BOBCAT MANAGEMENT SYSTEM AND DATABASE

May 1995

Maine Department of Inland Fisheries & Wildlife
Wildlife Resource Assessment Section
Mammal Group

PART I. - BOBCAT MANAGEMENT SYSTEM

INTRODUCTION

This document describes the current system by which biologists of the Maine Department of Inland Fisheries and Wildlife (MDIFW) make bobcat (Lynx rufus) management decisions on an annual basis. Part I outlines the decision-making process by which biological information indicates management options. Part II details techniques for estimating biological parameters used as inputs in the decision-making scheme presented in Part I. Goals, population and allowable harvest estimates, and habitat information were detailed in the 1985 bobcat assessment.

MANAGEMENT GOALS AND OBJECTIVES

Management Goal

Maintain bobcat populations at no lower than 1985 levels and maintain user opportunity.

Abundance Objective

Maintain fall bobcat population at no lower than 1985 levels (estimated at approximately 1,850).

Use Objective

Maintain 1985 hunting and trapping opportunity (season length and timing) as long as abundance objective is met.

Capability of habitat:

The habitat is capable of supporting bobcat densities at 1985 levels.

Feasibility:

It may not be possible to meet the abundance objective annually because of the impact of severe winters on bobcat.

Desirability:

These objectives will have both desirable and undesirable aspects for hunters and trappers. In most years, opportunity to pursue bobcats should be maintained. However, extreme harvests, severe winters, and/or apparent population declines could result in hunting season closures. Most people are expected to support maintaining the number of bobcat at at least their present numbers.

Possible consequences:

Because some people regard the bobcat as rare (or even threatened), lack of a strong effort to reduce the kill could result in adverse public opinion. Conversely, season reductions (if required) are likely to be unpopular with bobcat hunters.

MANAGEMENT DECISION PROCESS

Management decisions primarily address the goal of maintaining a viable bobcat population while providing opportunity for use of the resource (Figure 1).

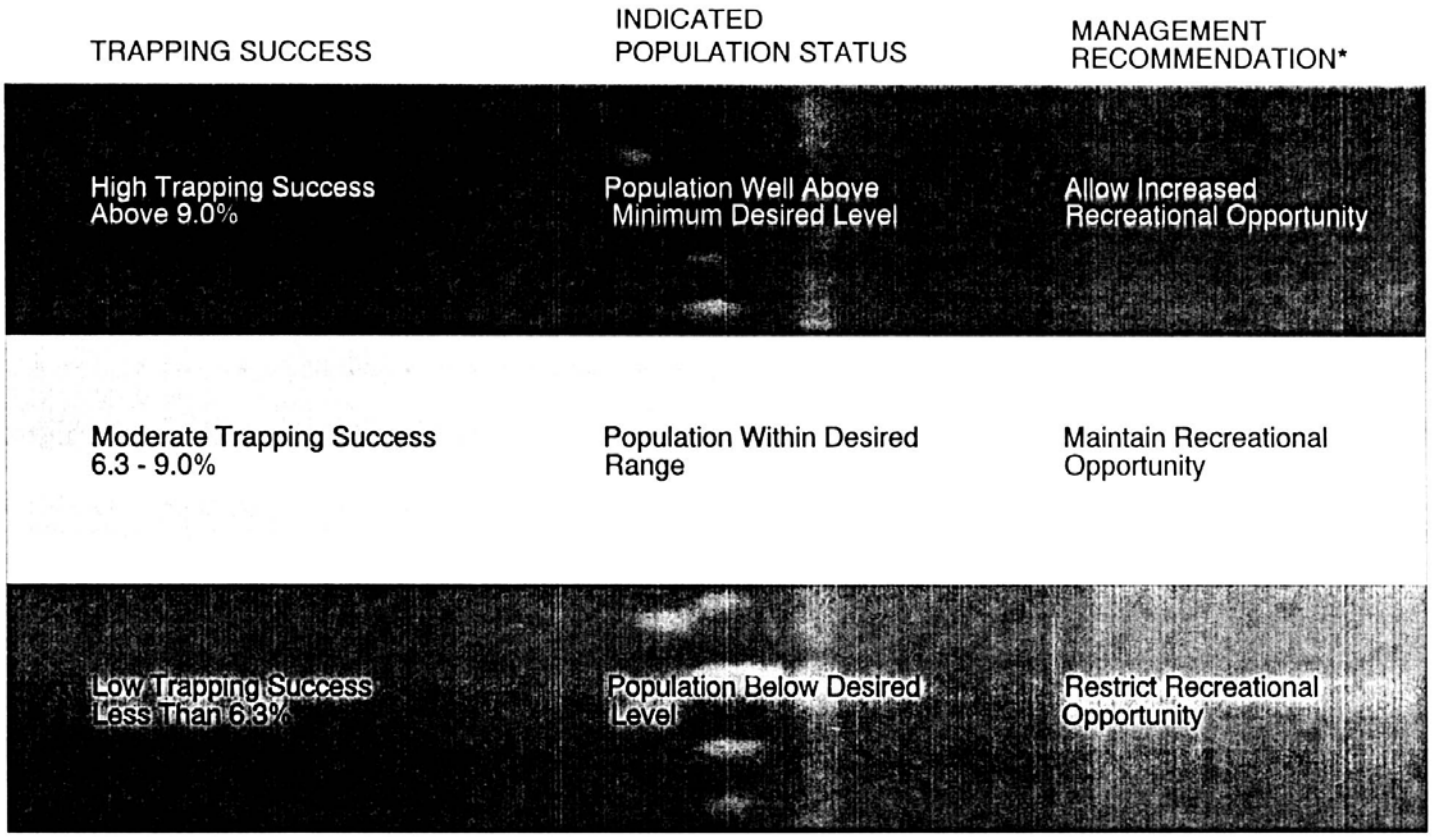
Decision-making is a series of yes or no answers to questions related to: 1) bobcat population level, 2) population trend, and 3) the presence of factors causing high mortality (severe winter weather, excessive harvest)(Figures 2, 3). Responses to questions are based on evaluation of all input criteria, and the flow charts guide the manager to the appropriate and/or current management option.

