SIKA DEER IN MARYLAND—AN ADDITIONAL BIG GAME ANIMAL OR A POSSIBLE PEST *

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The ring-necked pheasant, Hungarian partridge and chukar partridge are foreign species which have become valuable additions to our big game fauna and have offered a tremendous amount of sport to American hunters. Considerable research is currently being conducted by the federal government and many states to find additional desirable game birds. In contrast to this interest in exotic game birds little has been done with exotic game mammals yet these animals may also offer great recreational potentialities. Such a possible new game animal has recently gained prominence in Maryland following observations on a large and expanding herd of sika deer, *Cervus nippon,* existing on the Eastern Shore of Maryland.

The story of this herd of deer began when a private individual released four or five animals onto James Island in 1916. For many years the deer aroused little more than mild interest in a few people. A few were shot as early as 1938 on both James Island and nearby Taylor's Island. In January, 1958 an estimated 270 head existed on James Island which is only about 280 acres in size. By this time this species had, according to local residents, become common on Taylor's Island and was well established on the mainland.

Attention was concentrated on this herd last winter when notice was received that many dead deer had been found scattered over James Island. Investigation in March, 1958 verified these rumors. The cause of this catastrophe was investigated by the authors and Dr. Frank Hayes. The cause of death of one deer, which was autopsied by Hayes, was severe malnutrition and pine oil poisoning (Hayes, 1959). The food supply on the island had been reduced to such a low level that the deer were forced to eat relatively unpalatable materials such as the bark of loblolly pine, the source of pine oil poisons. These deer had eaten pine bark in previous years with no known mortality.

The cause of the mass mortality was a combination of unusual circumstances which is unlikely to be repeated for many years. In August, 1957 an uncontrolled fire swept over almost half of the island destroying a large portion of the animals' food supply.

In addition, the winter of 1957-1958 was unusually severe with record low temperatures and heavy snowfall, placing additional food requirements on the animals. Some of the deer had been accustomed to swimming to the mainland to feed, but for a brief period in February, 1958 ice formed around the island and the deer seemed reluctant to cross this ice. A summary of the circumstances leading to this catastrophe follows:

(1) A large herd of animals had built up which severely overbrowsed their range.
(2) A substantial amount of food was lost in a fire.
(3) Severe weather conditions required greater food consumption.
(4) The feeding area was restricted by an ice barrier around the island.
(5) The deer were forced to eat unpalatable materials including loblolly pine bark containing pine oils.
(6) The combination of very little food, severe weather and consumption of poisonous substances resulted in mass mortality.

A deer drive, using 13 men, was conducted in early May for the purpose of counting the survivors. At this time 109 live deer were counted. This figure, added to the 161 animals found dead, gives a total of 270 animals existing on the island before the mass mortality began in February. This total of 270 animals is an absolute minimum because not all of the dead deer were found and undoubtably some of the living deer managed to stay out of sight and were

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not counted. This density of about one animal per acre is much higher than any attained by white-tailed deer.

A recurrence of this mortality is unlikely during the next year or two because the herd has been reduced to less than half of its former size, the burned over area has produced brush vegetation and the wet summer of 1958 has been an excellent growing season. Furthermore, an attempt will be made to manage the Island herd by increased hunting and by establishing food patches.

What kind of an animal is sika deer? How similar is it to our native white-tailed deer? At present, we cannot answer these questions satisfactorily but we have learned a little from experience and the available literature.

Sika deer are about one quarter the size of white-tails. One and a half year old male white-tail deer from this region averaged about 165 pounds live weight. Nine sika deer, of undetermined age, shot on the island during the past few years averaged 31 pounds live weight. There is some evidence to indicate that the sika deer are heavier on Taylor's Island where present conditions are better than James Island, and were also heavier in former years on James Island. Three deer shot on James Island in 1938 averaged 127 pounds and the one shot in 1940 weighed 150 pounds. The records do not state whether this was live weight or dressed weight. In New Zealand the heaviest animals and the largest antlers were taken during the first few generations following the introduction of sika deer in 1905 (Wodzicki: 1950). Later, weight and antler size deteriorated "due probably to overstocking of the range."

The antlers of sika deer are not curved as are those of white-tailed deer but instead are straight with one or two short tines (one at the base and one near the tip) pointing forward. An "average" head among the James Island herd has antlers between six and twelve inches long and a basal diameter of about 3/4 inch. The longest set seen so far had 14 inch antlers. Antlers are retained into late April and May.

