DNR
State of Michigan
Department of Natural Resources
Lansing, Michigan

Wildlife Division Report 3216
September 25, 1994

History and current status of pheasants in Michigan

John W. Urbain, Michigan Department of Natural Resources, Box 30030, Lansing, MI 48909.

David R. Luukkonen and Glenn Y. Belyea, Michigan Department of Natural Resources, Rose Lake Wildlife Research Center, 8652 E. Stoll Rd., East Lansing, MI 48823.

Harold H. Prince, Department of Fisheries and Wildlife, Michigan State University, East Lansing, MI 48909.

Population Trends

Pheasant hunting in Michigan was "traditionally" good from 1940 to about 1964. Those fortunate enough to have hunted pheasants in the early 1940's and again in the mid-fifties helped harvest over one million birds annually. In fact, there was only one year (1947) between 1940 and 1964 when the total kill was less than 500,000, and 18 years when the kill exceeded 900,000. During the last 11 years the kill has been less than 200,000 (Fig. 1).

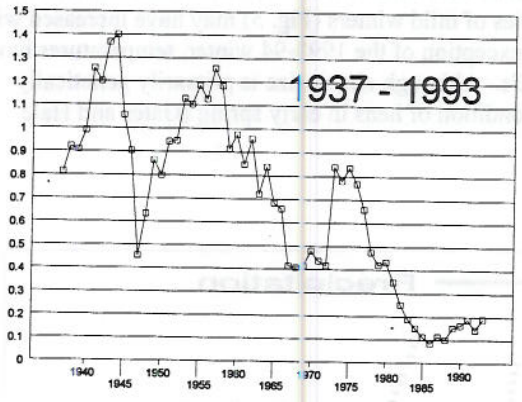

Fig. 1. MICHIGAN PHEASANT HARVEST

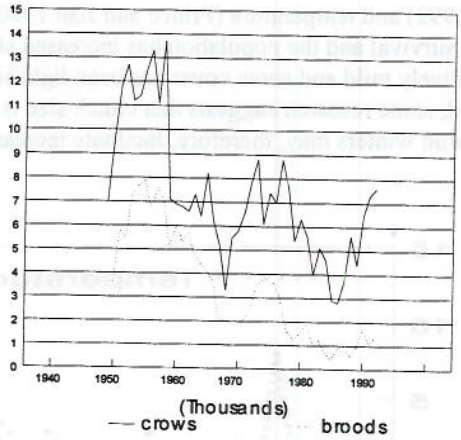

Fig. 2. MICHIGAN PHEASANT CROWS AND BROODS

There were about 500,000 pheasant hunters annually during the 1950's. Hunters gradually decreased as hunting success dropped in the mid-sixties. Pheasant populations improved between 1973 and 1976, with the annual harvest averaging near 800,000 (Some of this increase was the result of the "put and take" program). Then came the first of three very severe winters and pheasant numbers again began to decline. The wild pheasant kill dropped to about 84,000 in 1986, the lowest on record. Correspondingly, pheasant hunters also hit a new low--about 85,000. Since 1986, there has been a gradual increase in the pheasant harvest. There is reason to believe that pheasant populations have recovered in recent years to a greater degree than is indicated by the harvest. Traditionally, biologists felt that hunters took a relatively constant proportion of the fall rooster population. This no longer seems to be the case as evidenced by the more rapid rise in pheasant numbers as indicated by the carrier brood surveys and spring crowing counts. Both show a stronger recovery than the harvest (Fig. 2) Some factors that may be responsible for fewer hunters are: lack of rural contacts, fragmentation of land ownership, landowner reluctance to allow access and the inexperience of the "new" pheasant hunter.

WILDLIFE RESTORATION
Federal Aid Project
funded by your purchase of
hunting equipment

Printed by authority of: PA 86 of 1980
COPIES PRINTED: 600
COST PER COPY: $0.27
TOTAL COSTS: $163.60
Michigan Department of Natural Resources DNR

Reasons for Population Changes

Potential factors responsible for the pheasant decline include adverse weather during the nesting season, predators, habitat succession, changing farming practices, less farming in many areas, pesticides, herbicides, and fungicides. While the reasons for the pheasant decline are not completely understood, most biologists agree that many of the pheasant habitat essentials were lost across the farmlands. Surely the steady drop in total farmland acreage and the increase in average farm size are important factor (Figs. 3,4).

