35th Annual Meeting of the
Southeast Deer Study Group

Shifting Paradigms: Are Predators Changing the Dynamics of Managing Deer in the Southeast?

February 26-28, 2012

Sandestin Golf and Beach Resort's Grand Sandestin

Sandestin, Florida

Hosted by the Florida Fish and Wildlife Conservation Commission

WELCOME

The Florida Fish and Wildlife Conservation Commission welcomes you to the 35th Annual Southeast Deer Study Group Meeting in Sandestin, Florida.

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

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WHITE-TAILED DEER MOUNT CONTRIBUTORS

Gary Borland	Martin County	2001	155 2/8 net typical
James Cason	Marion County	2004	151 5/8 net typical
Lee Crews	Alachua County	2000	179 0/8 net non-typical
Bobby Davis	Dixie County	1989	150 1/8 net typical
Bobby Davis	Dixie County	1996	159 4/8 net typical
Bobby Davis	Dixie County	2006	152 5/8 net typical
Clifton Davis	Alachua County	1986	152 7/8 net typical
Sylvia Green	Madison County	2006	163 0/8 net non-typical
Danny Murphy	Jefferson County	2010	154 5/8 net non-typical
Robert Partin	Alachua County	2010	170 6/8 net non-typical
Casey Phillips	Richloam WMA	2005	156 5/8 net non-typical
Randal Potter	Gadsden County	1998	151 7/8 net non-typical
Mike Lopez-Reyes	Orange County	2009	146 1/8 net typical
Mike Lopez-Reyes	Volusia County	2007	152 3/8 net non-typical
Mike Lopez-Reyes	Volusia County	2008	150 0/8 net typical (found dead)
Gill Tyler	Suwannee County	2005	155 0/8 net typical (found dead)
Lucky Vaughn	Brevard County	1986	149 3/8 net typical

COMMITTEES

MEETING ORGANIZERS AND CO-CHAIRMEN

Cory R. Morea and Steve M. Shea

AWARDS - Steve Shea (Chair)

DISPLAY and EXHIBITS - James Kelly, Jessica Basham, Brigham Mason, Tony Young

FUNDRAISING - Jen Williams (Chair), Kurt Hodges

PAPER/POSTER SELECTION - Elina Garrison (Chair), Bill Giuliano, Jason Burton

PROGRAM and AGENDA - Brigham Mason (Chair)

REGISTRATION - Angela Leggett (Chair), Jessica Basham

SECURITY - Lt. Mark Hollinhead, Captain Jason Marlow

SITE COORDINATION - Toni Brannon (Chair), Justin Davis, Roger Shields

THE SOUTHEAST DEER STUDY GROUP

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

TWS PROFESSIONAL DEVELOPMENT

The 35th 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?
2011	Oklahoma City, OK	All Dressed Up With No Place to Go: The Issue of Access.
2012	Sandestin, FL	Shifting Paradigms: Are Predators Changing the Dynamics of Managing Deer in the Southeast?

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

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

SOUTHEAST DEER STUDY GROUP AWARDS

Career Achievement Award

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

Outstanding Student Oral Presentation Award

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

Outstanding Student Poster Presentation Award

2010 – Emily Flinn (Mississippi State University)
2011 – Melissa Miller (University of Delaware)

SCHEDULE OF EVENTS

Sunday, February 26, 2012

1:00 p.m. – 6:00 p.m.	Registration	Magnolia Registration
1:00 p.m. – 6:00 p.m.	Poster & Vendor Set-up	Magnolia Ballroom A, B & C
3:00 p.m.	Deer Committee Meeting	Camellia I
6:00 p.m. – 9:00 p.m.	Social (W/Heavy Hors D'oeuvres)	Finz Restaurant Pool Deck

Monday, February 27, 2012

7:00 a.m. – 12:00 p.m.	Registration	Magnolia Registration
7:00 a.m. – 8:00 a.m.	Poster & Vendor Set-up	Magnolia Ballroom A, B & C
8:00 a.m. – 5:00 p.m.	Posters/Exhibitors/Vendors	Magnolia Ballroom A, B & C
8:00 a.m. – 10:20 a.m.	Plenary Session	Magnolia Ballroom D, E, & F
10:20 a.m. – 10:40 a.m.	Break	Magnolia Foyer
10:40 a.m. – 10:50 a.m.	Door Prizes	Magnolia Ballroom D, E, & F
10:50 a.m. – 12:10 p.m.	Technical Session I	Magnolia Ballroom D, E, & F
12:10 p.m. – 1:30 p.m.	Lunch	On Your Own
1:30 p.m. – 1:40 p.m.	Door Prizes	Magnolia Ballroom D, E, & F
1:40 p.m. – 3:00 p.m.	Technical Session II	Magnolia Ballroom D, E, & F
3:00 p.m. – 3:20 p.m.	Break	Magnolia Foyer
3:20 p.m. – 3:30 p.m.	Door Prizes	Magnolia Ballroom D, E, & F
3:30 p.m. – 5:10 p.m.	Technical Session III	Magnolia Ballroom D, E, & F
5:10 p.m. – 6:30 p.m.	Dinner	On Your Own
6:30 p.m. – 7:00 p.m.	Social	Baytowne Marina
7:00 p.m.	Shoot From The Hip	Baytowne Marina

Tuesday, February 28, 2012

8:00 a.m. – 5:00 p.m.	Posters/Exhibitors/Vendors	Magnolia Ballroom A, B & C
8:00 a.m. – 8:10 a.m.	Door Prizes	Magnolia Ballroom D, E, & F
8:10 a.m. – 9:50 a.m.	Technical Session IV	Magnolia Ballroom D, E, & F
9:50 a.m. – 10:10 a.m.	Break	Magnolia Foyer
10:10 a.m. – 10:20 a.m.	Door Prizes	Magnolia Ballroom D, E, & F
10:20 a.m. – 12:00 p.m.	Technical Session V	Magnolia Ballroom D, E, & F
12:00 p.m. – 1:30 p.m.	Lunch	On Your Own
1:30 p.m. – 1:40 p.m.	Door Prizes	Magnolia Ballroom D, E, & F
1:40 p.m. – 3:00 p.m.	Technical Session VI	Magnolia Ballroom D, E, & F
3:00 p.m. – 3:20 p.m.	Break	Magnolia Foyer
3:20 p.m. – 3:30 p.m.	Door Prizes	Magnolia Ballroom D, E, & F
3:30 p.m. – 4:50 p.m.	Technical Session VII	Magnolia Ballroom D, E, & F
5:00 p.m.	Business Meeting	Camellia I
6:00 p.m. – 7:00 p.m.	Social	Magnolia Ballroom D, E, & F
7:00 p.m.	Awards Banquet	Magnolia Ballroom D, E, & F

Wednesday, February 29, 2012

Check-out. No events or exhibits.

MONDAY, FEBRUARY 27, 2012

PLENARY SESSION
MAGNOLIA BALLROOM D, E, & F
MODERATOR: STEVE M. SHEA – FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

8:00 **WELCOME**
Cory R. Morea, Deer Program Coordinator – Florida Fish and Wildlife Conservation Commission

8:10 **KEYNOTE ADDRESS**
Nick Wiley, Executive Director – Florida Fish and Wildlife Conservation Commission

8:30 **THE CHANGING FACE OF PREDATION IN THE SOUTHEAST** **P. 18**
Michael J. Chamberlain – University of Georgia

9:00 **COYOTE EFFECTS ON DEER POPULATIONS IN THE SOUTHEAST: WHAT'S THE EVIDENCE?** **P. 19**
John C. Kilgo – USDA Forest Service Southern Research Station

9:30 **HERE TO STAY. HOW DO WE DEAL WITH THEM?** **P. 20**
Karl V. Miller – University of Georgia

10:00 **A SILVER LINING: COYOTES AS A MANAGEMENT TOOL IN HIGH DENSITY DEER POPULATIONS** **P. 21**
Steve Demarais – Mississippi State University; Bob Zaiglin – Southwest Texas Junior College

10:20 **BREAK**

TECHNICAL SESSION I
MAGNOLIA BALLROOM D, E, & F
MODERATOR: MATT KNOX – VIRGINIA DEPARTMENT OF GAME & INLAND FISHERIES

10:40 **ANNOUNCEMENTS & DOOR PRIZES**

10:50 * **THE EMERGING DEER-COYOTE DYNAMIC: EVIDENCE OF FAWN AND ADULT DEER PREDATION IN THE SOUTHEAST** **P. 22**
M. Colter Chitwood, Marcus A. Lashley, Morgan B. Elfelt, Christopher S. DePerno, Christopher E. Moorman – North Carolina State University; John C. Kilgo – USDA Forest Service Southern Research Station

11:10 * **COYOTE EFFECTS ON WHITE-TAILED DEER: A SOUTH TEXAS PERSPECTIVE** **P. 23**
Chase R. Currie, David G. Hewitt, Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute

11:30 **WHITE-TAILED DEER (*ODOCOILEUS VIRGINIANUS*) FAWN SURVIVAL IN NORTHERN VIRGINIA** **P. 24**
Kurtis R. Moseley, R. Tim Stamps – Natural Resources and Environmental

*** Student Presenter**

Affairs Branch; John H. Rohm – Virginia Department of Game and Inland Fisheries; Brad Watkin – Natural Resources and Environmental Affairs Branch; Jonathan M. Chandler – National Park Service; Jessica H. Shively – Natural Resources and Environmental Affairs Branch; Ben Fulton – US Army

11:50 * **THE EFFECTS OF PREY ABUNDANCE AND LANDSCAPE CHARACTERISTICS ON FOOD HABITS OF COYOTES IN GEORGIA** **P. 25**
James D. Kelly, William D. Gulsby, Karl V. Miller – University of Georgia; Charlie H. Killmaster, John W. Bowers – Georgia Department of Natural Resources

12:10 **LUNCH** ON YOUR OWN

TECHNICAL SESSION II
MAGNOLIA BALLROOM D, E, & F
MODERATOR: JOE HAMILTON – QUALITY DEER MANAGEMENT ASSOCIATION

1:30 **ANNOUNCEMENTS & DOOR PRIZES**

1:40 * **A COMPARISON OF FAWN RECRUITMENT AND SIGHT-SPECIFIC PREDATOR INDICES IN MISSISSIPPI AND ALABAMA** **P. 26**
Kamen L. Campbell, Bronson Strickland, Steve Demarais, Guiming Wang – Mississippi State University; Chad Dacus – Mississippi Department of Wildlife, Fisheries, and Parks

2:00 * **WHITE-TAILED DEER SITE SELECTION IN RESPONSE TO PREDATOR EXCLUSION** **P. 27**
Michael J. Cherry – University of Georgia and Joseph W. Jones Ecological Research Center; L. Mike Conner, Jessica C. Rutledge, Lora L. Smith – Joseph W. Jones Ecological Research Center; Robert J. Warren – University of Georgia

2:20 **RECOVERY OF AN ENDANGERED CARNIVORE WITHIN THE CONTEXT OF MANAGING WHITE-TAILED DEER IN FLORIDA** **P. 28**
Dave Onorato, Mark Criffield, Mark Lotz, Mark Cunningham – Florida Fish and Wildlife Conservation Commission

2:40 * **HUMAN PREDATION RISK ALTERS BEHAVIOR OF WHITE-TAILED DEER DURING HUNTING SEASON** **P.29**
Andrew R. Little, Steve Demarais – Mississippi State University; Ken Gee – Samuel Roberts Noble Foundation; Samuel Riffell, - Mississippi State University; Stephen L. Webb – Hayden-Wing Associates; Joshua A. Gaskamp – Samuel Roberts Noble Foundation

3:00 **BREAK**

TECHNICAL SESSION III
MAGNOLIA BALLROOM D, E, & F
MODERATOR: DIANE EGGEMAN – FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

3:20 **ANNOUNCEMENTS & DOOR PRIZES**

*** Student Presenter**

3:30 **EVALUATION OF WHITE-TAILED DEER BREEDING CHRONOLOGY AND PRODUCTIVITY IN FLORIDA** **P. 30**
Elina P. Garrison, Richard A. Kiltie, Larry S. Perrin, Stephen M. Shea, Gary M. Mohr, Ryan S. Butryn – Florida Fish and Wildlife Conservation Commission.

