

# NEW HAMPSHIRE GAME MANAGEMENT PLAN

**2016-2025**

**Unanimously Adopted by the NH Fish and Game Commission  
06/10/15**

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## **Introduction**

The New Hampshire Game Management Plan presents the goals and objectives of the New Hampshire Fish and Game Department for the population and habitat management of big game and select small game species for the period January 2016 through December 2025. An initial draft was developed incorporating available biological information as well as public opinion obtained through “New Hampshire Residents’ Opinions on the Status and Management of Big Game Populations”, a random telephone survey conducted by Responsive Management, and the on-line “NH Game Management Questionnaire”. Public input received at a series of 5 public meetings around the state in late March, 2015 was used to develop a revised draft plan. Public input on the revised draft was solicited at open house sessions in April and used to develop a final draft. The final draft plan was presented to the Fish and Game Commission for their review as an information item on May 13, 2015, and was approved by the Commission on June 10, 2015. Our ability to achieve these goals and objectives will be influenced by a variety of factors including the availability of human and technical resources, the accuracy of the wildlife information we gather, the level of support we receive from our constituents, the decisions made by the Fish and Game Commission, the degree of access to huntable land, the health of wildlife populations, the availability and quality of habitat, and even weather variables that influence wildlife reproduction, survival, and hunting season harvest rates.

## **Authorities**

From a general perspective the Department, under statute RSA 207:58, is given guidance which states: “The legislature finds it is in the best interests of the state and its citizens to regulate, protect, restore, and conserve the wildlife resources of the state under a uniform scheme of management through the fish and game department. The general court further finds that it is in the best interest of the state and its citizens that the fish and game department recognize, preserve, and promote our special heritage of hunting, fishing, trapping, and wildlife viewing by providing opportunities to hunt, fish, trap, and view wildlife in accordance with title XVIII.”

Statutory authority for setting deer seasons is found in RSA 208:2 which states in part: “The executive director, after consulting with the commission, shall have the authority to open and close the seasons for the taking of wild deer, to fix the number and sex limitation for wild deer, and any other conditions governing the methods and manner of taking and reporting of the same, subject to ...”

Statutory authority for setting moose season is found in RSA 208:1-a which states in part: “No person shall hunt, take, or possess any moose or any part of the carcass of a moose taken in this state without first, obtaining a valid license for such activities from the department of fish and game. The executive director of fish and game, with the consent of the commission, may establish, by rules adopted under RSA 541-A, a hunting season for moose in any county of the state, or any portion thereof.”

Statutory authority for setting bear seasons is found in RSA 208:22 which states in part: “The executive director, with the consent of the commission, shall adopt rules, pursuant to RSA 541-A, relative to opening and closing the seasons for the taking of wild black bear, fixing the number of wild black bear that may be taken and any other conditions governing the methods and manner of taking and reporting of the same. The authority of the executive director as granted by this section may be exercised with reference to the state as a whole or for any specified county or part of a county.”

Statutory authority for setting turkey seasons is found in RSA 209:12-a which states in part: “The executive director shall adopt rules, pursuant to RSA 541-A, relative to: (a) Establishing seasons and bag

limits, and issuing wild turkey permits; (b) Establishing registration stations and registration agent fees for wild turkey; (c) Specifying the methods for taking and registering wild turkeys; (d) The enhancement, protection, and propagation of wild turkeys.”

Statutory authority for setting small game and game bird seasons is found in RSA 207:56 which states in part: “The executive director, after consultation with the Commission, shall have the authority to open and close the seasons for the taking of small game and game birds... to fix the number and sex limitations... and any other conditions governing the methods and manner of taking....”

## **Process**

New Hampshire’s wildlife resources are held in trust by the state for the benefit of our citizenry. Therefore, it is important that wildlife management plans incorporate public input and to the degree practicable, are consistent with public desires. Our previous big game management plan spanned the period 2006 through 2015 and has served as a good basis for management activities over that period. The initial draft represented an update of that plan, incorporating public input from a random telephone survey of New Hampshire residents, an on-line questionnaire, and updated biological information. Public comment on the initial draft plan was solicited in late March at a series of 5 public meetings around the state. Following consideration of input received at these meetings, a revised draft plan was developed and public input was again solicited at open house sessions in April. A final draft plan was then prepared and presented to the Executive Director of the NH Fish and Game Department and the NH Fish and Game Commission for their final review and approval. This plan will provide a solid foundation on which to base management decisions during the next decade.

## **Implementation**

This plan will serve as the basis for the management of deer, moose, bear, turkey and select small game species in New Hampshire for the next 10-years. Regional population objectives will serve as operational targets for Fish and Game biologists, as they strive to achieve desired population levels over the course of the 10-year period. It is important to note that the strategies used to achieve these objectives (e.g. season frameworks, method and manner of take and permit issuance) will continue to be subject to public input through our biennial season-setting process as described in RSA 541-A. This process includes informal and ongoing dialogue with user groups and a very formal process which involves public hearings and the incorporation of verbal and written public comment. These strategies will be used to achieve our population objectives, as defined in this Game Management Plan.

Based on the statistical variability of the various indices used to monitor population levels, it has been determined that population levels at  $\pm 12.5\%$  of the stated population objective will be considered “at goal”, and are not considered to require a management action intended to make a population change. This will help to stabilize season structure once the population objectives are reached. This approach reduces annual or biennial adjustments which might be needed to affect small population changes, and will improve hunter satisfaction. Our intent is to review hunting seasons annually to monitor population status, and every two years make recommendations for necessary changes to be made through biennial season setting. However, if severe winter weather or other unpredictable events occur which require immediate action, seasons may be adjusted annually. In the worst case scenario, where conditions create a short-term vulnerability which is unacceptable, emergency closure may be implemented.

The primary advantage of long-term planning is that it provides consistency of mission. That is, it allows the Department to focus its limited resources on specific goals and objectives over an extended period of

time. This approach preempts false starts, unscheduled reversals of direction, changes in data needs, and other unproductive resource expenditures that can result from unclear or changing management mandates. Generally speaking, game management goals and objectives are best achieved through slow, steady, consistent progress, with regular assessment of this progress. Thus, management plans serve the greater good by defining long-term goals and objectives, providing for management and data consistency, and minimizing resource waste.

## **Limitations**

Wildlife diversity, viability and abundance depend on diverse and abundant wildlife habitat. Protection and/or management of wildlife habitat benefit a myriad of species, including moose, deer, bear, turkey and small game, as well as a variety of nongame species. As it is the mission of the Department to conserve, manage and protect these resources (both game and nongame) and their habitats, all Wildlife Division staff and other divisions of the Department will work to fulfill this mission beyond the scope of this plan. Management of game populations at levels identified in this plan will serve to protect and achieve diverse cultural, recreational, economic and ecological values for the significant benefit of New Hampshire's citizenry. The goals and objectives for these species reflect the best effort to balance the biological, economic and recreational value of these populations with the resulting economic and ecological consequences.

