33rd Annual Meeting

Southeast Deer Study Group

QDM to IDM: The Next Step or the Last Straw?

San Antonio, Texas
February 28 – March 2, 2010

2010 Southeast Deer Study Group Meeting

Hosted by Texas Parks & Wildlife Department and
Texas Chapter of The Wildlife Society

COMMITTEES

MEETING ORGANIZER & CHAIRMAN

Mitch Lockwood

FINANCE

Fred Bryant (Chair)
Carter Smith
Mitch Lockwood
Donnie Draeger

DOOR PRIZES

Kevin Schwausch (Chair)
Donnie Draeger
David Veale

LOCAL ARRANGEMENTS

Donnie Frels (Co-Chair)
Jimmy Rutledge (Co-Chair)

REGISTRATION

Dale Prochaska (Chair)
Mary Ann Urban
Peggy Osborne
Lisa Wolle
Deanne Gonzales

PROGRAM & AGENDA

Alan Cain (Chair)
Justin Foster
Mike Miller
Billy Lambert
Daniel Kunz

DISPLAY & EXHIBITS

David Synatzske
Jeff Gunnels
David Forrester
Kevin Schwausch
Elishea Smith
James Rice
Mike Wallace

AUDIO – VISUAL

Lisa Harrison
Mark Thurman
Eric Garza

WELCOME

The Texas Parks & Wildlife Department welcomes you to the 33rd Annual Southeast Deer Study Group Meeting in San Antonio, Texas.

We would like to thank the following sponsors and donors for their generous donations and contributions to this meeting.

CONFERENCE SPONSORS

William O. Barrett

Rene R. Barrientos

Lee M. Bass

Kenneth R. Bell – Quick Line Service Company

Albert M. Biedenharn III – Crescent C Ranch

Ralph Duggins

Royce Faulkner

T. Dan & Debra Friedkin

Karen & Tim Hixon

Peter Holt – Holt Foundation

Dan Allen Hughes Jr.

International Bank of Commerce (IBC)

Steve C. Lewis – Jefferson Bank

Balous & Julie Miller

Ray A. Murski – Flint Creek Ranch

Bobby Parker – Parker Drilling Company

Happy Rogers – Buckhorn Museum and Saloon

Stuart Stedman – Stedman West Foundation

Buddy Temple – Temple Ranch

Texas Parks & Wildlife Foundation

Texas Wildlife Association

Ben & Patt Wallace – Macabi Ranch

J.P. Zachry – Rondado Properties LLC

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 locations, and themes 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 33rd 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.

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?

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

STATE	NAME	EMPLOYER
Alabama	Chris Cook	Alabama Department of Conservation & Natural Resources
Arkansas	Brad Miller	Arkansas Game & Fish Commission
Delaware	Joe Rogerson	Delaware Division of Fish & Wildlife
Florida	Cory R. Morea Steve Shea	Florida Fish & Wildlife Conservation Commission St. Joe Company
Georgia	Charlie Killmaster Karl V. Miller	Georgia Department of Natural Resources University of Georgia
Kentucky	Tina Brunjes	Kentucky Department of Fish & Wildlife Resources
Louisiana	Emile LeBlanc Scott Durham	Louisiana Department of Wildlife & Fisheries Louisiana Department of Wildlife & Fisheries
Maryland	Brian Eyler George Timko	Maryland Department of Natural Resources Maryland Department of Natural Resources
Mississippi	Chad Dacus Steve Demarais (Ch)	Mississippi Department of Wildlife, Fisheries, & Parks Mississippi State University
Missouri	Lonnie Hansen Jason Sumners	Missouri Department of Conservation Missouri Department of Conservation
North Carolina	David Sawyer Evin Stanford	North Carolina Wildlife Resources Commission North Carolina Wildlife Resources Commission
Oklahoma	Kenneth L. Gee Jerry Shaw	The Noble Foundation Oklahoma Department of Wildlife & Conservation
South Carolina	David C. Guynn, Jr. Charles Ruth	Clemson University South Carolina Department of Natural Resources
Tennessee	Daryl Ratajczak Ben Layton	Tennessee Wildlife Resource Agency Tennessee Wildlife Resource Agency
Texas	Mitch Lockwood Bob Zaiglin	Texas Parks & Wildlife Department Southwest Texas Junior College
Virginia	Matt Knox Nelson Lafon	Virginia Department of Game & Inland Fisheries Virginia Department of Game & Inland Fisheries
West Virginia	Jim Crum	West Virginia Division of Natural Resources

SOUTHEAST DEER STUDY GROUP AWARDS

CAREER ACHIEVEMENT AWARD

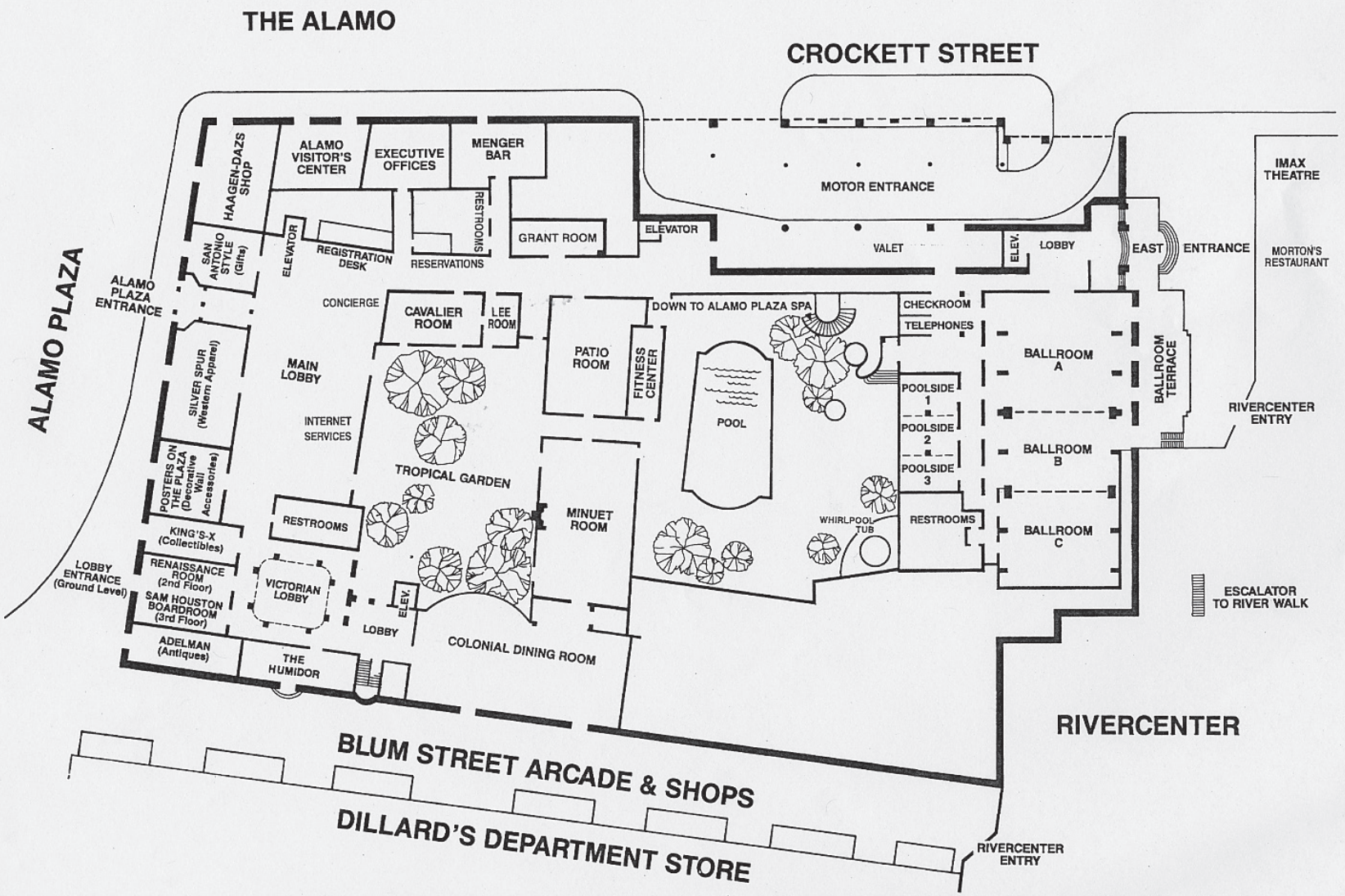
1996 – Richard F. Harlow
1997 – Larry Marchinton
1998 – Harry Jacobson
1999 – David C. Guynn, Jr.
2000 – Joe Hamilton
2002 – Robert L. Downing
2004 – Charles DeYoung
2005 – Kent E. Kammermeyer
2006 – William E. "Bill" Armstrong
2007 – Jack Gwynn
2008 – (none)
2009 – David E. Samuel

OUTSTANDING STUDENT 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)

San Antonio's MENGER HOTEL

The Menger Hotel/204 Alamo Plaza/San Antonio, Texas 78205/Telephone (210) 223-4361/Toll Free (800) 345-9285/FAX (210) 223-1328
www.mengerhotel.com/e-mail: menger@ipsa.net



SCHEDULE OF EVENTS

SUNDAY, FEBRUARY 28, 2010

3:00 p.m.	Deer Committee Meeting	Renaissance Room
1:00 p.m. – 5:00 p.m.	Registration	Patio Room
1:00 p.m. – 5:00 p.m.	Poster Setup	Cavalier Room
6:00 p.m.	Social & Dinner	Buckhorn Museum

MONDAY, MARCH 1, 2010

7:00 a.m. – 12:00 p.m.	Registration	Patio Room
7:00 a.m. – 8:00 a.m.	Poster Setup	Cavalier Room
8:00 a.m. – 5:00 p.m.	Poster Session	Cavalier Room
8:00 a.m. – 9:45 a.m.	Plenary Session	Ballroom
9:45 a.m. – 10:05 a.m.	Break	Minuet Room
10:05 a.m. – 10:10 a.m.	Announcements & Door Prizes	Ballroom
10:10 a.m. – 11:50 a.m.	Technical Session	Ballroom
11:50 a.m. – 1:25 p.m.	Lunch	On Your Own
1:25 p.m. – 1:30 p.m.	Announcements & Door Prizes	Ballroom
1:30 p.m. – 3:10 p.m.	Technical Session	Ballroom
3:10 p.m. – 3:30 p.m.	Break	Minuet Room
3:30 p.m. – 3:35 p.m.	Announcements & Door Prizes	Ballroom
3:35 p.m. – 5:15 p.m.	Technical Session	Ballroom
5:15 p.m. – 7:00 p.m.	Dinner	On Your Own
7:00 p.m. – 11:00 p.m.	Shoot From The Hip	Buckhorn Museum

TUESDAY, MARCH 2, 2010

8:00 a.m. – 5:00 p.m.	Poster Session	Cavalier Room
8:15 a.m. – 8:20 a.m.	Announcements & Door Prizes	Ballroom
8:20 a.m. – 10:00 a.m.	Technical Session	Ballroom
10:00 a.m. – 10:20 a.m.	Break	Minuet Room
10:20 a.m. – 10:25 a.m.	Announcements & Door Prizes	Ballroom
10:25 a.m. – 12:05 p.m.	Technical Session	Ballroom
12:05 p.m. – 1:35 p.m.	Lunch	On Your Own
1:35 p.m. – 1:40 p.m.	Announcements & Door Prizes	Ballroom
1:40 p.m. – 3:20 p.m.	Technical Session	Ballroom
3:20 p.m. – 3:40 p.m.	Break	Minuet Room
3:40 a.m. – 3:45 p.m.	Announcements & Door Prizes	Ballroom
3:45 p.m. – 5:05 p.m.	Technical Session	Ballroom
5:05 p.m.	Business Meeting	Renaissance Room
6:00 p.m. – 7:00 p.m.	Pre-Banquet Social	Ballroom Foyer
7:00 p.m.	Awards Banquet	Ballroom

MONDAY, MARCH 1, 2010

PLENARY SESSION
Menger Hotel – Ballroom

Moderator: **CLAYTON WOLF**

8:15 a.m. OPENING REMARKS; Carter Smith, Executive Director, Texas Parks & Wildlife Department

8:30 a.m. TEXAS PARKS & WILDLIFE DEER MANAGEMENT PROGRAMS; Mitch Lockwood, White-tailed Deer Program Leader, Texas Parks & Wildlife Department

8:55 a.m. DEER MANAGEMENT & DEER HUNTING: HOW FAR IS TOO FAR ON THE CONTINUUM?; Bob Brown, Dean, College of Natural Resources, North Carolina State University

9:20 a.m. A LANDOWNER'S / MANAGER'S PERSPECTIVE ON INTENSIVE DEER MANAGEMENT; Stuart W. Stedman, Stedman West Interest Inc. and Faith Ranch, Houston and Carrizo Springs, Texas

9:45 a.m. Break (20 minutes)

TECHNICAL SESSION: POPULATION SURVEY METHODS
Menger Hotel – Ballroom

Moderator: **DAVE HEWITT**

10:05 a.m. ANNOUNCEMENTS & DOOR PRIZES

10:10 a.m. DISTANCE SAMPLING TECHNIQUES FOR ESTIMATING WHITE-TAILED DEER DENSITY: AN OVERVIEW AND CASE STUDY

10:30 a.m. COMPARATIVE ANALYSIS OF POPULATION ESTIMATORS IN A KNOWN POPULATION OF WHITE-TAILED DEER

10:50 a.m. STAND SURVEY OF WHITE-TAILED DEER AND POPULATION ESTIMATES USING BOWDEN'S ESTIMATORS

11:10 a.m. BIAS ASSOCIATED WITH BAITED CAMERA SITES FOR ASSESSING POPULATION CHARACTERISTICS OF WHITE-TAILED DEER

11:30 a.m. RELATIONSHIP BETWEEN STEM COUNT INDICES AND ESTIMATED WHITE-TAILED DEER DENSITY

11:50 a.m. Lunch

TECHNICAL SESSION: SUPPLEMENTAL FEEDING EFFECTS: PART 1
Menger Hotel – Ballroom

Moderator: CHARLIE DEYOUNG

1:25 p.m. ANNOUNCEMENTS & DOOR PRIZES

1:30 p.m. EFFECTS OF HIGH PROTEIN VS. NATURAL FORAGE ON RUMEN RETICULUM MORPHOLOGY IN WHITE-TAILED DEER

1:50 p.m. ASSESSING THE EFFECTS OF SUPPLEMENTAL FEEDING ON WHITE-TAILED DEER PRODUCTIVITY USING STABLE ISOTOPES

2:10 p.m. USING STABLE ISOTOPES TO DETERMINE PERCENT OF PELLETED FEED IN FREE-RANGING WHITETAIL DIETS

2:30 p.m. NUTRITION AND PHYSIOLOGY OF WHITE-TAILED DEER CONSUMING WHOLE COTTONSEED

2:50 p.m. EFFECTS OF SUPPLEMENTAL FEED AND DENSITY ON WHITE-TAILED DEER ANTLER GROWTH

3:10 p.m. Break (20 Minutes)

TECHNICAL SESSION: HUNTING & MANAGEMENT
Menger Hotel – Ballroom

Moderator: BILLY LAMBERT

3:30 p.m. ANNOUNCEMENTS & DOOR PRIZES

3:35 p.m. HUNTER SATISFACTION AND IMPLEMENTATION OF QUALITY DEER MANAGEMENT IN WEST TENNESSEE

3:55 p.m. ANDERSON-TULLY COMPANY QDM (QUALITY DEER MANAGEMENT): SUCCESS BY IPM (INTENSIVE PEOPLE MANAGEMENT)

4:15 p.m. EFFECTS OF HUNTER DENSITY ON MALE WHITE-TAILED DEER MOVEMENTS IN SOUTH-CENTRAL OKLAHOMA

4:35 p.m. PERSPECTIVE ON INTENSIVE DEER MANAGEMENT FROM ALDO LEOPOLD

4:55 p.m. THE FUTURE OF RECREATIONAL DEER HUNTING: SPORT OF KINGS OR CONTINUED AMERICAN TRADITION?

