QDMA's Whitetail Report 2010

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An annual report on the status of white-tailed deer, the foundation of the hunting industry in North America.

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The QDMA Mission:
QDMA is dedicated to ensuring the future of white-tailed deer, wildlife habitat and our hunting heritage.

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Introduction

Last year, QDMA launched the *Whitetail Report* in an effort to share what we know about the threats, concerns, successes and challenges that are shaping the future of white-tailed deer – the single most important game species in North America. Because more hunters pursue whitetails, by far, than any other game species, and spend more money on deer hunting, by far, than any other type of hunting, whitetails are the foundation of the entire hunting industry. The 2009 *Whitetail Report* was received enthusiastically by members of the hunting media and the commercial hunting industry as well as by deer managers and hunters. It has been quoted, cited, and used as research and reference material by numerous publications and communicators. Copies have been acquired by many organizations, political leaders, professional wildlife managers and educators. Because of this response, QDMA worked diligently to follow through on our goal of making this an annual effort. We'd like to take this opportunity to thank state wildlife agency deer biologists from across the whitetail's range for providing much of the data included in this report.

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Information & Assistance

Members of the media who have questions about the *Whitetail Report*, need additional information, or need sources for stories on whitetail biology or management, can contact QDMA's Education & Outreach staff at any time using the information below, or contact the National Office at (800) 209-3337. Additionally, if you are not already receiving QDMA's news releases by e-mail, contact Palmer Pope (ppope@qdma.com) to have your name added to the mailing list.

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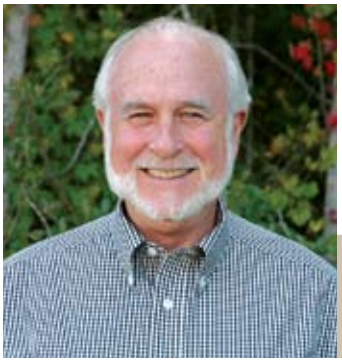

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Part One: *Regional Rankings*

Top Deer Management Programs by State

We all enjoy a little friendly competition. It's fun to see how we compare to others involved in similar hobbies, sports, or other pastimes. The same is true in the deer management arena. Deer managers routinely compare notes in an effort to continually improve the program they are in charge of; whether that be for 50 acres or an entire state.

To compare state deer management programs across the whitetail's range we surveyed each state agency in the continental U.S. and collected antlered and antlerless harvest data for 2007 and 2008, age structure of the antlered harvest for 2007 and 2008, and percentage of the state's wildlife management units (WMUs) currently at the desired deer goals. We then developed a system to rank each state's data relative to Quality Deer Management (QDM) principles. As a refresher, QDM is about balancing the deer herd with the habitat, and balancing the adult age structure and sex ratio. In a nutshell, it's about having the right number of deer for what the habitat can support, having bucks and does in all age classes, and having balanced numbers of adult bucks and does.

PHOTO BY TES RANDLE JOLLY

Quality Deer Management is about having the right number of deer for what the habitat can support, having bucks and does in all age classes, and having balanced numbers of adult bucks and does.

Our rating system is meant to commend states that are doing well, rather than point a finger at states ranking lower. It's also an arbitrary system, but one that addresses QDM principles. Our rating system used four variables:

1) percentage of a state's WMUs at the desired deer goals
2) percentage of 2008 antlered buck harvest that was 1.5 years old
3) percentage of 2008 antlered buck harvest that was 3.5 years or older
4) percentage of 2008 total harvest that was antlerless deer

Number 1 above is an index to the percentage of a state's WMUs where the deer herd is in balance with the habitat. Higher percentages are obviously preferred over lower numbers. Numbers 2 and 3 are indices to having a balanced age structure for bucks. The QDMA promotes protecting the majority of yearling bucks (1.5 years old), so states with lower percentages of yearlings ranked higher than those with higher percentages. Conversely, states with higher percentages of 3.5 years and older bucks ranked above those with lower numbers. Number 4 is an index to having a balanced adult sex ratio, and in many cases, to balancing the deer herd with the habitat. Higher percentages for this variable are generally preferred over lower numbers.

Many environmental, social, and cultural variables impact deer management programs, and these can vary widely across regions. Therefore, we only compared states to others within their region. We collected (at least some) data from all 37 states in the Midwest, Northeast and Southeast that comprise the vast majority of whitetail habitat (see map of regions on page 8). We were unable to acquire similar data for most western states so this analysis omits that region.

We selected the top five states for each of the four variables and awarded points as follows: 5 points for first place, 4 points for second place, 3 points for third place, 2 points for fourth place, and 1 point for fifth place. A perfect score would be 20 points (4 first place finishes at 5 points each = 20 points). We then totaled the scores and ranked the top 5 states for each region. In case of a tied score we used the percentage of WMUs at goal (Number 1 above) as the tiebreaker since QDM is first and foremost about balancing the deer herd with the habitat.

Drum roll please. In the Midwest, Kansas claimed the top spot with 15 points, followed by Missouri (10), Indiana (5.5), Nebraska (5) and Wisconsin (5). Kansas finished first in three of four categories, and Missouri was one of only two states, in any region, to place in the top five for every category. In discussions about the "I" states, Indiana often takes a back seat to neighboring Illinois and Iowa, but the Hoosier state outranked them in our analysis. Nebraska and Wisconsin tied with 5 points, but Nebraska won the tiebreaker by having 39 percent of WMUs at goal while Wisconsin had 33 percent. Kansas is well known for its big bucks, and now it can also be recognized as a state with an overall successful deer management program. Congratulations to Lloyd Fox, Big Game Program Coordinator, and his team at the Kansas Department of Wildlife and Parks. Also, congratulations to deer biologist Lonnie Hansen and his colleagues at the Missouri Department of Conservation.

In the Northeast, Vermont took top honors with 9.5 points, followed by Pennsylvania (7), Rhode Island (7), Virginia (7), and Delaware (6.5). Pennsylvania's high percentage of WMUs at goal (77 percent) broke the tie and awarded the Keystone state second place. Vermont enacted antler restrictions in 2005 that were designed to protect half of the yearling bucks. This regulation enabled the Green Mountain state to finish first in harvesting the lowest percentage of

QDMA'S TOP-FIVE STATES in Deer Management Success by Region

Midwest
1. Kansas
2. Missouri
3. Indiana
4. Nebraska
5. Wisconsin

Northeast
1. Vermont
2. Pennsylvania
3. Rhode Island
4. Virginia
5. Delaware

Southeast
1. Mississippi
2. Arkansas
3. Georgia
4. South Carolina
5. Louisiana

Quotable QDMA:
"In the Midwest... Kansas finished first in three of four categories, and Missouri was one of only two states, in any region, to place in the top five for every category."

Quotable QDMA:
"In discussions about the 'I' states, Indiana often takes a back seat to neighboring Illinois and Iowa, but the Hoosier state outranked them in our analysis."

Quotable QDMA:

"Mississippi was first or second in three of the four categories and this is yet another example highlighting the Mississippi Department of Wildlife, Fisheries and Parks' progressive deer management program."

yearling bucks in the Northeast (15 percent) and tied for third for harvesting the most 3.5 years and older bucks (26 percent of antlered buck harvest). Pennsylvania has implemented major changes to its deer program since 2002 including concurrent buck and antlerless seasons, antler point restrictions, an early antlerless season, a deer management assistance program (DMAP), a youth season, and a mentored hunting program. Hunters in both states are now reaping the rewards of these highly successful programs. Kudos to Shawn Haskell, Deer Team Chair for Vermont Fish and Wildlife Department, Chris Rosenberry, Deer and Elk Section supervisor for Pennsylvania Game Commission, and their teams for their successes.

In the Southeast, Mississippi claimed top honors with 13 points, followed by Arkansas (9.3), Georgia (8), South Carolina (7), and Louisiana (6.3). Mississippi was first or second in three of the four categories and this is yet another example highlighting the Mississippi Department of Wildlife, Fisheries and Parks' progressive deer management program. Congratulations to Chad Dacus, White-tailed Deer Program Coordinator, and his talented deer team. Arkansas finished second by placing in the top five for every category. Only one other state in the country (Missouri) accomplished this feat. Brad Miller, Deer Program Coordinator for Arkansas Game and Fish Commission, and his deer team should be proud of their efforts.

As you can see from the charts below and on the facing page, many states made the "top five" list for at least one category. This highlights the important work states are doing to continually improve their deer management programs and this is good for the future of deer hunting. We'll reiterate that our analysis should only be used to draw attention to the successes states are achieving and place well-deserved credit to the biologists in charge of those programs. We encourage all QDMA members to stay motivated and to continue promoting the QDM philosophy, regardless of where your state ranked this year. With a little help, your state could claim the top ranking in 2011.

Region	Points	% Units at Goal	% 1.5 Yrs	% 3.5+ Yrs	% Antlerless	Rank	State	Total Pts.
Midwest	5	KS	KS	KS	WI	1	KS	15
	4	MN	NE	KY	MO	2	MO	10
	3	MO	IN/MO	IN	IA/OH	3	IN	5.5
	2	IA	IN/MO	MO/OH	IA/OH	4	NE	5
	1	NE	IL/KY	MO/OH	ND	5	WI	5
Northeast	5	PA	VT	RI	DE	1	VT	9.5
	4	CT	VA/ME	NH	MD/NJ	2	PA	7
	3	MA	VA/ME	VT/VA	MD/NJ	3	RI	7
	2	VT	RI	VT/VA	PA	4	VA	7
	1	DE	MA	MA/DE	VA	5	DE	6.5
Southeast	5	SC/OK	AR	MS	GA	1	MS	13
	4	SC/OK	MS	TX	MS	2	AR	9.3
	3	GA	LA	LA	NC/SC	3	GA	8
	2	AR	AL	AR	NC/SC	4	SC	7
	1	TN	TX/OK	AL	AR/LA/TX	5	LA	6.3

Region	State	% Units at Goal	% bucks 1.5 yrs	% bucks 3.5+ yrs	% harvest that's antlerless
Midwest	Iowa	50	*	*	64
	Illinois	23	41	*	62
	Indiana	8	40	20	61
	Kansas	90	17	49	48
	Kentucky	33	41	21	54
	Michigan	15	61	14	49
	Minnesota	60	67	10	57
	Missouri	50	22 (58)**	24 (11)**	65
	North Dakota	25	*	*	63
	Nebraska	39	34	*	47
	Ohio	8	50	18	64
	South Dakota	*	*	*	48
	Wisconsin	33	53	*	69
Northeast	Connecticut	77	40	*	54
	Delaware	61	53	19	73
	Massachusetts	73	39	19	50
	Maryland	9	62	*	65
	Maine	29	37	15	36
	New Hampshire	39	45	29	41
	New Jersey	35	64	*	65
	New York	21	62	12	53
	Pennsylvania	77	52	13	64
	Rhode Island	60	38	35	53
	Virginia	27	37	26	56
	Vermont	71	15	26	44
	West Virginia	*	*	*	47
Southeast	Alabama	*	25	40	*
	Arkansas	76	13	49	45
	Florida	*	*	*	*
	Georgia	78	45	23	60
	Louisiana	*	22	50	45
	Mississippi	50	17***	58***	53
	North Carolina	*	39***	22***	52
	Oklahoma	80	27	26	44
	South Carolina	80	59	18	52
	Tennessee	70	44	16	32
	Texas	*	27	54	45
West	Arizona	40	*	*	*
	California	*	*	*	*
	Colorado	*	*	*	*
	Idaho	43	*	25	31
	Montana	*	*	*	*
	New Mexico	*	*	*	*
	Nevada	*	*	*	*
	Oregon	*	*	*	7
	Utah	*	*	*	*
	Washington	*	*	*	*
	Wyoming	*	*	*	44

* data not available

** data from antler-point-restriction counties (non-antler-point-restriction counties)

*** data from check stations and DMAP

Quotable QDMA:
"With respect to antlered buck harvest, 2008 was a good year for most states in the Northeast and Southeast but a tough one for the Midwest."

White-Tailed Deer Harvest

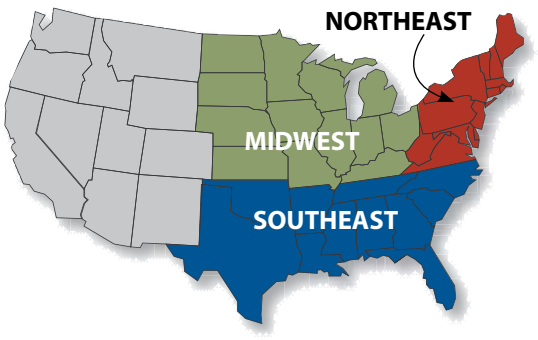
The 2009-10 deer season is closed or nearing so for states across the whitetail's range, and biologists will be crunching data in the coming months to assess the outcome of this past season. Until that data is available, we compared harvest data from the two most recent seasons – 2007-08 and 2008-09. Of the 37 states in the Midwest, Northeast and Southeast (see map) that comprise the majority of whitetail range, we acquired harvest data from all 37 for 2007, but 2008 data was not available for Florida and only 2008 age structure data was available for Alabama (not total harvest numbers). Therefore, we omitted 2007 data from these two states in the following analyses, but included their available data in the charts at the end of this article. The following data are from each state wildlife agency. States use several different techniques to collect this data, and some states collect more data than others. Analyses between states may not always compare "apples-to-apples," but each state provided their best possible data. Also, analyses across years should be robust to differential confidence levels in data from any individual state.

Antlered Buck Harvest

With respect to antlered buck harvest, 2008 was a good year for most states in the Northeast and Southeast but a tough one for the Midwest. In total, these three regions tagged over 2.7 million antlered bucks each year. The difference in the two year's harvest was less than 0.2 percent. Texas reported the largest harvest at 340,159 antlered bucks. Michigan was next with 248,350 and Georgia was third with 159,567 antlered bucks.

The Northeast harvested 526,193 antlered bucks in 2008, a 4 percent increase from 2007. Nine of 13 northeastern states (69 percent) shot more bucks in 2008 than in 2007. The average increase was 7 percent and ranged from 1 percent in New York to 12 percent in Pennsylvania. Numerically, Pennsylvania shot 13,210 additional bucks in 2008. All four Northeastern states that shot fewer bucks in 2008 were in New England. New Hampshire's harvest was reduced 17 percent, Maine's was 16 percent lower, Massachusetts' was 4 percent lower, and Rhode Island's was 1 percent lower. New England is well known for its severe winters and their corresponding impacts on deer herds and hunter harvests, and this decline was expected in some areas.

The Southeast (minus Alabama and Florida) harvested 1,169,997 antlered bucks in 2008. This harvest was within a ½ percent of the 2007 harvest. Seven of 9 southeastern states (78 percent) shot more bucks in 2008. The average increase was 9 percent and ranged from 0.1 percent in Mississippi to 21 percent in Tennessee. Numerically, Texas shot 51,932 additional bucks (+18 percent) and Georgia shot 16,475 additional bucks (+12 percent) in 2008. Of the 2 states that shot fewer bucks, Arkansas' (-2 percent) harvest was nearly equal to 2007, while Louisiana's was considerably less at 23,650 fewer bucks (-21 percent). Interestingly, Louisiana hunters also shot exactly 21 percent fewer antlerless deer in 2008 than 2007 (71,190 in 2008 vs. 90,540 in 2007). According to the Louisiana Department of Wildlife and Fisheries, this reduction is likely a result of a combination of factors including impacts of coyotes, baiting, exurbia (lack of access to deer), hurricanes (reduced visibility and access), and others.



The Midwest harvested 1,047,153 antlered bucks in 2008, an 8 percent decline from 2007. Many states in the Midwest had a tough year as seven of 13 (54 percent) shot fewer antlered bucks in 2008. The average decrease was

Continued.

Estimated Deer Harvest

	Antlered Bucks 1.5 Years and Older		Antlerless Deer	
State	**2007**	**2008**	**2007**	**2008**
Alabama	129,600	*	212,400	*
Arizona	4,333	5,080	0	0
Arkansas	94,834	93,375	59,827	74,963
California	*	*	*	*
Colorado	*	*	*	*
Connecticut	5,312	5,892	5,750	6,790
Delaware	3,501	3,771	10,139	10,105
Florida	74,235	*	46,844	*
Georgia	143,092	159,567	207,623	239,350
Idaho	14,885	13,610	7,159	6,149
Illinois	81,356	71,813	118,246	117,088
Indiana	49,375	50,845	75,052	78,903
Iowa	54,295	51,710	91,919	90,484
Kansas	39,526	41,462	34,155	39,028
Kentucky	49,984	54,936	63,451	65,674
Louisiana	110,660	87,010	90,540	71,190
Maine	16,103	13,564	12,781	7,497
Maryland	32,221	34,725	59,987	65,712
Massachusetts	5,826	5,582	5,713	5,620
Michigan	267,429	248,350	216,555	241,573
Minnesota	109,000	96,000	151,000	126,000
Mississippi	131,970	132,167	143,647	148,687
Missouri	120,524	99,957	180,391	182,162
Montana	*	*	*	*
Nebraska	34,585	36,235	22,537	32,397
Nevada	*	*	*	*
New Hampshire	7,667	6,390	5,892	4,526
New Jersey	17,467	18,399	29,549	34,859
New Mexico	162	137	0	0
New York	104,451	105,747	114,690	117,232
North Carolina	83,665	85,051	88,321	91,246
North Dakota	36,445	33,963	61,673	57,577
Ohio	87,648	89,962	145,206	162,055
Oklahoma	58,059	59,449	37,832	45,820
Oregon	1,086	815	73	63
Pennsylvania	109,200	122,410	213,870	213,440
Rhode Island	1,067	1,055	1,029	1,210
South Carolina	112,522	119,346	126,671	129,432
South Dakota	33,398	33,413	36,642	30,459
Tennessee	77,604	93,873	86,907	70,540
Texas	288,227	340,159	224,625	279,491
Utah	*	*	*	*
Vermont	8,955	9,539	5,516	7,452
Virginia	109,718	112,207	133,074	144,175
Washington	*	*	*	*
West Virginia	83,033	86,914	62,904	76,689
Wisconsin	170,142	138,507	347,431	313,378
Wyoming	7,975	8,304	5,980	6,488

* data not available

Quotable QDMA:

"In 2008, the average percentage of the antlered buck harvest that was 1.5 years old was 41 percent, down from 43 percent in 2007. Arkansas averaged the fewest yearlings (13 percent) and Minnesota averaged the most (67 percent)."

substantial at 11 percent, and it ranged from -5 percent in Iowa to -19 percent in Wisconsin. Numerically, Wisconsin shot 31,635 fewer bucks, Missouri took 20,567 less (-17 percent), Michigan tallied 19,079 less (-7 percent), Minnesota shot 13,000 fewer (-12 percent), and even Illinois shot 9,543 fewer bucks (-12 percent). On the plus side, Kentucky shot 4,952 additional bucks (+10 percent), and Ohio hunters shot 2,314 more bucks (+3 percent). South Dakota shot nearly equal numbers in 2007 and 2008, and Indiana, Kansas and Nebraska all shot 3 to 5 percent more bucks in 2008.

Age Structure

We also acquired the age structure of the above harvest data for most states. Thirty-two states reported the percentage of their antlered buck harvest that was 1.5 years old, and 26 states reported the percentage that was 2.5 and 3.5 years or older. In 2008, the average percentage of the antlered buck harvest that was 1.5 years was 41 percent, down from 43 percent in 2007. Arkansas averaged the fewest yearlings (13 percent of antlered buck harvest) and Minnesota averaged the most (67 percent of antlered buck harvest). Other notables included Vermont (15 percent), Kansas (17 percent) and Mississippi (17 percent) all shot low percentages of yearlings, while Michigan (61 percent), Maryland (62 percent), New York (62 percent) and New Jersey (64 percent) all shot high percentages.

Twenty of 32 states (63 percent) shot a lower percentage of yearling bucks in 2008 than 2007. The average decline was 3 percent and ranged from -1 percent in several states to -12 percent in Maine and Oklahoma. Other notables include Vermont, where hunters shot 10 percent fewer yearlings, and Arkansas and Rhode Island, where hunters shot 9 percent fewer. Hunters are clearly passing more yearling bucks and allowing them to reach at least one year older.

Through progressive deer management programs and more knowledgeable hunters, today's deer herds have a more balanced and natural sex ratio and buck age structure, and they're providing tremendous hunting and viewing opportunities for sportsmen and women.

The average percentage of the antlered buck harvest that was 2.5 years was 31 percent in both 2007 and 2008. This statistic ranged from 19 percent in Texas to 59 percent in Vermont. Indiana and Tennessee averaged 40 percent 2.5-year-olds, and Missouri averaged 54 percent 2.5-year-olds in the state's antler-point-restriction (APR) counties (Missouri averaged 31 percent in non-APR counties). Overall, 14 of 26 states (54 percent) shot a higher percentage of 2.5-year-olds in 2008 than 2007. The average increase was 3 percent and ranged from 1 percent in several states to 9 percent in Vermont. Hunters are obviously benefiting from passing yearling bucks.

Continued.

Buck Harvest by Age Class

	1.5 Years Old		2.5 Years Old		3.5 Years Old	
State	**2007**	**2008**	**2007**	**2008**	**2007**	**2008**
Alabama	28	25	31	35	41	40
Arizona	*	*	*	*	*	*
Arkansas	22	13	34	38	42	49
California	*	*	*	*	*	*
Colorado	*	*	*	*	*	*
Connecticut	40	40	*	*	*	*
Delaware	59	53	28	29	13	19
Florida	*	*	*	*	*	*
Georgia	43	45	29	32	28	23
Idaho	*	*	*	*	*	*
Illinois	39	41	*	*	*	*
Indiana	44	40	39	40	17	20
Iowa	*	*	*	*	*	*
Kansas	19	17	46	34	36	49
Kentucky	45	41	40	38	15	21
Louisiana	24	22	19	20	49	50
Maine	49	37	25	23	13	15
Maryland	63	62	*	*	*	*
Massachusetts	40	39	22	24	21	19
Michigan	62	61	24	25	14	14
Minnesota	67	67	20	20	10	10
Mississippi	16***	17***	21***	21***	59***	58***
Missouri	24(52)**	22(58)**	53(36)**	54(31)**	23(13)**	24(11)**
Montana	*	*	*	*	*	*
Nebraska	40	34	*	*	*	*
Nevada	*	*	*	*	*	*
New Hampshire	45	45	32	26	23	29
New Jersey	62	64	*	*	*	*
New Mexico	*	*	*	*	*	*
New York	62	62	26	26	12	12
North Carolina	41***	39***	38***	39***	20***	22***
North Dakota	*	*	*	*	*	*
Ohio	50	50	32	32	18	18
Oklahoma	39	27	34	32	17	26
Oregon	*	*	*	*	*	*
Pennsylvania	56	52	32	35	12	13
Rhode Island	47	38	30	27	23	35
South Carolina	59	59	23	23	18	18
South Dakota	*	*	*	*	*	*
Tennessee	49	44	36	40	15	16
Texas	20	27	20	19	59	54
Utah	*	*	*	*	*	*
Vermont	25	15	50	59	25	26
Virginia	38	37	36	37	26	26
Washington	*	*	*	*	*	*
West Virginia	*	*	*	*	*	*
Wisconsin	56	53	*	*	*	*
Wyoming	*	*	*	*	*	*

* data not available
** data from antler-point-restriction counties (non-antler-point-restriction counties)
*** data from check stations and DMAP

The average percentage of the antlered buck harvest that was 3.5 years and older was 27 percent in 2008, up from 25 percent in 2007. This statistic ranged from 10 percent in Minnesota to 58 percent in Mississippi. Other notables included Arkansas (49 percent), Kansas (49 percent), Louisiana (50 percent) and Texas (54 percent). It's quite an accomplishment that these states move such high numbers of bucks into the 3.5 years and older age classes. Overall, 14 of 26 states (54 percent) shot a higher percentage of 3.5 year and older bucks in 2008 than 2007. Kansas had the largest increase from 2007 by shooting 13 percent more 3.5 year and older bucks, followed by Rhode Island (+12 percent) and Oklahoma (+10 percent). A short time ago most hunters couldn't fathom passing yearling bucks. Today, that restraint is allowing significant numbers of bucks to reach older age classes.

Antlerless Harvest

Antlerless harvests vary widely across states and years due to differences in deer density, productivity, a state's goals (reducing, stabilizing, or increasing the deer population), weather and other factors. However, we can learn much about a state's management program by comparing the antlerless and antlered buck harvests. Continuing with the analysis of states in the Midwest, Northeast and Southeast, hunters from these regions harvested 3,382,804 antlerless deer in 2008. This was an increase of 111,659 deer (+3 percent) from 2007. Overall, Wisconsin topped the list with 313,378 antlerless deer. Texas followed with 279,491 and Michigan was third with 241,573 antlerless deer.

This doe was taken by QDMA member Ken Kozminski of Michigan. Ken's home state was third in the nation for total harvest of antlerless deer in 2008, with 241,573.

Regionally, the Midwest shot virtually identical number of antlerless deer in 2007 and 2008 (1,544,258 in 2007 vs. 1,536,778 in 2008). These harvests were a difference of 0.5 percent. South Dakota (30,459) and Nebraska (32,397) shot the fewest antlerless deer in the region while Michigan (241,573) and Wisconsin (313,378) shot the most. However, Nebraska shot 9,860 more antlerless deer (+44 percent) in 2008 than in 2007. Wisconsin topped the list in 2008 but shot 34,053 less (-10 percent) antlerless deer than in 2007. Minnesota also shot 25,000 fewer (-17 percent) antlerless deer in 2008. Illinois, Indiana, Iowa, Kentucky and Missouri had antlerless harvests in 2008 that were within 5 percent of their 2007 harvests.

Nine of 13 (69 percent) Midwestern states shot more antlerless deer than antlered bucks in 2008. Only Kansas, Michigan, Nebraska and South Dakota shot more antlered bucks than antlerless deer. The average percentage of antlerless deer in the total deer harvest for 2008 was 59 percent, and it ranged from 47 percent in Nebraska to 69 percent in Wisconsin.

