Progress in forest openings research. No. 16 1966

McCaffery, Keith R.; Creed, Wm. A. (William A.)
[Madison, Wis.]: Wisconsin Conservation Dept., Research and Planning Division, 1966

Research Report No. 16

(Game)

PROGRESS IN FOREST OPENINGS RESEARCH

By

Keith R. McCaffery and William A. Creed

WISCONSIN CONSERVATION DEPARTMENT

Research and Planning Division

April, 1966

When discussing summer range, we must keep in mind that the big northern Wisconsin deer herd of the 1940's resulted primarily from changes in the summer range wrought by cutting and burning during the previous 50 years. The winter range was there all the time waiting to be filled. And in time it was filled. The impact of land use on winter range was less dramatic, and more often detrimental than otherwise. And even though much of our winter range has existed in a rather wretched condition for 20-30 years, a relatively high deer population has been maintained by continued disturbance of the forest environment, mostly cutting, and mostly outside of what we normally consider deer-yards.

We started thinking seriously about summer range problems around 1960. Ralph Hovind, who was then area game supervisor at Woodruff, was a prime mover in getting us started on finding out what our summer range problems were. From 1960-63, we made exploratory studies, mostly dealing with facts and figures on deer kill in relation to land use statistics. We did not have the manpower for a full-scale investigation, and very little fieldwork was accomplished during this period. But we did do a lot of thinking about this problem, found out what other states were doing, and sought advice from other resource workers in this state. And by delving into various types of statistics, we defined a few approaches which wouldn't work. Thus, we were better prepared to proceed positively when this project was expanded in 1963.

We have found that understanding the ecology of deer in the snowfree period of the year is a complicated business. Deeryard ecologists have often repeated that determination of winter range trends requires either a practiced eye or very careful measurements. But it doesn't take a whole lot of head-scratching to determine a problem exists when one snowshoes into the middle of a deeryard and finds carcasses lying around, and sugar maple, balsam, and alder as big as your thumb chewed off by deer. This kind of problem is obvious. On the other hand, deer behavior during the snowfree period makes the animal a sort of will-o-the-wisp, and it is difficult indeed to find out where deer are, what they are doing, and why.

When we review the progress of summer range research in this country, we find these investigations have met with failure more often than success. Still, some agencies have embarked on opening programs, notably in such states as Indiana, Missouri, Pennsylvania, and some of the mid-Atlantic states. Most of these efforts have been on National Forest lands. Here in Wisconsin the Nicolet National Forest already has a going program which prescribes 3 percent of the commercially typed acreage to be set aside for permanently maintained openings.

One of our game managers rather succinctly stated his reactions to a land use program which includes opening maintenance as an objective. He said openings constitute a tangible problem, they can be recognized, and they can be maintained if we want to do it. He also pointed out that openings influence a variety of wildlife species, not just deer, and that a manager can point to such a program as a significant contribution to wildlife in his district.

Talk presented at joint WCD - U. S. Forest Service Meeting, Woodruff
March 30, 1966

The loss of forest openings, brushland, and forest cover-type diversity occurring in Wisconsin's woodlands is an insidious process, not too obvious perhaps, but destined to have profound effects on wildlife populations. Normal plant succession is perhaps the major mechanism causing these changes, but the trend is being accelerated through ambitious reforestation and type conversion programs. Once we recognize that a problem exists, and apparently we have, then we can begin considering habitat maintenance and development, where, when, how much, and what kind of.

That openings are important to wildlife is not a new concept. It's been recognized since game investigations began in the 1930's. Few resource managers would argue with this concept and yet openings are becoming more and more scarce on the forest landscape. Little attention has been focused on this problem until recently.

As mentioned earlier, our work began about 1960, but full-scale field research wasn't in progress until 1963. At that time we began work on the Glidden District of the Chequamegon National Forest and in Iron County. This work involved mainly shining and track counts in an effort to quantitatively document the need for openings. Since 1964, most of our work has been in the northeastern portion of the state.

