Report to the Joint Standing Committee on Inland Fisheries and Wildlife

As Required by 12 Section 10107-A

White-tailed Deer Population Management

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Inland Fisheries & Wildlife

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In response to the requirements set forth in Title 12 Section 10107-A the Department of Inland Fisheries and Wildlife submits the following report on the actions taken and proposals for the management of Maine's white-tailed deer.

Highlights of 2017 White-tailed Deer Report

- Overview of Current Framework for Deer Management in Maine
- Update on Maine's New Deer Management Plan
- Review and Report on White-tailed Deer Survival Study

Deer Management Brief Overview

During the mid- to late 1970s Maine's Department of Inland Fisheries and Wildlife adopted a strategic planning process which facilitated defining clear goals and objectives for the state's white-tailed deer. It is these publicly derived goals and objectives that drive management actions across the state's 29 Wildlife Management Districts (WMDs [Figure 1]).

An increased understanding of population dynamics, and the advent of the well-developed goals and objectives, helped to pave the way for Maine's most recent iteration in its deer management program, the state's Any-deer permit (ADP) system. Since its inception in 1986, the ADP system has provided MDIF&W with a means of regulating doe harvests, while simultaneously maximizing hunting opportunity for Maine's hunters. The Department's deer management decisions relate primarily to determining annual doe harvests needed to guide Maine's deer toward WMD level objectives.
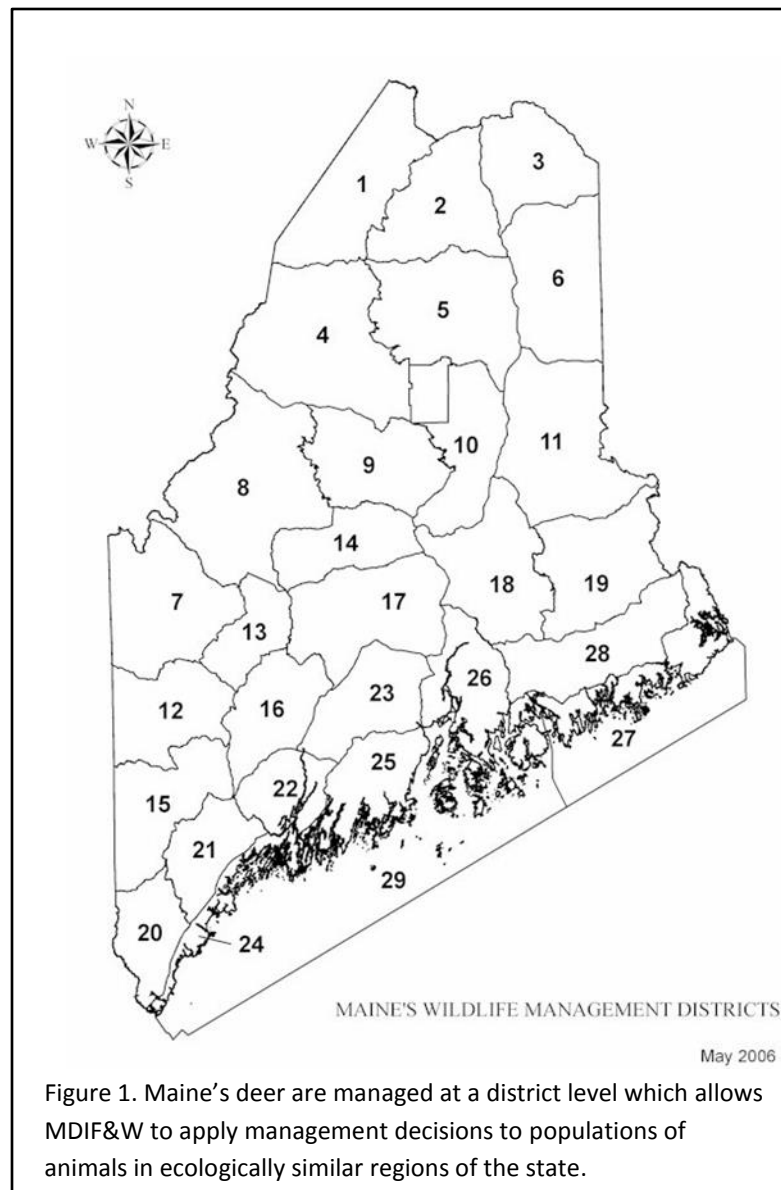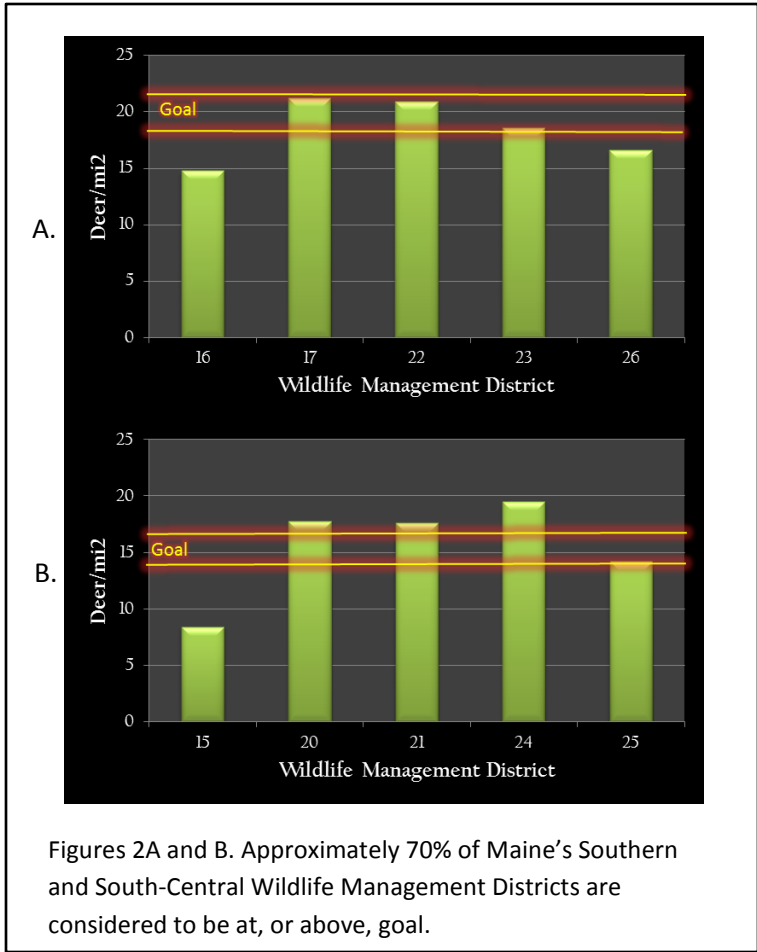

