WILDLIFE MANAGEMENT PLAN
and
PLANTING SCHEDULE
for
STINCHFIELD WOODS

H. F. Hammond

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By H. F. Hammond

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INTRODUCTION

The original purchase of the Stinchfield Woods area was made by the University of Michigan in 1925. This was made possible by a gift from Mrs. Charles Stinchfield in 1924. She gave the University $10,000 to be used for the establishment of a memorial to her husband and his father, Jacob Stinchfield, both of whom had been Michigan lumbermen. The University purchased the original tract with this money and gave it the name of Stinchfield Woods in honor of these men.

The original tract was approximately 220 acres and is known as Stinchfield. Since that time there have been three additional purchases which are known as the Bell 80, Peach Mountain Tract, and the C arr Tract. The Bell 80 was purchased the same year as was the Stinchfield Tract, while the latter two were obtained through the State Department of Conservation in 1945 and 1946 respectively.

The Stinchfield Tract was old farm land with approximately 107 acres of it in hardwoods. These woods had all been grazed by sheep, and were in poor shape as far as any forest reproduction was concerned. Since the purchase by the University, the remainder of the land was planted to conifers and is now completely covered. Many of these stands are now at the stage where the crowns have closed and the boles of the trees have begun to clean themselves.

The Bell 80 was another old farm. This tract contained some of the best land in the area and was under cultivation, except for approximately six and one-half acres, which was in

hardwoods. The first plantations here were set out in 1927 and have shown better growth than any of those on the Stinchfield Tract. The white pine here has done exceptionally well.

The Peach Mountain Tract was bought by the school in the spring of 1946 from the State Department of Conservation. There are 147 acres in this tract, sixty acres of which are in hardwoods and the remainder in abandoned fields and pastures. The woods on this tract also have been heavily grazed by sheep and are still in a very open condition. There have been two plantations made on this area so far; one in 1946 and one in 1947. The State has stipulated in the purchase that nothing shall be planted on Peach Mountain itself that will ever interfere with the view from there. They demand also that the hill is to be kept accessible to the public, subject, of course, to the regulations prohibiting the building of fires and hunting, as such rules apply to the rest of the forest.

The Carr Tract contains sixty acres with all but thirteen in hardwoods. This had not been grazed as recently as the woods on the Peach Mountain Tr act, and is in relatively good shape as to natural reproduction. There is some timber here of sawlog size at the present time. As yet, there have been no improvements or plantings made on this tract.

The following table shows the composition of the entire area under consideration in this study.

Present Land Use in Acres

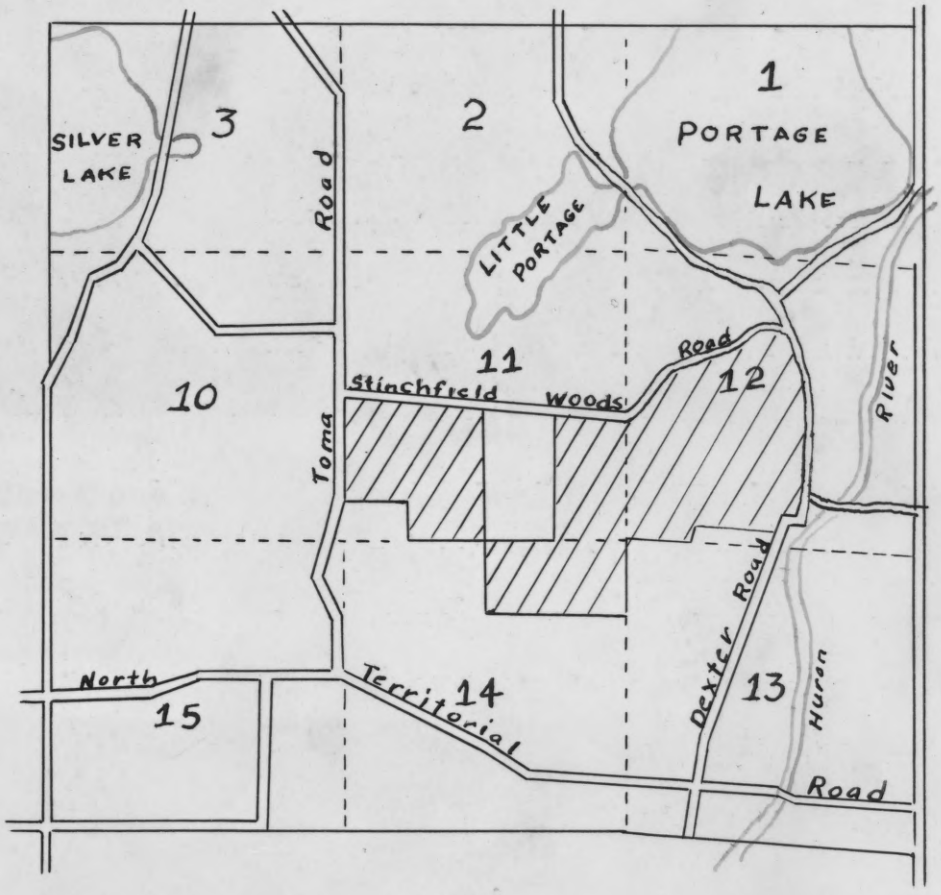
SECTION	HARDWOODS	CONIFERS	OPEN LAND	ROADS and FIRE LINES *
Bell 80	6.44	66.32	--	7.24
Carr Tract	46.68	--	11.00	2.32
Stinchfield	75.26	128.66	--	16.08
Peach Mountain	60.00	--	61.00	28.00
	188.38	194.98	72.00	53.64

* The land included under Roads and Fire Lines on the Peach Mountain Tract includes that left for the Sawmill and the Radio Station.