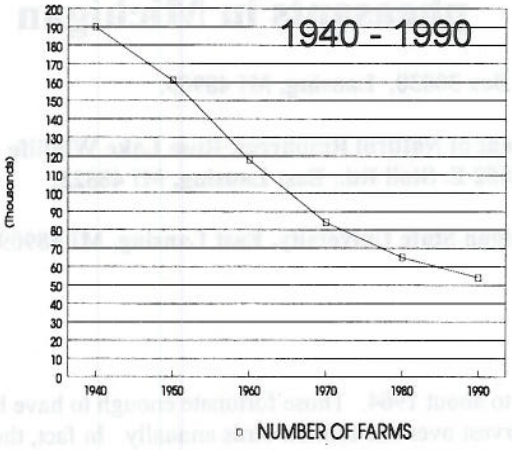

Fig. 3. MICHIGAN FARMS

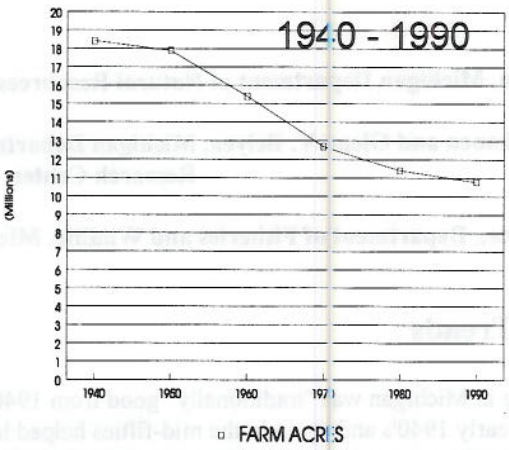

Fig. 4. MICHIGAN FARMS

Winter survival of pheasants has been linked to winter weather conditions such as snow cover (Warner and David 1982, Perkins 1992) and temperature (Prince and Jian 1990). The recent series of mild winters (Fig. 5) may have increased winter pheasant survival and the population has increased slightly. With the exception of the 1993-94 winter, temperatures have been relatively mild and snow cover has been light since the mid-1980's. Although clutch size is primarily genetically controlled, some research suggests that clutch size is affected by the condition of hens in early spring (Gates and Hale 1975). Mild winters may, therefore, facilitate increased production.

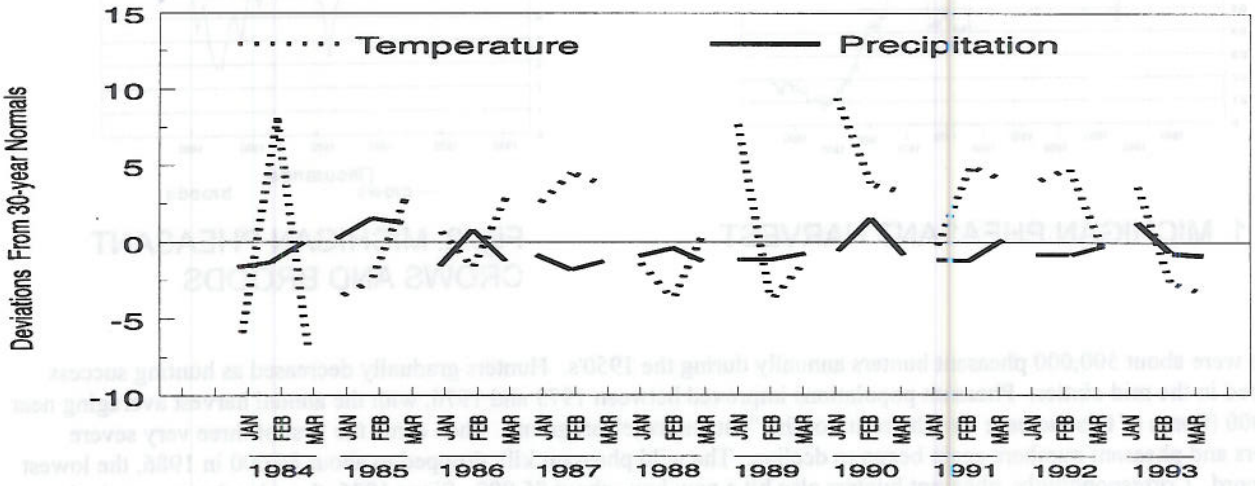

Fig. 5. WINTER (JAN-MAR) WEATHER CONDITIONS FOR SOUTHERN MICHIGAN, 1984-93

Another factor that may have improved conditions for Michigan's pheasants is the federal Conservation Reserve Program (CRP). Pheasant habitat may have improved as a result of CRP in Hillsdale, Barry, Lenawee, Branch and Arenac Counties where 3 to 9 percent of the farmland was included in the CRP. Most other counties have less than 3 percent signed up under CRP, which probably provides only small benefits to pheasants.