Figure 1. Maine's deer are managed at a district level which allows MDIF&W to apply management decisions to populations of animals in ecologically similar regions of the state.

MDIF&W's deer specialist annually works in conjunction with the state's Regional Biologists to collect critical harvest and biological data used to inform the decision process.

The management decision process integrates an understanding of where the deer population is in relation to the WMD specific objectives, population growth, or decline, birth, death, and survival, the effects of past harvests, and

Figures 2A and B. Approximately 70% of Maine's Southern and South-Central Wildlife Management Districts are considered to be at, or above, goal.

the effects of winter weather on the animals. The Department's wildlife biologists use this information to determine specific harvest recommendations for the purpose of initiating a population level response (i.e., stabilize, growth, or decline) within a WMD. As such, a major assumption of the current management system is that harvest related mortality is additive to the population (i.e., a change in hunting related mortality would result in a similar change in deer mortality).

Maine's central and southern WMDs are managed to balance deer hunting and viewing with the negative aspects often associated with overly abundant deer populations (e.g., depredation, deer-car collisions, and disease). The objective for WMDs located in Maine's central districts (i.e., WMDs 16, 17, 22, 23, and 26) are to maintain deer populations at approximately 20 deer/mi², or no higher than 60% of what the landscape can sustain. Similarly, WMDs 15, 20, 21, 24, 25, and 29 (Maine's southern districts), have an objective of 15 deer/mi², or no higher than 60% of maximum supportable population. Maine's southern WMDs are managed to a lower density due to a higher density of people. Currently, approximately 70% of Maine's Southern and South-central WMDs are considered at, or above, goal (Figures 2A and B).

Unlike southern Maine, the western, northern, and eastern regions of the state remain chronically under both short-term and long-term management objectives.