3:50 * **UTILITY OF THE LACTATION INDEX: COMPARING THE LACTATION INDEX TO SITE-SPECIFIC FAWN RECRUITMENT METRICS** **P. 31**
Kamen L. Campbell, Bronson Strickland, Steve Demarais, Guiming Wang – Mississippi State University; Chad Dacus – Mississippi Department of Wildlife, Fisheries, and Parks

4:10 * **VARIATION IN FEMALE MORPHOLOGY IN MISSISSIPPI: NUTRITION OR GENETIC DIFFERENCES?** **P. 32**
Jake D. Oates, Steve Demarais, Bronson Strickland – Mississippi State University; William McKinley – Mississippi Department of Wildlife, Fisheries and Parks

4:30 * **AGE AND MASS IN A DOMINANCE HIERARCHY: WHAT MAKES HER THE BOSS?** **P. 33**
Eric S. Michel, Steve Demarais, Bronson Strickland, Jerrold L. Belant – Mississippi State University; Lann Wilf – Mississippi Department of Wildlife, Fisheries and Parks

4:50 * **PHYLOGEOGRAPHIC STRUCTURE OF WHITE-TAILED DEER SUBSPECIES IN MEXICO** **P. 34**
Karla G. Logan, Randy W. DeYoung, Alfonso Ortega-Santos, David Hewitt, Damon Williford – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville; James R. Heffelfinger – Arizona Game and Fish Department

5:10 **DINNER** ON YOUR OWN

SHOOT FROM THE HIP SESSION
BAYTOWNE MARINA
MODERATOR: STEVE M. SHEA – FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

6:30 **SOCIAL**

7:00 **SHIFTING PARADIGMS: ARE PREDATORS CHANGING THE DYNAMICS OF MANAGING DEER IN THE SOUTHEAST?**
Kip Adams – Quality Deer Management Association
John Kilgo – USDA Forest Service Southern research Station
Karl Miller – University of Georgia
Charles Ruth – South Carolina Department of Natural Resources
David Synatzske – Texas Parks and Wildlife

*** Student Presenter**

TECHNICAL SESSION IV
MAGNOLIA BALLROOM D, E, & F
MODERATOR: BOB ZAIGLIN – SOUTHWEST TEXAS JUNIOR COLLEGE

8:00 **ANNOUNCEMENTS & DOOR PRIZES**

8:10 * **WHITE-TAILED DEER SEASONAL MOVEMENTS IN NORTHWEST LOUISIANA** **P. 35**
Kate Hasapes, Christopher E. Comer – Stephen F. Austin State University

8:30 **MALE WHITE-TAILED DEER MOVEMENT PATTERNS DURING THE RUT: CHAOTIC OR STRATEGIC?** **P. 36**
Aaron M. Foley, Randy DeYoung, David Hewitt – Caesar Kleberg Wildlife Research Institute; Mickey Hellickson – King Ranch; Karl V. Miller – University of Georgia; Ken Gee – Samuel Roberts Noble Foundation; Mitch Lockwood – Texas Parks and Wildlife Department

8:50 * **THE EFFECTS AND PREDICTABILITY OF SOLUNAR ACTIVITY ON DEER MOVEMENTS** **P. 37**
Marcus A. Lashley, M.Colter Chitwood, Morgan B. Elfelt, Aimee P. Rockhill, Christopher S. DePerno, Christopher E. Moorman – North Carolina State University

9:10 * **EFFECTS OF SUPPLEMENTAL FEED ON WHITE-TAILED DEER ACTIVITY** **P. 38**
Lucas W. Garver – USDA, Natural Resources Conservation Servicel; David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols – Caesar Kleberg Wildlife Research Institite; Don A. Draeger – Comanche Ranch

9:30 * **WHITE-TAILED DEER VISITATION RATES AT MEDICATED BAIT SITES IN SOUTHERN TEXAS** **P. 39**
Chase R. Currie, David G. Hewitt, Alfonso Ortega-Santos - Caesar Kleberg Wildlife Research Institute; Greta L. Schuster, Tasha Perry – Texas A&M University-Kingsville; Tyler A. Campbell – USDA APHIS Wildlife Services; Kim. A Lohmeyer, Adalberto A. Pérez de León – USDA ARS Knipling-Bushland U.S. Livestock Insects Research Laboratory

9:50 **BREAK**

TECHNICAL SESSION V
MAGNOLIA BALLROOM D, E, & F
MODERATOR: GRANT WOODS – WOODS AND ASSOCIATES, INC.

10:10 **ANNOUNCEMENTS & DOOR PRIZES**

10:20 * **SEEKING IMPROVED EFFICIENCY OF CAMERA SURVEY TECHNIQUES FOR WHITE-TAILED DEER** **P. 40**
Peter K. Acker, Stephen Ditchkoff, Chad Newbolt – Auburn University

*** Student Presenter**

10:40 * **AERIAL VERTICAL-LOOKING INFRARED IMAGERY TO EVALUATE BIAS OF DISTANCE SAMPLING TECHNIQUES FOR WHITE-TAILED DEER** **P. 41**
Jared T. Beaver, Craig A. Harper – University of Tennessee; Robert E. Kissell, Jr. – University of Arkansas; Lisa I. Muller, Peyton S. Basinger, Matthew J. Goode – University of Tennessee

11:00 **CAMERA COLLARS FOR COLLECTING INTERACTION DATA FROM DEER** **P. 42**
David G. Hewitt – Caesar Kleberg Wildlife Research Institute; Michael J. Lavelle, Kurt C. Vercauteren – USDA; Aaron M. Hildreth – University of Nebraska; Tyler A. Campbell, David B. Long – USDA

11:20 * **EVALUATING THE DESIGN OF AN EXPANDABLE COLLAR FOR SUBADULT CERVIDS** **P. 43**
David M. Kalb, Jacob L. Bowman – University of Delaware; T. Brian Eyler – Maryland Department of Natural Resources

11:40 * **SENSITIVITY OF WHITE-TAILED DEER TO ULTRAVIOLET AND INFRARED LIGHT** **P. 44**
Bradley S. Cohen, David A. Osborne – University of Georgia; George R. Gallagher – Berry College; Karl V. Miler, Robert J. Warren – University of Georgia

12:00 **LUNCH** ON YOUR OWN

TECHNICAL SESSION VI
MAGNOLIA BALLROOM D, E, & F
MODERATOR: KEN GEE – THE NOBLE FOUNDATION

1:30 **ANNOUNCEMENTS & DOOR PRIZES**

1:40 * **TEMPORAL AND SEASONAL VARIATION IN HABITAT SELECTION OF WHITE-TAILED DEER IN AN AGRICULTURAL LANDSCAPE** **P. 45**
Melissa M. Miller, Jacob L. Bowman – University of Delaware; Joseph Rogerson – Delaware Division of Fish and Wildlife

2:00 * **POPULATION CHARACTERISTICS OF A WHITE-TAILED DEER HERD IN AN INDUSTRIAL PINE FOREST OF NORTH-CENTRAL LOUISIANA** **P. 46**
John H. Harrelson – Louisiana State University; Michael Chamberlain – University of Georgia; Scott Durham – Louisiana Department of Wildlife and Fisheries

2:20 * **INFLUENCE OF POPULATION DENSITY ON FORAGE INTAKE RATES AND FORAGING EFFICIENCY OF WHITE-TAILED DEER** **P. 47**
D. Justin Folks, Kory R. Gann, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch; Kim N. Echols – Caesar Kleberg Wildlife Research Institute

2:40 * **EFFECTS OF POPULATION DENSITY ON WHITE-TAILED DEER DIET QUALITY AND COMPOSITION** **P. 48**
Kory R. Gann, D. Justin Folks, David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols – Caesar Kleberg Wildlife Research Institute; Don A. Draeger – Comanche Ranch

*** Student Presenter**

3:00 **BREAK**

TECHNICAL SESSION VII
MAGNOLIA BALLROOM D, E, & F
MODERATOR: JOE BOZZO – FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

3:20 **ANNOUNCEMENTS & DOOR PRIZES**

3:30 * **AN INTEGRATED POPULATION MODEL APPROACH TO MONITORING RESPONSE OF WHITE-TAILED DEER POPULATIONS TO REGULATION CHANGES** **P. 49**
Frances E. Buderman, Duane R. Diefenbach – Pennsylvania Cooperative Fish and Wildlife Research Unit

3:50 **IMPACTS OF ANTLER RESTRICTIONS ON WILDLIFE MANAGEMENT AREAS IN FLORIDA** **P. 50**
James D. Kelly, Erin H. Leone, Cory R. Morea, Elina P. Garrison – Florida Fish and Wildlife Conservation Commission

4:10 **SELECTION OF REMOTE-SENSING CAMERA LOCATIONS FOR SUB-SAMPLING OF WHITE-TAILED DEER HERDS ON LARGE PROPERTIES** **P. 51**
Brandon T. Rutledge, Michael J. Cherry, Jean C. Brock, L. Mike Conner – Joseph W. Jones Ecological Research Center

4:30 **CONTENT ANALYSIS OF HUNTING EXPERIENCES OF FEMALE COLLEGE STUDENTS** **P. 52**
Susan T. Guynn, Robert B. Powell – Clemson University

5:00 **BUSINESS MEETING**

6:00 **SOCIAL**

7:00 **BANQUET**

*** Student Presenter**

POSTER SESSION
Magnolia Ballroom A & B

*** Student Presenter**

Monday, 8:30 am

The Changing Face of Predation in the Southeast

Michael J. Chamberlain – University of Georgia

White-tailed deer are affected by a host of mammalian predators throughout the Southeastern United States, and have evolved in the presence of these predators for millennia. Historically, whitetails were subject to predation from larger carnivores such as cougar, black bear, and red wolves. However, predator communities have been altered through changes in land use, societal pressures, and public sentiment. Conservation and wise management of cougar and black bear populations have resulted in success stories for both species. Specifically, black bear populations have been restored in some areas of the region, and continue to expand in others as restoration efforts and land use practices facilitate range expansion. The eastward movement of coyotes into the Southeast has occurred rapidly, and has changed predation pressures on whitetails and many other species. As coyotes have occupied available habitats in the Southeast, they have interacted and hybridized with other canids, owing to their reproductive potential. Coyotes inhabiting the Southeast are morphologically larger than their western counterparts, and have a dynamic social system that is poorly understood. Although considered as dietary generalists, coyotes are capable of successfully taking larger prey species, and their behavioral plasticity suggests that they are capable of exploiting the niche of competing predator species in many landscapes. Predation is a complex phenomenon, and will continue to challenge managers charged with managing landscapes for whitetails and other species. A thorough working knowledge of predator ecology and behavior is a critical first step in developing comprehensive management plans for whitetail populations in the Southeast.

NOTES

Monday, 9:00 am

Coyote Effects on Deer Populations in the Southeast: What's the Evidence?