Stinchfield is set up as an experimental forest, to demonstrate the results of planting abandoned farm lands to conifers, as well as to show the effects of improvement cuttings and protection from grazing on natural hardwood stands. (4)** To date, there have been no sawlogs taken from any of the coniferous stands, but there has been some revenue from the sale of cord wood taken out in thinning these stands. There have been some sawlogs, as well as cord wood, taken from the hardwoods. With a sawmill in operation on the tract at the present time, some of both hardwood and coniferous timber is being utilized. However, conifers are not of sufficient size as yet to yield anything larger than two-by-four size.

** The number (4) refers to the"Literature Cited" list on page 39. Each title bears a number, and will hereafter be referred by these.

This forest has also been invaluable in providing an opportunity for students to obtain some actual experience in practical forestry operations. It is also used as a laboratory for study in a number of forestry classes. However, to date, the wildlife has been merely incidental as far as any provision for its management is concerned; and it has not been used for study purposes except by a few students in connection with problems for Masters' Degrees. Since it is now recognized that the best forest land use is that which gives both forestry and wildlife their due consideration, it would seem that this area should be made to produce a crop of both timber and wildlife. This statement is made with the thought in mind that forestry has the priority here and must continue to be regarded first, with wildlife being controlled so that it does not endanger this primary purpose.



PART OF DEXTER TWP.

WASHTENAW CO. MICHIGAN

SCALE 0 1 2 MILES

LEGEND

U. OF M. PROPERTY

SECTION LINES

Figure 1

Figure 2
This shows one of the younger coniferous stands with an abundance of ground cover

Figure 3
This shows the ground cover left after a heavy thinning and pruning operation

Figure 4
A stand in which the crowns have closed and ground cover is at a minimum

Figure 5
An open oak-hickory stand with plenty of den trees for squirrels, but no ground cover

Figure 6
A large white oak den tree showing the method of marking trees that are to be left

Figure 7
An oak-hickory stand that is old enough to supply plenty of mast, but is lacking in den trees

Figure 8
This shows a hardwood stand that has an under story, and is bordered by a stand of conifers. Grouse were consistently flushed here.

GAME RESOURCES OF THE AREA

The land that immediately surrounds Stinchfield is essentially a farm wildlife habitat. This area under consideration, i.e., Stinchfield, is returning to a forest area, and as time goes on, will naturally assume more of the characteristics of such a habitat. This obviously means that the game compositions of this land will be essentially different from that of the surrounding territory. This tendency has already begun to be noticeable in some respects. T he entire area is seriously handicapped in not containing any body of water or flowing stream. This is largely balanced, however, by the fact that there is a lake on the north side, and a river on the east side of the forest.(See Figure 1, page 5). These sources of water are near enough to be of considerable value to some of the wildlife of the area, at least tothose species which require free water for their existence.

The following page shows a list of the species of game birds, animals, and furbearers known to be present in the forest. An estimate is given of their approximate abundance. These figures are based on field observations taken from September 15, 1947 to December 20, 1947. No claim is made for their accuracy, other than as an estimate. The relative abundance is a correlation of the abundance of these species to the same species in the surrounding territory.

NAME	SCIENTIFIC NAME (6)	RELATIVE ABUNDANCE	ESTIMATED NUMBER
Cottontail rabbit	Sylvilagus floridanus	abundant-young plantations; scarce, elsewhere	average 1 for 4 acres
Fox squirrel	Sciurus niger	abundant	average 1 for 2 acres hardwood
Gray squirrel	Sciurus carolinensis	common	50-75
Red fox	Vulpes fulva	abundant	4-6
Coyotes	Canis latrans	scarce	1-2
Skunks	Mephitis mephitis	scarce	10-15
Raccoons	Procyon lotor	scarce	3-4
Opossum	Didelphis virginiana	scarce	6
Woodchuck	Marmota monax	common	25-30
Deer	Odocoileus virginianus	common	6
Ruffed grouse	Bonasa umbellus	common	10-12
Pheasant	Phasianus colchicus	scarce	2-4

The food and habitat conditions as they exist at the present time will be discussed for each individual species.

Cottontail rabbit

The cottontail rabbit is the most abundant species on the area at this time. There is an abundance of food and cover existing for them in the younger plantations and also in some of the older plantations(also coniferous) where there have been

pruning and thinning operations recently enough that there is still a great deal of brush on the ground.(See Figures 2 and 3, page 6). Rabbits are very scarce in the hardwood areas, probably due to the lack of any thick ground cover. During the warm part of the year, they are to be found in considerable numbers in the fields that have not as yet been planted; however, with the advent of cold weather, they seem to concentrate in the areas of heaviest cover.(9) The limiting factor for the cottontail rabbit would seem to be the lack of heavy cover during the winter months. There seems to be an ample supply of food for them at all seasons of the year. These heavier coniferous plantations also furnish good protection for them from predators, particularly avian predators. There does not seem to be any problem at present as fas as predation is concerned. Since there is no hunting permitted in the forest, predators undoubtedly are the important factor toward keeping the rabbit population on a balance. There seems to be no reason, at least now, to try to control the predators in the woods, in respect to rabbits.

Fox squirrels

Fox Squirrels are abundant throughout the hardwood sections of the forest. From the first to the fifteenth of October, for example, an average of three and one-half squirrels per hour was observed. This is computed for all the hardwood sections in the forest, and as such, makes the figures merely an average. Some of the plots had a much higher number of squirrels sighted than this figure indicates, while others had none.