Human population growth and development threatens New Hampshire's wildlife resources by diminishing and/or degrading our habitat base and in the case of game species, by limiting (due to sprawl and fragmentation) our ability to effectively manage game populations and therefore our ability to achieve the goals and objectives identified in this plan. As regulated hunting is the primary and most effective means of managing game populations, it is essential to maintain adequate hunting access throughout the state in order to achieve these goals and objectives. The Department's Landowner Relations Program works to maintain and expand access to private land where possible, but with over 70% of the state's land privately owned, the Department has limited ability to impact land access. Therefore it is imperative that municipalities and private landowners do all they can to ensure adequate hunting access remain available so game species can be effectively managed when needed. It is also important for hunters and others who enjoy wildlife to conduct themselves in a safe and ethical manner to maintain broad public support and ensure landowners continue to allow hunting access to privately owned lands. Additionally, changes in climate are beginning to impact New Hampshire's wildlife in ways that benefit some species while negatively impacting others. While it is beyond the scope of this plan to resolve all the challenges posed by these trends, it is important for us to acknowledge that these challenges are daunting, and that many of the wildlife goals, objectives and values we ascribe to in New Hampshire are imperiled by these trends. Despite and because of these challenges, the Fish and Game Department will continue to work in partnership with local, regional and statewide land conservation interests, by providing technical and financial assistance when possible, to protect significant wildlife habitat.

## **WHITE-TAILED DEER**

New Hampshire's statewide deer population estimate is approximately 100,000 animals. If the Department is successful in reaching all the Wildlife Management Unit objectives identified in this plan, the statewide deer population will remain similar to current levels; however the distribution of deer across the state will change slightly. This plan also took into consideration the ability to achieve these objectives and maintain the population at that level. The Department anticipates it may take several years to achieve these objectives in some units, and/or to determine whether they are achievable. If achieved, New Hampshire will still have one of the lowest density deer herds in the eastern United States. This is the result of balancing low soil productivity (and therefore potential to carry deer on the landscape), severe winter weather, known impacts deer can have on habitat and other wildlife species, and social intolerance for high deer density in heavily developed landscapes. Additional background information on the history, management and status of deer in New Hampshire is available at: [www.wildlife.state.nh.us/Hunting/game\\_plan\\_2015.html](http://www.wildlife.state.nh.us/Hunting/game_plan_2015.html) in the "New Hampshire White-tailed Deer Assessment – 2015".

**Goal 1:** NH will regionally manage white-tailed deer populations by balancing and incorporating social, economic, ecological and public safety factors using the best available science/knowledge.

Objectives: Population objectives are summarized in the following table.

**Table 1. Deer population objectives by wildlife management unit (WMU) expressed in terms of adult (1 ½ years old and older) buck kill during the fall hunting seasons.**

WMU*	CURRENT LEVEL <sup>1</sup>	2006-2015 OBJECTIVE <sup>2</sup>	2016-2025 OBJECTIVE <sup>2</sup>	MANAGEMENT ACTION REQUIRED <sup>3</sup>
A	303	335	300	None
B	134	125	125	None
C1	63	100	65	None
C2	91	125	90	None
D1	150	260	170	Increase
D2E	9	125	20	Increase
D2W	419	410	360	Decrease
E	92	100	80	Decrease
F	104	150	105	None
G1	441	340	340	Decrease
G2	99	190	100	None
H1	425	460	460	None
H2	634	750	675	None
I1	189	330	215	Increase
I2	231	360	260	Increase
J1	322	375	310	None
J2	992	940	940	None
K	676	735	675	None
L	677	525	525	Decrease
M	913	535	535	Decrease

\* - See Appendix 1 for a map of deer management units.

<sup>1</sup> – A 2-year average of adult buck kill during the hunting seasons is used as the index to deer populations. This “Current Level” is the average of 2013 and 2014 adult buck kills.

<sup>2</sup> – Population objectives will be considered achieved when the adult buck kill is within ±12.5% of the specified objective.

<sup>3</sup> – If the “Current Level” is ±12.5% of the 2016-2025 objective no management action is required, others are as indicated.

**Table 2. Deer population objectives by wildlife management unit (WMU) expressed in terms of adult (1 ½ years old and older) buck kill per square mile of habitat.**

WMU	CURRENT LEVEL	2006-2015 OBJECTIVE	2016-2025 OBJECTIVE	MANAGEMENT ACTION REQUIRED
A	0.54	0.61	0.54	None
B	0.41	0.38	0.38	None
C1	0.32	0.51	0.33	None
C2	0.39	0.55	0.39	None
D1	0.70	1.20	0.79	Increase
D2E	0.09	1.20	0.19	Increase
D2W	1.23	1.20	1.06	Decrease
E	0.14	0.15	0.12	Decrease
F	0.23	0.33	0.23	None
G1	1.12	0.86	0.87	Decrease
G2	0.45	0.86	0.46	None
H1	1.14	1.21	1.24	None
H2	0.99	1.16	1.05	None
I1	0.59	1.01	0.67	Increase
I2	0.65	1.01	0.73	Increase
J1	0.74	0.86	0.71	None
J2	1.36	1.27	1.29	None
K	1.18	1.26	1.18	None
L	1.76	1.26	1.37	Decrease
M	2.00	1.00	1.17	Decrease

Objective for WMUs A: The objective for this unit is to maintain the deer population at approximately the current level since the quantity and quality of available natural deer wintering habitat is such that it appears to be near its long-term ability to sustain the current population. Additional antlerless hunting opportunities may be possible.

Objective for WMUs B C1, C2: The objective for these units is to maintain deer populations at approximately the current levels. Current densities are relatively low; however, severe winter weather and/or changes in habitat appear to be impacting these populations' long term ability to be sustained at higher levels. Maintaining populations at or near current levels will potentially allow for more antlerless hunting opportunity.

Objective for WMUs D1 and D2E: The objective for these units is to slightly increase the deer population. While these units have limited growth potential due to severe winter weather, they have been able to achieve higher levels in the recent past.

Objective for WMU D2W: The objective for this unit is to decrease deer numbers slightly from current levels. This unit has been exhibiting slightly skewed pre-hunt adult sex ratios. Maintaining populations at a lower level will potentially allow for more antlerless hunting opportunity and help balance adult sex ratios.

Objective for WMU E and F: The objective for these units is to maintain the deer populations at approximately current levels. These units comprise large portions of the White Mountain National Forest. Winters in these units are severe, habitat productivity is relatively low, and changes in forestry practices have caused much of the habitat to mature. These changes appear to be impacting these populations' long term ability to be sustained at higher levels. Maintaining populations at or near current levels will potentially allow for more antlerless hunting opportunity.

Objective for WMUs G1: The objective for this unit is to decrease deer numbers slightly from current levels. This unit lies in central NH south of the White Mountains and has adequate habitat capabilities. Deer numbers in this unit have increased fairly rapidly and densities above current levels have the potential to create human/deer conflicts.

Objective for WMUs G2: The objective for this unit is to maintain deer populations at approximately the current level. This Unit lies east of G1 and the Connecticut River valley and has habitat that is less productive and winters that are more severe, which appears to be impacting this population's long term ability to be sustained at higher levels. Maintaining populations at or near current levels will potentially allow for more antlerless hunting opportunity.

Objective for WMU H1 and H2: The objective for these units is to maintain deer populations at approximately current levels. The quality of the habitat, less severe winters, and low potential for deer/human conflicts indicate it is within these units' long-term habitat carrying capacity to sustain populations at these levels while continuing to provide antlerless hunting opportunities.

Objective for WMUs I1, I2: The objective for these units is to increase deer numbers slightly from current levels. Current deer densities are lower than other portions of central New Hampshire and the habitat is likely capable of supporting slightly higher deer numbers.

Objective for WMUs J1: The objective for this unit is to maintain deer populations at approximately the current level. This population has shown limited growth and winter weather and/or changes in habitat appear to be impacting this populations long term ability to be sustained at higher levels. Maintaining populations at or near current levels will potentially allow for more antlerless hunting opportunity.

