FARM GAME HABITAT RESTORATION IN KENTUCKY

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Kentucky's Farm Game Habitat Restoration Project was started in July, 1948, with two project leaders. The general objective was simply to improve farm game habitat, but establishment of quail food plots of bicolor lespedeza was the major activity. Multiflora rose and several other plants were also used, but an effort was made to keep the broad objective in mind rather than develop a mechanical plant distribution project.

Seven other leaders (Don Strode, William Skaggs, Arnold Mitchell, Francis Collins, Keith Clapp, John Storner, and Chester Stephens) worked on the project and assisted in formulating the methods, studies, and philosophy of the project.

METHODS

Methods and procedures were somewhat similar to those used in other southeastern states; however, the biologists did more actual field work with farmers.

Mechanical Procedures

Instructing Soil Conservation Service (SCS) personnel and State conservation officers concerning project objectives and methods, and convincing them of the value of the project was the first job. This job is still in progress. This training included many field trips with these personnel, during which the benefits of the plants were explained to farmers, and plantings were planned on the land.

After this training, SCS personnel and conservation officers selected the sites for most of the plantings. Although these men are not trained wildlife men, they usually did a good job of selecting planting sites. On many farms in Kentucky there are only one or two places where land will be devoted specifically for wildlife, and this is usually near the best quail cover on the farm.

Plantings are also established by Junior Conservation Clubs.

Biologists delivered plants to the counties, and SCS personnel and conservation officers delivered most of them to the farms. Biologists assisted with this job as much as time permitted.

During the planting season visits for farmer cooperators were found to be very beneficial. In many cases biologists helped with the actual planting. Many farmers become preoccupied with other farming activities and forgot their wildlife food and cover plants. Others thought the plants were dead and failed to plant them.

After the planting season biologists visited practically all of the plantings. This was considered an essential part of the project for three reasons: 1) It disclosed exactly how many plots were established, and how good they were; 2) It afforded an opportunity to advise the farmer on the care the plot needed; and 3) The visit encouraged the farmer to give the plot the care it needed.

Data were recorded on standardized forms and, after all plantings were visited, lists were prepared by counties for all cooperators, their addresses, species planted, grade, dimensions, and age of plots. A county list was given each conservation officer and SCS farm planner and their immediate supervisors, with a request that they visit these farmers whenever convenient.

Biologists visited older plantings to study their reaction to cultural practices, soils and fertilizers, and wildlife use of the plantings.

All these field contacts with farmers, soil conservationists and conservation officers offered opportunities to further the broad objective of general habitat improvement. Biologists pointed out such simple practices as spot plowing in broomsedge fields, allowing ragweed to go to seed, leaving edges of grain fields unharvested, leaving brushy fencerows and odd areas, strategic location of brushpiles, and leaving den trees. The importance of habitat management was explained to many individuals who had known nothing about wildlife management except predator control, restocking, and regulation of the hunters' kill.

Plant Species Used

In addition to bicolor and rose, about twelve other plant species were used on a much smaller scale. In some few cases Siberian peatree, false indigo, and ninebark were used as substitutes for bicolor or in combination plantings (Fort Knox, etc.). Russian olive was distributed for grouse and songbirds, Russian mulberry for squirrels and songbirds, walnut for squirrels, and pines and sericea lespedeza for cover. Few plantings of these species were established.

Sericea lespedeza is poorly adapted to bicolor border plantings in Kentucky. Many of the available planting sites are in odd areas rather than along woods borders. Most woods border plantings are adjacent to brushy growth rather than tall timber, hence the shaded area is narrow. It is difficult to persuade the farmer to devote the minimum 15 feet for a bicolor strip, much less an additional 10 feet for sericea. Frequently a rose fence is needed, and this makes it even less likely that additional space will be sacrificed for sericea.

Nevertheless, about 2,000 pounds of sericea seed were distributed during the past two years, and the amount will be increased next year. Some bicolor plots need a companion planting of sericea, and in many areas, sericea alone probably will be useful. Hunters report that nearly all sericea fields hold quail during the winter.

Problems Encountered

Some problems apparently not prominent in other states were encountered. The agricultural pattern in Kentucky is one of the greatest handicaps. It usually calls for two years cultivation of a field, then two to eight years pasture. Thus, nearly all land is grazed sometime during a three-year period. Wildlife production, especially quail, is very incidental. There are no large estates where quail are considered a major crop.

Working with 25 or 30 Soil Conservation Districts left each biologist insufficient time to study old plantings as he desired. But the gathering of some information was deemed necessary to intelligent operation of the project.