The best areas, in point of numbers of squirrels sighted, are the ones having the larger timber and some den trees. The largest numbers of squirrels were seen in plots* 2,3,7,15, and the northern third of plot 45 in Block I. Tn Block II, plots 1 and the eastern half of plot 13 had a fairly high population. There is an abundance of hickory and oak trees in all the plots, to supply mast for an even larger population than now exists. It is not apparent that any food shortage for the squirrels exists during any part of the year. The preceding statement is true if the mast crop is not a complete failure; and such a failure is not likely, inasmuch as both black and white oaks are present in sufficient quantity to supply the demand, even if the hickory crop is a complete failure. Both pignut and shagbark hickory grow in this forest. It is extremely doubtful that there will ever be a total seed failure by all these species in any one year.

The limiting factor for the fox squirrel population is probably the lack of den trees over a large part of the forest. It is quite noticeable that the higher densities of this species are to be found where there are more dens present. Even in the larger and more mature timber, there are relatively few dens available, due to the fact that any overmature trees have consistently been removed during the improvement cuttings that have been made in the course of forest operations.

* Plots referred to by number at this point, can be found on the enclosed large map; all future references to locations will be by the indicated plot number.

Gray squirrels

Gray squirrels are now present in some parts of the forest, but they have just begun to come back into this area. It is not possible to state just when the first one was sighted here, but they have become common only during the last three or four years. This is a positive indication that the woods is returning to a truly forest habitat.

The food requirements are essentially the same for them as for the fox squirrels. Being a true forest animal, the gray squirrel can be expected to increase here and will probably eventually be the important squirrel of the forest; the fox squirrel can be reasonably expected to decrease somewhat as the habitat becomes more of a true forest condition and there are fewer openings and more underbrush. The fact that this is a relatively small tract and that there are open fields and crop land around it, preclude the possibility of fox squirrels' entirely disappearing. The gray squirrel requires the same den trees as does the fox squirrel, so any improvements along this line will be of benefit to both species, regardless of which one is dominant. Of course no hunting is permitted and therefore only natural enemies and the habitat conditions control the population.

Several predators are present that do take some toll of both species of squirrels, but not enough to be of any consequence. The predators are really of little importance. Durward Allen(1) lists the dog as the worst predator of the fox squirrel, and these animals are virtually negligeable in the number of

squirrels that they can catch. In two years that this area has been under observation, only two kills were found by the writer, and they both appeared to be the work of hawks.

Red fox are abundant over the area of this forest. There is not a plot anywhere in the forest that does not have fox tracks through it. In this survey, only one fox was seen; this one was observed last October 10th in plot 13 of Block II. Tracks are especially plentiful and have been ever since the first snow fall. No dens have been found, but there may be some that have not been located. The fox population here has increased during the last few years, as it has every where else. It is worthy of mention here that one of the farmers, Mr. William Clark, whose land adjoins the forest property, states that he had to stop pasturing his sheep in an adjacent pasture, due to the fact that the foxes and coyotes killed too many of the lambs. Whether they were actually to blame or not is impossible to determine now, but he is firmly convinced that they were. There is no reason to believe that they are abundant enough to furnish cause for worry as to survival of the other game of the forest, and it is doubtful if any control measures are necessary. Any game which is taken is probably more than balanced in value by the number of mice taken by them. These mice would be extremely detrimental to the young plantations.

Coyotes have been reported on the area from time to time and there have been two of these killed just outside the fence; these were probably chased from inside by dogs.

During this study, none has been seen, but tracks are evident in every fresh snow. These tracks are believed to be coyote tracks. They have been observed on several occasions in plot 13 of Block II. They are probably of little major importance as predators, but they should be controlled. If they are permitted to become abundant, they may become a decimating factor on the growing deer herd of the woods, as well as an increasing liability to the farmers of the surrounding sections.

Skunks

Some skunks are present in the forest, but they can be classified as relatively scarce. This condition is due largely to the fact that the skunk prefers a more open habitat, one interspersed with cultivated fields and pastures.(6) A disease that nearly exterminated this animal was prevalent a few years ago, and they are just beginning to be plentiful throughout the whole region again. During the forepart of the winter, three different dens were observed and tracks were seen in several other places. Skunks are not plentiful here at the present time to be of much importance one way or the other. If they become overly abundant, they might, by destroying grouse nests, be a controlling factor for that species. There is no need to develop any control measures now, and the only improvement possible here would be the formation of more dens for them. Woodchucks, is not molested, will furnish these for the skunks.

Raccoons can be classified as scarce and it is doubtful if they would ever be any more plentiful than they are now.

Tracks have been seen several times in the fire lines around the Bell 80, which is close to Little Portage Lake. This Lake has a swampy margin. A raccoon was observed on November 12, in plot 12 of Block I. This individual was sunning himself on top of an old squirrel nest. There is only one tree in the entire forest property that has a cavity large enough to be used as a raccoon den. This is a white oak in plot 45 of Block I. Due to the lack of den trees and the fact that there is no open water in the forest, it is doubtful if there will ever be any raccoon population here that is worthy of any serious consideration.

Opossums

The opossum, like the raccoon, is scarce throughout the forest. Tracks are seen from time to time, but in no particular part of the forest, more than in any other. The reason that they are not more plentiful is probably due to the distance from surface water, as in the case of the raccoon. The tracks seen are undoubtedly made by an occasional one that wanders through the woods. No reason is indicated for making special improvements to favor this animal or for trying to control it in any way. They would not be particularly harmful to the more desirable species, even though they were much more plentiful than at this time.

Woodchucks

The woodchuck is another common animal of this area. In themselves, they are neither harmful nor beneficial in the forest. Their chief value exists in the dens that they dig.

These dens are used then by both rabbits and skunks.(9) The woodchuck is now protected except for a short season and in the interests of other game, it easily merits such protection. There is no way to manage this species here, except to give them all possible protection.