Objective for WMUs J2 and K: The objective for these units is to maintain deer populations at approximately current levels. While providing generally good habitat quality and with milder winters than areas further north, these units also have a higher potential for deer/human conflicts due to development and both deer and human population increases.

Objective for WMU L and M: The objective for these units is to decrease deer numbers 23% and 41%, respectively, from current levels. The southeast portion of New Hampshire continues to exhibit the highest levels of human population growth and development. The potential for deer/human conflicts and socially unacceptable high deer densities are greatest in this portion of the state.



- Goal 2:** NH deer will be managed at levels within the carrying capacity of suitable habitat without supplemental feeding programs, while maintaining animal and plant biodiversity.
- Goal 3:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal and municipal partners to address ecological and social impacts associated with locally overabundant deer populations.
- Goal 4:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, and public and private partners to minimize the loss of important deer habitat and to conserve, protect and enhance deer habitat on state, federal and private lands, through education and through the expenditure of technical and financial resources.

Objective 4-1: Identify important deer habitat to facilitate protection and to educate landowners and other land stewards.

Objective 4-2: Promote use of the Department's GIS capabilities to identify important habitat.

Objective 4-3: Assist local, state, federal and private conservation groups and organizations to protect, conserve and manage important deer habitat.

# MOOSE

With the exception of the Connecticut Lakes region, all regions are currently below objectives set in the 2006-2015 Plan and the statewide population is currently estimated to be 4,000. Due to our changing climate, much has changed for moose and moose management in the past 10 years. Even historically, New Hampshire has been on the southern edge of viable moose range. As our climate has changed and our winters have shortened, moose parasites are flourishing in ways they have not in the past. At this point moose populations are being influenced primarily by two parasites.

The first is winter tick (*Dermacentor albipictus*). Winter tick impacts are worsened by shorter winters and increased moose density. Both short winters and higher moose densities increase tick loads on moose which cause reduced moose body weight, reduced productivity, increased spring mortality and irruptive mortality events well above the increased “normal” spring mortality. Currently, we know that at New Hampshire moose densities of approximately 0.6 moose/mi<sup>2</sup> or less, tick impacts are reduced. At moose densities above this, regional objectives may not be able to be maintained. In addition, the weight objectives under Goal 2, may not be achievable in years of heavy tick loads even in the face of good browse supplies.

The second parasite that is influencing our moose populations is brainworm (*Parelaphostrongylus tenuis*). Brainworm is carried by white-tailed deer and as deer densities increase so does the infection rate for moose. Currently climate changes are favoring deer population increases and deer are not harmed by brainworm, but moose typically die with infection rates as low as 1 – 2 worms. In North America, moose populations have been known to decline to near zero in the face of deer densities above 10/mi<sup>2</sup>. At deer densities above this level, moose density objectives in these higher deer density regions (Ct. Lakes, Central, South West and South East) may be unreachable and moose populations may continue to decline.

Due to changing conditions, it is inappropriate to set 10-year objectives. Therefore the objectives listed here may be changed as new management and research information is obtained and as our climate continues to change. In addition, as winter tick may cause either very high irruptive mortality events in northern populations and brainworm may cause southern moose populations to continue to decline, cut-off thresholds have been instituted for most regions at which point moose permit issuance will be temporarily halted until the population exhibits two consecutive years of positive growth that results in a density estimate at least 13% above the cut-off threshold, at which point permit issuance may resume.

Additional background information on the history, management and status of moose in New Hampshire is available at [www.wildlife.state.nh.us/Hunting/game\\_plan\\_2015.html](http://www.wildlife.state.nh.us/Hunting/game_plan_2015.html) in the “New Hampshire Moose Assessment – 2015”. Finally, the moose species assessment was written based on moose data through the year 2013. This document was able to include data for 2014. Due to this change, information regarding regional populations may differ from that found within the species assessment.

**Goal 1:** New Hampshire will regionally manage moose populations by balancing and incorporating social, economic, public safety and ecological factors, using the best available science.

Objectives: Population objectives are summarized in the following table.

**Table 1. Moose population objectives by management region expressed in terms of moose/mi<sup>2</sup>.**

REGION*	1997-2005 OBJECTIVE	2006-2015 OBJECTIVE	2016-2025 OBJECTIVE	CURRENT LEVEL <sup>2</sup>	MANAGEMENT ACTION REQUIRED <sup>3</sup>	Cut-Off**
<b>Ct. Lakes</b> (A1, A2)	2.61 <sup>1</sup>	2.24	2.24	2.16	None	1.09
<b>North</b> (B, C2, D1)		1.82	1.28	1.28	None	0.68
<b>White Mtn.</b> (C1, D2, E1, E2, E3, F)	0.86	0.68	0.47	0.44	None	0.24
<b>Central</b> (G, H1, I1, I2, J1, J2)	0.47	0.47	0.25	0.25	None	0.20
<b>South West</b> (H2, K)	0.42	0.41	0.23	0.23	None	0.20
<b>South East</b> (L, M)	0.17	0.17	0.10	0.10	None	---

<sup>1</sup> – Note that in the 1997-2005 management plan Units A1, A2, B, C2, and D1 were combined as the North region.

<sup>2</sup> – A 2-year average of moose observation rates is used to estimate density. This “Current Level” is the average of 2013-2014 moose observation rates.

<sup>3</sup> – If the “Current Level” is within ±12.5% of the current objective the level is considered to be at the objective and no management action is necessary.

\* - See Appendix 2 for a map of moose management units and regions.

\*\* - These “densities” represent cut-off thresholds at which permit issuance will be suspended. Permit issuance may resume if the population exhibits two consecutive years of positive growth resulting in a density estimate that is at least 13% above the cut-off threshold (see Objectives 1-1 through 1-5 below).

Objective 1-1: Connecticut Lakes Region (WMUs A1 and A2). Historically this region has been able to maintain higher moose densities with lower tick levels than seen in the North region, probably due to the longer winters it experiences in its northern half. At the current density of 2.16 moose/mi<sup>2</sup>, animals in this region exhibit reduced weights and currently weights and productivity are below those found in the North region. This could be due to influences of both habitat and chronic tick loads. The population is currently stable although the 2014 observation rate did exhibit a marked decline. Adjacent moose populations in Vermont and Maine are estimated to be 1.6 and 1.8 moose/mi<sup>2</sup> respectively, and both these populations are

also experiencing declines and reduced weights. It is felt that a population reduction would perhaps reduce tick loads and help increase productivity in the Ct. Lakes region. However, the average deer density within this region has recently reached  $10.9/\text{mi}^2$  and is now above the level which evidence suggests causes moose populations to decline. Without a reduction in the deer population, it is possible that brainworm will cause the moose population here to decline without any other intervention. Should the moose population decline to an estimated density of  $1.09/\text{mi}^2$ , permit issuance will be suspended. Permits may be re-issued if the population exhibits two consecutive years of positive growth which results in an estimated density at least 13% greater than the cut-off threshold.

Objective 1-2: North Region (WMUs B, C2 and D1). The objective is to maintain this population at its current level of approximately  $1.28 \text{ moose}/\text{mi}^2$ . This area has the highest tick densities and tick levels that cause irruptive moose mortality events as seen here in 2008, 2010 and 2013. Due to shorter winters than are seen in the Ct. Lakes region, this region supports higher tick levels at lower moose densities. Recently, mature cow weights have declined, however they continue to be relatively good and result in relatively good productivity. If weather patterns continue to allow for high tick density it is unknown if the objective moose density can be maintained over time. Should the population decline to an estimated density of  $0.68/\text{mi}^2$ , permit issuance will be suspended. Permits may be re-issued if the population exhibits two consecutive years of positive growth which results in an estimated density at least 13% greater than the cut-off threshold.