Shining

Shining revealed a seasonal pattern of use (Fig. 1). This pattern is familiar to all of us because it conforms closely with the frequency with which we see deer in agricultural fields and along highway rights-of-way.

Perhaps more important is the intensity of use that has been observed. If we assume deer are randomly distributed, 3 deer plotted on this graph for these openings is the equivalent of 25 deer per square mile. As you can readily see, the intensity of use is quite great, especially during spring and fall. The high intensity of use during fall was further substantiated through pellet counts.

The high amount of variation from night to night could be caused by any one or combination of factors. Two factors, the weather and microclimate, are presently under study by Dr. Stearns (North Central Forest Experiment Station).

Critics might look at this and say that use and need are not synonymous, so how can we infer that they are? We believe the answer to this is found in the results of track counts. Track counts in areas with few openings have given results indicating lower densities of deer than other areas with more openings. More on this later.

Just why deer use openings has been the subject of some speculation. Our impression is that the primary use made of openings is for food. Food habit studies in Missouri found that grass accounted for more than one-fourth of the food eaten by deer in spring. Grass seems to be a seasonally important source of nutrition in Wisconsin as well. The fact that activity in forest openings corresponds closely with deer use of farm fields and roadsides seems to corroborate this conclusion. Grass may be a vital "shot in the arm" after winter and before fawning, and also during the rut and before winter.

Also evident from the shining was an apparent preference for smaller openings. This was observed on the Argonne Experimental Forest in 1964 (Fig. 2), and on the Glidden District the previous year. The fact that this same pattern was repeated suggested that there was a relationship between size and use. Because size is an important aspect from the standpoint of land use, we decided to test the size-use relationship further, plus the effect of adjacent forest type on deer use.

Pellet Counts

In the process of studying openings, we found that it was possible to make pellet counts in openings at certain times of the year. In consultation with our Technical Services Section we designed a survey that would measure the use of different sized openings and also compare the use of openings in aspen with northern hardwood openings. This amounted to sampling 5 size classes with each having 10 openings, 5 in aspen types and 5 in northern hardwood. The results were quite satisfying.

The relative intensity of use is shown in Fig. 3. The average number of pellet groups found per sample in each size class is plotted over the average acreage of the size class. Size classes were $\frac{1}{2}$-1 acre, 1-2 acres, 2-4 acres, 4-8 acres, and 8-16 acres. Both the correlation coefficient and regression coefficient are significant at the .01 level.

What does it mean? One thing the graph shows right away is that the slope is downward as anticipated, rather than upward as it would be if we were measuring sharptail preference. The second thing it shows is that small openings are used more heavily than large openings. It also shows that just because small openings receive highest use, larger openings should not be disregarded. They still receive a good amount of use and administratively they require less maintenance.

Fig. 4 is a combined measure of intensity and distribution of use. Here the data are regrouped into 7 width classes with frequency plotted over average width. The r and b are again significant at the .01 level. This graph suggests that narrower openings may be more efficient than others. But again, maintenance problems must be considered.

The results of the test between aspen and hardwood openings did not show a significant difference at this level of sampling, although numbers of pellet groups in aspen averaged somewhat higher than northern hardwood openings.

To date our research has been restricted mainly to studying those openings that are in the greatest danger of being lost. More work will be done on frost pockets next year and possibly other types of openings later if necessary.

Track Counts

We have conducted mid-summer track counts in Sawyer, Iron, Forest, Florence, and Langlade Counties, and have shown that there are far fewer deer in northern hardwoods than in aspen or areas with openings. From 2 to 5 times as many tracks can be found in aspen as in northern hardwoods. In the Goodman Timber of Florence County, fewer than 10 tracks per mile were found in the hardwood without openings and 40 tracks per mile were found in the aspen area. A similar result was obtained in Langlade County. These results indicate that there are likely fewer than 10 deer per square mile in near-monotypic northern hardwoods.

