

The Winter Deer Range
in a Section of the Huron Mountains,
Marquette County, Michigan

A. M. Stebler

An investigation of the winter deer range on the property of the Huron Mountain Club was made during the period extending from March 6 to 10, 1939. The purpose of the investigation was to gather information which will aid in or lead to the development of a land management plan for the club property which will take into consideration the wildlife as well as the cover. In this report the discussion will be confined to the deer and its habitat. It should be realized that the time spent in the field was much too short to permit any thorough investigation or study. Despite this handicap, however, it is believed that some observations were made and tentative decisions reached which justify this report. The work in the field was done with the assistance of Messrs. Cash Wensser and Roy Semeyn of the Conservation Department, and Mr. Dunham, a guard on the club property. Mr. Dunham's services, mostly as a guide, were secured through the kind permission of Mr. H. E. Perkins, manager of the club. In many other ways, too, Mr. Perkins was extremely generous and helpful.

The Winter Deer Range

The deer in this area show no proclivity toward banding together in a yard during the winter, a habit which is so manifest generally in Michigan's Upper Peninsula during this season. The winter range, however, is not so extensive as that of the summer. At this time it appears that the deer occupy only that part of the area which lies between the bases of the mountains and the Lake Superior shoreline. It is well known, of course,

that in summer they range throughout the area. The mountainous areas may be abandoned during the winter because of their relatively greater exposure to the rigors of the climate. On the lower lands between the bases of the mountains and the lake shore a greater amount of protection is afforded because the cover is usually somewhat more dense and the general ground surface is such that it is not greatly exposed to the wind. Available forage may be somewhat more abundant on the lower areas than in the mountainous parts of the district, but from casual observation it would seem that this difference is so slight as to be negligible as a factor influencing the choice of range in the winter by the deer.

The cover of the winter deer range is predominantly virgin hardwood timber. Its composition varies somewhat according to site. In the better drained situations it is composed mostly of hard maple and yellow birch with a good complement of hemlock and basswood. Elm becomes prominent in the slightly more moist situations, as for example along the floodplain of the Salmon-Trout River. On the wet sites swamps are developed, which are composed mostly of white cedar, balsam fir, and spruce. The swamps, however, are small and constitute only a fractional part of the total winter deer range. Blocks of land from which the hardwood timber was removed were observed in Section 30, T52N, R27W, Sections 25, 35, and 36, T52N, R28W, and Sections 13 and 18, T52N, R29W. In the last description logging operations were currently in progress.

The sustaining potential of this range for deer is definitely low. In the tracts of virgin hardwood the conditions are, without doubt, the most critical. Usually there is little or nothing available upon which the deer may forage at this season. A small balsam fir appears occasionally which is browsed to a limited degree by the deer. Also there is an occasional wind-fallen hemlock. But instead of being browsed but little by the deer, their utilization is complete and appears avid. It is doubtful if the situation is much less severe in the swamps. Here too much of the available forage occurs as wind-fallen timber, usually white cedar or balsam fir. The forage available on the standing timber is scant to say the least. Available forage is relatively more abundant in the older hardwood cuttings than anywhere else. The cutover sites are coming back with a copious reproduction of hard maple, yellow birch, with moose maple and cherry being common associates. It appears that this reproduction has been browsed by the deer considerably in the past and it still appears to be browsed extensively, but at the time of this inspection it was subjected to only a minor degree of foraging. Mr. Dunham reported that now it is used mostly in the late fall and the early winter. This may be the case for while indications of recent browsing were everywhere in evidence on the brush, the deer were not moving about and foraging in the cuttings. A deer trail occasionally traversed them and along these, some browsing was still in progress. For the most part, these stands of brush are reaching the end of their period of usefulness as deer forage. This is true particularly in the southwest quarter of Section 13, T52N, R29W. To a lesser degree, this same condition prevails in the southwest quarter of Section 30, T52N, R27W.