5:15 p.m. Dinner

SHOOT FROM THE HIP
Buckhorn Museum

7:00 p.m. INTENSIVE DEER MANAGEMENT TECHNIQUES – A PATH TO PURGATORY OR PARADISE?

TUESDAY, MARCH 2, 2010

TECHNICAL SESSION: INFLUENCING ANTLER CHARACTERISTICS
Menger Hotel – Ballroom

Moderator: TY BARTOSKEWITZ

8:15 a.m. ANNOUNCEMENTS & DOOR PRIZES

8:20 a.m. EFFECTS OF SELECTIVE HARVEST ON ANTLER SIZE IN WHITE-TAILED DEER: A MODELING APPROACH

8:40 a.m. WHITE-TAILED DEER ANTLER RESEARCH: A CRITIQUE OF DESIGN AND ANALYSIS METHODOLOGY

9:00 a.m. CAN CULLING BUCKS LEAD TO GENETIC CHANGE ON LARGE ACREAGES

9:20 a.m. EFFECTS OF GENETIC HETEROZYGOSITY ON ANTLER DEVELOPMENT IN THE PROGENY OF SPIKE-ANTLERED SIRES

9:40 a.m. REPEATABILITY OF ANTLER CHARACTERISTICS IN SOUTH TEXAS

10:00 a.m. Break (20 Minutes)

TECHNICAL SESSION: SUPPLEMENTAL FEEDING EFFECTS: PART 2
Menger Hotel – Ballroom

Moderator: JEFF GUNNELS

10:20 a.m. ANNOUNCEMENTS & DOOR PRIZES

10:25 a.m. DO INCREASED WHITE-TAILED DEER DENSITIES AND SUPPLEMENTAL FEEDING REDUCE PALATABLE PLANT ABUNDANCE?

10:45 a.m. DOES SUPPLEMENTAL FEEDING AFFECT STEM COUNT INDICES?

11:05 a.m. EFFECTS OF SUPPLEMENTAL FEED ON FORAGING BEHAVIOR AND DIET COMPOSITION OF WHITE-TAILED DEER

11:25 a.m. EFFECTS OF WHITE-TAILED DEER DENSITY AND SUPPLEMENTAL FEEDING ON VEGETATION BIOMASS

11:45 a.m. AN EVALUATION OF THE EFFECTS OF BIOSTIMULANTS ON ESTABLISHMENT AND GROWTH OF WILDLIFE FORAGES

12:05 p.m. Lunch

TECHNICAL SESSION: AIDS TO SELECTIVE HARVEST MANAGEMENT
Menger Hotel – Ballroom

Moderator: CHAD DACUS

1:35 p.m. ANNOUNCEMENTS & DOOR PRIZES

1:40 p.m. AGING ON THE HOOF: FACT OR FANTASY?

2:00 p.m. AGING PHOTOGRAPHED MALE DEER USING MORPHOMETRIC RATIOS

2:20 p.m. EVALUATING ACCURACY OF ESTIMATING GROSS ANTLER SCORE USING PHOTOGRAPHS

2:40 p.m. THE ROLE OF WILDLIFE MANAGEMENT ASSOCIATIONS IN ESTABLISHING THE ANTLER-RESTRICTION REGULATIONS IN TEXAS

3:00 p.m. A CASE STUDY OF AN ANTLER HARVEST RESTRICTION ON A PUBLIC HUNTING AREA

3:20 p.m. Break (20 Minutes)

TECHNICAL SESSION: DEER ECOLOGY & MANAGEMENT

Menger Hotel – Ballroom

Moderator: **RANDY DEYOUNG**

3:40 p.m. ANNOUNCEMENTS & DOOR PRIZES

3:45 p.m. OPTIMIZING MEDETOMIDINE DOSE COMBINED WITH KETAMINE AND TILETAMINE-ZOLAZAPAM TO IMMOBILIZE WHITE-TAILED DEER

4:05 p.m. DOES FAWNING HABITAT INFLUENCE PREDATION RISK?

4:25 p.m. EFFECTS OF DEER DENSITY ON PREDATION LEVELS IN SOUTH CAROLINA

4:45 p.m. EFFECTS OF RAINFALL AND DEER ABUNDANCE ON THE CONDITION AND PRODUCTIVITY OF A SOUTH TEXAS DEER HERD

6:00 p.m. Banquet Social

7:00 p.m. Banquet

POSTER SESSION

Menger Hotel – Cavalier Room

- WHITE-TAILED DEER: A THREAT TO THE CATTLE FEVER TICK ERADICATION PROGRAM?
- PHYSIOLOGICAL ANALYSIS OF WHITE-TAILED DEER IN COASTAL NORTH CAROLINA
- MORPHOLOGICAL VARIATION IN MALE WHITE-TAILED DEER IN MISSISSIPPI
- AGGRESSIVE BEHAVIOR IN WHITE-TAILED DEER AT SUPPLEMENTAL FEED SITES
- QUANTIFYING MOVEMENT PATTERNS OF MALE WHITE-TAILED DEER DURING THE BREEDING SEASON
- A SPATIALLY EXPLICIT MODEL OF THE WHITE-TAILED DEER POPULATION IN DELAWARE
- DIET SELECTION PATTERNS OF WHITE-TAILED DEER FAWNS
- EFFECTS OF DEER DENSITY AND SUPPLEMENTAL FEEDING ON PALATABLE PLANTS
- DEER FOOD PLANT RESPONSES TO INTENSIVE LOBLOLLY PINE STAND REGENERATION REGIMES
- A SUMMARY OF IMPLEMENTING TELEPHONE GAME CHECKING IN ARKANSAS
- SPATIAL AND TEMPORAL RELATIONSHIPS BETWEEN DEER HARVEST AND DEER-VEHICLE COLLISIONS AT OAK RIDGE RESERVATION, TENNESSEE
- DISTANCE SAMPLING USING GROUND BASED THERMAL IMAGERY – AN EFFECTIVE DEER MANAGEMENT TOOL FOR STATE WILDLIFE AGENCIES
- RESPONSE OF NON-GAME SPECIES TO WHITE-TAILED DEER FOOD PLOTS IN APPALACHIAN HARDWOOD FORESTS
- WHITE-TAILED DEER MOVEMENTS IN RESPONSE TO FLOOD EVENTS IN EASTERN ARKANSAS
- FAWN USE OF SUPPLEMENTAL FEED IN SOUTH TEXAS
- ESTIMATING MOUNTAIN LION DISTRIBUTION IN TEXAS BASED ON PREDICTIVE ECOLOGICAL NICHE MODELING WITH THE GENETIC ALGORITHM FOR RULE-SET PREDICTION
- DEVELOPING SIGHTABILITY MODELS FOR AERIAL SURVEYS OF DEER ON RANGELANDS

Abstract Presentations

Monday, 10:10 am

Distance sampling techniques for estimating white-tailed deer density: an overview and case study

Charles W. Anderson, Clayton K. Nielsen, Ryan D. Hubbard, Janice K. Stroud, and Eric M. Schauber – Cooperative Wildlife Research Laboratory of Zoology, Southern Illinois University; Cyrus M. Hester – Cooperative Wildlife Research Laboratory of Forestry, Southern Illinois University

Abstract: Distance sampling has been used to estimate population density for >60 wildlife species in >135 countries. Although wildlife biologists need reliable estimates of white-tailed deer (*Odocoileus virginianus*) density to facilitate management decisions, few studies have examined distance sampling as a density estimation technique for deer. During winters 2007-08, we conducted direct and indirect distance sampling surveys for deer in 3 study areas: southern Illinois (SI), east-central Illinois (EI), and the northern-lower peninsula of Michigan (NM). We were interested in potential differences between density estimates derived via direct methods (i.e., spotlight surveys conducted via road transects) versus indirect methods (i.e., pellet surveys via random walking transects). Density estimates obtained via indirect sampling [mean deer/mi^2, (95% CI)] for NM, EI, and SI were 33.7 (27.5-41.7), 31.1 (19.7-49.0), and 40.2 (30.6-52.9), respectively. Density estimates obtained via direct sampling for NM, EI, and SI were 51.8 (43.3-62.7), 20.2 (13.2-31.3), and 45.8 (35.5-59.3), respectively. Non-overlapping CI for the NM study site indicates the direct distance sampling estimate was significantly higher than the indirect distance sampling estimate. In landscapes consisting of a greater interspersion of open lands and forest cover (i.e., Illinois), both distance sampling methods provide similar results, indicating no bias regarding transect placement. However, in more forested landscapes, transect placement matters: deer may be attracted to roadsides, resulting in higher density estimates not indicative of surrounding forested areas. We conclude by discussing the advantages of distance sampling compared to other deer survey techniques, namely the ability to convert spotlighting indices into actual density estimates.

* Student Presenter

NOTES

Monday, 10:30 am

Comparative analysis of population estimators in a known population of white-tailed deer

Ryan Reitz, Mark Mitchell, Kevin Schwausch, Justin Foster, and Jay Carroll – Texas Parks & Wildlife Department; Floyd Weckerly – Department of Biology, Texas State University

Abstract: The number of small geographically closed populations of white-tailed deer is increasing in the Edwards Plateau of Texas. Also, there is little information on the reliability of population estimators at small scales within the ecoregion. We compared formal (infrared triggered camera, distance sampling) and informal population estimators (spotlight, Hahn, mobile, stand, and helicopter) on a known population of white-tailed deer within a 528 acre high-fenced enclosure. Estimated sex ratios and abundance were compared to known values. Precision (Percent Coefficient of Variation) and accuracy (percent relative bias) of all methods were highly variable within and across years. Precision ranged from 4.1% (Blind Count in the afternoon) to 70.1% (Hahn Line) and 11.3% to 26.0% for informal and distance sampling estimates respectively. Relative bias ranged from -66.7% (Helicopter) to 42.1% (Spotlight) and -49.2% (Camera) to -11.1% (Camera) in informal and formal estimators respectively. Relative bias of sex ratio estimates ranged from -71.8% (Hahn Line) to 107.6% (Camera). Managers should recognize the variability in precision and accuracy of population and sex ratio estimates within small high-fenced enclosures. Combining estimates from formal and informal methods may provide reliable estimates.

NOTES

Monday, 10:50 am

Stand surveys of white-tailed deer and population estimates using Bowden's estimators

Floyd W. Weckerly - Texas State University; Justin Foster – Texas Parks & Wildlife Department

Abstract: Providing supplemental feed and managing white-tailed deer (*Odocoileus virginianus)* on small parcels of land is increasing. Yet, there has been little work addressing how to estimate population abundance and herd composition on small land parcels. We conducted stand surveys of white-tailed deer in a 528 acre enclosure in central Texas in 2007 and 2008 to address two main objectives. One, evaluate a stand survey protocol developed for use on small land parcels and, two, use stand survey data to conduct simulations evaluating the reliability of abundance and sex ratio estimates obtained from Bowden's estimator. Population abundances, sex ratios, and sighting frequencies of every animal were known. The enclosure had five stands where corn was provided and surveys were conducted at dawn and dusk. The protocol was adequate for observing many deer in populations. We conducted 10,000 bootstrap simulations to evaluate bias and precision of abundance and sex ratio estimates in relation to percentage of population marked, number of surveys, and whether surveys were conducted in the morning, evening, and both morning and evening. Also, abundance was evaluated in relation to whether uniquely marked animals were identified to individual and sex ratio was evaluated in relation to the intersexual distribution of marks. Abundance estimates were less biased and more precise when all marked animals were uniquely identified and 40 – 70 percent of the population was marked. Sex ratio estimates were less biased when 40 – 70 percent of the population was marked; however, they were less precise than abundance estimates.