Deer

There is now a growing deer herd in the forest. The first signs of their presence were observed during the summer of 1946. At that time, only a few tracks were seen occasionally in the fire lines. During the winter of 1946 and 1947, there were no signs apparent. Early in the spring of 1947, tracks were seen again, and the first deer was seen on the fifteenth of June. During the summer and fall, signs of their presence became increasingly abundant. No more deer were actually seen, however, until the twenty second of November, when a large buck and doe were seen. Since the snow has been on the ground, tracks are to be seen in all parts of the woods. An estimated population of at least six deer have wintered there the past winter. With the advent of cold weather, they seem inclined to retreat to the coniferous plantations. (See Figure 4,page 7).

The fact that the deer are returning to the property further proves that it is turning into a true forest condition; and forest game, rather than farm game animals, must be considered for future management. The land belonging to the University and that under private ownership immediately adjacent to it and of similar character, should support a herd of twenty five or thirty

deer without any important damage to the forest trees. The lack of water is once more of definite disadvantage in the case of the deer population. While there is water available to them nearby, they have to cross a road in each instance (See Figure 1, page 5), in order to reach water. The important problem in managing this deer herd is going to be the problem of keeping poachers from killing them and to keep the dogs and coyotes from running them and eventually driving them away.

Ruffed Grouse and Pheasants

Only two game birds inhabit the forest; these are ruffed grouse and ring-necked pheasants. The grouse are more plentiful than the pheasants now and there is every indication that the trend is still further in that direction. The habitat is much more favorable for the grouse than it is for the pheasants and it will continue to become even more so. The only pheasants now are found around the edges of the forest and probably use the forest itself only during the most severe weather or during the hunting season when they have become frightened.

Grouse are to be found throughout the woods, in the hardwoods during the fall, spring, and summer, and in the dense coniferous stands during the winter months. The writer flushed as many as six in a half day period during the fall. At that time of the year, they were still in groups of two or three, but since the coming of cold weather, they are to be found singly.

Compared with other grouse coverts throughout this

section, there is a better than average population present in the woods at this time.(11) Some of the forestry practices now being carried on tend to favor the grouse. There are underplantings of conifers in several of the hardwood plantations, and a number of small plantations of conifers surrounded by the hardwoods. This interspersion of cover is especially advantageous to grouse(7). The presence of the numerous roads and fire lines throughout the woods tends to provide openings and to expose enough bare soil to more than meet the requirements of grouse. The younger coniferous plantations which have more or less hardwood brush and briars growing up in them will satisfy their requirements for this type of cover.

A problem will arise when certain parts of the forest have reached a more advanced stage. When that happens, a need to create some openings will appear. These will be necessary to provide a better interspersion of cover. One other habitat requirement that is necessary for grouse is definitely lacking at Stinchfield; this is the presance of old logs of a fairly large diameter, to be used as drumming sites. In the past, it has been the practice to utilize any fallen trees for firewood, or, if desirable, for saw logs. Leaving some of the poorer quality logs in the woods will meet this requirement and will mean small loss in the financial revenue realized from the woods. Some of the plantings that will be of considerable advantage to this species will be discussed later.

Since the habitat is not suitable for pheasants and will continue to become even less suitable as time passes, it

does not seem feasible to try to improve the situation for them.

This concludes the discussion of the game resources of Stinchfield Forest and the habitat as it exists in regard to them. The other wild life of the woods which have not been mentioned, such as song birds, hawks, owls, and small rodents, will benefit from any sound forestry practices that take benefits for wildlife into consideration. Any improvements made for the game species will be of benefit to one or more species of these animals and birds. Since this area probably will be utilized more in the future as an outdoor classroom for the study of the varied forms of wildlife that are not to be found on the other study areas in this territory, it is felt that there should be as great a variety of wildlife present as is possible. It is perhaps worth mentioning again that this forest will always have as its primary purpose, the production of forestry products; therefore, no measures should be adopted that will interfere to any extent with the practical forestry operations of the area. H owever, we can not ignore the fact that wildlife is also considered to be a forest product.(8)

SUGGESTED IMPROVEMENTS

Rabbits

One of the few improvements that can be made for rabbits and that will not interfere with the normal forestry practices, is the alteration of some of these practices in such a way as to be of benefit to the rabbits. As has been mentioned before, the rabbit populations are concentrated in the coniferous plantations, mainly the younger ones and ones with an abundance of slash on the ground.(See Figure 3, page 6). The practice of permitting the branches that are pruned off, to lie in a pile around the base of trees provides good ground cover in those stands that would not otherwise have any ground cover at all. The tops and branches of trees that are taken out in thinning operations are also left on the ground, and in the event of a heavy thinning, provide very excellent cover. These thinnings also open up the plantations so that briars and herbaceous vegetation have a chance to appear and, in so doing, furnish food for rabbits. As far as rabbits are concerned, this practice is definitely advantageous and it should be continued; any form of brush disposal which would destroy this cover should not be started. It has been the practice in making cuttings in the hardwood tracts, to lop and scatter the brush. These areas are deficient in ground cover, especially during the winter months. A better practice, for rabbits and other wildlife, would be to pile the brush whenever it is at all practical to do so.(See Figure 5, page 7) This would furnish

cover in certain parts of the forest, where such cover is now totally lacking.

By giving woodchucks all possible protection, a good supply of rabbit dens should be assured. It is doubtful if there is any need for these in the thick cover of the younger plantations, but in the older ones and in the hardwood plantations, there is certainly a need for more dens throughout the entire forest.