The logging operations in progress in Section 18, T52N, R28W are furnishing an abundance of forage for the deer in the form of slash from the hardwoods but particularly from the hemlock. The multitude of deer tracks present in these operations indicate an intense utilization of this food source by the deer. But there is so much forage made available in this manner that the deer are hardly able to make any impression on it. Although this food supply was abundant, it appeared evident that it was not servicing any large number of deer.

The Deer Herd

Impressions gained as a result of these field investigations indicate that the size of the deer herd on this range is small, numbering perhaps not more than two hundred individuals. They are generally distributed in the area described above and appear to move freely throughout this range. Scattered trails, which seem to be in constant use, are to be seen all through the area. Nowhere do they yard, although the swamps appeared to be used to a somewhat greater extent than other types of cover. Since available forage is scarce everywhere due to the maturity of the cover, it may be that the swamps receive a greater degree of use from the deer more for the shelter they furnish than for the feed. Hosley and Ziebarth (1935, p.547) point out that deer show a strong preference for coniferous types for bedding down during the winter. The snow seemed not to offer any impediment to their free movement, and it averaged only two to two and one half feet in depth at this time.

Due to the relative paucity of its availability, food it would seem is the factor above all others which governs the size of the deer herd. This same factor may be responsible for the absence of the yarding proclivity among the Huron Mountain Club deer. Its scarcity makes yarding impossible if the deer are to live.

It would seem absurd to regard the larger mammalian predators as a menace to the welfare of the deer herd, for they are apparently so rare. Judging from the number of trails found alone, the red fox seems to be most numerous although not many trails were found. The fresh trail of only one bobcat was discovered. This was on the Salmon-Trout about a mile below the road. No fresh signs of the coyote or the wolf were seen. Mr. Dunham reported, however, that he had seen the fresh tracks of a pair of wolves several days previously on the lower part of the Salmon-Trout near the Norways.

No dead deer were found during the course of these investigations. This may indicate that insufficient time was spent in the field; it may indicate that the predators are not destroying any deer to speak of, due perhaps to the scarcity of the former; it may indicate that a balance of a sort has been attained between the size of the deer herd and the amount of available feed; or it may indicate that a combination of these conditions are operating. At any rate the information is not conclusive, but there does appear to be no warrant for predator control.

Alfalfa hay was being provided for the deer in at least four mangers located adjacent to the road between the club farm and a point west of Pine Lake. This artificial feeding had just been begun at the time these investigations were made. To illustrate how this hay was appreciated

by the deer, a filled manger would be completely devoured in less than twenty-four hours. The mangers were large enough to hold at least a bale of pressed hay. The mangers were so located that it is likely the hay they contained was available to all the deer resident in the area. Considering the paucity of a available natural forage, hay provided at this time may be considered almost a god-send to the deer. With the development of the proper type of timber management, however, it should not be necessary to resort to artificial feeding, valuable though it is with the present conditions prevailing.

Management

It should be emphasized at the outset that no tried and proven procedures have yet been developed for the management of either the northern hardwood timber or for the management of a wild deer herd. Therefore, any project which is undertaken should be considered in the nature of an experiment. Toward both of these singular objectives, however, some progress is being made. Desirable though these attempts are, it appears that efforts should also be bent toward developing means whereby both objectives could be attained with one operation. That is to say, when efforts are designed toward timber management the improvement of the deer habitat should also be considered.

Should it be decided to undertake a management program affecting both the deer and the timber, the objective should be toward handling the timber in such a way that the deer herd will not be increased to any great extent but rather toward developing a means of providing for the herd now resident. In other words, the attempt should be to increase the carrying capacity of this range by timber management to the extent that the present

deer herd will be provided for adequately without increasing its size materially, for in view of the small degree of harvesting to which this herd is subjected any increase in its size is believed to be undesirable. At the present time it appears that the deer are largely an aesthetic asset, and this type of use has little effect in decimating their ranks. For such use, the present herd is probably adequate or very nearly so. On almost any foray into the wilderness, either in the summer or the winter, it is possible to view one or more deer. Thus anyone desiring to see deer may do so almost at will. If such an objective can be accomplished, artificial feeding would no longer be necessary. Thus the aesthetic value of the deer may, therefore, be increased. Destruction of cover, extermination of some plants, and large herd mortality are some of the harmful potentialities associated with an overpopulation of deer.

