2012 - 2013 Lake Shelbyville White-tailed Deer Checkstation Results

In order to obtain information on the status of Lake Shelbyville's white-tailed deer population, 40% of all successful shotgun applicants were required to check any deer they harvested during the 1st shotgun season. Data collected helps determine herd health and aids in setting harvest regulations to ensure habitat quality is not degraded. In 2012 much of the Midwest experienced a severe drought along with an outbreak of Epizootic Hemorrhagic Disease (EHD that impacted the local deer herd.

METHODS

Forty percent of all successful shotgun applicants in Lake Shelbyville Project (LSP) Moultrie (n=75) and LSP Shelby (n=89) were sent incidental observation cards and were required to bring any deer they harvested during the 2012 1st shotgun season to the check station located at Wolf Creek State Park. These 3 days were picked due to the high volume of hunters afield increasing the odds for obtaining a high sample number of deer. Forty-three of those surveyed checked deer through the station for a 26% return rate. Additional deer were checked from the annual Lake Shelbyville Disabled Deer Hunt for a total of 63 deer checked over the weekend. Deer killed out of Wolf Creek State Park on this hunt were excluded from this analysis due to higher herd densities in this area potentially skewing the results. Cementum annuli aging, which is about 90% accurate, is used to assign age classes to every deer checked through the station (except fawns). Teeth are pulled and sent to a lab where they are stained and sectioned in order to count the rings, much like the rings on a tree. Persons who returned their results are referred to as cooperators in the following tables. All data was summarized by year and compared to baseline data collected during the 2006 season. A few graphs at the end compare 2012 to the five year average to look at the impact of the 2012 drought on the older age class bucks.

RESULTS AND DISCUSSION

Doe Harvest Results

Figure 1. Age structure of does harvested during 1st shotgun season by cooperating deer hunters at Lake Shelbyville. *Note the jump in older age class does in 2008 and 2009.*

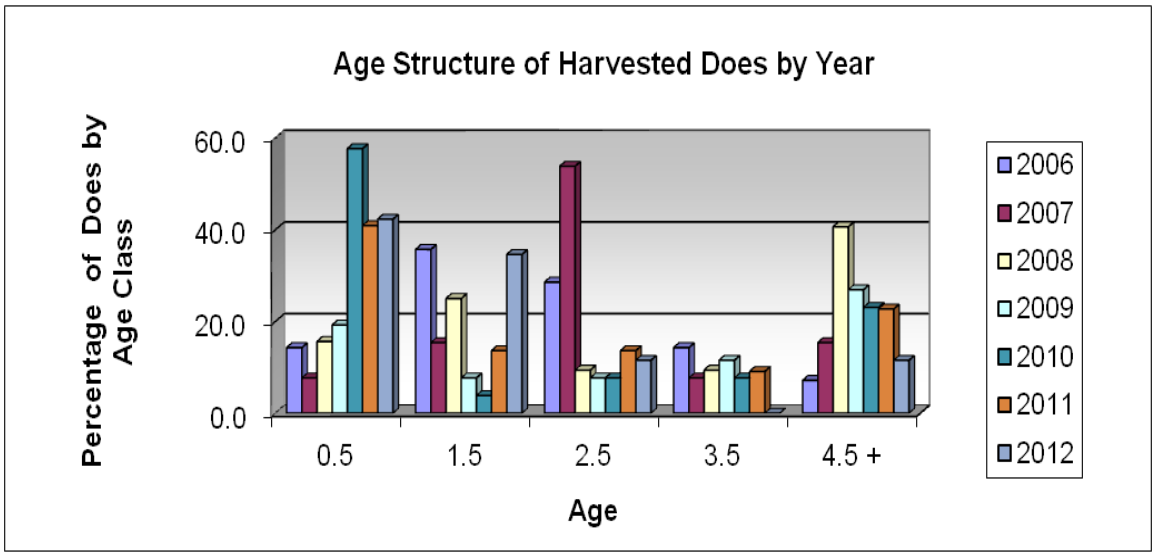
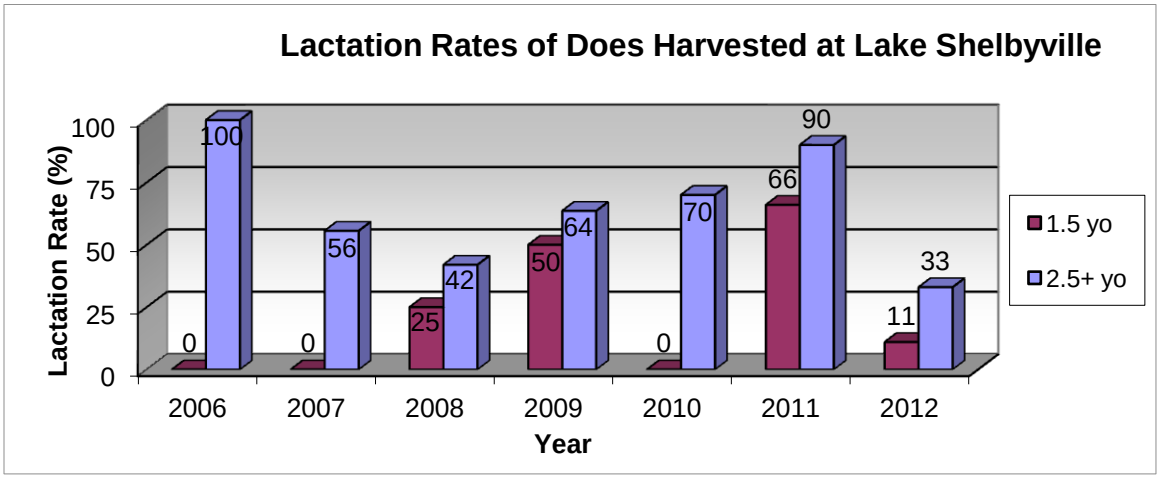