Sichuan Pheasants

The Sichuan pheasant introduction project began in 1985 (Squibb 1985). Biologists had hoped that a bird more adapted to Michigan habitat conditions could boost the sagging wild pheasant populations. Because of the improved political climate between the United States and The Peoples Republic of China, there was an opportunity to collect wild eggs from Sichuan Province of China and from those eggs maintain a captive population. The hope was that a pheasant race that nests in more brushy and forested habitats might be better adapted to Michigan's non-agricultural habitats than the Michigan ring-necked pheasant which seems to be more dependent on an agricultural based habitat. This is especially true in light of the fact that more of southern Michigan is becoming non-agricultural. While optimistic, the potential for high predation rates in these habitats was recognized as a possible limitation at the initiation of the experiment (Prince et al. 1988).

Generally, pheasants and mature trees don't mix well. Where woodland cover exceeds 20-30%, ring-necked pheasant populations tend to be lower than in landscapes with few trees (Wagner et al. 1965). This might result from the fact that mature trees provides almost no food or cover for pheasants and that pheasants are more vulnerable to predation where agriculture does not dominate the landscape (Wagner et al. 1965, Peterson et al. 1988). Trees provide hunting perches, nest sites and concealment for some important pheasant avian predators such as red-tailed hawks and great-horned owls. This may have the effect of increasing raptor populations near locations where pheasants nest, roost, loaf or feed. Certainly, populations of these raptors have increased in Michigan and other midwestern states (Peterson et al. 1988).

A potential advantage of the Sichuan project was the introduction of new genetic variation into a declining pheasant population. The combination of a history of artificial selection of ring-necked pheasants in captivity and a population bottleneck during initial introductions are reasons for loss of genetic variation. The declining density and low numbers of pheasants in the 1980's added to this problem. There was a suspicion that the genetic variation was not large enough in our wild pheasant population to adapt to the changing habitat conditions. This was not a new idea (Trautman 1982), but Michigan was in a unique position to test it.

For these reasons, the Sichuan experiment began with the release of pure-strain Sichuan's in 1987. Small groups of Sichuan pheasants totaling 50 to 60 in number were released on alternate square-mile blocks covering an entire township. Each release township received about 500 to 600 birds. To date, 96,000 have been released in the priority sites of southern Michigan. Evaluation of releases usually employed some form of marking and monitoring after release of the birds. Michigan has been committed to fully evaluating the Sichuan program.

The program has necessarily followed a strategy of "adaptive management." Each breeding season brought improvements in the rearing and handling of the pheasants. At the same time, adjustments were made in the release protocols to accommodate research findings from radio-tagged pheasants. The sentiment among many of the Wildlife Division employees that have been involved with this program is that: "we have given this program our very best effort." The challenge now is to evaluate what impacts the program has had.

Some wildlife biologists believe that up to 20 years are needed to properly evaluate introductions. A common pattern is an immediate response followed by a long term decline. Livingston County was chosen as the first site for release because it was an optimal release area based on evaluation factors. The Livingston County study area received 2,598 Sichuan pheasants from 1987 through 1989. Although, initial studies of reared and released pheasants were very encouraging, recent indicators show a downward trend. Reproductive success of the released birds appeared to be high enough to establish wild populations (Campa et al. 1987, Rabe et al. 1988). As predicted, we found that Sichuan hens utilized woody habitats more readily than the ring-necked pheasants for nesting (Luukkonen 1990). This led to the hypothesis that differential habitat use of the subspecies may allow the Sichuan population component to be additive to the base ring-necked population.

