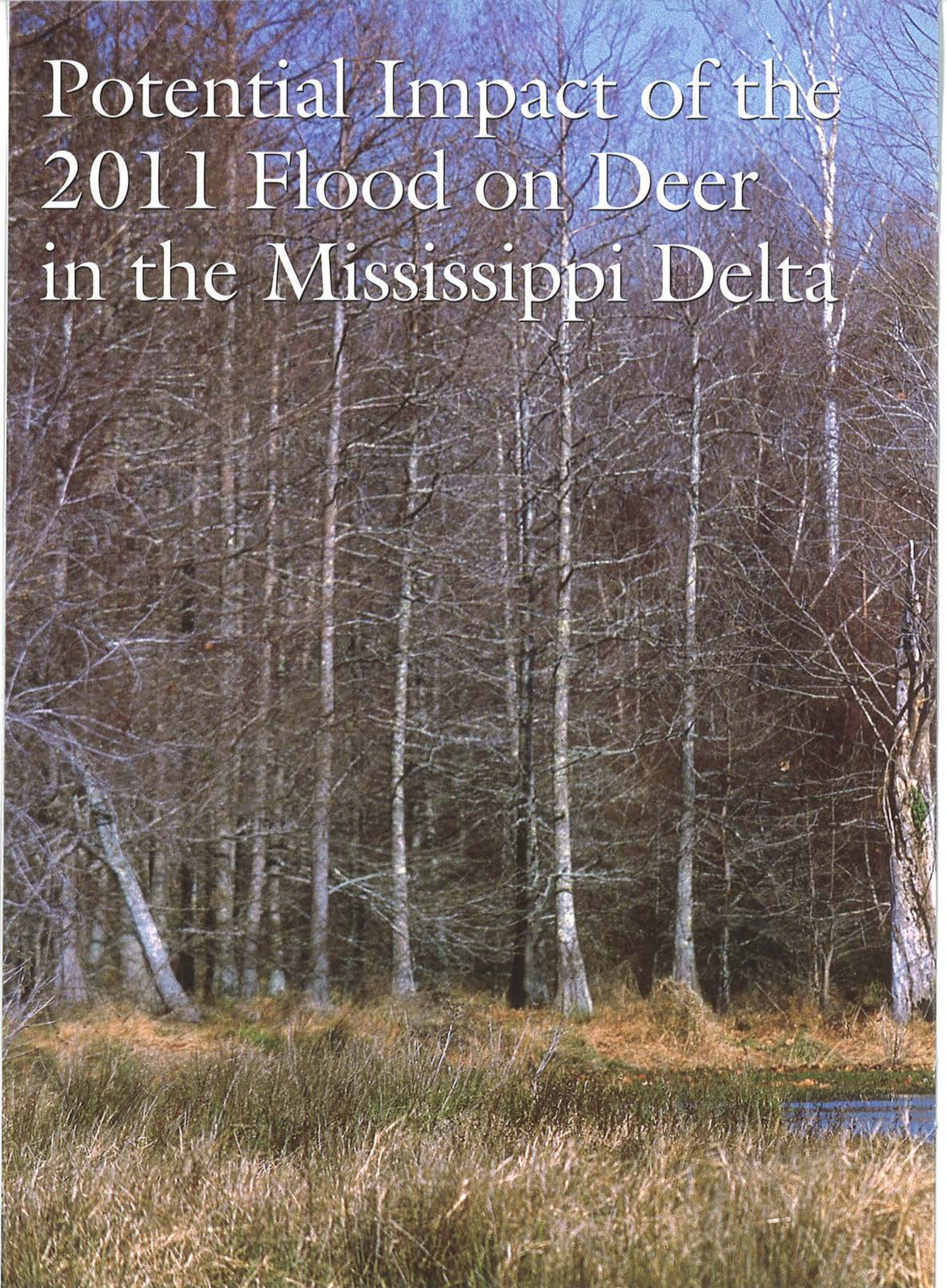


Potential Impact of the 2011 Flood on Deer in the Mississippi Delta



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The Mississippi River Flood of 2011 has many hunters understandably concerned about the impact on deer throughout the Delta. By any historical reference point, the 2011 Flood was of epic proportions, and epic impacts on deer populations might be expected. However, one must realize that deer have lived with the river's flooding longer than we have and are adapted to minimize the challenges caused by the annual fluctuations in water levels. In this article, we will discuss what the Mississippi State University Deer Lab research teaches us about deer behavioral adaptations to periodic flooding. We will also present a general plan that deer biologists with the Mississippi Department of Wildlife, Fisheries and Parks will be recommending on properties affected by the flood. This is a plan you can put into practice to minimize the river's impacts and monitor the deer population on your property.

Prior Research on Deer Movements during Floods

Davis Island, Miss., is a 23,000 acre island in the Mississippi River just south of Vicksburg. Prior to the great flood of 1927, it was a peninsula extending out from Vicksburg on the Mississippi side of the river. But the flood cut through the peninsula and changed the course of the river, leaving the island along the Louisiana side.

On May 27, 1983, the Mississippi River reached 49.3 feet at the Vicksburg gauge, or about six feet above flood stage. At this level, less than two percent of Davis Island remained out of water. There were 14 deer (four bucks and 10 does) radio-collared on the island. Four bucks and eight of the 10 radio-collared does left the island before the river reached its peak flood level, swam to Louisiana and crossed the main river levee. One buck left early January, when the river approached 41 feet, and was subsequently killed by hunters on the Louisiana side of the Levee.