Figure 2. Lactation rates of 1.5 year old and 2.5+ year old (adult) does checked by cooperating deer hunters at Lake Shelbyville.



Lactation is a term for whether a doe is "in milk". This information is important because it provides evidence that a doe successfully raised one or more fawns. The percentage of adult does (2.5 years old or older) lactating in a given year provides an estimate of the reproductive health of the herd and the number of fawns that were recruited into the population. A lactation rate of 80 percent or higher for adult does is considered excellent. The actual lactation rate is generally higher, but does that give birth early, lost a fawn, and/or weaned their fawns early often are recorded as "dry" when harvested during the season. In the northern and Midwestern portions of the whitetail's

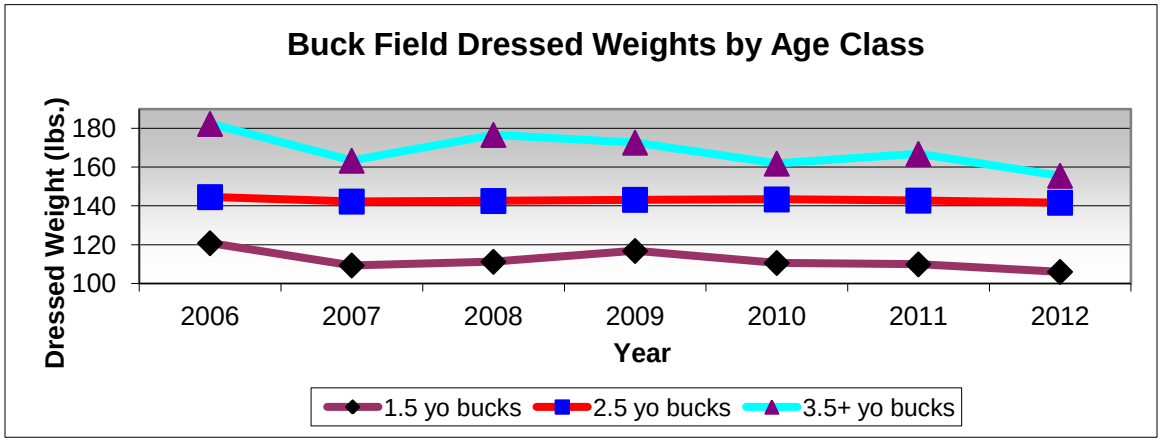
range, a moderate to high percentage of yearling does may be lactating during the hunting season indicating they bred as fawns. This is a very healthy situation and a sign of high quality habitat. Lactation rates this year dropped to 33% for mature does and 11% for 1.5 year old does. However, this does not track well with the high numbers of fawns that showed up in the harvest this season. Because of this, we suspect the lactation rates were actually higher than reported. The higher incidence of fawns showing up in the harvest could also have been due to the loss of the mother to EHD and the subsequent orphaning of the fawn making the fawns much more vulnerable to harvest. Only 24% of the doe sample was made up of does 2.5 years and older. All others were either fawns or 1.5 year olds.

Note the uptick in lactation rates for the adult does since 2008. This tracks closely with the increased doe harvest on the lake (see Figure 7). Basically, the lower the herd density the healthier the herd is. In 2006, the first year of the survey, there were few adult does in the harvest – we suspect that due to this small sample size or possibly reporting errors, that the 100% lactation rate is not accurate. As dramatic as the drop was in 2007 and subsequent years it is unlikely that this was correct.