It is not believed either that the entire area of the club should be subjected to timber management. In a report submitted to the club some time ago, Professor Leopold recommended that an area surrounding and including Mountain Lake be reserved as a sanctuary. For any number of obvious reasons it is believed that his recommendations should be adopted. The sanctuary area thus set aside would and should remain inviolate and natural. This would leave the remainder of the area except the club headquarters available for experimentation in management procedures, which should be made on the winter deer range already described. This would involve the land lying north of Howe and Rush Lakes and that lying south of Conway Bay and west of Conway Lake. For aesthetic reasons it is believed that a strip of timber should be left adjacent to the Lake Superior shore. Also for the

same reasons it is believed that the timber lying adjacent to the Salmon-Trout River should be preserved as it is. In the latter situation the stream-side timber has values other than the aesthetic. It protects the sides of the valley from exposure to rapid run-off of rain and snow water, it protects against land slides in the spring after the frost leaves the soil and it becomes saturated with water to the extent that it is almost liquid, and it shades the stream protecting it from excessive warming. Roadside timber should be left for fire protection and aesthetic values.

The swamp lying within Sections 25 and 36, T52N, R27W is in dire need of cutting operations which will release eventually the mature timber with which it is stocked. This swamp is composed predominantly of white cedar, to which it should reseed if it is cut properly. Watson (1936, pp. 22 and 23) claims the northern white cedar reproduces prolifically. One handicap the cedar reproduction may face is heavy browsing by deer which has the effect of hindering or even preventing its growth and development. This writer points out further that, "Balsam fir reproduces in the forest similarly to northern white cedar. The northern white cedar is able to germinate and grow in either colder and darker places; the balsam fir comes in the more open spots.

"If there is any balsam fir seed trees within seeding range, any cuttings, heavy or light, but particularly if clear cut in patches on medium to good sites, are sure to result in a good crop of balsam fir reproduction."

Since cedar is highly desired as a winter deer food, it is clear that the cutting should not be too intensive. For while balsam fir is eaten by deer at this season, it does not have either the palatability or the nutritional value of the cedar.

Another factor which occurs in connection with cutting operations in cedar is the disposal of the slash. It has been considered good silvicultural practice to dispose of slash by burning to reduce the fire hazard. Because of this ever potential danger, no doubt there are situations where this practice is amply justifiable. It seems, however, that this danger has been overemphasized. It would seem that in the more out-of-the-way places which are rarely visited by persons that there is little danger of fire at least from the human element.

Despite its fire hazard potentialities, however, slash apparently is not without value. Random observations indicate that in some situations the presence of slash means the difference between the survival or perishing of cedar reproduction. If the slash is absent, the seedlings are clipped by the deer almost as soon as they appear, eventually resulting in the establishment of less palatable species. Where slash is present in the proper form, the cedar is able to attain some size before it is available as feed. When it does become available to the deer, it at least furnishes more feed than it would if it were available at a younger age. Thus the same number of trees will support more deer or a given number of deer for a longer period of time; there are more meals available.