The problem is that northern hardwoods are taking over more and more of the range while at the same time aspen is disappearing. This is the insidious creeping sterility mentioned earlier that is decreasing the ability of the land to produce game. We could possibly stay or delay this trend through burning and/or silvicultural practices, but it doesn't look like we will. Private industry has also voiced its concern over this problem, but for another reason. Perhaps economics will eventually save some of our aspen. One easy and tangible thing that we can do (and don't have to speculate about) is save openings. Openings will help to offset the effect of succession and the loss of aspen.

Recommendations

At this time we'd like to present some of our basic recommendations of a policy nature regarding openings.

1. THAT 5 PERCENT OF THE TYPED COMMERCIAL FOREST BE MAINTAINED IN PERMANENT UPLAND OPENINGS. There is nothing magical about 5 percent--we'd like to see more than 10 percent! This would approach the biological optimum from the game standpoint; however, this is getting to the point where it threatens the economic operation of the forest, and in addition, what forest property would still have 10 percent in openings? The Nicolet decided on 3 percent and we understand that Ed Wilder had a hard time fulfilling that!

2. THAT OPENINGS LESS THAN 5 ACRES BE PRESERVED FROM PLANTING. Not only is this biologically desirable, it's economically sound. The Forest Service Manual contains a policy statement under Title 2400 which states, "The minimum stand area to be artificially regenerated for production of timber is 10 acres. Justification for artificially regenerating areas smaller than 10 acres must benefit other resources" (2472.03). The "other resources" alluded to here must mean esthetic and wildlife resources, neither of which would likely benefit from the planting.

We hope ambitious YCC, EOA, APW, NYC, and other work programs won't be used to plant these uneconomic stands.

Just because we recommend that no small openings should be planted doesn't mean that we should plant all those larger. If we have a 15-acre opening serving a fairly large area otherwise devoid of openings, by all means save that opening! A large sodded opening, especially on a hardwood site, requires almost no maintenance, which is another advantage of saving larger openings wherever we can.

3. THAT OPENINGS BE MAINTAINED WHERE THEY ARE DEFICIENT OR IN A STATE OF TRANSITION. We have a good opportunity to get this type of work done now with the various work programs for the underprivileged. Instead of giving them a bundle of trees and a planting bar, give them an ax and a can of silvicide. Have them police some of those openings where rock elm, scraggly maple, aspen or some other species are threatening the existence of good openings. They're generally of poor form anyway.

Other recommendations of an administrative or practical nature include the following:

1. SPACE OPENINGS ECOLOGICALLY RATHER THAN MECHANICALLY. Openings near other components of good game range will receive the greatest use. If your range is fairly mixed up, an opening surrounded by northern hardwood is the most stable and should receive priority.

2. LEAVE AN UNCUT STRIP AROUND OPENINGS IN ASPEN. This will prevent suckering into the opening.

3. CHOOSE OPENINGS WITH ACCESS WHERE POSSIBLE. This will simplify maintenance, and will promote greater public use.

4. CONSIDER ESTHETICS WHEN SAVING OPENINGS. Openings can be used as attractions to hikers just like flowages and beaver dams. Many openings contain relics of past eras that are really quite interesting. Also save openings along roads and highways, because openings themselves are colorful and add variety to the forest landscape.

Conclusion

A land manager shouldn't feel that getting into an openings program is complicated. If we accept openings as being a desirable and necessary component of game range, we can overlook some of the biological complexities. Difficult decisions as to which opening to save will be seldom encountered. In most places you'll find less than 5 percent of the forest in upland openings. The first and vital step in an openings program is designating the best that you have now.

We may presently have 5 percent of our forest landscape still occupied by openings. If we don't act now, in ten years we'll have less, and by then the effect of past planting will have manifested itself. First thing we'll know, we'll find ourselves in the woods with our D-7's creating openings at a phenomenal cost in an effort to regain some of what we let slip through our fingers.

Before closing we want to reiterate for the benefit of those Department people who might not know.....the Forest Service has already adopted openings programs on many of their forests including the Nicolet. We must not procrastinate and say that there is nothing we can do for forest game. Here is something tangible that can be done, and we think it's time to get on the bandwagon.