Buck Harvest Results

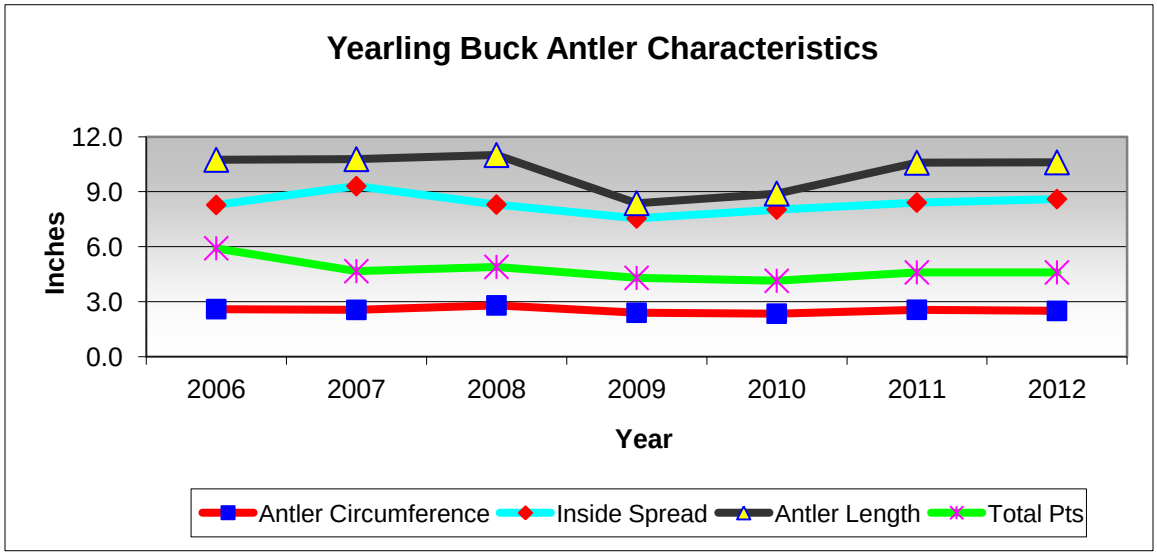
All bucks are weighed, aged, and antler measurements taken to include inside spread, main beam length, number of points and basal circumference. We typically see annual variations in antler characteristics across age classes. We suspect this is due to environmental factors from the previous fall/winter expressing themselves in antler growth. A good mast crop coupled with a mild winter should produce better antler growth the following year as bucks are in excellent shape going into spring. Poor mast years and/or harsh winters would have the opposite effect. Drought during the antler growing season could also have a negative impact on antler growth. In 2012 much of the Midwest experienced such a drought which definitely had an impact on antler growth.

Figure 3. Field dressed weights by age class and year for all bucks checked by cooperating deer hunters at Lake Shelbyville.



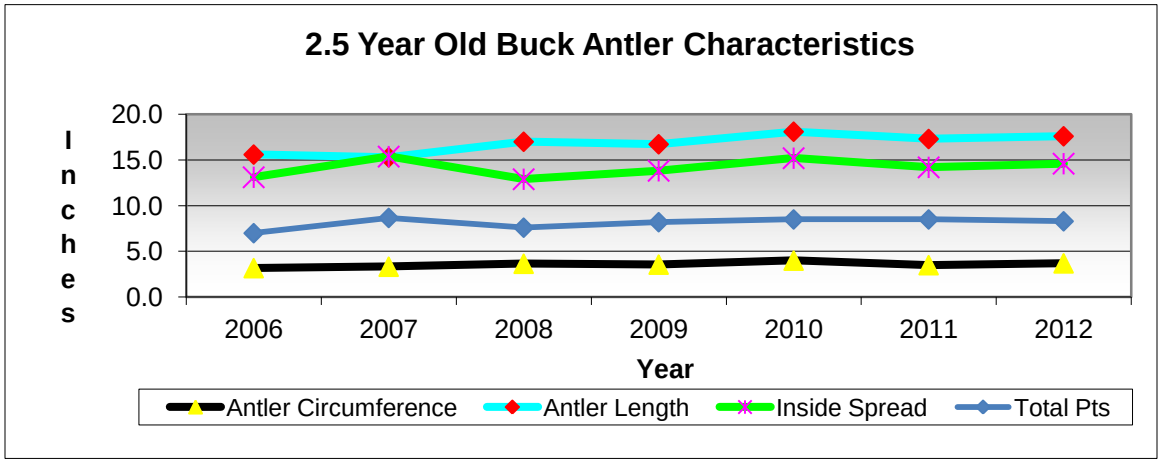
Field dressed weights of bucks decreased across all age classes with the most dramatic decrease in the older bucks. Yearling bucks are the best indicators of health when analyzing field dressed weights among bucks because they do not lose as much weight during the rut as the older age class bucks (which are more active participants). The 3.5+ year old age class weights dropped 15 pounds in 2012 when compared to the five year average. Most likely due to drought impacts since antler measurements decreased significantly as well.

Figure 4. Yearling buck antler characteristics by year checked by cooperating deer hunters at Lake Shelbyville.



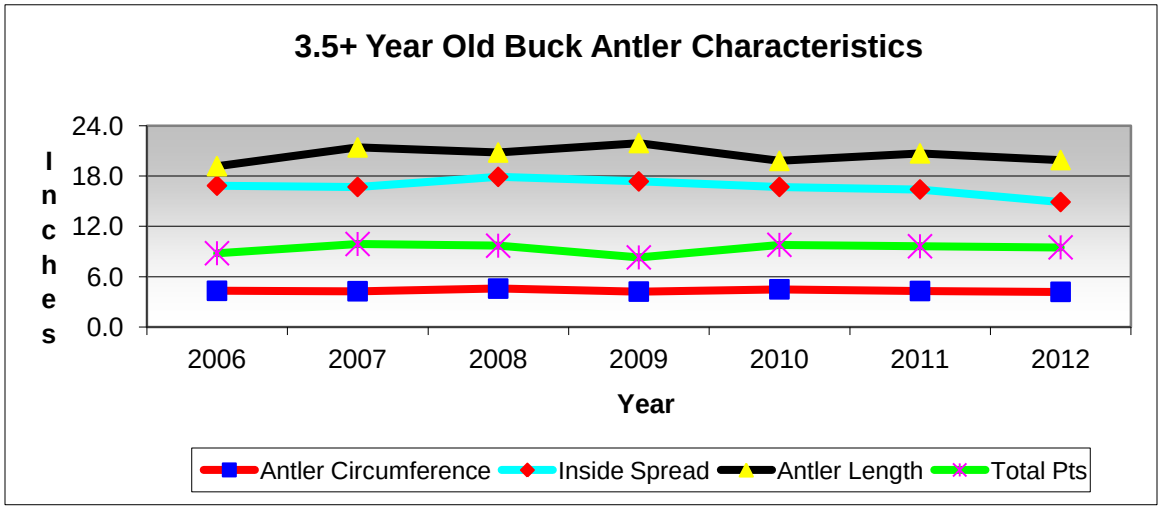
Antler measurements taken from yearling bucks stayed roughly the same as 2011, with the heaviest buck in this age class field dressing 121 pounds.