The Northeast shot 695,307 antlerless deer in 2008. This was an additional 34,413 deer (+5 percent) from 2007. Rhode Island (1,210) and New Hampshire (4,526) took the fewest while Virginia (144,175) and Pennsylvania (213,440) took the most antlerless deer. Virginia shot 11,101 (+8 percent) more antlerless deer and West Virginia shot 13,785 more (+22 percent) antlerless deer in 2008. Percentage-wise, Vermont increased their harvest by 35 percent while Maine's antlerless harvest dropped 41 percent in 2008.

Matching the Midwest, 9 of 13 (69 percent) northeastern states shot more antlerless deer than antlered bucks in 2008. Three of the 4 states that took more bucks were in New England (Maine, New Hampshire, Vermont), where severe winter weather and reduced productivity allow for successful deer management programs with lower doe harvests. Also, the fourth state (West Virginia) increased its antlerless harvest by 22 percent in 2008 and harvested nearly as many antlerless deer as antlered bucks. The average percentage of antlerless deer in the total deer harvest for 2008 was 57 percent, and it ranged from 36 percent in Maine to 73 percent in Delaware.

The Southeast (minus Alabama and Florida) shot 1,150,719 antlerless deer in 2008. This was 84,726 more (+8 percent) than in 2007. Oklahoma (45,820) and Tennessee (70,540) took the fewest, and Georgia (239,350) and Texas (279,491) took the most antlerless deer. Texas had the largest numerical and percentage increases from 2007 to 2008 by shooting 54,866 more antlerless deer (+24 percent) in 2008. Georgia hunters also had a good year by shooting 31,727 more (+15 percent) antlerless deer in 2008. Arkansas had the largest percentage increase by shooting 25 percent more antlerless deer in 2008. Louisiana experienced the largest decline by harvesting 19,350 fewer (-21 percent) antlerless deer in 2008 than in 2007.

Contrary to the other two regions, 5 of 9 (56 percent) southeastern states shot more antlered bucks than antlerless deer in 2008. Only Georgia, Mississippi, North Carolina and South Carolina took more antlerless deer than antlered bucks. The average percentage of antlerless deer in the total deer harvest for 2008 was 49 percent, and it ranged from 43 percent in Tennessee to 60 percent in Georgia. This average percentage was noticeably lower than in the Midwest and Northeast.

Summary

The sex ratio and age structure of modern-day deer populations and harvests are far better than those of a decade or two ago. Through progressive deer management programs and more knowledgeable hunters, today's deer herds have a more balanced and natural sex ratio and buck age structure, and they're providing tremendous hunting and viewing opportunities for sportsmen and women. Deer hunters and managers should be proud of the role they're playing in balancing deer herds with their habitats and reducing yearling buck harvests to allow more bucks to reach maturity. History will describe today's hunters as managers and stewards rather than the mere consumers of yesteryear.

Quotable QDMA:

"In the Southeast, Texas had the largest numerical and percentage increases from 2007 to 2008 by shooting 54,866 more antlerless deer (+24 percent) in 2008. Georgia hunters also had a good year by shooting 31,727 more (+15 percent) antlerless deer in 2008. "

Part Two: *Current Issues & Trends*

Quotable QDMA:
"We received data from 38 states, and 26 (68 percent) reported selling more hunting licenses in 2008 than in 2007!"

License Sales

In our 2009 Whitetail Report (download at www.qdma.com) we discussed "Hunter Numbers, Demographics and Trends" on pages 23 to 25. In the article we stated that while hunter numbers are in a steady decline, the number of big game hunters was only slightly declining and was even increasing in some states. As *Families Afield* and other hunter recruitment initiatives continue to attract and retain new hunters, we were interested in the most recent license sales data available from state agencies, so we surveyed wildlife agencies in the continental U.S. and asked for the total number of hunting licenses (number of unique hunters) sold in 2007 and 2008.

Numerous agencies and conservation organizations are working to promote youth involvement in hunting, including QDMA (this photo was taken at QDMA's 2009 National Youth Hunt). The combined efforts are having an impact on hunting participation and license sales.

We received data from 38 states (see map), and 26 (68 percent) reported selling more licenses in 2008 than in 2007! One state sold approximately equal numbers, and only 11 states (29 percent) sold fewer licenses in 2008. For states selling more licenses, the average increase was 3.5 percent and ranged from 0.3 percent in Pennsylvania and Tennessee to 22.6 percent in Idaho. Numerically, Missouri tallied the largest increase by selling an additional 28,521 licenses (+4 percent) in 2008. For states selling fewer licenses, the average decrease was 1.7 percent and ranged from 0.3 percent in Alabama and South Carolina to 6.8 percent in Mississippi. Numerically, Mississippi tallied the largest decrease by selling 14,446 fewer licenses in 2008. However, according to a Mississippi Department of Wildlife, Fisheries and Parks deer biologist, this decline is misleading as Hurricane Katrina had a major negative impact on license sales in Mississippi in 2005. License sales rebounded slightly

Hunting License Sales, 2007 to 2008

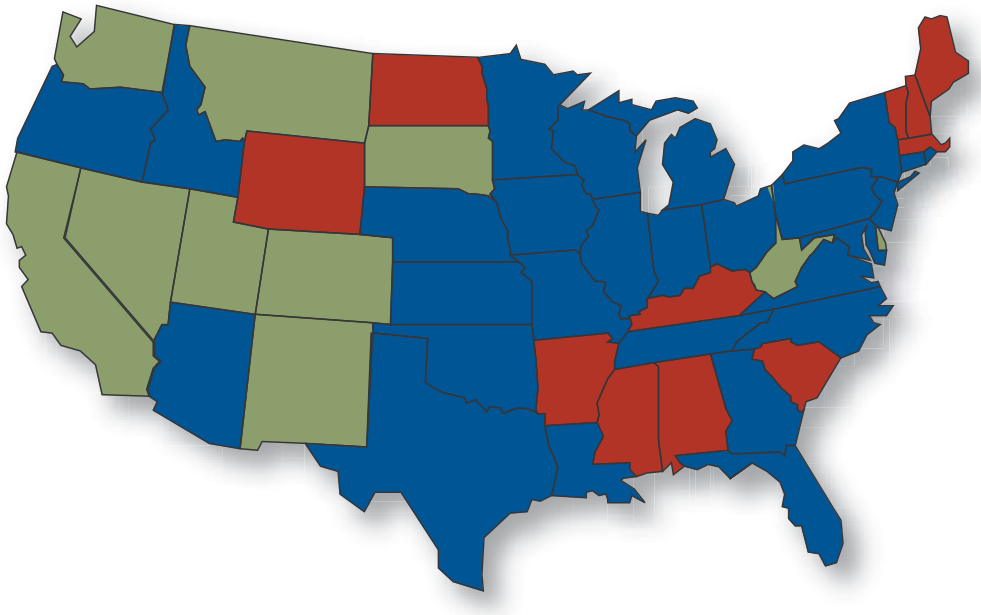
(Data from individual state wildlife agencies)

States selling MORE hunting licenses in 2008 than in 2007*

States selling FEWER hunting licenses in 2008 than in 2007

Data not available

*Minnesota's license sales were roughly equal in 2007 and 2008.



Quotable QDMA:

"For states selling more licenses, the average increase was 3.5 percent and ranged from 0.3 percent in Pennsylvania and Tennessee to 22.6 percent in Idaho."

in 2006, and then jumped in 2007. So, while 2008 license sales are less than in 2007, the number is likely a return to normalcy for the state.

New England states also took it on the chin as Maine, Massachusetts, New Hampshire and Vermont all sold fewer licenses in 2008. Fortunately only 29 percent of the survey respondents sold fewer licenses in 2008. Of these 11 states, 9 (82 percent) had 2008 license sales within 3 percent of their 2007 values. In total, 32 of the 38 respondents (84 percent) had 2008 license sales within +/- 5 percent of their 2007 numbers.

Regionally, 9 of 11 (82 percent) Midwestern states had increased sales in 2008, 3 of 4 (75 percent) Western states had increased sales, and 7 of 11 (64 percent) Northeastern and Southeastern states had increased sales in 2008. In the Midwest, Missouri had the largest increase adding 28,521 licenses (+4 percent), while Kentucky had the largest decline selling 6,549 fewer licenses (-1.9 percent). In the Northeast, New York added 26,330 licenses (+4.5 percent) while Massachusetts sold 2,306 fewer (-3.3 percent). In the Southeast, Texas sold 19,691 additional licenses (+1.8 percent) and Mississippi sold 14,446 fewer licenses (-6.8 percent). Finally, in the West, Idaho sold 12,692 more licenses (+22.6 percent) while Wyoming sold 2,323 fewer licenses (-2.5 percent).

With a declining trend for hunter numbers and reduced wildlife agency budgets, it is encouraging for the majority of states to report license sales increases in 2008. Let's hope when the 2009 license sales become available they will show a similar increase. We may have turned the corner with declining hunter numbers, and to do so in a tough economy is even more encouraging.

Hunter Effort

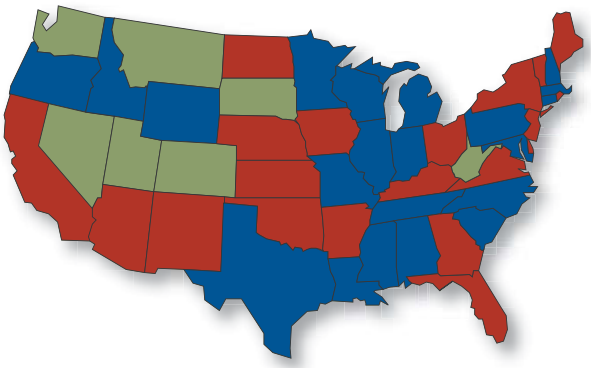
Quotable QDMA:
"Given the declining trend in license sales that we hear so much about, it is encouraging that only four of the 16 states reporting data for both years had fewer man-days in 2008 than in 2007."

The U.S. Fish and Wildlife Service (FWS) conducts a national survey of fishing, hunting, and wildlife-associated recreation every five years. The most recent survey was published in 2007 and includes data from 2006. This report includes the number of days afield by type of hunting, and categorizes these data for all hunting, big game, small game, migratory bird, and other animals. According to the FWS, big game hunters logged 164 million days in pursuit of their quarry in 2006. While white-tailed deer hunting constitutes the bulk of these days, the report does not separate big game hunting by species.

To get a measure of the number of man-days spent pursuing whitetails, we surveyed state agencies in the contiguous U.S. and asked for the number of man-days expended for white-tailed deer in 2007 and 2008. We received responses from 41 states (see map); 21 states reported 2007 hunter effort data and 16 also reported 2008 data. Since nearly half of the states that responded to the survey do not collect man-days of effort, we were not able to estimate what proportion of big game effort in the FWS report was likely attributable to whitetail hunters. However, we did receive some interesting information. For states that collect/estimate this data, white-tailed hunter effort ranged from 62,000 man-days in Oregon to 9.7 million man-days in Michigan (see chart).

Given the declining trend in license sales that we hear so much about, it is encouraging that only 4 of the 16 states reporting data for both years had fewer man-days in 2008. Two of the 4 states (Michigan and Pennsylvania) had reductions of 0.2 percent, and this is essentially a wash for states that tallied 9.7 and 6.5 million man-days in 2008, respectively. The other states with reductions were Wyoming (-1 percent) and Louisiana (-3 percent) -- minute reductions for sure.

Minnesota estimated equal numbers of man-days in 2007 and 2008, and the other 11 states reported increases ranging from 1 percent in Maryland to 76 percent in Idaho (note: data from Idaho included man-days for mule deer and increased from 241,059 to 424,779). Other notable increases included Oregon (22 percent), Connecticut (16 percent), and Mississippi (8 percent). Excluding the monumental percentage increase in Idaho, the other states' average increase was 7 percent. This is extremely encouraging for deer management programs and the future of deer hunting.



States responding with hunter-effort data

States that do not collect hunter-effort data

No survey response

Total Man-Days of Effort by Deer Hunters During the 2008 (or 2007) Season.
(man-days given in millions)

State	Man-Days
Michigan	9.7
Texas	9.5
Pennsylvania	6.5
Alabama	(4.4)
Tennessee	3.9
North Carolina	(3.7)
Indiana	(3.6)
Wisconsin	3.4
Missouri	3.1
Illinois	(3.1)
Louisiana	3.1
Mississippi	2.9
South Carolina	2.3
Minnesota	2.0
Maryland	(0.8)
New Hampshire	0.7
Connecticut	0.4
Idaho	0.4
Massachusetts	0.3
Wyoming	0.1
Oregon	0.06

State Agency Budgets

The tough economy has had an overriding influence on our daily lives for over a year now. The hunting industry has been nearly immune to past recessions, but that was not the case this time around. Many state wildlife agencies, conservation organizations, and hunters are currently feeling the impacts. We surveyed state wildlife agencies to determine how their 2009 budget compared to their 2008 (or most recent) budget, and what impacts it had on their daily routines. Here is what we learned. (The maps at the bottom of the page illustrate the data).

Of the 37 states in the Midwest, Northeast and Southeast that make up the majority of white-tailed deer range, 35 completed our survey. The following data were provided by those states.
- 3 states (9 percent) had larger budgets in 2009
- 11 states (31 percent) had budgets equal to 2008 (or their most recent year)
- 21 states (60 percent) had reduced budgets in 2009

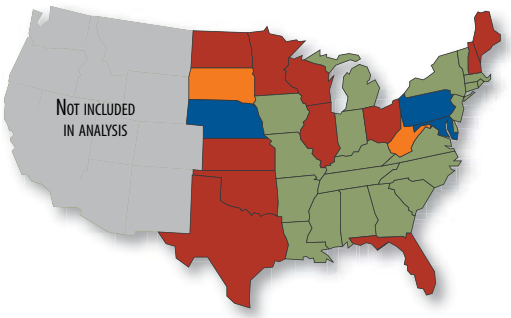
Of those with smaller budgets, 15 (71 percent) were reduced 1 to 10 percent, 5 (24 percent) were reduced 11 to 20 percent, and 1 (5 percent) was reduced more than 20 percent.

Regionally, the Midwest faired the best as only 5 of 12 (42 percent) states were impacted by reduced budgets. The Northeast and Southeast were hit similarly hard as 8 of 12 (67 percent) Northeastern states and 8 of 11 (73 percent) Southeastern states received budget cuts. Of the 21 (of 35) states with reduced budgets:

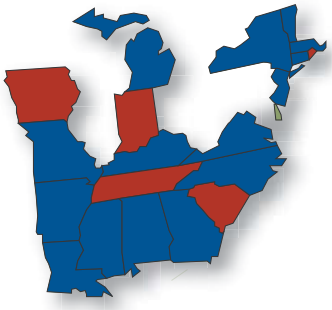
- 18 (86 percent) had to reduce travel to professional meetings
- 17 (81 percent) had to leave vacant positions unfilled
- 13 (62 percent) had to reduce staff
- 12 (57 percent) had to reduce programs
- 9 (43 percent) had to reduce travel for normal duties
- 9 (43 percent) had to reduce data collection programs
- 9 (43 percent) had to reduce educational materials such as magazines and brochures

Some states were also unable to hire new staff or fill temporary positions, while others were unable to purchase equipment and supplies.

Budget cuts are never easy, but when they impact management of our natural resources we all suffer. Most states are funded primarily or entirely by sportsmen's dollars, and this is a flawed system as all citizens can enjoy the beauty our natural resources provide. Hunters, and deer hunters in particular, currently shoulder the load. Hopefully, our state wildlife agencies can someday receive funding from the broader audience they currently serve.



Budget increased from '08 to '09
Budget stayed the same from '08 to '09
Budget decreased from '08 to '09
No data available



'09 budget 0-10 percent below '08
'09 budget 11-20 percent below '08
'09 budget 20-plus percent below '08

Quotable QDMA:
"Of the 37 states in the Midwest, Northeast and Southeast that make up the majority of white-tailed deer range, 60 percent had reduced budgets in 2009."

QDM Cooperatives

Quality Deer Management (QDM) is about balancing the deer herd with the habitat, balancing the adult sex ratio, and balancing the age structure for bucks and does. Sometimes, this is easier said than done, especially when most deer managers own or manage acreages far smaller than deer home ranges. This is where QDM Cooperatives come into play. A QDM Cooperative is a group of landowners and hunters working together to improve the quality of the deer herd and hunting experiences on their collective acreage. QDM Cooperatives are rapidly spreading across the whitetail's range and Michigan is among the nation's leaders with more than 60 formally established QDM Cooperatives.

A recent survey of QDMA members and QDM advocates showed an astounding 34 percent of respondents are involved in a QDM Cooperative. That equates to tens of thousands of landowners and millions of acres, resulting in an enormous impact on deer herds and wildlife habitats across the country. See the information on this page for a look at current participation trends of QDM Cooperatives.

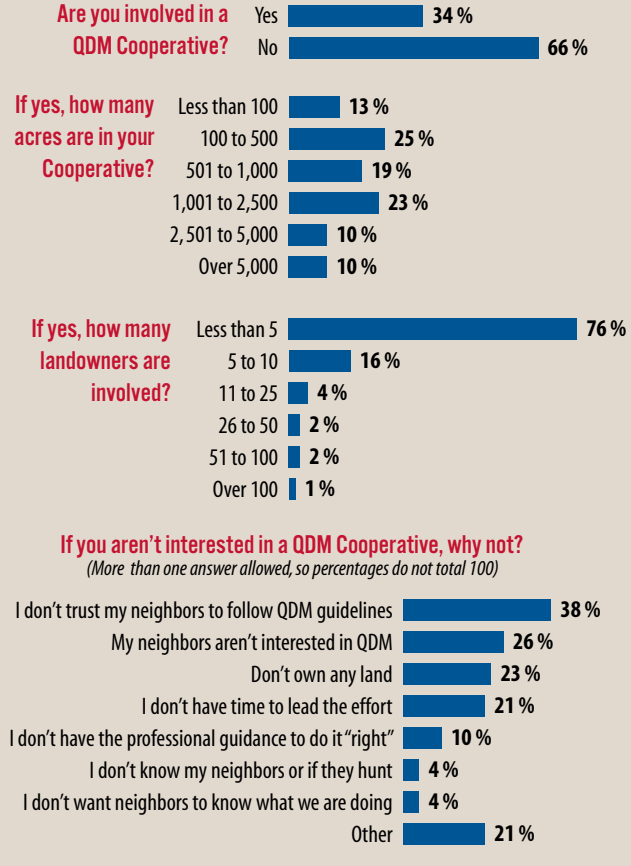
To help highlight the need for hunter cooperation across multiple small properties, let's look at several recent research projects regarding deer behavior.

Quotable QDMA:

"A recent survey of QDMA members and QDM advocates showed an astounding 34 percent of respondents are involved in a QDM Cooperative. That equates to tens of thousands of landowners and millions of acres, resulting in an enormous impact on deer herds and wildlife habitats across the country."

Participation in QDM Cooperatives

In 2009, QDMA sent an electronic survey to members and non-members who are part of our e-mail database, asking a number of questions about various aspects of Quality Deer Management. Below are the results of questions about participation in QDM Cooperatives (Note: to have your e-mail address added to our database, call 800-209-3337).



Yearling Buck Dispersal

There have been several buck dispersal studies during the past two decades in a variety of habitat types, including studies at Penn State, the University of Georgia, the University of Illinois, and Chesapeake Farms in Maryland. In general, these studies have shown approximately 50 to 70 percent of bucks leave their birth area when they're 12 to 18 months old; most disperse one to five miles, although some have gone more than 30 miles; of those that disperse, approximately 25 percent do so in the spring and 75 percent do so in the fall (note: a recent study at Michigan State University in a high-density deer herd reported higher spring dispersal which likely was caused by the high number of does in the study area); some research suggests yearling bucks won't disperse if they are orphaned (usually a buck's mother initiates dispersal movements through aggression); and some research suggests even two-lane roads can stop, or alter the path of, a dispersing buck.

Kirk Nartker (right) of QDMA's Clinton/Ionia Branch in Michigan gets an assist from Josh Nurenberg while putting up a sign for the East Olive QDM Cooperative. Though QDM Cooperatives are spreading in many states, Michigan is a national leader.

Research by Dr. Mark Conner and his colleagues on Chesapeake Farm's management program showed QDM can reduce overall dispersal by up to 20 percent, decrease average dispersal distance, and increase survival of dispersing bucks. Thus, a QDM approach at the landscape level is the best way to minimize the impacts of yearling dispersal.

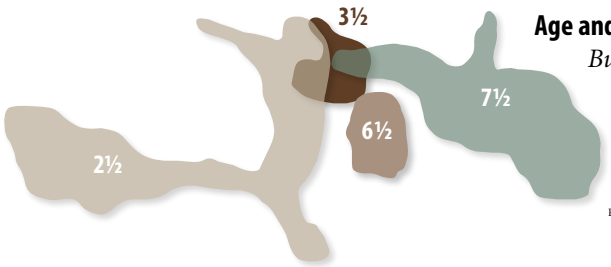
Home Range Size

Recent adult buck home range and movement studies have also been conducted by Chesapeake Farms, Louisiana State University, Mississippi State University, Samuel Roberts Noble Foundation and Texas A&M University at Kingsville. Two studies of particular interest were at Texas A&M University – Kingsville by Dr. Dave Hewitt and his colleagues, and Chesapeake Farms by Dr. Mark Conner and James Tomberlin. Researchers in these studies placed global positioning system (GPS) radio-collars on bucks 2 ½ to 7 ½ years old (no yearlings) and measured their annual home ranges and movement patterns. The average home range size in the South Texas study was 2,271 acres and it ranged from 661 to 7,332 acres! The average home range size in the Maryland study was 740 acres and it ranged from 346 to 1,448 acres. The Maryland home ranges were smaller but they still averaged more than a square mile.

Quotable QDMA:

"The Maryland researchers found their collared bucks moved 1.5 to 3 miles per day during the pre-rut and rut, while the Texas researchers found their collared bucks moved 7 to 15 miles per day during these same time periods!"

Biologists once believed that a buck's home range increased in size as he matured. The South Texas and Maryland studies showed this is not necessarily true. The diagram on this page clearly shows that younger bucks in the South Texas study had small and large home ranges, and fully mature bucks also had small and large home ranges. Thus, QDM Cooperatives provide benefits to bucks across all age classes.



Age and Home-Range Size

Buck age and home-range size do not appear to be related. This diagram from a Texas study shows relative size, shape and overlap of four home ranges, with the ages of each buck shown.

FROM RESEARCH AT TEXAS A&M-KINGSVILLE

Buck Daily Movements

The same two studies also showed bucks move the most just before the peak of the rut. The Maryland researchers found their collared bucks moved 1.5 to 3 miles per day during the pre-rut and rut, while the Texas researchers found their collared bucks moved 7 to 15 miles per day during these same time periods! Theoretically this is when they are most vulnerable to harvest, and this time period corresponds to the hunting season in many states. This is also when your neighbors are in the woods and highlights the benefits of being involved in a Cooperative.

Daily Movements and Home Range Summary

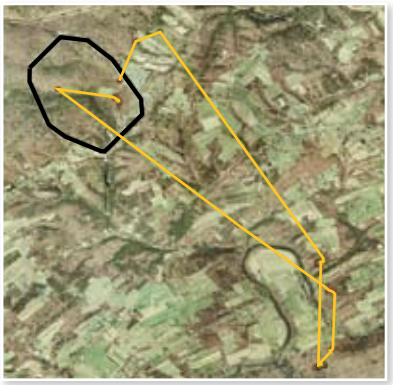
Ultimately, the researchers in both studies concluded that there was no apparent correlation between daily movements, home range size or age of bucks. Some bucks with small home ranges moved little while others with small home ranges move a lot; they just did so in a small area. Similarly, some bucks with large home ranges moved very little while others spent a lot of time on their feet. The same held true across different ages of the study animals; so, it appears that bucks are simply individuals with distinct movement patterns. This trait means a buck's daily movements during the breeding season likely affect his chances of survival.

Buck Excursions

With the advent of GPS radio-collars, researchers have also identified a behavior that we could only speculate about until recently, called "excursions." Excursions are short-duration, long-range movements out of a buck's home range that coincide with the breeding season. They are not an extension of their home range. Rather, they are distinct round trip movements generally lasting one to three days, encompassing 1 to 5 miles out of their home range and back again. Of 16 collared bucks in the South Texas study, 38 percent went on an excursion during the pre-rut, 100 percent took an excursion during the rut, and 41 percent went on an excursion during the post-rut. Of 15 collared bucks in the Maryland study 40, 58, and 20 percent went on excursions during the pre-rut, rut, and post-rut respectively. Excursions likely explain how some hunters shoot a buck they have never seen before, even when they have hundreds of hours of observation data and thousands of trail camera photos. They may also explain how a hunter can watch a buck all fall only to see him get shot two or more miles away. Excursions also likely explain the single trail camera photo you get of a specific buck. He may be camera shy, but there's also the possibility that it was the only time he traveled through your property.

Doe Excursions

Excursions aren't limited to bucks. Penn State researchers Dr. Duane Diefenbach, Matt Keenan and Andrew Norton studied movement patterns of adult does. The map on the right shows the home range of a study animal and an excursion it took during the peak of the rut. The doe's home range was approximately 640 acres, and she moved nearly four miles away during the excursion. Researchers identified similar movements in five of eight GPS-collared does during the study. Chesapeake Farm's researchers reported similar findings.



Even does make rut "excursions," as this map reveals. This doe left its core area (black line) and traveled nearly 4 miles away before returning (the gold line shows the 4-day trip).

Multiple Properties

Recent work by Michigan State University researchers Dr. Henry Campa III and Jordan Burroughs showed 92 percent of doe home ranges were 123 to 494 acres in their high-density study area. They found does on one study site used seven different landowner's properties. These weren't quarter-acre lots either, as properties ranged from 50 to 600 acres. Does on another study site used 16 different properties where acreages ranged from less than 10 to 637 acres. We know the average doe home range is smaller than the average buck home range. So, if does in the Michigan study area were using 7 to 16 different properties, how many properties were bucks in the area using? It could have been a lot more than 16.