About ten years ago on the east side of this swamp, the hardwood timber was clean cut. There is now a copious reproduction of hard maple, yellow birch, and moose maple along with some cherry on the site. As mentioned above, it has been used considerably by the deer as food. At the present time it is reported to be used only during the late fall and the early winter. When this investigation was made in early March, it was not being used at all except along an occasional deer trail. Much of this reproduction has now attained an approximate height of twelve feet, and the growth is exceedingly dense. It would seem advisable, therefore, to practice some thinning which would facilitate the development of the remaining saplings and at the same time furnish more forage for the deer. If the thinning were done in the winter, it is likely that the cut material would be utilized by the deer. Sprouts from the roots of this and renewed reproduction would shortly produce a new forage supply. Clepper (1936, p.414) and Hosley and Ziebarth (1935, p.550) strongly emphasize the value of this practice both from the standpoint of silviculture and deer management. This illustrates to some extent how judicious silviculture may serve a dual purpose--improvement of both the timber stand and the deer range. The same situation and recommendation apply to the stand of hardwood reproduction in the southwest quarter of Section 13, T 52N, R29W.

In arranging to cut stands of virgin hardwood timber it would be exceedingly desirable to attempt to develop a rotation of selectively cut stands of timber, which would furnish a continuous supply of timber and maintain the deer range adequately. The first cutting probably should be of overmature and defective timber. A pamphlet prepared by one or more

anonymous authors of the U. S. Forest Experiment Station at Dukes, Michigan describes such a cutting on page X. All old and defective trees were cut on ten acres in the fall of 1927. The original volume of the stand was 13,578 board feet per acre. Sixty-two percent or 8,370 board feet per acre were cut leaving 5,208 board feet per acre. This cutting netted the operator \$103.81 per acre, which made it a paying proposition. The gross annual growth of the remaining timber was 192 board feet per acre, the mortality 32 board feet per acre, leaving a net annual growth of 160 board feet per acre.

Considering the fact that deer range management is part of the problem, it probably would not be well to embark upon an extensive cutting program. Instead it would seem advisable to cut only a small plot each year, but one which was large enough at the same time to pay at least for the cost of the operation. The purpose of the small cutting would be to attempt to provide forage for the deer only a little in excess of their needs, which excess would serve as a safety margin.

After the first rotation described above was completed, mature trees should be selected for cutting upon a basis whereby enough trees were cut each year to pay at least for the operation. Selection for maturity seems preferable to size selection for several reasons. When timber is cut on a rigid diameter basis (cf. page XI of the forest experiment station pamphlet described above) many of the trees cut are "still sound, healthy and making good growth. Many of the smaller trees left are decadent, deformed and unhealthy." Accordingly, defective trees

should be removed as well as the mature. It probably would be several years before this second phase of the management program would be under way.

The original cutting of the overmature and defective timber would make possible an abundant reproduction since approximately 50% more or less of the timber would be removed. This removal would make both space and light available for the growth and the development of the seedlings. Enough trees of the climax species would be left for seeding to permit immediate return to the climax formation provided that fires did no damage. All reproduction should be subjected to periodic thinnings designed to improve the quality of the new stand and to maintain an adequate supply of forage for the deer.

The value of not disposing of the slash has already been indicated in connection with the discussion of the swamp cuttings. The same recommendation applies with respect to the hardwood cuttings. The slash should be allowed to lay just as it is trimmed from the timber. All limbs large enough to be used as chemical wood probably should be used for that purpose or for fire wood for club use. But aside from this the rest should be permitted to lie, because the twigs will furnish the deer with forage, and what remains after they have browsed it will serve as ground cover which will give the seedlings some protection from premature utilization by the deer. It has been found (selective logging pamphlet) that the burning of slash does not necessarily reduce the fire hazard. The herbaceous and scattered shrubby growths that appear often constitute a greater fire hazard for a longer period of time than the slash. In the cutting procedures described above, the slash would not probably constitute a hazard after the first summer.