NOTES

Monday, 11:10 am

Bias associated with baited camera sites for assessing population characteristics of white-tailed deer

Clint McCoy and Stephen S. Ditchkoff – Auburn University School of Forestry and Wildlife Science

Abstract: Because of its ease of use and cost efficiency, remote photography seems to be increasing in its popularity as a tool for scientists and wildlife biologists. Camera surveys have been used to estimate population parameters among a variety of species, including white-tailed deer. However, this survey technique involves placing bait in front of the camera in order to capture animals more frequently, which could introduce biases in parameter estimates. From September 2008 to March 2009, we monitored cameras placed at random, along game trails, and at feed stations to determine if sex/age structure could be accurately assessed in a population of white-tailed deer. Since cameras placed at random should provide the least biased estimates of population structure, we compared estimates from feed stations and trail-based cameras to those from random sites to determine if they accurately assess population structure. Our results indicated that there was no single time period in which, both sex ratio and recruitment, estimates could be determined accurately from cameras placed at feed stations. Trail-based camera surveys provided population estimates very similar to those from random sites, and may provide a feasible alternative to using baited camera stations.

* Student Presenter

NOTES

Monday, 11:30 am

Relationship between stem count indices and white-tailed deer

Jimmy Rutledge, Alan T. Cain, Daniel J. Kunz, and Evan McCoy – Texas Parks & Wildlife Department; Timothy E. Fulbright, Charles A. DeYoung, and David G. Hewitt – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville

Abstract: The Stem Count Index Method is used by the Texas Parks & Wildlife Department to determine whether herbivore densities are within carrying capacity of the habitat by estimating use of woody plants. We determined the relationship between Stem Count Indices and estimated deer density. Pairs of 200 acre enclosures on the Comanche and Faith Ranches near Carrizo Springs, Texas, contain low, medium, and high deer densities. Densities are estimated twice/year using trail cameras and deer are added or removed from enclosures. One of each pair of enclosures is provided protein pellets ad libitum. Percent of browsed twig tips of woody plant species was estimated in winter (January or February) and summer (August), 2004-2009. Plants were classed according to palatability with first choice plants the most palatable and third choice plants the least palatable. Percent of browsed twigs was greater ($P < 0.05$) during winter than summer for first and second choice plants, but was similar between seasons for third choice plants ($P = 0.48$, averaged across years). Percent of second choice twigs browsed was more closely related to estimated deer density ($r^2 = 0.62$ to 0.82, 2005 to 2008) during winter than percent of first ($r^2 = 0.34$, averaged across years) or third ($r^2 = 0.20$) choice twigs browsed. Stem Count Index estimates for second choice plants during winter appear to be strongly related to estimates of deer density made with the trail camera technique.

NOTES

Monday, 1:30 pm

Effects of high protein vs. natural forage on rumen-reticulum morphology in white-tailed deer

Ryan Luna and Floyd Weckerly – Department of Biology, Texas State University

Abstract: Browsers such as white-tailed deer (Odocoileus virginianus) respond to changes in the quality and quantity of their diet. In order to better understand how deer respond to changes in diet, we studied the rumen-reticulum characteristics of deer fed natural forage compared to deer fed solely a high protein pelleted diet. The studies were conducted during October 2008 at Mason Mountain Wildlife Management Area in Mason County, Texas for the deer on natural forage, and Kerr Wildlife Management Area in Kerr County, Texas for the deer on a high protein, pelleted diet. Animals were sacrificed and their body weights were taken. The rumen-reticulum along with its contents was excised and weighed. The rumen-reticulum was emptied of its contents, reweighed, and the capacity was measured. Surface enlargement factor (SEF) and papillae density were measured and a bacterial count was conducted from the rumen fluid. The findings suggested that there are papillae density differences between deer on natural forage compared to deer solely consuming protein. Changes in papillae density augment the absorptive surface area in the rumen, thus changing rumen-reticulum wall dynamics. The findings indicated that as body weight increases, deer consuming free range forage have an increase in rumen-reticulum plasticity, and deer on a high protein diet had a decrease in rumen-reticulum plasticity. This study has management implications in demonstrating that deer require an adjustment period when transitioning from a high protein diet to free range forage.

* Student Presenter

NOTES

Monday, 1:50 pm

Assessing the effects of supplemental feeding on white-tailed deer productivity using stable isotopes

Ryan L. Darr, David G. Hewitt, Timothy E. Fulbright, and Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville; Kelley M. Stewart, Natural Resources and Environmental Science, University of Nevada Reno; Don A. Draeger – Comanche Ranch

Abstract: Supplemental feeding as part of an intensive deer management program may increase white-tailed deer (*Odocoileus virginianus*) productivity, promoting population growth and increased foraging pressure. We examined the effects of a pelleted supplement and corn (Zea mays) on the early stages of deer productivity across a 107,000 ac ranch in South Texas. Productivity was assessed during April 2008 using adult female body mass, body condition score, and tissue nitrogen isotope value (δ15N) along with fetus number, fetus sex, and conception date. We also collected deer tissues, which allowed us to estimate percent supplement (corn + pelleted feed) use by individuals using carbon stable isotope values (δ13C). We used generalized linear models with the appropriate link function to compare productivity measures between treatments—supplemented and unsupplemented deer—and to the percent of supplement in the diet. Our results indicated that adult female body mass, body condition score, and tissue δ15N value along with fetus number and fetus sex did not differ between treatments or with percent overall supplement consumed. Average conception date averaged four days earlier in unsupplemented deer, however. Our results indicate that the response of white-tailed deer productivity to supplemental feeding in southern Texas largely depends on rainfall and resulting vegetation quality, unlike highly seasonal environments where past research occurred. With sufficient rainfall supplemental feeding appears to have few effects on productivity at conception and during early gestation. Our research also shows that productivity in South Texas is more limited by energy availability than by protein.

* Student Presenter

NOTES

Monday, 2:10 pm

Using stable isotopes to determine percent of pelleted feed in free ranging whitetail diets

Don A. Draeger and T. Dan Friedkin – Comanche Ranch; David G. Hewitt, Ryan Darr, and Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville

Abstract: Use of stable isotopes allows researchers to reasonably estimate the proportional contribution of different food sources to total diet over varying time periods. We collected 192 antler samples from October 2007 to February 2008 during Comanche Ranch helicopter deer captures in Maverick County, Texas. Sampled deer were in pastures provided with a pelleted feed supplement designed to differ in carbon-isotope value from the natural vegetation. Samples were analyzed for Carbon (δ13C) stable isotope composition by the Analytical Chemistry Laboratory at the University of Georgia. We examined the relationships between age, body weight, antler size, and deer density versus percent of pelleted feed (POF) in the diet. POF in diet versus weight of yearling deer was positively correlated ($P<0.0001$) such that each 10% increase in POF in the diet increased yearling body weight by 3.2 pounds. All other age classes displayed no significant correlation ($P>0.086$). Antler size was not related to POF in the diet for any age class ($P>0.101$). Yearling deer had a lower POF in the diet (30%; $P>0.001$) than deer in older age classes, which averaged 60 POF. Deer in low density pastures displayed a higher POF in diet than deer in medium and high density pastures. However, differences in forage quality among pastures may have influenced these results and further research will be necessary to understand the effect of deer density on use of pelleted feed.

NOTES

Monday, 2:30 pm

Nutrition and physiology of white-tailed deer consuming whole cottonseed

Sarah L. Bullock and David G. Hewitt – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville; Randy Stanko and Kim C. McCuistion – Texas A&M University – Kingsville; Michael Dowd – Southern Regional Center, ARS-USDA; Jimmy Rutledge – Texas Parks & Wildlife Department; Don A. Draeger – Comanche Ranch

Abstract: White-tailed deer managers are looking for alternatives to pelleted feeds. Managers have considered using whole cottonseed (WCS) as a supplement for white-tailed deer because WCS is high in protein and fat; moderate in fiber; weather resistant; and, not readily eaten by non-target animals because of gossypol, a toxic plant compound. Gossypol has greater negative effects in monogastric mammals than in ruminants, although it can reduce antler density, body condition, and sperm quality in cervids. Twenty white-tailed deer were used to evaluate WCS digestibility, effects on health and reproduction, and factors affecting plasma gossypol concentration. WCS had higher digestible energy (4.6 vs. 2.4 kcals/g) and digestible protein (18 vs. 13 g/100g feed) than chopped alfalfa. WCS did not affect red blood cell fragility (diagnostic symptom of gossypol toxicity), antler density, or sperm quality. However, treatment and control males differed in body condition score (3.8 ±0.38; 4.6 ±0.25), rump fat thickness (0.67in ±0.04; 0.79in ±0.06), and body weight change, respectively. Plasma gossypol concentrations declined to low levels 3 weeks after deer were switched to a non-cottonseed diet, however detectable gossypol remained in the plasma for over 5 weeks. Plasma gossypol concentration was related linearly to WCS intake, potentially allowing estimation of WCS intake by free-ranging deer. Our data suggest health and production of white-tailed deer are not compromised by WCS consumption; however, managers should consider removing WCS from pastures >5 weeks before peak breeding to decrease risk of toxicosis.

* Student Presenter

NOTES

Monday, 2:50 pm

Effects of supplemental feed and density on white-tailed deer antler growth

Kent M. Williamson, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Robin N. Donohue, and Kim Echols – Caesar Kleberg Wildlife Research Institute; Matthew T. Moore – Faith Ranch; Don A. Draeger – Comanche Ranch

Abstract: White-tailed deer (*Odocoileus virginianus*) antler size is affected by nutrition, which may be influenced by supplemental feed and deer-density. We investigated supplemental feed and density effects on antler growth using 2 study-sites, each with 6 200-acre enclosures; 3 enclosures had ad libitum supplemental feed. Target populations of 10, 25, and 40 deer were maintained for both feed treatments. Males were captured, aged, and given unique ear-tags. Number of antler points (>1 inch) was recorded for yearling deer from photos or during capture. Gross Boone and Crockett (B&C) antler score of 5+ year-old (mature) males were estimated from photos or measured during capture. Estimates were converted using a regression equation (r^2=0.90) derived from the relationship between estimated and known scores. Yearling males were more likely (P=0.02) to be spike-antlered (19 of 20; 95%) in unsupplemented enclosures than in supplemented enclosures (18 of 44; 41%). Effect of density on antler score of mature males depended on supplemental treatment (P=0.001). Gross B&C score of unsupplemented mature males (n=38) decreased (P<0.001) 1.16 (0.53-1.79) inches for each additional deer in unsupplemented enclosures. Gross B&C antler score of supplemented mature males (n=32) was not affected by density (P=0.48). B&C antler score of unsupplemented mature (n=38) males averaged 116 inches (SD=17), while score of fed (n=32) deer averaged 131 inches (SD=18). Supplemental feeding reduced density imposed constraints on mature buck antler size within the range of densities we tested and decreased the probability of spike-antlered yearlings.

* Student Presenter

NOTES

Monday, 3:35 pm

Hunter satisfaction and implementation of Quality Deer Management in west Tennessee

Jared T. Beaver, Christopher E. Shaw, Allan E. Houston and Craig Harper – University of Tennessee

Abstract: Quality Deer Management (QDM) is increasingly practiced throughout the range of white-tailed deer. However, published data evaluating both hunter attitudes and effects of this management strategy are few. A QDM program was initiated at Ames Plantation in west Tennessee in 2004. We evaluated pre-season hunter surveys from 2004 – 2008 and harvest characteristics from 2002 – 2008. Pre-season hunter attitudes following implementation of QDM favored antlerless deer harvest (>90%) and restricting buck harvest to individuals at least 3.5 years old (>85%). Most hunters felt buck fawns should be protected (>79%). Maximum antler score expectations by hunters increased over time, as did the annual mean antler score of bucks harvested. Mean gross antler score by age class remained similar. Older age classes (>3.5 years) represented a greater proportion of the buck harvest following harvest restrictions (4 years old or 120 gross B&C score). Prior to QDM, bucks represented at least 50% of the harvest; after QDM, bucks represented less than 32% of the harvest. Average doe harvest per hunter following QDM implementation increased 44% over the pre-treatment average and remained consistent each year thereafter at greater than 1.5 does per hunter. Mature buck (>3.5 years) harvest per hunter steadily increased following implementation of harvest restrictions from a pre-treatment average of 0.05 to 0.30 in 2008. Total deer harvest remained similar since inception of the QDM program.

Overall hunter satisfaction with Ames Plantation's QDM program when compared to others was greater than 73%. Hunter satisfaction is critical for success of a QDM program. We recommend annual educational meetings for hunting groups to summarize and explain population, harvest, and habitat data, answer questions, and set realistic goals. Annual surveys should provide a means for hunters to provide feedback.

* Student Presenter

NOTES

Monday, 3:55 pm

Anderson-Tully Company QDM (Quality Deer Management): success by IPM (Intensive People Management)

Mike Staten and Stan Priest – Anderson-Tully Company

Abstract: Anderson-Tully Company (ATCO) manages 350,000+ acres of naturally regenerated upland and bottomland hardwood forests in seven states. Out of necessity to control white-tailed deer herbivory of desirable tree regeneration, ATCO promotes Quality Deer Management (QDM) as the preferred method to control and manage deer populations.

In 1986, QDM was made mandatory on ATCO lands to balance the population and shift the harvest of bucks from 1.5 years to 2.5 years of age. This was accomplished by using minimum doe quotas and maximum buck limits with a progressive array of antler restrictions. In 2003, the goal was changed to manage for at least 50% 3.5+ year old bucks in the harvest, with most clubs using either a minimum 18" beam or 15" inside spread. With growing support within clubs, increasing antler restrictions promotes harvesting a higher percentage of 4.5+ year old bucks.

We consider our program QDM for Older Age Class Bucks. Average annual harvest is approximately 2,800 bucks. In 1988, only 10% of harvested bucks were 3.5+ years old, with an average age of 2.0 years. In 1998, 34% of harvested bucks were 3.5+ years old, with an average age of 2.8 years. In 2008, 77% of harvested bucks were 3.5+ years old, with an average age of 3.8 years. Evidently club members can learn to judge antler characteristics that protect younger age class bucks. Expectations are set high, but much time is spent on education. Eventually, we will learn to manage by aging bucks "on-the-hoof".