Figure 5. Antler characteristics of 2.5 year old bucks by year checked by cooperating deer hunters at Lake Shelbyville.



The 2.5 year old age class varied very little from 2010. Very few of these bucks would make the Pope and Young (archery record book) minimum score of 125 inches of antler. This note is included because many hunter's contact us each year expressing an interest in harvesting a trophy buck. A buck meeting the archery record book standard of 125 inches is considered by many to be a trophy buck. The heaviest buck in this age class in 2012 was 155 lbs. field dressed.

Figure 6. Antler characteristics of 3.5+ year old bucks by year checked by cooperating deer hunters at Lake Shelbyville.



In the 3.5+ year old age class there was an across the board drop in all but total number of points. Inside spread had the greatest drop at 2.1 inches when compared to the 5 year average. The heaviest buck in this age class in 2012 field dressed 185 lbs. and was 3.5 years old.

Inside Spread – An Excellent Indicator of Age

A public meeting was held in July of 2008 to discuss adding antler restrictions to the lake regulations in order to protect young bucks. This section was added to point out that the best indicator of age for Lake Shelbyville bucks is inside spread (the distance between the antler beams) and **not** the total number of points. The data in the table below comes **directly** from antler measurements taken from known age class bucks harvested on Lake Shelbyville over the last seven seasons. The total number of antler points is a very **poor** indicator of age and would protect very few bucks as indicated by Table 1. Under these 2 scenarios, a 16" inside spread restriction clearly protects many, many more bucks than a point restriction does. If a hunter wants to ensure they pass on younger bucks, look for an inside spread as wide or wider than a bucks ears and more than 70% of the time the buck will be 3.5 years or older. In 2012, this would not have worked as well as only 30% of the 3.5+ year old bucks would have been legal.

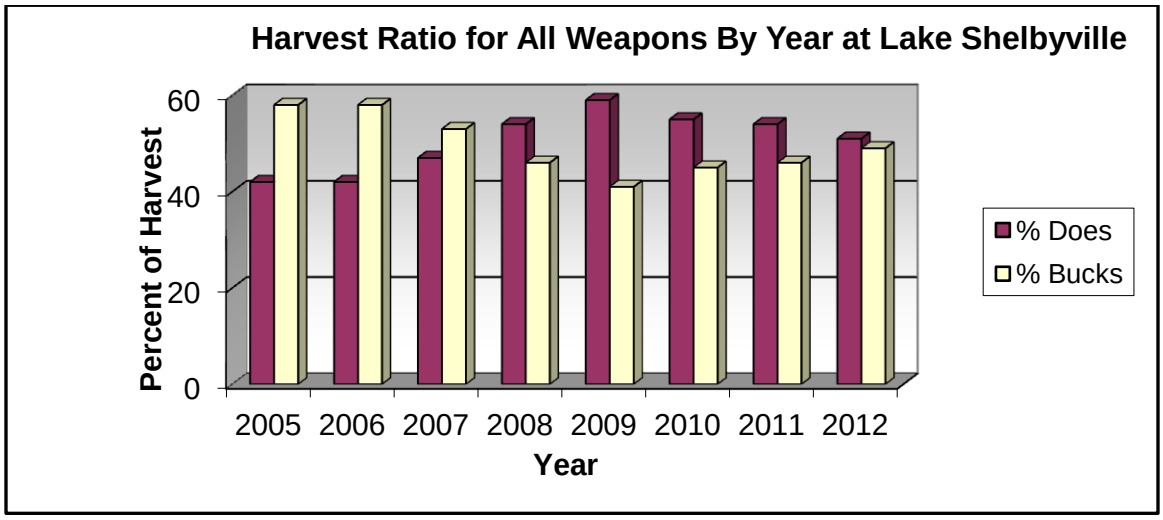
Table 1. Percentage of antlered bucks on Lake Shelbyville that would be **protected** from harvest under 4 points to 1 side rule or a 16" inside spread restriction. The last row is this year's data. It was added to show the impact of the drought.