Some of the plantings that are to be made for wildlife will be of considerable value to the rabbits. It is planned to plant approximately 100 apple trees, scattered in openings in the forest. These are to be planted in fence corners and along the roads and fire lines where there is an open situation that will remain open; by this is meant places where the forest trees will not grow up and overtop them. Multiflora rose is to be planted also in odd corners and other places where it will not interfere. As this species grows to a height of six to eight feet and is impenetrable either by man or domestic stock, it cannot be planted where it will interfere with the normal activities of the forest. These plantings will add both food and cover for rabbits. The difinite locations for planting these and others will be discussed later.

On the next page is a partial reproduction of a table found in reference number 9, pages 71 and 72.

TABLE

A summary of shrubs, vines, and trees which attract wildlife.

NAME	SCIENTIFIC NAME	COVER VALUE	VALUE OF FRUIT AS FOOD
Wild grape	Vitis vulpina	Good	Good-fall and winter
Elderberry	Sambucus canadensis	Good-summer Medium-winter	Good-late summer
Wild black cherry	Prunus serotina	Poor	Good-late summer and fall
Sumac, staghorn	Rhus typhina	Fair-summer Poor-winter	Good-winter
Snowberry	Symphoricarpos racemosus laevigatus	Medium to poor	Late summer and fall
Grey dogwood	Cornus paniculata	Medium	Late summer and fall
Raspberry	Rubus idaeus	Good	Late summer
Blackberry	Rubus spp.	Good	Late summer
Wild rose	Rosa spp.	Good	Good-winter
Hawthorn	Crataegus spp.	Good	Good-fall and winter
Nightshade	Solanum	Poor	Late summer and fall
Bittersweet	Celastrus	Good	Emergency-fall and winter
Japanese barberry	Berberis thunbergi	Good	Emergency-fall and winter
Pine-Norway	Pinus resinosa	Good	None
Pine-Scotch	Pinus sylvestris	Good	None
Spruce-White	Picea glauca	Good	None
Spruce-Norway	Picea excelsa	Good	None
Cedar-Red	Juniperus virginiana	Good	Fall and winter
Viburnum	Viburnum spp.	Medium to poor	Summer and fall
Wild crabapple	Malus	Medium	Good-fall and winter
Sassfras	Sassafras varii-folium	Medium to poor	Winter(rabbits)
Mulberry	Morus spp.	Poor	Summer
Serviceberry	Amalanchier canadensis	Medium	Summer
Black Locust	Robinia pseudo acacia L.	Poor	Emergency, early winter

Squirrels

Management of fox and gray squirrels is of necessity limited to that part of the forest that is planted to hardwoods. As has already been stated, there is at present a fairly good population of these species present. Durward Allen(1) states that two squirrels per acre is near the maximum that any large area can support. However, smaller areas where conditions are exceptionally favorable, may at times have a much higher population.

Observations at Stinchfield have demonstrated that some parts of the forest are supporting a much higher population than others. The limiting factor for them would seem to be a lack of den trees. Since last fall, the hardwood sections have been canvassed and some of the existing den trees have been marked so that they will be saved during future cutting operations. All the den trees that were found and were either in use or in a usable condition, as far as could be determined, were marked. They were blazed and an X was cut in the blaze. (See Figure 6, page 8). This was done with Mr. Frank Murray's approval and cooperation. Any trees that are located in the future will be marked in a similar manner, and they will be saved if it is at all possible to do so. In all, there are thirty eight trees marked in this way; see large accompanying map for their location and distribution. Since there are approximately 186 acres in hardwoods, this means an average of only one den tree to nearly five acres of woods. It has been recommended by various authorities that from 2 to 5 den trees are needed per acre.(1) and (5). Since there is quite obviously such a shortage of den trees, and since the

formation of such trees takes many years, the best solution of this problem would seem to be to build and install some nest boxes in suitable locations. The making and installation of these might make a useful and instructive project for the classes in Wildlife Techniques. These nest boxes should be periodically checked for use; this should prove instructive as well as highly interesting.

The material for their construction can be made available through the school saw mill. In this way, there would be very little actual expense involved. Durward Allen gives the following specifications for nest boxes: "They should be 10" to 1' square and 2' to 3' high. Near the top and next to the tree, there should be a 3" hole." (1) He further recommends that they be placed high up in the tree and either nailed to the bole of the tree or fastened to the tree with wire.

There are several plots that are in serious need of more dens. Plots 10,11,12, 14, and 15 in Stinchfield Tract are some of these.(See Figure 7, page 8). All but the northern part of the Peach Mountain Tract, where there is already an abundance of dens, is especially lacking in den facilities. Much of this area was clear cut at one time and there is as yet no timber old enough to have formed hollow tree dens (3). The western part of the hardwoods on the Carr Tract is practically the same as most of the Peach Mountain Tract. Both of these plots produce an abundance of mast, but the squirrel population here is lower than any-

where else (in the hardwoods) in the forest. This would seem to indicate that a lack of dens in these areas is a limiting factor for the squirrels. If these areas could be made to support a population of even one squirrel per acre, it would be a worthwhile project to construct some artificial dens.

There is an abundance of food throughout the forest for squirrels. No planting seems to be indicated in order to provide more food for them. However, some of the suggested plantings will undoubtedly be of some benefit to them, in increasing the amount of summer food, even though these plantings are primarily intended for other species.(See Table 2 in Reference 2). Leaving some of the old fence rows between the different parts of the forest will form lanes of travel from one part of the forest to another, as well as providing additional food, during the summer months.

As mentioned before,it is expected that the gray squirrel will become the dominant squirrel, while the fox squirrel will probably decline in numbers. It is extremely doubtful, however, that the fox squirrel will ever disappear entirely from this forest, due largely to the surrounding open and farming land.