NOTES

Monday, 4:15 pm

Effects of hunter density on male white-tailed deer movements in south-central Oklahoma

Andrew R. Little, Stephen Demarais, and Samuel K. Riffell – Department of Wildlife and Fisheries, Mississippi State University; Kenneth L. Gee and Joshua A. Gaskamp – Samuel Roberts Noble Foundation

Abstract: Analyzing fine-scale movement patterns of male white-tailed deer (*Odocoileus virginianus*) during hunting season provides understanding of deer response to hunting pressure. During the 2008 firearms deer season, we studied deer movements on a 4,569 acre ranch in south-central Oklahoma. We fitted 25 male deer (≥ 2.5 years of age at time of data collection) with GPS collars programmed to collect locations every 8 minutes from 8 November – 31 December. We compared deer movements at three hunter densities: high (1 hunter/75 acres), low (1 hunter/250 acres), and control (no hunters on a sanctuary area) during 4 seasons (i.e., pre-season, scouting, hunting, and post-season). Hunters in the high density area observed 6 collared males (31.2%) 20 times while the low hunter density area observed 4 collared males (14.3%) 8 times. Control, high, and low density movements during morning (6 am-10 am; $F_{2, 91} = 0.07$ $P = 0.929$) and afternoon (2 pm-6 pm; $F_{2, 114} = 0.63$, $P = 0.532$) did not differ, but nocturnal treatment movements were marginally significant ($F_{2, 113} = 2.04$, $P = 0.135$). Average hourly movements differed by season ($F_{3, 167} = 9.27$, $P < .001$), which were 388.5 (SE = 26.48), 394.4 (SE = 35.50), 348.3 (SE = 37.34), and 188.2 (SE = 30.07) yards during pre, scouting, hunting, and post-season, respectively. Prior to the hunting season, we had 4 collared males poached and 1 harvested by a hunter during the muzzleloader season. Final results will be presented and provide a better understanding of factors that influence buck movement patterns during hunting season.

* Student Presenter

NOTES

Monday, 4:35 pm

Perspectives on intensive deer management from Aldo Leopold

Steve Nelle – Natural Resource Conservation Service

Abstract: Deer management in the southeastern states and especially Texas has undergone profound change during the last 20 years. For many landowners, traditional agriculture, by itself, has not been profitable enough to sustain families and justify land ownership. Recreation and income from hunting has become the economic salvation of many farms and ranches. In an effort to fast-forward the production of economically valuable, large antlered bucks, landowners, deer managers and hunters employ various techniques of intensive deer management on millions of acres. Practices such as high fencing, supplemental feeding and importing outside genetics are becoming more and more routine. When an industry such as deer hunting is going though such rapid change, it is prudent to pause and consider the long term wisdom of the new direction. Aldo Leopold (1887 – 1948) is considered the father of modern wildlife management. His writings are still regarded as the most thoughtful commentary on land and wildlife management in North America. He wrote with prophetic clarity about some of the ethical issues facing game management and hunting. Numerous relevant excerpts from Leopold classics, Game Management (1932) and A Sand County Almanac (1949) will be presented, and are intended to provoke thoughtful and balanced consideration of the current trends in deer management and its relationship to agriculture and recreational hunting.

NOTES

Monday, 4:55 pm

The future of recreational deer hunting: sport of kings or continued American tradition?

David Henderson – Community Services Association, Sea Pines Plantation; Anthony DeNicola – White Buffalo Inc

Abstract: Future generations of deer hunters will face significant obstacles. Unstoppable societal changes will lead to continued declines in hunter participation, recruitment, and retention. Land use changes will continue to decrease the supply of traditional deer hunting lands and lease fees may eventually surpass most hunters' ability to pay. Southeastern deer populations are trending stable; however, conflicts with humans are increasing. This disparity will continue and may even widen as the percentage of deer populations that cannot be managed effectively by traditional means increases. Future generations will also have opportunities; however, new skill sets, techniques, laws, regulations, and mindsets will be required. This presentation will examine current deer hunting methodology, speculate on how it may change in the future, and suggest actions intended to keep recreational deer hunting a benefit to society and American tradition available to all.

NOTES

Tuesday, 8:20 am

Effects of selective harvest on antler size in white-tailed deer: a modeling approach

Stephen L. Webb – Hayden Wing Associates; Stephen Demarais and Bronson Strickland – Department of Wildlife and Fisheries, Mississippi State University; Randy W. DeYoung – Caesar Kleberg Wildlife Research Institute, Texas A&M – Kingsville; Brian Kinghorn – School of Environmental and Rural Science, University of New England; Kenneth L. Gee – Samuel Roberts Noble Foundation

Abstract: Selective harvesting in wild deer (*Odocoileus spp.*) populations is commonly practiced to increase antler size. However, response in free-ranging populations is difficult to quantify because antler response is influenced by environmental variation, population demographics, and harvest intensity. We used quantitative genetics models to determine how white-tailed deer (*O. virginianus*) antlers responded to selection and what variables (i.e., population size, age structure, mating ratio and heritability) were most influential in improving antler size. We validated genetics models by comparing modeled results with empirical data from a controlled deer breeding program; modeled antler points (AP) and Boone and Crockett score increased (2.2-4.3 AP and 19.1-38.5 in, respectively) after 8 years of selection, similar to observed increases in AP (3.2) and score (36.3 in) from a captive reference population. In modeled free-ranging populations, mating ratio, age structure and heritability were more important in influencing antler response than size of the population. However, response to selection in free-ranging populations was much less (0.1-0.9 AP) than breeding operations even after 20 years of selection. Our models demonstrate how selective harvesting of male white-tailed deer is an inefficient process for modifying population-level genetic characteristics related to antler size. Response of antlers in free-ranging deer will be lower because individual reproductive success is lower, breeding is done by a large group of males, dispersal maintains gene flow from populations with disparate management goals, and reproductive and survival rates are lower. Therefore, selective harvesting should be justified only for controlling

* Student Presenter

NOTES

Tuesday, 8:40 am

White-tailed deer antler research: a critique of design and analysis methodology

Stephen Demarais and Bronson Strickland – Department of Wildlife and Fisheries, Mississippi State University

Abstract: Debate within the popular and technical literature regarding predictability of antler size at maturity based on 1.5-year antler size in white-tailed deer (*Odocoileus virginianus*) has led to confusion and uncertainty within constituent groups. Koerth and Kroll (Journal of Wildlife Management 72:1109–1113) provided measures of age-related antler development using recaptures of known-age males from 12 deer populations in southern Texas. Several design and analysis issues reduce the scope and validity of their conclusion that amount of growth in the first set of antlers was a poor predictor of antler growth at maturity. Although unstated, the statistical hypothesis they tested did not coincide with their specific conclusions. Using a simulation, we show that their methods were susceptible to measurement bias. Their results are applicable only to populations with similar culling and management programs. Additionally, we provide recommendations for projects that evaluate predictability of antler size at maturity based on antler size at younger ages.

NOTES

Tuesday, 9:00 am

Can culling bucks lead to genetic change on large acreages?

Don A. Draeger and T. Dan Friedkin – Comanche Ranch; Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Mitch Lockwood, Jimmy Rutledge, and Don B. Frels Jr. – Texas Parks & Wildlife Department

Abstract: In the fall of 2006 Comanche Ranch initiated the most aggressive selective harvest program ever subjugated to a free ranging white-tailed deer herd. The designed 10-year buck culling study will help clarify manager's expectations from different culling criteria. From October 2006 to January 2010 using a helicopter and net gun we captured 2,113 white-tailed bucks on the 113,000 acre ranch in Maverick County Texas. Bucks are captured at random on 3 areas within a 28,500 acre study area. All captured bucks are aged, and measured for Boone and Crockett (B&C) score. Bucks meeting culling criteria are sacrificed, and the meat donated to worthy users. Bucks not meeting the culling criteria are released. On one area the following bucks are culled: yearlings with less than 6 points, 2-year olds with less than 8 points, 3- and 4-year olds less than 9 points, and 5-year olds and older with a gross B&C score of less than 145. On another area, all yearlings and 2-year olds are released, and the older deer are culled by the same criteria as above. Finally, the third area serves as a control and all bucks captured are released. Seven hundred fifty nine bucks have met the culling criteria (41%) on the 2 treatment areas. We are using the gross B&C score for the yearling age class as one indicator for genetic change. The results after 4 years of culling show no changes in the average B&C score for the yearling age class among treatments.

NOTES

Tuesday, 9:20 am

The effects of genetic heterozygosity on antler development in the progeny of spike-antlered sires

Don B. Frels Jr., Eugene R. Fuchs, Dale F. Prochaska, and Justin A. Foster – Texas Parks & Wildlife Department

Abstract: Although interest regarding the role of genetics in antler development of white-tailed deer (*Odocoileus virginianus*) continues to increase, scientists have very little knowledge of the actual genes which produce the results. Researchers associated with the Kerr Wildlife Management Area concede that although a few (<5%) spike-antlered yearlings do produce respectable antlers at maturity, the majority of their resultant male offspring will exhibit less than desirable antlers due to the heritability of heterozygous antler traits. Utilizing the same dams, our study compared antler measurements from offspring (n= 66) resulting from three distinct matings to illustrate this influence. Group 1 sires (n=3) were nutritionally-stressed yearling spikes that produced a gross Boone and Crockett Score (GBC) >130 at maturity. Group 2 sires (n=3) were spike-antlered yearlings which also produced GBC scores >130 at maturity, however these bucks represent the largest male offspring resulting from the mating of a large-antlered male (205 GBC) and females from yearling spike-antlered sires. The male progeny from these two matings were then compared to offspring sired by yearling bucks (n=5) with 6 or more antler points. The three matings resulted in significant differences (P<.01) in GBC score at the yearling age class and at maturity, except for Group 1 mature bucks (P=.0721). These data suggest a possible link between heterozygous antler traits and spike-antlered yearlings resulting in lesser quality antlers at maturity.

NOTES

Tuesday, 9:40 am

Repeatability of antler characteristics in south Texas

Aaron M. Foley, John S. Lewis, Randy W. DeYoung, and David G. Hewitt – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville; Steven D. Lukefar – Department of Animal and Wildlife Science, Texas A&M University-Kingsville; Mickey W. Hellickson – King Ranch Inc.

Abstract: South Texas is a region associated with variable rainfall which influences white-tailed deer antler growth. To abate the climatic effects on antler growth, supplemental feed is often utilized. To determine whether supplemental feed removes environmental variation from antler size, we calculated the repeatability of antler traits. Repeatability is defined as the ratio of within individual variance to among individual variance of a measured trait. Repeatability also sets the upper limit of heritability. We used 10 years of antler measurements derived from randomly captured male white-tailed deer (N = <5,000) across 5 different ranches. Feed station density varied among the 5 ranches; control (n = 1), ~3.2 feed stations/1000 ac. (n = 3), and ~4.8 feed stations/1000 ac. (n = 1). Data were separated into age classes; results in this abstract are limited to males aged 3.5+. Average repeatability estimates across all ranches were lowest for number of points (x = 0.55, 95% CI = 0.48-0.63) and highest for antler spread (x = 0.69, 95% CI = 0.62-0.76). As rainfall variability increased, repeatability estimates decreased for antler spread, number of points, and length of 4th tine. As the intensity of supplemental feed level increased, there was an increase in repeatability estimates for number of points, main beam length, and antler circumference. Interactions between amount of rainfall and supplemental feed affected repeatability of 3rd and 4th tine measurements. Different repeatability measurements of certain antler traits have potential implications for culling criteria in certain geographical locations influenced by rainfall and supplemental feed.

* Student Presenter

NOTES

Tuesday, 10:25 am

Do increased white-tailed deer densities and supplemental feeding reduce palatable plant abundance?

Eric D. Grahmann, Nathan Kelley, Ryan L. Darr, Timothy E. Fulbright, David G. Hewitt, and Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Don A. Draeger – Comanche Ranch

Abstract: Contradicting hypotheses exist in the literature concerning effects on vegetation of supplemental feeding white-tailed deer (*Odocoileus virginianus*). Our objectives were to determine responses of plant canopy cover to deer at 3 densities with and without supplemental feeding. On 2 ranches, 2 enclosures of 200 acres each contained target populations of 10, 25, or 40 white-tailed deer (6 enclosures/ranch). One enclosure in each pair of densities was provided with dry, pelleted feed ad libitum. Canopy cover of vegetation was estimated during summer 2004-2009. We analyzed data using repeated measures analysis of variance with plant canopy cover as the dependent variable and density (3 levels) and feeding (2 levels) as independent variables. Treatment main effects were not significant ($P > 0.05$) for forbs, woody plants, or cacti. But, half-shrubs ($P = 0.048$) tended to increase in fed enclosures verses enclosures not fed, averaged across deer densities. Although not statistically significant ($P > 0.05$), both palatable forb and half-shrub cover tended to increase less than non-palatable forbs and half-shrubs in fed enclosures. Supplemental feeding appears to have no major impacts on the vegetation community in the short-term, but trends suggest that unpalatable herbaceous plants may be fed upon less in areas where deer are provided supplemental feed.

* Student Presenter

NOTES

Tuesday, 10:45 am

Does supplemental feeding affect stem count indices?

Daniel J. Kunz, Alan T. Cain, Jimmy Rutledge, and Evan McCoy – Texas Parks & Wildlife Department; Timothy E. Fulbright, Charles A. DeYoung, and David G. Hewitt – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville

Abstract: The Stem Count Index Method is used by the Texas Parks & Wildlife Department to determine whether herbivore densities are within carrying capacity of the habitat by estimating use of woody plants. We determined the effect of supplemental feeding on the relationship between Stem Count Indices and estimated deer density.

Pairs of 200 acre enclosures on the Comanche and Faith ranches near Carrizo Springs, Texas, contain low, medium, and high deer densities. Densities are estimated twice/year using trail cameras and deer are added or removed from enclosures. One of each pair of enclosures is provided protein pellets ad libitum. Percent of browsed twig tips of woody plant species was estimated in winter (January or February) and summer (August), 2004-2009. Plants were classed according to palatability with first choice plants the most palatable and third choice plants the least palatable.

