

FEASIBILITY STATEMENTS FOR SNOWSHOE HARE GOALS AND OBJECTIVES

Prepared by: Walter Jakubas
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This document is an analysis of the of Snowshoe Hare goals and objectives proposed June 26, 2002 by the Woodcock, Grouse, and Snowshoe Hare Working Group. The analyses consist of determining the 1) desirability, 2) feasibility, and 3) possible consequences of implementing the proposed goal and objectives. Separate objectives were set for the Industrial Forest¹ (IFR) and the Forest / Agriculture / Residential² (FARR) regions of Maine. A separate discussion on the capability of the habitat for meeting the goal's objectives, which is normally included as part of this review, was not included. Because the objectives were given as either habitat or outreach objectives, information that would have been presented in the "capability of habitat section" is presented in the feasibility statement or was considered not applicable (i.e., for outreach objective).

Goal: Increase the quality and quantity of snowshoe hare habitat and increase the awareness and understanding of snowshoe hare, its habitat requirements, and its importance as a prey species in Maine.

Overview: An increase in the quality and quantity of snowshoe hare habitat should increase the state's overall carrying capacity for hare. This may translate into higher hare populations or hare populations that experience less severe fluctuations in hare numbers over time. Snowshoe hare are a major food item for many carnivores including marten, fisher, great horned owls, barred owls, coyote, lynx, and bobcat. Higher or more stable hare populations will provide a prey base that may allow higher densities of predators to persist. These predators provide recreational opportunities for hunters, trappers, and wildlife viewers. Although the opportunity to hunt or view snowshoe hare is good in most of the state, an increase in the quality and quantity of snowshoe hare habitat may particularly benefit hare hunters and viewers in the FARR of Maine. Guided hare hunts have become increasingly popular in recent years, but the long-term outlook for this industry is not certain given the fluctuating nature of snowshoe hare populations. Increasing the carrying capacity of hare by improving their habitat increases the potential that this commercial activity can be maintained.

The higher predator populations that may result from maintaining a higher population of snowshoe hare may have some negative consequences. In

¹Wildlife Management Districts in the industrialized forest region include WMDs 1, 2, 4, 5, 7, 8, 9, 10, 14, 18, and 19.

²Wildlife Management Districts in the forest/agriculture/residential region include WMDs 3, 6, 11, 12, 13, 15, 16, 17, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, and 30.

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particular, fisher, coyote, and owls prey on animals that may have high value to some members of the public. Although predation is a necessary and natural event, people often view predation as a nuisance when domestic animals are involved, and may view predators as competing with them for a common wildlife resource. Snowshoe hare may damage tree seedlings, if enough cover is present for them to feel secure while feeding. Higher hare populations may increase damage to tree plantations or regenerating forests; however, the extent of snowshoe hare damage to regenerating forests in the Northeast has not been a major concern to date.

Habitat Objective 1: Through 2017, maintain the quantity and quality of snowshoe hare habitat in the industrial forest region (IFR) of Maine at 2002 levels.

Desirability: *What has to be done to achieve this objective?* Timber harvest analyses from the "2001 state of the forest and progress report on forest sustainability standards" (Maine Forest Service) indicates that long term (> 50 years) harvest rates are not sustainable, but that forest inventories are sufficient to maintain current harvest levels through the period covered by this assessment. They also indicate that the current age structure of Maine's forests is unbalanced with many old stands, that regenerated from the 1920's spruce budworm outbreak, and a large component of young stands, that regenerated from the 1980's spruce budworm outbreak and salvage harvesting. Habitat projections, from the snowshoe hare assessment, indicate that the carrying capacity of hare would likely decrease in this region. This decrease in carrying capacity is occurring because stands regenerating from the 1980's spruce bud worm outbreak and salvage cutting are currently growing past the point where they are optimal hare cover. To maintain the current carrying capacity for snowshoe hare in the IFR at 2002 levels until 2017, an increase in the forest harvest rates would likely be needed. Since, we do not know the effect of partial cutting practices or intensive stand management activities have on snowshoe hare populations, current cutting practices may have to be modified in order to achieve this objective.