4-25-66
jk

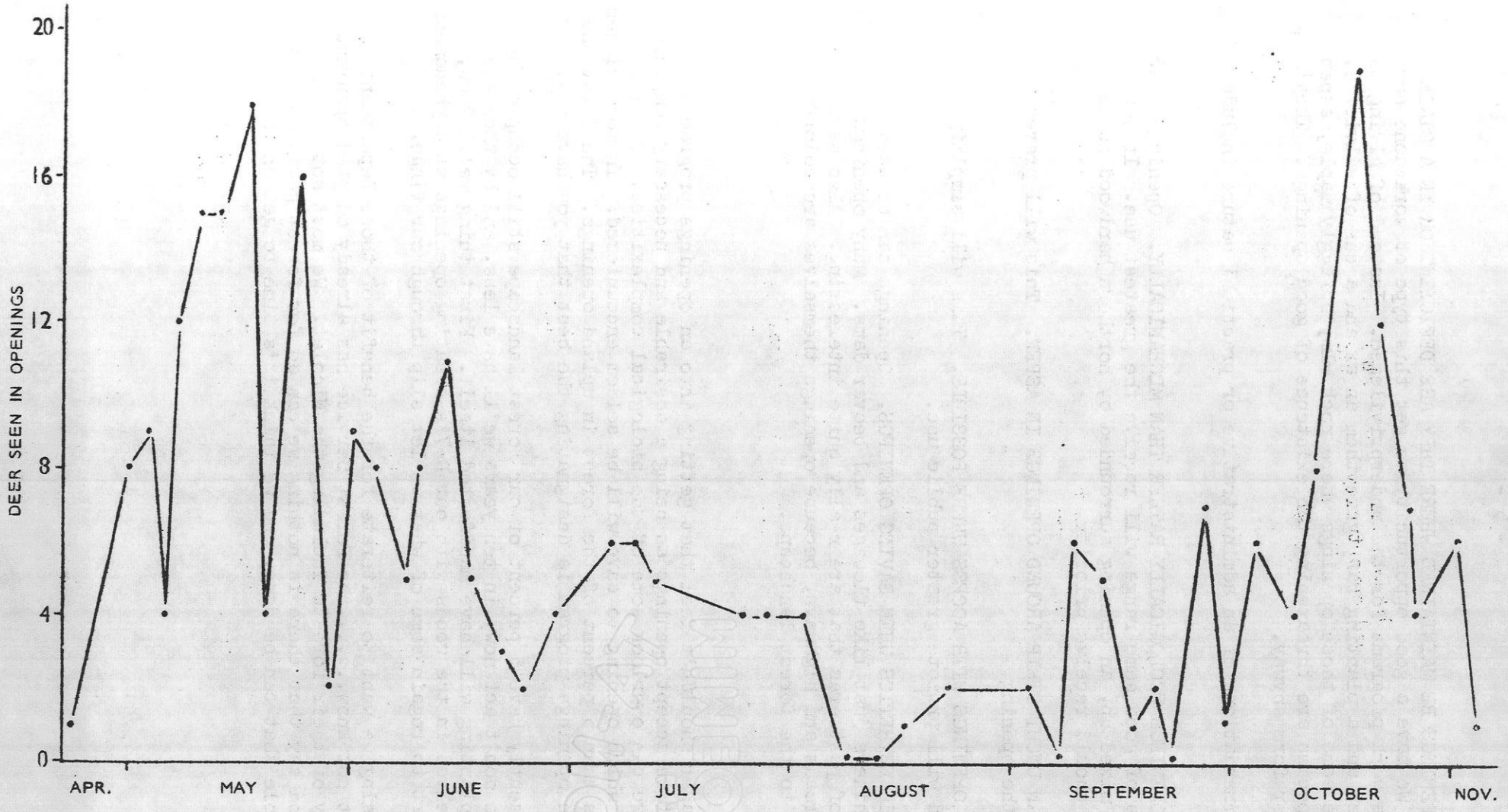

Figure 1. Seasonal use of Argonne forest openings.