Conclusion

If you're a small-acreage landowner, you should now understand why it will be difficult for you, acting alone, to bring balance into the deer population. The best way to ensure the young bucks in your area are protected is to get as many of your neighbors as possible involved in a QDM Cooperative. Given the distances some bucks move, it's to your benefit to talk to your immediate neighbors, the landowners who border your neighbors, and even the landowners two or more properties removed from yours. It's true that not all of them will be interested in QDM, but many will. Begin communicating with those who are interested, and chances are your success will grow over time. This doesn't mean you can't have a high-quality QDM program without a Cooperative, but in most cases you can be far more successful by being involved in one.

Members of the Butternut Creek QDM Cooperative in Montcalm County, Michigan gather to celebrate their success and take a group portrait. Now 11 years old, the Cooperative involves multiple small tracts totaling more than 2,000 acres.

Deer Predators: COYOTES

Quotable QDMA:
"The intense predator removal prior to fawning drastically increased fawn survival by 193 to 256 percent!"

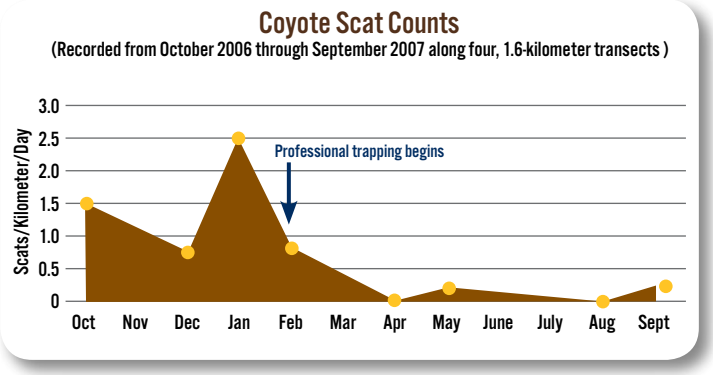
In the not-too-distant past deer managers south of deer-wolf regions paid little attention to fawn predation rates. Today, this issue is much different. Predator expansion and herd management programs designed to reduce deer populations have recently caused managers to take a much closer look at fawn predation by bobcats, bears, and especially by coyotes.

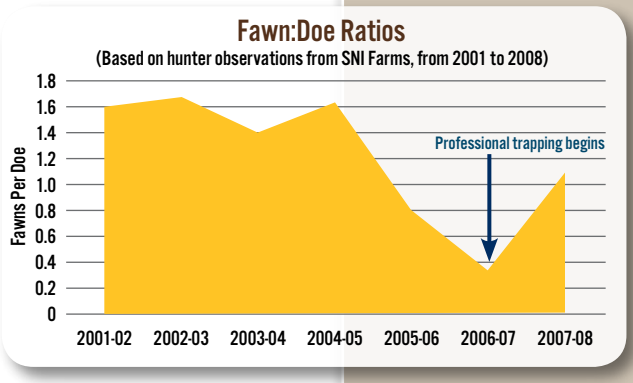
Recent Research

In 2000, Penn State graduate student Justin Vreeland and his colleagues Dr. Duane Diefenbach and Bret Wallingford estimated survival rates and cause-specific mortality for fawns in Pennsylvania. With help from numerous volunteers they captured and radio collared 218 fawns. The Pennsylvania researchers displayed a Herculean effort to amass such a large sample size as prior fawn mortality studies were based on far fewer animals. Justin and his colleagues monitored fawns in two study sites; one was in a forested landscape and the other in an agricultural landscape. The forested site showed evidence of heavy overbrowsing by deer, and low ground (fawning) cover was lacking. Conversely, the agricultural site contained a higher percentage of quality fawn cover. By nine weeks after capture (late summer) 72 percent of fawns in the agricultural site were alive while only 57 percent were alive in the forested site. Predators killed 49 fawns (22 percent) and this was the leading cause of mortality. Notably, 41 of those fawns (84 percent) were killed at the forested site, and of the 31 deaths that could be attributed to a specific predator -bobcats killed 3, coyotes killed 13 and black bears killed 15 fawns! Fawn predation was not high at the agricultural site but it was much higher in the forested site. Interestingly, bears and coyotes took nearly equal numbers of fawns. While coyotes have been blamed for fawn predation for many years, this was one of the first studies that identified a high predation rate by black bears in a forested environment. Black bear predation on white-tailed deer fawns is discussed in detail in a separate article on page 26 in this report.

This research was followed by recent studies in Alabama, Georgia, and South Carolina. University of Georgia (UGA) graduate student Cory VanGilder studied the effects of intensive predator removal on white-tailed deer recruitment in northeast Alabama. Cory and Drs. Grant Woods and Karl Miller inferred predator impacts on a 2,000-acre study site by comparing fawn recruitment data before and after an intensive predator removal program. The study site had been under a QDM program for 10 years and had reduced the deer population through aggressive antlerless harvests. This repeated substantial doe harvest led to a dramatic negative impact on fawn recruitment due to the high ratio of predators to deer. Researchers calculated pre- and post-removal recruitment rates using camera surveys, hunter observation data, and remote web-based cameras mounted over food plots. They also monitored relative predator populations using scat deposition rates and scent-station surveys (see graphs on the facing page). The researchers removed 22 coyotes and 10 bobcats during trapping efforts from February through July 2007. This removal reduced the predator abundance indices to nearly zero immediately prior to the fawning season. It worked! The intense predator removal prior to fawning drastically increased fawn survival by 193 to 256 percent! This study clearly identified that managers couldn't dismiss coyotes and bobcats as having little impact on this site's fawn crop.

PHOTO BY TES RANDLE JOLLY





Another UGA graduate student, Brent Howze studied predation and white-tailed deer recruitment in southwestern Georgia. Brent and Drs. Robert Warren and Karl Miller from UGA and Mike Conner from the Joseph W. Jones Ecological Research Center assessed whether predation was causing the low fawn recruitment rate at the 29,000-acre research center. Deer density on the site was roughly 10 to 15 per square mile and spotlight counts and hunter observation data estimated approximately 0.5 fawns per adult doe in the fall pre-hunt population. Researchers selected two study blocks. One 11,000-acre block was designated as a predator removal zone, and researchers removed 23 coyotes and 3 bobcats between January and August 2008. Most were removed during fawning (June and August). Another 7,000-acre block was used for a control area and no predators were removed. The two blocks contained similar habitats and were 2.5 miles apart. Researchers conducted remote camera surveys to determine pre-hunt fawn recruitment rates, and they estimated 0.72 fawns per doe in the predator removal zone and only 0.07 fawns per doe in the non-removal zone. In other words, 2 fawns were recruited for every 3 does in the predator removal zone, while it took over 28 does to recruit the same number of fawns in the zone where predators weren't removed! This study had a smaller sample size than the Alabama or Pennsylvania studies, but predators clearly had a large influence on the number of fawns that survived to the fall pre-hunt population.

In a related study, Dr. John Kilgo and his colleagues from the USDA Forest Service and Charles Ruth from the South Carolina Department of Natural Resources studied the impacts of coyotes on fawn survival on the Savannah River Site (SRS) in west-central South Carolina. The researchers assessed the potential impact of coyotes by monitoring the survival and causes of mortality of radio-collared fawns. The SRS had 8 to 15 deer per square mile, a balanced adult sex ratio, and the estimated fawn:doe ratio was nearly identical on the SRS and surrounding areas. During 2006 to 2008 researchers captured and monitored 60 fawns. Forty-four (73 percent) fawns died prior to being recruited into the fall population! Bobcats killed 6 and coyotes predated at least 28 fawns. Coyotes killed 47 to 62 percent of all fawns monitored, and coyote predation accounted for 64 to 84 percent of all mortality! Most (66 percent) deaths occurred within the first three weeks of life and over a third (36 percent) occurred within the first week. During 2008, researchers also collected and analyzed residual predator saliva from 22 carcasses to confirm predator species and individual identity. Fifteen coyote-killed fawns provided sufficient saliva and analyses identified 13 individual coyotes. This analysis revealed that, at least on the SRS, coyote preda-

Quotable QDMA:
"High-quality fawning cover and a short fawning period help reduce fawn predation rates, but in some cases predators can still exact a heavy toll on the number of fawns surviving to the fall pre-hunt population."

tion is not restricted to a limited number of alpha males. In summary for the SRS study, 4 of 5 monitored fawns died in 2006, 15 of 22 died in 2007, and 26 of 33 died in 2008. This study again emphasized the importance of coyote predation on fawn recruitment rates.

Collectively, these studies demonstrated the game has clearly changed for deer managers with respect to fawn predation. Geographically and numerically expanding predator populations, in combination with more aggressive antlerless harvest rates, are altering the dynamics of traditional harvest models. Increased fawn recruitment rates from presumably healthier deer populations are not being realized in some areas. These recent studies highlight the synergistic role abundant predator populations can play on intentionally (or otherwise) reduced deer populations. High-quality fawning cover and a short fawning period help reduce fawn predation rates, but in some cases predators can still exact a heavy toll on the number of fawns surviving to the fall pre-hunt population. All deer managers are encouraged to take a close look at the long-term trend in fawn recruitment rate for the property they hunt and/or manage when establishing annual target doe harvests. (See the full article on fawn recruitment found on page 31 in this edition of the Whitetail Report).

Coyote Range Expansion Demonstrates Adaptability

Historically limited to the open grasslands, plains, and deserts of the Southwest the coyote has extended its range in all directions – north, south, east, and west. A significant amount of this range extension occurred during the 20th Century, but the trend continues as a reflection of the animal's ability to adapt, changes in the landscape (including forestry and agricultural practices), an increase in prey numbers and availability, relative safety in suburban and urban areas, and human assistance.

Today, coyotes exist from Nova Scotia to Florida and, of course, westward to their original southwestern range. They are and will continue to be an integral cog in the mechanisms of our dynamic ecosystems. Is this the same animal that originated in the Southwest? Have we known the eastern coyote long enough to enable a sound comparison with its western predecessors? The western coyote's reputation as a livestock predator has yet to be realized to the same extent in the East, although reports are on the increase. Research has documented that eastern coyotes will consume nearly anything, although there are a few foods that make up the bulk of their diet depending on regional availability (small mammals, birds, soft mast, and deer).

Coyotes, as top predators, have been shown to have direct and indirect impacts on species diversity of prey and plants. For example, the removal of red foxes can alter the number of their favored prey species, rodents and rabbits, thus ultimately altering plant communities. Relatedly, researchers in Nova Scotia found that the number of deer eaten by coyotes declined with increasing small mammal density. In some regions and/or during some years (e.g., high versus low rainfall) coyote predation has limited white-tailed deer populations. In extreme or persistent cases of coyote predation, deer populations have been regulated. Specifically when coupled with continual negative reproductive conditions, such as in areas with inherently low deer densities, poor habitats, or perpetually severe environments.

Frequency of food items in coyote diets, Cook County, Illinois

Diet Item	Occurrence
Small rodents	42%
Fruit	23%
White-tailed deer	22%
Eastern cottontail	18%
Bird species	13%
Raccoon	8%
Grass	6%
Invertebrates	4%
Human-associated	2%
Muskrat	1%
Domestic cat	1%
Unknown	1%

(Based on the contents of 1,429 scats collected during 2000-2002. Some scats contained multiple items, therefore the percentages exceed 100 percent.)

The Urban Coyote: An Artifact of Our Modern Society

A comprehensive ecological study of coyotes by Stanley D.

Gehrt (School of Environment and Natural Resources, The Ohio State University) was initiated in 2000 in the Chicago metropolitan area, specifically Cook County, Illinois. By February 2006, researchers had captured 253 coyotes and radio-collared 175. Tracking individual coyotes day and night produced over 30,000 locations, making this the most extensive urban study of coyotes ever conducted.

PHOTO BY GIL LACKEY

Gehrt and his colleagues found that urban coyotes have a highly organized social system, similar to their rural counterparts. Territories are defended by packs or groups; however, in protected areas (no shooting or trapping) the group size is typically five to six adults and the pups born that year. By contrast, in rural areas the activities of hunting and trapping usually result in a much smaller group consisting of an alpha pair of coyotes and their pups.
Radio-tracking also revealed that members of packs or groups in this study had home ranges averaging three square miles, whereas solitary coyotes had much larger home ranges averaging 25 square miles. Generally, the home ranges of rural coyotes throughout North America vary as a function of food availability, are much larger, vary seasonally, and differ according to sex with males occupying larger areas.

The Cook County study found that, contrary to popular belief, urban coyote diets are similar to those of rural coyotes. Scat analyses showed that urban coyotes subsist primarily on a diet of small rodents, fruit, deer (fawns), and rabbits rather than garbage and pets, primarily cats.

Ultimately, predation by urban coyotes may serve an important ecological function by preventing an increase in difficult to manage white-tailed deer and Canada goose populations. Although urban coyotes do not take enough adult deer or geese to reduce populations, the impact on fawns and goose nests (eggs) may abate population growth. In concert with the Ohio State University study, colleagues from the Illinois Natural History Survey conducted a fawn survival study in different locations within the Chicago area and found that coyotes killed 20 to 80 percent of the fawns in different populations.

Summary

Coyotes have successfully invaded all areas of whitetail range and they'll be an annual variable in deer management programs. Whether rural or urban and North or South, coyotes are now part of the dynamic relationship between deer and the environment. Coyotes can affect deer herds positively or negatively, so their presence can't be summed with a broad generalization. Their actual impacts will need to be measured and monitored, and deer seasons and bag limits can be adjusted if necessary. The important thing is to realize they are now a player in many deer management programs, and as managers, we need to acknowledge them as such.

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Quotable QDMA:
"Whether rural or urban and North or South, coyotes are now part of the dynamic relationship between deer and the environment."

Deer Predators: BLACK BEARS

Quotable QDMA:
"The results of a 2004 Pennsylvania study revealed that 46 percent of 106 fawn mortalities were related to predation. Black bears caused 33 percent of the 49 predation events and coyotes were responsible for 37 percent."

One of the earliest published accounts of predation on white-tailed deer fawns by black bears appeared in 1967 and involved a single incident in Canada. Anecdotal information from Michigan, New York and the Canadian provinces of Vancouver and Alberta suggesting that black bears kill fawns was published during the early 1980s.

More intensive studies conducted within the past 25 years have substantiated that black bears have their place in the list of predators of deer fawns. Although, coyote predation remains the leading cause of fawn mortality in some Canadian provinces and throughout the United States, including Maine, Massachusetts, Illinois, Iowa, Mississippi, Oklahoma, and Texas.

A 1999 publication reported predator-related fawn mortality of 10 percent by coyotes, 18 percent by black bears, and 4 percent by bobcats in New Brunswick, Canada. A two-year study (October – November) in Minnesota during the early 1990s revealed that wolves and black bears were leading causes of fawn mortality. Fawn survival through the study period averaged 49 percent. Among the predator-related mortalities, 49 percent were attributed to black bears and 51 percent to wolves.

The results of a Pennsylvania study published in 2004 revealed that 46 percent of 106 fawn mortalities through the first 34 weeks were related to predation. Black bears caused 33 percent of the 49 predation events and coyotes were responsible for 37 percent of the predator-related mortalities. Fawn survival after 34 weeks approached 53 percent in agricultural areas and 38 percent in the forested landscape. Researchers determined that fawn survival in Pennsylvania was comparable to reported survival in agricultural and forested regions in the whitetail's northern range. They concluded that there was no evidence of fawn survival rates preventing white-tailed deer population growth.

Black bear numbers have reached an all-time high throughout the whitetail's range, and it appears this predator species is continuing to increase, at least in certain regions. Black bear populations are stable to increasing in many northern states (including New York and New Jersey), in the mountain and coastal areas of North and South Carolina, central Georgia (a disjunct population on and around the Ocmulgee Wildlife Management Area), and in portions of Louisiana and Arkansas. Additional research is necessary to document and track the influence of black bear predation on white-tailed deer populations, and their role as competitors for food (primarily hard and soft mast).

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FERAL HOGS

When the world was shifting and forming new continents in the Miocene Epoch (more than 5 million years ago), the swine family was excluded from the New World. Early explorers are responsible for the introduction of swine into the new world, now the United States. Hernando de Soto brought the first true pigs to the Atlantic Coast of Florida in 1539. "Pure Russian" wild boars were released into a 20,000-acre enclosure in Sullivan County, New Hampshire, in 1890.

Originating from domestic ancestry, feral hogs are wild swine of the family Suidae. Three types of wild hogs are now found in the United States: feral hogs, Eurasian wild boar (Russian), and hybrids resulting from a cross between the feral hog and the Russian wild boar.

Facts About Feral Hogs

- Life expectancy of a feral hog is 6 to 8 years
- The average size of a feral hog is 100 to 150 pounds, but weights exceeding 600 pounds have been reported
- Feral hogs are prolific breeders: Sows reach breeding age at 7 or 8 months, and they can produce 2 litters per year. The average litter size is 4-6, but sows may have as many as 10-13 piglets per litter.

In the continental United States, California, Florida, and Texas rank at the top in feral hog numbers. There are substantial feral hog populations on some of the Hawaiian Islands as well. As of 2006, approximately 4 million feral hogs existed in 39 states and four Canadian provinces.

The maps on the next page, provided by the Southeastern Cooperative Wildlife Disease Study (SCWDS) at the University of Georgia, track the spread of feral swine populations in the United States from 1982 through 2004, which is the latest available map. However, current tracking show feral hog expansion into several additional counties and states as the populations expand northward.

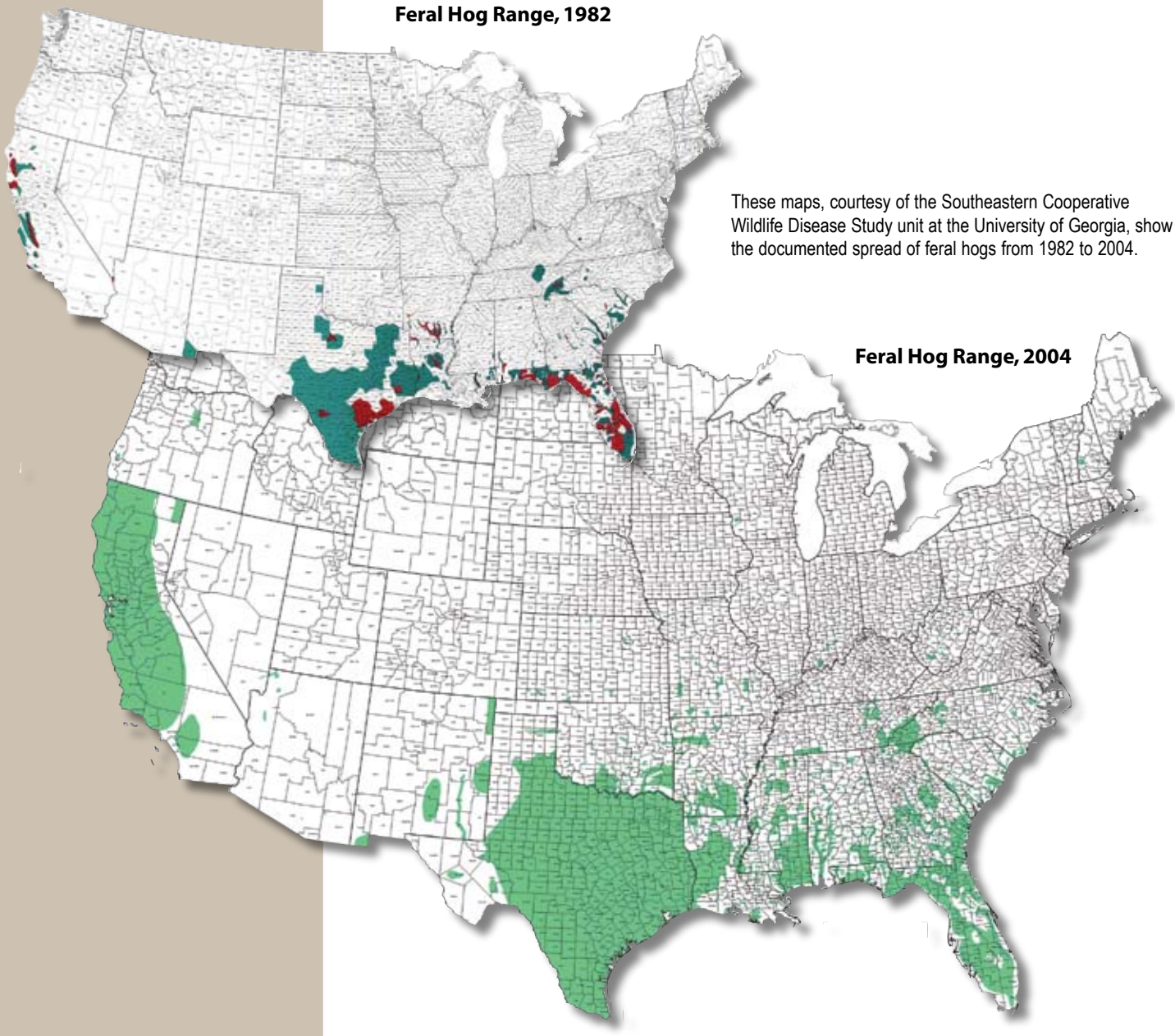
Feral hog populations have exploded in many areas, sometimes as a result of being trapped alive, transported and released in new areas by people. Photo courtesy of QDMA member Dennis Pawlowski of Florida.

Quotable QDMA:
"As of 2006, approximately 4 million feral hogs existed in 39 states and four Canadian provinces."

Feral swine populations are spreading at an alarming rate due primarily to the adaptive nature of the animals, their phenomenal reproductive rate, their escape from domestic facilities and wild boar hunting operations, and through human assistance – misguided attempts to create sport hunting opportunities. There are state and federal laws prohibiting the movement of feral swine, but more and stricter laws are necessary.

Predator/Prey Relationships

The list of predators that prey upon feral swine, particularly the piglets, includes coyotes, bobcats, feral dogs, mountain lions, black bears, bobcats, and large raptors, even owls. Coyote populations have been observed to increase with the spread and increase in feral swine populations. The predator/prey relationship is a two-way proposition for feral hogs. As opportunistic omnivores they have been reported to destroy quail and wild turkey nests and probably those of other ground-nesting birds. Feral hogs will feed on the carcasses of other animals, including newborn fawns.



These maps, courtesy of the Southeastern Cooperative Wildlife Disease Study unit at the University of Georgia, show the documented spread of feral hogs from 1982 to 2004.

Depredation and Economic Impact

The presence of feral hogs on any property is costly. They compromise stock operations through depredation, and destruction of man-made structures, especially fences. Feral hogs cause problems to farmers by rooting and wallowing in fields and destroying crops. In Texas, for example, the estimated annual agricultural damage from feral hogs is $52 million. And, the annual expense incurred by Texas landowners to control feral hogs is $7 million. The forestry industry is not immune to feral hog damage either. Feral hogs cause significant damage in newly-planted pine plantations. Also, in areas with high feral hog densities the numbers of automobile collisions is on the increase. Perhaps the greatest threat to the Nation's multi-billion dollar livestock industry is associated with the control of diseases carried by feral swine.

Diseases and Parasites

Feral swine can carry at least 30 important viral and bacterial diseases and 37 parasites that can affect humans, pets, and a variety of livestock and wildlife. Examples of these important diseases are pseudorabies, swine brucellosis, tuberculosis, anthrax, and tularemia. Most important among the parasites harbored by feral swine is the microscopic worm that causes trichinosis. This disease is contracted by humans by consuming undercooked infected pork. Rubber gloves should be worn when handling or dressing feral swine. Contact with reproductive organs and blood should be avoided and handlers should wash thoroughly after processing feral swine carcasses.

2010 International Wild Pig Conference

The Berryman Institute has announced the 2010 International Wild Pig Conference to be held at the Crowne Plaza Grand Hotel in Pensacola, Florida on April 11-13. This inaugural conference is the only forum in the world that will provide federal, state, and private stakeholders a venue to discuss the biological, financial, and social implications specific to wild pig subsistence in our ecosystems. Visit their website (www.wildpigconference.com) to learn more about the 2010 International Wild Pig Conference.

Rooting by feral hogs causes damage to agricultural crops and wildlife food plots, and it results in additional wear and tear on agricultural equipment.

Quotable QDMA:

"The presence of feral hogs on any property is costly. In Texas, for example, the estimated annual agricultural damage from feral hogs is $52 million."

Conclusion

The current range and impending spread of feral swine in North America has created an enigma. Feral hogs provide excellent table fare and in some areas they are as popular a quarry of hunters as the whitetail. Yet, where their ranges overlap with whitetails there is a competition factor with regard to certain foods, particularly hard and soft mast.

There is a dire need for additional research and practical knowledge to provide a better understanding of the feral hog's impact on humans, livestock, and game and non-game wildlife species. As feral hog populations increase in numbers and range, their potential damage to the environment and its diverse ecosystems is expected to increase accordingly.

Controversy will always be associated with the feral hog situation on a small scale and nationally as long as there are biologists, farmers, ranchers, foresters, hunters, and even motorists.

QDMA encourages wildlife managers to control hog populations before they become well-established. A multi-pronged attack, including trapping (below) and sport-hunting (right) must be used. QDMA also strongly opposes the movement and release of live hogs into new areas.

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Fawn Recruitment Rates

Herd monitoring is an important but often overlooked Quality Deer Management (QDM) Cornerstone. Some managers neglect to collect the appropriate data because they're not sure how to use it for management purposes. With a little help in analysis and interpretation, managers can use the data they collect to assess the status of their management program within their respective state, as well as compare how well they stack up to other states and/or regions. To provide a comparison among states, QDMA surveyed state agencies and collected fawn recruitment rate information from 1998 and 2008. With respect to our survey, all states didn't provide the requested information, but most did and the data provided for meaningful comparisons among states and between years.