John C. Kilgo – USDA Forest Service Southern Research Station

During the latter half of the twentieth century, we experienced the restoration to abundance of white-tailed deer across the eastern United States, with many areas even suffering damage from overabundant deer. However, a growing body of research now indicates that the establishment and increase of coyote populations in the region have begun to affect deer populations in some areas. I will review this information, focusing first on evidence indicating declines in deer recruitment and then on evidence that predation by coyotes is the cause for declines. Recruitment at one site in South Carolina declined from near 1 fawn per doe prior to the arrival of coyotes to <0.4 fawns per doe currently. Radio-telemetry research on fawns at that site, as well as in Alabama, determined that low recruitment was attributable to exceedingly high levels of predation by coyotes on neonates. Studies in Alabama, Georgia, and South Carolina all reported increased recruitment following intensive experimental coyote removals, further indicating that predation by coyotes depressed recruitment at those sites. I will discuss these and other recent data in the context of existing deer-coyote research from the historic range of the coyote. I conclude predation levels by coyotes can be very high and in some situations, particularly where doe harvest is aggressive, can have dramatic effects on southeastern deer populations. I predict that this pressure will require significant changes in how deer populations are managed in the Southeast in the future, because coyotes are here to stay.

NOTES

Monday, 9:30 am

Here to Stay. How Do We Deal With Them?

Karl V. Miller – University of Georgia

Coyote populations have increased dramatically during the last decade in many areas of the southeastern United States. Because a growing body of evidence has indicated that coyotes are responsible for declines in recruitment in many areas, deer management prescriptions must be responsive to changing herd demographics. Although intensive coyote removal before and during fawn drop can increase fawn survival, trapping efforts likely are not a practical solution on most areas, and may not be warranted in others. Alternative strategies, such as providing abundant alternate prey, or increasing fawning cover, have been proposed to increase fawn survival, but the success of these strategies has not been demonstrated. Further, growing evidence of the behavioral plasticity of this predator, along with temporal and geographic variations in coyote density and impacts, clearly demonstrates the need for further research on coyote impacts as well as the importance of obtaining site-specific data on fawn recruitment rates. In some areas, antlerless harvest prescriptions may need to be adjusted in response to observed recruitment rates and deer management objectives. Because low recruitment rates may reduce potential population growth rates, antlerless harvest prescriptions may become more conservative to prevent overharvest. Site-specific data from camera surveys, hunter observations, and lactation rates will become increasingly important to monitor changing recruitment rates and population trends as a basis for developing sound deer management prescriptions.

NOTES

Monday, 10:00 am

A Silver Lining: Coyotes as a Management Tool in High Density Deer Populations

Steve Demarais – Mississippi State University; Bob Zaiglin – Southwest Texas Junior College

The bad news: there is evidence that coyote predation can significantly reduce fawn recruitment across the Southeast. The good news: there is evidence that coyote predation can significantly reduce fawn recruitment across the Southeast. One recent project documented that up to 62% of monitored fawns died from coyote predation. Concern about the increased impact of coyotes on fawn recruitment in the SE is certainly justified for those management units where abundant recruitment is needed to support relatively high harvest rates of older-aged males. However, declining hunter recruitment has been heralded as a significant issue across the Southeast at previous Deer Study Group meetings. Problems related to deer over-abundance in exurban and suburban areas, where hunting is problematic, continue to escalate. Additionally, some large-scale private property owners hesitate to allow access to the number of hunters required to properly control deer density. We argue that large-scale inability to control deer density will be the greatest deer management issue facing state management agencies in the future and that coyotes may be a key component of any realistically effective effort within the Southeast. Before we sound too loud or too widespread of an alarm over coyote predation of deer fawns, we should carefully clarify the target audience and circumstances under which this issue is pertinent.

NOTES

Monday, 10:50 am

The Emerging Deer-Coyote Dynamic: Evidence of Fawn and Adult Deer Predation in the Southeast

M. Colter Chitwood, Marcus A. Lashley, Morgan B. Elfelt, Christopher S. DePerno, Christopher E. Moorman – North Carolina State University; John C. Kilgo – USDA Forest Service Southern Research Station

The emerging white-tailed deer-coyote dynamic in the southeastern United States has captured the attention of researchers, landowners, and hunters. Determining fawn survival and causes of mortality is critical to understanding how coyotes affect deer populations. During 2011, we determined white-tailed deer fawn survival and causes of mortality at Fort Bragg Military Installation, North Carolina. In May and June, we captured fawns with the aid of vaginal-implant transmitters (VITs). Of 27 collared fawns, 5 (18.5 %) survived the 16-week study period. Of the 22 mortalities, 15 (68 %) were attributed to coyote and bobcat predation, 5 (22.7 %) were attributed to starvation, and 2 (9 %) were unknown. Most (55 %) mortalities occurred during the first week of life. Four of 28 adults we monitored with VITs were killed by coyote(s), as evidenced by bite wounds and trauma to the throat and mandible. Three of the 4 were killed in April and May, at the beginning of the fawning period, and we were unable to recover any fetuses at the carcass sites. Low fawn recruitment and adult female mortality due to coyotes may be contributing to the decline of the deer population at Fort Bragg.

*** Student Presenter**

NOTES

Monday, 11:10 am

Coyote Effects on White-tailed Deer: A South Texas Perspective

Chase R. Currie, David G. Hewitt, Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute

Coyote (*Canis latrans*) predation has implications for white-tailed deer management and has been extensively studied in southern Texas. The proportion of fawns killed by coyotes has varied from 17 – 83% depending on the location and year, however it is not clear if this mortality was additive, especially during drought. Coyote predation seems to have little impact on adult deer populations, although adult males may be vulnerable following the breeding season, when most mortality occurs. The effect of coyote removal on fawn production has varied from no effect to 70% and 43% more fawns produced on coyote removal sites. In two studies where coyotes were experimentally excluded, deer numbers initially increased as a result of increased fawn survival (25%, 40.4 to 50.8 deer/mile^2; 96%, 101 to 198 deer/mile^2). Deer populations later declined on these sites from disease and nutrition problems. Intensive annual coyote removal is necessary to increase fawn survival and may not be feasible in many cases because coyote populations recover rapidly after removal ceases. The interaction between coyotes and deer in south Texas is still unclear, although coyote predation appears to impact fawn survival in some cases. White-tailed deer populations persist in southern Texas even in areas with little deer management, periodic drought induced reproductive failures, and high coyote densities. As coyote populations increase in the southeastern U.S., managers may need to lower harvest rates of female deer to compensate for coyote related fawn mortality.

*** Student Presenter**

NOTES

Monday, 11:30 am

White-tailed Deer (*Odocoileus virginianus*) Fawn Survival in Northern Virginia

Kurtis R. Moseley, R. Tim Stamps – Natural Resources and Environmental Affairs Branch; John H. Rohm – Virginia Department of Game and Inland Fisheries; Brad Watkin – Natural Resources and Environmental Affairs Branch; Jonathan M. Chandler – National Park Service; Jessica H. Shively – Natural Resources and Environmental Affairs Branch; Ben Fulton – US Army

Increasing coyote populations have raised concerns regarding potential negative predation impacts on white-tailed deer fawns in many parts of the eastern US. Following coyote establishment aboard Quantico Marine Corps Base (QMCB), Virginia, land managers observed a diminished capacity for white-tail deer populations to recover following increases in antlerless harvest (*Odocoileus virginianus*). Accordingly, we initiated a study to investigate white-tailed deer fawn cause-specific mortality, survival, and habitat associations in northern Virginia. During 2008-2011, we captured and radiocollared 55 fawns at QMCB, Virginia. We located and captured fawns using several techniques including ground searches, thermal imaging, and implantation of vaginal integrated transmitters in does. We monitored fawns daily for 12 weeks from May-August. We used a known fates model in program MARK to estimate survival rates and compare explanatory models based on Akaike's Information Criterion corrected for small sample sizes (AICc). We recorded 17 mortalities with an overall survival probability of 0.60 (95% Confidence Interval 0.46-0.73). Primary mortality causes included natural (53%), Unknown (29%), and predation (18%). Model $\{S_{age}\}$ had the lowest AICc value suggesting survival was influenced age. Indeed, 70% of our mortalities occurred within two weeks of capture. Reduction of either-sex hunting days by 50% in areas with heavy hunter pressure and low deer densities has resulted in improved annual herd recovery, suggesting that significant harvest strategy alterations are required to account for mortality levels observed in our study.

NOTES

Monday, 11:50 am

The Effects of Prey Abundance and Landscape Characteristics on Food Habits of Coyotes in Georgia

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

To better understand the ecological role of coyotes and potential impacts they may have on prey populations in the Southeast, particularly white-tailed deer, we evaluated their seasonal food habits via scat analysis from March 2010 through February 2011 on Cedar Creek (CC) and B.F. Grant (BFG) Wildlife Management Areas. These 2 sites in the Piedmont of central Georgia differed in habitat composition and therefore availability of coyote food items. Cedar Creek was primarily comprised of mature loblolly pines, with 7% early successional habitat (<7 year old stands). Deer density was estimated at 24/mi^2. B.F. Grant was comprised of a variety of hardwood and pine forest types with 28% early successional habitat. Deer density was estimated at 50/mi^2. We analyzed 146 coyote scats from CC and 207 from BFG. Commonly occurring food items were persimmon, muscadines, white-tailed deer, cotton rats, rabbits, and insects. During the fawning season (May-June), 61.5% and 26.7% of scats contained fawn remains on BFG and CC, respectively. Just prior to fawning (March-April), coyotes on BFG relied primarily on small mammals but switched almost exclusively to fawns during the fawning season. Our data supports an optimal foraging model; fawn abundance on BFG was likely sufficient to make them the most profitable prey choice, when available, while fawn abundance on CC may have been below this level. Furthermore, our data suggests that abundant alternative prey may not buffer fawn predation, especially when deer are abundant.

*** Student Presenter**

NOTES

Monday, 1:40 pm

A Comparison of Fawn Recruitment and Sight-specific Predator Indices in Mississippi and Alabama

Kamen L. Campbell, Bronson Strickland, Steve Demarais, Guiming Wang – Mississippi State University; Chad Dacus – Mississippi Department of Wildlife, Fisheries, and Parks

Predators are of growing concern regarding white-tailed deer fawn survival in the Southeast. We had the opportunity to index coyote and bobcat presence and estimate fawn recruitment on 16 properties in Mississippi and Alabama. Using trail cameras, we calculated capture success rate and latency to detection indices for both coyotes and bobcats. We also had 2 estimates of fawn recruitment; hunter observation fawn:doe ratios and post-season camera survey fawn:doe ratios. We correlated each predator index with both estimates of fawn recruitment. No statistically significant correlations were found between predator indices and camera survey fawn recruitment. However, both indices of bobcat activity approached significance with hunter observation recruitment estimates. Additionally, we compared all predator indices to population lactation values and found no significant or strong correlations. When comparing coyote indices to fawn recruitment, nothing suggested high predator activity caused a decrease in fawn recruitment. However, 3 of 4 bobcat and fawn recruitment regressions indicate high bobcat activity may be weakly related to lower fawn recruitment. Although it is plausible that relationships between predators and fawn mortality exist, we were unable to detect a significant predator effect on fawn recruitment among the populations we studied.