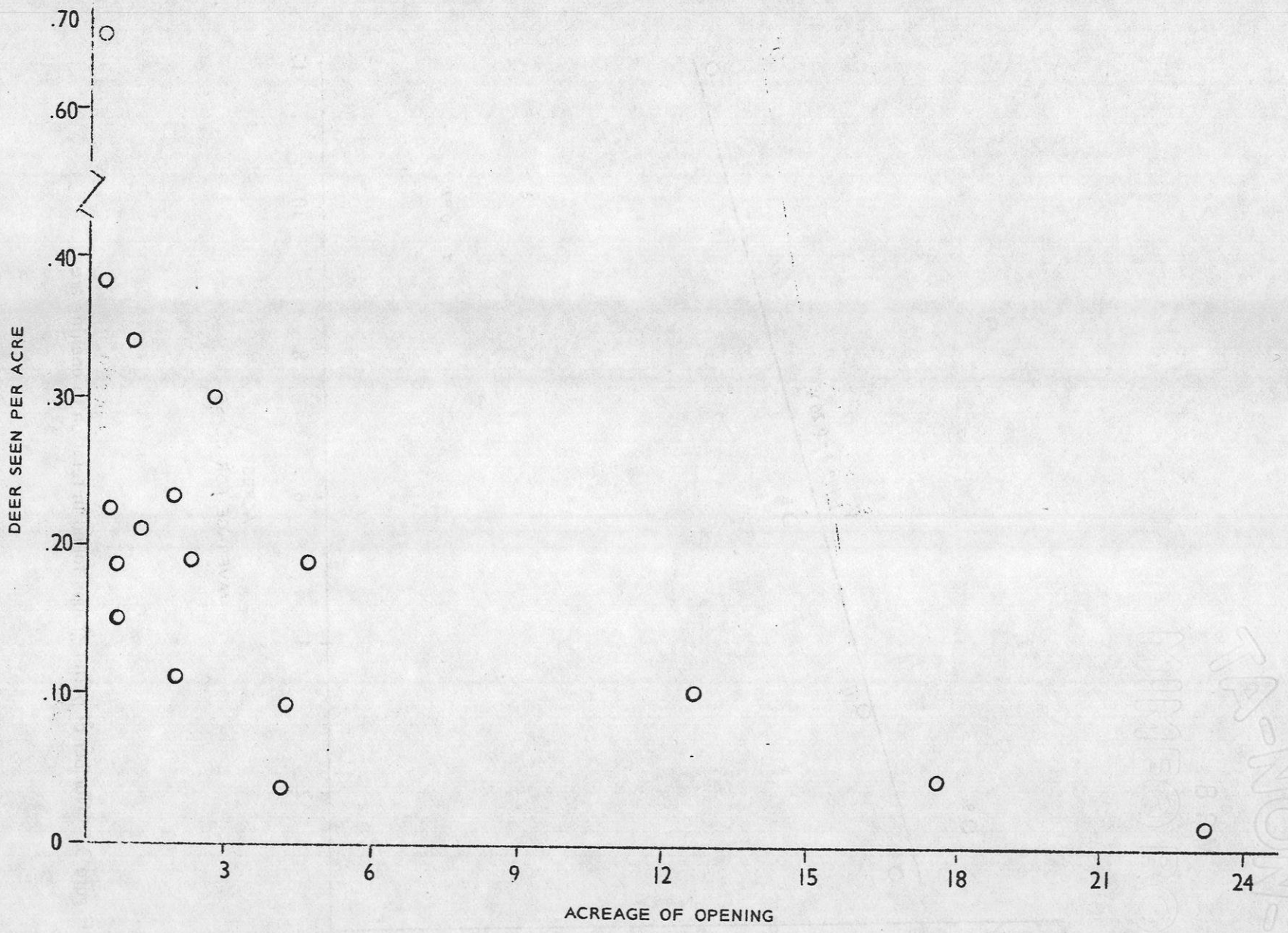

Figure 2. Deer use of Argonne openings by size --- 1964.