Deer

The Deer herd at this time is so small that it is of no major concern. However, if past records such as those of the George Reserve are an indication of trends, it can be expected that the deer population will reach a size that will constitute a major problem in a very few years. In the instance of the George Reserve, a herd was started in 1928 with four pregnant does and two bucks. By 1933, there was a herd of 160 animals.

The condition at Stinchfield is different from this case in some respects, mainly in the fact that there is no swamp area present here and in the fact that this area is not completely fenced in such a way as to keep the deer population confined to the area. The dense coniferous plantations here will largely take the place of the swamps at the George Reserve as winter cover, but will not replace them as a source of free water, except when there is snow on the ground. The fact that the area is not enclosed will permit the existing population to spread out over the surrounding territory so that there will not be, in all probability, a concentration here as dense as that of the George Reserve.

However, the history of the George Reserve serves as a good example of the rate at which a deer herd will increase if it has adequate protection. Should the herd here ever approach this density, measures would have to be taken to reduce the population and keep it down or the forestry projects would suffer greatly. The population here must be carefully watched so that it never reaches a point in numbers that may injure the forest.(13) The Stinchfield area and the surrounding territory, to which the deer will have access in this case, should be able to support a herd of from twenty to thirty head, without receiving any appreciable damage. This should make an interesting problem for the wildlife classes to keep a record of from year to year. It is a reasonable contention that even under the existing conditions, some definite action will have to be taken to control this herd within the next five years.

Plantings of white cedar are to be made along the fire lines and roads of the forest, not so much to furnish any regular supply of food, as rather to take some of the browsing pressure away from the young plantations. While this is not a good site for white cedar, it will at least grow here and do sufficiently well to furnish some food for the deer.

It seems reasonable to believe that if the deer here are protected and are not allowed to become so numerous that there is not sufficient browse for them, they will inhabit this area from now on. The most important problem here will be protection from poachers and from dogs that may roam the forest. Since there is much private land surrounding Stinchfield, the poaching problem may well be the most serious.

Ruffed grouse

Grouse are the only game birds that can be expected to be of any importance here. As was stated earlier, there are some of these birds present here now, but not in the numbers that the area should support. There seems to be an abundance of good cover for them at all seasons of the year and probably an ample supply of food.(See Figure 8, page 9) One vital factor for their welfare is definitely lacking, however, and that is the presence of logs that can be used for drumming sites (7). This situation can be easily remedied by leaving a few of the poorer quality logs in the woods when each plot is cut over. This would entail no extra work and would represent a very small monetary loss.

Plenty of dense coniferous cover is available and there

are numerous small patches and underplantings of conifers in the hardwood stands to provide all the winter cover necessary for them. Some of the food plants that are to be planted along the fire lines will provide additional food for this species. There is an abundance of fire lines and dirt and gravel roads throughout the forest that provide sources of grit and good dusting sites for grouse(10). There are numerous openings left. These are used for log landings and for buzzing wood, and are not used for several years at a time, and are permitted to grow up to brush when not being used.

There are no predators now present that take a sufficient toll of grouse to warrant any special control measure.(11) As far as this writer can determine, the limiting factor for the grouse is the lack of drumming sites, and if this condition is remedied, they should show an increase.

Fur bearers

There are no special management factors that seem to be applicable to the fur bearers in this particular situation. Leaving trees with dens large enough to accommodate a raccoon, may induce some of them to stay, if the trees are along the edges nearest the water. This is not a good natural habitat for raccoon(see page 10), and no amount of management will ever produce any large population of this species here. Skunks and opossums will probably never be abundant here, but there should continue to be a few of both species present. The foxes and coyotes have demonstrated their ability to take care of themselves in too many cases to merit any special measures in their behalf. Woodchucks, as mentioned

before, are of decided benefit to the rabbits as well as to the furbearers. They should be given all protection possible both from hunting and from dogs. None of the plantings suggested will benefit any of these animals directly;they will benefit indirectly, however, in an increased amount of prey for the predatorsa among them. These predators are considered by many to be harmful to the game of an area such as this;however, unless there is to be hunting or some other method of removing surplus animals, predators are a necessary part of the wildlife of this or any area.

PLANTINGS FOR WILDLIFE

The following chart gives a list of the species to plant and the wildlife which they will benefit as to cover or food, or both. Key to numbers is to be found at the bottom of the chart.

COMMON NAME	SCIENTIFIC NAME	FOOD	COVER
Apple	Malus spp.	1,2,3	
Dogwood	Cornus paniculata Cornus florida	1,2,3	
White Cedar	Thuya occidentalis	1	2,3
Wild grape	Vitis spp.	1,2,3,4	2,3
Hazelnut	Corylus americana	1,2,3,4	3
Highbush cranberry	Viburnum opulus	1,2,3,4	
Multiflora rose	Rosa Multiflora	1,2,3	2,3
Japanese barberry	Berberis thunbergi	2,3	3

1-deer 2-grouse 3-rabbits 4-squirrels

The species of plants chosen were selected mainly for their food value. Some of these plants are present on the area at this time in small quantities. These are apple, grape, hazelnut, and Japanese barberry. They are all utilized now and a better distribution of them will improve food conditions over much of the forest.

Apple trees are to be scattered over the entire forest, as stated earlier, wherever there is a site suitable for them. The presence of red cedar in all parts of the forest will probably cause these apple trees to be affected with cedar gall, but this

will not seriously affect the fruit as a wildlife food.