*** Student Presenter**

NOTES

Monday, 2:00 pm

White-tailed Deer Site Selection in Response to Predator Exclusion

Michael J. Cherry – University of Georgia and Joseph W. Jones Ecological Research Center; L. Mike Conner, Jessica C. Rutledge, Lora L. Smith – Joseph W. Jones Ecological Research Center; Robert J. Warren – University of Georgia

Predation risk influences foraging behavior and movement of prey. For example, white-tailed deer *(Odocoileus virginianus*) abundance is greater in the margins of wolf (*Canis lupus*) pack territories where wolf use is less. However, it is unknown whether the spatial organization of white-tailed deer is caused directly by predation, indirectly by predator avoidance, or their combined effects. Therefore, we conducted a study on the Joseph W. Jones Ecological Research Center, Newton, Georgia, USA, to determine effects of predator exclusion on aspects of white-tailed deer behavior. Coyotes *(Canis latrans*) were the primary predator of white-tailed deer on this site and fluctuations in coyote abundance and habitat selection may impact white-tailed deer movement. To test this hypothesis, we identified 8, ~ 104-acre plots with similar habitats, and excluded coyotes and other mesomammal predators from 4 plots using an electric fence; remaining plots served as controls. White-tailed deer freely crossed the 4 foot fences. Within all 8 plots, we monitored relative abundance of white-tailed deer using thermal camera surveys (3 times seasonally, 2004-2007), and monthly track count surveys (2004-2011). White-tailed deer were detected by thermal camera surveys and track counts more frequently in exclosure plots than in control plots (106 versus 51, and 404 verse 101, detections respectively $P < 0.001$ for both analyses). We suggest that white-tailed deer preferred predator exclosures because of reduced predation risk. White-tailed deer select for areas of reduced predation risk based on predator abundance rather than habitat associations.

*** Student Presenter**

NOTES

Monday, 2:20 pm

Recovery of an Endangered Carnivore within the Context of Managing White-tailed Deer in Florida

Dave Onorato, Mark Criffield, Mark Lotz, Mark Cunningham – Florida Fish and Wildlife Conservation Commission

Managing white-tailed deer (*Odocoileus virginianus*) populations in the context of a federally protected carnivore is complex. The breeding population of the endangered Florida panther (*Puma concolor coryi*) is restricted to suitable habitat south of the Caloosahatchee River in South Florida. This population has steadily increased since 1995—from 20-30 to 100-160 panthers—and concerns have been raised regarding the impact of panther recovery on deer populations. South Florida deer populations persist at lower densities than in other portions of the southeastern US and are influenced by multiple factors aside from predation, most notably water level fluctuations. Previous prey selection studies have revealed deer, hogs, raccoons, and armadillos are the most common prey for panthers. A latitudinal gradient in the selection of large prey by panthers was noted from the Everglades ecosystem, (deer 78.4% and hog 0.7% of consumed biomass) to the northern portion of the breeding range (deer 27.0% and hog 58.7% of consumed biomass). These findings highlighted the importance of a healthy deer herd in South Florida to support a recovering panther population. Revisiting prey selection patterns following population expansion is essential to gain a better grasp of current interactions between the panther population and deer herd levels. We present preliminary results from a study that will use location clusters from GPS radiocollared panthers to assess predation rates. Subsequent findings may prove important to the continued recovery of the panther and effectively managing prey populations for both predators and hunters.

NOTES

Monday, 2:40 pm

Human Predation Risk Alters Behavior of White-tailed Deer during Hunting Season

Andrew R. Little, Steve Demarais – Mississippi State University; Ken Gee – Samuel Roberts Noble Foundation; Samuel Riffell, - Mississippi State University; Stephen L. Webb – Hayden-Wing Associates; Joshua A. Gaskamp – Samuel Roberts Noble Foundation

Presently, recreational hunters are the primary predator of many ungulate populations. Although ungulates develop antipredator strategies to avoid encounters with natural predators, little research has addressed how human predation influences behavior of white-tailed deer. We evaluated observation rates (i.e., index to harvest susceptibility), movement distance, and resource selection of 37 adult (≥ 2.5 years) male deer on a 4,600 acre property in Oklahoma during 2008 and 2009 rifle deer seasons. Deer were exposed to low (1 hunter/250 acres) and high (1 hunter/75 acres) hunter densities as a surrogate of risk level during initial (opening weekend) and prolonged (last two weekends) hunting periods (i.e., exposure to risk). Despite increased hunter effort in the high density area, hunters observed a similar number of deer/hunter-hour as the low density area. Hunters in the low and high density areas observed more deer/hunter-hour during opening weekend ($\bar{x}$ = 0.053, SE = 0.013) than during the following two weekends ($\bar{x}$ = 0.014, SE = 0.005). Movement distance most influenced observation rates followed by landscape features such as elevation, vegetation type, slope and distance to road. Leading up to the observation event, observed collared deer moved 1.6x greater distances ($\bar{x}$ = 134.6 yds; 95% CI: 102.1 - 167.1) than deer that were not observed. After observation, observed deer continued to move 1.8x greater distances ($\bar{x}$ = 136.4 yds; 95% CI = 103.9 - 168.9) than unobserved deer. These findings offer support that deer adapt to human predation risk through behavioral modifications in movement distance and resource selection that minimizes harvest susceptibility.

*** Student Presenter**

NOTES

Monday, 3:30 pm

Evaluation of White-tailed Deer Breeding Chronology and Productivity in Florida

Elina P. Garrison, Richard A. Kiltie, Larry S. Perrin, Stephen M. Shea, Gary M. Mohr, Ryan S. Butryn – Florida Fish and Wildlife Conservation Commission.

Information on breeding chronology and estimation of reproductive potential are crucial to understanding the dynamics of white-tailed deer populations. In northern deer ranges, the duration of breeding and parturition is short and well defined with little geographic variation. In southeastern states, however, significant temporal and spatial variations in breeding season have been demonstrated. Florida is particularly unique because asynchrony in breeding dates can be as much as 9 months which presents challenges in developing management regulations such as hunting season timing and length. The primary objective of this study was to obtain breeding chronology data in Florida, particularly in northwest Florida where data were limited. We also determined age-specific prevalence of pregnancy, productivity, fetal sex ratios, and condition indices. Since 2009, we have examined over 300 harvested female deer from 50 study areas. We determined conception dates based on fetus lengths and evaluated condition indices based on Southeastern Cooperative Wildlife Disease Study guidelines. Peak breeding in north Florida followed a general east to west trend and ranged from mid-October in the east to late-February in west Florida. However, notable asynchronies were observed, even within relatively small geographic areas. In southern Florida, breeding occurred as early as July. Productivity varied considerably among years and between areas and was directly related to female age and body condition. The results of this ongoing study can be used for management decisions regarding hunting zone boundaries and season dates. Further research is necessary to determine causes of wide variation in breeding chronology in Florida.

NOTES

Monday, 3:50 pm

Utility of the Lactation Index: Comparing the Lactation Index to Site-Specific Fawn Recruitment Metrics

Kamen L. Campbell, Bronson Strickland, Steve Demarais, Guiming Wang – Mississippi State University; Chad Dacus – Mississippi Department of Wildlife, Fisheries, and Parks

The lactation index is commonly used by deer managers to assess deer condition and reproduction in populations. However, given the potential insensitivity of annual lactation indices to actual changes in reproduction and recruitment, the lactation index may not accurately reflect fawn recruitment. We compared lactation rates from deer populations in Mississippi and Alabama to 2 other metrics of fawn recruitment: post-season camera survey fawn:doe ratios, and hunter observation fawn:doe ratios. Lactation rates were adjusted for date of harvest relative to mean parturition date. Next, we correlated site-specific lactation rates to camera- and hunter-derived estimates of fawn recruitment. Adult ($\geq$2.5-year) lactation rates were related to camera-derived estimates of fawn recruitment. However, lactation rates were not related to hunter-derived fawn recruitment estimates. Given the relationship between lactation rates and camera-derived fawn recruitment estimates, we predicted fawn recruitment from lactation rates. Lactation rates of 60, 70, 80, 90 and 100% correspond to fawn recruitment rates of 0.15, 0.43, 0.71, 0.99, and 1.27, respectively. Thus, we conclude the lactation index may be used to estimate fawn recruitment in Mississippi and the Southeast.

*** Student Presenter**

NOTES

Monday, 4:10 pm

Variation in Female Morphology in Mississippi: Nutrition or Genetic Differences?

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

Female white-tailed deer vary regionally in body mass in Mississippi. Biologists have explained these differences based on regional variation in nutrition, but this cause has not been fully explored. To evaluate the effect of nutrition as a cause of regional variation in female body morphology, we raised first-generation (F1) fawns produced by wild adult females from the Delta (heaviest deer), Thin Loess (Loess; mid-weight deer), and Lower Coastal Plains (LCP; lightest deer) on a full ration 20% protein diet. Regional patterns in body mass were maintained in F1 females but hind foot length was similar in females from the Loess and LCP at 4 years of age. First-generation females were bred by bucks from the same soil region to produce a second generation (F2). Second generation Delta and LCP females showed significant improvements in body mass between generations. F2 LCP females caught up to Loess females and hind foot length no longer varied among regions in the second generation. Our results indicate that regional differences were partially compensated for in the second generation. However, the presence of regional variation despite identical nutrition for two generations indicates that genetic differences may exist between some soil regions or full compensation may require more than two generations. Therefore, management expectations relative to growth response by females to management improvements should be region specific in Mississippi.

*** Student Presenter**

NOTES

Monday, 4:30 pm

Age and Mass in a Dominance Hierarchy: What Makes Her the Boss?

Eric S. Michel, Steve Demarais, Bronson Strickland, Jerrold L. Belant – Mississippi State University; Lann Wilf – Mississippi Department of Wildlife, Fisheries and Parks

There has been much debate as to whether age or size is more important in the establishment of a dominance hierarchy and what effect dominance may have on access to resources, and ultimately fitness. Nine dominance hierarchies were documented within groups of 11-25 various-aged female white-tailed deer based on behavioral interactions during November - April of 2008- 2010. Does were sedated every November to measure body mass, body length and rump fat. A scaled body mass index was developed to incorporate both body mass and length measurements and was used as another indication of body condition. Body mass explained only 8% ($P < 0.001$) of the variation in dominance rank and age was not significant. Scaled mass index and rump fat were not correlated with rank within the hierarchy indicating that there was no functional relationship between relative dominance ranking and body condition. This lack of relationship may have been due to lack of resource limitations within this captive setting. These results suggest that body mass plays a more important role than age in determining dominance in captive female white-tailed deer.

*** Student Presenter**

NOTES

Monday, 4:50 pm

Phylogeographic Structure of White-tailed Deer Subspecies in Mexico

Karla G. Logan, Randy W. DeYoung, Alfonso Ortega-Santos, David Hewitt, Damon Williford – Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville; James R. Heffelfinger – Arizona Game and Fish Department

White-tailed deer (*Odocoileus virginianus*) are distributed throughout much of the American Continent, ranging from southern Canada to Peru. Thirty-eight subspecies are recognized; fourteen are present in Mexico. Subspecies were based upon minor morphology and geographic distribution. Although remarkable differences in body and antler size and timing of rut are evident among some subspecies, their genetic distinctness remains unclear. There is no current way to distinguish among subspecies or even to determine the validity of the subspecies designations. This lack of information had led to a big-game management system that mainly encourages the conservation of large-antlered deer. We analyzed DNA sequence data from the mitochondrial control region obtained from 248 hunter-harvested or captured whitetails. We collected samples in 73 locations within the range of 9 subspecies. We obtained 480 bp of sequence, and observed 160 polymorphic sites and 130 haplotypes. Phylogenetic analyses did not reflect clear separations among subspecies genealogy. Analysis of Molecular Variance (AMOVA) showed greater variation within subspecies than among subspecies. We observed a deep phylogenetic discontinuity between the whitetails from southeastern Mexico and those from the rest of the country. The geographic distribution of major clades and subdivision within clades suggests a complex evolutionary history of lineages in the sampled populations. Phylogeographic analyses indicate possible historical fragmentation during the Last Glacial Maximum and subsequent secondary contact, which explains why currently designated subspecies might not represent historical independent groups. Our results indicate subspecies should be re-evaluated to reflect the biographic history of unique lineages.