Causes of Failure

Causes of failure of bicolor plots in 10 counties were analyzed for two years. Of the 29 complete failures, 23% was due to grazing. Browsing by rabbits and groundhogs destroyed another 10%. Weeds, lack of proper seed beds, late planting and improper soil accounted for 10% each. Ten percent was plowed under by farm hands and early planting accounted for 7%. The cause of failure was unknown in 10%.

Cultivation

Cultivation proved to be beneficial. Although some plots survived without it, bicolor seldom completely dominated the site. Blackberries and other shrubs, as well as dense ground competition, usually survived among the bicolor. Dense ground cover is said to make the plot less desirable for quail since the seed are harder to find. Shrub competition, if not completely eliminated, tends to increase until it becomes detrimental.

Planting Stock

Desirability of large seedlings was frequently demonstrated. Larger seedlings had more stored food, and were able to keep pace with or outgrow weeds. Small plants usually were overtopped and suffered high mortality from weed competition. For this reason, the use of bicolor seed was discouraged.

Fall plantings were tried on several occasions, and usually were unsuccessful. Simple decaying of the plants in the ground was as frequent as frost heaving. However, some of the fall plantings in 1951 were reported to be in good condition.

Miscellaneous Plant Species

False indigo, ninebark, and Siberian peatree were planted in rows about six feet apart. This appeared too wide, because weeds developed between the rows before the plants became large enough to shade the entire area.

Unfertilized portions of one false indigo plot produced only about ⅓ as much seed and vegetative growth as fertilized parts. Shade did not retard growth during the first two years.

One-year-old Siberian peatree seedlings all died before the second summer. Much better survival was obtained with two-year-old stock in 1952.

Seed Maturity and Rate of Falling

To determine whether or not bicolor will consistently mature seed before frost in Kentucky, conservation officers were asked to check good, mature plots immediately after the first killing frost. An average of 85% of the seed were judged mature in such plots in 1950, and 86% in 1951. It has been repeatedly observed that young plots and those making poor growth mature seed several weeks later than mature, healthy plots. Thus the percentage of their seed mature at frost is lower.

Another factor of importance is the time at which seed fall from the plants. Seed collection boxes were placed in one plot, and seed in the boxes were counted each month. Of 988 seeds, 17% fell in December, 30% in January, 34% in February, 13% in March, and 6% in April. This indicated that 64% of the seed fell during months when natural quail food is scarce, and likely to be frequently covered by snow. This study will be continued.

Wildlife Use Indicated by Questionnaires

During the winter of 1951 - 52, questionnaires were sent to 271 farmers who had established good or fair bicolor plots. Of these, 125 (41%) were returned, but 43 were from plots thought to be poorly located, too young, or too small to support quail. Of the other 82, quail were reported in 74%. Birds may have been present in some of the other 26%, since some farmers saw their plots infrequently. Of the plots hunted, quail were flushed from 86% and were killed from 61%. One farmer reported many doves in his plot, and another flushed grouse on several occasions from his plot.

RESULTS

During the four years the project was in operation, about 2,615 plots of all species were planted. Of these, about 1,573 were shrub lespedezas, 852 were rose fences and 190 were miscellaneous species. Although no significance should be attached to totals of plants distributed, the total for the four years was about 6,534,868. Of these, 4,069, 810 were shrub lespedezas and 2,343,855 were multiflora rose.

Of the 1,573 shrub lespedeza plots 732 were considered good. This figure would have been higher without the extremely high standards used during 1949, 1950, and 1951. More than half (402) of the good plantings were established in 1952, when the standards were lowered. Table 1 summarizes these figures. These are the only total figures which are considered significant. Plantings of other species were not evaluated so carefully.

Table 1. Plants delivered and plantings established in Kentucky, 1949 - 52.

	Shrub lespedezas			Rose	
		Plots			
Year	Plants	Total	Good	Plants	Fences
1949	175,000	106	34	19,500	18
		60.1%	19.4%		
1950	438,100	264	116	527,300[a]	70
		60.3%	26.4%		
1951	1,587,150[a]	489	181	720,650	261
		30.8%	11.4%		
1952	1,869,560	715	402	1,081,405	581
		38.2%	21.4%		

[a] The Soil Conservation Service supplied 550,000 *Lespedeza intermedia japonica* plants and 500,000 *Rosa multiflora* plants to the Soil Conservation Districts during the years indicated.

During the first two years, each biologist handled less than 200,000 bicolor plants. About 40% of these were left "heeled-in." In 1951 and 1952 each biologist handled between 300,000 and 600,000. About 64% of these are still "heeled-in." A 325% increase in plants distributed brought only a 56% increase in plots planted. Figure 1 shows these relationships graphically. This suggests that too much effort was expended to distribute a huge number of plants, while something else was neglected.