Dogwoods, flowering and gray, will be planted along the fire lines and roads. The plantations in the older part of the forest are planted right up to the fire lines. This not only reduces the effectiveness of the fire lines, but does not leave room for any shrubs or herbaceous vegetation that can be used for wildlife. The presence of these shrubs(deciduous) along the fire lines, further adds to their effectiveness as fire breaks. These shrubs will be planted along all the proposed fire lines and roads as they are constructed, as well as along the existing roads and fire lines, wherever there is room for them.

At the present time, there is only one plantation of white cedar. Itis is plot six of Block II, the only really good site for this species in the entire forest. However, the cedar will grow to some extent on other sites and will produce some winter browse for the deer population. It can be planted along the new roads as well as the old ones, and it will be of aesthetic value as well as food value.

Wild grape is not present in many places. Since it is harmful to both young conifers and young hardwoods, it has always been removed wherever it occurred in any of the plantations. This practice will naturally be continued in the future, but a suitable place for wild grape does exist along old fence rows which originally separated the different tracts of the forest. Leaving these old fence rows will be of decided advantage in fire control as well as wildlife food production.

Hazelnut is another species that can be planted along fire lines and fence rows. This shrub has a high food value for the game species that are to be especially encouraged here.

Highbush cranberry is one of the viburnums and has no special value over the other viburnums in food production and value. This or any of the other viburnums can be planted along the fire lines and roads, as well as in old fence rows.

Multiflora rose must be confined to odd areas where there will never be any occasion or need to go through. Fence corners and spaces where the fire lines do not follow the fence closely, are the only locations possible for this particular plant. While it has a good value as both food and cover, it forms such an impenetrable thicket, that it cannot be planted, obviously, along roads and fire lines.

Japanese barberry has been planted in some places along the main road through the S tinchfield Tract. It is utilized by both grouse and rabbits for food and as good cover by rabbits. This is a low growing shrub and can be planted close to the road without interfering in any way.

These plants have been selected primarily for their value to wildlife, as well as for the fact that they can, with but one exception, be raised in the forestry nursery, from locally collected seed at a small cost; multiflora rose is available through the State Department of Conservation at a small cost.

The planting can be done by the regular planting crews of the Forestry School, or it might be done by the wildlife classes. The cost of planting would be low in either case, as these trees and shrubs can all be planted in the same method used for planting forest trees. The plantings need not be made all at the same time, and probably would be best done over a period of several years. It will take at least two years to obtain planting stock, if it is to be raised in the forestry nursery. By that time, the new fire lines and roads should be completed and the planting sites prepared. No estimate of the amount of stock of any of these species need be made in advance, due to the fact that it will not all be planted at one time, and so should be raised in small quantities as needed.

PROPOSED PLANTATIONS

The following table shows the plots that are to be planted to forest plantations. They are shown on the large map, outlined in green. Species to be used, as well as planting dates for them are indicated in this table.

PLOT	SPECIES	PLANTING DATE	AREA (ACRES)	STOCK NEEDED
BLOCK I				
37	White Pine Western Yellow Pine Norway Spruce	1948	12	4,500 4,500 1,800
39	European Larch Hard Maple	1949	7.5	3,500 3,250
40	Western Yellow Pine White Pine Jack Pine	1950	7	2,000 2,300 2,000
41	White Pine Norway Spruce	1951	10	6,000 3,000
44	Jack Pine	1952	9	8,100
BLOCK II				
14	White Pine	1953	11	10,000

The map shows that the new plantations that have been laid out are not in any precise geometrical form, but conform to the contours of the land as much as is possible. The rows are to be planted on the contour, and the species indicated for each plot are to be mixed in no regular pattern. It will be noted also that most are to be mixed plantings, wherever the site is of such a character that more than one species are well adapted to it. Plot 44 is the only exception to this rule, in Block I.

Jack Pine was selected in this case because the land here is probably the poorest of any that is yet to be planted. It should prove a good site for Jack Pine but is not well suited to any other. A pure stand of White Pine was chosen for Plot 14 of Block II; adjoining plantations of White Pine have done exceptionally well and this is a similar site.

The European Larch and Hard Maple were selected for Plot 39 to keep the fire hazard as low as possible around the sawmill. These species should do well here and will not be nearly as conducive to fire as would a pure stand of conifers. Species for the other sites were selected on the basis of what these particular species have done on similar sites in other parts of the forest.

The spacing of these new plantings is to be eight feet between the rows and six feet between the trees in the rows. By this spacing, wider than any used on the other plantations, thinnings and improvement cuttings can be taken out without making any special skid trails, as the rows will be far enough apart to permit a tractor to go between any of them. This wider spacing should also eliminate the first thinning that is necessary on plantations that are more closely spaced. It should not reduce the quality of the trees to any appreciable extent.

SUMMARY

These,then, are the general objectives to be considered in the future study of Stinchfield, in reference to the wildlife resources.

1. To improve the habitat for wildlife, and thus encourage as wide a variety as is possible.

2. To realize that improvements for wildlife must not be made at the expense of the actual forestry operations.

These are the specific recommendations toward carrying out the above objectives.