Are these activities or their results desirable? Maintaining the carrying capacity for snowshoe hare in the IFR at 2002 levels will essentially ensure that snowshoe hare habitat will remain at optimal levels through 2017. If this objective can be achieved, the habitat will be adequate to maintain hare numbers at levels that will support existing predator populations, hunting, and viewing opportunities in this region. However, hare populations naturally fluctuate in Maine, and it is not known the degree to which these fluctuations occur independent of habitat conditions. If hare populations decrease independent of habitat conditions, the high carrying capacity of the habitat for snowshoe hare will be maintained. Consequently, the habitat will have adequate resources for a recovering hare population and should enable the hare population to return to high population densities. If increased cutting of mature forests is needed to sustain the current carrying capacity for hare, this could adversely affect deer wintering areas in the IFR and other animals that depend on mature forests. Furthermore, increased cutting may increase forest fragmentation,

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which is detrimental to a number of species of wildlife (e.g., marten, birds dependent on forest interiors). This objective would run contrary to the Department's deer management objectives of increasing the amount of habitat suitable for deer wintering areas. Moose, and enjoyment of moose by the public, may benefit from maintaining a large amount of early successional habitat on the landscape. Early successional habitat provides browse for moose and creates more opportunities for the public to view moose.

Feasibility: The feasibility of achieving this objective will be highly dependent on whether partial cutting practices create forest regeneration that is favorable for snowshoe hare. Additional research is needed to determine which partial cutting practices promote stem densities favorable to snowshoe hare, and the length of time these cuts remain suitable for snowshoe hare. If partial cutting can be used to create optimal hare habitat, this objective could be achieved over the next 15 years. Since forests are already being cut faster than they are being replaced, the long-term sustainability of this cutting rate may not be possible. Increased cutting rates or clearcutting may not be compatible with the forest management plans of large landowners, and is contrary to the Department's deer management goals which call for increasing deer wintering areas in northern and downeast Maine.

Capability of Habitat: See Feasibility.

Possible Consequences: If this objective were fully implemented, hare habitat conditions would remain optimal and should provide ample hunting opportunity for snowshoe hare, as long as the population does not fluctuate downward. Other game species, such as ruffed grouse, woodcock, and moose may also benefit by having more habitat in early successional stages. Predators dependent upon snowshoe hare, such as lynx, bobcat, fisher, coyote, great horned owls, and barred owls, should be able to maintain their current populations as long as the snowshoe hare population remains stable. However, to achieve these benefits cutting rates in the IFR would have to increase, and the acreage of mature timber stands may decline. It is unknown at this time whether current partial cutting practices could be used to achieve this objective, or whether harvesting techniques would have to emphasize clearcutting. The decline of mature timber stands may have an adverse effect on deer wintering areas and habitat used by forest interior species (e.g., some songbirds) and species that need mature timber for escape cover (e.g., marten).

Habitat Objective 2: By 2017, increase and then maintain the quantity and quality of snowshoe hare habitat on suitable, state-owned wildlife management areas by 100% from 2002 levels.

Desirability: *What has to be done to achieve this objective?* Doubling the amount of habitat that is suitable for snowshoe hare on state wildlife management areas (WMAs) by 2017 essentially means increasing the amount of woody understory

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cover on state management areas that have significant upland areas. Conifers, such as balsam fir, provide the best cover for snowshoe hare. Although a number of forest cutting practices can create suitable hare habitat, some of the highest hare densities are found in regenerating clearcuts that are 10 to 15 years old. Therefore small clearcuts would likely be considered as desirable cutting practices to create hare habitat. There are approximately 36 WMAs having upland habitats that could be managed for snowshoe hare; all but one are located in the forest/agriculture/residential region (FARR). Total upland habitat on these WMAs is approximately 41,000 acres. However, our Department does not know the amount of upland habitat that is currently suitable for hare.

Are these activities or their results desirable? Increased forest cutting on WMAs in the FAAR of Maine may result in increased hardwood regeneration along with conifers (conifers are more desirable for hare cover). If this deciduous component were not removed to promote a higher density of coniferous cover, the regenerating forests would provide habitat suitable for species such as snowshoe hare, woodcock, ruffed grouse, New England cottontail, moose, and numerous other species that utilize early successional habitat. If the regenerating forests were managed to promote conifer growth, and thus optimize its value for snowshoe hare, species such as woodcock and ruffed grouse would derive minimal benefits from this habitat. However, species that prey on hare (e.g., bobcat) would still benefit from this form of forest management.