*** Student Presenter**

NOTES

Tuesday, 8:10 am

White-tailed Deer Seasonal Movements in Northwest Louisiana

Kate Hasapes, Christopher E. Comer – Stephen F. Austin State University

We examined male and female deer movements throughout the year at Barksdale Air Force Base in Bossier Parish, Louisiana, from 2009 to 2011. Captured bucks (n = 15) and does (n = 15) were fitted with Sirtrack global positioning system (GPS) collars programmed to obtain a location fix once per hour for a full year. The year was split into three seasons, winter, spring, and summer, based on Barksdale's estimates of conception and parturition dates. We calculated daily rate of travel (yd/h) and extreme daily distances (yd) and compared them among seasons and gender. We also identified abnormally high daily movement for individual deer based on 90% confidence intervals. For each season and gender, movement patterns differed between years. During the winter, movement patterns differed between genders. Does showed a high incidence of abnormally high movement during the rut and post-rut periods and showed tendencies to take long excursions outside of established ranges during these periods. In spring, buck movements continued to show peaks approximately every 30 days while doe movements did not exhibit a consistent pattern. Does exhibited increased movements prior to and decreased movements post parturition; however, we did not detect consistent weekly variation in movement rates and concluded that parturition events of individual does cannot be detected through movement parameters.

*** Student Presenter**

NOTES

Tuesday, 8:30 am

Male White-tailed Deer Movement Patterns During the Rut: Chaotic or Strategic?

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

Because white-tailed deer are not easily observed and conventional radio-telemetry does not allow for fine-scale movement investigations, descriptions of male breeding strategies is lacking. Most does are bred during a 2 to 4 week period and individual does are receptive for only 1 to 2 days. The short time window suggests males would have a strategy to locate receptive does rather than wandering randomly. To address this question, we captured and GPS-collared 106 adult male white-tailed deer across 4 years in South Texas. Radio-collars recorded locations every 15 to 20 minutes during late October to mid-February, which covered the entire breeding season. Males did not wander widely during peak rut; only 30% of their home ranges were utilized. Instead of roaming widely, most males had 2 or more focal points of activity within their home ranges. Focal points were 60-140 acres in size. During peak rut, focal points were re-visited frequently and most males visited focal points every 20 to 28 hours. Because females are in estrus for about 24 hours, our data suggest that males space their visits to assess female receptiveness. Furthermore, focal points of several individual males overlapped with other bucks which suggest many bucks visited the same doe groups during peak rut. Our data improve understanding of how males search for females, the white-tailed deer breeding system, and the use of spatial memory while searching for resources.

NOTES

Tuesday, 8:50 am

The Effects and Predictability of Solunar Activity on Deer Movements

Marcus A. Lashley, M.Colter Chitwood, Morgan B. Elfelt, Aimee P. Rockhill, Christopher S. DePerno, Christopher E. Moorman – North Carolina State University

Hunters commonly use weather and solunar events to predict optimal hunting times and movements of animals to increase hunting and fishing efficiency. Although many studies have connected feeding and breeding activities to solunar activity, little research has focused on white-tailed deer. Therefore, our objectives were to determine if white-tailed deer movement rates are influenced by solunar activity and accurately predicted by activity tables. In spring 2011, we fitted 16 adult female deer with GPS collars recording locations at 2.5-hour intervals. We used approximately 22,000 GPS fixes to correlate deer movement rates to solunar activity and compared daily peak movements to solunar table predictions. We analyzed movement rates in 5-day windows centered on each of the 4 moon phases (i.e., new, first quarter, full, last quarter). Days excluded from the windows were lumped into a “non-quarter” category. All categories exhibited peaks in movement rate near dusk except during the new moon when movement rate peaked near dawn. Nocturnal movement rates were not affected by moon phase. Mid-morning movement rates were greatest in the non-quarter category, and mid-day movement rates tended to be greatest during the full moon phase. Our data suggest deer movement rates are influenced by moon phase; however, movement rates still peaked during crepuscular periods regardless of moon phase. Predictability of peak movement rates using fish and game activity tables will be discussed.

*** Student Presenter**

NOTES

Tuesday, 9:10 am

Effects of Supplemental Feed on White-tailed Deer Activity

Lucas W. Garver – USDA, Natural Resources Conservation Servicel; David G. Hewitt, Timothy E. Fulbright, Charles A. DeYoung, Kim N. Echols – Caesar Kleberg Wildlife Research Institite; Don A. Draeger – Comanche Ranch

White-tailed deer behavior is influenced by many factors, including availability and quality of forages. Patterns of activity may differ when nutritionally-balanced, pelleted feeds are provided. We examined the effects of pelleted feed on activity, movement rates, and proximity to resources for white-tailed deer in 200-acre enclosures for 10 months using deer outfitted with GPS collars. Deer provided supplemental feed moved 25% faster during nighttime than deer without supplemental feed ($P = 0.03$); rate of movement was similar during daylight hours. Head movements were 19% greater for deer without supplemental feed during evenings ($P = 0.06$); head movements were similar between supplement treatments at other times of day. Deer with no supplemental feed spent 11% more time close to the center of enclosures where water was present during morning and midday ($P = 0.04$); in contrast, at night deer with supplemental feed spent 27% more time near the center where feed and water were available ($P \leq 0.01$). Supplemented male deer spent 5% of nighttime near the center of enclosures, whereas unsupplemented males spent less than 1% of nighttime near the center ($P \leq 0.01$). Supplemental feed influences when and where deer are active. Because most active time is spent foraging, changes in behavior indicate shifts in foraging patterns which may influence vegetation communities and necessitate modifications to management. *Ad libitum* supplemental feed may also cause deer to increase nighttime foraging, influencing visibility of deer and susceptibility to harvest.

*** Student Presenter**

NOTES

Tuesday, 9:30 am

White-tailed Deer Visitation Rates at Medicated Bait Sites in Southern Texas

Chase R. Currie, David G. Hewitt, Alfonso Ortega-Santos – Caesar Kleberg Wildlife Research Institute; Greta L. Schuster, Tasha Perry – Texas A&M University-Kingsville; Tyler A. Campbell – USDA APHIS Wildlife Services; Kim. A Lohmeyer, Adalberto A. Pérez de León – USDA ARS Knipling-Bushland U.S. Livestock Insects Research Laboratory

The cattle fever tick, *Rhipicephalus* (*Boophilus) microplus*, has been found on white-tailed deer (*Odocoileus virginianus*) complicating efforts of the USDA's Cattle Fever Tick Eradication Program. Our objective was to assess patterns of deer visitation to medicated bait sites used to treat deer for ticks. In March, September, and November 2010, we captured 120 deer on 3 study sites in Zapata County, Texas. Each deer was uniquely marked with colored and numbered ear tags. Motion triggered cameras were used to monitor deer visits to bait sites for 1 week (6, 24-hr periods) every month. The identity of marked deer in photographs was noted. Bait-site density was 1/85 acres. The proportion of adult male deer (0.60) visiting bait sites was greater than adult females (0.12), averaged across seasons. No more than 16% of marked fawns visited bait sites. Of adult deer that visited sites, males visited bait sites more days/week (3.1 vs. 2.1; $P < 0.001$) except during summer, had more photos/week taken (14.9 vs. 6.8; $P < 0.001$), and visited more bait sites/day (1.1 vs. 1.0; $P = 0.028$) than females. Bait site visitation did not vary seasonally for females ($P > 0.05$). Males visited bait sites less often during summer (2.6 days/week) and had fewer photos/week during winter (10.6 photos) and summer (11.6 photos) compared to other seasons (≥2.7 days/week and ≥15.6 photos/week, respectively). Our results suggest that treating fawn and female white-tailed deer will be difficult and may require higher bait-site density to overcome social interactions that presumably caused these patterns of bait site use.

*** Student Presenter**

NOTES

Tuesday, 10:20 am

Seeking Improved Efficiency of Camera Survey Techniques for White-tailed Deer

Peter K. Acker, Stephen Ditchkoff, Chad Newbolt – Auburn University

Technology now provides increased battery life and storage capacity in today's trail cameras versus what was previously available. However, this can result in a dramatic rise in man-hours required to review countless photographs. We examined techniques to reduce processing time when using trail cameras to survey and estimate population parameters of white-tailed deer (*Odocoileus virginianus*). The study took place at the Auburn University Deer Lab, in Camp Hill, AL; a 430-acre enclosure containing approximately 90 adult deer, the majority of which were tagged and individually identifiable. We used one camera site per 107.5 acres, and corn as bait, for all surveys. During September and October 2010 we completed 2, 7-day camera surveys after a 5-day pre-bait period to compare the efficacy of a camera set on a 10-minute-delay placed beside one with a 5-minute-delay. At 7 of 8 sites, the longer delay captured as many or more individuals than the camera set for the short delay, yet took only 52% the number of pictures. During September 2011, we surveyed for 15 days, to compare the results of a 10-day survey without pre-baiting, to a 10-day survey conducted after a 5-day pre-bait period. The number of individual deer detected was positively influenced by the addition of a 5-day pre-bait period. These data suggest that increases in the delay of an infrared-triggered camera can reduce the number of images without negatively impacting the number of different individuals detected, but elimination of a pre-baiting period may negatively influence the effectiveness of camera surveys.

*** Student Presenter**

NOTES

Tuesday, 10:40 am

Aerial Vertical-Looking Infrared Imagery to Evaluate Bias of Distance Sampling Techniques for White-tailed Deer

Jared T. Beaver, Craig A. Harper – University of Tennessee; Robert E. Kissell, Jr. – University of Arkansas; Lisa I. Muller, Peyton S. Basinger, Matthew J. Goode – University of Tennessee

Population monitoring is an important consideration when managing white-tailed deer (*Odocoileus virginianus*). Distance sampling has been used to estimate population density, and has been applied to ground thermal infrared sensing (ground imaging) and spotlight surveys to overcome limitations with these techniques. However, surveys are usually along roads, which may violate a critical assumption of distance sampling and bias density estimates. Aerial vertical-looking infrared imagery (aerial imaging) was designed to overcome the burdens of traditional distance surveys. We compared population and precision estimates and evaluated assumptions for each technique on Arnold Air Force Base in Tennessee during January-February 2010. Deer density (deer/mi^2) and precision for spotlight and ground imaging were 60.19 (CV = 15.1) and 41.83 (CV = 13.1), respectively, with left truncation (deletion of observations closest to road), and 12.35 (CV = 13.9) and 18.10 (13.9) without truncation. Aerial imaging density and precision estimates were 14.01 (CV = 23.1), respectively. Aerial imaging showed deer distances were closer to roads than randomly generated distances, suggesting a road-bias selection by deer, which potentially biased spotlight and ground-imaging estimates high by 487% and 231%, respectively. All precision estimates were within acceptable standards for making management recommendations. However, the high cost of ground imaging did not justify its use over spotlight surveys. We found road bias can invalidate distance sampling unless random transects representative of the study area are applied. Aerial imaging is less susceptible to road bias, but it should be restricted to large areas where high initial cost can be justified.

*** Student Presenter**

NOTES

Tuesday, 11:00 am

Camera Collars for Collecting Interaction Data from Deer

David G. Hewitt – Caesar Kleberg Wildlife Research Institute; Michael J. Lavelle, Kurt C. Vercauteren – USDA; Aaron M. Hildreth – University of Nebraska; Tyler A. Campbell, David B. Long – USDA

Current technological advancements in electronics are enabling wildlife researchers to collect previously unobtainable data. More specifically, researchers have replaced traditional methods, such as direct observation, with animal-borne video cameras to collect behavioral data. As such, we outfitted 26 adult male white-tailed deer (*Odocoileus virginianus*) within a closed population (1,000-fenced ac) in southern Texas in fall 2010 with animal-borne cameras. Over a period of 12 days we captured 1,239 video clips including 85 documenting deer-to-deer direct contacts. Direct contacts included licking/grooming (n = 5), sparring (n = 63), nose-to-nose or nose-to-rump contacts (n = 16), and breeding (n = 1). We also recorded 144 video clips of deer within 3.3 ft. of conspecifics. Although we focused on direct interactions that could reveal clues about potential modes of disease transmission, other valuable data acquired using such devices could include behavior, diet, and habitat use. Valuable information pertaining to indirect interactions that may facilitate transmission of disease including focal sites or shared fomites such as feeders could also be documented and quantified. Although our video systems are still in the developmental stages, a commercial product is available and their use will undoubtedly become more widespread.