Fawn recruitment rate is a measure of the number of fawns per adult doe (1.5 years and older) alive in the fall pre-hunt population. Basically, this index records the number of fawns that survive to approximately six months of age and expresses that number in relation to the number of adult does in the population. The fawn recruitment rate is lower than the number of fetuses per doe and the number of fawns born in the spring, since not all fetuses survive to become fawns and not all fawns survive until fall. This rate is a good measure of a deer herd's productivity, and it is an important factor when determining the biologically appropriate number of does to harvest. Monitoring the fawn recruitment rate also provides insight into herd health, and it alerts managers to potential problems such as high fawn predation rates.

Our survey revealed several states do not calculate this valuable index. For those that do calculate it, most states' recruitment rates remained similar or declined slightly from an average of 0.88 fawns per adult doe in 1998 to 0.83 in 2008. This means less than one fawn was recruited for every adult doe in both years, and it explains why the old adage, "When you shoot a doe you're really killing three deer" is a myth. The fact that actual recruitment rates are lower than many hunters envision can be a difficult concept to grasp because we know healthy, mature does tend to have twins, and they can even have triplets in high-quality habitats. However, some fawns will die before they're recruited into the fall population. They may succumb to disease, be abandoned by their mother, get hit by a car, or be killed by a predator.

Also, the definition of fawn recruitment rate is the number of fawns per adult doe (1.5 years and older). Yearling does are included in this figure, but many yearlings do not have any fawns. Obviously, yearlings with fawns were bred as fawns. In areas such as Iowa, the majority of doe fawns breed and can have fawns as yearlings. Some fawns in Iowa even give birth to twins! However, in other areas such as Delaware or South Carolina, less than 10 percent of the doe fawns breed. That means over 90 percent of the yearling does in Delaware and South Carolina have zero fawns, and that dramatically reduces the fawn recruitment rate.

Quotable QDMA:

"For those that do calculate fawn recruitment, most states' recruitment rates remained similar or declined slightly from an average of 0.88 fawns per adult doe in 1998 to 0.83 in 2008."

Quotable QDMA:
"In some areas predators may have little impact on fawns, but recent research in Alabama, Georgia and South Carolina confirms that bobcats and coyotes can significantly reduce fawn recruitment rates."

Let's use the following hypothetical data as an example, starting with the same number of adult does:

Deer Herd A

No. Does	Age (yr.)	No. Fawns Recruited	Fawns per Doe
5	1.5	1	0.2 fawns
10	2.5 and older	12	1.2 fawns
15	All does	13	0.87 fawns

Fawn Recruitment Rate = 13 fawns per 15 adult does or 0.87 fawns per adult doe

Deer Herd B

No. Does	Age (yr.)	No. Fawns Recruited	Fawns per Doe
5	1.5	3	0.6 fawns
10	2.5 and older	12	1.2 fawns
15	All does	15	1.0 fawns

Fawn Recruitment Rate = 15 fawns per 15 adult does or 1.0 fawns per adult doe

In this realistic example, Deer Herd B has a higher recruitment rate simply because a higher percentage of its yearlings had fawns. Notice the 2.5 years and older does recruited the same number of fawns in both herds. If you expand this recruitment rate to larger herds, the difference between 0.87 and 1.0 fawns per adult doe will have significant implications in the rate at which a deer herd will grow and/or for the number of deer that you can harvest annually.

Getting back to the survey; many states have worked to balance deer herds with their habitat and to improve habitat quality during the past decade, so you would expect the 2008 average recruitment rate to be higher than it was in 1998. Since it was lower, it begs the question, "What impact are predators having on fawn recruitment rates?" In some areas predators may have little impact, but recent research in Alabama, Georgia and South Carolina, as discussed on pages 22 to 24, confirms that bobcats and coyotes can significantly reduce fawn recruitment rates.

We asked for statewide averages in our survey, but it is important to remember the average recruitment rate can vary widely within a state. This is especially true for large states with diverse habitats, deer management programs, and snow or rainfall rates. Our survey revealed there is much variation in recruitment rates across the whitetail's range. In 2008, fawn recruitment rates varied from less than 0.5 in Arizona and Oklahoma to 1.2 fawns per adult doe in Illinois and Iowa. That means the average doe in Illinois and Iowa recruits nearly 2.5 times as many fawns per year as the average doe in Arizona and Oklahoma! Given this information, it is not surprising the productive Midwest grows so many bucks and requires such high antlerless harvest rates to keep deer herds in balance with their habitat.

Sportsmen and women can estimate the fawn recruitment rate on the property they hunt/manage with observation data, spotlight counts, and/or scouting camera surveys. Each technique has biases associated with it, but it's more important to estimate this index in the same manner each year so you can monitor trends in the data over time. Compare your estimate to the range reported above (0.5 to 1.2), and then closely examine the direction your trend is moving. Increasing fawn recruitment rates suggest herd health is improving and may permit higher harvest rates. Decreasing recruitment rates suggest herd health is declining and/or fawn mortality is increasing. These figures can help fine tune your annual target doe harvest and help you achieve success in your management program.

Doe Fawn Breeding Rates

Doe fawn breeding rates are the percentage of doe fawns that conceive during their first year (generally six to eight months of age). This is governed by nutrition, and doe fawns attain sexual maturity when they reach a specific weight threshold. In general, southern fawns reach it at approximately 70 pounds and northern fawns at approximately 80 pounds live weight. Fawns hitting this threshold tend to do so in December and January, and are one reason for an apparent "second" rut in many areas.

Since the percentage of doe fawns that breed is based on weight, not age, it is a good indicator of herd health, and you can monitor this index by checking the lactation status of all yearling does that are harvested. Deer herds with access to abundant high-quality forage and light to moderate winters can have breeding in over 50 percent of their doe fawns. Conversely, deer herds exposed to poor habitat or severe winters often have less than 5 percent of their doe fawns reach the threshold weight and breed.

Doe fawn breeding rates vary widely across states. Less than 10 percent of doe fawns breed in Delaware, Idaho and South Carolina, while 70 percent of them breed in Iowa. This is testament to the mineral-rich soils and volume of agriculture in Iowa that provides abundant high-quality forage, and allows fawns to grow rapidly. Amazingly, 10 percent of the doe fawns that breed in Iowa give birth to twins. Even more amazing is that 21 percent of the doe fawns that breed in the farmland region of Ohio have twins!

Nationwide, 26 percent of doe fawns bred in 1998, and that average dropped slightly to 23 percent in 2008. However, since this index is so closely tied to a region's habitat quality, it is difficult to lump the breeding rates across a region or even a state together. For example, in Pennsylvania

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PHOTO BY TES RANDLE JOLLY

Quotable QDMA:
"The percentage of doe fawns that breed can have a major impact on your management program, especially regarding the number of deer you can harvest annually."

an average of 25 percent of the doe fawns bred in 2008, but that percentage varied from 0 to 38 percent across the state's wildlife management units (WMU). Similar ranges occurred in Alabama (0 to 33 percent), New Hampshire (0 to 25 percent), South Dakota (0 to 58 percent), and Virginia (3 to 49 percent). These rates likely varied even more across specific properties within any WMU. This is one reason why collecting data from your location and using that to make site-specific harvest recommendations can benefit your deer management program. Also, you can compare your data to WMU or state averages and assess how your management program measures up, and whether you have realistic expectations for what you can accomplish.

The percentage of doe fawns that breed can have a major impact on your management program, especially regarding the number of deer you can harvest annually. Let's use the following hypothetical data as an example:

Deer Herd A

No. Does	Age (yr.)	No. Fawns Recruited	Deer Eligible for Harvest
40	1.5	0	40 + 0 = 40
60	2.5 and older	60	60 + 60 = 120
100	All does	60	160 deer

Deer Herd A has no fawn breeding (0 fawns for 1.5 year-olds), and 2.5+ year-olds recruited 1 fawn each.

Deer Herd B

No. Does	Age (yr.)	No. Fawns Recruited	Deer Eligible for Harvest
40	1.5	10	40 + 10 = 50
60	2.5 and older	60	60 + 60 = 120
100	All does	70	170 deer

Deer Herd B has the same number of does as Herd A, but it is from an area where half of the fawns will breed and have fawns as yearlings (n=20 fawns). We'll estimate that only half of those newborn fawns will survive to be eligible for harvest (half of 20 is 10; the other half will be lost to predation, vehicles, etc.). Notice the only difference between Herds A and B is Herd B had some fawn breeding, and thus additional deer eligible for harvest.

In this realistic example of only 100 does, by having half of the fawns breed in Deer Herd B (and being conservative with the number that survived) we increased the number of deer available for harvest by 10 individuals. Generally speaking, fawns are born at approximately a 1:1 buck:doe ratio, so this property would have five more doe fawns and five more buck fawns on the ground. Those doe fawns that survive would breed either their first or second fall, and the buck fawns that survive would have antlers next year. This directly relates to how quickly a deer herd can grow and how many bucks and does are available for harvest or merely for viewing each year.

This is a simple example, but it clearly shows the impact that doe fawn breeding can have on a deer population and its corresponding management program. It also partly explains why highly-productive states like Illinois, Iowa and Ohio can have so many bucks in their herds. Restricting the buck harvest clearly plays a key role, but the fact that a sizable percentage of doe fawns contribute their own fawns at one year of age can't be overlooked.

Buck Fawn Harvest Rates

The most important tenet of Quality Deer Management (QDM) is to balance the deer herd with the habitat's ability to support it. Critics often speak of trophy bucks and antlers as the driving force, but hunters and managers who truly delve into the QDM philosophy quickly learn the correct number of deer for the landscape comes first, followed by complete age structures and balanced sex ratios. Fortunately, you can work on these three objectives simultaneously by harvesting the biologically appropriate number of antlerless deer and passing young bucks.

Many deer herds are more in balance with the habitat today than they've been in the recent past, and this is cause for celebration. However, some areas still have overabundant deer herds resulting from harvesting too few antlerless deer. Harvesting the proper number of antlerless deer can be difficult for a variety of reasons including hunters' unwillingness to shoot them; a lack of opportunity with regard to access, seasons and/or bag limits; or simply low hunter numbers or their inability to shoot enough antlerless deer. Most states currently have more liberal antlerless seasons and bag limits than they've had in the past, but some landowners and clubs still have difficulty acquiring enough antlerless tags or permits.

Given that hunter numbers have declined, the average hunter is now asked to take more antlerless animals in overabundant deer situations. Unfortunately research shows there is a limit to the number of deer an individual hunter is willing to take annually. This limit is generally less than three deer, and given that one or two may be bucks, the number of antlerless deer is further reduced. One strategy to increase the impact of the antlerless harvest is to maximize harvest of adult does

Quotable QDMA:
"The QDMA recommends buck fawns constitute less than 10 percent of your total antlerless harvest."

and minimize harvest of fawns. We'll clarify there is nothing wrong with harvesting fawns, and QDMA routinely prescribes fawn harvest to collect biological data from this age class. However, if you're struggling to balance the deer herd with the habitat, and you're limited in the number of antlerless deer you take during the hunting season, focusing on adult does rather than fawns can help you reach your management objectives more quickly.

The QDMA recommends buck fawns constitute less than 10 percent of your total antlerless harvest. Educating hunters on distinguishing fawns from adult deer and even separating buck and doe fawns in the field is a relatively simple matter. By observing head and body features and behavior, most hunters can accurately distinguish between fawns and adults and buck and doe fawns most of the time. We stress that last part because mistakes will happen. Specifically, focusing on adult does rather than buck fawns provides more meat for the table, helps balance the herd more quickly, and allows additional buck fawns to survive. More buck fawns means more yearling bucks the following year, which is good for balancing the adult sex ratio and for hunter satisfaction.

Let's use a real-world example from Pennsylvania. Before the Pennsylvania Game Commission implemented the Deer Management Assistance Program (DMAP) in 2003 most Pennsylvania hunters could only get one or two antlerless tags. On one particular farm, it was difficult for the landowners to harvest enough antlerless deer with this restricted bag limit, even with an extremely high hunter density of nearly one hunter per 25 acres. During this time, when a hunter shot a button buck he/she had to use their only antlerless tag on it (or one of two), and thus they lost the ability to use it on an adult doe. Fortunately the Game Commission provides DMAP to most landowners today, and it has allowed many to achieve the proper antlerless harvest for the past several seasons.

Some contend protection of buck fawns is unnecessary, but in situations like the example above we'll argue that learning to distinguish between antlerless deer in the field and selecting against buck fawns can dramatically help managers meet their deer density goals. Many state agency biologists recognize this and provide information to hunters on how to identify antlerless deer on the hoof. With escalating antlerless harvests in many states, we were interested in how the buck fawn harvest has changed over the past decade. To calculate this QDMA surveyed all state wildlife agencies and asked what percentage of their total antlerless harvest were buck fawns in 1998 and 2008. The data showed the percentage of buck fawns in the antlerless harvest declined from an average of 19 percent in 1998 to 16 percent in 2008. This savings may appear small, but given the harvest of approximately 3.4 million antlerless deer in 2008, a 3 percent savings would have equated to 102,000 buck fawns. Nationally, the percentage ranged from 3 percent in Mississippi (data collected on wildlife management areas and DMAP properties) to 25 percent in Ohio and Wisconsin in 2008. The percentage in Ohio and Wisconsin is not surprising as both states have highly productive deer herds (i.e., a lot of fawns entering the populations) and aggressive antlerless harvest programs. However, both states could benefit if some of those buck fawns harvested were adult does instead. Notable declines in buck fawn harvest from 1998 to 2008 occurred in New Jersey (25 to 13 percent), Georgia (26 to 18 percent), North Carolina (17 to 12 percent) and Virginia (22 to 17 percent).

Many states have progressive deer management programs, and it's showing in the health and quality of their herds and habitats, and especially in the satisfaction of their hunters. We'll reiterate that many deer herds are in balance with the habitat today, and reduced doe harvests are needed in these areas. The focus of this article was for areas with too many deer and how targeting adult does rather than fawns could increase hunters' effectiveness at balancing the herd with the habitat. As fewer hunters are asked to harvest additional deer, more effective and efficient strategies become necessary. Selecting adult does over buck (and doe) fawns meets this criterion, and it provides additional meat for the table. Sounds like a win-win situation.

Could GonaCon® Replace Deer Hunting?

Increasingly, state wildlife agencies are facing the dilemma of what to do about urban deer. As cities expand and claim additional acreage for shopping malls, parking lots and suburban dwellings, traditional deer habitat is replaced with urban and suburban landscapes. Whitetails can still thrive in these landscapes, so "deer habitat" may not be lost. What is lost, or at least severely hampered, is the ability to manage those deer. Gone are the hunting clubs and the traditional hunting opportunities that are no longer appropriate in the suburbs. Yet, hunting opportunities still exist in small pockets of suburban woodlands – especially for bowhunters. The stage is set for a unique discussion of the role of hunters in deer management.

Hunters argue they can manage suburban deer herds if given access to a sufficient number of properties. Anti-hunters claim you can manage the deer herds with "birth control" and traps rather than bullets and arrows. Homeowners just want to be able to grow a vegetable or flower garden and allow their children to play in the yard without the threat of Lyme disease. Given these three views, it's easy to see why state agencies devote a substantial amount of time to the topic. They're about to spend even more time and resources on it dealing with a newly registered contraceptive called GonaCon®. GonaCon is the first contraceptive vaccine registered for use in free-ranging white-tailed deer populations. This news may not directly affect you, your QDM program or the community where you live and hunt, but it is news that could affect the future of deer management and hunting.

Quotable QDMA:
"GonaCon is the first contraceptive vaccine registered for use in free-ranging white-tailed deer populations."

Birth Control for Deer

Before we look closely at GonaCon, let's review an abridged version of the birth control strategy for managing deer populations. This management strategy uses birth control rather than hunters to limit or prevent new animals from being born into the population. This approach has received much publicity because it is nonlethal and has the potential to regulate deer populations in urban and suburban areas closed to hunting. "Immunocontraception" is a birth control method that

Anti-hunters see GonaCon®, a birth-control drug for deer, as a non-lethal option for controlling urban and suburban deer populations.

Quotable QDMA:
"The public has a general misunderstanding regarding the availability and practicality of immunocontraceptive vaccines. Despite misperceptions, overabundant deer herds cannot be controlled solely with immunocontraceptives."

uses the deer's immune system to prevent pregnancy. This is the most common method of inducing infertility in deer, and much research has been conducted over the past four decades to develop an effective contraceptive that can be used on free-ranging deer herds.

Dr. Tony DeNicola (left), a QDMA member, has been involved in scientific trials of GonaCon, which has not been shown to be effective at reducing deer numbers in free-ranging populations.

Unfortunately much confusion surrounds the status of fertility control agents. The public has a general misunderstanding regarding the availability and practicality of immunocontraceptive vaccines. Despite misperceptions, overabundant deer herds cannot be controlled solely with immunocontraceptives. Successful fertility control may limit population growth, but it does little to reduce the existing population. There are also misconceptions about vaccine availability and effectiveness. Scientists developed contraceptives that block or end pregnancy years ago but only recently were able to develop one that is effective and practical for non-captive deer herds. Until late 2009, all research on vaccines was conducted under investigative permits, as there were no vaccines authorized for use on free-ranging deer herds. That has now changed, as GonaCon was recently registered for use on free-ranging deer herds by the Environmental Protection Agency (EPA).

How Does GonaCon Work?

GonaCon is an immunocontraceptive vaccine for bucks and does developed by scientists at the U.S. Department of Agriculture's (USDA) Wildlife Services' National Wildlife Research Center. It's touted as a single-shot multiyear vaccine that's effective for two to four years in deer. In addition to whitetails, GonaCon has also successfully prevented pregnancy in California ground squirrels, Norway rats, feral cats and dogs, domestic and feral swine, wild horses, bison and elk. Prior vaccines required additional treatments and/or were less effective. GonaCon's label states deer must be treated by hand injection only. This prohibits administering the vaccine via darts and increases the cost and labor necessary to treat deer. It is a precautionary measure because GonaCon will also cause infertility in human females (and possibly males). Not allowing deer to be treated via darts ensures no one stumbles across a fully loaded dart that may have missed an animal and not been recovered by the shooter. Current research is trying to develop an oral contraceptive that could treat deer by placing the vaccine on corn or other food sources, but this technology is likely a few years away.

Other than accidental injection, there supposedly aren't any human health risks associated with eating treated deer as our stomachs break the vaccine down to its basic proteins. However, there may be a health risk for treated deer. One side effect of GonaCon is a pea-sized granuloma at the injection site, and some research animals have developed small to baseball-sized abscesses underneath these granulomas.

With earlier vaccines, treated does would enter estrous but not conceive. These does would enter estrous approximately every 28 days for several months, and bucks would expend precious energy breeding and re-breeding these does. QDMA's Kip Adams was involved in some early contraceptive research at the University of New Hampshire's deer research facility, and he watched some of their captive bucks waste a tremendous amount of energy chasing and breeding does from November through February. By February, these bucks were so worn down that, in a free-ranging situation, it's unlikely they would have survived the winter. Unlike these earlier vaccines, GonaCon works in the hypothalamus portion of the brain to cut off the body's reproductive processes. This means does do not come into estrous and thus won't be bred.

In bucks treated with GonaCon, suppressed testosterone production results in a lack of rutting behavior and the associated neck swelling and muscular growth. Treated bucks resemble does with antlers. The vaccine also alters antler development. In a study by Dr. Gary Killian and his colleagues at Penn State's deer research facility, bucks either remained in velvet or shed their hardened antlers four to six weeks earlier than non-treated bucks. These body and antler characteristics don't match our experiences or expectations for the noble white-tailed buck.

Is GonaCon a Practical Solution?

Fertility control in deer is a rapidly advancing technology. However, even with current advancements the immunocontraceptive approach is expensive, with estimated costs ranging from $500 to $1,000 per deer (due mainly to deer capture and handling costs). Because annual mortality rates for suburban deer populations are low, an estimated 70 to 90 percent of the does in a population need to be treated to limit or stop herd growth. According to Dr. Tony DeNicola of White Buffalo Incorporated in Connecticut, who has been involved with many GonaCon studies, approximately 10 percent of deer don't respond to the vaccine. So, if 70 to 90 percent need to be effectively treated, GonaCon will have to be administered to 80 to 100 percent of the does in a population – a very difficult task. This only freezes population growth. It does not reduce a population, so it must be combined with a removal technique. This approach's effectiveness and practicality are limited to enclosed or very localized herds rather than truly free-ranging populations. It's clear we still have much to learn about antifertility drugs and their effects on deer behavior and management programs.

Will GonaCon Replace Hunting?

So, what does GonaCon mean to the average deer hunter? It means your state wildlife agency will be dealing with the reality that GonaCon is now registered with the EPA as a usable product to prevent pregnancy in free-ranging white-tailed deer populations. Fortunately, it will be up to each state on how they'll regulate its use as it will be registered as a "Restricted Use" product for use by state or federal wildlife or natural resource management personnel or persons working under their authority. Unfortunately, it will relegate whitetails to "pest" status as the vaccine is listed as a pesticide.

Will GonaCon replace hunting? Even Wildlife Services (developers of GonaCon) does not view the product as a replacement for hunting but a tool that could potentially be used after a population has already been reduced. This is sure to become a hot topic in 2010, and anti-hunters will be singing GonaCon's praises. As hunters, GonaCon won't replace us, but our value will be increasingly questioned by non- and anti-hunters in suburban landscapes – which are only going to continue expanding across the whitetail's range. Therefore, it is paramount that we continue educating ourselves on deer biology and management and demonstrate that we are ethical and responsible deer stewards. Our actions, rather than GonaCon, will dictate how and where we hunt in urban and suburban environments.

Quotable QDMA:

"If 70 to 90 percent of deer need to be effectively treated, GonaCon will have to be administered to 80 to 100 percent of the does in a population – a very difficult task. This only freezes population growth. It does not reduce a population."

Deer Farming

What do you think of when you hear the term deer breeder? How about the phrase high-fence? Are you imagining motivated entrepreneurs that are simply practicing their right to free enterprise? Or do you picture free-ranging whitetails being reduced to "alternative" livestock, sold for profit to affluent shooters, for scent or lure manufacturers, meat and velvet processors, or even for photo opportunities in the hunting media?

No matter where you stand – or take cover – on this cultural clash, the practice of fencing in white-tailed deer for aesthetic, financial or other reasons is one of the most divisive issues today within the deer management and/or deer hunting industries. In fact, you're even sure to find professional deer biologists on either end of the support spectrum. But because deer farms vary from 1-acre pens to fenced ranches covering tens of thousands of acres, it is difficult to discern where the ethical line should be drawn.

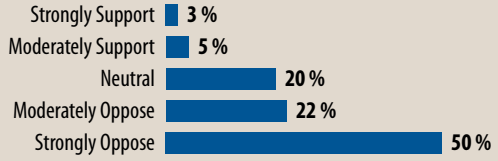
How Many?

According to the National Wildlife Federation, only six states have no deer farms or elk ranches: Alaska, Massachusetts, Nevada, Rhode Island, South Carolina and Utah (Note: Due to varying statutes, some of these states may have captive deer herds that aren't recognized or tracked as "commercial deer farms" by the individual states). The other 44 states are home to roughly 8,500 captive-cervid operations. Of Canada's 13 provinces and territories, only three (Labrador/Newfoundland, and the Nunavut and Northwest territories) have no deer or elk operations. The other ten have about 2,600 fenced facilities. So, one thing is for sure - deer breeders and their farms are likely here to stay, at least for the foreseeable future.

Privatizing Whitetails

This question was one of several asked in an April 2009 survey. The results presented here are based on responses from 750 active QDMA members.

How do you feel about privatization of the whitetail resource through enclosing native deer herds by use of a deer-proof fence?



Money See, Money Do

In the United States alone the annual economic impact of the captive cervid industry is nearly $3 billion, according to the North American Deer Farmers Association (NADEFA). However, that's less than 3 percent of what is generated annually through wildlife recreation in the United States, and the industry is supported by relatively few individuals. Still, as of 2007, NADEFA's 2,000 plus members reportedly owned $111 million in "alternative livestock."

As with any commercial product, supply, demand and perceived value ultimately decide what individuals are willing to pay. Private and public auctions for breeder bucks, breeder does, and frozen "straws" of buck semen used for artificial insemination make up significant revenue streams. For example, a review of whitetail auction sites revealed that semen straws often sell for $200 each, but semen prices from high-quality bucks with solid reputations sell for several hundred or thousands more. High-end or record book bucks and does of impeccable pedigree sell for much higher prices.

Threat of Disease Transmission – is it Valid?

Although double-fences are often suggested by regulatory agencies to hamper the threat of escapes and/or disease transmission, captive cervid facilities usually resist because of the excessive cost. However, escapes through fences or open gates are a valid concern. According to the Wisconsin Department of Agriculture, Trade and Consumer Protection from March 2004 through mid-October 2007, Wisconsin captive cervid facilities reported 437 escapes, which included 261

whitetails, 75 elk and 101 exotics, including red deer; obviously a great concern for a state that has both wild and captive whitetail herds confirmed to carry chronic wasting disease (CWD).

In 2004, another CWD-positive state, Michigan, also reported escape problems. A review of 584 of the state's 740 registered captive cervid facilities found that 37 percent weren't complying with regulations. This included 456 previously unreported escaped or intentionally released animals. One year later, Michigan whitetail hunters harvested eight ear-tagged deer, and not one had been reported missing, as the law requires.

In 31 states and one Canadian province, authority to regulate deer farms is shared by the wildlife and agriculture agencies. QDMA recommends that wildlife agencies have sole responsibility.

Impacts on Deer Hunting

Hunters and conservationists should be concerned with the negative impact the privatization of deer and other wild game animals may have on hunting. Currently, public attitude surveys show the general public supports recreational deer hunting as long as meat consumption is part of the equation. However, this support erodes as the public perceives a swing toward trophy hunting or hunting farmed deer.

Who's in Charge?