Research on wild-trapped pheasants then began in Livingston County after the termination of Sichuan releases. During the winters of 1990-93 ring-necked and Sichuan pheasants were radio-tagged to better understand the dynamics of this mixed-race population. Population indices and mark-resight population estimates showed that pheasant numbers increased from 1987 through 1990, remained stable through the winter of 1991, and then declined dramatically (Figs. 6 and 7). There were an estimated 44 birds per square mile on the study area during the winter of 1991. The population declined 45% over the next two years (Fig. 7). The reasons for the decline of this population appeared to be excessive mortality as a result of predation (Luukkonen et al. unpublished data). Survival rate comparisons of radio-tagged Sichuan and ring-necked hens has generally showed no racial differences, however, Sichuan hens hatched significantly fewer young per hen (Luukkonen et al. unpublished data). The proportion of birds exhibiting Sichuan plumage characteristics declined from 44% in 1990 to 21% in 1993. This decline may be a result of the lower production by Sichuan hens or from domination by ring-necked pheasants. Additionally, differences in nest site selection between the races could not be detected in the wild birds. Another feature of this population was the low rate of nest loss caused by agricultural operations. The largest factor

contributing to nest losses was predation. Analyses of successful and depredated pheasant nests showed no clear advantage in avoiding nest predators by hens selecting woody nest sites. There may be more advantages for hens selecting woody nest sites in areas dominated by agricultural cover types.

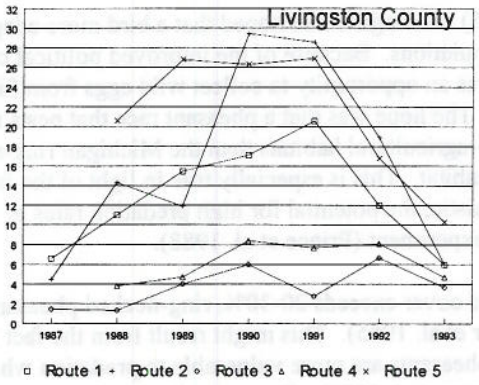

Fig.6. PHEASANT CROWING COUNTS

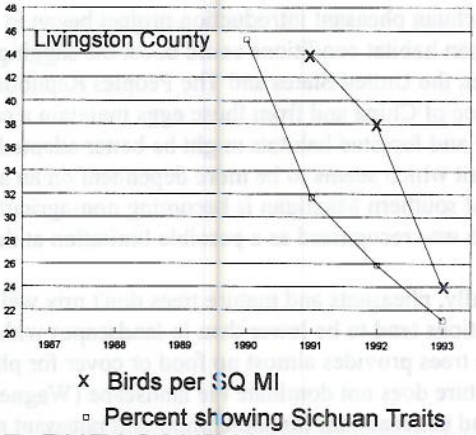

Fig. 7. PHEASANT WINTER TRAPPING

An initial concern among researchers working on this study was that this project only involved one study area with no "control" areas for comparison. Another study has been initiated in Barry and Eaton counties that involves four release areas and four control sites. At the same time, two cooperating states (Ohio and Pennsylvania) are conducting similar research. The results of these studies will better evaluate the additivity of Sichuan pheasants to wild ring-necked populations.

At present we are unable to document any clear additive impact of Sichuan pheasants on local or state-wide populations. The Livingston county pheasants with "good" nesting success could not overcome high mortality to maintain the population. Despite these findings, the Sichuan pheasant has shown to be behaviorally different from the ring-necked pheasant. The high predation rates we observed may mask some positive effects that these traits may have on reproductive success or survival.

The Future

Our pheasant population will fluctuate depending on winter survival and summer production. Without large scale intervention, pheasant numbers will remain at current levels or, more likely, decline. Continued intensification of farming and the loss of habitat quantity and quality, deterioration of the already marginal CRP fields, and urban development bode ill for pheasants and other farmland wildlife.

What remains now is solving the problem of excessive mortality. Since predator control is costly and socially unacceptable, the future focus should be on improving habitat. This too is costly and habitat improvement experiments have shown varying degrees of success (Warner 1988). One of the important factors in success of habitat initiatives appears to be the scale at which they are attempted. Large scale approaches appear to have the best potential for success. Since approximately 97% of southern Michigan is in private ownership, impacting pheasant habitat on a large scale will necessarily involve private landowners.

A recent survey of southern Michigan landowners identified pheasants as a highly desirable species; nearly 70% of randomly selected landowners indicated that they desire more game birds such as pheasants and quail on their properties (Nelson and Yanni 1993). Another indication of the importance of pheasants to Michigan's landowners has been the success of Pheasants Forever Chapters. Gratiot and Jackson county chapters were identified as the number one and number two counties in the country for habitat acres developed in 1993 (Finden 1994). Furthermore, Michigan had 5 of the top 10 chapters in the country for habitat acres developed for pheasants. Habitat development by these five chapters alone contributed over 13,000 acres to pheasants. Clearly, private groups in cooperation with the Wildlife Division's Working Together for Wildlife Program have the potential to improve pheasant habitat in southern Michigan.