Percent of browsed twigs was similar ($P>0.21$) between enclosures with pelleted feed and enclosures not provided pelleted feed for first, second, and third choice plants. Relationships between percent of browsed twigs and estimated deer density tended to be stronger in supplementally fed enclosures than in enclosures with no pelleted feed. Stem Count Index estimates are related to estimates of deer density; however, greater precision in counting deer in supplementally fed enclosures possibly results in stronger relationships.

NOTES

Tuesday, 11:05 am

Effects of supplemental feed on foraging behavior and diet composition of white-tailed deer

Luke W. Garver, Kent M. Williamson, Ryan L. Darr, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung and Kim Echols – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Don A. Draeger – Comanche Ranch

Abstract: White-tailed deer foraging choices can affect vegetation composition thereby influencing many ecological processes. Supplemental feeding may alter foraging behavior by shifting amount, rate, and type of forage deer consume. Our objectives were to determine effects of providing supplemental feed on foraging behavior and selectivity of white-tailed deer. We released tame female deer into 200-acre enclosures with and without ad libitum access to pelleted supplemental feed. Deer foraging was observed seasonally from April 2007 through February 2009. We recorded foraging time and number, size, and frequency of bites as well as species and forage class of vegetation consumed. Plant samples were collected, weighed, and nutritionally analyzed, allowing estimation of nutrient intake rates for each deer. Unsupplemented deer spent 12% more of their active time eating ($P=0.008$) but dry matter and nutrient intake rates did not differ between feed treatments ($P\geq0.117$). Unsupplemented deer had higher bite rates ($P\leq0.038$) during spring 2007 and winter and summer 2008, and larger bite sizes ($P=0.003$) in summer 2007. There were no significant differences in the proportion of forbs, shrubs, or grasses in the diet between treatments ($P\geq0.068$). Diets of unsupplemented deer had a greater proportion ($P\leq0.05$) of cacti, litter, flowers, fungi, mast, and sub-shrubs, but no clear patterns existed in relative amount of these diet components among seasons and years. Addition of supplemental feed changes foraging behavior of deer by decreasing foraging intensity and changing diet composition, but does not affect dry matter or nutrient intake rates.

* Student Presenter

NOTES

Tuesday, 11:25 am

Effects of white-tailed deer density and supplemental feeding on vegetation biomass

Kim N. Echols, Timothy E. Fulbright, Charles A. DeYoung, David G. Hewitt, Carlos E. Gonzales, Nathan D. Kelley, and Eric D. Grahman – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Don A. Draeger – Comanche Ranch

Abstract: Supplemental feeding of deer may result in increased foraging pressure on more palatable plants. Increasing deer densities within fed pastures has the potential to compound this effect on vegetation. We hypothesized that forb biomass would decline with supplemental feeding and increasing deer density and that there would be no effects on browse and cacti biomass. We conducted research in 6 200-acre high-fenced enclosures stocked with high (40), medium (25), and low deer densities (10) replicated on 2 ranches in Dimmit County, Texas. Pelleted dry feed was provided ad libitum to one pair of each density per ranch. Our statistical models accounted for variability in targeted densities for each enclosure. We estimated plant biomass during March and August (2004-2009) using forty 2.7 ft2 X 4.9 ft sampling frames/enclosure. Samples of each forage class were clipped and visually estimated (double sampling); samples were dried to a constant weight at 104˚ F. During the drought years of 2006 and 2009, browse biomass declined as deer density increased but no relationship was detected during the other 4 years. Forb biomass trended downward with increasing deer densities averaged over the 5 years and both feed treatments. No differences were detected between fed and unfed enclosures ($P>0.05$) for any forage class or total biomass. Cacti, grass, and half shrub biomass showed no relationship to deer density. Vegetation biomass in semi-arid environments appears to be more influenced by extreme weather (temperature, rainfall) than by deer density or supplemental feed availability.

NOTES

Tuesday, 11:45 am

An evaluation of the effects of biostimulants on establishment and growth of wildlife forages

Bronson Strickland and Bill Hamrick – Department of Wildlife, Fisheries, and Aquaculture, Mississippi State University; Marcus Lashley and Craig Harper – University of Tennessee

Abstract: Land managers often report low germination rates, poor seedling survival, and suboptimal production when planting forage food plots. To potentially improve planting success and vigor, seed and plant biostimulants are often recommended. We conducted 3 forage trials to evaluate the effects of DeltAg Seed Coat and Plant Power treatments in 2007, 2008, and 2009 in Tennessee and Mississippi. In the cool-season trials, seedling counts, root length, root mass, and shoot length were greater in the Seed Coat-treated plots ($P < 0.10$); however, forage biomass did not differ. In the 2008 warm-season trial, seedling counts, root length, root mass, and forage biomass did not differ among treatments. In the 2009 warm-season trial, seedling counts, root length, and root mass, did not differ among treatments, but forage biomass was greater in the Plant Power-treated plots ($P < 0.10$), with an average increase of 150 lbs dry matter/acre. Our data suggest drought tolerance and nutrient absorption may be positively affected by the Seed Coat treatment, however, forage production was largely unaffected by biostimulant additives. Additional replication with various forage plantings is needed to assess the effectiveness of these treatments. The economic implications of our findings will be discussed.

NOTES

Tuesday, 1:40 pm

"Aging on the hoof": fact or fantasy?

Kenneth L. Gee – Samuel Roberts Noble Foundation; John H. Holman – Fresh Tracts

Abstract: Use of physical characteristics to estimate age of white-tailed deer (*Odocoileus virginianus*) in the field, commonly referred to as "aging on the hoof" (AOTH), is becoming increasingly popular as part of selective harvest management programs. There have been no scientific evaluations of this aging method to date. To determine practitioners' levels of accuracy and proficiency applying the AOTH method, we developed an assessment consisting of a series of photographs of 70 wild, known-age deer from south-central Oklahoma ranging in age from 1.5 - >10.5 years. A pre-assessment questionnaire was developed to determine participants' professional status, degree of use of technique, perceptions about the technique, etc. The pre-assessment questionnaire and the assessment were distributed to 2009 Southeast Deer Study Group registrants and other selected individuals. One hundred twenty-nine individuals completed the assessment, consisting of 107 professionals that use the technique, 16 professionals that had little experience with the technique, and 6 non-professionals. Considering only professionals that use the technique, the average percentage of correct age estimates was 36%, with a range of 16-56%. Percentages of estimates correct by age-class for professionals that use the technique were 62%, 43%, 25%, 30%, 25%,15%, 7%, 7%, 7%, and 2% for the 1.5, 2.5, 3.5, 4,5, 5.5, 6.5, 7.5, 8.5, 9.5, and 10.5 year-classes, respectively. Additional analyses emphasizing various age groupings and management and research implications will be discussed.

NOTES

Tuesday, 2:00 pm

Aging photographed male deer using morphometric ratios

Jeremy J. Flinn, Stephen Demarais, Harry A. Jacobson, and P. D. Jones – Department of Wildlife and Fisheries Science, Mississippi State University; Kenneth Gee – Samuel Roberts Noble Foundation

Abstract: Subjective methods for aging live male white-tailed deer based on a variety of physical characteristics are abundant in the technical and non-technical literature and their accuracy has been questioned. We evaluated accuracy of several quantitative measures of body features for assignment of age classes using pictures of 103 known-aged bucks taken September-October in pens and in the wild. We used logistic regression with a step-wise procedure to identify which morphometric ratios best assigned bucks to age classes using penned deer. The model used five ratios to correctly assign 71% of wild bucks to 1, 2, 3, and ≥4 year age classes. The same model correctly assigned 84% of wild bucks to 1, 2-3, and ≥4 year age classes. Additional analyses will include the effect of season.

* Student Presenter

NOTES

Tuesday, 2:20 pm

Evaluating Accuracy of Estimating Gross Antler Scores Using Photographs

Jeremy J. Flinn, Stephen Demarais, Bronson K. Strickland, and Stephen Webb – Department of Wildlife and Fisheries Science, Mississippi State University; Kenneth Gee – Samuel Roberts Noble Foundation

Abstract: Widespread use of infrared-triggered trail cameras has produced photographs of male white-tailed deer (*Odocoileus virginianus*) with unknown antler dimensions. We developed a computer program to estimate selected antler measurements and a gross antler score, similar to Boone and Crockett's gross non-typical score. We photographed 150 mounted antlers with known scores at three angles: 0°, 45°, and 90°. We placed a known-size, spherical object in the picture for scale and measured the photographed antlers in GIS. Using the GIS values and known values we constructed predictive equations to estimate three-dimensional scores from the two dimensional photographs. Using a known-size object to adjust scale, estimated gross antler scores for 50 known-score deer were produced with a mean error of 4.6% and 3.4% at 0° and 45°, respectively. We sampled several anatomical features from harvested and sedated deer to use as the known-size reference in free-ranging deer pictures. Using average ear width as a scale and two pictures, 0° and 45°, yielded the most accurate estimate of gross antler score (4.5%) for live deer. This program provides a reasonably accurate estimate of gross antler score using photographs.

* Student Presenter

NOTES

Tuesday, 2:40 pm

The role of wildlife management associations in establishing the antler-restriction regulations in Texas

Meredith P. Longoria, David Forrester, and Bobby Eichler – Texas Parks & Wildlife Department

Abstract: A wildlife management association (WMA) can be an effective tool to combat the negative impact of land fragmentation on wildlife management efforts. By working together, and in effect combining acreages, landowners are better able to manage wildlife on a landscape level. Texas Parks & Wildlife biologists work closely with WMAs to provide technical guidance and education to landowners in respect to wildlife management on private lands. The majority of WMAs in Texas place emphasis on white-tailed deer management. WMAs in the Oak-Prairies region voluntarily implemented selective harvest management practices to protect younger bucks and were instrumental in the implementation and adoption of the current antler-restriction regulations for white-tailed deer. At the request of the WMAs in the Oak-Prairies region along with additional input from the public, TPWD Commissioners voted to implement a 3-year experimental antler-restriction regulation in 6 counties within the Post Oak Savannah ecological area, from 2002-2005. Overall the experiment was considered a success as statewide harvest data indicated that hunter opportunity was increased, and the harvest was shifted away from the younger age-classes. With the cooperation of WMA members in the Oak-Prairies region in combination with the perceived success of the 3-year experiment and positive feedback from hunters and the public, these regulations are now in effect in 113 Texas counties to date.

NOTES

Tuesday, 3:00 pm

A case study of an antler harvest restriction on a public hunting area

David Synatzske, Morgan Richardson, and Daniel Walker – Texas Parks & Wildlife Department

Abstract: The Chaparral WMA is a 15,000 acre research and demonstration area located in LaSalle and Dimmit counties in the heart of the South Texas brush country. Deer hunting on the area is by lottery permit drawing. The area has an abundance of mature bucks is noted for quality of its buck harvest. The area receives more than three times as many applications for either sex hunts than any other public hunting area in Texas. From 1991 to 1994, hunters were allowed to harvest one buck. Under these harvest regime hunters most often selected mature bucks exhibiting superior antler development or high grading of the deer herd. Regulations were modified in 1995 to increase the harvest of bucks with poor antler development. The bag limit was increased to two bucks and a buck harvest antler restriction was put in place. One of the two bucks must have less than 8-points and the other buck must have inside spread greater than ear width. Our objective was to increase the harvest of bucks exhibiting poor antler development: yearling spikes, and medium age and mature bucks with less than 7 antler points. Hunters were given a pre-hunt briefing explaining the objectives and the rationale behind the antler restriction. Hunters were encouraged to harvest spikes and mature bucks with less than 8 points. Under antler restrictions the harvest of bucks with poor antler development increased from less than 20% of the annual buck harvest to about 50%. A modest decrease (35% to 25%) in the percentage of % mature bucks in the herd has been observed as result of the increased harvest of spikes and other young cull bucks. The number of trophy bucks (> 140 Gross Boone & Crocket) harvested each year has remained stable.

A trend of decreasing inside spread in mature bucks has been observed while average gross Boone & Crocket score for mature bucks has remained stable since the implementation of antler restrictions.

NOTES

Tuesday, 3:45 pm

Optimizing medetomidine dose combined with ketamine and tiletamine-zolazepam to immobilize white-tailed deer

Lisa I. Muller, Robert J. Warren, and Karl V. Miller – Department of Forestry, Wildlife, and Fisheries, University of Tennessee; David A. Osborn – Warnell School of Forestry and Natural Resources, University of Georgia; Tom Doherty – College of Veterinary Medicine, University of Tennessee; Kevin Keel – Southeast Cooperative Wildlife Disease Study Group, University of Georgia; Brad F. Miller – Arkansas Game & Fish Commission

Abstract: Chemical immobilization is often needed for safe and effective capture and handling of white-tailed deer. Modifications of drug combinations are still needed for optimal field use. We evaluated ketamine (1.5 mg/kg; for relatively shorter recovery), tiletamine-zolazepam (1.0 mg/kg; for rapid induction), and different concentrations of medetomidine (125, 150, 175, or 200 mcg/kg; for synergistic effects and relaxation) in 22 female white-tailed deer at the University of Georgia Whitehall Deer Research Facility in Athens, Georgia on 14-15 and 21 of May 2009. Deer were weighed before treatment, hand-injected while physically restrained in a squeeze chute, and released into a pen for monitoring. We measured temperature, respiration, pulse rate, hemoglobin saturation (using pulse oximetry), and measured arterial blood gasses at time of immobilization, 10 and 20 minutes later. Forty-five minutes after injection, we injected atipamezole (0.35 mg/kg) for reversal. Using ANOVA, we found no differences in induction time with the different concentrations of medetomidine. Deer were lateral and approachable for all treatments combined at 4.9 and 5.6 minutes, respectively. We treated 13 of the 22 deer with a cold-water enema to reduce core body temperatures. Hemoglobin saturation (SpO2) was 79.5, 82.0, and 82.3 at 0, 10, and 20 minutes, respectively. Arterial blood gasses gave similar results. Recovery occurred earlier and was more consistent for the 125 and 150 mcg/kg medetomidine with deer able to stand with moderate ataxia to minimal sedation by 60-90 minutes. We recommend using medetomidine with ketamine/tiletamine/zolazepam to provide rapid and safe chemical immobilization in deer.