Age Class (Years)	4 Points to 1 Side	4 Points to 1 Side (2012)	16" Inside Spread	16" Inside Spread (2012)
1.5	78%	79%	100%	100%
2.5	9%	11.1%	79%	100%
3.5+	1.5%	0.0%	31%	70%

Seven out of 10 bucks in this age class in 2012 had inside spreads less than 16".

Harvest Ratios by Year on Lake Shelbyville

Figure 7. Deer harvest ratios for all weapons combined for the 2005 - 2012 seasons as reported by the Illinois Department of Natural Resources for Lake Shelbyville.



In 2008, Either Sex (ES) shotgun tag numbers were reduced and replaced with Antlerless Only (AO) tags. Since then we have seen a dramatic shift in the harvest ratios of does: bucks over the last eight seasons for all deer killed on Lake Shelbyville/season. In 2005 and 2006, approximately 160 **more** bucks than does were harvested off the Lake. In 2007, we added a special antlerless only (AO) muzzleloader season to Lake Shelbyville with 100 AO tags in an effort to increase the doe harvest, bringing the harvest ratio up to 47% doe/53% buck. In 2008, 40 of the Either Sex shotgun tags were changed to AO and 80 additional AO tags were added. This shifted the harvest ratio to 54% doe/46% buck in 2008, 59% doe/41% buck in 2009, 55% doe/45% buck in 2010 and 54% doe/46% buck in 2012. Note the high percentage of does 4.5 years and older harvested in 2008 – 2010 in **Figure 1**. A number of the does we checked were 8.5 and older with one 14.5 year old doe in the group in 2008 and an 11.5 year old doe in 2011! This dramatic jump in older age class does is not surprising since the does have historically been harvested at a lower rate than bucks, thus allowing the does to advance in age. We expected to see the doe age classes shift more towards younger does and it has already been happening, starting in 2010 (Figure 1). A shift to younger age classes indicates a reduction in herd size.

Lake Shelbyville Buck Age Structure

Figure 8. Age structure of **antlered** bucks checked by cooperating deer hunters at Lake Shelbyville.

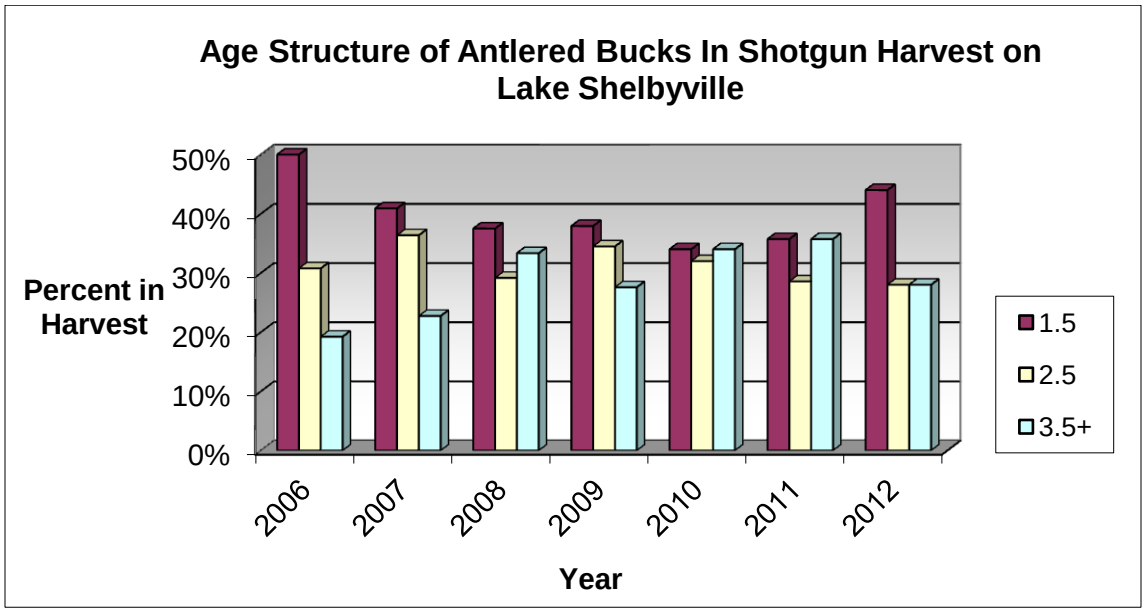
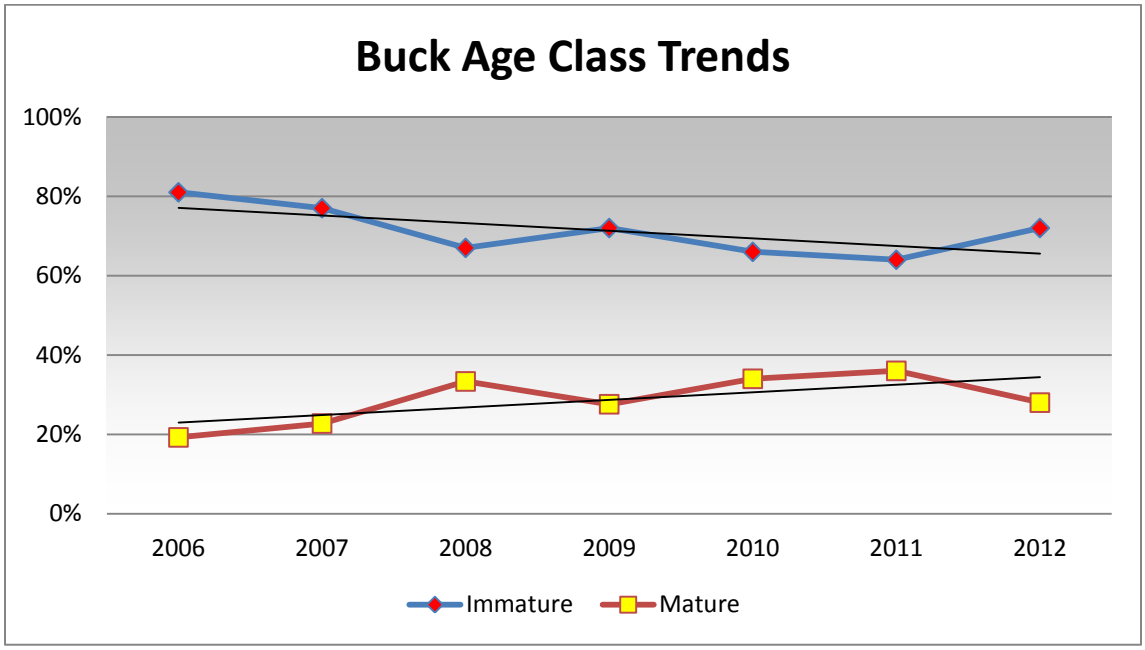