Objective 1-3: White Mountains Region (WMUs C1, E, F and D2). The objective is only slightly higher than the current population; a density of approximately  $0.47 \text{ moose}/\text{mi}^2$ . The density has fluctuated around this objective for the past six years and this appears to be a density that the area can support. Should the population decline to an estimated density of  $0.24/\text{mi}^2$ , permit issuance will be suspended. Permits may be re-issued if the population exhibits two consecutive years of positive growth which results in an estimated density at least 13% greater than the cut-off threshold.

Objective 1-4: In the Central Region (WMUs H1, I1, I2, J1, J2 and G), deer densities in all WMU's exceed or come close to the level at which evidence indicates moose densities decline due to brainworm transmission. It is believed that this has caused a steady decline in the moose observation rate and density over the past six years. It is unknown at this time if this decline will level off. Therefore the objective and the current density of  $0.25 \text{ moose}/\text{mi}^2$  are the same and represent a desire to stabilize the population at least at this level. Should the population decline to an estimated density of  $0.20/\text{mi}^2$ , permit issuance will be suspended. Permits may be re-issued if the population exhibits two consecutive years of positive growth which results in an estimated density of at least 13% greater than the cut-off threshold.

Objective 1-5: In the Southwest Region (WMUs H2 and K) deer densities in both units exceed the level at which evidence suggests moose densities decline due to brainworm. This has likely caused a fairly steady moose decline since 1999. As in the Central Region, it is unknown at this time if this decline will abate. The objective of  $0.23 \text{ moose}/\text{mi}^2$  is the same as the current density and represents a desire to stabilize the population at least at this level. Should the population decline

to an estimated density of 0.20/mi<sup>2</sup>, permit issuance will be suspended. Permits may be re-issued if the population exhibits two consecutive years of positive growth which results in an estimated density of at least 13% greater than the cut-off threshold.

Objective 1-6: In the Southeast Region (WMUs L and M), deer densities are the highest in the state and greatly exceed those believed to cause declines in moose populations. The moose density has declined steadily since 2008. Due to the very high road and human population density in this region, it is felt that moose populations should be kept low to reduce negative moose/human interactions. The objective is to maintain the density at or below the current density of 0.1moose/mi<sup>2</sup>. There is no cut-off threshold here and moose permits will be suspended if hunter satisfaction levels demand it.

Objective 1-7: The New Hampshire Fish and Game Department will work cooperatively with the Department of Transportation, the Department of Safety, local law enforcement interests and other organizations, on regulations, road design and educational programs designed to reduce wildlife/vehicle collisions.

**Goal 2:** The New Hampshire moose population will be managed to maintain a desirable adult sex ratio and adult and yearling cow weights and minimize winter tick impacts.

Objective 2-1: Manage regional moose populations to ensure that 40% of the adult moose are male as measured in the deer hunter observation rate.

Objective 2-2: Maintain the moose population at levels which on average enable regional yearling cow dressed weights to attain 440 lbs and adult cow dressed weights to attain 550 lbs.

**Goal 3:** New Hampshire residents and visitors will understand, appreciate and value the role of and possibilities for moose in our changing ecosystem.

Objective 3-1: The New Hampshire Fish and Game Department will continue to use the educational and communication tools at its disposal to help people learn how to: live with moose, view moose safely, drive and snowmobile safely in moose country, and value, protect and manage moose habitat.

Objective 3-2: The New Hampshire Fish and Game Department will seek to educate and inform the motoring public about the risks, causes, and avoidance of moose/vehicle collisions to make our roads safer for wildlife and people.

Objective 3-3: The New Hampshire Fish and Game Department will seek to update and educate the public regarding the influences on and changing possibilities for moose populations in the face of a changing climate.

Objective 3-4: The New Hampshire Fish and Game Department will provide information and guidance to towns or jurisdictions wishing to develop and maintain moose watching areas in natural browse based settings away from highways.

**Goal 4:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, and public and private partners to minimize the loss of important moose habitat and to conserve, protect and enhance moose habitat on state, federal and private lands, through education and through the expenditure of technical and financial resources.

Objective 4-1: Identify important moose habitat to facilitate protection and to educate landowners and other land stewards.

Objective 4-2: Promote use of the Department's GIS capabilities to identify important habitat.

Objective 4-3: Assist local, state, federal and private conservation groups and organizations to protect, conserve and manage important moose habitat.

# BLACK BEAR

The black bear population in New Hampshire during 2013 was estimated at 5,300. This represents a 20% increase over the 2004 population level of 4,400 bears. If the objectives of this plan are achieved, the statewide bear population will approach 4,700 which represents an 11% decline from the 2013 level. Knowledge of bear population rates of change (growth or decline) suggest that it will take 5 to 10 years to achieve the objectives specified in this plan. Additional background information on the history, management and status of bear in New Hampshire is available at: [www.wildlife.state.nh.us/Hunting/game\\_plan\\_2015.html](http://www.wildlife.state.nh.us/Hunting/game_plan_2015.html) in the “New Hampshire Black Bear Assessment – 2015”.

**Goal 1:** New Hampshire will regionally manage bear populations by balancing and incorporating social, economic, public safety and ecological factors, using the best available science.

Objectives: Population objectives are summarized in the following table.

**Table 1. Black bear population objectives by management region are expressed in terms of density as the number of bears per square mile.**

REGION*	CURRENT LEVEL <sup>1</sup>	2006-2015 OBJECTIVE	2016-2025 OBJECTIVE	MANAGEMENT ACTION REQUIRED <sup>2</sup>
<b>North</b> (A, B, C2, D1)	0.51	0.6	0.6	Increase
<b>White Mtn.</b> (C1, D2, E, F)	0.89	0.8	0.8	Decrease
<b>Central</b> (G, I1, J1, J2)	0.70	0.6	0.5	Decrease
<b>South West-1</b> (H1, I2)	0.53	0.5	0.5	Stabilize
<b>South West-2</b> (H2, K)	0.53	0.5	0.5	Stabilize
<b>South East</b> (L, M)	0.06	0.2	0.05	Decrease
<b>Statewide</b>	0.58	0.57	0.52	Decrease

\* - See Appendix 3 for map of bear management units and regions.

<sup>1</sup> – Age/sex data (pooled over 3 years) and 3-year mean deer hunter-based observation rates are used to index regional bear populations. This Current Level is the estimated 2013 bear density from the model using 2011-2013 age/sex data and observation rates from the deer hunter mail survey.

<sup>2</sup> – If the “Current Level” is  $\pm 12.5\%$  of the 2016-2025 objective no management action is considered necessary, others are as indicated.

Objective for the North Region: The bear population objective in the North Region represents a modest (+18%) increase from the current estimated density.

Objective for the White Mountains Region: This objective represents a slight (10%) reduction from the current estimated density. Because the required change is less than 12.5%, no immediate management action is required. Given the level of human activity in this region, there is a higher potential for bear/human conflicts.

Objective for the Central Region: This objective represents a 28% decrease from the current estimated density based on the view that human population growth, associated anthropogenic food attractants and bear-human conflict levels warrant decreased bear numbers.