Five deer left the island between January 31 and May 11, as the water rose from 41 to 43 feet. The last six deer left the island sometime between May 11 and May 27, as the river reached its peak. Of the two does that stayed on the island, one was found dead after flood waters receded, and the second survived. This survivor apparently took refuge on an old slave levee, which would have been the only land out of water.

All deer that left the island, except the buck that was harvested by hunters, returned to their normal home ranges on Davis Island when the river dropped to 33 feet or less on the flood gauge. These 11 deer returned to the island between June 22 and August 8.

Five of the 14 original deer were tracked through 1984, when the river again exceeded flood stage and reached its highest level of 45.8 feet on May 25. Four of the five left the island between April 12 and May 11 as the river reached 42 feet on the flood gauge. The fifth deer left when the river hit 45 feet on May 21. All deer left the island at a lower flood gauge level than they had the previous year. During these flood conditions, it was not uncommon for some deer to move 10 to 15 miles from their normal home range, and one buck was recorded 20 miles away.

Traditional Migration Routes

Additional research during 1993-95 showed how other radio-collared deer responded during flood conditions on Davis Island. Eight of nine adult bucks left the island during the 1993 flood when water got to 43.6 feet on May 18. Four of five bucks left during the 1994 flood when the water got to 46 feet on May 3. Showing the same adaptive behavior as the deer during the 1980s, most deer left the island well before the river rose to maximum flood stage level. In general, deer left when the river was still below flood stage and at 39-41 feet on the Vicksburg gauge. All of these bucks survived through flood conditions and returned to their home ranges on the island when waters receded.

