coyote Study (VACS). One objective of VACS is to estimate seasonal diet of coyotes in western Virginia and compare the seasonal availability of prey items to their occurrence in coyote diet. Diet is determined by dissecting scat (feces) and identifying prey items based on remains such as bones, teeth, hair, and seeds. Prey abundance and availability for predation is estimated seasonally by small mammal trapping, camera trapping, vegetation surveys for fruit-bearing plants, and ground-based distance sampling of deer using infrared imagery. Frequency of occurrence of prey items in scat will be related to seasonal abundance of common prey species. Field collection of scat and prey abundance estimation will continue through spring 2013. We report on progress to date and plans for future research.

***Student Presenter**

NOTES

Poster Session

Cost Efficiency and Effectiveness of Various Baits to Estimate White-Tailed Deer Density Using Camera Traps

Michael T. Biggerstaff, Marcus A. Lashley, M. Colter Chitwood, Christopher E. Moorman – North Carolina State University

Trail cameras are used commonly to estimate white-tailed deer (*Odocoileus virginianus*) density and inform harvest guidelines. Traditionally, corn has been used to attract deer to camera sites. However, baiting cameras with corn is expensive and requires frequent replenishment. We will compare the accuracy and cost effectiveness of a low- (trace mineral salt), medium- (rice bran), and high-priced bait (corn) in a standard 2-week pre-hunt survey (August). We will deploy 24 cameras randomly in eight replicates of three cameras each. Replicates will be split between an area of high (~40 deer/mi^2) and low (~5 deer/mi^2) deer density at Fort Bragg Military Installation, North Carolina, and each replicate will include a camera baited with each product. Density estimates of salt and rice bran sites will be compared to respective corn sites to determine accuracy. Corn is the accepted product for standard surveys. We estimate for a standard 2-week survey, salt will be least costly at $8.00 per camera, rice bran will higher in cost at $32.00 per camera, and corn will be most costly at $40.00 per camera. We hope to inform managers of cost effectiveness and accuracy of different baits used in pre-hunt camera surveys to estimate deer density. We hypothesize salt and rice bran may generate estimates similar to corn at less cost.

***Student Presenter**

NOTES

Poster Session

Patterns of Supplemental Feed Use by White-Tailed Deer

Dawson W. Lilly, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols, David B. Wester – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

Provision of supplemental feed for white-tailed deer (*Odocoileus virginianus*) is common in Texas. Knowledge regarding factors that influence supplemental feed use can help land managers make informed decisions about and enhance their supplemental feeding program. Our research objective was to evaluate supplemental feed use by white-tailed deer to determine factors that influence feed consumption and their relative effect. Supplemental feed was available *ad libitum* in 6, 200-acre high-fenced enclosures on 2 south Texas ranches. Two enclosures had a low (32 deer/sq. mi), two a medium (80 deer/sq. mi), and two a high (128 deer/sq. mi) target deer density. We monitored feed consumption between 2007 and 2011 and assessed effects of season and climatic conditions on per capita feed consumption. Season influenced the effect of deer density (P = 0.045) on per capita feed consumption. Per capita feed consumption tended to be greater at low deer densities than at medium and high densities during winter, spring, and autumn, but was similar across densities during summer. Feed intake was lower during summer compared to other seasons, perhaps because high temperatures reduced feed intake, cactus and mesquite mast crops provided abundant food that deer preferred, and high water demands caused deer to reduce intake of the pelleted feed.

***Student Presenter**

NOTES

Poster Session

Foraging Ecology and Population Parameters of Unmanaged White-Tailed Deer in Southern Texas

Kory R. Gann, David G. Hewitt, Timothy E. Fulbright, J. Alfonso Ortega-S., Thomas W. Boutton- Texas A&M University; Alfonso Ortega-S., Jr. – East Wildlife Foundation

White-tailed deer management has become sufficiently pervasive, especially in Texas, that populations not subjected to harvest or other management are valuable to provide a baseline for diets, body weight, body condition, and population parameters. To provide such data along a precipitation gradient across southern Texas, we will capture up to 750 white-tailed deer each autumn, from 2011–2015, on 4 properties on which deer are unmanaged. Tissue samples collected from deer will allow us to establish a baseline of carbon and nitrogen stable isotope ratios that can be used to understand deer foraging ecology. We will also record each deer's body weight, body condition, age, antler size, and lactation status. A total of 738 deer were captured in 2011 and over 700 will be captured in 2012, giving us insight into the age and sex structure of the populations. The drought southern Texas experienced in 2011 vastly reduced fawn survival. However, the number of yearling deer captured was high, indicating high fawn survival in 2010 when rainfall was above average. Body weights of adult deer increase along an east-west gradient (coastal populations to 100 miles inland) from 140 to 169 lbs for males and 94 to 109 lbs for females. Weights of yearling deer do not show these same trends suggesting that early growth rates are similar, but deer on the western-most property continue to grow, whereas deer on the coast cease growth at an earlier age.