Objective for the Southwest-1 Region: The population objective in the Southwest-1 Region represents an effort to stabilize (a 6% decrease) the population at the current level.

Objective for the Southwest-2 Region: The population objective in the Southwest-2 Region represents an effort to stabilize (a 6% decrease) the population at the current level.

Objective for the Southeast Region: This objective represents a 17% decrease from the current density estimate and reflects a desire to maintain a very low bear population in this highly developed region of the state. Habitat in this region is highly fragmented and intermixed with residential and semi-urban areas. This region has the highest percentage of developed land of any of the management regions. Due to the high human population and associated anthropogenic attractants, the likelihood of bear-human conflicts is high if the bear population were allowed to grow.

**Goal 2:** The New Hampshire Fish and Game Department will support public education efforts so that residents and visitors are more informed on the behavior, ecology and management of black bears and are familiar with methods to minimize bear-human conflicts.

Objective 2-1: Promote public understanding of black bear conservation and management in New Hampshire.

Objective 2-2: Communicate critical bear-related messages to the public using mass media and face-to-face interaction.

Objective 2-3: Increase public awareness and responsibility by making residents and visitors of New Hampshire understand the role that their actions play in bear-human conflict trends.

Objective 2-4: Provide technical guidance on techniques and methods used to minimize bear-human conflicts and to increase public tolerance and appreciation of black bears in New Hampshire.

**Goal 3:** The New Hampshire Fish and Game Department will promote conflict abatement methods to prevent bear-human conflicts from exceeding acceptable levels.



Objective 3-1: Work with federal, state and town officials to help establish laws, rules and/or policies that promote the proper storage of anthropogenic food attractants.

Objective 3-2: Work with the NH Dept. of Agriculture and UNH Cooperative Extension's 4-H Program to promote the use of electric fencing and other protective barriers to prevent damage by bears to dairy, livestock, poultry and other agricultural resources.

Objective 3-3: Minimize bear complaints with success measured in the context of increased human population growth and on the basis of a reduced need to respond to complaints or invest in mitigation.

**Goal 4:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, and public and private partners to minimize the loss of important bear habitat and to conserve, protect and enhance bear habitat on state, federal and private lands, through education and through the expenditure of technical and financial resources.

Objective 4-1: Assist local, state, federal and private conservation groups and organizations to identify, document, protect, conserve and manage important bear habitat.

Objective 4-2: Work with NH Dept. of Transportation and the Federal Highway Administration to identify, maintain and improve connectivity across major roads that intersect important and extensive documented bear habitat.

**Goal 5:** Provide recreational opportunities that involve black bears.

Objective 5-1: Establish bear hunting seasons, regulations and programs that 1) effectively manage bear populations at the levels consistent with Goal 1, 2) are biologically appropriate and defensible, 3) attain broad public support, 4) are equitably distributed across multiple user groups, and 5) encourage hunter participation and satisfaction.

Objective 5-2: Provide opportunities for residents and visitors to partake in the non-consumptive use of the bear resource including activities such as wildlife viewing.

# WILD TURKEY

There are significant differences in the population attributes of deer, bears and moose, as compared to wild turkeys. Large mammals have relatively modest reproductive rates and relatively high survival rates, as compared to turkeys. From a population dynamics perspective they are referred to as k-selected species. Unlike large mammals, wild turkeys are prone to dramatic fluctuations in reproduction and survival, and are referred to as r-selected species. Because of these characteristics, managers have less control over turkey populations than over large mammals. Simply stated, factors other than hunting heavily influence the rate and direction of turkey population change. As a result, wildlife managers can facilitate turkey population change, but don't precisely control it over the short-term. Our general posture is to facilitate turkey population growth by establishing conservative hunting frameworks. When turkey populations reach certain threshold values, we are then afforded the opportunity to liberalize turkey hunting seasons to take advantage of additional recreational and economic value.

There was an estimated population of 26,900 turkeys in 2004. The goal for 2015 was to reach a population of 40,000 turkeys. The estimated population as of early fall 2014 was 39,060 turkeys. Therefore, the goal was reached. It was also predicted that the turkey carrying capacity throughout the state would be reached by 2014. Turkeys have now occupied every town in the state, and the population may have leveled off at approximately 40,000 turkeys, or a statewide average of 4.5 turkeys per square mile. Depending upon degree of hatchling success each summer, the population might go as high as 50,000, or drop to 30,000 or fewer turkeys.

Another goal had been to liberalize hunting by having a fall shotgun season in WMUs with the better turkey population densities and spring harvests. Since 2006 there has been a 5-day fall shotgun season in 12 of the 18 WMUs. The 6 northern WMUs may continue without a fall shotgun season because of significantly poorer habitat and lower turkey populations. Since its inception in 2004, New Hampshire's turkey Youth Hunt weekend as accounted for an average of 13.2% of the annual spring harvest.

The overall population objective for the period 2016-2025 will be to maintain an annual population of 40,000 turkeys, and to liberalize spring and fall hunting seasons somewhat in the better WMUs if and when turkey population growth warrants it. Other goals are to continue with the public winter flock survey, summer brood survey, and the turkey hunting registration stations annually, in order to determine turkey numbers and distribution in the state. There will have to be continued monitoring of the turkey pox viruses to determine effects on turkey flock and degree of losses. Additional background information on the history, management and status of wild turkey in New Hampshire is available at: [www.wildlife.state.nh.us/Hunting/game\\_plan\\_2015.html](http://www.wildlife.state.nh.us/Hunting/game_plan_2015.html) in the "New Hampshire Wild Turkey Assessment – 2015".

**Goal 1.** NH will regionally manage turkey populations by balancing and incorporating social, economic and ecological factors using the best science available.

Objectives: Population objectives are summarized in the following table.

**Table 1. Wild turkey population status by wildlife management unit (WMU), expressed in terms of spring kill per square mile of forested land below 2,500 feet in elevation.**

WMU*	CURRENT LEVEL <sup>1</sup>	2006-2015 OBJECTIVE	2016-2025 OBJECTIVE	HUNTING STRATEGY <sup>2,3,4</sup>
<b>A</b>	0.11	0.07	0.20	Conservative
<b>B</b>	0.10	0.07	0.20	Conservative
<b>C1</b>	0.15	0.09	0.20	Conservative
<b>C2</b>	0.16	0.14	0.20	Conservative
<b>D1</b>	0.53	0.50	0.60	Moderate
<b>D2</b>	0.58	0.50	0.75	Moderate
<b>E</b>	0.08	0.09	0.20	Conservative
<b>F</b>	0.17	0.19	0.20	Conservative
<b>G</b>	0.46	0.41	0.60	Moderate
<b>H1</b>	0.83	0.50	1.00	Liberal
<b>H2</b>	0.58	0.50	0.75	Liberal
<b>I1</b>	0.50	0.50	0.60	Moderate
<b>I2</b>	0.54	0.49	0.60	Moderate
<b>J1</b>	0.39	0.34	0.50	Moderate
<b>J2</b>	0.82	0.29	1.00	Liberal
<b>K</b>	0.86	0.50	1.00	Liberal
<b>L</b>	0.98	0.25	1.00	Liberal
<b>M</b>	0.83	0.18	1.00	Liberal

\*See Appendix 4 for map of turkey wildlife management units.

<sup>1</sup> – Current Level is the spring kill per square mile of turkey habitat for the 2014 season.

<sup>2</sup> – Conservative strategies allow spring hunting and a fall archery season.