For the purposes of this process, bobcat carrying capacity is considered constant between assessments of habitat quality and quantity.

This system is based on the premise that bobcats are at the northern edge of their range in Maine and the population is expected to fluctuate widely. Many of the factors that affect bobcat survival, and therefore bobcat numbers, (i.e. winter weather, hare abundance, hunting conditions, pelt price) are extremely variable and beyond our control. Therefore, we cannot expect to maintain bobcats at unusually high numbers indefinitely, and bobcat numbers may occasionally reach unacceptably low levels.

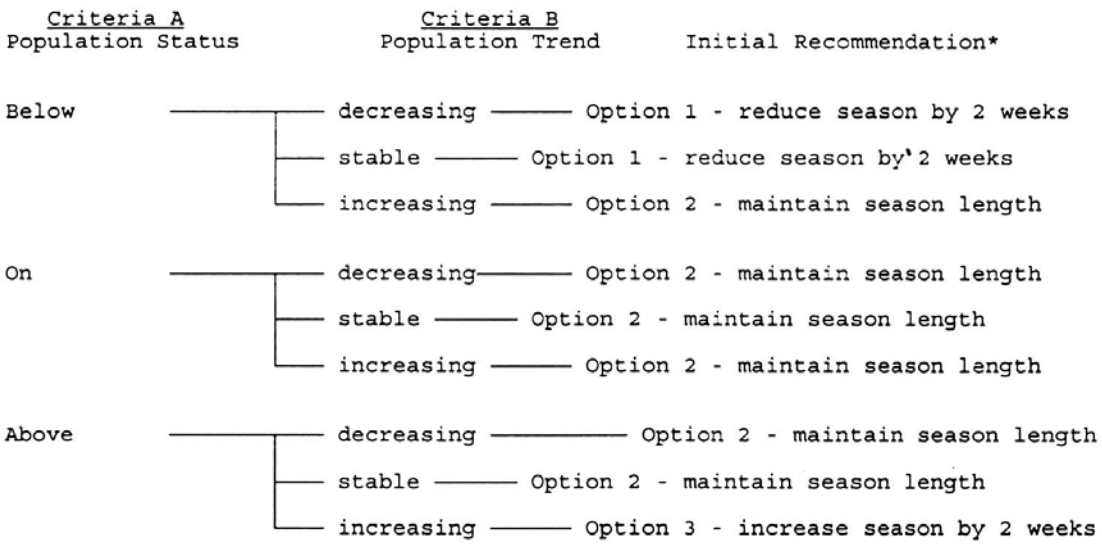
Bobcats are taken by <u>both</u> trapping and hunting. Bobcat trapping is believed to be largely incidental to trapping for other upland furbearers, and trapping effort on upland furbearers is primarily regulated in response to concerns for species other than bobcat. Some measure of trapping effort is available. The bobcat hunting season is separate from most other hunting seasons, and contributes between 50% and 80% of the total take of cats. No reliable measures of hunting effort exist. This management