***Student Presenter**

NOTES

Poster Session

Response of Two Preferred Browse Species to Increasing White-Tailed Deer Density and Nutrition Enhancement

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Providing nutritious artificial feeds may alter effects of increasing white-tailed deer (*Odocoileus virginianus*) densities on vegetation. We tested the hypothesis that increasing deer densities and providing supplemental feed in southern Texas negatively impacts growth of browsed plants relative to unbrowsed plants. Research was conducted on 2 ranches in Dimmit County, Texas. We constructed 6,200 ac enclosures per ranch, each containing 10, 25, or 40 deer/200 acres. Pelleted feed was provided *ad libitum* to one of each pair of similar densities per ranch. The height, width, and internode length of non-lignified growth was determined for highly preferred kidneywood (*Eysenhardtia texana*) and granjeno (*Celtis ehrenbergiana*) plants. Plants were protected from browsing with fenced enclosures (cages) in 2005 and a corresponding unprotected plant was selected for each caged plant in each enclosure. Data were collected June 2007-2012 with 2005 as a covariate. Height and width of granjeno varied among sampling dates ($P < 0.001$). There was a deer density*feeding treatment*sampling date interaction for ratio of number of internodes per twig ($P>0.009$). Averaged across deer densities and feeding treatments, protected kidneywood plants were taller ($P<0.04$) and wider ($P<0.02$) than uncaged plants. Ratio of number of internodes per non-lignified growth segment changed by density*year ($P>0.0188$) and year*caging treatment ($P>0.0142$). In 2009 the ratio of internodes per non-lignified growth segment of uncaged plants was greater in lower densities. Despite high browsing pressure, granjeno appears to be highly resistant to browsing by white-tailed deer. Whereas kidneywood is negatively affected by browsing, even at low deer densities.

***Student Presenter**

NOTES

Poster Session

Seasonal Spatial Ecology of Mature Male White-Tailed Deer in North-Central Pennsylvania: Preliminary Results

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Although the spatial use and movement ecology of white-tailed deer (*Odocoileus virginianus*) has been thoroughly investigated, little work has focused on mature (≥ 3 years old) males. Studies that have been conducted have focused on buck movements on agricultural landscapes, or large ranches in the south central U.S. No studies have investigated mature buck movement patterns in forested landscapes essentially devoid of anthropogenic influences. During winter and summer of 2012 we equipped 19 mature bucks with GPS collars on a 7,000 acre forested study site in north central Pennsylvania. Due to early retrieval of some collars, we conducted preliminary analyses on the winter, spring, and summer movements of six bucks, ranging in age from 3 to 5+ years old. We determined home range and core area size using the *a*-LoCoH method, and investigated seasonal habitat selection. Seasonal home range size varied from 120 hectares to 600 hectares, which depended on season and individual deer. In addition, we observed long distance movements of up to 3.2 km from the center of the seasonal home range of several deer. These extended excursions occurred in the spring season with a duration of hours to just a few days. Results of this research hold implications for understanding the behavior of mature males and for managing for mature bucks in areas where winters are harsh and resources can be seasonally limited.

***Student Presenter**

NOTES

Poster Session

Practicality of Bud Caps and Seedling Guarding to Mitigate White-Tailed Deer Browse Damage

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Seedling regeneration is a common concern among forest managers. High deer density can be of particular concern because deer may increase seedling mortality through herbivory and rubbing behavior. Because decreasing deer populations through female harvest is not an always an option, managers often must consider other methods to protect seedlings from deer damage. We are evaluating the effectiveness of bud caps and fencing to protect seedlings from deer damage. We will use seedling survival and cost efficiency of treatment as measures of effectiveness in a unique, disjunct population of eastern white pine (*Pinus strobus*). Over 1900 seedlings were planted in small group selection cuts and in thinned stands of mature loblolly pine (*Pinus taeda*). Additionally, we will consider distance to forest edge and fine-scale herbivory pressure on seedling survival. We will conduct browse surveys to determine the extent of plant herbivory and to evaluate deer diet selection across the site. Concurrently, we will use motion-sensing trail cameras to estimate deer density. Our results should help guide the canopy opening size, seedling stocking densities, and protective control measures that most efficiently ensure regeneration of eastern white pine forests.