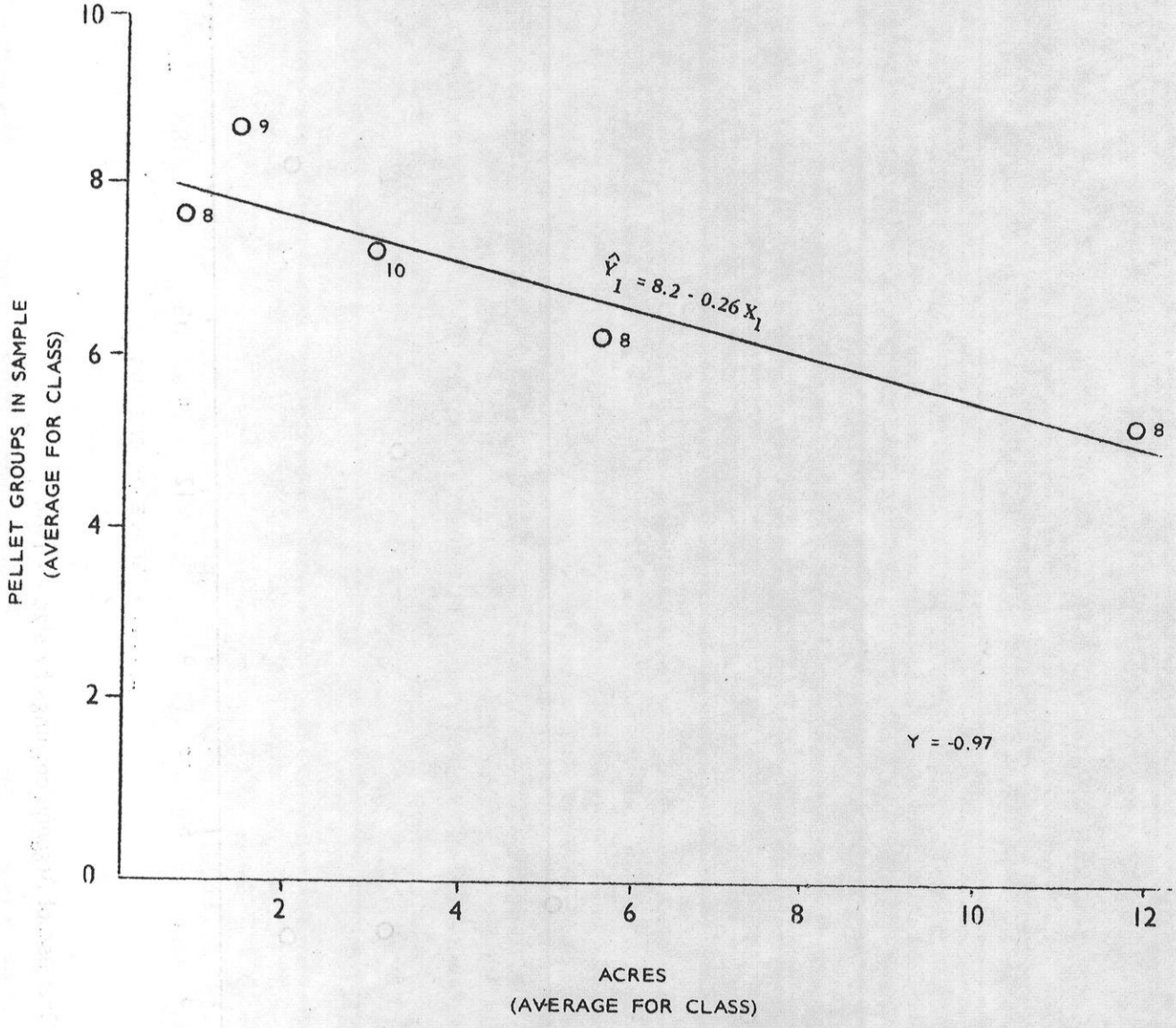

Figure 3. Number of pellet groups found in relation to opening area.