NOTES

Tuesday, 11:20 am

Evaluating the Design of an Expandable Collar for Subadult Cervids

David M. Kalb, Jacob L. Bowman – University of Delaware; T. Brian Eyler – Maryland Department of Natural Resources

Researchers use expandable collars for studying subadult cervids and male cervids that experience neck expansion during the rut. This collar allows investigation of the ecology of subadult cervid populations that has previously been a challenge to study. We captured 60 juvenile male sika deer (<8 months) during winters 2008-2009 and attached expandable radio collars (M4230B, ATS, Isanti, MN). Most juveniles had necks too small for the original design, so we lined each collar with biodegradable foam (2008= 1 in., 2009= 3/8th in.). Of the 60 collars, all were retained until at least 253 days, 4 failed prior to 365 days (all from 2008), 7 collars failed prior to 457 days (15 months; all 2008), and 13 collars failed prior to 548 days (18 months; all from 2008). Maximum recorded retention time was 817 days which was still on the animal when telemetry was concluded. Collars did not drop off at different rates between seasons ($\chi^2_3 = 3.19$, $P = 0.363$). Our data suggests that this expandable collar design for deer can be used on animals before a permanent collar can be deployed. We also suggest further improvements beyond those that we employed, such as an improved stitching design and slower elastic expansion.

*** Student Presenter**

NOTES

Tuesday, 11:40 am

Sensitivity of White-tailed deer to Ultraviolet and Infrared Light

Bradley S. Cohen, David A. Osborn – University of Georgia; George R. Gallagher – Berry College; Karl V. Miler, Robert J. Warren – University of Georgia

Although many aspects of white-tailed deer (*Odocoileus virginianus*) biology and physiology have been studied thoroughly, few studies have confirmed deer cognitive perception, partly because of the difficulty of training deer to respond behaviorally in controlled experiments. We obtained a behavioral measure of relative visual sensitivity by comparing intensity thresholds based on performance of deer in forced-choice discrimination tests conducted at the short and long wavelengths of their purported visual spectrum. By using an automated training device, we taught deer to associate a food reward with a light stimulus. We recorded deer responses across a series of decreasing intensities for each wavelength until deer could no longer discriminate the stimulus light from an unlit light. When deer performed at chance percentages we assumed they could no longer perceive the light. We regressed a best fit line to each deer's performance as intensity decreased at a single wavelength, which was used to demarcate the sensitivity threshold to that wavelength. We compared thresholds across wavelengths and delineated sensitivity measurements best fitting previous cone template functions. Our results confirm white-tailed deer's relative spectral sensitivity, which agreed with previously measured cellular sensitivity and deer's visual perception. Deer are dichromats with much greater sensitivity to shorter wavelengths and much lower sensitivity to longer wavelengths when compared to humans. For example, deer are about eight times more sensitive than humans to lights of wavelengths around 430 - 440 nm, which is the peak emission of most UV-brighteners.

*** Student Presenter**

NOTES

Tuesday, 1:40 pm

Temporal and Seasonal Variation in Habitat Selection of White-tailed Deer in an Agricultural Landscape

Melissa M. Miller, Jacob L. Bowman – University of Delaware; Joseph Rogerson – Delaware Division of Fish and Wildlife

Crop damage by white-tailed deer (*Odocoileus virginianus*) is a complicated issue facing private landowners and state biologists throughout the country. Local farmers believe deer that cause crop damages are unavailable for harvest during legal hunting seasons and hours. In order to determine if deer are available for harvest, we investigated habitat selection at seasonal and temporal scales. We captured 21 adult female deer, equipped them with VHF radio collars, and collected 4,650 telemetry locations (day=2,337; night=2,316) in an agricultural landscape (40%). In Delaware, legal hunting hours were ½ hour before sunrise to ½ hour after sunset, which we defined as day. We developed resource selection functions (RSFs) and found that use of crop and forested habitat varied by season and time of day. We further investigated habitat use during season and time of day combinations and found the greatest use of crop was during the summer nighttime (28%). Use of crop during the summer daytime (17%) did not differ from the fall nighttime (20%). The lowest crop use was during the fall daytime (11%). Our results indicate that deer that are potentially causing crop damage during the summer are not using crops as much during the fall and therefore less available for harvest. Additional analysis regarding land ownership may assist managers in understanding how deer are using the landscape between seasons.

*** Student Presenter**

NOTES

Tuesday, 2:00 pm

Population Characteristics of a White-tailed Deer Herd in an Industrial Pine Forest of North-Central Louisiana

John H. Harrelson – Louisiana State University; Michael Chamberlain – University of Georgia; Scott Durham – Louisiana Department of Wildlife and Fisheries

White-tailed deer are one of the most important game species in Louisiana. The forest products industry represents the most important agricultural commodity in Louisiana. I conducted research assessing space use, habitat selection, and survival of white-tailed deer on a 9600 ac industrial forest. I captured 61 deer in Union Parish, Louisiana in 2009-2010, radio-marked 24 females and 23 males, and ear-tagged 7 females and 6 males. Males home range sizes varied seasonally and were 573 ac, 173 ac, and 319 ac for spring, summer, and fall respectively. Female home range sizes did not differ seasonally and were 257 ac, 222 ac, and 153 ac for spring, summer, and fall respectively. Forest openings were important to both sexes when establishing home ranges. Core area selection exhibited a season and sex interaction as both sexes shifted selection in the fall to 0-4 year old pine and 13-19 year old pine stands. Use of habitats within home ranges did not vary by sex, season, or an interaction between them. Males and females chose 5-12 year old pine stands consistently across all seasons. Survival rates for adult males in spring, summer, and fall were 0.95, 0.97, and 0.54 respectively. Survival rates for females were 0.95, 0.97, and 0.56 for spring, summer, and fall respectively. All fall mortality was hunting-related, whereas mortalities during spring and summer resulted from unknown causes. The extensive use of bait was thought to influence space use and survival, and further research is needed to determine the effects of baiting.

*** Student Presenter**

NOTES

Tuesday, 2:20 pm

Influence of Population Density on Forage Intake Rates and Foraging Efficiency of White-tailed Deer

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

Many intensive white-tailed deer (*Odocoileus virginianus*) management practices favor high deer densities. It is important to understand how density influences deer foraging behavior because nutrition is a large determinant of productivity. At the Comanche and Faith ranches near Carrizo Springs, TX, we used the bite count method with tame, female white-tailed deer to examine the effects of population density on foraging behavior seasonally from summer 2009 to spring 2011. Two to 3 tame does resided permanently in each of 2 200-acre high-fenced enclosures at each ranch that represented low (10 deer/enclosure) and high (40 deer/enclosure) population densities. We found no effect of deer density on bite rate, bite size, dry matter intake rate, digestible protein intake rate, metabolizable energy intake rate, and time spent foraging relative to active time. All response variables differed seasonally and between years because our study included a record wet period in year 1 and a record drought in year 2. Within the bounds of our design, deer maintained these measures of foraging behavior despite a 4-fold increase in deer density. In this highly variable, semi-arid environment, precipitation had a much larger effect on foraging behavior than did deer density. In stochastic environments, feedbacks of deer density on nutrient intake may not operate as traditionally thought, with implications for population regulation and management.

*** Student Presenter**

NOTES

Tuesday, 2:40 pm

Effects of Population Density on White-tailed Deer Diet Quality and Composition

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

Selective foraging by deer at high deer densities may lead to overutilization of higher quality forages, causing reduced biomass, abundance, and nutritional quality of available vegetation, thereby affecting deer productivity and survival. The objectives of our study were to determine the effects of population density on white-tailed deer diet quality and composition in southern Texas. We hypothesized that at high deer densities, diets would consist of a greater proportion of lower quality forages, thus reducing diet quality. To test this hypothesis, 2-3 tame female deer were placed in 4 200-acre high-fenced enclosures on 2 ranches in South Texas. Each ranch had enclosures of low (10 deer) and high (40 deer) population densities. We used the bite-count technique seasonally from summer 2009 to spring 2011 to quantify deer diet composition and analyzed representative samples to estimate diet quality. Neither digestible protein nor metabolizable energy in deer diets varied with deer density. Cactus was the only forage class in deer diets that differed with deer density; deer in the high density treatment consumed more succulents during winter and less succulents during spring than deer in the low density treatment (P=0.005). Deer diets differed greatly among seasons and between years because of variable precipitation. In this erratic, semi-arid environment, precipitation appears to have a much greater affect on deer diets than deer density.

*** Student Presenter**

NOTES

Tuesday, 3:30 pm

An Integrated Population Model Approach to Monitoring Response of White-tailed Deer Populations to Regulation Changes

Frances E. Buderman, Duane R. Diefenbach – Pennsylvania Cooperative Fish and Wildlife Research Unit

Deer populations can be managed via hunter harvest by altering either license allocations or season length; however, an increase in license allocations may not be sufficient to offset a shortened season. To examine the effect of reduced season length on the harvest of antlerless deer, and evaluate whether harvest could be maintained through increased license allocations, the Pennsylvania Game Commission restricted the antlerless season to the last 7 days of a 12-day rifle season for antlered deer in 4 wildlife management units (WMUs) over 3 years. We estimated harvest rates of yearling and adult deer in each WMU by developing a statistical model to simultaneously use data from deer marked with ear tags and a $100 reward and deer monitored via radio-telemetry. We then used an integrated population dynamics model to estimate abundance, which incorporated WMU-specific reproductive rates, harvests, and harvest rates. We used the harvest rates and abundance of deer in these WMUs to evaluate the effect of hunting regulations on pre- and post-harvest population sizes. Using reward tags and radio collars reduced bias and cost and improved precision of harvest rates. Furthermore, integrated population models can provide estimates of parameters not readily obtained with traditional monitoring methods. In our study, we obtained estimates of fawn harvest rates and recruitment of fawns into the hunted population in each WMU. Using multiple sources of data in an integrated population model can be an effective tool for measuring the response of game species to changes in harvest regulations.

*** Student Presenter**

NOTES

Tuesday, 3:50 pm

Impacts of Antler Restrictions on Wildlife Management Areas in Florida

James D. Kelly, Erin H. Leone, Cory R. Morea, Elina P. Garrison – Florida Fish and Wildlife Conservation Commission

Over the last decade, Antler Point Restrictions (APRs) have been implemented on a number of Florida's Wildlife Management Areas (WMAs) in response to the increasing demand from hunters for this type of hunting opportunity on public lands. Harvest data collected on 23 WMAs over 5 regions, pre- and post-implementation, were analyzed to understand the impacts of APR's (i.e., at least three points on one side) on antlered deer harvest and antler quality. We compared changes in the proportions of age-classes at harvest, average weight, antler quality by age-class, and harvest per hunter effort (HPE). There was a significant decrease in the proportion of 1.5 year-old bucks in the harvest after APRs were enacted ($p=0.0569$). This effect was consistent across all 5 regions, but there were no differences for any other age class. Average weight increased post-implementation ($p=0.0001$), an effect which was consistent across regions. Predicted gross B&C scores also changed as a result of the APRs ($p=0.0495$); they increased post-implementation for the 2.5 and 3.5 year-old age-classes, but remained unchanged for the youngest (1.5) and oldest (4.5+) age-classes. There was a general decrease in HPE post-implementation ($p=0.0039$), however this differed by region ($p=0.0753$). HPE appeared to decrease in the Southwest, Northwest, and Northeast regions, there were no discernible differences in the North Central and South regions. We conclude that APRs on Florida WMAs are effective at protecting the 1.5 year-old age-class, and there is no evidence thus far of a negative impact on antler quality (i.e., high-grading).