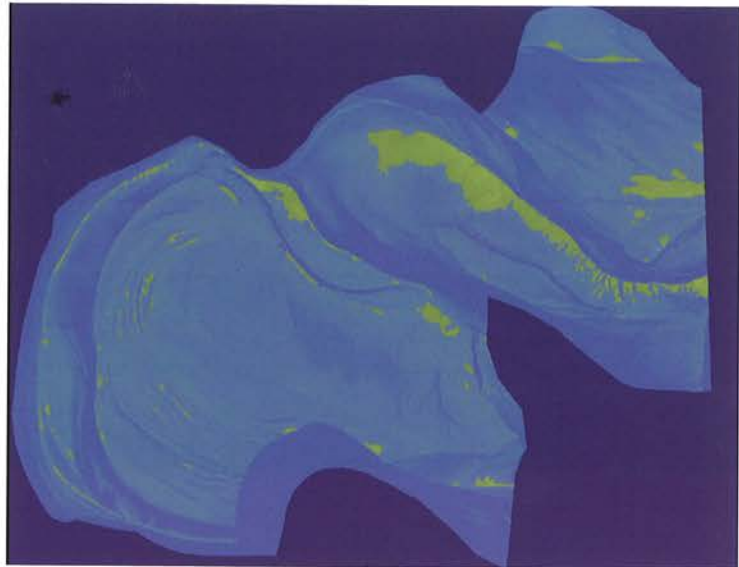
Kings Point is another large island on the Mississippi side of the river, to the north of Vicksburg at the confluence of the Mississippi and Yazoo rivers. Deer on Kings Point behaved very much like those on Davis Island, moving long distances to high ground when the river reached 39-40 feet on the Vicksburg gauge. Five of nine Kings Point deer left in the 1993 high water, and four of five left in the 1994 high water. Several other radio-collared bucks along the river just north of Greenville, Miss., responded in 1994 similarly to the Davis Island and Kings Point deer, moving to dry land

outside of the levees when the river approached flood stage. All of these deer survived the flood conditions.

In another interesting note, two yearling bucks radio-collared on Kings Point during 1991 and 1992 actually swam the Mississippi River and were later harvested in Louisiana. These two bucks did not leave during a flood stage of the river, but left as part of a normal dispersal occurrence for young bucks. However, what is noteworthy about their departure from Kings Point is they swam a mile-wide river with a very strong current, demonstrating how well deer can swim.

The above studies tell much about the effect of flooding on deer that reside in flood prone areas along the Mississippi River. Deer appear to have traditional migration routes that allow them to escape flood conditions. Most of these deer survive the flood and return to their normal home ranges after the flood recedes.

Several long-time members of a hunting club on Davis Island shared their memories of the 1973 flood with Jacobson. That



These two maps show Davis Island at crest during the 1983 Flood (top) and the 2011 Flood (below). Those lands not inundated are shown in green.

year, flood waters reached 51.6 feet on the Vicksburg gauge. Afterwards, the members expected not to be able to hunt deer for a number of years, as they were sure most of the herd drowned. To their surprise, the 1974 hunting season turned out to be one of the best hunting seasons the club had ever experienced.

Let's fast forward to the 2011 Flood conditions, when water rose to 57 feet at Vicksburg. Clearly, some deer mortality can be expected to result from this flood. However, as long as their traditional refuge areas of dry land were available, most deer will survive and eventually return to their normal home range areas. Conditions certainly would be more difficult for deer that reached a "normal" high ground area, one that would have provided a safe haven during most floods, only to be forced from it as the 2011 river levels inundated that outcrop. These animals may have been required to swim great distances after having spent stress-filled days with limited food on dwindling acreage.

How the Flood May Affect Deer Populations

Fawn recruitment may suffer more than adult survival, depending on the timing and depth of the flood relative to fawn birth. Survival of newborn fawns could be reduced if adult females are crowded onto upland habitats with limited forage resources for a month or more prior to their birth. We know that significant declines in forage quality and quantity can affect fetal development and, ultimately, the survival of new born fawns. Fawns that survive the flood event will likely return with their mother to her normal home range. However, she may delay her return until her fawn is large enough to handle the rigors of the return trip. Thus, late fawning females may not return to their batture habitat until well into the fall. Camera surveys conducted at the conclusion of the 2011-12 deer season will provide valuable information regarding fawn recruitment. Hunter observations of does and fawns will also provide critical information on the status of the 2011 fawn crop.

Any type of impact on fawn recruitment will be reflected in relative population composition in later years. If fawn recruitment is particularly low during 2011, then the relative population of older bucks may decline as the 2011 cohort reaches harvestable ages in subsequent hunting seasons, such as the 2013, 2014 and 2015 seasons.

A historical analysis of the Davis Island deer herd by MSU Deer Lab researchers in 2005 revealed that body weight of young and adult deer, and lactation rate of young does, was affected most by flooding. Lactation rate collected from does in the hunting season indicates how successful does were at rearing their fawns. A low lactation rate usually means low fawn production or survival. Following severe flooding events, such as the devastating Flood of 2011, body weights will likely be below average. However, the extent of the decrease in body weight will be influenced by the quality of habitat in areas where deer sought refuge, which varies throughout the Delta.