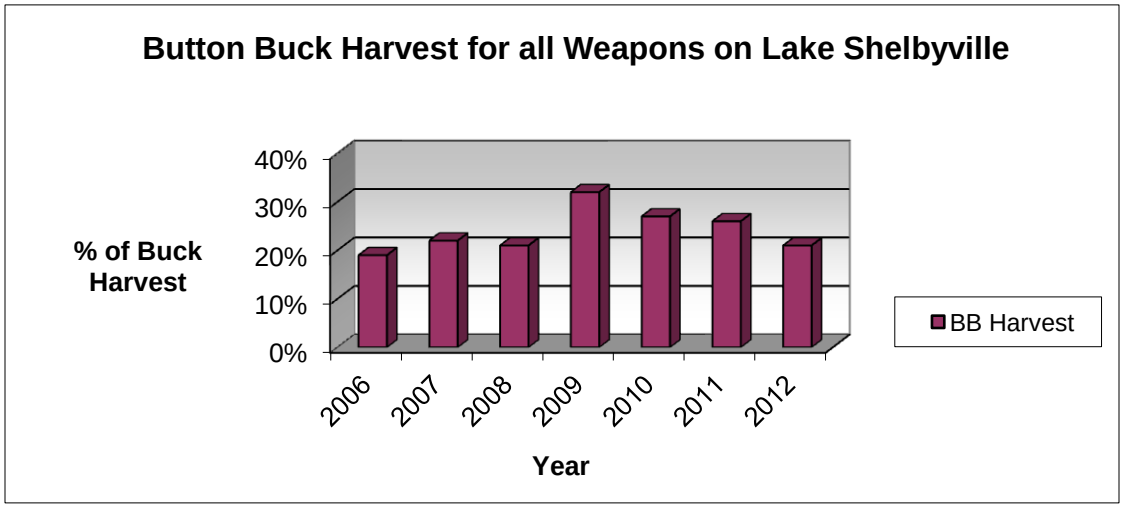
Figure 9. Lake Shelbyville buck age class trends from 2006 - 2012.



This section was placed after the harvest ratio results to point out the shift in older age class bucks. Even though we do not have data prior to 2006 on age structure – there is little doubt it was similar to 2006. Notice the decreasing trend in immature bucks and increasing trend in 3.5+ year old bucks – a decrease of 17 % in immature bucks and an increase in 17% of 3.5+ year olds since 2006. This is undoubtedly due to the reduction in

Either Sex firearm tags and a shift to harvesting more does. This year we saw a decrease of 8% in the 3.5+ age class. We feel this is likely due to the outbreak of Epizootic Hemorrhagic Disease (EHD) that hit central Illinois in 2012. EHD and its impacts are discussed on page 11.

Figure 10. Percentage of Button Bucks in Buck Harvest on Lake Shelbyville.