***Student Presenter**

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Table 1. Southeastern state deer harvest summaries for the 2011-2012 or most recent available season.

State	Land Area (sq. mi)	Deer Habitat (sq. mile)	Deer Habitat (% Total)	Percent Forested	% Land Area Public Hunting	Harvest Male	Harvest Female	Harvest Total
AL	51,628	48,014	93	71	5	145,000	192,000	337,000
AR	52,609	44,718	85	53	12	98,910	93,838	192,748
DE	1,954	714	36	15	10	6,505	7,054	13,559
FL	51,628	29,280	50	45	16	88,912	47,276	136,188
GA	57,800	37,181	64	64	6	141,591	269,890	411,481
KY	40,395	39,654	97	59	9	65,932	53,731	119,663
LA	41,406	26,562	64	52	4	74,480	58,520	133,000
MD	9,837	8,766	89	41	4	43,278	52,094	95,372
MO	69,561	21,396	31	31	4	153,503	135,091	288,594
MS	47,296	31,250	66	66	6	131,502	140,773	272,275
NC	48,794	35,089	72	58	6	117,237	102,750	219,987
OK	69,919	37,425	54	19	3	66,320	46,543	112,863
SC	30,207	21,920	73	63	7.5	120,407	106,051	226,458
TN	42,246	25,770	61	49	9	95,913	71,789	167,702
TX	261,914	152,730	58	40	<2	309,207	265,601	574,808
VA	39,589	35,642	90	59	8	119,882	113,106	233,104[1]
WV	24,064	22,972	95	79	9	84,415	50,650	135,696[1]
Avg or	940,847	619,083	69.3	51.2	7	1,862,994	1,806,757	3,670,498

Table 1. Continued.

State	Harvest/sq. mi. Deer Habitat	Method of Data Collection[2]	Estimated Pre-season Population	Length of Season (Days)[3]			Method of Setting Seasons[4]	% Land Area Open to Dog Hunting
				Archery	Black Powder	Firearms		
AL	7.2	A,B,C,I	1,600,000	109 (A,C)	5 (A,C)	74 (A,C)	A,B	70
AR	4.3	A,C, F, G	800,000	166 (C)	12 (C)	49 (C)	A,B	70
DE	8.51	B, F, G	36,000	131 (C)	14 (A,B)	35 (A,B)	A,B,C	0
FL	4.7	E		30	9	72	A,B	20
GA	11.1	A,C,D,E, G	1,000,000	115-146 (C)	80-95 (A,C)	73-88 (C)	A,B,C	23
KY	3.0	D,F,G	~1,000,000	136 (C)	3(A), 9(B)	10-16 (C) + 4 Jr. days	A,B,C	0
LA	5.0	A,B,C	500,000	123(C)	14(A,B)	65	A,B,C	80
MD	10.9	B,C,D,F,G	233,000	95 (C)	3+9 (A), 13 (B)	13 (A), 2 (B), + 2 Jr. day	A,B,C	0
MO	13.5	B,C,D,F,G	1,400,000	98	11	25	A,B	0
MS	8.7	C, E	1,700,000	122 (C)	12 (A),14 (B)	46	C	90
NC	6.3	A,B,C,D,F,G	1,350,000	21-56	12	18-68	A,B,C	50
OK	3.0	A,C, E, online	550,000	107 (C)	9	16	A,B	0
SC	10.6	A,B,C	750,000	16 (A)	10 (A)	70-140	C	60
TN	6.5	A,D	600,000	40	14	47	A,B,C	0
TX	3.76	B,C	3.3 million [5]	35	14	79-93 (B, C)	A,B	0
VA	6.5	A,B,C,D,F	~900,000	42-72	12-31	13-43	A,B	55
WV	5.9	A	629,000	85 (C)	12 (C)	22 (C)	A,B,C	0
Avg. or Total	7.03		16.2-16.4 million					30.47

Table 1. Continued.