The philosophical void on this subject is vast; but one of the most destructive consequences from this division, with regard to the future of deer hunting and the overall health of our deer herds, is the confusing maze of regulatory control of captive cervid facilities currently found across North America.

According to the CWD Alliance, as of October 2009, ten states and four Canadian provinces grant jurisdiction over captive cervids to the state or provincial Department of Agriculture (see the table on the following pages). The state/provincial wildlife agency has authority in nine states and five provinces. In the remaining 31 states and one province, captive cervid farms are jointly managed by both agencies.

In most cases this regulatory matrix is a direct result of lobbied and enacted law, swapping control from one agency to another. The problem is that inconsistency across state or provincial boundaries possibly creates missed opportunities for communication between agencies controlling and regulating captive cervid facilities, and certainly limits management efforts. There are also fundamental differences between wildlife and agricultural departments regarding captive cervid issues and free-ranging wildlife populations. Given the potential for disease transmission and the threat to our $67 billion hunting industry, the QDMA advocates for sole regulatory authority of captive cervid facilities to state/provincial wildlife agencies. These agencies have more experience with wildlife species, and more at stake with wildlife disease issues, especially with regard to transmission to free ranging populations.

Quotable QDMA:
"The QDMA advocates for sole regulatory authority resting with state/provincial wildlife agencies. These agencies have more experience with wildlife species, and more at stake with wildlife disease issues, especially with regard to transmission to free-ranging populations."

Who's In Charge? *Regulatory Jurisdiction for Deer Farms by State & Province*

Alabama	Department of Conservation & Natural Resources
Arizona	Game and Fish Department
Arkansas	Department of Fish & Game regulates imports relating to wildlife, Livestock & Poultry regulates imports relating to livestock. A memorandum of understanding between the two agencies delegates final permitting authority to Fish & Game.
California	Department of Fish & Game (DFG) has authority over all captive cervids and issues the permits required for possession. Department of Food & Agriculture (DFA) becomes the lead over captive cervids only if a disease outbreak occurs which could impact livestock (TB and brucellosis).
Colorado	Division of Wildlife (DOW) regulates wildlife imports and has authority over commercially raised mule deer and other commercially raised wildlife species. The Department of Agriculture (CDA) has authority over disease management for alternative livestock (fallow deer and elk). Authority over possession, importation, and movement of alternative livestock (elk and fallow deer) is shared, and CWD management in alternative livestock facilities requires DOW approval of the herd plan. Moratorium on new licensing of cervid ranches by DOW; CDA is licensing new alternative livestock facilities.
Connecticut	Department of Environmental Protection and Department of Agriculture
Delaware	Department of Agriculture has jurisdiction over all exotic cervids, while the Division of Fish and Wildlife has jurisdiction over white-tailed deer.
Florida	Fish & Wildlife Conservation Commission (FWC) regulates possession of captive cervids, Department of Agriculture & Consumer Services (FDACS) oversees importation and health requirements.
Georgia	The Department of Natural Resources (GDNR) and Department of Agriculture (GDA) have joint authority over deer farms. Farmed deer are restricted to fallow, sika, and red deer, elk, caribou and their hybrids. White-tailed deer are not included as farmed deer. The GDA administers the deer farming license and provisions relating to health requirements, humane treatment and slaughter. Also, the GDNR inspects facilities prior to Ag approval and issuance of deer farming license. Further, the GDNR has jurisdiction over escaped farmed deer. The GDNR has authority over wild animals, which include the cervid species that can be legally farmed in Georgia. Thus, anyone holding any cervid species is required to have a wild animal license to legally possess a cervid other than white-tailed deer.
Idaho	Idaho State Department of Agriculture/Animal Industries has jurisdiction over domestic cervids - which includes elk, fallow deer and reindeer. Department of Fish and Game has jurisdiction over importation and possession of all other species of wildlife.
Illinois	Department of Agriculture processes and administers import applications and oversees captive cervid CWD monitoring program. Department of Natural Resources administers Captive Game Breeder licensing program. Both have authority over importation and possession.
Indiana	Department of Natural Resources and State Board of Animal Health
Iowa	Department of Agriculture and Land Stewardship
Kansas	Kansas Department of Animal Health has jurisdiction over captive cervids.
Kentucky	Dept. of Fish and Wildlife Resources (KDFWR) regulates holding of cervids. Dept. of Agriculture is in charge of the health aspect of captive cervids & intrastate movement.
Louisiana	Department of Agriculture & Forestry regulates cervids kept for commercial purposes. Department of Wildlife & Fisheries regulates white-tailed deer kept for non-commercial purposes.
Maine	Department of Agriculture regulates cervids used for commercial purposes, the Department of Inland Fisheries and Wildlife regulates all other imports.
Maryland	Department of Natural Resources and the Department of Agriculture
Massachusetts	Division of Fisheries and Wildlife (F&W) regulates importation and possession, the F&W Board creates and modifies regulations and policies regarding captive cervid imports.
Michigan	In April 2004, the responsibility for regulations and bio-security of captive cervid facilities was transferred from the Department of Agriculture (MDA) to the Department of Natural Resources. MDA continues to oversee disease testing of captive cervids.
Minnesota	MN Board of Animal Health regulates all captive deer, elk, and other cervids.
Mississippi	Mississippi Department of Wildlife, Fisheries & Parks (MDWFP) has jurisdiction over white-tailed deer, Department of Agriculture & the Board of Animal Health has jurisdiction over exotics. As of July 1, 2006, MDWFP has plenary power to regulate all commercial and noncommercial wild animal enclosures.
Missouri	Department of Conservation regulates free-ranging elk, mule deer, and white-tailed and captive cervids in hunting preserves and breeding facilities. Department of Agriculture regulates elk meeting the "livestock" definition. *Change to occur* - March 1, 2010 the Missouri Department of Agriculture will assume the role of regulating all herds (elk, mule deer, and white-tailed deer) that are enrolled in the State's CWD monitoring program.
Montana	Fish, Wildlife & Parks has jurisdiction over licensing, reports, record keeping, exterior fencing, classification, unlawful capture, inspection, and enforcement of those activities. Department of Livestock has authority over marking, inspection, transport, importation, quarantine, hold orders, interior facilities, health, and enforcement of those activities.
Nebraska	Nebraska Department of Agriculture
Nevada	State veterinarian has regulatory authority over captive cervids.
New Hampshire	NH Fish & Game Department and Department of Agriculture, Markets & Food
New Jersey	Division of Fish and Wildlife has possession permitting authority. The NJ Department of Agriculture (State Veterinarian) has condemnation authority and authority over health certification requirements for imports. The USDA-VS Area Veterinarian-in-Charge has authority to enforce federal importation regulations and provide indemnification for slaughtered deer herds.
New Mexico	New Mexico Department of Game and Fish

Who's In Charge? *Regulatory Jurisdiction for Deer Farms by State & Province*

New York ..... NYS Department of Agriculture and Markets (NYSDAM) regulates deer and elk held under wire. NYS Department of Environmental Conservation (DEC) issues licenses to possess captive-bred white-tailed deer.

North Carolina ..... The NC Wildlife Resources Commission (NCWRC) holds authority over the possession and transportation of captive deer and elk in North Carolina. Specifically, the NCWRC requires a captivity license for the possession of cervids and transportation permits for their movement (importation, exportation, intrastate transportation, emergency vet, and slaughterhouse permits), regulates minimum facility standards, CWD testing, cervid tagging, record-keeping, sanitation and care, etc., and enforces those rules through conducting semiannual inspections of all cervid facilities in the state. The NC Department of Agriculture & Consumer Services also holds joint authority over the transportation of cervids in North Carolina (specifically importation and intrastate transportation), requires tuberculosis and brucellosis testing, assists with facility inspection and regulates the production of meat from fallow deer and elk. The State Veterinarian holds premise quarantine authority.

North Dakota ..... State Board of Animal Health

Ohio ..... Department of Natural Resources, Division of Wildlife, issues permits for white-tailed deer in captivity and carcass regulations. Department of Agriculture oversees import requirements and permits.

Oklahoma ..... Oklahoma Department of Wildlife Conservation and Oklahoma Department of Agriculture, Food, and Forestry

Oregon ..... Oregon Department of Fish and Wildlife and the Oregon Department of Agriculture have joint jurisdiction.

Pennsylvania ..... Pennsylvania Game Commission and the PA Department of Agriculture

Rhode Island ..... Department of Environmental Management

South Carolina ..... Department of Natural Resources has ultimate control over importation and possession of captive cervids. Clemson University Livestock and Poultry Health also provides permit if and only if the DNR has previously permitted importation of the cervid.

South Dakota ..... Animal Industry Board

Tennessee ..... TN Department of Agriculture

Texas ..... Texas Animal Health Commission and the Texas Parks and Wildlife Department

Utah ..... Utah Division of Wildlife Resources; and the Utah Department of Agriculture has jurisdiction over captive elk facilities.

Vermont ..... Department of Agriculture, Food & Markets is responsible for captive cervid importation, health certificate, facility standards.

Virginia ..... Virginia Department of Game & Inland Fisheries (VDGIF) has the jurisdiction over captive cervids. If captive cervids are imported into VA, which is currently prohibited by Department regulation, then a VA Dept. of Ag and Consumer Services (VDACS) health certificate is required.

Washington ..... The Washington Department of Fish & Wildlife (WDFW) regulates the importation and possession of captive cervids. Both WDFW and the Washington State Department of Agriculture (WSDA) regulate the disease testing requirements for captive cervids.

West Virginia ..... WV Division of Natural Resources is responsible for native or once native to WV captive cervid species and WV Department of Agriculture regulates all other captive cervids.

Wisconsin ..... Department of Agriculture, Trade and Consumer Protection regulates importation of all cervids and registers farmed cervids.

Wyoming ..... WY Game & Fish Commission

Alberta ..... Agriculture and Rural Development

British Columbia ..... Canadian Food Inspection Agency (CFIA)- the Animal Industry Branch; Livestock Health, Management & Regulation - Food Safety & Quality Branch; BC Ministry of Agriculture and Lands

Manitoba ..... Farmed Elk - Manitoba Department of Agriculture and Food; Other Cervids - Manitoba Conservation

New Brunswick ..... Permit for captive wildlife issued by Minister of Natural Resources

Northwest territories .... Department of Environment and Natural Resources

Nova Scotia ..... Wildlife Division, Department of Natural Resources

Ontario ..... Canadian Food Inspection Agency (CFIA) has jurisdiction over captive cervids in all provinces/territories regarding reportable diseases (CWD, Tb, Brucellosis, etc). Provincial jurisdiction over farmed cervids is with the Ontario Ministry of Agriculture, Food & Rural Affairs (OMAFRA). Ministry of Natural Resources (MNR) has jurisdiction over non-captive wildlife except migratory birds.

Quebec ..... Canadian Food Inspection Agency (CFIA) has jurisdiction over captive cervids in all provinces/territories regarding reportable diseases. The Minister of Natural Resources and Wildlife (MRNF) is in charge of carrying out any regulatory control measures for captive or free-ranging cervids. The Minister of Agriculture, Fisheries and Food (MAPAQ) is in charge of carrying out the Food Products Act and the Animal Health Protection Act over captive cervids.

Saskatchewan ..... Saskatchewan Agriculture

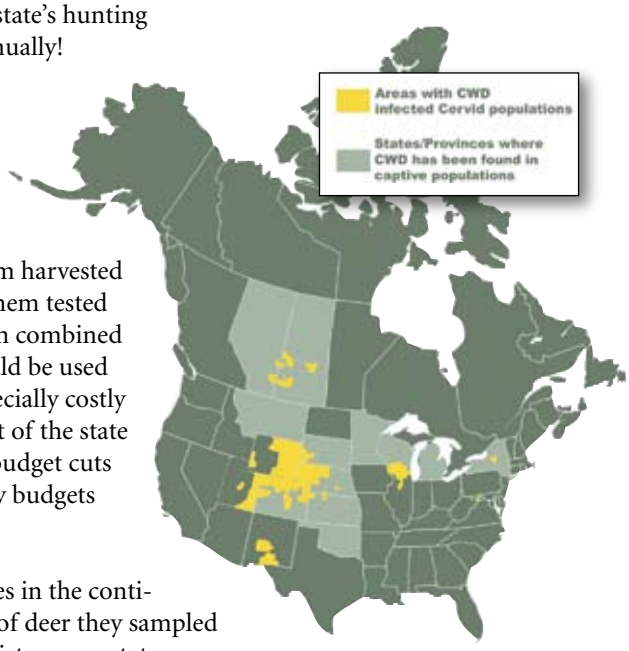
Yukon ..... Yukon Department of Environment

The Cost of Chronic Wasting Disease (CWD)

Quotable QDMA:
"Collecting tissue samples from harvested deer is time consuming and having them tested costs states over $1 million annually – valuable funds that could be used for other wildlife projects."

Chronic wasting disease (CWD) is an always fatal neurological disease that affects deer, elk and moose. There is no vaccine or cure for CWD, and this contagious disease can be spread via urine, feces, saliva, blood, and possibly other vectors. See pages 17 to 19 in QDMA's 2009 Whitetail Report (download at www.qdma.com) for additional information on the biology of the disease.

Confirmation of CWD in Wisconsin in February 2002 has been very costly to state wildlife agencies; even those where CWD has not been identified. Currently, CWD has been confirmed in wild cervid populations in 11 states and two provinces (see map) and in captive populations in 10 states and two provinces. The disease has resulted in millions spent on research and testing. Wisconsin alone has spent nearly $41 million on research, monitoring, sharpshooting, and registration/sampling stations from 2002 to 2009. This work is an attempt to protect the state's deer herd, but it's also protecting the state's hunting industry; estimated at $2.2 billion annually!



source: Chronic Wasting Disease Alliance (www.cwd-info.org)

Regardless of whether CWD has been identified in your state, the disease is impacting deer and other wildlife by drawing from your state wildlife agency's financial and personnel resources. Collecting tissue samples from harvested deer is time consuming, and having them tested costs states over $1 million annually in combined expenditure – valuable funds that could be used for other wildlife projects. This is especially costly during a time when at least 60 percent of the state wildlife agencies in the U.S. received budget cuts in 2009 (see the article on state agency budgets on page 17 of this report).

QDMA surveyed state wildlife agencies in the continental U.S. to determine the number of deer they sampled for CWD and the cost per sample. Thirty-seven states reported testing 59,968 samples in 2008 (see chart on the facing page). Oregon and Tennessee tested less than 100 deer while Wisconsin tested over 8,000. The average cost per sample was $25 but they ranged widely from $10 per sample in Delaware and Pennsylvania to $90 or more in South Carolina and South Dakota. For the 26 states reporting costs, only 1 spent less than $5,000 on testing in 2008. Nine states spent $5,000 to $15,000, four states spent $15,000 to $25,000, and 12 states spent over $25,000; including three that spent $140,000 to nearly $210,000! In total, these 26 states spent nearly $1.2 million for testing in 2008, and this doesn't include data from Colorado, Kansas, Montana, Nebraska, New Mexico or West Virginia; all states where CWD had been confirmed and samples would have been tested in 2008.

In addition to impacts on the deer herd and hunting industry, the costs for CWD testing are much higher for states that have confirmed its presence. For example, in the Northeast, New York has confirmed the disease in an insolated area, and in 2008 the Department of Environmental Conservation tested 7,450 deer for a cost of over $200,000. None of New York's neighboring states have identified CWD, and New Jersey, Massachusetts, Pennsylvania and Vermont (data from Connecticut was not available) combined only tested 5,036 deer; these four CWD-free states tested over 2,000 less deer for considerably less cost.

Every aspect of CWD is costly to state wildlife agencies, whitetail populations and the future of

hunting. While not all funds spent on CWD testing come from state wildlife agency general operating budgets, these dollars could have been spent on other more productive projects if not for the presence of CWD in several deer herds. As sportsmen, it's clearly in our best interest to protect the herds we hunt from this dreaded disease and to do our part to control it anywhere it is identified.

2008 CWD Sampling Costs

State	Deer Sampled	Cost/Sample ($)	Total Expenditure ($)
Alabama	625	25	15,625
Arizona	2157	17	36,669
Arkansas	888	20	17,760
California	*	*	*
Colorado	228	*	*
Connecticut	*	*	*
Delaware	599	10	5,990
Florida	551	*	*
Georgia	593	12	7,116
Idaho	500+	*	*
Illinois	7758	12.50	96,975
Indiana	*	*	*
Iowa	4232	13.50	57,132
Kansas	*	*	*
Kentucky	2067	*	*
Louisiana	437	12	5,244
Maine	848	15	12,720
Maryland	1015	12	12,180
Massachusetts	487	40	19,480
Michigan	830+	*	*
Minnesota	200	25	5,000
Mississippi	1215	12	14,580
Missouri	1220	25	30,500
Montana	*	*	*
Nebraska	*	*	*
Nevada	*	*	*
New Hampshire	405	21	8,505
New Jersey	339	*	*
New Mexico	*	*	*
New York	7450	28	208,600
North Carolina	1000	12	12,000
North Dakota	*	*	*
Ohio	1469	51	74,919
Oklahoma	986	25	24,650
Oregon	31	17.50	542
Pennsylvania	3810	10	38,100
Rhode Island	192	*	*
South Carolina	528	90	47,520
South Dakota	1465	95.56	140,000
Tennessee	26	*	*
Texas	3963	20	79,260
Utah	*	*	*
Vermont	400	*	*
Virginia	1200	*	*
Washington	*	*	*
West Virginia	*	*	*
Wisconsin	8507	18.50	157,379
Wyoming	2247	15	33,705

* data not available

Quotable QDMA:

"For the 26 states reporting costs, only one spent less than $5,000 on testing in 2008. Nine states spent $5,000 to $15,000, four states spent $15,000 to $25,000, and 12 states spent over $25,000; including three that spent $140,000 to nearly $210,000."

Deer Population Goals By State: A Progress Report

Hunters routinely discuss antlerless harvests as being too high or too low. These hunters' opinions generally relate to the antlerless harvest in the area(s) they hunt. Many hunters fail to realize their state wildlife agency manages deer, and therefore establishes target antlerless harvest goals, on a wildlife management unit (WMU) or deer management unit level. States cannot and do not manage deer at the individual private property level, and thus the target antlerless harvest they establish for the unit you live or hunt in may be too low, just right, or too high for the property you hunt. This is where the QDMA can help by teaching you how to determine the biologically-appropriate antlerless harvest for your area (see "How Many Antlerless Deer Should I Harvest?" on page 53).

Quotable QDMA:

"States cannot and do not manage deer at the individual private property level, and thus the target antlerless harvest they establish for the unit you live or hunt in may be too low, just right, or too high for the property you hunt. This is where the QDMA can help by teaching you how to determine the biologically appropriate antlerless harvest for your area."

State wildlife agencies take a lot of grief for the number of antlerless deer harvested each year because hunters want to see a lot of deer, while farmers and orchardists want to see minimal damage to their crops. Nature photographers want to easily view deer while foresters don't want to easily find deer damage on new seedlings, and motorists generally want fewer deer for safety reasons. Whitetails affect many stakeholders and each has a different desired deer density. Fortunately, most wildlife agencies establish, with assistance from stakeholders, target deer densities or goals for their WMUs. These goals may be based on estimated deer numbers or densities, herd or habitat health indices, deer damage levels, or other variables. Different states use different indices and some are more biologically measurable than others. For example, Pennsylvania's goals are based on herd health, habitat health, and deer-human conflicts. Pennsylvania uses reproduction (i.e., embryos/fetuses per adult female), forest regeneration (i.e., percent forested plots with adequate regeneration), and citizen advisory committees to gauge acceptable levels of deer-human conflicts in each WMU. These indices are measurable, comparable across WMUs, and provide defendable antlerless harvest goals. They are also less controversial than deer density estimates and goals used by many states. By comparing your state agency's estimate for the current deer herd to the established goal for the WMU you live or hunt in, you can gain a better understanding of the agency's deer seasons, bag limits and target antlerless harvest.

Continued.

When setting deer population goals, state wildlife agencies must consider the viewpoints of many stakeholders, including hunters (who want to see more and better quality deer) and non-hunting citizens (who many want to see fewer deer in some situations, like in areas where deer/vehicle collisions are common).

Deer Density vs. Goals

State	% WMUs at Goal	% WMUs Above Goal	% WMUs Below Goal
Alabama	*	*	*
Arizona	40	20	40
Arkansas	76	16	8
California	*	*	*
Colorado	*	*	*
Connecticut	77	15	8
Delaware	61	28	11
Florida	*	*	*
Georgia	78	11	11
Idaho	43	43	14
Illinois	23	61	17
Indiana	8	77	15
Iowa	50	50	0
Kansas	90	10	0
Kentucky	33	33	34
Louisiana	*	*	*
Maine	29	18	54
Maryland	9	91	0
Massachusetts	73	27	0
Michigan	15	65	20
Minnesota	60	30	10
Mississippi	50	25	25
Missouri	50	25	25
Montana	*	*	*
Nebraska	39	55	6
Nevada	*	*	*
New Hampshire	39	17	44
New Jersey	35	39	26
New Mexico	*	*	*
New York	21	29	50
North Carolina	*	*	*
North Dakota	25	75	0
Ohio	8	89	3
Oklahoma	80	10	10
Oregon	*	*	*
Pennsylvania	77	14	9
Rhode Island	60	40	0
South Carolina	80	15	5
South Dakota	*	*	*
Tennessee	70	10	20
Texas	*	*	*
Utah	*	*	*
Vermont	71	29	0
Virginia	27	69	4
Washington	*	*	*
West Virginia	*	*	*
Wisconsin	33	58	9
Wyoming	*	*	*

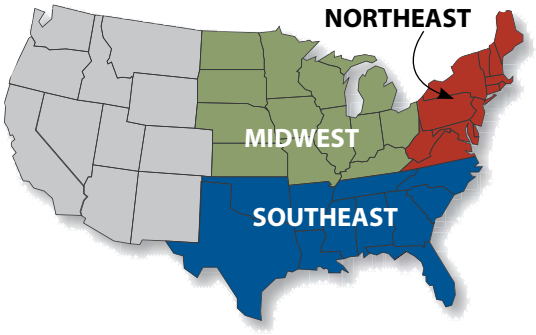
* data not available

Quotable QDMA:
"Nationally, Kansas had the highest percentage of WMUs with the deer herd at goal (90 percent). Oklahoma and South Carolina followed with 80 percent of units at goal."

We surveyed state wildlife agencies in the continental U.S. and collected data on the percentage of a state's WMUs that were under, at, or above the established goals. We did not ask what variables were used to establish those goals, and we are not comparing goals between or among states in this analysis. Our goal was simply to assess the relative percentage of WMUs below, at, and above goal for each state. We received current and target data from 12 of 13 Midwestern states, 12 of 13 Northeastern states, six of 11 Southeastern states, and two of 13 Western states. Since we only received data from two Western states we omitted the West from our regional analysis, but we included their data in the chart on the previous page.

Nationally, Kansas had the highest percentage of WMUs with the deer herd at goal (90 percent). Oklahoma and South Carolina followed with 80 percent of units at goal, Georgia had 78 percent, Connecticut and Pennsylvania had 77 percent, and Arkansas had 76 percent of WMUs at goal. In total, only 7 of 32 states (22 percent) had greater than 75 percent of their units at goal. Another nine states had at least half of their units at goal: Iowa, Mississippi and Missouri (50 percent), Minnesota and Rhode Island (60 percent), Delaware (61 percent), Tennessee (70 percent), Vermont (71 percent), and Massachusetts (73 percent). That leaves 16 of 32 states (50 percent) with less than half of their WMUs at the established goals.

Some states have high percentages of WMUs above the desired goal such as Maryland (91 percent), Ohio (89 percent), Indiana (77 percent) and North Dakota (75 percent). Others have relatively high percentages below goal such as Maine (54 percent), New York (50 percent), New Hampshire (44 percent) and Arizona (40 percent). Twenty-five of 32 states (78 percent) had at least one WMU below goal, and this highlights the fact that nearly all states are trying to grow the deer herd in at least a portion of their state. Conversely, all 32 states had at least one WMU above goal, thus all were also trying to reduce the herd in at least a portion of their state.



Regionally, the Southeast averaged the highest percentage of WMUs at goal (72 percent). The Northeast followed a distant second with an average of 48 percent and the Midwest had 36 percent of WMUs at goal. The Midwest also averaged the highest percentage of units above goal (52 percent) and the lowest below goal (12 percent). This is likely a faction of this region's productive soils, habitats and deer herds combined with lower hunter densities than the Northeast or Southeast. The Southeast also had the lowest percentage of units above goal (13 percent) and an equal percentage below goal. However, it's unfortunate that only 6 of 11 (55 percent) Southeastern states have established WMU goals for their deer herds, because it provides sportsmen and women with a better understanding of where future population reduction and/or protection efforts need to occur within their state.

Knowing where the WMU you live or hunt in is relative to the goal for that unit provides an understanding of the unit's specific target antlerless harvest prescribed by the state wildlife agency. This basic understanding is for the entire WMU, and savvy deer managers can establish an antlerless harvest tailored for their specific location. Hopefully the information in this article and the accompanying chart provides insight into the season and bag limits established by your state wildlife agencies.

QDMA's Agency of the Year

Each year at its national convention, the Quality Deer Management Association (QDMA) recognizes an agency or organization for its dedication to the Quality Deer Management (QDM) philosophy with the Agency of the Year award. Criteria for this award include:

- The recipient must have a record of supporting the philosophy of QDM and the mission of the QDMA.
- The recipient must practice innovative and progressive deer management techniques.
- The recipient must have affected positive change in deer management regulations (e.g., season structure, bag limits, etc.), hunter education, hunter recruitment, and/or involvement in youth hunting.
- The recipient's qualities should be reflected in how its professional staff serves its constituents (hunters) and manages its state's natural resources, particularly the white-tailed deer.
- The recipient must have engaged its hunters and other key stakeholders, including QDMA, in the deer management process.