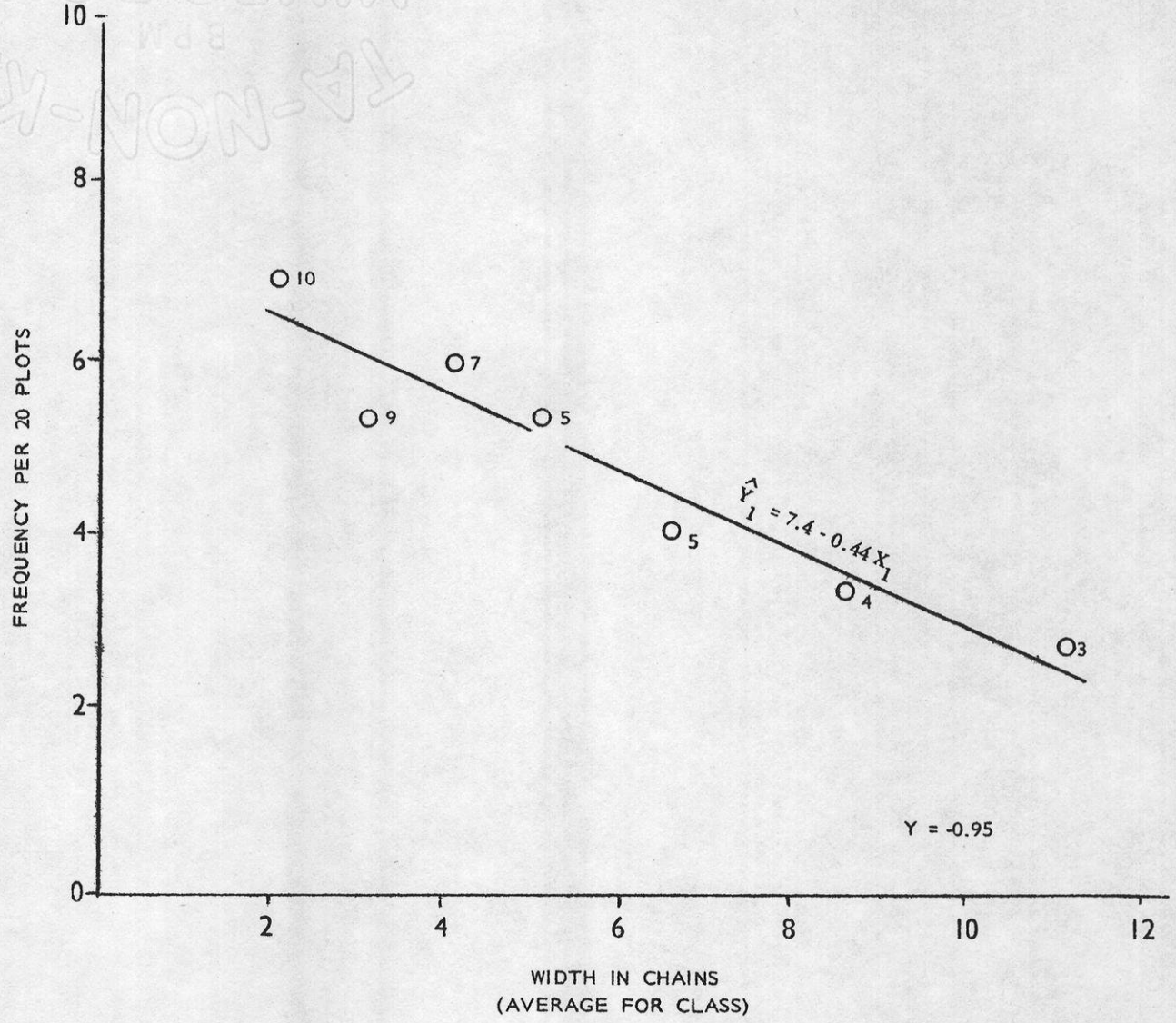

Figure 4. Plots containing pellet groups in relation to opening width class.