We expect reproduction to be lower for younger deer (yearling and 2.5-year does). These younger does are relatively inexperienced in coping with long-distance movements to avoid flood waters, and the impact of this stress will likely affect their ability to birth and raise their fawns. Surprisingly, MSU Deer Lab researchers did not see an effect of flooding on mature does. Evidently, their experience with past floods and their larger, more resilient bodies can handle the rigors of stress related to flooding much better than younger does.

What Can You Do?

At this point, it's too early to determine exactly what effect the Flood of 2011 had on the deer population in your area. Over the next year, deer biologists and managers will incorporate monitoring strategies to gauge how deer populations are responding. Diligent record keeping by hunting clubs will be critical for an accurate conclusion. Hunter observations can play a very important role in determining what fawn production and survival will be this season. Hunters can record the number of adult does and

fawns seen on their property while hunting this fall (bow season is the best time because it's relatively easy to differentiate fawns from adult does); the ratio of fawns per doe provides an index of fawn crop. Lactation data from adult does will also need to be recorded. As we mentioned earlier, lactation rate is another index used to determine fawn production. Camera surveys are another tool that can be used. Calculating the ratio of fawns per doe from pictures can be another important metric used to assess the fawn crop. Lastly, recording body weights of harvested bucks and does will provide information on habitat conditions. All these procedures are what we call "relative measures." That is, there is no set number that is good or bad for a property; it's all relative to what is normal for a property.

If you have been collecting these data on your property in the past, then you can compare your data from the 2011-12 season to data from prior seasons to determine what effect the flood may have had on your deer herd. If you have been working with a biologist from MDWFP or a consulting biologist, they should be able to make this comparison for you.

Occasionally, the Mississippi River approaches flood stage in late December and January, during open hunting seasons for deer. At these times, deer are susceptible to unusual hunting mortality, because they are forced into habitat where they are much more vulnerable. For this reason, hunting may need to be curtailed within certain areas when the river approaches flood stage. There is a law in place that closes hunting season when the river reaches flood stage at Memphis, Helena, Greenville and Vicksburg, and it remains closed until the river is two feet below flood stage.

Be Aware of Potential Anthrax Outbreak

We've been talking about direct effects from floods, but the flood's aftermath can also be of some concern beyond the obvious cleanup of camps and equipment. Environmental conditions following a flood may increase the likelihood of certain diseases of deer. The most significant flood-related disease is anthrax, a bacterial disease that causes internal bleeding and rapid death of great numbers of deer and livestock, and humans are susceptible. Spores remaining dormant in soil from previous outbreaks concentrate in pooling water, and outbreaks tend to occur during dry summer months following periods of heavy rains or flooding. Anthrax outbreaks were documented in the Delta during the 1970s and 1990s, so we know spores are available. Anyone seeing dead deer or livestock carcasses in previously flooded areas should not touch or move the carcasses and should notify their local conservation officer.

In summary, although it's too early to know the extent of direct deer mortality, loss of both young and adult deer may occur in some areas of the Mississippi flood plain. Absence an outbreak of anthrax, the most important effect of the current record flooding of the Mississippi River on deer will likely be a reduced fawn crop in the fall of 2011. Proper monitoring of deer populations as they return to flooded lands using camera surveys, hunter observations and check station data will allow deer biologists and managers to gauge the ultimate impact of this epic flood on deer populations.

Much of this information was written by Harry Jacobson and originally published on ScoutLookWeather.com. In addition to Professor Emeritus Harry Jacobson, contributions were made by Associate Extension Professor Bronson Strickland and Professor Steve Demaris, all of the Mississippi State University, Department of Wildlife, Fisheries and Aquaculture as well as Chad M. Dacus Assistant Chief, Bureau of Wildlife, Mississippi Department of Wildlife, Fisheries and Parks.