In 2009 the Ohio Department of Natural Resources (ODNR) received this prestigious award. The ODNR enacted several changes in their antlerless permit system to increase the antlerless harvest and move it earlier in the season. In an effort to better serve the hunters and the natural resources, they made a reduced-cost permit available during archery season. As a result, more antlerless deer were harvested, the harvest occurred earlier in the season, and fewer bucks were harvested. This was a win-win situation for the state's deer herd and hunters.

The ODNR also offered numerous controlled deer and waterfowl hunts, including hunts designated for the mobility impaired, youth, and women. The availability of these hunts offered those who do not have access to hunting land the opportunity to harvest deer. The ODNR's efforts are working to enhance the state's deer herd, educate the public on stewardship, get youth involved in outdoor activities, and serve their constituents in general.

Two additional positive changes the ODNR has implemented include increased penalties and fines for poaching whitetails and a farmer-hunter "match" program. The increased fines were implemented prior to 2009, and the match program took affect after they received this award, but they are two more examples of innovative programs aimed at further improving deer management in Ohio. In total, they make the ODNR a most-deserving recipient of QDMA's 2009 Agency of the Year Award.

Mike Tonkovich, deer biologist for the Ohio Department of Natural Resources, accepts QDMA's 2009 Agency of the Year Award from QDMA Board member Craig Dougherty of New York. The award was presented at QDMA's National Convention in Louisville, Kentucky.

Past winners of this award include the Mississippi Department of Wildlife, Fisheries and Parks (2008), Southeastern Cooperative Wildlife Disease Study Group (2007), Missouri Department of Conservation (2006), Delaware Department of Natural Resources and Environmental Control and Delaware Department of Agriculture (2005), Kentucky Department of Fish and Wildlife Resources (2004), and the Pennsylvania Game Commission (2003).

Part Three: *Reference & Research*

Quotable QDMA:
"All types of buck-harvest restrictions have advantages and disadvantages. The key is to implement a strategy devised from local data, and then garner support from the local sportsmen and women affected by it."

Antlered Buck Management

A recent thread on the Forum at QDMA.com focused on antler restrictions. Specifically, Forum users were discussing how many states had them and what restrictions were used. This theme was timely as antler restrictions are a hot topic among deer hunters. Whether you love or hate them, you can be sure your state wildlife agency has discussed them. In fact, as we reported in the 2009 edition of the Whitetail Report, at least 22 states had some form of antler restrictions implemented in 2008, and an untold number of managers employed antler or other buck harvest restrictions on private and leased lands. Eight states (Alabama, Arkansas, Delaware, Georgia, Michigan, Mississippi, Pennsylvania and Vermont) had statewide restrictions for at least one buck in the bag limit, while 14 states used them in some wildlife management areas, units, regions, and/or military bases. It's important to remember that buck harvest restrictions are not synonymous with Quality Deer Management (QDM). Rather, they are a strategy to protect a specific age class (generally 1½-year-olds) or age classes of bucks.

Antlered deer management is important because hunters like to shoot bucks, and in the past hunters routinely overharvested the buck segment of populations. This provided much opportunity to experiment with buck harvest restrictions, and today QDM practitioners can choose from a myriad of strategies and tailor one to fit their situation. Many antler restrictions have been used including point, spread and beam-length requirements as well as Boone & Crockett (B&C) score. Additionally, age/body characteristics, buck quotas, earn-a-buck programs, and combination approaches have been used to regulate buck harvest. All restrictions have advantages and disadvantages. The key is to implement a strategy devised from local data, and then garner support from the local sportsmen and women affected by it – whether that is a hunting club, a QDM Cooperative, or a larger area such as a WMA or county. This is often best accomplished by a strong educational campaign informing them about the strategy's costs and benefits.
Let's take a closer look at the various strategies for managing antlered bucks.

Antler Point Restrictions

Antler point restrictions (APRs) are a commonly-used technique, and they involve establishing a minimum number of points a buck must have to be eligible for harvest. This minimum number should be established with the aid of a biologist and with local harvest data.

Among the advantages of APRs, they are simple and easy to enforce. The disadvantage of APRs is the number of antler points is a poor predictor of deer age. Yearling bucks can have racks ranging from short spikes to 10 or more points. Therefore it can be difficult with APRs to protect the majority of the yearling age class while still making other age classes available for harvest. Managers may unintentionally focus harvest pressure on yearlings with larger racks or protect older age classes with smaller racks. However, because APRs are simple for hunters to follow and easy to enforce, they are the most common buck harvest restriction discussed and implemented by state agencies. Of the 22 states that employed antler restrictions in 2008, 16 employed APRs, and depending on the state, the number varied from one to four points on a single antler.

Antler Spread

Antler spread restrictions involve establishing a minimum antler-spread width a buck must have to be eligible for harvest. Again, this width should be established with the aid of a biologist and from local harvest data.

The premise of a width restriction is few yearling bucks attain an outside antler spread of more than 15 to 16 inches. Hunters can estimate a buck's spread by viewing where the antlers are in relation to the buck's ears when extended. Ear tip-to-tip distance is approximately 15 to 16 inches for northern deer and slightly less for southern deer. Therefore, if a buck's antlers are as wide as or wider than his ears, there is a good chance he is at least 2½ years old. The advantage of a spread restriction is it is a much better predictor of whether a buck is 1½ or 2½ years old or older and therefore can do a better job protecting yearlings. Disadvantages of a spread restriction include it is slightly more difficult to determine the legal status of a buck in the wild compared to APRs, it can be more difficult for state agencies to enforce, and some mature bucks can have tall, narrow racks that are less than 16 inches wide. A spread restriction is more biologically sound than an APR and therefore is commonly used on private and leased lands where managers have more control over the program. In 2008, four states (Delaware, Georgia, Kentucky and West Virginia) used antler spread restrictions. None employed them statewide for all bucks, but each used them for at least a portion of their bag limit and/or in at least one area of the state, such as counties or wildlife management units.

Boone & Crockett Score

A third technique is harvesting based on a buck's B&C score. An advantage of this is research shows gross B&C score is highly correlated with relative age in many areas. Therefore, this technique can be successfully used to separate yearling bucks from 2½-year-old and older bucks. Disadvantages include it requires time and practice to become proficient at scoring a live buck in the wild. Since some young bucks have high-scoring antlers while some mature bucks have low-scoring antlers, this technique is less useful for separating 2½-year-olds from 3½-year-olds, or 3½-year-olds from 4½-year-olds, as there can be much overlap in antler scores of middle-aged and mature bucks. This technique is commonly used as part of a combination approach on private and/or leased lands, but is not employed by any state agency.

There is a wide range of strategies for managing buck harvest, from spread restrictions to bag limits. No technique is perfect, but they all have advantages that should be considered.

Age Based on Body Characteristics

A fourth technique is harvesting by age restrictions based on body characteristics. This technique involves establishing the age classes available for harvest, and hunters then use body characteristics – not antler characteristics – to determine eligible bucks. Distinguishable body changes occur as deer progress through age classes, and this technique requires hunters to be skilled in identifying those changes. Estimating the age of bucks on the hoof is not an exact science, but with practice, hunters can easily separate bucks into three groups: yearlings, 2½-year-olds, and 3½-plus. The advantage of this technique is you can either target or protect multiple age classes of bucks. The disadvantage of this technique is it requires time and practice for hunters to learn the body characteristics of each age class specific to their region and habitat and be able to accurately estimate the age of local bucks. This technique is a lot of fun and is very rewarding for true whitetail enthusiasts. Age restrictions are the most biologically sound approach and are used in the majority of intensive management programs.

Quotable QDMA:

"The disadvantage of antler-point restrictions is the number of antler points is a poor predictor of deer age. Therefore it can be difficult with APRs to protect the majority of the yearling age class while still making other age classes available for harvest."

Quotable QDMA:
"QDMA considers buck-harvest restrictions on a case-by-case basis and applies a three-part test. First, is the restriction biologically sound? Second, is it supported by a majority of affected hunters and landowners? Finally, will it be objectively monitored to determine success or failure?"

Buck Quotas and Earn-a-Buck

Two additional techniques are buck harvest quotas and "earn-a-buck" programs. Both of these programs restrict the number – not the age or antler size – of bucks that can be harvested. Buck harvest quotas are similar to what most states use to limit the antlerless harvest. With this technique, managers issue a limited number of buck tags, and thus some bucks are protected because not all hunters receive a tag. Buck quotas can be established on an area or hunter basis. For example, managers can allot a specific number of bucks for a wildlife management unit (WMU), county, property, etc., or limit the number of bucks an individual hunter can harvest. An advantage of this technique is it can prevent overharvest of bucks. Disadvantages are it can result in unhappy hunters if the quota is met early in the season, and it can still allow an overharvest of yearling bucks, especially in areas with high hunter numbers.

Earn-a-buck programs are typically used in areas of high deer density where managers must force hunters to remove additional antlerless deer. The premise of this technique is a hunter must harvest an antlerless deer to receive (or validate) his/her buck tag. A hunter that doesn't help the management program by harvesting a doe is not permitted to shoot a buck. This technique protects some bucks because not all hunters will have the opportunity to harvest a buck after harvesting an antlerless deer. Disadvantages are similar to those in buck quota programs. This technique was developed as a strategy for meeting antlerless harvest goals. It simply has a secondary benefit of protecting bucks.

Combination Approaches

As its name implies, this technique combines two or more of the above strategies to manage the buck harvest. For example, it could be a combination of a minimum number of antler points and a minimum spread, or a minimum B&C score and minimum age. It can also be an "either/or" approach such as requiring a buck to have a minimum number of points or a minimum spread. Finally, some managers use an *a la carte* approach where a buck must meet at least one harvest criteria, such as 1) a gross score of 120 inches, 2) be at least 3½ years of age, or 3) have at least a 16-inch inside spread. Combination approaches are generally more biologically sound, flexible and preferred to single restriction strategies. In 2008, three states (Mississippi, South Carolina and Texas) used a combination of antler points and spread, and Mississippi used a combination of antler points, spread and/or main beam length to restrict the buck harvest in at least a portion of their state.

Which is Best?

From a biological standpoint, age restrictions are typically best because they are the most precise and flexible way to achieve management goals. From a practical standpoint, harvesting by age may not be possible initially due to varying skill levels among hunters. However, harvesting by age should be the eventual goal of nearly all QDM programs. Education and experience are the keys to success.

At the property, WMU, or state level there are many ways to protect numbers or specific age classes of bucks. No technique is perfect but they all have advantages.

Which strategy does the QDMA support? We examine each buck harvest restriction on a case-by-case basis and apply a three-part test. First, is the restriction biologically sound? Second, is it supported by a majority of affected hunters and landowners? Finally, will it be objectively monitored to determine success or failure? If the restriction meets these criteria, it stands a good chance for success. The challenge is to educate hunters on the benefits and limitations of each restriction and achieve broad-based support for the selected technique. Hunter support is crucial, and it can lead a management program to success, or doom it for failure. In general, the most biologically sound techniques provide the most benefits, but all of them can improve a deer management program when applied correctly.

How Many Antlerless Deer Should I Harvest?

Harvesting the correct number of antlerless deer is one of the most important aspects of QDM. Harvest too few antlerless deer and the herd will negatively impact the habitat, the deer themselves and other wildlife species. Harvest too many antlerless deer and the herd will drop below the carrying capacity of the habitat while you unnecessarily remove animals that could provide viewing and harvesting opportunities.

A target antlerless harvest depends on many variables, including deer density, doe age structure, habitat quality, property size, neighboring management practices, adult sex ratio, fawn recruitment rate, seasonal conditions such as extreme winter weather or summer drought, and your deer management goals. This is not a complete list, but it covers the major factors. At first glance it may seem overwhelming, but each piece of data is obtainable. Each item is analogous to a piece of a jigsaw puzzle – the more pieces you have, the clearer the picture. In this case the picture is a deer population, and more pieces of information equate to better management decisions, such as determining the proper target antlerless harvest.

A formal trail-camera survey is one of several tools that can help hunters make density and population estimates. These estimates can then guide the setting of antlerless harvest goals.

The appropriate antlerless harvest rate varies by region. For example, the average property in Florida cannot withstand a comparable antlerless harvest to the average property in Illinois. The appropriate harvest rate also varies within the state and even at the county level. For properties with comparable deer density goals, one with low-quality habitat will likely have a lower target harvest than a property with high-quality habitat, even if the properties are only a few miles apart. This point is obvious, but we state it to show there is not an "exact" harvest rate that can be applied to a specific location or region.

Fortunately, we can calculate a target antlerless harvest. We can also use ballpark harvest rates to establish an initial target harvest in the absence of survey data. Then, the key is to collect enough harvest and/or observation data to refine the target antlerless harvest in future years.

Calculating a Target Doe Harvest

Population models used by many state wildlife agencies across the whitetail's range suggest a harvest of 20 to 30 percent of the adult does in a given population will stabilize the herd. For clarity, this includes adult does only and not fawns. It is important to recognize that many of these models were created over the past few decades during periods of rapid whitetail population growth and expansion. During this period, fawn recruitment was high due to abundant habitat and low predator densities. However, there is a growing body of evidence suggesting that an increasing number of predators such as coyotes, bobcats and black bears, in combination with an increasing number of deer-vehicle accidents and a general trend toward reducing deer populations, is impacting deer populations more than previously believed. Therefore, more conservative doe harvests may be justified in areas with low habitat quality and high predator densities.

If your goal is to increase the deer herd, harvest fewer than 20 to 30 percent of the does. If your goal is to decrease the herd, harvest more than this percentage. You can easily calculate this number

Quotable QDMA:

"Harvest too many antlerless deer and the herd will drop below the carrying capacity of the habitat while you unnecessarily remove animals that could provide viewing and harvesting opportunities."

if you have an estimate of the number of does on the property. Many landowners and managers conduct annual scouting-camera surveys to estimate the deer density. These surveys provide estimates of the number of adult bucks, adult does and fawns on a property. They also provide useful estimates of the adult buck:doe and fawn:doe ratios.

If you do not have a deer-density estimate, there are some general harvest guidelines that can help determine your target antlerless harvest. It is important to recognize these are ballpark rates, and they do not replace a harvest rate calculated from survey data. However, they can be used to set an initial target harvest.

Whether you're in New England, the Southeast or somewhere in between, poor habitats obviously can't feed or support as many deer as good habitats. Lower-density herds also provide lower target levels since there are fewer animals available for harvest. With that in mind, the chart below provides some ballpark figures selected to harvest 20 to 30 percent of the does in a population and stabilize the deer herd.

Not sure about the productivity of the habitat in your area? Check with your state wildlife agency for deer productivity data. You can also contact your local Cooperative Extension office or a wildlife consultant. Your own herd monitoring efforts will help; harvest data such as average weight by age class and lactation rates for yearling does are useful measures of habitat productivity. Monitoring browse pressure on food plots and natural forages, especially with the use of browse exclosures, can tell you much about the size of a deer population in relation to available forage.

Ballpark Doe Harvest

Until you determine the number of adult does on a property using a camera survey or other method, use these ballpark ranges to *stabilize* a deer population. Higher harvest rates will reduce a population. Lower rates will allow population growth.

Poor or Low-Quality Habitats:
One adult doe for every 300 to 640-plus acres.

Moderate-Quality Habitats:
One adult doe for every 100 to 300 acres.

High-Quality Habitats:
One adult doe for every 25 to 100 acres.

What if, like most folks, you manage a small property? This is where Cooperatives can play a big role. QDM Cooperatives provide many benefits to landowners including the opportunity to harvest the appropriate number of antlerless deer. By pooling habitat, deer data, and harvest pressure, managers are more likely to achieve their target antlerless harvest, and all Cooperative members benefit when the right number of deer are harvested (read more about the biological importance of QDM Cooperatives on page 18 of this report).

What does this mean for your management program? Calculate your target doe harvest immediately prior to the hunting season. If your goal is to stabilize the deer population, harvest 20 to 30 percent of the adult does. Determine the actual number by conducting a scouting-camera or alternative survey and estimating the total number of does on the property or Cooperative. Multiply that number by 20 to 30 percent and you have your target doe harvest. If you don't have a density estimate, harvest one adult doe for every 300 to 640-plus acres of low-productivity habitat, one for every 100 to 300 acres of moderately productive habitat, and one adult doe for every 25 to 100 acres of highly productive habitat. Be careful to not harvest more than one buck fawn for every 10 does. The best way to achieve this target harvest is to clearly communicate the importance of reaching it to everyone hunting on the property or Cooperative and to start as early in the hunting season as possible. Good luck, and be sure to collect a jawbone and harvest data from every antlerless deer!

Detecting The Rut Peak

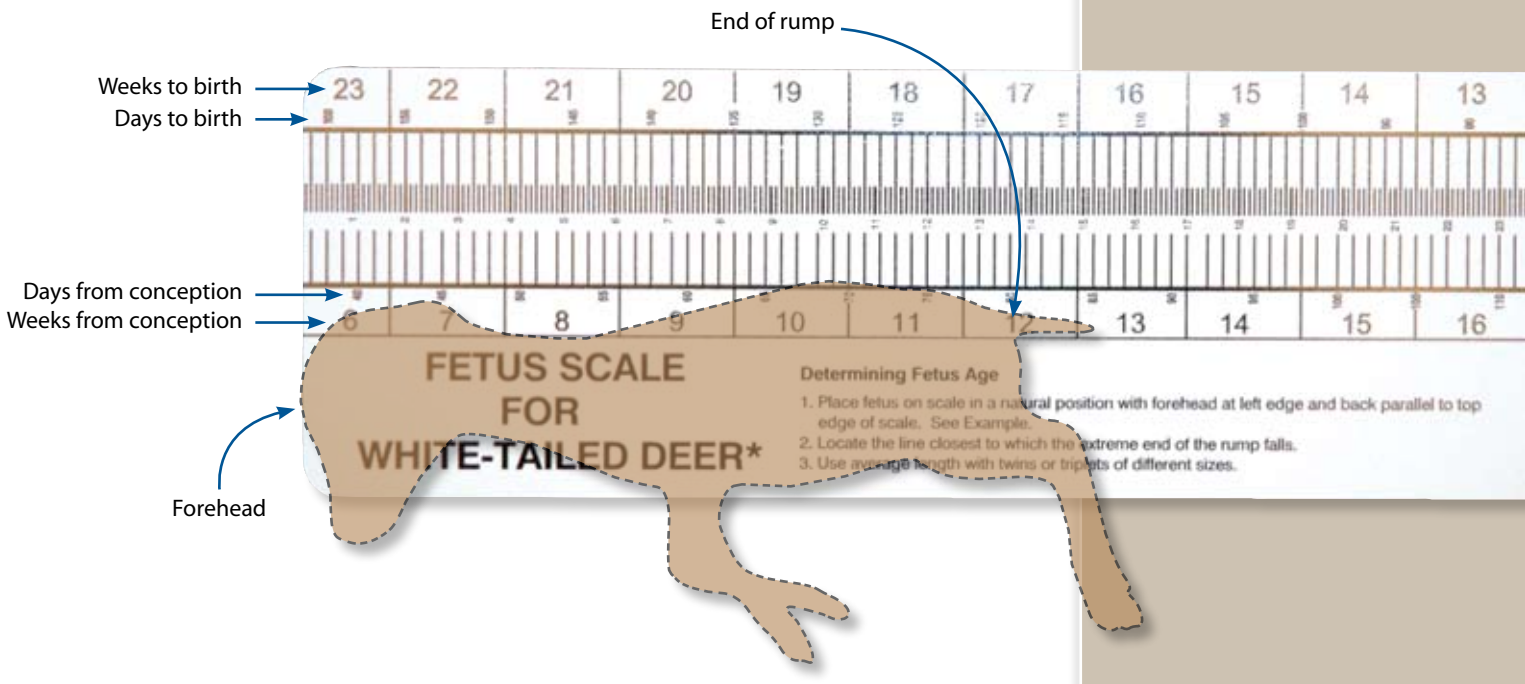
Fetal aging sounds like a technique used by Ob/Gyn doctors and ultrasound technicians, but deer managers can learn a lot about the population they're managing by taking some annual fetal measurements. This practice is not new or limited to the South, as the initial studies on fetal development in white-tailed deer began in the 1940s in New York. However, Joe Hamilton, QDMA's founder and Southern Director of Education and Outreach, led a research project from 1979 to 1983 that ultimately developed the fetal-aging criteria and scale that deer managers throughout North America still use today.

The technique was developed using "crown-to-rump" measurements of known-aged fetuses. Therefore, by measuring the length from the forehead (crown) to the junction of the tail and back (rump) of a fetus on the fetal scale, you can determine the fetus's age. Then, you can use the scale to backdate and determine the date the fetus was conceived, and foredate to estimate the date it would have been born. This analysis is the preferred method for determining the length of and especially the peak of the rut across the whitetail's range, and it allows managers to detect changes in breeding dates with respect to herd management programs.

Getting Started

Expensive equipment isn't necessary. All you need is an $8 fetus scale, available from QDMA, and a little knowledge about where to find the fetuses. Fetuses are located in the reproductive tract, and that lies low and at the back end of the abdomen (just above the udder). If you hang a doe for field dressing, hanging by the hind legs makes locating the reproductive tract very easy. It will be hanging below but close to the bladder and above the intestines. If you field dress a doe on the ground, it is easier to locate the reproductive tract before you remove the entrails. That way blood and/or stomach contents (for those who aren't careful with their knife) don't make identification more difficult.

Once you locate the reproductive tract make one incision and cut it away from the body. Then place the tract on a flat surface. The tract consists of the uterus (or birth canal), which branches into halves that each contain an ovary. There may be a fetus in each half of the tract, only one half, or no fetuses. Cut into the tract and remove any fetus(es). You can cut the umbilical cord flush



Quotable QDMA:

"In general, as a deer population goes from unmanaged and unbalanced toward a balanced sex ratio, improved adult age structure and increased health, the span of time from first to last conception date will be shorter, and the rut peak will be stronger."

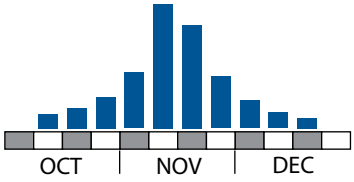
with the body. It's that simple, and it's even easier than pulling a jawbone. However, make sure you collect a fetus and not a cotyledon. Cotyledons are part of the placenta, have a capsule-like appearance and may look somewhat similar to very young fetuses. However, a quick inspection will easily distinguish between the two. Once the fetus is in hand, you can age it and determine conception and birth dates in less than five minutes at camp or on your tailgate using a fetus scale. If you don't have a scale, store the fetus(es) in the freezer for analysis at a later date.

For Example

Let's say you harvested a doe on December 15, and you determined the age of the fetus was 51 days. Refer to the easy-to-use Julian date chart on the back of your fetus scale. Julian dates allow you to calculate the number of days between two calendar dates by simple subtraction. The Julian date of December 15 is 349 (it's the 349th day of the year). This number minus the fetal age in days (51) is 298, the Julian date for October 25. This is the date of conception. The number of days to parturition, or birth, was 147, as determined on your scale. This number, added to the Julian date of the harvest (349) is 496. The Julian date of 496 occurs on May 11, the date the fawn would have been born.

Graphing the Data

Once you determine conception dates, it's time to graph the data. According to Joe Hamilton, a simple bar chart works well, and you plot the number of pregnant does in your harvest data (the sample size) on the vertical axis. Plot the conception dates on the horizontal axis and group them on a weekly basis. This chart will reveal the range of breeding dates and the peak of the rut for your area.



Breeding data charted by week should resemble a bell-shaped curve like the one in this example, with some early and some late breeding on either side of the main peak. The timing of the peak will vary by region.

In all deer populations, there will be does that are bred earlier and later than most, and this occurs for a variety of reasons. Thus, the conception date from one pregnant doe is not a reliable indicator of the rut peak. With more does in your data set, you will gain a more complete picture of the rut.

In general, as a deer population goes from unmanaged and unbalanced toward a balanced sex ratio, improved adult age structure and increased health, the span of time from first to last conception date will be shorter, and the rut peak will be stronger.

Fetal Aging For Everyone?

Fetal aging is a great way to determine the relative length and peak of the rut in your area. You simply need a fetal scale and some fetuses. Unfortunately, that second requirement can be difficult to collect in some locales. Crown-to-rump measurements are an accurate technique for aging fetuses, but fetuses must be at least 35 to 40 days old for the technique to work (and about 60 days old to determine sex). This isn't a problem in areas with late deer seasons and/or early ruts. However, many northern firearms seasons coincide with or immediately follow peak breeding. In some areas of the South, the rut peaks later in the year, near the end of hunting season. Thus most harvested deer, even if pregnant, have fetuses far younger than 35 to 40 days. If this is the case in your area you can still check for fetuses as some does breed early. For example, in Pennsylvania peak breeding generally occurs between November 10 and 20, but Game Commission conception data shows breeding routinely occurs in October. The fetuses from these early-bred does would be old/large enough during the firearms season to determine conception date using the fetal scale.

Many states have late antlerless or primitive weapons seasons where you could collect fetuses from harvested does. A word of caution, however: Don't wait until these late seasons to achieve the majority of your antlerless harvest simply to collect fetuses. The benefits of early antlerless

harvests far outweigh the benefits of collecting 35-day-old or older fetuses. A third option is to collect fetuses from road-killed does during winter or spring. This option is a little messier, and it is illegal in some areas, so be sure to check your local regulations. A final option is to contact your state or provincial wildlife agency and ask for conception dates in your area. This may not be as representative as data you can collect locally, but it's better than nothing.

Is It Flawless?

Researchers in Mississippi recently determined newborn fawns from the Lower Coastal Plain (lower-quality habitat) were lighter and shorter than fawns from the Thin Loess and Delta soil regions (higher-quality habitats) in Mississippi. The researchers also found twins were lighter and shorter than singletons, and males were heavier than females. This research may have implications for the accuracy of the fetal scale. However, since 82 percent of fetal growth occurs during the final trimester of pregnancy, 35- to 135-day-old fetuses (first and second trimester fetuses) may not exhibit the differential growth rates identified in newborn fawns in Mississippi's different soil regions. Fortunately the vast majority of harvested does will have fetuses less than 135 days old, and the technique described above should be accurate for management purposes.