FIGURE 1. CONCEPTUAL RELATIONSHIP BETWEEN BOBCAT TRAPPING SUCCESS, POPULATION STATUS, AND MANAGEMENT*



*POPULATION TREND AND HIGH MORTALITY FACTORS WILL ALSO AFFECT MANAGEMENT RECOMMENDATIONS'

Figure 2. Decision Path for initial Bobcat Management recommendation - to be modified by High Mortality Factors as outlined in Table 1.



system recommends adjustment of the hunting season by 2-week intervals to regulate the take of bobcats, but relies on trapping success as an index to population level.

Bobcat management is directed at maintaining bobcat numbers at or above 1985 levels. Management proceeds by manipulating hunting harvest size (by adjusting season length) to reduce harvests and promote population growth during periods of low bobcat abundance, and to take advantage of surplus harvestable animals during temporary population peaks. All hunting season adjustments will impact the ending date of the-season; the starting date will remain December 1. Trapping success is used as an index of bobcat abundance and population trends.

There are 3 levels of bobcat abundance relative to IFW management goals (bobcat numbers a 1985 levels and 1985 recreational opportunity when possible)(Figure 1). These are:

1. Population below 1985 levels. In this situation, management action includes reducing mortality (harvest) to allow the population to grow.
2. Population at or slightly above 1985 levels. Management action includes maintaining existing hunting season framework.
3. Population well above 1985 levels. Management action includes expanding recreational opportunity to or near 1985 levels to take advantage of this situation, which is likely to be temporary.

Between 1980 and 1986, the bobcat hunting season was the beginning of December through the end of February, and the trapping season was the end of October through early December. High pelt prices, combined with 1985 levels of opportunity and increasingly easy access (logging roads, ATVs, snowmobiles)

throughout the state, probably played a large role in the decline in bobcat numbers after 1985. There is also indication that the establishment of coyotes in Maine, which occurred by the late 1970's, has had an adverse impact on bobcat (Litvaitis and Harrison, 1989). In 1987, the bobcat hunting season was reduced to December 1 - January 31. This framework appears to be meeting population goals and should be regarded as the base season framework to be modified by management action under this management system. Increased human access to bobcat range and competition with coyotes may make pre-1985 season lengths biologically unacceptable on a regular basis.

Input Criteria for Bobcat Management

No direct measure is available to relate current bobcat numbers to 1985 levels. Trapper success is an indirect measure and is assumed to vary with bobcat abundance. It is used in this system as an indicator of population level relative to 1985, and as an indicator of population trend. Trapping success is the best index to the bobcat population that is currently available, because bobcat trapping is thought to be largely incidental to other land trapping. Trapping success will be used to assess population level until 1997 when a 4 year series of track counts will be available as a second indicator (Appendix V).

Severe winter weather and extremely high harvests can cause excessive bobcat mortality. These high mortality factors (HMFs) reduce bobcat population viability. When they are present, management recommendations based upon trapping success are modified to ensure additional protection to the bobcat population.

Criteria A

This input attempts to answer the question "Is the population on target (at or above 1985 levels)?" It further asks the question, "Is the population sufficiently above the target minimum that opportunity could be increased?"

For year n it is calculated as:

TS^n = % Trapper Success in year n = $\frac{\text{\# of trappers who caught a bobcat in year n} - 100}{\text{\# of trappers who caught a fox, coyote or bobcat in year n}}$

Trapper success was 6.3% in 1985 and averaged 6.3% from 1982-1985. Therefore, 6.3% trapper success is used as an indicator of the minimum acceptable population. There is no clear indicator of extremely high populations, but historical records suggest that high populations generate at least 9k success (Appendix VII).