The doubling of hare habitat in WMAs would provide additional hunting opportunity especially in the FARR. One of the major issues facing hunters is the loss of land to hunt on, because of residential development and posted land. This problem is more prevalent in southern Maine where many of the WMAs occur. Wildlife Management Areas in the FARR currently provide more than 38,000 acres of upland habitat for hunting. An increase in hare habitat may provide increased opportunity to hunt grouse and woodcock, if the deciduous component of the regenerating forest stands is maintained. One negative aspect of increasing the amount of snowshoe hare habitat is that forest cutting may decrease the amount of land devoted to deer wintering areas. In addition, species that are dependent upon mature forests (e.g., marten, squirrels, cavity nesting birds) may be adversely affected by a higher proportion of early successional habitat on wildlife management areas.

Feasibility: The feasibility of increasing hare habitat by 100% on approximately 36 WMAs (approximately 41,000 acres of upland habitat) will largely be determined by the Department's ability to: quantify the existing habitat on its WMAs that are suitable for hare, obtain funds for intensive management of these areas (this includes hiring an individual to oversee the timber management of these areas), and resolve any conflicts between this objective and other management goals or objectives. The largest impediment to achieving this objective will be obtaining the funds and personnel for the management of these WMAs.

Capability of Habitat: See Feasibility.

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Possible Consequences: If this objective were implemented, the carrying capacity and hunting opportunities for snowshoe hare would likely increase on WMAs. The probability that hunters would take advantage of this increased hunting opportunity is good, since almost all of the WMAs occur in the FARR where hunting opportunity is increasingly becoming limited because of land development and posting. Costs and benefits to species needing early successional habitat or mature forests would be similar to those described for Habitat Objective 1; however, because of the smaller land-scale involved in this objective, only local populations of animals would be affected. Implementation of this objective would have little impact on lynx and marten, since they are more prevalent in the IFR.

Habitat Objective 3: By 2017, increase and then maintain the quantity and quality of snowshoe hare habitat in the forest/agriculture/residential region (FARR) of Maine by 30% from 2002 levels.

Desirability: *What has to be done to achieve this objective?* The FARR is comprised of approximately 13,500 mi² of forested land, with an unknown quantity of land suitable for snowshoe hare. To get a very rough estimate of the amount of land that is currently suitable hare habitat, the capability of a forest type to support hare (see assessment p. 32) was compared to the highest hare densities assigned to any forest type in Maine (i.e., 389 hare / mi²). The amount of hare habitat a given forest type contained was calculated as:

$$\text{Eq. 1 } HH_f = A_f \cdot (HD_f / HD_o),$$

where HH_f = hare habitat in a given forest type (mi²), A_f = area of forest type (mi²), HD_f = estimated hare density in a forest type (hare / mi²), HD_o = optimal hare density (389 hare / mi²). Therefore, if a forest type supported only 99 hare / mi², the amount of hare habitat in that forest type would be $\frac{1}{4}$ (i.e., 99/398) of the total area. This calculation underestimates the amount of hare habitat, since hare obviously can live in less than optimal habitat. Therefore, the estimate of the amount of habitat needed to achieve the objective will be conservative. Good hare habitat in the FARR was estimated to be 6,900 mi². To achieve the objective of increasing the amount of hare habitat by 30%, approximately 2100 mi² of additional forestland will need to be kept in early successional growth stages. This amounts to 32% of the "Not Cut..." forest types in the FARR. It is unknown at this time whether current partial cutting practices could be used to achieve this objective, or whether harvesting techniques would have to emphasize clearcutting. Major landowners do not own most of the land in FARR; therefore, the task of managing habitat for hare would fall on the small woodlot owners.