1. To permit brush to remain after hardwood cuttings and thinnings.(see page 22)

2. To mark and save den trees, with a total of at least one per acre, and not more than 3 per acre.(see page 25)

3. To construct and install nest boxes for squirrels. (see page 26)

4. To maintain an annual deer census, to keep the population below the point of danger to the plantations. (see page 28)

5. To leave drumming logs for grouse (see page 29)

6. To provide additional food by planting certain shrubs and trees. (see page 32)

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STINCHFIELD

WOODS

ROAD

TOMEY ROAD

6
White Cedar

White, W. Yellow and Austrian Pine
11

7
Austrian Pine

White Pine
Nor. Spruce
12

5
Western Yellow Pine

4
White Pine

4C
White Pine

3
Norway Pine

3
Norway Pine

2C

2A

Norway Pine

8
Norway Pine

10
Norway Spruce

9
Corsican Pine

2B
Norway Pine

1
Oak-Hickory

14
White Pine

13
Oak-Hickory

20
Norway Pi

19
Scotch Pine

18
Scotch Pine

15
Oak-

880
900
920
940
960
970
980
990
1000
1010
1020
1030
1040

N

WOODS ROAD

N

3
Pine
2C 2A
Norway Pine
10
Norway Spruce
Norway Pine
2B
Norway Pine
ickory
13
oak-Hickory
20
Norway Pine
21
27
Scotch Pine
33
White Pine
oak-Hick
31
Norway, White and Austrian Pine
32
Norway Pine
19
Scotch Pine
17
Scotch Pine
18
Scotch Pine
30
Norway Pine
35
White Pine
28
Scotch Pine
29
Norway Pine
34
Jack Pine
Jack Pine
44
White and Norway Pine
16
oak-Hickory
Jack Pine
26
Mixed Conifers
24
Scotch Pine
23
Scotch Pine
25
Aspen, Pine and Spruce
15
oak-Hickory
14
43
Scotch Pine
22B
11
11A
12
oak-Hickory
13
Scotch Pine
22A

ROAD

ROAD

DEXTER

21
Norway Pine

27
Scotch Pine

33
White Pine

31
Norway, White and Austrian Pine

32
Norway Pine

37
White, w. Yellow Pine
Norway Spruce

36
W. Yellow Pine
Norway Spruce

38
Red Cedar

39
E. Larch
Hard Maple

40
W. Yellow, Jack and White Pine

45

35
White Pine

30
Norway Pine

Oak-Hickory

19
Pine

17
Scotch Pine

18
Scotch Pine

28
Scotch Pine

29
Norway Pine

34
Jack Pine

Jack Pine

44

White and Norway Pine

16
Oak-Hickory

26
Mixed Conifers

24
Scotch Pine

23
Scotch Pine

25

Oak-Hickory

15

14
Oak-Hickory

Scotch Pine

22B

43

Aspen, Pine and Spruce

Landing

41
White Pine
Norway Spruce

11

12
Oak-Hickory

13

1040 RADIO TOWER

SAW MILL

STINCHFIELD WOODS

PARTS OF
SECTIONS 11, 12 & 14; DEXTER TWP.

WASHTENAW CO. MICH.

SCHOOL OF FORESTRY & CONSERVATION
UNIVERSITY OF MICH.

SCALE 0 200' 400' 600'

NOV. 1947

H.J. Hammond

N

TOMEY ROAD

7 Austrian Pine
12 White Pine / Nor. Spruce
5 Western Yellow Pine
4 White Pine
4C
8 Norway Pine
10 Norway Spruce
Norway Pine
9 Corsican Pine
2B Norway Pine
2C 2A
1 Oak-Hickory
14 White Pine
13 Oak-Hickory
19 Scotch Pine
Scotch
15
11
10
2 Oak-Hickory
3
4 Norway Spruce / Corsican Pine
Austrian Pine
White and Norway Pine
5A
6 Oak-Hickory
1 Corsican Pine
5B W. Yellow Pine
White and Norway Pine
5C Austrian Pine
Oak-Hickory
CABIN

9
Corsican Pine

2B
Norway Pine

1
Oak-Hickory

13
Oak-Hickory

19
Scotch Pine

17
Scotch Pine

18
Scotch Pine

White and Norway Pine

16
Oak-Hickory

28
Scotch Pine

30
Norway Pine

29
Norway Pine

34
Jack Pine

Jack Pine

26
Mixed Conifers

24
Scotch Pine

23
Scotch Pine

25

15
Oak-Hickory

14

11

12
Oak-Hickory

13

Scotch Pine

22B

Scotch Pine

22A

11A

Norway and White Pine

10
Oak-Hickory

9

2
Oak-Hickory

3

4
Norway Spruce
Corsican Pine
White and Norway Pine

Austrian Pine

1
Corsican Pine

5A

5B W. Yellow Pine

5C
Austrian Pine

6
Oak-Hickory

White and Norway Pine

Oak-Hickory

White Pine

7

Norway and White Pine

White, Norway, Corsican and W. Yellow Pine

8

CABIN

DS

TWP.

SERVATION

600'

LEGE

FIRE LINES
ROADS
PROPOSED FIRE LIN
PROPOSED ROADS
TYPE LINES
NEW PLANTING SIT
DEN TREES TO BE

H.J. Hammond

19
Scotch Pine
17
Scotch Pine
18
Scotch Pine
16
Oak-Hickory
White and Norway Pine
28
Scotch Pine
29
Norway Pine
30
Norway Pine
Norway, White and Austrian Pine
31
32
Norway Pine
35
White Pine
45
40
W. Yellow, Jack and White Pine
E. Larch Hard Maple
DEXTER
34
Jack Pine
44
Jack Pine
Jack Pine
26
Mixed Conifers
24
Scotch Pine
23
Scotch Pine
25
Landing
Aspen, Pine and Spruce
Oak-Hickory
15
Oak-Hickory
14
43
White Pine Norway Spruce
41
Scotch Pine
22B
Scotch Pine
22A
11
12
Oak-Hickory
13
11A
Red Cedar
42
Norway and White Pine
10
Oak-Hickory
9
6
Oak-Hickory
Norway and White Pine
White Pine
7
White, Norway, Corsican and W. Yellow Pine
8

LEGEND

- FIRE LINES
- ROADS
- PROPOSED FIRE LINES
- PROPOSED ROADS
- TYPE LINES
- NEW PLANTING SITES
- DEN TREES TO BE SAVED ⊕