NOTES

Tuesday, 4:05 pm

Does fawning habitat influence predation risk?

John C. Kilgo, Matthew J. Goode, Mark A. Vukovich, and Christopher E. Shaw, – USDA Forest Service Southern Research Station; H. Scott Ray – USDA Forest Service – Savannah River; Charles Ruth – South Carolina Department of Natural Resources

Abstract: Recent research has demonstrated that predation on fawns by coyotes (*Canis latrans*) can have substantial impacts on some deer populations in the region. We hypothesized that predation risk may be affected by habitat conditions in areas where fawns are born and spend their first weeks. We compared the vegetation types and understory densities of habitats used by depredated fawns with those of surviving fawns. During 2007-2009 we radio-monitored 78 fawns on the Savannah River Site in South Carolina. We characterized the type and density of each fawn's natal area at 15 locations, including its birth site and 14 radio-locations taken daily during its first two weeks of life. Does used hardwood stands as birth sites in greater proportion than their availability in the SRS landscape and pine stands in lesser proportion, and the understory surrounding birth sites was denser than that at random locations across the landscape. Fawn home ranges included greater proportions of hardwood and young pine stands and lesser proportions of mid-aged and mature pine stands than available in the landscape, and understory density within fawn home ranges was greater than that at random locations. However, neither the composition nor understory density in home ranges of depredated fawns differed from that of surviving fawns. We conclude that fawning habitat at SRS is characterized by hardwood forests with a dense understory but that within such areas, predation risk is not affected by habitat conditions. Thus, improving fawn survival through vegetation management to enhance fawning habitat may be difficult.

NOTES

Tuesday, 4:25 pm

Effect of deer density on predation level in South Carolina

Christopher E. Shaw, John C. Kilgo, Matthew J. Goode, and Mark A. Vukovich – USDA Forest Service Southern Research Station; H. Scott Ray – USDA Forest Service – Savannah River; Charles Ruth – South Carolina Department of Natural Resources

Abstract: Predation on fawns by recently established coyotes (*Canis latrans*) has been shown to represent a major source of mortality in the low-density deer population at the Savannah River Site (SRS), South Carolina. Evidence suggests that this new source of mortality is additive to previously existing sources. We hypothesized that predation may be lower and hence survival rate higher (assuming additive mortality) in a population with a higher deer density, due to the effects of predator swamping. We used camera surveys to assess fawn: doe ratios as an index to fawn survival in a low and a high density deer population on and near the SRS during September 2008. Estimated density in the low-density population was 13.6 deer/mi^2 and in the high-density population was 64.6 deer/mi^2, a 4.75-fold difference. During 720 camera-days, we obtained 5,471 deer photographs. Despite the difference in density, fawn: doe ratios were similar between the two populations (0.47 in the low-density population; 0.42 in the high-density population), indicating that fawn survival was no greater in the high-density than the low-density population. Though a greater total number of fawns apparently survived to recruitment age in the high-density population, coyotes appeared to have similar proportional effects on the two populations. Thus, while it may take longer for coyote predation to affect a high-density population, our data suggests that such populations may not be immune to coyote effects, particularly if predation losses are not considered in harvest plans.

NOTES

Tuesday, 4:45 pm

Effects of rainfall and deer abundance on the condition and productivity of a south Texas deer herd

Dan Walker, David Synatzske, and Morgan Richardson – Texas Parks & Wildlife Department

Abstract: The Chaparral WMA is a 15,000 acre research and demonstration area located in LaSalle and Dimmit counties in the heart of the South Texas brush country. The area receives on average about 25 inches of rain per year; however rainfall is highly variable with the area frequently experiencing periods of severe droughts. Fawn recruitment is highly variable (CV = 0.51). Helicopter survey estimate of the annual fawn crop on the area have ranged from as low as 8% to as high 78% over the span of a year. Similarly, 10% annual variation in body weights and antler size of mature deer are not uncommon. Neither annual (Jan. to Dec.) or growing season (Mar. to Aug.) rainfall was significantly ($P>0.10$) correlated with fawn recruitment, body weights of adult doe (Age class 3.5+), or antler size of mature bucks (Age class 5.5+); However, the combination of the current year's and the previous year's growing season rainfall were ($P<0.05$). They accounted for 30% to 40% of the annual variation in these herd indices. The best fit model for predicting adult doe weight included both deer density and two growing seasons of rainfall ($P<0.05$, $R^2=0.73$). A wet spring and summer may not result in increased herd productivity or above average antler size in mature bucks as commonly perceived by many South Texas ranchers and hunters. The effects of the previous summer's rainfall must also be taken in to account. The highly variable nature of fawn recruitment observed underscores the need for annual surveys in this region.

NOTES

Poster Session

Poster Presentation

White-tailed deer: a threat to the cattle fever tick eradication program?

Tyler A. Campbell – USDA APHIS Wildlife Services; Antonio Cantu, J. Alfonso Ortega-S, and David G. Hewitt – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville; Zeferino Garcia-Vazquez – Centro Nacional de Investigacion Disciplinario en Parasitologia Veterinaria

Abstract: Since 1893 state and federal agencies have been engaged in efforts to eradicate cattle fever ticks (CFTs) (Rhipicephalus annulatus and R. microplus), the vectors for bovine babesiosis, from the U.S. These collective efforts have been successful and CFTs have been eradicated from throughout the southeastern U.S. and California. Today, CFTs only occur within a permanent quarantine zone in counties along the Rio Grande River in southern Texas. Recently, however, outbreaks of CFTs have occurred outside the permanent quarantine zone. For example, since October 2008, >127 CFT-infested premises in 8 southern Texas counties have been detected and quarantined. Many personnel within the Cattle Fever Tick Eradication Program (CFTEP) believe that white-tailed deer (Odocoileus virginianus) are maintaining CFTs during and beyond the 9-month cattle pasture vacation regulatory period and that deer are a major threat to the program. Our objectives are to 1) provide a historical perspective into the role deer played in the CFTEP, 2) review evidence from the outbreak that implicates deer as maintenance hosts for CFTs, 3) describe CFTEP regulations aimed at treating deer and carcasses for CFTs, and 4) outline research needed to understand the role of deer as hosts for CFTs and develop effective management prescriptions. It has been estimated that if CFTs were allowed to re-establish across their former range in the U.S. that it would cost the cattle industry $1 billion per year. Therefore, it is important for deer biologists to understand the risks deer pose to the CFTEP and have knowledge of the issue.

NOTES

Poster Presentation

Physiological analysis of white-tailed deer in coastal North Carolina

Colter M. Chitwood and Christopher S. DePerno – Department of Forestry and Environmental Resources, North Carolina State University; Suzanne Kennedy-Stoskoph – College of Veterinary Medicine, North Carolina State University

Abstract: Generally, deer management focuses on population-level parameters (e.g., abundance, sex ratios), but popularity of Quality Deer Management has elevated interest in individual-level health parameters (e.g., kidney fat, body weight, serum analysis). Measures of health can be used by state agencies, private managers, and hunters to determine the success or failure of management strategies. In coastal North Carolina, information about the health of deer is lacking. In July 2008 and March 2009, we collected 60 female white-tailed deer from a 78,000-acre pocosin forest managed intensively for timber and hunted almost exclusively with dogs. Blood was collected via cardiac puncture and analyzed for standard serum chemistries, fructosamine, and emerging tick-borne diseases. Also, we obtained spleen and adrenal gland weights, kidney fat index (KFI), femur marrow fat index (MFI), and abomasal parasite count (APC). Serum chemistries were within expected ranges with the exception of potassium, which was high. Fructosamine was a good indicator of glucose regulation. Levels of KFI and MFI were poor-to-fair depending on the sampling period. Spleen and adrenal gland weights did not vary between periods and APC was low in both periods. Three deer from the July sample tested positive for Bartonella vinsonii berkhoffii, a strain associated with dogs and previously unreported in white-tailed deer. Our results create baseline data for physiological condition of white-tailed deer in coastal North Carolina and indicate that deer in this habitat are healthy but live lower on the relative health scale than deer from more productive habitats.

* Student Presenter

NOTES

Poster Presentation

Morphological variation in male white-tailed deer in Mississippi

Emily Flinn, Stephen Demarais, and Bronson Strickland – Department of Wildlife and Fisheries, Mississippi State University; Chad Dacus – Mississippi Department of Wildlife, Fisheries, and Parks

Abstract: Male white-tailed deer (Odocoileus virginianus) antler and body size vary among physiographic regions in Mississippi. This variation may be due to regional differences in nutrition; however, researchers have not determined whether genetic potential differs among regions. We compared body and antler growth from birth to 3.5 years of age in captive first generation male white-tailed deer from 3 physiographic regions (Delta, a high quality area; Thin Loess, a moderate quality area; and Lower Coastal Plain [LCP], a lower quality area) raised on a 20% crude protein diet. A modified Boone and Crockett score did not differ among regions at 1.5 years. However, the LCP scores were about 17% smaller than the Delta and Loess ($P < 0.05$) at 2.5 years, and about 12% smaller than Delta and Loess ($P <= 0.01$) at 3.5 years. Body mass was 12 and 19% greater in Delta bucks than Loess and LCP at 1.5 years. Body mass differed among all regions at 2.5 and 3.5 years. Our preliminary patterns are similar to those reported from wild harvested deer. These patterns could be due to either lingering maternal effects from the source populations and/or actual differing genetic potential among regions. A complete answer will require data collection through a second generation of bucks raised on the controlled diet.

* Student Presenter

NOTES

Poster Presentation

Aggressive behavior in white-tailed deer at supplemental feed sites

Robin N. Donohue, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, and Kim Echols – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville; Don A. Draeger – Comanche Ranch

Abstract: Aggressive interactions are important to the development and maintenance of a social hierarchy among white-tailed deer. Supplemental feed is provided to improve deer productivity and survival, but unlike natural forage is spatially concentrated. As a result, aggressive interactions may occur more frequently at feed sites, potentially limiting supplemental feed consumption by less dominant individuals.

We studied aggressive interactions at supplemental feed sites on 2 South Texas ranches. Each ranch had 3 200-acre high-fenced enclosures. The enclosures were managed at low, medium, and high population densities. Pelleted feed was provided ad libitum at centralized feed sites. Behavioral observations were made using trail cameras placed at each feed site. Observations were recorded during 14-day collection periods in December, March, August, and October. Each interaction was assigned a severity value depending on the stereotyped behavior displayed. Preliminary data from 2 seasons, at 3 densities on 1 ranch indicated that the rate of aggressive interactions (interactions/pair of deer/hr) does not vary by density but that average severity of the interactions does. We found that in interactions between age/sex classes, bucks dominated does in 94% of encounters, bucks dominated yearling bucks and fawns in 100%of encounters, yearling bucks dominated does in 90% of encounters, and does dominated fawns in 100% of encounters. Understanding aggressive behavior at supplemental feed sites and the effect of population density will help managers improve their supplemental feed programs.

* Student Presenter

NOTES

Poster Presentation

Quantifying movement patterns of male white-tailed deer during the breeding season

Aaron M. Foley, Randy W. DeYoung, and David G. Hewitt – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Mickey W. Hellickson – King Ranch; Karl V. Miller – Warnell School of Forestry and Natural Resources, University of Georgia; Kenneth L. Gee – Samuel Roberts Nobel Foundation

Abstract: Species use varying strategies to locate mates during breeding season. Described strategies come from species that are easily observed. White-tailed deer often reside in densely vegetated habitats, making direct observation difficult. In South Texas, we captured 15 male white-tailed deer and affixed GPS collars. Collars were programmed to collect locations at 20 minute intervals during the breeding season. We used correlated random walk (CRW) method to assess differences in movement patterns. Turn angles and step lengths from each individual were used to compute net squared displacement (NSD) in a 24 hour path during peak rut. To determine whether individuals followed CRW, we generated an expected NSD by bootstrapping observed turn angles and step lengths 10,000 times. Confidence intervals were produced by the percentile method. We found that 7 of 15 individuals had lower NSD than expected, indicating short trips and returning to the same area. Seven different individuals had similar NSD as expected with CRW, indicating random movement. Only 1 individual had higher NSD than expected, indicating a long distance trip. We are able to classify 2 broad types of strategies; individuals that tend to take short trips and return to the general area, and those that moved randomly. Individuals that stayed in the area may be exhibiting female defense or have a prior knowledge of female locations. Males moving randomly may not be able to acquire females. This has implications for describing the mating system of the white-tailed deer and determining which strategy may be more profitable for finding mates. *An additional 72 collared individuals will be added to analysis.

* Student Presenter

NOTES

Poster Presentation

A spatially explicit model of the white-tailed deer population in Delaware

Brian R. Jennings, Jacob L. Bowman, and Greg Shiver – University of Delaware; Greg Moore – Delaware Division of Fish and Wildlife

Abstract: White-tailed deer population models are used by many states to predict population levels and aid in making management decisions. Delaware did not have a deer population model, so we developed a model and used it to investigate changes to the harvest regimes. We used survival rates, reproductive rates, harvest data, a population estimate, and spotlight counts to construct the model. We modeled 7 changes to the harvest regimes, 2 scenarios involved adding days to the main shotgun season and the 5 other scenarios involved closing seasons or terminating permits. The model began in February 2006 and we ran the scenarios until August 2014. Without changing the harvest regime, our model predicted the state population to decrease 28% by the fall of 2014. The additional days on the main shotgun season caused the population to decline at a greater rate by 2014. Terminating the severe deer damage program did not impact the 2014 predicted deer population. Closing the October antlerless season and the January shotgun season caused a 23% increase to the 2014 predicted population, in both scenarios. Compared to scenario without changing the harvest regimes, the deer population was 11% greater in 2014 with the January muzzleloader season closed and 37% greater in 2014 with both January shotgun and muzzleloader seasons closed. The model showed several options are available for managers to increase or decrease the deer population by 2014 using different harvest regimes depending on the desired population level.