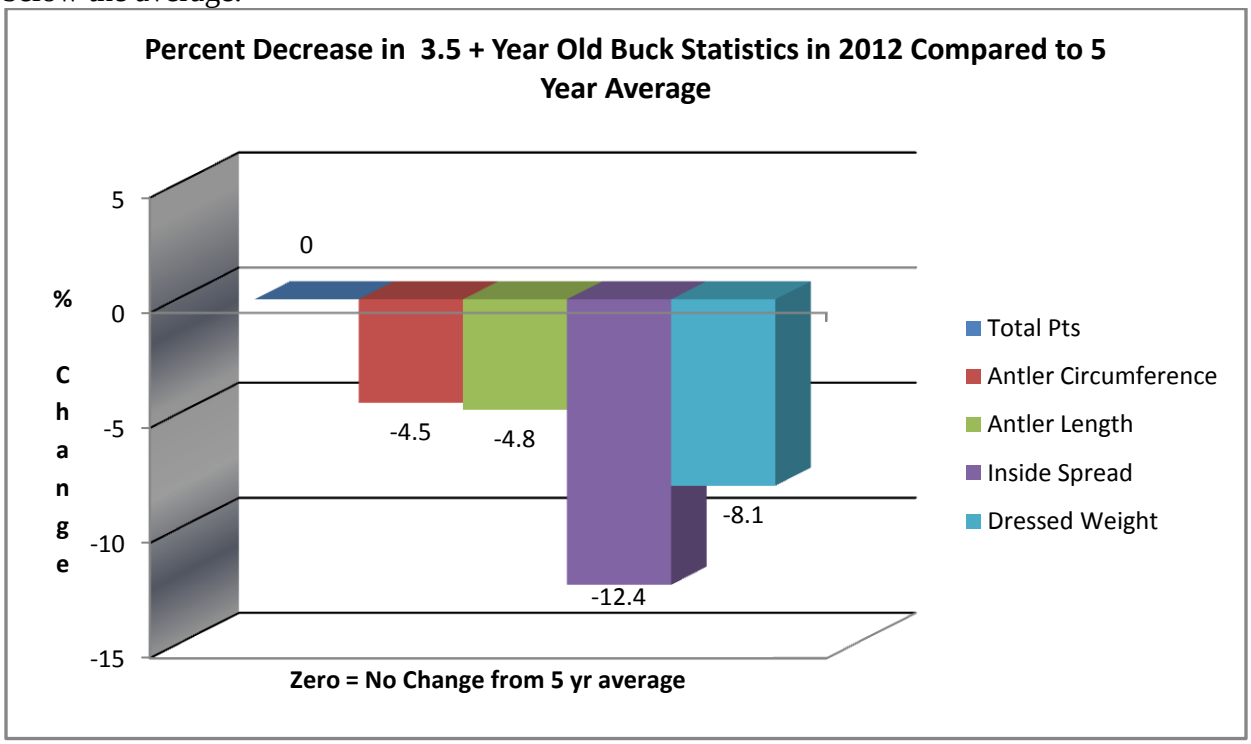


We've included Figure 10 to point out the high incidence of button bucks (buck fawns) showing up in the harvest on Lake Shelbyville. Almost 1/3 of bucks killed on Lake Shelbyville in 2009 were buck fawns. This is obviously a consequence of a shift towards increasing the doe harvest on the lake. While some button bucks showing up in the harvest is of little consequence, high button buck harvests **will** impact the number of bucks advancing towards the older age classes in subsequent years. We would like to see button bucks make up no more than 10 – 15% of the buck harvest. While it sometimes can be difficult to tell a button buck from a doe it can be done if a few simple steps are taken before an arrow is loosed or the trigger pulled. Generally, button bucks are more curious and bold and are often the first one to enter the fields, etc. Wait for a few minutes and allow other deer to filter into the area so a size comparison can be made – it is difficult to judge the size of a single deer. Quite often a single antlerless deer by itself is a button buck – give them a pass if they are clearly by themselves. When first spotted, check their head for the "buttons", which often can be seen with the aid of binoculars or scope. At bow ranges, the "buttons" are often visible to the naked eye and deer with very short muzzles and a "fuzzy" appearance are often fawns. We encourage you to take a few moments before the shot to ensure it is not a button buck.

Drought of 2012

Below is a comparison of all biological data collected from 3.5+ year old bucks harvested in 2012 (N = 10) and the previous 5 years average (2007 – 2011) for the same parameters (N = 56). In 2012, all antler measurements decreased except total number of points with the largest drop seen in the inside spread. The five year average was 17.0 inches inside and it decreased to 14.9 inches, a 12.4% decrease in inside spread. The average weight decreased from 169 pounds to 155 pounds – a decrease of 8.1%. Almost assuredly this decrease was due to the effects of the drought we experienced in 2012. To put this in perspective, a deer that scored 150 inches in 2012 would likely have grown an additional 11 inches of antler in a normal rainfall year.

Figure 11. Comparison of measurements taken from all 3.5+ year old bucks harvested in 2012 to the previous 5 years average. A zero change means there is no difference, a positive number would mean an increase over the average and a negative indicates it was below the average.