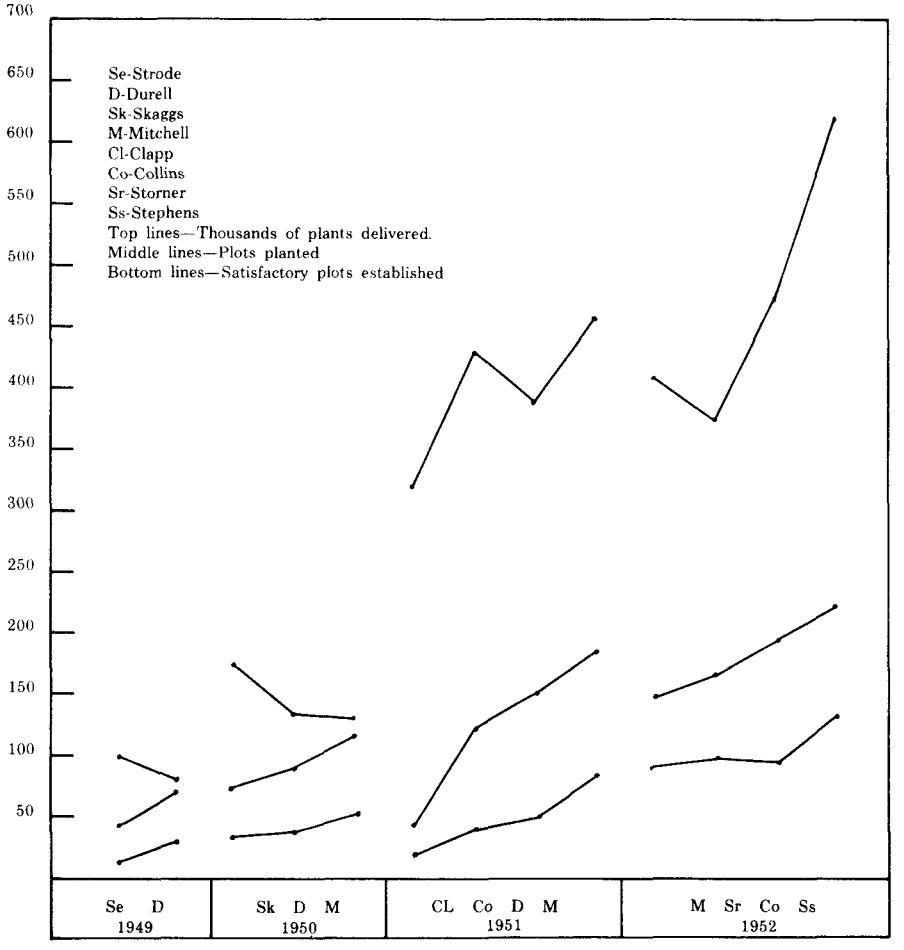

Fig. 1. Shrub lespedeza plots established and plants delivered in areas of Kentucky to which different leaders were assigned.

These results seem very poor. But eight biologists have worked on the project, and none was able to establish a number of plots significantly greater than his fellow workers. For this reason, and because of the problems already mentioned, it

seems unlikely that Kentucky will ever have such an effective program with regards to reported numbers of established plots, as states farther south.

CONCLUSIONS

In Kentucky, farm game habitat improvement has mushroomed into an enormous operation. We who work on the project are fortunate that our administrators look with favor on our work, but the resources placed at our disposal imply a responsibility that the program be carefully considered and made as sound and efficient as possible. This was the apparent objective of the Wildlife Management Institute, when they sponsored Dr. W. H. Marshall's study of this program in several states.

The rightful place of our project, especially bicolor lespedeza, the primary plant should be considered carefully. Just what can it do, what are its limitations, and how much good is it actually doing?

There are those who contend that with bicolor you can produce quail anywhere. This enthusiasm probably contributed to the development of the other extreme school of thought — that bicolor is a worthless fad.

In Kentucky an attempt has been made to develop a middle-of-the-road attitude. It is recognized that bicolor is usually poor cover, furnishes little or no food during the spring, summer and fall, and in fact offers little to quail except a food supply during a short period of the year. Its value is questioned in small grain farming areas where food seems plentiful and cover scarce.

But even with these limitations, bicolor is a valuable tool in game management. In much of Kentucky winter food appears to be the limiting factor for quail. Here bicolor seems to supply just what is needed.

The Farm Game Habitat Restoration Project in Kentucky is not just a bicolor project. In areas where cover is lacking, sericea and multiflora rose are recommended along with bicolor. These cover plants will be used alone where cover seems to be the limiting factor for quail or rabbits.

In estimating how much good bicolor actually is doing, only one yardstick should be recognized: the number of good seed-producing plots established where they will benefit quail. Some beautiful figures could have been compiled on plants distributed and percentage survival, but they would tell nothing. Quail cannot eat bicolor plants nor statistics.