<sup>3</sup> – Moderate strategies allow for spring hunting and a fall archery season. A fall shotgun season is possible if the spring harvest equals or exceeds 0.50 gobblers killed per square mile.

<sup>4</sup> – Liberal strategies allow for spring hunting and a fall archery season and a fall shotgun season. If the spring harvest reaches 0.75 to 1.00 gobblers killed per square mile, season liberalization will be considered.

Objective 1-1: (WMUs A, B, C1, C2, E and F); Maintain the existing spring gobbler season and fall archery season. No fall shotgun season should be added unless spring gobbler harvest densities reach  $\geq 0.50$  gobblers per square mile.

Objective 1- 2: (WMUs D1, D2, G, I1, I2, and J1); Maintain the existing spring gobbler season, fall archery season and fall shotgun season. These units seem to be fluctuating just below and/or above 0.50 gobblers killed per square mile. Liberalizing seasons any further could negatively impact populations in these units.

Objective 1- 3: (WMUs H1, H2, J2, K, L and M); Consider liberalizing the spring and fall seasons by adding a 2<sup>nd</sup> gobbler in the spring bag limit and/or by adding a weekend to the

fall shotgun season if spring kills consistently equal or exceed  $\geq 0.75$  gobblers killed per square mile.

Objective 1-4: Monitor the possible effects of excessive fall harvests on the turkey population. Biological staff from the National Wild Turkey Federation have recommended that fall season harvests not exceed 20% of the spring harvest numbers, because the spring harvests could be negatively impacted if too many hens are taken during the fall seasons.

**Goal 2:** Monitor the statewide turkey population annually in order to determine regional distribution and degree of growth of the turkey populations, and the general health of the turkey populations.

Objective 2-1: Annually conduct the Public Internet Winter Turkey Flock Survey.

Objective 2-2: Annually conduct the Public Internet Summer Turkey Brood Survey.

Objective 2-3: Monitor the prevalence of the avian pox virus and Lymphoproliferative Disease Virus (LPDV) in the regional turkey populations in order to determine the effects on turkeys and the degree of losses.

**Goal 3:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, public, private or other conservation partners to minimize the loss of turkey habitat, and to conserve, protect and enhance turkey habitat on state, federal and private lands, through education and through the expenditure of technical and financial resources.

Objective 3-1: Encourage maintenance and mowing of fields which are a very important summer habitat for turkey broods because of the preferred diet of grasshoppers and other insects. The Small Grants Program that provides funds to landowners to mow and maintain fields is beneficial.

Objective 3-2: Encourage landowners to maintain existing wild apple trees, and to plant crabapple trees which retain fruit over the winter. These are valuable turkey winter foods.

Objective 3-3: Work with UNH Cooperative Extension to promote turkey habitat management on private lands, by providing information, technical services and financial aid.

**Goal 4:** Educate and encourage residents and visitors to understand and appreciate wild turkeys in New Hampshire.

Objective 4-1: Provide information by way of multiple outreach methods, in order to inform the public and sportsmen regarding turkey ecology, behavior, habitat needs and hunting and other recreational opportunities, including public viewing of turkeys and management of the turkey population.

# SMALL GAME

Small game species provide significant recreational opportunities to New Hampshire residents and visitors. Among these species, ruffed grouse and snowshoe hare stand out as being the most popular of those species which are managed by the Department (woodcock, a migratory species, is largely managed by the U.S. Fish and Wildlife Service). Small game population levels are influenced primarily by weather, habitat and natural cycles, and while hunting plays a minor role, goals and objectives to help conserve these species and provide recreational opportunities are valuable, and many activities designed to help grouse and snowshoe hare benefit many other wildlife species.

While not providing specific population objectives, the following plans are designed to serve as a guide for conserving these species in New Hampshire. Additional background information on the history, management and status of ruffed grouse and snowshoe hare in New Hampshire is available at [www.wildlife.state.nh.us/Hunting/game\\_plan\\_2015.html](http://www.wildlife.state.nh.us/Hunting/game_plan_2015.html) in the “New Hampshire Ruffed Grouse Assessment – 2015” and the “New Hampshire Snowshoe Hare Assessment – 2015”.

**Goal 1:** New Hampshire will regionally manage ruffed grouse populations by balancing and incorporating social, economic and ecological factors, using the best available science.

Objective 1-1: Continue to solicit small game data from small game hunters to quantify hunter interests, activities, and preferences. With accumulating years of data, we gain substantial insight into the abundance of ruffed grouse and other small game species. Over time, survey results will provide trend data for management decision-making.

**Goal 2:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, and public and private partners to develop methods for evaluating and monitoring early successional habitat to help identify and prioritize habitat management opportunities.

Objective 2-1: Use GIS based information and information from other sources to quantify, evaluate and monitor potentially suitable habitat for ruffed grouse in each small game region (see Appendix V for a map of small game management units and regions).

**Goal 3:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, and public and private partners to minimize the loss of ruffed grouse habitat on state, federal and private lands through education and through the expenditure of technical and financial resources.

Objective 3-1: Encourage active ruffed grouse habitat management on state, federal and private lands by providing technical services and financial resources.

Objective 3-2: Use the Small Grants Habitat Program to achieve specific targets for creating and maintaining early-successional and young forest habitat.

# Snowshoe Hare

**Goal 1:** New Hampshire will regionally manage snowshoe hare populations by balancing and incorporating social, economic and ecological factors, using the best available science.

Objective 1-1: Continue to solicit small game data from small game hunters to quantify hunter interests, activities, and preferences. With accumulating years of data, we gain substantial insight into the abundance of ruffed grouse and other small game species. Over time, survey results will provide trend data for management decision-making.

Objective 1-2: Incorporate findings from the snowshoe hare research project currently underway in the northern New Hampshire. Results from the project should provide insight into the influence of forest stand and landscape composition on snowshoe hare density and population fluctuations in New Hampshire, with a particular emphasis on high elevation and lowland matrix habitat.

**Goal 2:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, and public and private partners to develop methods for evaluating and monitoring early successional habitat to help identify and prioritize habitat management opportunities.

Objective 2-1: Use GIS based information and information from other sources to quantify, evaluate and monitor potentially suitable habitat for snowshoe hare in each small game region (see Appendix V for a map of small game management units and regions).