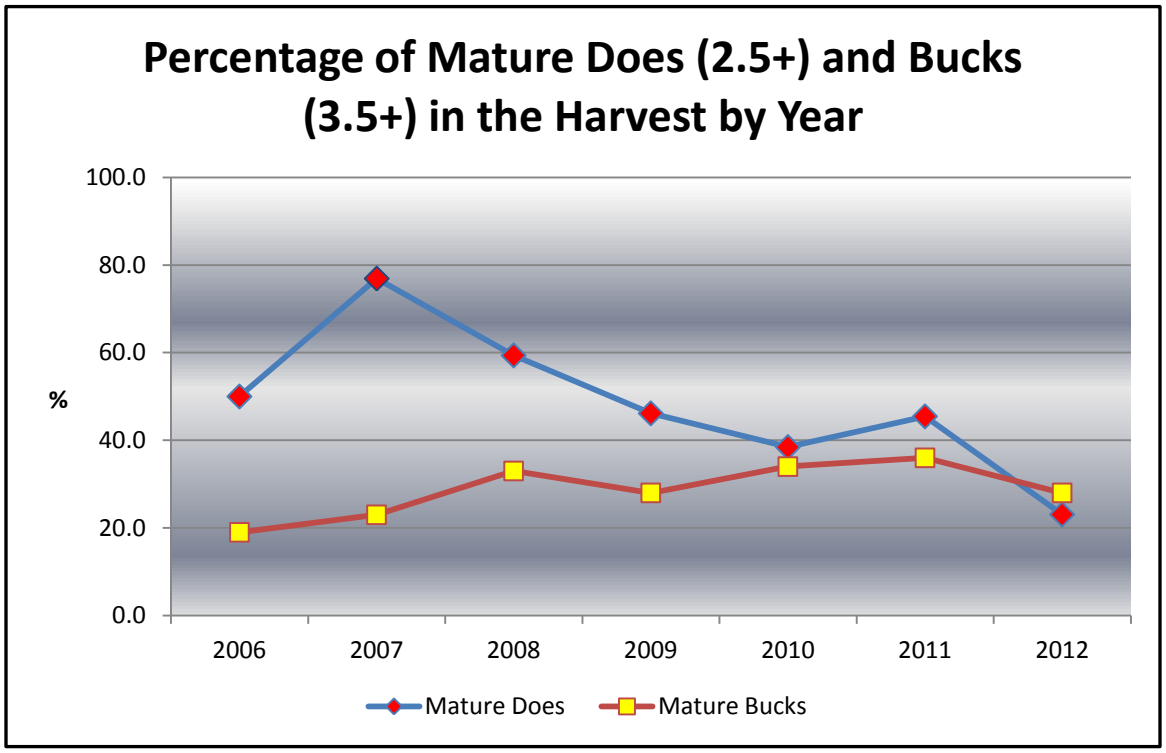


Epizootic Hemorrhagic Disease (EHD) – The Wildcard of 2012

In addition to the drought of 2012, the appearance of EHD in the herd undoubtedly took a toll on the deer; how much we do not know at this time. EHD is the most important viral disease of white-tails in the US, although frequency and severity varies by region. The virus that causes EHD is transmitted by biting flies (midges) commonly known as sand gnats, sand flies, no-see-ums or punkies. The disease is characterized by a sudden onset of illness where deer initially lose their appetite and fear of man, grow progressively weaker, often salivate excessively, develop a rapid pulse and respiration rate, and fever (affected animals frequent bodies of water to lie in to reduce their body temperature) and finally become unconscious. Hemorrhage and lack of oxygen in the blood results in a blue appearance of the oral mucosa, hence the name "bluetongue". Eight to 36 hours following the onset of observable signs, deer pass into a shock-like state and die.

Seven of the 63 deer (11.1%) checked through the station in 2012 showed signs of chronic EHD in the form of sloughing hooves. In these surviving deer, the fever at the onset of the disease often causes growth interruption in the hooves and later peeling or sloughing of the hoof walls. Interestingly only two of the seven deer (28.5%) were does even though does represented 40% of the check station total. Speculation is that the adult doe segment of the herd was hit harder than the bucks due to the stress of raising fawns. This speculation is due to the sharp decline seen in the older age class does in the harvest, low lactation rates and the high incidence of fawns and yearlings in the harvest. Fawns and 1.5 year old does (typically low percentages of this age class raise a fawn) made up 77% of the sample in 2012. There were obviously fawns in the harvest so lactation rates should have been much higher than what was observed in the adult does. We speculate that the high incidence of young deer in the harvest was due to hunters shifting their harvest to these younger does because they weren't seeing the older does. These young deer were likely more visible due to the lack of guidance from an older doe. An 8% drop was also observed in the older age class bucks, likely due to EHD loss. The buck below is a Shelby County buck that was found in mid-September, shortly before he died.

Figure 12. Percentage of mature bucks and does in the harvest of the last seven seasons. Note the 50% decrease in the number of mature does from 2011 to 2012.



Note in the chart above that in 2007 almost 80% of the does were 2.5+ years of age. Poor fawn recruitment was experienced that year with only 12% of the total harvest made up of fawns (both button bucks and doe fawns). Excluding 2007 from the average, the number of adult does in the harvest over the last 6 years averaged 47% (45% in 2011). In 2012 the percentage of mature does in the harvest (2.5+) was 23% - down 50% from the previous year. Because fawns made up a high percentage of the harvest, we can make an educated guess that we lost many of the adult does after weaning their fawns – likely in September and October. Reports of EHD deer deaths spiked in September on the lake with approximately 100 reported deer; many of them does. With the high incidence of young does in the harvest and low numbers of adults, we expect there to be fewer deer next season. For this reason, we are reducing the number of antlerless tags for shotgun and muzzleloader season for the 2013 – 2014 season.

We appreciate your support in helping us monitor herd health at Lake Shelbyville. This allows us to ensure no long term habitat damage is sustained at Lake Shelbyville and that our herd remains healthy. By seeing how the data you provided is being used, we hope you continue to support our efforts in the future.

Sincerely,

Ricky D. Raymond
Operations Manager