* Student Presenter

NOTES

Poster Presentation

Diet selection patterns of white-tailed deer fawns

Donald C. Kahl Jr., David G.Hewitt, Timothy E. Fulbright, and Kim C. McCuistion – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville

Abstract: Nutrient requirements of white-tailed deer (Odocoileus virginianus) fluctuate seasonally and vary between sexes and ages of individuals. Although this variation is well documented, nutrient recommendations and supplemental feeding programs are based on average nutrient requirements and thus do not allow individuals whose requirements differ from the average to select an appropriate diet. Our objectives were to evaluate: (1) the ability of captive fawns to mix experimental rations to meet energy and protein requirements; and (2) the changes in diet selection that occur as seasonal requirements fluctuate. Daily consumption rates and monthly growth rates were measured for 13 (7 male and 6 female) captive white-tailed deer fawns from Dec 2008-Dec 2009. Throughout the study, 2 experimental rations differing in protein and energy concentrations were offered ad libitum. Between Jan and Aug 2009 female and male fawn growth rates were 1.5 times and 2.7 times greater, respectively, than normal growth rates of fawns from the northeastern United States (Thompson et al. 1973). Fawns selected a diet containing 3.22 kcals/g digestible energy and 11.3% crude protein which supported high growth rates. Improved understanding of fawns' ability to select an appropriate diet from foods varying in energy and protein concentrations will help improve habitat management and supplemental feeding practices.

* Student Presenter

NOTES

Poster Presentation

Effects of deer density and supplemental feeding on palatable plants

Nathan D. Kelley, Timothy E. Fulbright, David G. Hewitt, Charles A. DeYoung, Kim Echols, Eric D. Grahmann, and Carlos E. Gonzalez,– Caesar Kleberg Wildlife Research Institute Texas A&M University-Kingsville; Don A. Draeger – Comanche Ranch

Abstract: Kidneywood, granjeno, guayacan, orange zexmenia, and bush sunflower are distributed throughout southern Texas and are important in diets of white-tailed deer. Our objective was to determine effects of different deer densities and supplemental feeding on density of these 5 species. Research is being conducted on the Comanche and Faith ranches in Dimmit County, Texas. Six 200 acre high-fenced enclosures were constructed on each ranch. One of 3 target deer densities were maintained in each enclosure by adding and removing animals twice/year: 10 (low density), 25 (medium density), and 40 (high density). Half of the enclosures were provided supplemental feed year-round. Twenty 164 ft transects were placed in each enclosure using restricted randomization. Density and height class (<1.6, 1.6-5, and >5 ft) of each plant species was estimated annually along each transect during 2004-2009. Bush sunflower <1.6 ft tall and bush sunflower 1.6-5 ft tall were 2.8 and 2.4 times more abundant ($P<0.05$), respectively, in enclosures with supplemental feeding than in enclosures with no supplemental feed. Density of mid-sized (1.6-5 ft tall) granjeno was relatively constant during 2005-2008 in fed and unfed enclosures; however, in 2009 density of mid-sized granjeno tended to increase ($P<0.05$) with increasing deer density in unfed enclosures. Supplemental feeding appears to result in reduced deer impact on bush sunflower. Density of the plant species we studied does not appear to be negatively impacted by increasing deer density within the range of deer densities we examined.

* Student Presenter

NOTES

Poster Presentation

Deer food plant responses to intensive loblolly pine stand regeneration regimes

Graham M. Marsh, Karl V. Miller, Steven Castleberry, Vanessa Lane – Warnell School of Forestry & Natural Resources, University of Georgia; Darren Miller – Weyerhaeuser Company; T. Bently Wiggly - NCASI

Abstract: Although intensive silvicultural can boost loblolly pine (*Pinus taeda*) yields by > 150%, relatively little is known about how increased intensity of regeneration techniques impacts white-tailed deer (*Odocoileus virginianus*) habitat in young plantations. We examined the response of deer forage plants to 6 stand re-establishment treatments on 6 sites in the North Carolina Lower Coastal Plain. The treatments represented an intensity gradient of silvicultural regimes variously incorporating chemical site preparation (CSP), mechanical site preparation (MSP), herbaceous release (banded or broadcast), and planting density. We measured percent cover of vegetation (woody, herbaceous and vine) during 7 growing seasons until 2009 and classified growing season vegetation as preferred or non preferred according to published literature. All groups rebounded quickly following release treatments in the first growing season. Preferred herbaceous species varied little among treatments, although these species were generally more abundant on sites that had received the highest intensity of site preparation treatment, and were most prevalent at 2 to 4 years post treatment. Preferred vine and woody species were most abundant on sites that did not receive a chemical site preparation treatment, and these differences persisted through the seventh growing season. Wide spacing between rows resulted in more preferred woody and vine cover, but not herbaceous cover. Although composition of preferred forages (woody vs. herbaceous) varied across an intensity gradient, abundant forage occurred in all treatments after the first growing season through 7 years post treatment.

* Student Presenter

NOTES

Poster Presentation

A summary of implementing telephone game checking in Arkansas

Matt W. Hodges and Brad Miller – Arkansas Game & Fish Commission

Abstract: Deer harvest records provide state agencies with important information for management programs. Mandatory deer checking has been required in Arkansas since 1938 and has primarily consisted of hunters completing paper checksheets issued to county check stations or private deer hunting clubs enrolled in the game checking program. However, the delays in the process of paper checksheet collection and database entry greatly reduce the utility of traditional harvest data in crafting regulations for upcoming seasons. Internet checking of harvested game was added in 2001 and provided near real-time harvest data with minimal cost. However, those animals comprise only 26% of the total harvest. To improve data timeliness and quality, an automated telephone game checking system replacing paper checksheets was implemented for the 2009-10 deer season. As of November 23, 2009, a total of 111,493 white-tailed deer have been checked for the 2009-10 season. Of that total, approximately 59% of deer have been checked using the toll-free number. Calls to the automated toll-free number were successfully completed 76% of the time. All remaining calls were connected to a live operator to complete the checking procedure. Internet and mobile application checking (e.g., IPhone, Blackberry), were the other game check methods and comprised 37% and 4% of the remaining checked animals, respectively. Cost estimates for telephone game checking are approximately $210,000, compared to $173,800 for the former paper checksheet program. Although some future modifications to telephone checking are possible, the implementation of telephone game checking has largely been successful in Arkansas.

NOTES

Poster Presentation

Spatial and temporal relationships between deer harvest and deer-vehicle collisions at Oak Ridge Reservation, Tennessee

Amanda M. Pierce, Lisa Muller, Phillip Allen, Jason Henning, and Graham Hickling – University of Tennessee; Neil Griffin – Oak Ridge National Laboratory; Jim Evans – Tennessee Wildlife Resource Agency

Abstract: The Department of Energy Oak Ridge Reservation and the nearby adjoining City of Oak Ridge, Tennessee had experienced a rise in deer-vehicle collisions (DVCs) to the point where safety for employees and residents became a concern. The Oak Ridge Reservation and the City of Oak Ridge were divided into 180 individual grids about 1 mile^2 each. DVCs were monitored and recorded by grids from 1975 - 2008. The number of DVCs in 1975 was 16 and reached a high of 273 in 1985. Therefore, managers initiated a hunting program in 1985 and recorded deer harvest numbers by grid each year. Deer harvest has been occurring from 1985 until present, except when hunting was cancelled due to security concerns after the 9/11 terrorists attacks in 2001. By 2008, the number of DVCs decreased to 100 per year. When hunting first started in 1985, they harvested 926 deer. By 2008, harvest declined to 481. Overall, hunting has affected the number of DVCs. However, we have also used GIS mapping to record DVCs, percent grid where harvest is allowed, land cover types, and road distance by grid to determine factors affecting DVCs on the smaller landscape. We expect managers can possibly use this data to guide intensive local management aimed at reducing DVCs. Final analysis will be available at the meeting.

* Student Presenter

NOTES

Poster Presentation

Distance sampling using ground based thermal imagery – an effective deer management tool for state wildlife agencies

Daryl R. Ratajczak and R. Gray Anderson – Tennessee Wildlife Resource Agency; Robert E. Kissell Jr. – University of Arkansas

Abstract: State wildlife agencies are often limited in their ability to manage deer due to the lack of adequate data at the landscape level (i.e., county-wide level and up). Hunting regulations are often based on harvest data or other indices that may not reflect actual herd parameters. Population size and density can be measured using distance sampling, but its effectiveness has not been tested at the landscape-scale in the Southeast. The primary objective of this study was to determine deer densities at a scale appropriate for making regional management decisions. An eight-county study area in south-central Tennessee was defined and data were collected along 40 randomly selected road-based transects (471 total miles). Deer were observed using hand-held thermal imaging devices and distances were recorded with range-finders. Deer densities were calculated for two cover types, open and forested, using distance sampling. Deer density in the open cover type was 29.7 deer/mi^2 (95% C.I. = 24.9 – 35.4, CV = 0.089) while the forested cover type density was 9.8 deer/mi^2 (95% C.I. = 7.2 – 13.4, CV = 0.159). This yielded a post-hunt deer population of 77,034 (17.7 deer/mi^2) for the entire area (4,358 mi^2). Our initial results yielded an estimate that may be used for management purposes. Cost analysis indicated that manpower and financial commitments were within the constraints of the agency budget.

NOTES

Poster Presentation

Response of non-game species to white-tailed deer food plots in Appalachian hardwood forests

Wilson E. Ricks and Karl V. Miller – Warnell School of Forestry and Natural Resources, The University of Georgia: Brian P. Murphy-Quality Deer Management Association

Abstract: Establishment of food plots is an increasingly important tool for managing white-tailed deer (*Odocoileus virginianus*) habitat in the eastern United States. However, little is known about their impacts on non-game species. During 2008 and 2009, we evaluated songbird and small mammal responses to food plots planted with perennial clovers on 20 northern sites (New York and Pennsylvania) and 20 southern sites (Georgia and Tennessee). We completed a total of 1,400 breeding bird surveys (BBS) on all sites and an additional 500 winter bird counts on 10 sites in North Georgia. We compared songbird detections within the food plot, food plot edge, and 410 feet into the adjacent forest. For the southern BBS, species richness and abundance were greater at the food plot edges, than within the plot or in the adjacent forest. For the northern BBS, species richness and abundance were greatest at the food plot edges and adjacent forest. The winter counts showed no differences between treatments. We surveyed small mammals' relative abundance using snap traps over 15,000 trap nights on each of the northern and southern food plots in the same treatments. Small mammal richness and capture rates were greatest along the food plot edges. Food plots within closed canopy hardwood forests did not negatively impact non-game wildlife, but rather the plot edges enhanced habitat conditions for several avian and small mammal species. The creation of food plots may provide habitat for some non-game species in hardwood landscapes where early successional habitat is limited.

* Student Presenter

NOTES

Poster Presentation

White-tailed deer movements in response to flood events in eastern Arkansas

Blair Smyth and Don White – University of Arkansas- Monticello; Brad Miller – Arkansas Game & Fish Commission

Abstract: Little information is available on white-tailed deer (*Odocoileus virginianus*) movements related to flooding events inside the Mississippi River levee system. Currently, the Arkansas Game and Fish Commission has classified twelve regions in Eastern Arkansas as flood-prone zones, and adjusts management strategies in response to flooding events in these areas. Our objectives were to quantify deer movements during flood events and to determine if these movements differed by age or gender. The study was conducted in Arkansas County on the Freddie Black Choctaw Island Deer Research Area, inside the Mississippi River levee system in eastern Arkansas. We captured and fitted 21 deer with GPS collars in late winter of 2008. The GPS collars recorded up to twelve locations per day for each animal. We used these locations along with a land-cover classification map and LIDAR data to better understand deer reaction to flood events. In spring 2009, river levels rose five feet above flood stage. It appears that movements due to flooding may differ by gender. The project is scheduled to continue for two additional years. It will provide Arkansas Game and Fish deer movement information that can be used to better manage flood prone regions in Arkansas.

* Student Presenter

NOTES

Poster Presentation

Fawn use of supplemental feed in south Texas

Kristopher VanBogelen, David G. Hewitt, and Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Mickey W. Hellickson – King Ranch Inc.

Abstract: Fawn survival and growth are important factors for land managers to consider as they look for ways to optimize their deer population. Enabling fawns to access supplemental feed could increase both survival and growth. Thirty fawns were fitted with ear tag radio-transmitters using a helicopter capture method with net guns near Aguilares, Texas in October 2008. Fawn access to supplemental feed sites was monitored during winter using trail cameras at all feeders in the fawns' home ranges. Preliminary results show that only 2 of 30 fawns were using supplemental feed and that they did not use the feed regularly. Feed sites on the study area are surrounded by a hog panel fence to keep non-target species from consuming feed. Fencing may limit fawn access to the feed. Social interactions with adult deer may also keep fawns from entering feed sites. Thirty more fawns will be tagged in autumn 2009 and feeder use by fawns will be examined via trail cameras. Fence heights will be varied across the study area, allowing us to determine an effective accessibility height. These data will be useful to South Texas ranch managers as they try to consistently produce deer that can be harvested during the hunting season. Understanding fawn access to feeders will allow managers to enhance their deer management efforts.