NOTES

Tuesday, 4:10 pm

Selection of Remote-Sensing Camera Locations for Sub-Sampling of White-tailed Deer Herds on Large Properties

Brandon T. Rutledge, Michael J. Cherry, Jean C. Brock, L. Mike Conner – Joseph W. Jones Ecological Research Center

Remote-sensing camera surveys have become a viable tool for monitoring white-tailed deer (WTD) herd trends. However, on large properties it is often impractical and perhaps unnecessary to sample the entire acreage. At the Joseph W. Jones Ecological Research Center (JWJERC) at Ichauway, staff have conducted track count surveys and WTD spotlight counts for 20 years and camera surveys for 5 years. Survey techniques have been refined over time to improve population estimates. This intensively monitored herd provided a unique opportunity for comparison of survey methods and sampling locations. We compared multiple methods for selecting camera locations using perceived deer densities, proportional representation of habitat types, and density estimates based on track count surveys. Our goal was to identify camera locations that provide reliable density estimates which could be extrapolated to the entire property. Using ArcGIS we developed deer density surfaces using both perceived densities and densities estimated from track count data. Land cover data was used to determine percentages of habitat types to allow proportional representation. Camera grids were placed in areas of varying deer densities and habitats. Abundance estimates from camera surveys were compared to track count and spotlight count estimates. Using this process, camera survey grids could potentially be placed such that mean deer density for the property can be reliably estimated. We provide recommendations for determining location of camera survey grids based on data availability, resources, management objectives, and desired precision.

NOTES

Tuesday, 4:30 pm

Content Analysis of Hunting Experiences of Female College Students

Susan T. Guynn, Robert B. Powell – Clemson University

Hunting is the foundation of wildlife conservation in North America. Despite the importance of hunting, the number of licensed hunters has dwindled by 14% over the past 30 years. However, the number of female hunters has increased by 9% in the past 15 years. To explore the hunting experiences of women, forty-one women enrolled in Clemson University's Women's Hunting class were asked the question "What does hunting mean to me?" A content analysis of their responses was conducted to identify common themes regarding their hunting class experiences. Women in the class ranged from freshman to graduate students and were enrolled in many academic disciplines. Their previous hunting experience ranged from no exposure to hunting and/or firearms up to actual harvest of a game species. We identified 14 themes summarizing the experiences of the women. Overwhelmingly, the most common benefit of their hunting experience was "Changes in Personal Ethics/Attitudes/Increased Self Confidence" (85.37%) followed by the development of a "Land Ethics" (63.41%), "Experiencing Nature" (63.41%) and "Experiencing, Defending and Continuing the Hunting Heritage" (58.54%). To further investigate female hunters, a research framework describing personality traits and psychological benefits that women derive from hunting will be presented using a three-dimensional approach. The theoretical framework measures personality traits, needs and the potential benefits of hunting derived from Awe experiences. The framework and subsequent research will be used to develop a multi-dimensional profile of female hunters for creating recruitment and retention programs by state wildlife agencies.

NOTES

Poster session

Effects of White-tailed Deer Population Density and Resource Enhancement on Plant Biomass

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

Supplemental feeding is a common white-tailed deer (*Odocoileus virginianus*) management practice in Texas. Availability of nutritious feeds may alter selection of natural forages by white-tailed deer; however, it is unclear how feeding and increasing deer densities impact vegetation. We hypothesized that increasing deer densities and consumption of nutritionally balanced pelleted feeds result in increased foraging pressure on palatable plants, reducing their abundance. Our research was conducted on 2 ranches in southwestern Texas, USA. We constructed six 200-acre enclosures on each ranch. The experimental design was a randomized, complete block with 2 blocks and a factorial array of treatments consisting of 3 deer densities and 2 supplemental feeding treatments. Nutritionally balanced pelleted feeds were provided *ad libitum* to one of each pair of similar densities on each ranch; deer in the other member of a pair of densities were not provided feed. Twenty 164-foot transects were placed within each enclosure using restricted randomization. Plant standing crop was harvested bi-annually in 20 randomly selected plots/enclosure to correct estimates to wet mass. Samples were dried and estimates were corrected to dry mass. Sampling date interacted with feed treatment for spring forbs ($P = 0.048$) and summer half-shrubs ($P = 0.033$). Standing crop of forbs in spring and half-shrubs in summer were greater in enclosures with feed during wet years. Providing supplemental feed appears to reduce deer effects on forbs and half-shrubs during years with above average rainfall. Variation in annual rainfall had pronounced effects ($P<0.001$) on variation in browse and forb standing crop.

*** Student Presenter**

NOTES

Poster Session

Winter White-tailed Fawn Mortality in South Texas

Robert D. Kaiser III, David G. Hewitt, Mickey W. Hellickson, Charles A. DeYoung – Caesar Kleberg Wildlife Research Institute

Fawn mortality during the first 2 months after birth can be high in south Texas, but little is known about fawn mortality during winter. Unlike northern regions of the white-tailed deer range, south Texas winters are relatively mild and therefore the assumption is that most fawns have little difficulty surviving winter and recruiting into the population. However, data from deer surveys, captures, and some limited research suggests that winter mortality may be greater than currently assumed. Our objective is to measure fawn survival during winter (November – March) on a study site near Aguilares, Texas. Thirty fawns will be caught in 2010 and 2011 using the helicopter net gun technique, fitted with a radio ear tag, and released at the capture site. The fawns will be located at least twice weekly from November – March. Upon receiving a mortality signal, transmitters will be promptly located to determine cause of death. Locations will be plotted and used to build winter home ranges for fawns in ArcGIS. Odds of survival will be calculated using statistical software. After the first field season, 60% of fawns survived the winter. Two deaths were attributed to bobcat predation, 2 to coyote predation, and 7 were unknown causes of death. The final transmitter was found with no visible signs of distress, suggesting this transmitter might have been pulled from the fawn's ear and no mortality had occurred.

*** Student Presenter**

NOTES

Poster Session

Patterns of Antler Breakage in White-tailed Deer

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

Antlers contribute greatly to the life history and ecology of the species of the deer family (Cervidae). Breeding performance and behavior of males may be altered due to antler breakage. Though many species' general pattern of antler breakage are not described, studies indicate that diet composition and quality, age, antler size, dominance rank, and demographic parameters (e.g., adult sex ratio, density) of the population may explain variation in antler breakage rates between individuals and subpopulations. Our objectives were to describe antler breakage patterns and evaluate the correlation of certain antler traits and precipitation with antler breakage rates. From 2001–2010, we collected 487 cast antlers of captive white-tailed deer (*Odocoileus virginianus*) managed at relatively high densities with a sex ratio skewed towards males. We took various measurements from each antler and used logistic regression (response variable: broken or unbroken) to evaluate relationships between antler characteristics, precipitation, and observed breakage patterns. Overall cast antler breakage rate was 30%. Beam circumference and total number of antler points had the greatest effect on an antler's probability of breaking. No effect of seasonal precipitation was documented, but supplemental feed was available ad libitum. The main beam and G2 antler point were least susceptible to antler breakage. The study provides a general description of antler breakage in a white-tailed deer herd and reaffirms that antler breakage rates are likely a byproduct of individual characteristics and herd demographics.

*** Student Presenter**

NOTES

Poster Session

Landowner's Attitudes Toward White-tailed Deer Subspecies Conservation in Mexico

Karla G. Logan, Randy W. DeYoung, Alfonso Ortega-Santos, David Hewitt – Caesar Kleberg Wildlife Research Institute

Fourteen subspecies of white-tailed deer (*Odocoileus virginianus*) occur in Mexico, three of which co-occur in the U.S. The subspecies display obvious divergences in body and antler size. For instance, dressed body mass of the diminutive Coues (*O. v. couesi*) males rarely exceeds 40 kg, whereas Texas white-tail (*O. v. texanus*) males regularly exceed 60 kg. The prospect of economic opportunities associated with hunting large-antlered deer has led to the translocation of Texas whitetails into the historic range of smaller-bodied subspecies. We surveyed 149 landowners from Mexico to determine attitudes toward subspecies of white-tailed deer. Results revealed clear economic advantages for hunting revenue in ranches within the range of Texas' deer over ranches with other subspecies. More than 90% of landowners with ranches outside of the Texas deer distribution thought big game production was limited by lack of trophy categories, while 80% within the Texas deer range disagreed. Eighty percent agreed the establishment of additional trophy categories for small-bodied subspecies is desirable. Forty percent believe that additional categories would reduce translocations across subspecies boundaries. Despite the fact that most landowners disagreed with introductions of exotic subspecies, translocations were widespread. The main reasons to justify these translocations were the aim to increase the antler size of the native deer and to provide more trophies for hunting demand. Our results suggest that the integrity of small-bodied white-tailed subspecies may be preserved by the implementation of additional trophy categories to recognize the unique nature of native subspecies.

*** Student Presenter**

NOTES

Poster Session

Seasonal Dietary Patterns of Coyotes (Canis latrans) and Black Bears (Ursus americanus) in Western Virginia

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

The adaptability of coyotes makes it difficult to predict their effects on Virginia ecosystems based on coyote research from other regions. Recent white-tailed deer harvest data have shown a decline in harvest in the western part of the state, particularly on public land. Cumulative effects of black bear and coyote predation is one possible cause of this observed harvest trend. In May 2011, fieldwork began for the Virginia Appalachian Coyote Study (VACS). A primary objective of VACS is to estimate seasonal diet of coyotes and black bears in western Virginia and assess the potential for predation to limit deer numbers. Diet is determined by dissecting scat (feces) and identifying prey items based on remains such as bones, teeth, hair, and seeds. Samples are collected monthly along transects that follow roads and trails in the George Washington National Forest and surrounding state and private lands. Scats are identified using DNA collected from the scat. Prey abundance and availability for predation is estimated by small mammal trapping, camera trapping, vegetation surveys for fruit-bearing plants, and distance sampling of deer using infrared imagery. Frequency of occurrence of prey items in scat will be related to seasonal abundance of common prey species. To date, >450 scat samples have been collected, and >50 have been analyzed in the lab. Field collection will continue through spring 2013, and diet estimates from the first six months will be available by January 2012.