Following the 1985-1999 planning period, MDIF&W and public working groups recognized that limited availability of, and/or compromised, deer wintering areas continued to preclude the state from growing its deer population in 2/3 of its Wildlife Management Districts (WMDs). As such, the Department employed a two tiered objective to allow the population to grow in proportion to the availability of their habitats so that the deer numbers do not grow too quickly potentially resulting in the animals becoming a detriment to themselves. More specifically, for the short-term, MDIF&W managed its deer populations to 50%-60% of what Maine's DWAs could sustain in terms of deer numbers. Once enough habitats became available, the deer populations would be managed to 10 deer/mi². The two tiered approach was applied to WMDS 1-11, 12-14, 18, 19, 27, and 28. Current deer populations are estimated to be at levels below the 50% to 60% threshold of what the landscape can sustain. As such, they are considered lower than our short-term objective (Figure 3.
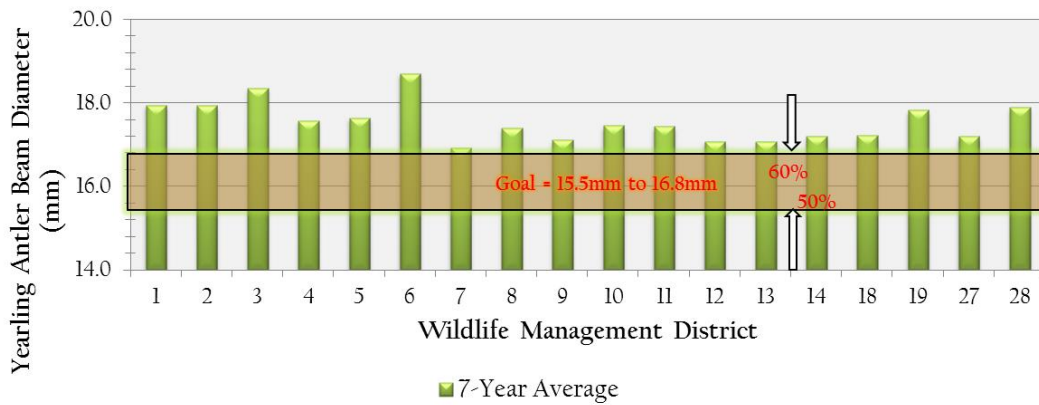
Figure 3. Yearling antler beam diameters allow us to assess the nutritional state of Maine's deer, as well as an estimate of where the deer lie along the ecological carrying capacity continuum. Maine's white-tailed deer are generally healthy and reside below 50% of what Maine's wintering habitat could potentially support. YABD of WMD's XXX averages YYY which indicates the population is below objective or something like that.

2016 Strategic Planning Process

In the spring of 2016, MDIF&W initiated a strategic planning process to update the state's deer management goals and objectives. The ultimate goal is to be sure that MDIF&W can continue to satisfy contemporary Maine's needs in regard to its big game species. Employing a private human dimensions firm to conduct a comprehensive survey, the Department solicited input from Maine's public to inform the process. Specifically, the survey was conducted to assess public opinion of Maine's big game management processes, as well as on the status of the state's game populations, and important management aspects.

The survey provided MDIF&W with insight into its constituents' feelings toward game management, in Maine. Examples of the information obtained by the survey include, but are not limited to:

- 86% of Maine's hunters rated IFW's ability to manage deer from fair to excellent
- 95% of landowners rated the Department's ability to manage deer as fair to excellent
- 86% of Maine's general population rate deer management as fair to excellent.
- On average across user groups (i.e., General population, Landowners, and Hunters) 65% of respondents felt that the deer population should remain the same; as opposed to being grown, or decreased.
- On average, again across user groups, 77% of respondents, whom initially wanted an increase in the deer population, would not want the increase if it negatively impacted the health of the animals.
- On a scale of 0 to 10, the health of the deer being important to the public scored an 8.4.
- On average, over 90% of respondents supported legal hunting as a method to manage Maine's deer population.
- A majority of respondents would support special management options (e.g., special archery season, targeted doe permits, and/or allowing the harvest of multiple deer) if deer became locally overabundant.

Utilizing the data provided by Responsive Management, and working with public stakeholders and other professionals within the field of wildlife science, we have drafted an initial set of new goals and objectives for Maine's deer populations. The Department expects that the update will allow for a more proactive and holistic approach toward deer management, in Maine.

For example, the current deer management framework utilizes specific deer densities to define when the MDIF&W has met its goals (i.e., Provide hunting and viewing opportunity while minimizing the negative impacts of too many deer). The specified density assumes that Maine's white-tailed deer are healthy, and that the public is happy. The new plan, and associated objectives and strategies, will introduce more specificity into Maine's deer management. The proposed changes would no longer assume that a specified density meant that Maine's deer were healthy, and its constituents happy. On the contrary, MDIF&W would annually track characteristics of health for deer, and periodically conduct surveys to track public opinions of game management. In short, the Department will have a better understanding of the biological and ecological health of Maine's deer and its habitats, as well as increased understanding of social tolerances associated with Maine's deer populations.

The Department is currently in the process of drafting the first version of the complete plan.