The technique may not be perfect, but it's been successfully used across the whitetail's range for more than 20 years. This is due in part to rigorous testing during development of the criteria and scale. Joe and his colleagues compared measurements between males and females, singletons and twins, fresh and preserved fetuses, and fetuses from 1½- to 3½-year-old does, and found negligible differences. The researchers suggest using the average length of twins or triplets, but otherwise the scale is robust with respect to sex, number and "freshness" of fetuses and mother's age (at least through 3½ years).

How to Age a Whitetail Fetus

1. Place fetus on the fetal scale in a natural position with the forehead at the left edge and the back parallel to the top edge of the scale.
2. Locate the line closest to which the extreme end of the rump falls.
3. Use average length with twins or triplets of different sizes.
4. There are five sets of measurements on the fetal scale. These include a millimeter scale, days from conception, weeks from conception, days to parturition (birth), and weeks to parturition.

Once you know the number of days from conception, flip over to the other side of the fetal scale to determine the date of conception.

5. Locate within a calendar the date the doe was harvested and convert that date to a Julian date (which runs from one to 365 days on one calendar and from 366-730 days on the calendar for the subsequent year). The fetal scale has a calendar that makes this conversion simple.
6. Subtract the age of the fetus in days (days from conception as measured on the scale) from the Julian date noted in No. 5.
7. On the calendar on the fetal scale, locate the date block with the Julian date found in No. 6. This is the date of conception.
8. The procedure for determining date of birth is similar, except days to birth (as measured on the scale) are added to the Julian date noted in No. 5. Two calendars are provided on the scale. Select the calendar that allows you to subtract the days from conception from the Julian date and also allows adding the days to parturition to the Julian date.

Not a Make-or-Break Proposition

Aging versus not aging fetuses won't make or break your management program, but it is a quick and simple technique to collect valuable data about the deer population you're managing. The data can provide insight toward the relationship between the deer population and the habitat's ability to support it, the adult sex ratio, the adult age structure and even herd health. More importantly, it provides solid data on the best dates to be firmly positioned in your favorite deer stand.

Quotable QDMA:
"Approximately 20 to 25 percent of twin fawns have different fathers."

Did You Know?

White-tailed deer are the most-studied big game animal in North America. There are volumes of literature available on whitetails, and hunters are more savvy than ever on information pertaining to their favorite quarry. With all of this information, it may seem that hunters know a whitetail inside and out, and yet research continually adds to our knowledge or changes what we previously believed. Here are some interesting facts about whitetails established by research. Did you know:

- The average adult whitetail consumes one ton of food per year.
- Deer sleep in short bouts, alternating between a doze and full alertness, and they can sleep with their eyes open or closed and with their head up or in a resting position.
- Fawns are not scentless – they have a scent, as that's how their mother recognizes them, and fawns may even rub-urinate when only days old.

Or how about:

- Approximately 20 to 25 percent of twin fawns have different fathers.
- 50 to 70 percent of bucks disperse 1 to 5 miles from their birth area when they are 12 to 18 months of age.
- During their life, most bucks sire fewer than five fawns that reach 6 months of age.

These twin fawns, a doe and a buck, may not be actual "twins." Research has shown that approximately 20 to 25 percent of twin sets have different fathers.

Regarding does, did you know:

- You can determine the peak of the rut in your area by measuring fetuses from harvested does.
- Does also use scrapes during the breeding season, and they may use them on a regular basis.
- 82 percent of fetal growth occurs during the final trimester of pregnancy. This time frame corresponds perfectly with spring green-up in northern herds.

How are you with numbers? Did you know:

- Fawns average about 300 white spots.
- Except for nursing two to four times a day, a fawn spends the first four weeks of life in hiding, separate from the doe.
- Healthy fawns average 4 to 8 pounds at birth and they will double their weight in two weeks and triple it within a month.
- Healthy fawns can outrun a man when only a few days old but it generally takes three to six weeks before they can elude most predators.

You're more knowledgeable about bucks? Did you know:

- Pheromones deposited at signposts (rubs and scrapes) by mature bucks may have a "bio-stimulating" or trigger effect on the breeding season.
- Older bucks may also produce "controlling" or "priming" pheromones that yearling bucks are not physically mature enough to produce.
- Areas with mature bucks can have 10 times as many rubs as areas without them,
- Mature bucks make about 85 percent more scrapes and 50 percent more rubs than yearling bucks.

- Young bucks can sire up to a third (30 percent) of fawns even in populations where mature bucks comprise over 50 percent of the bucks.

Regarding communication, did you know:

- Bucks of all ages use scrapes, and the same scrape may be used by many individuals.
- Scraping activity peaks just prior to peak of the rut, but active scrapes may be found over several months.
- Most scraping activity (85 percent) occurs at night.
- Scrapes only a few hundred yards apart may be used by completely different groups of bucks, which brings into question the idea of a "scrape line."

Researchers monitoring scrapes have found that bucks of all ages and even does use scrapes. They've also found that 85 percent of scrape use occurs at night.

Quotable QDMA:

"Scrapes only a few hundred yards apart may be used by completely different groups of bucks, which brings into question the idea of a "scrape line."

How is your antler knowledge? Did you know:

- Deer antlers can grow an inch or more per day, making them the fastest normal growing tissue known to man.
- In photoperiod-controlled experiments, deer can grow up to three sets of antlers per year or retain their antlers for more than one year.
- Transplanting material from a buck's pedicle to other skeletal regions results in growth of antler tissue in the transplanted area (such as on the forehead of mice or the leg of a deer).
- Bucks "steal" minerals from their skeleton to harden their antlers in late summer – thus they experience a yearly form of osteoporosis.

"Deer antlers can grow an inch or more per day, making them the fastest normal growing tissue known to man."

How did you do? Did you know all of the above information? If not, don't feel bad as it's nearly impossible to stay abreast of all the literature and research involving whitetails in North America. Fortunately, QDMA recognizes that, and it's one reason we provide this service to our members. Each issue of *Quality Whitetails* magazine contains the latest information on deer biology, ecology, and management, as well as native habitat and food plot management.

Quotable QDMA:
"Quality Deer Management is as different from Trophy Deer Management as it is from traditional strategies, even though many hunters and non-hunters incorrectly consider QDM and TDM to be one in the same."

Deer Management Strategies

Quality Deer Management (QDM) is a household name to modern day deer hunters. You can't pick up a hunting magazine, watch outdoor television, or talk to the guys at camp without seeing or hearing the letters QDM. The rise in popularity of QDM is a good thing for deer, other wildlife species, habitats and hunters. While today's hunters are more educated than ever before, there are still many who don't fully understand how QDM differs from traditional or trophy deer management. The following information compares and contrasts the three management strategies using seven measurable variables.

Traditional Deer Management

Under traditional deer management, any antlered buck is harvested, regardless of age or antler quality, and few does are harvested. Deer researcher Dr. Grant Woods refers to traditional deer management as "Maximum Buck Harvest Management." This is the strategy that every state in the country used and some continue to use today. This strategy may work when the deer herd is below the habitat's carrying capacity but fails when the herd equals or exceeds the carrying capacity.

Protecting yearling bucks and increasing the number of 2½- and 3½-year-old bucks available for harvest is a realistic and achievable goal for the vast majority of deer hunters. This is one reason QDM is within reach of far more hunters than Trophy Deer Management.

Quality Deer Management

Quality Deer Management is the approach where young bucks are protected from harvest, combined with an adequate harvest of female deer to produce healthy deer herds in balance with existing habitat conditions. QDM is first and foremost about having the biologically appropriate number of deer for the habitat. If a habitat will support 20 deer per square mile, QDM says put 20 deer per square mile on it. If a habitat will support 30 deer per square mile, put 30 deer per square mile on it, but don't put 30 deer on habitat that can only support 20. QDM also improves age structures by allowing bucks to reach all age classes – not just 1½ and 2½ years. QDM accomplishes this by not shooting the majority of yearling bucks each year.

Trophy Deer Management

Trophy Deer Management (TDM) is the approach where only fully mature bucks, 5½ to 7½ years old, with high scoring antlers are harvested (with the exception of cull bucks) and does are aggressively harvested to maintain low deer density and optimum nutrition for the remaining animals. TDM is not practical in much of the United States, and the strategy is negatively viewed by much of the hunting and non-hunting public.

Acreage Requirements
- None for traditional deer management
- Varying acreage requirements for QDM
- 5,000-plus acres for TDM

Buck Harvest
- Shoot mostly young bucks in traditional deer management
- Shoot mainly 2½- to 4½-year-old bucks in QDM
- Shoot fully mature (5½ to 7½ years old) in TDM

Doe Harvest
- Shoot few if any in traditional deer management
- Shoot an adequate number in QDM
- Shoot high number in TDM

Adult Sex Ratio
- Generally heavily skewed toward does under traditional deer management
- More balanced ratios in QDM, though still favoring does
- Nearly equal ratios in TDM

Deer vs. Habitat
- Deer herd often greater than habitat's carrying capacity in traditional management
- Deer herd in balance with habitat's carrying capacity in QDM
- Deer herd often less than habitat's carrying capacity in TDM

Influence on Habitat
- Moderate to severe habitat damage in traditional deer management
- Minimal habitat impact in QDM
- Minimal habitat impact in TDM

Deer-Human Conflicts
- high deer-human conflicts in traditional deer management
- reduced deer-human conflicts in QDM
- low deer-human conflicts in TDM

The seven items above show how the different management strategies affect our deer herds and habitats. Each strategy is unique and shouldn't be confused with the others. For example, QDM is as different from TDM as it is from traditional strategies, even though many hunters and non-hunters incorrectly consider QDM and TDM to be one in the same. Each strategy has its place in deer management, but evaluation of the deer herd and habitat is necessary to correctly choose the strategy that will be most effective at producing a healthy deer herd and healthy habitat. Traditional deer management works when the deer population is below the habitat's carrying capacity, and the goal is to increase the deer herd and provide recreational hunting. TDM works best when the goal is to produce mature, trophy-class bucks with high scoring antlers. QDM works best when the deer population is at or exceeding the habitat's carrying capacity and the goal is to improve the health of the deer herd and balance it with available habitat. Fortunately, QDM also provides tremendous hunting opportunities, and unlike TDM, is a realistic goal for most hunters.

The Four Cornerstones of QDM

Most hunters know that QDM involves passing young bucks. However, fewer know that any successful QDM program is built on four "Cornerstones," with buck management being only one small piece of the puzzle.

Quotable QDMA:

"QDM works best when the deer population is at or exceeding the habitat's carrying capacity, and the goal is to improve the health of the deer herd and balance it with available habitat."

Quotable QDMA:

"Carrying capacity is a measure of the number of deer an area can support, both biologically and culturally, and its value changes annually, seasonally and across properties."

What is Carrying Capacity?

"Carrying capacity" is an often-used concept in deer management discussions. Biologists, managers and hunters routinely refer to the "carrying capacity" of an area, or whether a deer herd is above or below this magical point. Actually, what does carrying capacity mean?

Carrying capacity is the maximum number of individuals or inhabitants that an environment can support without detrimental effects. Deer populations can and do exceed the carrying capacity on a regular basis. In doing so, they sacrifice their own health as well as damage the vegetation and harm other wildlife species. One reason for the rise in popularity of Quality Deer Management was enough biologists, managers and hunters were fed up with deer herds exhibiting poor health because they were allowed to increase to levels approaching or surpassing an area's carrying capacity. QDMA encourages all deer hunters to manage deer populations at densities lower than this so they are in balance with their habitats. Determining whether a population is below, at, or above carrying capacity, and how to achieve or maintain balance, can be easier said than done.

Biological Carrying Capacity

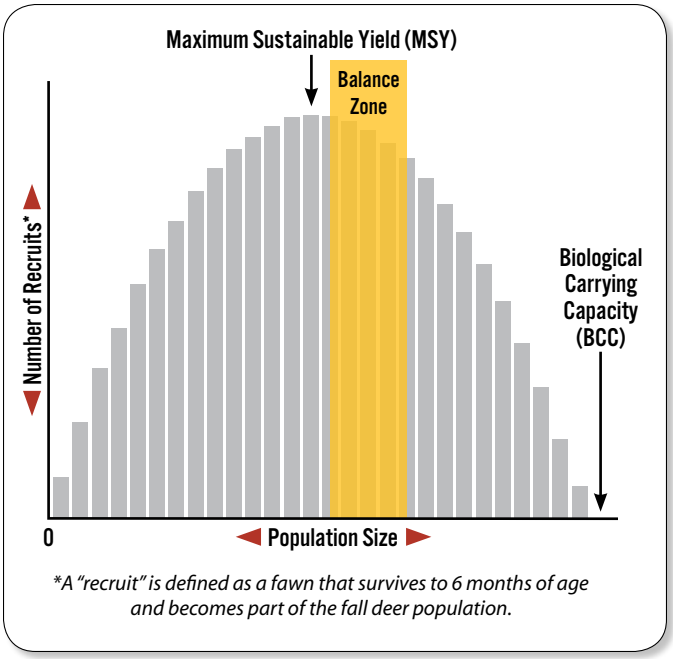
To understand how carrying capacity should play into a QDM program, let's start by separating the term into its most common uses. Biological carrying capacity (BCC) is largely determined by the quality and quantity of available habitat. The BCC is the number of deer a given parcel can support in good physical condition over an extended period of time without adversely impacting the habitat. Unfortunately, deer reproductive rates allow populations to exceed BCC unless the number of fawns recruited is balanced by mortality. (Note: A fawn is "recruited" when it survives to about 6 months of age and enters the fall deer population).

Cultural Carrying Capacity

Cultural carrying capacity (CCC) is defined as the maximum number of deer that can coexist compatibly with local human populations. According to Mark Ellingwood, wildlife program supervisor for the New Hampshire Fish & Game Department who coined the term, an area's CCC is determined by the values of the people living there. The CCC can be higher or lower than BCC since some people have high tolerances for deer and deer-related issues while others do not. The CCC becomes especially important in suburban deer management and in many agricultural regions.

Maximum Sustainable Yield

The chart on this page depicts the normal growth curve of a deer population. Starting with a low density, the population grows rapidly because there are sufficient resources for the herd, so fawn recruitment is high. This growth continues until the population reaches a density that is approximately half of BCC. This point is referred to as the maximum sustainable yield (MSY), and this is where fawn recruitment is maximized. Therefore, this is the point where the maximum number of bucks is brought into the population. When the population grows



**A "recruit" is defined as a fawn that survives to 6 months of age and becomes part of the fall deer population.*

above this density, resources are less abundant for each deer, so the number of fawns recruited into the population declines. This is why fewer, healthier does can produce and recruit more fawns (and thus more bucks). This is also why the old adages, "When you kill a doe you're really killing three deer" or "When you kill a doe you're killing next year's buck" are rarely true.

You can harvest more deer on a sustained basis when a population is at MSY than at any other density. You likely aren't seeing as many deer as if the population was at BCC, but the population is much healthier and you're able to harvest a far higher number year after year. However, populations are unstable at MSY, and even slight overharvests reduce the number of recruits and the population. It's much wiser to be just to the right of MSY. In this part of the growth curve, populations are stable, and slight overharvests actually increase fawn recruitment.

Balance Zone

A main goal of QDM is to balance a deer herd with its habitat. Where does this point occur on the chart? It's actually not a single point. Rather, it is a zone, and it occurs just to the right of MSY.

Where is the deer herd that you hunt in relation to this zone on the figure? You determine this by collecting some habitat, observation and harvest data. Do you have a visible browse line? If so, you're way past where you want to be. Take a walk in the woods and observe whether the understory is regenerating. Next, determine if there are preferred tree species in that understory versus non-preferred species. These assessments help you gauge where you are on the figure.

Combine your habitat assessment with observation data collected from the archery and/or firearms seasons and harvest data collected from every deer harvested or found dead on the property. By recording the number of does and fawns observed, you can estimate whether the number of recruits is increasing or decreasing. Combine this with harvest data such as weight and lactation status and you can determine whether the overall health of the herd is increasing or decreasing.

The goal isn't to find the exact spot on the figure where a deer herd lies. Rather, initially it is to estimate whether it is to the left or right of MSY. If you like to see deer, shoot a lot, and don't want to sacrifice herd or habitat health, then you should move the population toward the left side of the balance zone. If you like to see a lot of deer but not shoot as many, and are willing to sacrifice some herd and habitat health, then you can allow the population to move toward the right side of the balance zone. A word of caution if you choose the latter: Keep a close eye on habitat and herd health indicators. Once habitat damage becomes severe, recovery takes time and may only be possible if you reduce the deer population below MSY.

Many QDM practitioners are interested in increasing the quality of the habitat they hunt. This is a great way to also increase the carrying capacity of an area. In low-productivity habitats, a deer herd in the balance zone may be too low to provide acceptable hunting experiences. In these cases, the best alternative is to improve the habitat. Depending on habitat type this can be accomplished through timber harvesting, tree and shrub planting, prescribed burning, disking, roller chopping, or fertilizing. Then the area can be supplemented with high-quality food plots. An area with increased food and cover can support more deer and is definitely more attractive to whitetails.

The Take-Home Message

Carrying capacity is a measure of the number of deer an area can support, both biologically and culturally, and its value changes annually, seasonally and across properties. This is one reason some hunters observe many deer while others a mile or so away can see few or none. Rather than trying to determine the exact carrying capacity of the land you hunt, it's much simpler to manage a deer herd to be in balance with the habitat. You do so by monitoring the health of the herd and its habitat, and determining where that specific herd is in relation to the balance zone. This is a simple procedure that requires a few years of habitat, observation and harvest data. The costs are certainly worth the benefits, as a herd managed at this level provides healthy deer, healthy habitats and tremendous hunting opportunities.

Mature Bucks: Who Needs 'Em?

Quotable QDMA:
"When a balanced buck age structure is achieved, it ensures the behavioral and biological mechanisms that shape deer populations are allowed to function."

For decades in the late 1900s states such as Alabama, Michigan, Pennsylvania and others managed deer herds in such a manner that the majority of bucks harvested were 1½ years old and very few bucks ever reached maturity. In Pennsylvania, less than 1 percent of bucks reached maturity prior to implementation of antler restrictions in 2002. Even in the absence of mature bucks, does will still breed and most northern does will even breed during their first estrous cycle. Does this mean there is no biological benefit to having mature bucks in a herd? Does it mean there is no biological harm in not having them?

TES RANDLE JOLLY

Pheromones left by mature bucks at rubs and scrapes may play a "priming" role in the timing and length of the rut. More mature bucks means more rubs and scrapes in the woods, which also increases hunting enjoyment.

The importance of mature bucks extends far beyond being the most sought-after targets during hunting season. To understand why, let's first define maturity and then look at the role mature bucks play in a deer herd.

Whitetail bucks generally reach skeletal maturity from 4½ to 6½ years and grow their largest set of antlers from 5½ to 7½ years. Most biologists refer to bucks 1½ to 2½ as young or immature, 3½ to 4½ as middle-aged, and 5½ or older as mature. For this article, let's combine middle-aged and mature bucks and consider 3½ years old or older as mature.

Mature bucks are awesome creatures. Even dyed-in-the-wool meat hunters relish the opportunity to shoot a mature whitetail. And why not? Mature bucks are rare in many areas and it's difficult to make them available to hunters. Producing them requires knowledge, skill and time, and harvesting them is usually more difficult. Just as big fish and big trees indicate successful fishery and forestry programs, the presence of mature bucks is a positive sign for a deer management program.

Priming the Rut

Whitetails are social animals, and scent is their primary communication method. During the breeding season signposts such as rubs and scrapes provide the location for scent marking and information sharing. A growing body of research suggests pheromones (chemicals secreted from an animal's body that affect other animals) are deposited at these signposts by mature bucks, and these pheromones may have a "bio-stimulating" or trigger effect on the breeding season.

Research also suggests that older bucks produce "controlling" or "priming" pheromones that yearling bucks are not physically mature enough to produce. Some studies even suggest a buck

reaching dominant status produce greater amounts of pheromones than less dominant bucks of the same age, and increased stimulation of does by mature bucks through signposts may cause earlier and more synchronized breeding. While there isn't definitive proof that priming pheromones exist in whitetails, retired researcher Louis Verme and his colleagues found that does penned with bucks experienced estrous earlier than those that were not.

As most hunters know, rubs and scrapes play central roles in deer social life immediately before and during the rut. The relative abundance of rubs and scrapes on a given area is directly related to the density of mature bucks, and areas with mature bucks can have 10 times as many rubs as areas without them. Noted researchers John Ozoga and Louis Verme found yearling bucks lacked the scent-marking behaviors characteristic of mature bucks. In their study, mature bucks began making scrapes two months before any doe bred, whereas yearling bucks made only 15 percent as many scrapes and none until one week before the first doe bred. They also noted yearling bucks made only 50 percent as many rubs as mature bucks during the breeding season.

Signpost behaviors are important to the whitetail's breeding ecology, and therefore the "priming" effect that mature bucks may have on the length and/or timing of the rut is reduced or absent when mature bucks are scarce.

HARDY JACKSON

When mature bucks are absent, young bucks participate more strenuously in rut activities. This drains resources that could have been invested in reaching physical maturity more quickly.

Young Buck Health and Fitness

The priming effect from signposts likely has a stronger effect in southern latitudes as northern studies show the majority of does are bred during their first cycle even in the absence of mature bucks. However, this doesn't discount the benefit of mature bucks to northern herds. Research shows young bucks engage in breeding and may sire nearly a third (30 percent) of fawns even in populations where mature bucks comprise over 50 percent of the bucks. Of course young bucks sire a higher percentage of fawns in populations with fewer mature bucks. However, this is unfortunate because it is advantageous for yearling bucks to spend less time chasing and/or breeding does and additional time feeding and storing fat for the upcoming winter. Yearling bucks that enter winter in better physical condition have higher winter survival rates and are able to contribute more spring forage to body growth and less to recovering the additional body weight lost during winter. Young bucks can handle the breeding requirements of a herd but they do so at their own nutritional expense. Therefore, the presence of mature bucks suppresses the breeding activities of young bucks. This is good for the future health and growth of these young bucks and the health of the entire deer population.

Quotable QDMA:

"More mature bucks equals more rubs and scrapes for hunters to find. Hunters witness behaviors like sparring and chasing more often, and hunters are more likely to hear vocalizations like grunting. Success rates with rattling and calling are higher. Even hunting for shed antlers in the off-season is more productive."

Breeding Dates and Timing of the Fawn Drop

Abundant research shows skewed adult sex ratios combined with young buck age structures often result in does not being bred until their second or third estrous cycles. Second and third-cycle fawns are born one to two months later than fawns from does bred on time, and these fawns begin life at a distinct disadvantage. Habitat quality is reduced by the time they're born, they have less time to grow before the onset of winter, and predation rates are often higher because you lose the "saturation effect" of having abundant prey on the ground at the same time.

In northern populations young bucks breed the majority of does during their first cycle, but southern populations aren't as fortunate. Having mature bucks in the population helps ensure the vast majority of southern does are bred during their first estrous cycle, bringing about the benefits of an earlier, shorter fawning period.

"Natural" Deer Populations

Mature bucks are part of a "natural" deer herd. Archaeologists determined historic deer populations had an advanced age structure. We assume that Native American hunter-gatherers harvested the first deer available, regardless of its age or sex, and thus their harvest was a relatively random sample of the population. Examinations of deer remains in Native American middens (trash piles) suggests many deer survived to older ages (20 to 26 percent of populations were 5 years or older). Interestingly, data from modern-day unhunted herds show similar age structures. Unfortunately, most modern-day hunted herds have this age structure for does but few do for bucks, a result of harvests made up largely of yearling bucks. However, according to Dr. Dave Guynn from Clemson University, when a balanced age structure is achieved it ensures the behavioral and biological mechanisms that shape deer populations are allowed to function. Dave continues that the density, sex ratio and age structure of a deer herd should mimic a population regulated by natural predators and hunting by Native Americans. This natural condition provides for a nutritionally and socially healthy herd, and it is only achieved when mature bucks are present.

Priming Hunter Enthusiasm

In addition to the biological benefits, mature bucks also provide additional recreational opportunities for hunters. Sightings or trail-camera photos of a mature buck can help motivate more hunters and keep them afield longer. When you are trying to achieve doe harvest goals, recruit help for habitat management efforts, or simply gather attentive club members for an educational program on QDM topics, increased interest works in your favor.

Finally, the enjoyment level of hunting is often directly proportional to mature buck numbers. More mature bucks equals more rubs and scrapes for hunters to find. Hunters witness behaviors like sparring and chasing more often, and hunters are more likely to hear vocalizations like grunting. Success rates with rattling and calling are higher. Even hunting for shed antlers in the off-season is more productive. All of these factors increase enthusiasm for hunting and year-round QDM efforts.

So, can deer herds exist without mature bucks? Sure they can, but remember:
- Whitetail populations evolved with mature bucks.
- Their social order works best with mature bucks.
- Young bucks' fitness can be enhanced by the presence of mature bucks.
- Hunting interest increases when mature bucks are present.

All of these points are good for the deer herd, for deer management and for the future of hunting. The next time you pass a young buck, know that you did your part to improve the health of the deer herd as well as increase your chance of taking a mature buck in the future.

Habitat Management

As hunters develop a more complete understanding of QDM, the importance of habitat quality takes a larger role. Of QDM's four Cornerstones, herd management is often the first that hunters gravitate to, but habitat management quickly grabs the attention of many QDM practitioners and is often one of the most satisfying aspects of a deer management program.

Quality habitat is important for bucks and does in all age classes. Does need nutritious forage to raise healthy fawns, bucks need it for large bodies and antlers, and both sexes require adequate cover to escape predation. Given the average deer eats 2,000 pounds of vegetation annually, it's easy to see a tremendous amount of forage is necessary to support even a low-density deer herd. Larger herds and herds managed to maximize body and antler growth and reproductive capacity require even more high-quality foods.