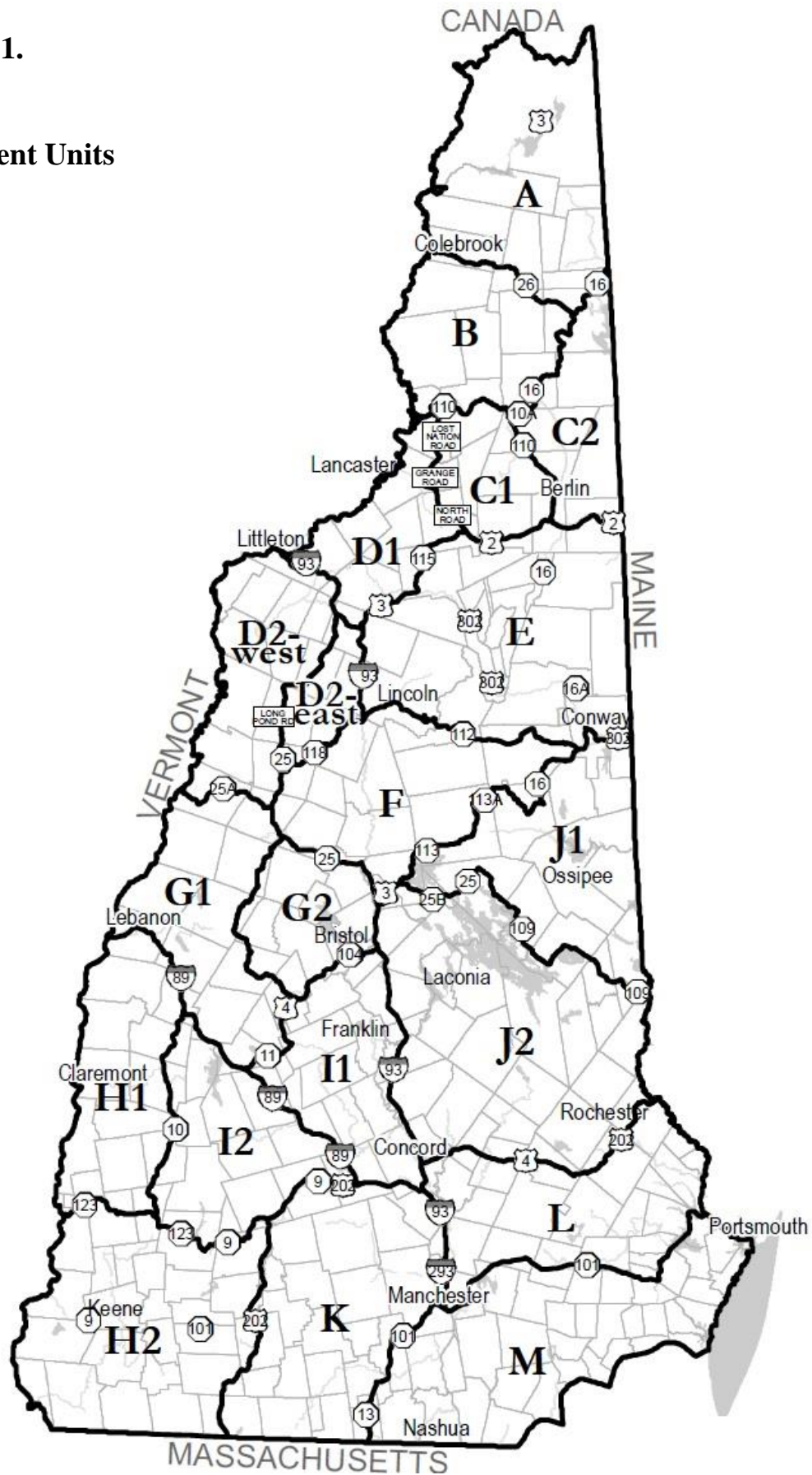
**Goal 3:** The New Hampshire Fish and Game Department will work alone and in partnership with state, federal, and public and private partners to conserve, protect and enhance spruce-fir habitat on state, federal and private lands through education and through the expenditure of technical and financial resources to minimize loss of snowshoe hare habitat.

Objective 3-1: Encourage active snowshoe hare habitat management on state, federal and private lands by providing technical services and financial resources.

Objective 3-2: Use the Small Grants Habitat Program to achieve specific targets for creating and maintaining a full range of size classes when promoting spruce-fir habitat.