*** Student Presenter**

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Table 1. Southeastern state deer harvest summaries for the 2010-2011 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	145,000	192,000	337,000
AR	52,609	44,718	85	53	12	97,319	86,920	184,239
DE	1,954	714	36	15	10	6,600	7,583	14,183
FL	51,628	29,280	50	45	16	102,862	75,683	178,545
GA	57,800	37,181	64	64	6	155,256	308,747	464,003
KY	40,395	39,654	97	59	9	59,170	51,206	110,376
LA	41,406	26,562	64	52	4	84,425	69,075	153,500
MD	9,837	8,766	89	46	4	42,748	53,135	95,883
MO	69,561	21,396	31	31	4	143,031	132,168	275,199
MS	47,296	31,250	66	66	6	122,705	148,185	270,890
NC	48,794	35,089	72	58	6	116,085	118,062	234,147
OK	69,919	37,425	54	19	3	63,314	46,000	109,314
SC	30,207	21,920	73	63	7.5	116,755	105,894	222,649
TN	42,246	25,770	61	49	9	90,598	72,214	162,812
TX	261,914	152,730	58	40	<2	357,378	330,698	688,076
VA	39,589	35,642	90	59	8	115,343	106,731	222,074
WV	24,064	22,889	95	79	9	64,014	42,039	106,053[10]
Avg or Total	940,847	619,000	69.3	51.2	7	1,882,603	1,946,340	3,828,943

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	7.2	A,B,C,I	1,600,000	109 (A,C)	5 (A,C)	74 (A,C)	A,B	70
AR	4.1	A,C, F, G	800,000	151 (C)	12 (C)	49 (C)	A,B	70
DE	8.9	A, F	36,000	131 (C)	14 (A,B)	35 (A,B)	A,B,C	0
FL	3.1	B	NA	30	9	72	A,B	40
GA	12.5	A,C,D,E, G	904,000	115-146 (C)	80-95 (A,C)	73-88 (C)	A,B,C	23
KY	2.8	D,F,G	1,034,000	136 (C)	2 (A), 9 (B)	10-16 (C) + 4 Jr. days	A,B,C	0
LA	5.8	A,B,C	500,000	123(C)	14 (A,B)	65	A,B,C	80
MD	10.9	B,C,D,F,G	235,000	87 (C)	3+9 (A), 13 (B)	13 (A), 2 (B) + 1 Jr. day	A,B,C	0
MO	12.9	B,C,D,F,G	1,400,000	98	11	25	A,B	0
MS	8.7	B,C	1,700,000	122 (C)	12 (A),14 (B)	46	C	90
NC	6.7	A,B,C,D,F,G	1,350,000	21-56	12	18-67	A,B,C	50
OK	2.9	A,C, E, online	550,000	107	9	16	A,B	0
SC	10.5	A,B,C	750,000	16 (A)	10 (A)	70-140	C	60
TN	6.2	A,D	700,000	52	14	39	A,B,C	0
TX	4.45	B,C	3.3 million [9]	35	14	74-88 (B, C)	A,B	0
VA	6.2	A,B,C,D,F	~900,000	36-66	12-31	13-43	A,B	55
WV	4.7	A	554,000	73 (C)	12 (C)	21 (C)	A,B,C	0
Avg. or Total	118.55		16.3-16.5 million					30.5

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	197,100	Down	$24.20	$277.70	Hunter Log	Mandatory	N/A
AR	300,000	Stable	$10.50 – 25	$100 – 300	License Tag	Mandatory	Female/Mgt buck
DE	20,270	Stable	$25	$130+	Physical Tag	Mandatory	2 Antlered, Unlimited Antlerless
FL	150,000	Stable	$12	$151	Some WMA's	Mandatory	No
GA	322,224	Stable	$19-$43	$295-$373	License Tag	Mandatory	WMA'S
KY	255,000*	Stable	$50	$190	License Tag/ Hunter Log	Mandatory	Yes
LA	160,700	Stable	$29-50	$300-352	Physical Tag	Mandatory	DMAP
MD	64,250	Stable	$36.50	$130	Physical Tag	Mandatory	Antlered only
MO	507,068	Stable	$17	$225	License Tag	Mandatory	Antlerless only
MS	106,498	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	328,590	Down	$25	$280	License Tag	Mandatory	DMAP
SC	140,462	Down	$25	$225	None	None	Yes & DMAP
TN	200,000	Down	$56	$251	Physical	Mandatory	Quota permits
TX	692,209	Stable	$25	$315	License Tag	None	MLDP permits
VA	240,000	Down	$46-82	$197-259	License Tag	Mandatory	Unlimited on private lands, antlerless only
WV	215,000	Down	$43	$209	Physical Tag	Mandatory	Yes
Total	4,139,371						

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	6	2	23,000 (B)
AR	Yes	Yes	Yes	Yes	No	unknown	unknown	16,961 (C)
DE	Yes	Yes	Yes	Yes	No	0	0	4,230 (B)
FL	Yes	Yes	Yes	Yes	No	0	0	Unknown
GA	Yes	Yes	Yes	Yes	No	4	4	50,000 (C)
KY	Yes	Yes	Yes	Season & Handicap	No	3	2	3,125 (A)
LA	Yes	Yes	Yes	Yes	No	0	0	8,437 (C)
MD	Yes	Yes	Yes	Yes	No	3	3	33,000 (C)
MO	Yes	Yes	Yes	Yes, Firearms	No	1	0	5,706 (A)
MS	Yes	Yes	Yes	Yes, Firearms, Primitive Weapons	No	6	4	13,489 (C)
NC	Yes	Yes	Yes	Yes	No	7	5	20,000 (A)
OK	Yes	Yes	Yes	Yes	No	0	0	9,333 (C)
SC	Yes	WMAs only	Yes	Yes	No	2	2	2,214 (A)
TN	Yes	Yes	Yes	Yes	No	2	1	20,000 (C)
TX	Yes	WMAs only	Yes	Yes	No	4	0	38,067 (C)
VA	Yes	Yes	Yes	Yes	No	4	4	48,700 (B)
WV	Yes	Yes	Yes	Yes (Disabled)	No	4	3	16,210 (A)
Total						46	30	

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)	~15	~20	~45	$5-16
AR	5	2-5	2	A,C	?	?	?	$6-10
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	$4-15
GA	12	10	2	A (One buck must be 4-points on 1 side) B (9 counties are more restricted)	54	25	129	$5-20
KY		Varies	1	C (10 WMAs)	----------	41% Combined	----------	$15-25
LA	6	3	3	Yes (C)	24	25	45	$5-30
MD	6 Region A & 36 Region B	3 Region A & 30 Region B	3 Region A & 6 Region B	No	38	35 (C)	48	$5-35
MO	Varies	Varies	3; 1 with firearm	Yes, 69 counties	18	-	36	$10
MS	8	5	3	C	51.8	58.7	70	?
NC	6	6	2/4[6]	NA	----------	52% Combined	----------	$2-6
OK	6	Up to 6	2	No	23	21	34	$5-10
SC	15+	10+	5+	C (10 WMAs)	33	28	66	$8–10+
TN		Varies	3 statewide	None	----------	44% Combined	----------	$5-10
TX	5	Up to 5	Up to 3	C	----------	67% Combined	----------	$7-15
VA	6 (east) & 5 (west)	6	3 (east)& 2 (west)	On 2 WMAs + 2 Counties	~35	~39	~53	?
WV	11	Up to 9	Up to 3	6 WMAs	27	13	42	$1-6
Avg.					27.32	23.51	46.2	

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	100	Yes	Yes	No
AR	A	None	None	800	Yes	Yes	Yes, Private
DE	DDAP SDDAP	None	None	148	No	Yes	Yes
FL	A	640	None	1,250	Yes	Yes	Yes
GA	None				Yes	Yes	No-North Zone Yes-South Zone
KY	B	None	None	275	Yes	Yes (except March – May)	Yes, Private
LA	A	40	Yes	827	Yes	Yes	Yes, Private
MD	None				Yes	Yes	Yes, Private Only. None W CWD
MO	B	5	None	150,000	Yes	Yes	No
MS	A,D	Variable	None	626	Yes	Yes	No
NC	A	Regional; 1,000/500	$50	92	Yes	Yes	Yes
OK	A	1,000	$200-400	215	No	Yes	Yes
SC	A	None	$50	1,659	Yes	Yes	Yes 28 co. No 18 co.
TN				3.8 mil. ac.	With officer approval	Yes	No
TX	A,B,C	None	None	7,038	Most of Texas	Yes	Yes
VA	DCAP DMAP DPOP	None	None	909 815 ~40	Yes (no weapon)	No (Sept 1 – first Sat in Jan)	No
WV	None				No	Yes[11]	Yes[11]

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 antlerless deer during archery season and if taken with antlerless deer permits, only one/day may be antlerless during the 7-day antlerless deer season.; MD–Unlimited antlerless archery bag limit for 5 counties in suburban archery zone. Bonus antlered tag required for 2nd buck with each weapon (archery, muzzleloader, firearm) in Region B and must kill 2 antlerless deer first; 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, northwestern season, and central deer seasons. Up to 4 bucks in those areas in the eastern deer 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 446 deer of unknown sex.

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

NOTES

NOTES


Restaurants/Refreshments
D Another Broken Egg Café
E Baytowne Marina Bar & Grill
B Finz Restaurant
AF Starbucks Coffee
D The Linkside Pub
Resort Relations
AF ATM
G Baytowne Conference and The Grand Sandestin Business Center
ADG Guest Registration
D Linkside Conference and Business Center
F Wachovia Bank
Resort Golf
H Baytowne Golf Club
Burnt Pine Golf Club
H Raven Golf Club
D The Links Course
Recreation/Relaxation
E Baytowne Marina
C Beachside Green
A Bike Station
E Fishing
D Fitness Center
D Club KZ
D Sandestin Day Spa & Salon
E Tennis Center
C The Dunes Putting Course
Designated "Resort Guest" Pools
5 Miles of Walk/Bike Trails
Choctawhatchee Bay
Horseshoe Bayou
LAKESIDE
BAYSIDE
BEACHSIDE
INSPIRATION 8100-8120
ELATION 5101-5816
BAHIA 4101-4525
LASATA 3002-3518
LE JARDIN 150-174
MARKET STREET INN
OBSERVATION POINT NORTH
OBSERVATION POINT SOUTH
TO BURNT PINE GOLF CLUB
THE GRAND SANDESTIN 2100-2911
PILOT HOUSE
The Village of BAYTOWNE WHARF at SANDESTIN
The Village of Baytowne Wharf is a unique collection of specialty merchants ranging from quaint boutique shops and charming eateries to lively nightclubs – all set against a backdrop of vibrant special events.
THE BUNGALOS 2431-2499
CRYSTAL LAKE 2000-2131
CRYSTAL COVE
BAYTOWNE MARINA
MAGNOLIA BAY 8580-8620
LAUREL GROVE 1301-1399
THE ANCHORAGE 8696-8724
TURNBERRY VILLAS 8501-8573
CLUB INTRAWEST
JOLEE ISLAND
Troon Dr
BAYPINE COTTAGES 8850-8880
PRESTWICK PLACE 1101-1134
HERON WALK 8960-8999
Baytowne Ave
Baytowne Village Dr
Lakeside Gate
COURTYARD BY MARRIOTT
RESIDENCE INN BY MARRIOTT
HORSESHOE BAYOU PUBLIC PARKING
BAYSIDE INN 6170-6891
GRAND HARBOUR 840-869
NORTH SHORE 960-985
HARBOUR POINT 800-827 900-919
VILLAS AT VANTAGE POINTE 31-86
PLAYERS' CLUB 001-028
SANDPIPER 701-773
Sandestin Blvd North
LINKSIDE 396-499
BAYOU VILLAGE 601-668
FAIRWAYS 171-310
SANDESTIN ESTATES 1-36
L'ATRIUM 311-357
AUGUSTA 517-559
MAGNOLIA 501-512
589-599
Bayside Gate
TUNNEL
Beachside Gate
Emerald Coast Parkway/US Highway 98
PANAMA CITY
DESTIN
PINE RIDGE 5351-5386
BEACHWALK VILLAS 5050-5209
TIVOLI 5220-5313
THE MARKET SHOPS AT SANDESTIN
The Market Shops at Sandestin is a showcase of unique boutiques surrounded by lush tropical courtyards and trickling fountains.
Sandestin Blvd South
TIVOLI TERRACE 5400-5444
ONE BEACH CLUB DRIVE 201-2104
LUAU I 6101-7908
LUAU II 6121-7228
WESTWINDS 4701-4849
BEACH CLUB
BEACHSIDE ONE 4010-4155
HILTON
SOUTHWINDS I, II & III 4400-4460, 4500-4552 4600-4654
BEACHSIDE TWO 4200-4377
BEACH ACCESS
Gulf of Mexico
Event Locations
G – Meeting Location
B – Sunday Night Social (Shuttle Provided)
E – Shoot from the Hip
G – Awards Banquet