State	No. of Hunters	5-Year Trend	Hunting License Fees (Full Season)		Tagging System		
			Resident	Non-Resident	Physical Tag? License Tag? None?	Mandatory? Volunteer? None?	Bonus Tags Available?
AL	197,100	Down	$24.20	$277.70	Hunter Log	Mandatory	N/A
AR	300,000	Stable	$10.50 – 25	$50 – 300	License Tag	Mandatory	Female/Mgt buck
DE	19,267	Stable	$25	$130+	Physical Tag	Mandatory	2 Antlered, Unlimited Antlerless
FL	136,966	Stable	$12	$151	Some WMAs	Mandatory	No
GA	301,993	Stable	$19-$43	$295-$373	License Tag	Mandatory	WMAs
KY	286,290[6]	Stable	$50	$190	License Tag/ Hunter Log	Mandatory	Yes
LA	158,600	Stable	$29-50	$300-352	Physical Tag	Mandatory	DMAP
MD	57,000	Stable	$36.50	$130	Physical Tag	Mandatory	Antlered only
MO	511,475	Stable	$17	$225	License Tag	Mandatory	Antlerless only
MS	106,498	Up	$18.85-33.85	$303.85-382.70	None	None	Antlerless,
NC	240,800	Stable	$25	$120	License Tag	Mandatory	Antlerless Only
OK	378,245	Stable	$25	$280	License Tag	Mandatory	DMAP
SC	140,152	Down	$25	$225	None	None	Yes & DMAP
TN	200,000	Down	$56	$251	Physical	Mandatory	Quota permits
TX	658,819	Stable	$25	$315	License Tag	None	MLDP permits
VA	240,000	Down	$46-82	$197-259	License Tag	Mandatory	Unlimited on private lands, antlerless only
WV	215,000	Stable	$35	$196	Physical Tag	Mandatory	Yes
Total	4,148,205						

Table 1. Continued.

State	Mandatory Hunter Ed.	Mandatory Orange	Handguns Permitted	Crossbows Permitted	Drugged Arrows Permitted	# Fatal Hunting Accidents		Highway Kill[7]
						All	Deer	
AL	Yes	Yes	Yes	Yes	No	6	2	23,000 (B)
AR	Yes	Yes	Yes	Yes	No	3	3	20,281 (C)
DE	Yes	Yes	Yes	Yes	No	0	0	4,963 (B)
FL	Yes	Yes	Yes	Yes	No	0	0	Unknown
GA	Yes	Yes	Yes	Yes	No	4	3	50,000 (C)
KY	Yes	Yes	Yes	Season & Handicap	No	2	1	2,938 (A)
LA	Yes	Yes	Yes	Yes	No	0	0	10,182 (C)
MD	Yes	Yes	Yes	Yes	No	0	0	34,000 (C)
MO	Yes	Yes	Yes	Yes, Firearms	No	2	1	36,592 (C)
MS	Yes	Yes	Yes	Yes, Firearms, Primitive Weapons	No	3	2	16,004 (C)
NC	Yes	Yes	Yes	Yes	No	5	2	48,362 (C)
OK	Yes	Yes	Yes	Yes	No	0	0	12,056 (C)
SC	Yes	WMAs only	Yes	Yes	No	5	5	2,044 (A)
TN	Yes	Yes	Yes	Yes	No	2	1	24,000 (C)
TX	Yes	WMAs only	Yes	Yes	No	2	0	45,418 (C)
VA	Yes	Yes	Yes	Yes	No	14	1	51,800 (C)
WV	Yes	Yes	Yes	Yes (Disabled)	No	2	2	20,295 (A)
Total						50	23	401,935

Table 1. Continued.