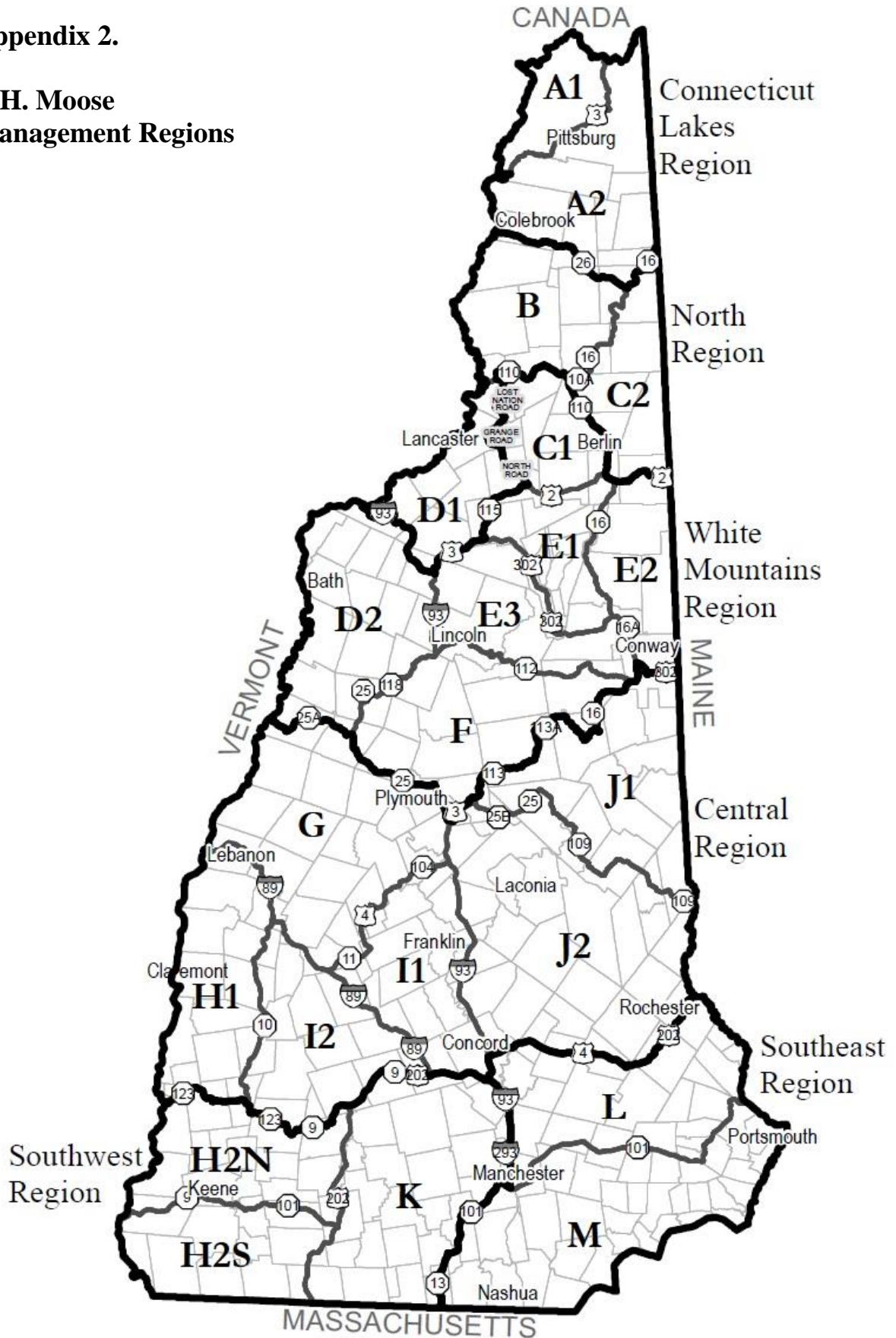
**Appendix 1.**

**N.H. Deer  
Management Units**



**Appendix 2.**

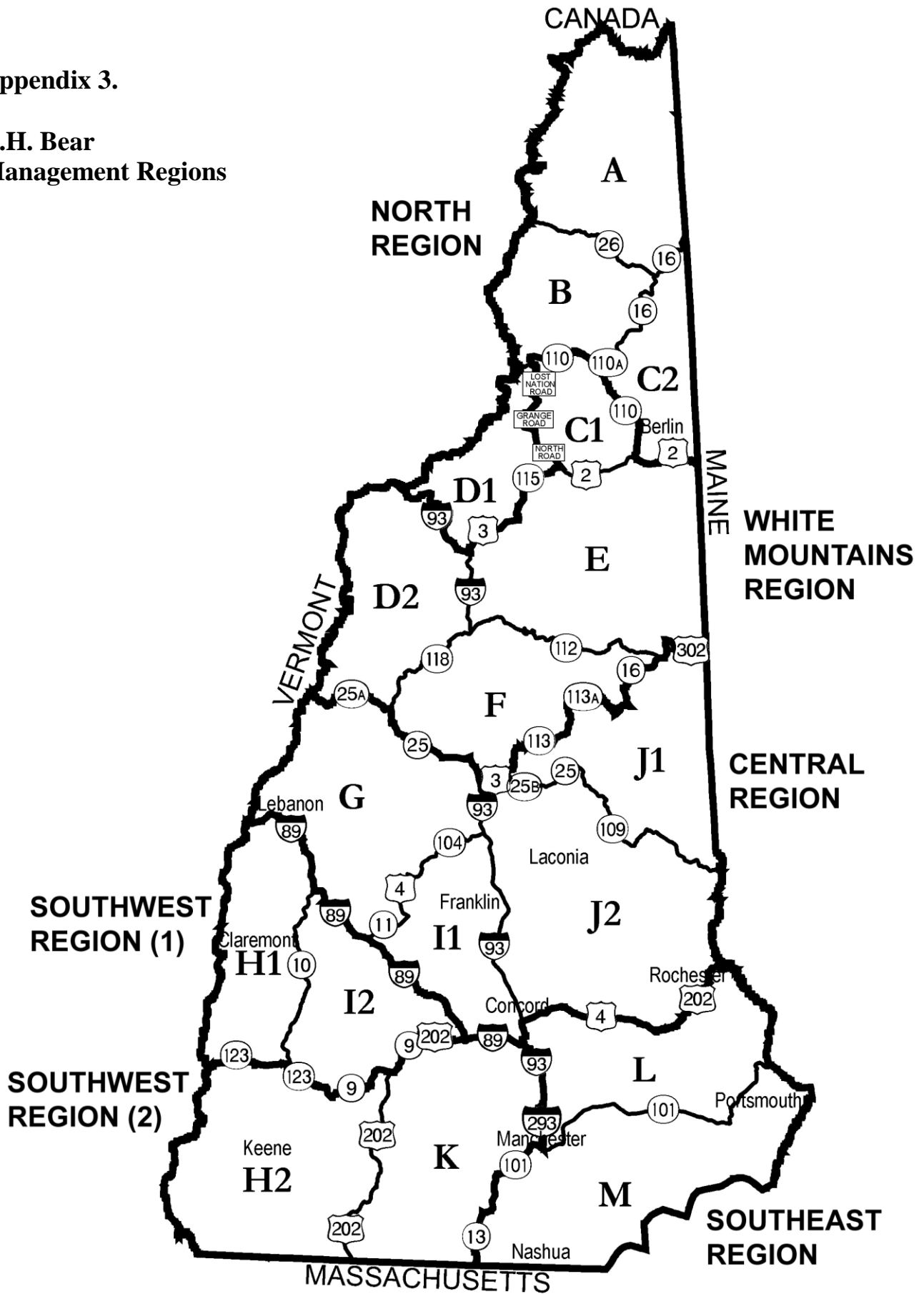
**N.H. Moose  
Management Regions**





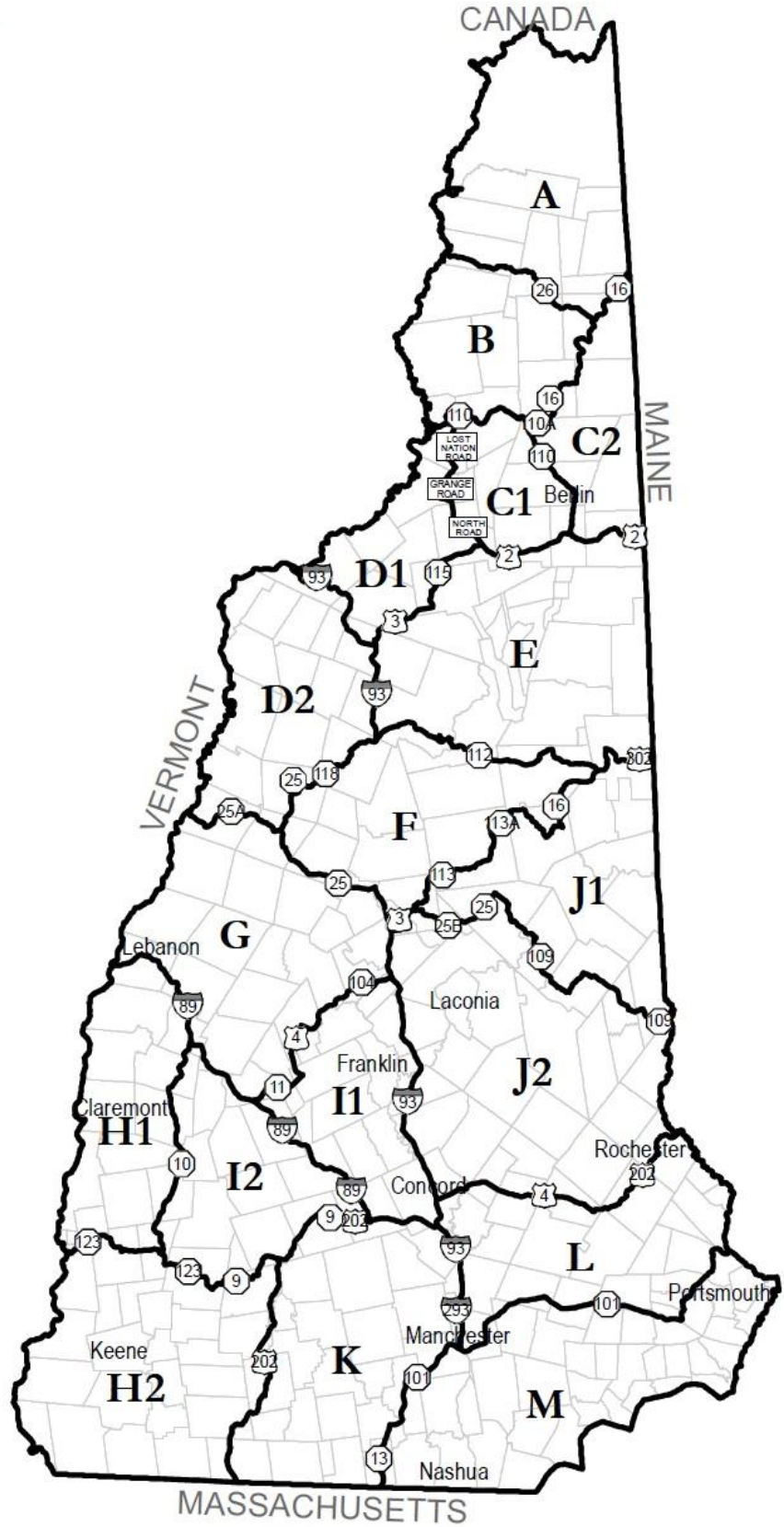
**Appendix 3.**

**N.H. Bear  
Management Regions**



**Appendix 4.**

**N.H. Turkey  
Management Units**



**Appendix 5.**

**N.H. Small Game  
Management Regions**