Both sexes and all ages of the James Island sika deer are spotted on the back and sides, these spots being especially prominent in summer. The rump bears a patch of white hairs (the speculum) bordered by a black ring. When startled the deer erect these white hairs creating a prominent white signal as the animal bounces away.

The upper jaw of these deer bears a canine tooth on each side which protrudes 1/4 to 1/3 of an inch. This tooth is sometimes visible in the living animal in the wild. The head of sika deer creates a more shortened and rounded appearance than in the case of the white-tailed deer. The body of the sika deer also appears heavier than that of the white-tail.

Sika deer are sociable animals running in herds of up to 60 animals. In contrast to the graceful bounding of the startled white-tail, sika deer have a stiff-legged jumping gait giving the impression of having bed springs on their hoofs. Sikas take readily to water, frequently negotiating the half mile distance from the island to Taylor's Island. According to local residents these trips are usually made at night and judging from the anecdotes recounted by these people these deer are even more nocturnal in their habits than are the native deer. At night during the mating season the stags utter a loud almost human scream. Both sexes utter a bird like chirp or whistle when startled.

Food habits and preferences are at present difficult to determine because many of the most palatable items have been consumed. Poison ivy, Japanese honeysuckle, and greenbriar were profuse years ago on James Island but have now almost entirely disappeared. These plants are probably on the preferred list of foods. In September, 1958 pokeweed, *Phytolacca americana,* was heavily browsed. Other plants showing evidence of browsing have been red rum, wax myrtle, loblolly pine (needles and bark), American holly, large-toothed aspen bark, and *Spartina patens.* Some of these plants may have been starvation foods. Studies of the food habits of these deer on the mainland, where they are not overcrowded, will reveal more about their food habits.

Sika deer thrive in several other countries where they have been introduced. In England, Vesey-Fitzgerald (1946) states that the sika is the

most hardy of the many deer species existing in England. These deer are "very wild and offer exciting stalking." Five sika deer were presented by the Emperor of Japan to France in 1890. The deer multiplied rapidly and have offered hunting since the beginning of the century. Sikas were introduced into Denmark in 1890 and at present a herd of about 500 exist there in the wild state. They have also been introduced into the Soviet Union, New Zealand and Australia (De Vos, Manville and Van Gelder 1956).

Sika deer offer a number of potentialities as a big game animal. These deer may serve as an additional trophy and offer a different type of hunting to sportsmen. They may help carry the brunt of heavy hunting where hunting of white-tails is heavy and they may be successful in places where waite-tails do not prosper.

On the other hand most exotic mammals that have become established in new lands have become serious nuisances. We can be sure that the sika will compete with native deer. Their relationship with their environment cannot be predicted. We can only guess what will happen. "When new species arrive and spread, even if they do not have the appearance of the explosive invader, they may herald the onset of future changes in the balance of populations. The complete unraveling of any of these relationships will be interesting but often very difficult." (Elton 1958.)

"The most serious problem is that of predicting the consequences of an introduction. The exotic only rarely will occupy the niche which the introducer expects to fill.

"By and large it seems impossible to introduce animals under 'scientifically controlled' conditions, because of our lack of knowledge of ecologic conditions." (De Vos, Manville and Van Gelder 1956.)

Sika deer seem to be well established and spreading on the Eastern Shore of Maryland. At present we cannot predict whether this species will become a welcome addition to our fauna or a serious nuisance. In either case some form of management will probably be desirable. Effective management will necessitate some knowledge of the biology of these animals which in turn depends upon the extent of future studies of this species.

REFERENCES

DeVos, Aantoon, Richard H. Manville and Richard G. Van Gelder. 1956. Introduced mammals and their influence on native biota. Zoologica, 41(4) :163-194.

Elton, Charles S. 1958. The ecology of invasions by animals and plants. Methuen & Co. London. 181 p.

Flyger, V. F. The identity of the exotic deer resident on James Island, Maryland and Assateague Island, Virginia. In press.

Hayes, Frank A. & Emmett B. Shotts. Pine oil poisoning in Sika deer. In press.

Vesey-Fitzgerald, Brian. 1946. British Game, Collins, London. 240 p.

Vidron, Francois. 1939. Le Cerf Sika. Paul Lechevalier, Paris. 56 p.

Wodzicki, K. A. 1950. Introduced mammals of New Zealand. Dept. of Scientific & Industrial Research, Wellington. Bul. No. 98. 255 p.

Whitehead, G. Kenneth. 1950. Deer and their management in the deer parks of Great Britain and Ireland. Country Life Limited. London. 370 p.