State	Limits [8]			Antler Restrictions [9]	% Hunting Success[10]			Avg. Leasing Fees/Acre
	Season	Antlerless	Antlered		Archery	Muzzleloader	Firearms	
AL	3/None[8]	2 per day	3	B,C (1 County, 6 WMAs)	~15	~20	~45	$5-16
AR	6	3-6	2	A,C	?	?	?	$6-10
DE	None	4+	2	One buck must have a spread ≥15"	?	?	?	?
FL	2/day [8]	1 or 2/day[8]	2/day [8]	C	23	20	57	$2-4
GA	12	10	2	A (One buck must be 4-points on 1 side)	31	22	53	$5-20
KY		Varies	1	B (9 counties are C (10 WMAs)	----------	41% Combined	-------------	$15-25
LA	6	3	3	Yes (C)	20	20	45	$5-30
MD	Varies	3 with 1 bonus in Region B	3 with 1 bonus in	No	42	38 (C)	44	$5-35
MO	Varies	Varies	3; 1 with firearm	Yes, 69 counties	20	-	37	$10
MS	8	5	3	C	46	48	60	?
NC	6[8]	6[8]	2/4 [8]	NA	----------	49% Combined	-----------------	$2-6
OK	6	Up to 6	2	No	27	22	35	$5-10
SC	15+	10+	5+	C (10 WMAs)	32	33	67	$8–10+
TN		Varies	3 statewide	None	----------	47% Combined	-------------------	$5-10
TX	5	Up to 5	Up to 3	C	----------	58% Combined	------------------	$7-15
VA	6 (east) &	6	3 (east)&	On 2 WMAs + 2 Counties	~35	~39	~53	?
WV	11	Up to 9	Up to 3	6 WMAs	34	16	48	$1-6
Avg.					29.5	27.8	49.4	

Table 1. Continued.

State	Private Lands Programs				Trailing wounded deer with dogs legal?	Supplemental feeding legal?	Baiting legal?
	Type[11]	Min. Acreage Requirements	Fee	No. of Cooperators			
AL	A	None	Yes	100	Yes	Yes	No
AR	A	None	None	800	Yes	Yes	Yes, Private
DE	DDAP SDDAP	None	None	148 174	No	Yes	Yes
FL	A	640	None	1,590	Yes	Yes	Yes
GA	None				Yes	Yes	No-North Zone Yes-South Zone
KY	B	None	None	275	Yes	Yes (except March – May)	Yes, Private
LA	A	40	Yes	704	Yes	Yes	Yes, Private
MD	None				Yes	Yes	Yes, Private Only. None W CWD
MO	B	5	None	150,000	Yes	Yes	No
MS	A,D	Variable	None	538	Yes	Yes	No
NC	A	Regional; 1,000/500	$50	81	Yes	Yes	Yes
OK	A	1,000	$200-400	151	No	Yes	Yes
SC	A	None	$50	1,616	Yes	Yes	Yes 28 co.
TN	None				With officer approval	Yes	No
TX	A,B,C	None	None	7,887	Most of Texas	Yes	Yes
VA	DCAP DMAP	None	None	864 708	Yes (no weapon)	No (Sept 1 – first Sat in Jan)	No
WV	None				No	Yes[12]	Yes[12]

Table 1. Continued; footnotes.

[1] Total harvest includes deer of unknown gender.

[2] A–Check Station; B–Mail Survey; C–Jawbone Collection; D–Computer Models; E–Telephone Survey; F–Telecheck; G– Butchers/Processors, H – Harvest card submitted end of season, I – Voluntary Internet Reporting.

[3] A–Early Season; B–Late Season; C–Full Season.

[4] A–Harvest & Biological; B–Departmental/Commission Regulatory; C–Legislative.

[5] Texas population estimates should not be compared to estimates prior to 2005 due to changed methodology.

[6] Asterisk if estimate includes landowner exempted hunters.

[7] A–Actual number based on reports; B–Estimated road kill; C-State Farm estimate

[8] AL – 3 antlered bucks per season. No season limit on antlerless deer.

FL – A total of two deer may be harvested per day. Both may be antlerless deer during archery season and if taken with antlerless deer permits. Only one/day may be antlerless during the 7-day antlerless deer season.

MD – Unlimited antlerless archery bag limit in Region B. Statewide antlerless bag limit of 1 buck per weapon (bow, muzzleloader, firearm). One bonus buck can be taken in Region B after buying bonus stamp and harvesting two antlerless deer.

MO – No daily or annual limit of antlerless deer but number that can be harvested in each county varies.

NC – Up to 2 buck in areas in the western, northwestern, and central deer seasons. Up to 4 bucks in areas in the eastern deer season. Unlimited bonus antlerless tags are available.

[9] A–Statewide Antler Restrictions; B–County Antler Restrictions; C–Region or Area Antler Restrictions.

[10] Averages do not include combined reports.

[11] A–DMAP; B–Landowner tags; C–Antlered buck tags; D–Fee MAP.

[12] Except for CWD area and public land from September 1 through December 31