Finally, the idea that we can positively impact pheasant populations on a large scale needs to be tested. A research project to evaluate such a program is presently being considered.

Literature Cited

Campa, H., III, M. L. Rabe, P. I. Padding, E. J. Flegler, Jr., G. Y. Belyea, and H. H. Prince. 1987 An evaluation of the release of Sichuan pheasants in Livingston County, Michigan, 1987. Michigan Dep. Nat. Resour., Fed. Aid Wildl. Restor. Proj. W-127-R-5, Study 71, Job 3. 71 pp.

Finden, J. 1994. 1993 Annual Report. Pheasants Forever 11(2):19-34.

Gates, J.M. and J.B. Hale. 1975. Reproduction of and east central Wisconsin pheasant population. Wisconsin Dep. of Nat. Resour. Tech. Bull. No. 85. 70pp.

Luukkonen, D.R. 1990. Comparisons of similarly-reared Sichuan and wild ring-necked pheasants. Michigan Dep. of Nat. Resour., Fed. Aid Wildl. Restor. Proj. W-127-R-8, Study 71, Job 6. 21pp.

Nelson, C.M. and S. Yanni. 1993. Southern Michigan landowner awareness and response to the Working Together For Wildlife Program. Michigan Dep. of Nat. Resour., Fed. Aid Wildl. Restor. Proj. W-127-R-11, Study 82, Job 3. 16pp.

Perkins, A.L. 1992. Overwinter movements and survival of ring-necked pheasant hens in north central Iowa. M.S.Thesis, Iowa State Univ. Ames, Iowa. 72pp.

Peterson, L.R., R.T. Dumke and J.M. Gates. 1988. Pheasant survival and the role of predation. Pages 164-196 *in* D.L. Hallett, W.R. Edwards, and G.V. Burger (eds.), Pheasants: Symptoms of wildlife problems on agricultural lands. North Central Section of The Wildl. Soc., Bloomington, IN. 345pp.

Prince, H.H., P. Squibb, and G.Y. Belyea. 1988. Sichuans, pheasants of the future?-Learning from past release programs. Pages 291-305 *in* D.L. Hallett, W.R. Edwards, and G.V. Burger (eds.), Pheasants: Symptoms of wildlife problems on agricultural lands. North Central Section of The Wildl. Soc., Bloomington, IN. 345pp.

---------, and C. Jian. 1990. Influence of temperature on metabolic rate of Sichuan and ring-necked pheasants. Michigan Dep. Nat. Resour., Fed. Aid Wildl. Restor. Proj. W-127-R-8, Study 71, Job 7. 26pp.

Rabe, M. L., H. Campa, III, E. J. Flegler, Jr., G. Y. Belyea, and G. M. Bragdon. 1988. An evaluation of 1988 Sichuan pheasant releases in Michigan. Michigan Dep. Nat. Resour., Fed. Aid Wildl. Restor. Proj. W-127-R-6, Study 71, Job 3. 97pp.

Squibb, P. 1985. The Sichuan pheasant. Michigan Nat. Resour. Mag. 54(5):4-11.

Trautman, C.G. 1982. History, ecology and management of the ring-necked pheasant in South Dakota. South Dakota Dep. of Game, Fish and Parks, Fed. Aid Wildl. Restor. Proj. W-75- R, Bulletin No. 7. 118pp.

Wagner, F.H., C.D. Besadny, and C. Kabat. 1965. Population ecology and management of Wisconsin pheasants. Wisconsin Cons. Dep., Tech. Bull. No. 34. 168pp.

Warner, R.E. and L.M. David. 1982. Woody habitat and severe winter mortality of ring-necked pheasants in central Illinois. J. Wildl. Manage. 46:923-932.

----------. 1988. Habitat management: How well do we recognize the pheasant facts of life? Pages 130-146*in* D.L. Hallett, W.R. Edwards, and G.V. Burger (eds.), Pheasants: Symptoms of wildlife problems on agricultural lands. North Central Section of The Wildl. Soc., Bloomington, IN. 345pp.