Early successional stands may produce 1,000 to 2,000 pounds of browse per acre, and they also provide the low ground cover necessary to protect fawns from predation and provide adults with secure bedding sites. For these reasons, a mix of forest age classes is important.

This information separates habitat management into three general categories – forests, old fields and food plots. Forests include areas dominated by woody vegetation and include scrub and shrub habitats. Old fields include areas dominated by grasses, legumes and forbs. These areas are in early successional stages and can include some small woody species. Food plots are areas in agricultural-type plantings. Natural vegetation management includes forests and old fields, and should be the focus of your habitat management efforts. Food plots should be used to supplement the natural vegetation.

Forest Management

Forests dominate the landscape in much of the whitetail's range. These wooded habitats provide food and cover and should include a diversity of stand types and age classes interspersed across the landscape. This diversity of stand structure helps provide year-round forage and cover and is especially important at the geographic limits of the whitetail's range. For example, insufficient winter cover from spruce/fir/hemlock stands in northern New England can preclude deer herd growth even if adequate spring, summer and fall habitats exist. Young stands are important from a forage and cover perspective. Mature forests are important for thermal cover and mast production, but they only produce an average of 50 to 100 pounds of browse per acre. Early successional stands may produce 1,000 to 2,000 pounds of browse per acre, and they also provide the low ground cover necessary to protect fawns from predation and provide adults with secure bedding sites. For these reasons, a mix of age classes is important.

Proper forest management may be achieved by techniques ranging from timber harvesting to

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prescribed burning to quality vegetation management (QVM). QVM is a popular southern forestry technique that involves spraying an herbicide to control undesirable hardwood brush, and conducting a controlled burn to remove dead vegetation and encourage new growth. Research has demonstrated QVM can dramatically improve habitat quality for whitetails.

Structure within the forest is also important. Tops from felled trees and brush piles provide security for whitetails, nest and den locations for other animals, and they can also protect seedlings from being browsed. Open park-like understories may look "clean," but they offer little for deer and other wildlife species. If you can see 50 to 100 yards in the woods, or if the woods are easy to walk through, then the understory layer is too open and deer would benefit from additional low-lying structure.

In regions where it is practical, prescribed burning can be an extremely cost-efficent method for quickly improving the quality of deer habitat and maintaining early successional areas. Always check with your state forestry agency for guidelines, permits, and free assistance.

Old Fields

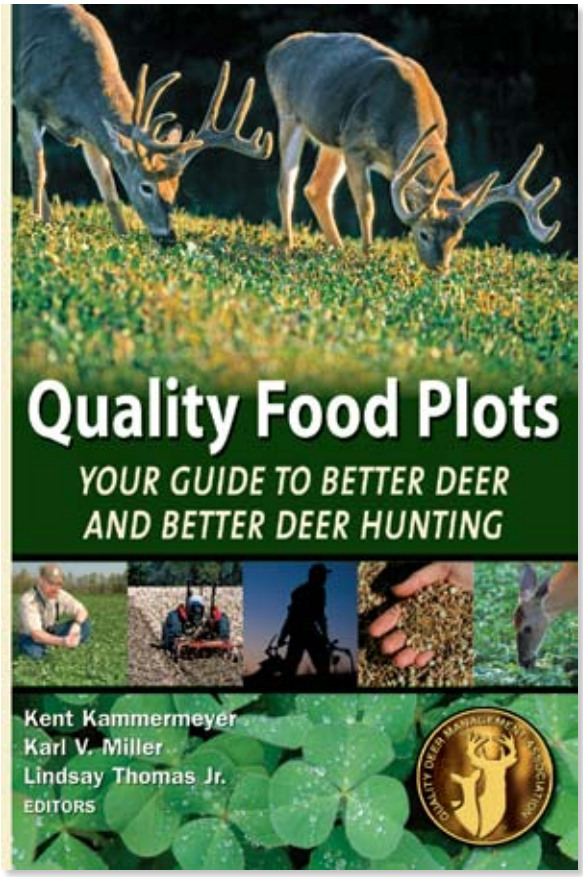
"Old fields" provide food and cover and should represent a minimum of 1 to 5 percent of a property. Some areas in the Midwest and Plains states are dominated by old fields, but many areas in the whitetail's range lack an adequate amount of this habitat type. Proper management of old fields ensures abundant food from legumes and forbs, and native warm-season grasses (NWSG) provide excellent escape, bedding, thermal and fawning cover. NWSG have been popular in the Midwest for many years and are being used at an increasing rate in the Northeast and other regions.

Old fields can be maintained by prescribed burning, disking, mowing, crushing with a roller chopper or bulldozer, fertilizing, applying herbicides, and/or a combination of these techniques. The preferred technique(s) will be dictated by your location. For example, prescribed burning is a valuable tool used throughout the Southeast but used infrequently in the Northeast due to forest composition, liability and smoke management concerns.

Food Plots

Food plots provide food, and species such as corn also provide excellent cover. Research has demonstrated measurable improvements in body weight and other physical parameters when 1 percent of an area is planted in high-quality food plots. The QDMA recommends planting 3 to 5 percent of an area to ensure abundant forage and guard against poor weather, insects or other

losses. The goal for a food plot program should be to provide year-round nutrition. There are many planting options, but a good rule of thumb is to plant 60 percent of your food plot acreage in cool-season perennials (clover mixes), 20 percent in cool-season annuals (brassicas), and 20 percent in warm-season annuals (corn, soybeans, etc.). You can alter these percentages as necessary based on your location. For example, Southern managers generally plant a little heavier percentage of warm-season annuals than in other regions. If you run short on summer food, plant additional warm-season annuals. If you need more winter forage, plant more brassicas and/or corn.



QDMA constantly receives questions and requests for guidance concerning food plots. To answer the demand, QDMA produced a 324-page book, "Quality Food Plots," which was written by multiple food plot experts and covers every region in North America.

Regardless of plant type, you should distribute food plots across the landscape. Plots typically range from ¼ to 5 acres, and long irregularly-shaped plots maximize the amount of edge habitat. If you have cool-season plots larger than 5 acres, divide them into multiple plots and select plant species to maximize seasonal use by deer. Warm-season plots tend to be larger as it is common for deer to destroy small corn, soybean or cowpea plots before they become established. Agricultural fields, abandoned fields, log landings and logging roads can all be productive food plot sites. You may even choose to "carve" food plots into previously forested areas. Such work can be expensive and labor intensive, but exact location and design can be specified to have the plot double as a strategic hunting location. This can be especially important when trying to harvest mature bucks. Once you've chosen your sites, prepared and amended the soil, selected seed varieties and planted the plots, what do you do next? Pray for rain! You can do everything right and your plots can fail if they don't receive adequate moisture. This reiterates the importance of focusing on natural vegetation management and using food plots to supplement – not replace – that habitat work.

Habitat management on private lands is accelerating at an incredible pace. QDMA members own and manage over 13 million acres in the U.S. Combine that with land being managed by other conservation organization members and the acreage is astounding. Proper habitat management for deer provides year-round cover from hardwood and softwood tree species, old fields and NWSG. Proper habitat management also provides year-round food from hard and soft mast, forbs, vines and shrubs, hardwood and softwood browse, and food plots. A diversity of species, stand types and age classes is necessary to provide this array of forages and cover. The "carrot" for many deer hunters' habitat work is better deer hunting, but good deer habitat benefits many other species as well.

Is Culling Necessary?

Quotable QDMA:
"It is impossible to control or even predict which bucks breed which does in the wild. Thus, it is difficult to control the genetic traits you select for (or against) by selectively harvesting bucks based on antler characteristics."

Today many hunters are implementing deer management programs aimed at increasing the average age of bucks and the nutritional level for the deer herd. As they begin seeing more 2½-year-old and older bucks, many managers become interested in improving the third piece of the antler formula – genetics. For decades, biologists have debated the practice of improving antler genetic potential by culling or removing specific bucks with undesirable antler traits. The idea is by removing these undesirable bucks you can improve overall antler quality within the deer herd. This idea works well in captivity because you can mate specific bucks to specific does, but is culling an effective strategy for improving the antler quality of free-ranging herds?

The hunter who killed this buck said he did so to prevent it from breeding, since it clearly had small, non-symmetrical antlers. Actually, this buck was just a typical yearling (1½ years old), and killing it was counterproductive to the QDM program. But this example reveals the widespread confusion among hunters, and mis-information in the media, regarding "culling" and "management bucks."

First, what is culling? Some managers define culling as removing inferior yearling bucks with few antler points (spikes or three-pointers) or missing points such as brow tines. Others define culling as removing older bucks with a low number of antler points (8 points or less) or other undesirable traits such as a narrow spread. For this discussion, we'll define culling as selectively removing bucks with any undesirable antler traits from any age class.

Much research has been conducted on this subject, often with seemingly conflicting results. Research from the Kerr Wildlife Management Area in Texas suggested antler quality could be improved by removing spike-antlered yearling bucks. Research from Mississippi State University suggested that yearling bucks' antlers were more a reflection of late birth date and poor nutrition rather than genetics. More current research on state hunting lands in Mississippi suggests that protection of poor-antlered yearling bucks (those with 3 or fewer points) under the state's four-total-point rule has resulted in high-grading, and has produced smaller antlers in older bucks. Current research on the King Ranch in Texas suggests that even aggressive culling on a free-ranging deer herd at the 10,000-acre scale has no impact on antler quality. Confused?

All of these research projects followed strict methodologies and had statistically significant results. However, there are numerous variables involved with a deer herd and its habitat that are difficult to control. For example, different deer herds have different population densities, age structures, sex ratios and nutritional levels (low vs. high). There are differences in soils, supplemental feeding programs, precipitation levels and countless other factors that play a role in a buck's antlers. Therefore, the studies aren't always comparing "apples to apples."

Before you decide which study is most applicable to your specific location, let's look at the breeding ecology of whitetails. For culling to improve the genetic potential of a deer herd's

antlers, bucks that are protected must be able to pass their "superior" antler genes to many offspring. Thus, these bucks would have to breed many does and sire many fawns. These bucks' male offspring would require access to high quality nutrition to fully express their antler potential, and they would have to remain in the area for the manager to benefit from his/her efforts.

But do bucks breed many does? It had been widely assumed that a small number of dominant, large-antlered bucks sired most of the fawns. However, current research shows mature bucks don't monopolize breeding rites. Even in populations with good age structure, yearlings and 2½-year-olds sired 15-30 percent of the fawns in northern and southern studies. Interestingly, some large bucks don't appear to sire any fawns. In Dr. Randy DeYoung's long-term study (over 11 years) bucks averaged less than three fawns per year (this is the number of fawns that survived to six months of age and were recruited into the population). There is also the incidence of multiple paternity. Two studies identified multiple paternity in 22-24 percent of multiple litters. That means one of every four to five sets of twins/triplets had multiple fathers. So, dominant bucks don't breed all of the does and they don't even sire all of the fawns from the does they breed.

Since many bucks each do a small amount of the breeding, and since does may breed with multiple bucks, it is impossible to control or even predict which bucks breed which does in the wild. Thus, it is difficult to control the genetic traits you select for (or against) by selectively harvesting bucks based on antler characteristics. And, it is difficult to improve (or degrade) the genetic traits within a deer herd by selectively harvesting bucks based on antler characteristics.

The good news is that we can improve antler size through our harvesting efforts. However, I'm not referring to removing specific bucks. Rather, I'm talking about passing young bucks so they can grow older and have the opportunity to express more of their antler growth potential. This improves the "age" factor of the antler formula and it is extremely easy to do. We can also harvest an appropriate number of does so bucks have more available forage. This, in combination with habitat management, improves the "nutrition" factor of the antler formula. Again, this is easy to do.

It's important to remember that many deer herds have skewed sex ratios, young buck age structures and they exceed their habitat's carrying capacity. In these situations, spikes and small antlers are generally caused by poor nutrition and/or late birth date. These parameters do not allow bucks to express their full genetic potential. We also need to remember that most abnormal antlers are NOT genetically based. Most result from injuries to the skull, pedicle, antler or body, and thus culling would have no effect on the antler genetics of the herd.

Let's revisit the research projects. The results from Dr. Mickey Hellickson's recent culling study in South Texas are likely the most applicable to the average deer manager because of the intensity of the culling efforts and the size of the study area. Mickey and his colleagues intensively culled the smallest antlered bucks in all age classes for eight straight years on 10,000 acres on the King Ranch in Texas. When the study was over, the average antler quality per age class was slightly *smaller* than when they started. While factors such as yearling buck dispersal off the study area could partially account for lack of impact, it clearly suggests that even intensive culling on this scale is unlikely to impact genetics.

So, should we be culling "inferior" bucks? If they are young bucks, the answer is "No" for most of the whitetail's range because they may have been born late or have been nutritionally deprived. If they are older bucks, the answer depends. If you have a surplus of bucks and you really dislike a certain buck – regardless of age – then go ahead and harvest him. However, don't expect it to make a big difference in what you see for antlers in the future. He's likely not siring a lot of fawns and of the ones he sires, the doe contributes half to their offspring's antler quality. Also, about 50-75 percent of yearling bucks disperse one to five miles from where they were born, so an average of ½ to ¾ of his male offspring will leave the area anyway. Unless you're involved in a trophy management program with a balanced buck-to-doe ratio, good buck age structure and optimum nutrition, let him go.

Aging White-tailed Bucks on the Hoof

Harvesting white-tailed bucks based on age is becoming an increasingly common management strategy. To implement this practice, hunters must have the ability to accurately age bucks on the hoof based on their body characteristics, an ability that most hunters considered impossible a decade ago. Today however, hunters across the whitetail's range are estimating the age of bucks in the field to achieve management goals and increase enjoyment.

Quotable QDMA:
"Like humans, whitetails possess distinct body characteristics by age class, and with a little practice hunters and non-hunters alike can become proficient at estimating the age of bucks on the hoof."

Like humans, whitetails possess distinct body characteristics by age class, and with a little practice hunters and non-hunters alike can become proficient at estimating the age of bucks on the hoof. There are many good reference books, videos and DVDs available for in-depth instruction and practice on aging bucks, and this article serves to introduce the topic and highlight the differences for each age class from fawns to post-mature animals. These body characteristics are subject to differing interpretation by different viewers, but the characteristics are relative to others in your area or region. Body characteristics also change by season. The breeding season is the best time of year to age bucks because of pronounced neck swelling and tarsal staining. You can estimate their age at other times of the year, but many characteristics are viewed relative to what they will (or did) look like during the rut.

Fawns

Fawns are easily distinguished from other age classes of bucks but are commonly misidentified as female deer. Buck fawns have small square bodies, small short heads and relatively large ears. Their heads are flatter between the ears rather than rounded like that of a doe. The distance from their ear to eye is also approximately the same as the distance from their eye to nose. In contrast, the distance from an adult doe's ear to eye is much shorter than from its eye to nose. Fawns also have short necks, flatter bellies and backs, and less muscle definition than adult does. QDMA has produced an educational poster, "Identifying Antlerless Deer," that uses close-up photography of live deer to help you learn to sort fawns from adult does and buck fawns from doe fawns using these characteristics. This makes a great visual tool for teaching hunting-club members or guests how to avoid harvesting buck fawns.

1½ Years

Note: The trail-camera photos in this section of the Whitetail Report were submitted by QDMA members to the "Age This!" department of Quality Whitetails magazine. A panel of five biologists reviewed each shot to arrive at a consensus age for the deer in the photo.

For most QDM programs, especially those in beginning stages, learning to identify yearling bucks is the most important aging skill. Yearling bucks have long legs, a thin neck, a slim body and an overall lanky appearance. Their legs appear too long for their bodies because their torsos (stomach, chest and neck) are not fully developed. Their antler spread is nearly always less than the width of their ears when their ears are in an alert position. They have a distinct line of separation between their neck and shoulders and little muscle definition. They have a thin waist, and they may have slight staining in their tarsal glands during the rut. Overall, a yearling buck can be said to look like a doe with antlers. In well-managed populations on high-quality-habitat, yearling bucks can have large bodies and even 10 or more antler points, but the above characteristics will be present and can be used to separate them from 2½-year-olds. This is why it is important to study body characteristics before considering antler size when attempting to age a buck in the field.

2½ years

Two-year-olds have legs that still appear too long for their bodies, and they still have an overall sleek appearance. They have developed some muscling in their shoulders and slight swelling in their neck during the rut, but their waist is still thin. Given adequate nutrition, their antler spread can be equal to or wider than their ears. Finally, they can have moderate staining in their tarsal glands during the rut, especially if few mature bucks are in the population.

3½ years

Three-year-olds have legs that appear to be the right length for their bodies because their torsos are now more fully developed. They have muscled shoulders and a highly swelled neck during the rut, but their waist is still lean. I liken three-year-olds to middle linebackers as they are big and strong but they're also lean and fast. A deep chest and lean waist give them a "racehorse" appearance. Their antler spread can be even with or wider than their ears. Research shows that at this age, most bucks have achieved 50 to 75 percent of their antler-growth potential. They also have a lot of tarsal staining during the rut.

Beyond 3½ years of age, determining the exact age of a buck becomes more difficult because of increased variation among individual bucks. However, for most QDM programs, harvest goals can be achieved if hunters are able to confidently separate bucks into one of three groups: A) Yearlings, B) 2½-year-olds, and C) 3½ or older. Hunters who want to sort and select bucks based on ages older than 3½ can still do so, but more time spent studying each buck may be required. In addition to viewing in the field, use trail-camera photos and home-video footage to refine your estimates. Also, once a buck has been harvested, check your own field estimates against age estimates based on toothwear and/or cementum annuli ages from a reputable lab. This will help you hone your skills at aging the deer in your region or habitat type.

4½ years

Because their stomachs, chests and necks are now fully developed, most four-year-olds have legs that appear too short for their body. They have fully-muscled shoulders, heavy swelling in their neck during the rut, and their waist has dropped down to become even with their chest. Given adequate nutrition they'll become structurally mature and can reach 75 to 90 percent of their antler growth potential. They also have a lot of tarsal staining and during the rut the stain may extend below the tarsal gland. Four-year-olds have an entirely different appearance than one- to three-year-old bucks.

5½ to 7½ years

Other than in select places, few free-ranging bucks exceed five years of age so I'll combine five- to seven-year-olds. Bucks in this category have legs that appear too short for their body. They also have several other characteristics of four year olds including fully-muscled shoulders, heavy swelling in their neck during the rut, and a waist that's even with their chest. However, they also may have a pot belly and a sagging back. Their increased body mass gives them a more rounded appearance, and they often look like a small cow. They will have achieved 90 to 100 percent of their antler growth potential, and they can have highly stained tarsal glands during the rut, with the stain extending well below the tarsal gland.

8½ and older

A few free-ranging bucks make it to the post-mature age category. These bucks have passed their prime and regress in both body and antler size. They generally have loose skin on their face, neck and shoulders – usually visible as a "chin flap" – and they may have pointed shoulder and hip bones. Their antlers can show age-related abnormalities such as abnormal points or wavy or curvy tines, and they have an overall "weathered" appearance.

As you study age-specific body characteristics you'll notice there aren't age-specific antler characteristics (other than the range of antler potential that may be reached at each age class, and this percentage can't be accurately estimated by viewing the antlers). Therefore, the QDMA suggests you don't rely solely on antler size when aging bucks. Large antlers on a younger deer and small antlers on an older deer can negatively influence your estimated age. We suggest estimating age based solely on body characteristics with respect to location and time of year and then use antler size to "check" the estimate or to break a tie if you can't decide between two ages.

QDMA offers a number of educational items to assist hunters in learning to age bucks in the field, including this poster showing body characteristics by age class.

For more assistance, we recommend the book "Observing and Evaluating Whitetails" by Dave Richards and Al Brothers, as well as the pocket field guide to aging bucks produced as a companion to this book. Also, QDMA has produced an educational poster, "Estimating Buck Age," that uses photos of live bucks of known ages to illustrate variations in body characteristics by age class. Again, this makes a great visual aid for educating hunters. All of these items are available at www.QDMA.com.

Aging bucks on the hoof is a lot of fun so whether you hunt them with a bow, sporting arm or camera, this information can make you a more knowledgeable whitetail enthusiast.

QDMA's REACH Program

In early 2006, the Quality Deer Management Association unveiled their exciting new REACH program. REACH is an aggressive national education and outreach program that will benefit hunters, landowners and deer managers in several ways. REACH is the acronym for Research, Educate, Advocate, Certify and Hunt. The program specifically addresses all of QDMA's core mission elements and was developed with input from QDMA members, state agency personnel, conservation leaders and QDMA National Board members. QDMA's goals for the program are ambitious, and they will directly benefit all QDMA members. Here is a brief synopsis of each element of REACH.

Research – QDMA expanded its role in designing, influencing, conducting and funding research on practical projects impacting white-tailed deer biology, ecology, management and hunting. QDMA's stance on deer management issues is based on good science, and good science comes from research. The first major accomplishment with this element of REACH occurred in May 2006 when QDMA announced they had secured a $50,000 grant for a cooperative project between the Pennsylvania Cooperative Fish and Wildlife Research Unit at Penn State University and the Pennsylvania Game Commission. Since then, QDMA has secured over $200,000 to support worthwhile research projects in multiple states.

Texas A&M-Kingsville deer research, funded in part through QDMA's REACH program.

Educate – QDMA expanded educational opportunities and activities on deer management and habitat improvement for QDMA members, natural resource professionals and the general public. QDMA continued conducting seminars, workshops and shortcourses and also provided web-based information, new books, charts, DVDs, posters and a nationally televised show, *Quality Whitetails*.

One of more than 150 educational events QDMA holds annually for hunters, landowners, school groups and others.

Three exciting new educational items included QDMA's landmark food plot book, *Quality Food Plots: Your Guide to Better Deer and Better Deer Hunting*. This book is over 300 pages and is a "must have" for food plot enthusiasts. The second item is an educational package titled *Living with White-Tailed Deer*. This package includes two versions, one for high schools and one for communities. The high school version is intended for grades 7-12 and is designed to teach students the process urban and suburban communities deal with when they have a deer problem. This is an excellent teaching tool that correlates to National Education Standards and has received The Wildlife Society's Conservation Education Award. The community version is intended for urban and suburban communities experiencing problems with overabundant deer. It explains and discusses the options available to solve their problems. This package educates stakeholders on the realities of urban and suburban deer management and will help communities experiencing problems and state agencies when dealing with urban and suburban deer issues.

The third item is Cyber Deer. Cyber Deer is a computer-generated program that is most advanced deer anatomy and shot placement tool available. It was created to train new and experienced hunters on organ and skeleton locations and proper shot angles for deer. Users can simulate both ground and tree stand hunting scenarios by selecting different distances and heights from the

deer. Users can also select rifle or bow as Cyber Deer takes proper account of hunting equipment used. Users can rotate the deer and receive instant feedback on shot angles. Users can then "shoot" the deer and receive feedback on shot attempt and shot placement. The user also receives feedback on what their shot hit (heart, lungs, liver, diaphragm, stomach, and/or skeleton), and the shot remains on the screen to assess it and to provide training opportunities. Cyber Deer will help new and experienced hunters make more knowledgeable and ethical shot placement decisions, and more knowledgeable hunters are better stewards of our natural resources and better ambassadors for hunting.

Advocate – QDMA increased its involvement in whitetail hunting and management issues at the state and federal levels. Education and Outreach Directors serve as liaisons between QDMA members/Branches and their respective state and federal agencies. This strengthened QDMA's ties with its members, state and federal agencies, conservation organizations and other stakeholders. Since 2006, QDMA engaged in over 200 legislative and management issues.

Since 2006, QDMA has engaged in more than 200 legislative and management issues at the state and federal level.

Certify – QDMA created an individual certification program that includes three levels of potential achievement, and each must be completed in sequence. Deer Steward I provides students with a comprehensive understanding of the key principles of deer and habitat biology, ecology and management. Deer Steward II teaches students how to apply the principles learned in Level I through hands-on and field experience. Finally, Deer Steward III, the most prestigious, must be earned through an individual's long-term service to white-tailed deer and /or the QDMA. QDMA is also creating a land certification program. The goal of these programs is to create more knowledgeable hunters and managers and to have improved deer herds and habitats.

QDMA's Deer Steward certification courses, launched in 2007, are a growing success.

Hunt – QDMA launched a national mentored youth hunting program. The program provided a framework to unite mentors and youth and is designed to create new long-term hunters. The program incorporates multiple recreational pursuits and is superior to "one time" events designed to expose (vs. mentor) newcomers to the sport. This program is the official QDMA Mentored Hunting Program and is strongly recommended for adoption by QDMA Branches, QDMA members and any individual or group interested in recruiting new hunters. It emphasizes the development of woods skills, wildlife knowledge, hunter safety and shooting skills. Small game and white-tailed deer hunting are both integral parts of the program. Skills are learned and discussed throughout the calendar year and may be reinforced in subsequent years. This is an excellent program that helps combat the declining youth recruitment rates across the country.

For more information on events and programs that are part of REACH, visit www.QDMA.com.

Media Resources

There are a number of ways for outdoor communicators to learn more from QDMA and gain access to our resources, and QDMA offers special opportunities to help. Be sure to also check out the Media Resources page at www.QDMA.com.

The QDMA National Convention
Members of the outdoor media attend the QDMA National Convention free of charge. You cover your travel and lodging, and we cover the rest, including meals at official Convention events. For more information on this opportunity, contact Lindsay Thomas Jr. at (800) 209-3337.

Deer Steward Certification
Each year, QDMA offers a limited number of free seats at Deer Steward Certification courses for outdoor communicators. To find out the Deer Steward course schedule and more information about attending, contact Matt Ross at (603) 978-7427.

E-mail News and Press Releases
Receive updates on QDMA initiatives, resources, merchandise and events through our special media e-mail news list. To join the mailing list, contact Palmer Pope at ppope@qdma.com.

Qualified, Expert Sources
Call on QDMA's staff experts anytime you need quotes or information for a story involving whitetail biology, management or hunting. Refer to page 3 of this report for contact information of specific staff members, or call (800) 209-3337.