The time of year best suited to logging operations for our purposes is another important consideration. It is doubtful if the season at which the timber is cut has any important silvicultural bearing, but it does have an important bearing upon the welfare of the deer. It is well known that in the early part of the winter deer are usually in reasonably good conditions and that for the most part there are no critical food shortage problems. But during the latter part of the winter, however, the situation is often much different. It is during this period usually that food shortages become acute, and the mortality as a result become high. The deer are then crucially exposed to an impoverished range. It is highly recommended, therefore, that the cutting operations be scheduled for this period of the year. This practice would have the effect of bolstering or replenishing an exhausted food supply. If the deer were slow to take advantage of this supply of forage, which is unlikely, they could be led to it with long bait lines. It has been demonstrated that it is possible to lead deer during midwinter for several miles with lines baited with hay. Thus the deer would be provided with feed at a season when its lack is most crucial, and the feed would be a sort of a by-product of another activity--logging. If successful, this means that the deer would no longer need to be provided with hay at feeding racks and the forage would be furnished at no cost to the club. The whole project should be self-liquidating.

Literature Cited

Anonymous.

Field studies in selective logging. U.S.D.A., Forest Service,
Lake States Forest Exper. Sta., University Farm, St. Paul,
Minn. 11 pp. multigraphed.

Clepper, Henry E.

1936. Forest carrying capacity and food problems of deer. Proc. N. Amer.
Wldf. Conf., Washington. pp. 410-415.

Hosley, N. W., and R. K. Ziebarth.

1935. Some winter relations of the white-tailed deer to the forests
in north central Massachusetts. Ecology, XVI (4): 535-553.

Watson, Russell.

1936. The northern white cedar. U. S. D. A., For. Serv., 44 pp. mimeo.

Figure 1

The foliage of this new-fallen hemlock has been completely browsed by the deer along the Salmon-Trout Trail north of the road.

(No. S-1071, Game Div., Mich. Dept. Cons.)

Figure 2

Most of the scattered cedar along the Salmon-Trout River are too mature to be of use to the deer as a source of food. The foliage of the young tree in this view had previously been browsed by the deer as high as they could reach. Then it was bent down by a windfall. This made the foliage of the crown available as food, which was quickly taken by the deer. (No. S-1073, Game Div., Mich. Dept. Cons.)



Figure 3

This large hemlock fell across the Salmon-Trout River near its lower end. Its foliage is being consumed by the deer. (No. S-1077, Game Div., Mich. Dept. Cons.)

Figure 4

In Michigan the balsam fir is not usually regarded as a deer food of importance. In the Huron Mt. Club area, however, all available foliage is being used by the deer. This is because more palatable foods are so scarce. This small tree happened to be a windfall. (No. S-1074, Game Div., Mich. Dept. Cons.)



Figure 5

The foliage of the young balsam-firs on this site has been almost completely browsed by the deer. A few scattered hardwood species have likewise been excessively browsed. Some of them have been browsed for at least three seasons. NW $\frac{1}{4}$ Section 36, T52N, R27W. (No. S-1083, Game Div., Mich. Dept. Cons.)

Figure 6

The swamp in the north part of Section 36, T52N, R27W furnishes the deer with little more than shelter. (No. S-1084, Game Div., Mich. Dept. Cons.)



Figure 7

The stands of virgin hardwood furnish the deer with scarcely any food at all. Here a lone, broken-down cedar has been completely defoliated by the deer. NW $\frac{1}{4}$ Section 31, T52N, R27W. (No. S-1080, Game Div., Mich. Dept. Cons.)

Figure 8

The maple reproduction coming in after a logging operation in the hardwoods in NW $\frac{1}{4}$ Section 31, T52N, R27W is supplying the deer with a small amount of food. (No. S-1079, Game Div., Mich. Dept. Cons.)



Figure 9.

The hardwoods on this site in Section 30, T52N, R27W were logged off about ten years ago. The reproduction, composed mostly of hard maple, yellow birch and cherry, is growing out of the reach of the deer. Thinning is necessary now to improve the quality of the reproduction, and to maintain a supply of available browse for the deer. (No. S-1082, Game Div., Mich. Dept. Cons.)

Figure 10

An elderberry which has been severely browsed by the deer for several years. Continued severe browsing eventually destroys this species. (No. S-1085, Game Div., Mich. Dept. Cons.)