There was no correlation between the number of plants delivered to an area, and the number of plots established. Very few individuals who requested more than 2500 plants actually established a plot.

Perhaps the weakest point in Kentucky's project is insufficient contacts with the farmer. Each person who receives plants is visited about three times — first when the plot is planned, second when the plants are delivered, and third when the planting is evaluated and recorded. Usually two of the visits are made by SCS technicians, but they cost money just the same. One more visit during planting season would probably greatly increase the number of plots planted. You may wonder how we can afford to visit cooperators four times, but figures will show that we cannot afford not to.

In 1952, about 1,000 farmers who received bicolor plants failed to plant them. In addition to 1,000,000 plants, this represents a loss of the salary, travel and maintenance of personnel while making about 3,000 visits to farms. The high

percentage of these farmers who later stated that they forgot the bicolor plants, or mistakenly thought that they were dead, indicated that a visit at planting time would have caused a high percentage of the plants to be planted. Examination usually showed that the plants the farmer thought to be dead were still living in the "heel-in" bed.

One criticism that Dr. Marshall (see above) made of Kentucky's project was that horticultural perfection of plots was stressed to such a point that site factors were neglected. The importance of selection of suitable sites had been insufficiently stressed, and the project has been revised to place more weight on this phase. But there are several valid reasons for upholding horticultural standards.

1. Studies made during normal years indicated that only about 85% of seed matured before frost in Kentucky's best bicolor plots. Unusually early frost would cause an even lower percentage. Lower percentages mature also in mediocre and poor plots. Thus, while ⅛ acre of bicolor may be more than is needed in states farther south, those states obviously can get by on smaller areas than can Kentucky.
2. Even if plots of 1/16 acre are large enough, it is inefficiency when a farmer uses 1,000 plants to establish a plot that requires only 500 plants.
3. Poor seed bed preparation and insufficient cultivation encourage perennial weeds to encroach, and these decrease the amount of seed produced.

Some individuals who disagree with strict horticultural standards point out that quail do use some of the sub-standard plots. That is true. Coveys have been known to survive in plots of 1/20 acre, in plots so weedy that very few seed were produced, and in fact a few coveys manage to survive on farms where bicolor has never been heard of. Therefore, the fact that quail utilize a poor plot does not definitely prove that the plot is responsible for the presence of the quail.

It has been pointed out that even if a planting produces only one pound of seed, that one pound may be enough to feed one more quail throughout the winter, and thereby increase the breeding population by one bird. But when you consider the cost of 1,000 plants delivered to a farmer, that one bird becomes rather expensive. Furthermore, if other quail foods are abundant in the area all winter, that one bird may have survived without the bicolor.

It seems that a bicolor project as large as Kentucky's is economically feasible only if the plantings definitely alleviate a food shortage. In some areas, it is more remunerative to provide more cover rather than more food.

SUMMARY

Kentucky's Farm Game Habitat Restoration biologists worked rather closely with soil conservationists, conservation officers and farmers. An effort was made to convince these people of the importance of general habitat management, as well as the single technique of food and cover plantings.

Visits to farmers during planting season were beneficial, and recording of each planting was considered an essential job. The greatest problem encountered was the pasture-row crop rotation system which causes most of the land in Kentucky to be grazed sometime during a three-year period.

Cultivation and large plants were considered desirable because they help to overcome weed competition. The use of bicolor seed was discouraged because of weed competition.

About 85% of bicolor seed in mature, vigorous plots matured before frost. The percentage was lower in young plots and mediocre plots. About 64% of the seed fell from the plants during January and February, according to one study.

According to questionnaires returned, quail used 74% of the good mature plots, and were flushed from 86% of the plots hunted. Doves and grouse were reported in some plots.

During four years, about 2,615 plantings were established as follows: shrub lespedeza 1,573; rose 852; miscellaneous 190. Almost half of the lespedeza plots were considered good.

High horticultural standards were maintained. During the first three years, only plots with good growth, few weeds, and minima of 1/10 acre area and 75% survival were rated satisfactory. The last year, the minimum area was lowered to 1/16 acre, and a good planting site was required.

From 1949 and 1950 to 1951 and 1952 a 325% increase in the number of plants distributed brought only a 56% increase in plots established. Apparently plant distribution was over-emphasized and something else was neglected.

Although bicolor is a valuable tool in game management, it should not be considered a panacea. In some areas cover plants (such as sericea and multiflora rose) should be emphasized.

Such a program as Kentucky's seems justified only if the plots alleviate a food shortage. Selection of suitable planting sites is important, but horticultural standards should not be forgotten.

There was little positive correlation between the number of plants distributed and plots established. The number of good plots established was the yardstick used for measuring the accomplishment of the project.