Winter Deer Project

MDIF&W biologists annually collect weather related data (i.e., temperature, snow depth, and deer sinking depth) from 27 representative sites across Maine to calculate a weather severity index (WSI). The index provides MDIF&W with an all-inclusive (i.e., accounts for predation, malnutrition, physical limitations of deer, etc...,) estimate of over-winter mortality rates (WMR), and spring fawn recruitment. The metric has been used since 1973 to estimate annual over-winter mortality of white-tailed deer at the statewide and WMD levels. Since the correlation between WSI and WMR was identified, the metric has become one of the cornerstones of Maine's deer management system. Indeed, the allocation of Any-deer permits can be directly influenced by our estimate of winter severity each year. For example, if Maine experiences an above average winter (long-term average (LTM) is equal to 15-year moving average) resulting in an above average WMR, a subsequent compensatory reduction to the number of Any-deer permits is made.

Despite the long-term success of the index, biologists previously found that WSI may have underestimated WMR during the mid- to late-1980s. The Department attributed the discrepancy to altered population dynamics as a result of loss of habitats following the spruce budworm outbreak. With the goal of rectifying the accuracy of the predictive equation, MDIF&W conducted dead-deer surveys between 1993 and 2000 to assess winter mortality rates associated with different WSI values of the time. The implication is that as ecological relationships continue to evolve on Maine's landscape we should likewise continue to monitor the efficacy of our metrics to maintain our high standards of wildlife management.

To this end, we initiated, in 2015, a monitoring project incorporating GPS-Satellite collar technology to track survival/mortality trends associated with Maine's deer populations. The primary goals of the monitoring project are to:

1) Reevaluate the correlation between WSI and WMR for white-tailed deer,
2) Assess seasonal survival rates for the adult (≥1.5 years) and young-of-the year deer,
3) Reassess the current winter severity index and try to identify a new, and more simplistic metric.

Indeed, updating our WSI by assessing contemporary trends in winter mortality may greatly benefit deer management in Maine. However, the proposed monitoring methods (see below) may also elucidate, for MDIF&W, other critical relationships (i.e., the project's secondary goals) to deer population management such as:

1) Identification of trends in survival/mortality between seasons for deer,
2) Begin to elucidate key dynamics in contemporary use of DWAs by white-tailed deer)
3) Assess the influence of feeding on survival and behavior of white-tailed deer

4) Compare the survival estimates from cementum annuli data to survival rates from GPS collared deer

3) Collect information on cause-specific mortality rates, and

4) Determine recruitment rates for young-of-the-year deer.

5) Collect covariate information on habitat and deer physiology that may influence deer survival rates

The project was initially scheduled to take place within WMD 17. This district, located in Central Maine, offered the best balance between minimizing logistical constraints, being able to assess a gradient of winter weather, and allowing us to meet budgetary constraints. However, since its inception it has grown to a collaborate project between MDIF&W, University of Maine, University of New Brunswick, New Brunswick Fish and Game, Irving, and Weyerhaeuser. Following this winter, the project will have 45 deer, per area, collared in 3-4 different WMDS, as well as similar numbers of animals collared in New Brunswick.

The project currently has a total of 59 collars on the air; this includes 18 new collars deployed this year. Since 2015, deer project staff have captured 228 animals and deployed a total of 77 collars. The Department hopes to have a total of 135 collars on the air by the end of winter 2017. The animals will be followed for at least the next five years. Any collars collected from dead animals will be redeployed until the end of the study period.

To date the project has experienced relatively few mortalities despite having monitored the animals through one above average (i.e., severe) winter, and two hunting seasons (Table 1 and Figure 4).

Table 1. Brief summary of Maine's winter deer capture work since its inception in 2015.

Year	Captures	Total Collars Deployed	Mortalities	Survival Rate
2014-15	52	18	6	83%
2015-16	148	40	10	75%
2016-17[1]	28	19	1	95%
Total	228	77	17	79%

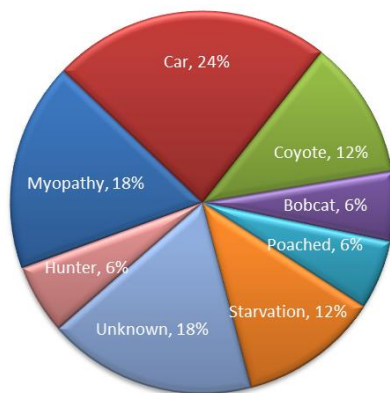[1]Note that the 2016-17 trapping period is currently underway.

Figure 4. GPS satellite technology allows us to locate deceased animals in quick enough time to often determine cause of death. Note that few collared animals have died which results in small numbers having a large impact on the proportions expressed within the figure.