* Student Presenter

NOTES

Poster Presentation

Estimating mountain lion distribution in Texas based on predictive ecological niche modeling with the genetic algorithm for rule-set prediction

John H. Young – Texas Parks & Wildlife Department; Michael E. Tewes – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Jason K. Blackburn – Spatial Epidemiology and Ecology Research Laboratory, California State University; Kristina M. McNyset – United State Environmental Protection Agency

Abstract: Our previous research on cougar (*Puma concolor*) determined they represent a major predator of white-tailed deer (*Odocoileus virginianus*) in many locations within Texas. Consequently, the spatial distribution of cougar habitat and selected landscape factors influence cougar occurrence and have important effects on the population dynamics and predation ecology of deer, particularly in southern and western Texas. We used the genetic algorithm for rule-set prediction (GARP) to model the ecological niche for cougars in the continental United States (CONUS) and Texas based on museum specimen records, harvest data, radio-telemetry studies, and post-processing. The predicted range for cougars across CONUS encompasses the majority of the western states eastward to western Oklahoma, Kansas, Nebraska, and South Dakota. The distribution extends in a narrow band along the southern coastal states of Louisiana, Mississippi, and Alabama, to Florida and then extends in a narrow band along the Atlantic Coast to Virginia. Extracting Texas from the CONUS model and conducting post-processing results in a predicted suitable habitat area of 46,781,788 acres encompassing all 11 of the state's Ecoregions. Post-processing substantially reduces the predicted distribution and reveals a high degree of fragmentation in the Pineywoods, Oak Woods and Prairies, Blackland Prairies, Gulf Coast and Prairies, Rolling Plains, and High Plains. While our model indicates suitable cougar habitat is available throughout Texas, the high degree of fragmentation in the Pineywoods, Blackland Prairies, Oak Woods and Prairies, and Gulf Coast Prairies, makes it unlikely that cougars are resident and may not be impacting white-tailed deer populations in these ecoregions.

NOTES

Poster Presentation

Developing sightability models for aerial surveys of deer on rangelands

Cody J. Zabransky, David G. Hewitt, Randy W. DeYoung, Charles A. DeYoung, and Eric J. Redeker – Caesar Kleberg Wildlife Research Institute, Texas A&M University – Kingsville; Calvin L. Richardson and Shawn Gray – Texas Parks & Wildlife Department; Louis A. Harveson – Borderlands Research Institute for Natural Resource Management

Abstract: Effective wildlife management requires knowledge of population size and composition. Helicopters are a commonly used tool for surveying wildlife populations, particularly on rangelands, because they allow large areas to be surveyed quickly. The value of resulting raw, uncorrected data is limited due to the failure of the method to count all animals. Resulting trend data are not nearly as valuable as unbiased population estimates in setting regulations and assessing deer management goals. The objective of this research is to develop a sightability model for use in estimating annual mule deer population size and composition in Texas. Thirty-six deer were fitted with GPS collars on each of two study sites per year to quantify factors (percent cover, vegetation type, activity, terrain, light, distance) potentially affecting visibility of mule deer during helicopter surveys. The 3 year study covers different parts of mule deer range in Texas including the Trans-Pecos and Panhandle regions. Logistic regression was used to determine those factors which affect sightability of deer from helicopters from 1,138 possible observations in the first two years. Preliminary analysis suggests that activity, distance, and vegetation type influence sightability of mule deer. These preliminary results suggest that uncorrected aerial survey data may not accurately estimate mule deer population size in Texas.

* Student Presenter

NOTES

Appendix

Southeastern State Deer Harvest Summaries

Table 1. Southeastern state deer harvest summaries for the 2008-2009 or most recent available season.

State	Land Area (sq. mi)	Deer Habitat		Percent Forested	% Land Area Public Hunting	Harvest		
		(sq. mile)	(% Total)			Male	Female	Total
AL	51,628	48,014	93	71	5	156,000	207,000	363,000
AR	52,609	44,718	85	53	12	107,322	74,963	184,991 [10]
DE	1,954	702	36	15	8	6,229	7,647	13,926
FL	51,628	29,280	50	45	16	57,641	31,880	89,521
GA	57,800	37,181	64	64	6	159,567	239,350	398,917
KY	40,395	39,654	97	59	9	61,164	59,446	120,610
LA	41,406	26,562	64	52	4	85,428	72,772	158,200
MD	9,837	8,766	89	46	4	44,232	54,026	98,258
MO	69,561	21,396	31	31	4	140,294	141,825	282,119
MS	47,296	31,250	66	66	6	132,167	148,687	280,854
NC	48,794	35,089	72	58	6	160,518	127,043	287,561
OK	69,919	37,425	54	19	2	63,069	48,358	111,427
SC	30,207	21,920	73	63	7.5	131,346	117,432	248,778
TN	42,246	25,770	61	49	9	86,727	72,146	158,873
TX	261,914	152,730	58	40	<2	340,159	279,491	619,650
VA	39,683	35,957	91	61	8	134,893	121,489	256,382
WV	24,064	22,889	95	79	9	93,353	66,710	163,603
Avg or Total	940,941	619,303	69.4	51.2	7	1,872,626	1,707,710	3,580,336

Table 1. Continued.

State	Harvest/sq. mi. Deer Habitat	Method of Data Collection[1]	Estimated Pre-season Population	Length of Season (Days)[2]			Method of Setting Seasons[3]	% Land Area Open to Dog Hunting
				Archery	Black Powder	Firearms		
AL	7.1	A,B,C,I	1,750,000	109 (C)	22 (A,B,C)	77 (A,C)	A,B	70
AR	4.1	A,H,I	800,000	151 (C)	12 (C)	51 (C)	A,B	70
DE	19.8	A,F	45,000	131 (C)	14 (A,B)	35 (A,B)	A,B,C	0
FL	3.1	B		30	9	72	A,B	20
GA	10.8	A,C,D,E,G	968,280	115-146 (C)	80-95 (A,C)	73-88 (C)	A,B,C	25
KY	3.04	D,F,G	1,003,000	136 (C)	2 (A), 9 (B)	Retain current entry, but add "+ 4 Jr. days."	A,B,C	0
LA	5.9	A,B,C	600,000	123(C)	14(A,B)	65	A,B,C	80
MD	11.2	B,C,D,F,G	229,000	87 (C)	3+9 (A), 13 (B)	13 (A), 2 (B), + 1 Jr. day	A,B,C	0
MO	13.2	B,C,D,F,G	1,400,000	98	10	25	A,B	0
MS	8.98	B,C	1,750,000	122 (C)	14 (A),10 (B)	46	C	90
NC	8.2	A,B,C,D,F, C	1,300,000	24-60	6	18-65	A,B,C	50
OK	2.56	A,C, E	500,000	107	9	16	A,B	0
SC	11.6	A,B,C	800,000	16 (A)	10 (A)	70-140	C	60
TN	6.2	A,D	700,000	52	14	39	A,B,C	0
TX	4.1	B,C	3.9 million [9]	30	9	81-94	A,B	0
VA	7.1	A,B,C,F		36-66	12-31	13-43	A,B	55
WV	7.1	A	705,000	64 (C)	6 (C)	22 (C)	A,B,C	0
Avg. or Total	130.98		16-16.5 million					58.8

Table 1. Continued.

State	No. of Hunters[4]	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	195,400	Stable	$24	$275	License Tag	Mandatory	N/A
AR	300,000	Stable	$10.50 – 25	$100 – 300	License Tag	Mandatory	Female/Mgt buck
DE	18,500	Stable	$25	$130	Physical Tag	Mandatory	2 Antlered, Unlimited Antlerless
FL	150,000	Stable	$12	$151	Some WMA's	Mandatory	No
GA	302,198	Stable	$19-$43	$295-$373	License Tag	Mandatory	WMA'S
KY	255,000*	Down	$50	$190	License tag/ Hunter Log	Mandatory	Yes
LA	162,600	Stable	$29-50	$300-352	Physical Tag	Mandatory	DMAP/LATD
MD	65,000	Down	$36.50	$130	Physical Tag	Mandatory	Antlered only
MO	500,000	Stable	$17	$175	License Tag	Mandatory	Antlerless only
MS	132,862	Down	$18.85-33.85	$303.85-382.70	None	None	Antlerless, DMAP & FMAP
NC	240,000	Down	$25	$120	License Tag	Mandatory	Antlerless Only
OK	370,038	Stable	$20	$201	Carcass Tag	Mandatory	DMAP
SC	145,236	Stable	$25	$225	None	None	Yes
TN	200,000	Down	$56	$251	Physical	Mandatory	Quota permits
TX	645,398	Up	$23	$300	License Tag	None	MLDP permits
VA	~250,000	Down	$37-72	$152-212	License Tag	Mandatory	Unlimited on private lands, antlerless only
WV	235,000*	Down	$43	$209	Physical Tag	Mandatory	Yes
Total	4,806,430						

Table 1. Continued.

State	Mandatory Hunter Ed.	Mandatory Orange	Handguns Permitted	Crossbows Permitted	Drugged Arrows Permitted	# Fatal Hunting Accidents		Highway Kill[5]
						All	Deer	
AL	Yes	Yes	Yes	Yes	No	2	1	25,000 (B)
AR	Yes	Yes	Yes	Yes	No	2	0	18,974 (C)
DE	Yes	Yes	Yes	DDAP& SDDAPfarms, Handicap, Gun	No	0	0	4,294 (B)
FL	Yes	Yes	Yes	Yes	No	0	0	Unknown
GA	Yes	Yes	Yes	Yes	No	1	?	50,000(C)
KY	Yes	Yes	Yes	Season & handicap	No	3	1	2,958 (A)
LA	Yes	Yes	Yes	Yes	No	0	0	10,000 (C)
MD	Yes	Yes	Yes	Handicap, 4 wks; >65; Entire Archery Season in Urban	No	1	1	25,000(C)
MO	Yes	Yes	Yes	Yes, Firearms	No	0	0	5,950 (A)
MS	Yes	Yes	Yes	Yes, Firearms, Primitive Weapons	No	3	3	13,954 (C)
NC	Yes	Yes	Yes	Handicap	No	3	3	19,693 (B)
OK	Yes	Yes	Yes	Handicap	No	1	0	Unknown
SC	Yes	WMA's only	Yes	Yes	Yes; No WMAS	2	2	1,921 (A)
TN	Yes	Yes	Yes	Yes	No	4	4	20,000 (C)
TX	Yes	WMAs only	Yes	Yes	No	6	1	Unknown
VA	Yes	Yes	Yes	Yes	No	7	5	48,300
WV	Yes	Yes	Yes	Yes (Disabled)	No	6	5	20,627 (A)
Total						41	26	

Table 1. Continued.

State	Limits [6]			Antler Restrictions [7]	% Hunting Success			Avg. Leasing Fees/Acre
	Season	Antlerless	Antlered		Archery	Muzzleloader	Firearms	
AL	3/None[6]	2 per day	3	B,C (1 County, 6 WMA's)	~25	~25	~55	$5-16
AR	4	2-4	2	A,C	?	?	?	$5.50
DE	None	4+	2	One buck must have a spread ≥15"	?	?	?	?
FL	2/day [6]	1 or 2/day[6]	2/day [6]	C	23	20	57	$2-4
GA	12	10	2	A (One buck must be 4-points on 1 side) B(9counties are more restricted)	47	29	111	$5-20
KY		Varies	1	C (9 WMAs)	----------	35% Combined	----------	$15-25
LA	6	3	3	Yes (C)	18	26	48	$5-30
MD		Regional	Regional	No	38	35 (C)	45	$5-35
MO	Varies	Varies	3; 1 with firearm	Yes, 65 counties	22	-	38	$10
MS	8	3+2 Archery	3	C	50.7	54.9	68.7	?
NC	6	6	2/4 [6]	NA	?	?	?	$2-6
OK	Gun	2	1	No	15	23	33	$2-5
SC	15+	10+	5+	C (8 WMA's)	31	29	68	$8–10+
TN		Varies	3 statewide	None	----------	44% Combined	----------	$5-10
TX	5	Up to 5	Up to 3	C	60	82	62	$7-20
VA	6 (east) & 5 (west)	6	3 (east)& 2 (west)	On 2 WMA's + 1 County	~36	~44	~51	UNK
WV	11	Up to 9	Up to 3	5 WMA	38	17	76	$1-5
Avg.					30.7	31.6	52.8	

Table 1. Continued.

State	Private Lands Programs				Trailing wounded deer with dogs legal?	Supplemental feeding legal?	Baiting legal?
	Type[8]	Min. Acreage Requirements	Fee	No. of Cooperators			
AL	A	None	Yes	150	Yes	Yes	No
AR	A	200 ac	$25	A=264,D=3,000	Yes	Yes	Yes, Private
DE	DDAP SDDAP	None	None	200 130	No	Yes	Yes
FL	A	640	None	1,250	Yes	Yes	Yes
GA	None				Yes	Yes	No
KY	B	None	None	305	Yes	Yes (except March – May)	Yes, Private
LA	A,D	40	Yes	A=391,D=467	Yes	Yes	Yes, Private
MD	None				Yes	Yes	Yes, Private
MO	B	5	None	150,000	Yes	Yes	No
MS	A,D	Variable	None	648	Yes	Yes	No
NC	A	Regional; 1,000/500	$50	112	Yes, dog areas	Yes	Yes
OK	A	1,000	$200-400	203	No	Yes	Yes
SC	A	None	$50	1,658 3.5 mil ac.	Yes	Yes	Yes 28 co. No 18 co.
TN					With officer approval	Yes	No
TX	A,B,C	None	None	5,030	Most of Texas	Yes	Yes
VA	DCAP DMAP	None	None	1,784; 932	Yes(east), No(west)	No (Sept 1 – first Sat in Jan)	No
WV	None				No	Yes except for CWD area	Yes except for CWD area

Table 1. Continued; footnotes.

[1] 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

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

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

[4] Asterisk if estimate includes landowner exempted hunters.

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

[6] 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 anterless deer during archery season and if taken with antlerless deer permits, only one/day may be antlerless during the 7-day antlerless deer season.; MO - No daily or annual limit of antlerless deer but number that can be harvested in each county varies.; NC - Up to 2 bucks in those areas in the western season, northwestern season, and central season. Up to 4 bucks in those areas in the eastern season.

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

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

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

[10] Total harvest includes 2,704 deer of unknown sex.

The Buckhorn Saloon
318 E .Houston St.

The Alamo

N. St. Mary's St.
Navarro St.
Jefferson
Broadway
3rd St.
Avenue E
N. Alamo St.
E. Houston Street
College St.
N. Presa St.
The River Walk
Alamo Plaza
Bonham
Bowie St.
Crockett Hotel
W. Crockett St.
E. Crockett St.
Losoya
Menger Hotel
Rivercenter Mall
W. Market Street
N. Presa St.
Alamo Plaza
E. Commerce Street
San Antonio Marriot Rivercenter
S. Alamo St.

Downtown San Antonio