Are these activities or their results desirable? The factors determining the desirability of increasing the amount of snowshoe hare habitat by 30% in the FARR are similar to those outlined in Habitat Objective 2. However, because of the scale

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of the land area to be considered for habitat manipulation, any effects on wildlife from this forest manipulation will be magnified. For snowshoe hare, a 30% increase in the amount of habitat they can utilize should increase population levels and may increase population stability. For people interested in hunting hare, an increase in hare habitat may open up additional areas for hunting in the part of the state where the greatest demand for snowshoe hare hunting exists. However, the forest fragmentation that may result from cutting more mature stands may be a management concern for those species that survive better in unbroken forest tracts. Deer, particularly in downeast Maine, need more deer wintering areas. Habitat objective 3 would run contrary to deer management objectives for downeast Maine. Although moose may be able to utilize the additional browse created by this habitat objective, much of FARR lies in the area the Department wants to reduce the moose population. Animals, such as black bears, would benefit from the increase in raspberry and blueberry production that often follows forest-clearing activities. However, the Department's management goal for black bear is to stabilize the population.

Feasibility: Like Habitat Objective 2, this objective would require quantification of existing suitable hare habitat in order to determine the amount of additional hare habitat that would need to be created. However, we can safely say that at least 2100 mi² of early successional habitat would have to be created by 2017 to accomplish Habitat Objective 3. This would necessitate cutting at least 140 mi² of forest every year for the next 15 years, and would be equivalent to increasing the total acreage of forests harvested in Maine each year by 17%. This increased rate of cutting in the FARR may not meet forest sustainability standards and would conflict with Department goals of creating more deer wintering areas. Given that small woodlot owners primarily own forests in the FARR, it does not seem feasible to get a large number of landowners to agree on one common goal and execute such an extensive harvest. Lowering the amount of habitat to be converted to suitable snowshoe hare habitat to a lower but measurable level (e.g., 5% increase) may be a reasonable alternative.

Capability of Habitat: See Feasibility.

Possible Consequences: If this objective were implemented, the carrying capacity and hunting/viewing opportunities for snowshoe hare would increase considerably in the FARR. Likewise, other species that utilized early successional habitats, and the public that enjoys these species, would benefit from the implementation of this objective. However, implementation of this objective would have negative consequences for deer and the sustainable production of Maine's forests. It is unknown at this time whether current partial cutting practices could be used to achieve this objective, or whether harvesting techniques would have to emphasize clearcutting. Because of the increased timber harvesting called for in this objective, there would be short-term economic benefits resulting from timber sales and forestry related employment.

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Outreach Objective: By 2005, and in conjunction with partners, develop and implement a program to increase the awareness and understanding of snowshoe hare, silvicultural practices that promote or enhance its habitat, its importance as a prey species in Maine, and ways for the hunter to differentiate it from the New England cottontail.

Desirability: *What has to be done to achieve this objective?* The outreach objective could be accomplished by a number of means including pamphlets, Internet sites, public presentations, and articles in popular outdoor journals. The Department would work cooperatively with other organizations to create and disseminate this information.

Are these activities or their results desirable? The outreach objective is desirable in that it promotes the dissemination of information that could potentially increase: snowshoe hare populations, opportunities for hunting/viewing hare and other early successional species, conservation efforts for New England cottontail, and the amount of habitat for other early successional species. Achieving this objective will be an essential part of working with small woodlot owners, as outlined in Habitat Objective 3. Lastly, raising the awareness of the biological importance of snowshoe hare to prey populations may encourage the Department to track fluctuations in hare populations as part of their wildlife management program.

Feasibility: This objective could readily be accomplished using a variety of media including pamphlets, Internet sites, public presentations, and articles in popular outdoor journals. The Department has already developed an informational pamphlet describing the difference between snowshoe hare and New England cottontail. Efforts to get this information out to interested hunters could be revisited.

Capability of Habitat: Not Applicable.

Possible Consequences: Implementation of this objective may increase the amount of habitat that is kept in an early succession state, which would benefit snowshoe hare and other species that use this habitat. Currently, snowshoe hare are being underutilized. By promoting recreational opportunities associated with snowshoe hare, more people may become interested in hunting or viewing them, and guided hare hunts may become more popular. Revisiting our efforts to inform hunters about the difference between snowshoe hare and New England cottontail may help maintain local populations of cottontails. However, few New England cottontails are currently taken by hunters, making habitat loss, rather than hunting, the primary threat to New England cottontail populations. Emphasizing the biological importance of snowshoe hare, may lead to improved surveys for snowshoe hare by the Department or the development of models that use snowshoe hare data to predict the status of certain predator populations.