Rules of Thumb for Criteria A

1. If trapper success is > 9.0% for 2 consecutive years, the bobcat population is above target.
2. If trapper success is $\geq$ 6.3% and $\leq$ 9.0%, or trapper success is >9.0% for 1 year, the bobcat population is on target
3. If trapper success is < 6.3?6, the bobcat population is below target.

Criteria B

Since bobcat populations may change rapidly, it is desirable to predict when the population is likely to fall below the target goal so protective action can be taken, or

when populations are expected to be high so that additional harvest opportunity can be permitted.

The rate of change (r) of a population is the slope of the natural log of the population regressed on time (Caughley and Birch 1971). When the population size is not known, an index may be used to estimate the rate of change. The most useful trend index currently available is trapping success. A track index will provide a more direct index to bobcat population trends after 1996.

r = slope of ln(I) regressed against time for 4 years where:

I = yearly value for the index

r = rate of change

Until 1997, when a series of track counts becomes available, trapper success will be used alone. In 1997, (r) will be considered 0 if the 2 indices do not agree in direction. If they do agree in direction, (r) will be calculated as the mean of the 2 rates of change. [Note: This should be revisited once we have some experience with comparisons between trapping success, track counts and population trends, especially in light of reduced trapper numbers and the potential for trapping regulation changes.]

Rules of Thumb for Criteria B

1. If r is < -0.10, the population is declining.
2. If r is ≥ -0.10 and $\leq +0.10$, the population is stable.
3. If r is $> +0.10$, the population is increasing.

Criteria C

This input attempts to answer the question "Are there extenuating circumstances that will affect the population by causing exceptionally high mortality?" Based on examination of past years' data, population declines, as measured by hunter success, are likely when harvests exceed 275 bobcats. Also, bobcats do not survive well during severe winters (Litvaitis, 1984). Drops in trapping success have occurred following winters when average sinking depth of deer in open areas (as measured at Winter Severity Stations) exceeds 10 inches in any month.

High Mortality Factors (HMF) are:

1. the total harvest exceeds
2. the average sinking depth (for deer from WSI stations) exceeds 10 inches for at least 1 month

Each month that average sinking depth exceeds 101, will be considered to be one HMF Consequently, several High mortality Factors may be recorded in a given year. The highest number of HMFs recorded per year in either the present year (year n) or the year immediately preceding (year n-1) govern decision-making under the following Rules of Thumb. This requirement addresses the severe, lingering impacts heavy mortality may have on bobcat populations.

Rules of Thumb for Criteria C:

Rules of Thumb for Criteria C are outlined in Table 1. As the number of high mortality factors increases, the initial management recommendation based on Criteria A

and B is modified to provide additional protection to the bobcat population. Only 2 additional weeks will be removed from the hunting season due to high mortality factors, regardless of the number of high mortality factors recorded. These rules of thumb are weighted, to initiate season restrictions under a lower number of HMFs when the population is low. Reduction in hunting opportunity is unlikely due to a high harvest, given a high bobcat population.

Note: Any season modifications due to application of Criteria C (HMFS) are for one season only. Each year, the previous year's initial season recommendation (not the final season recommendation) is used as the starting point for determining a season recommendation. Maximum season reduction due to HMFs is 2 weeks.

Table 1. Rule of Thumb for Criteria C

Population Status (Criteria A)	Number of High Mortality Factors[1] 1	2	3+
Below	Reduce hunting season 2 weeks for 1 year	Reduce hunting season 2 weeks for 1 year	Reduce hunting season 2 weeks for 1 year
On	No action	Reduce hunting season 2 weeks for 1 year	Reduce hunting season 2 weeks for 1 year
Above	No Action	No Action	Reduce hunting season 2 weeks for 1 year

[1]Highest number of HMFs recorded in current year or year immediately preceding current year are used as Criteria C. Example: If 1 HMF were recorded in current year, and 3 HMFs were recorded in preceding year, Criteria C would be: 3 HMFs.

MANAGEMENT OPTIONS

The management system provides management recommendations using a 2-tiered approach. First, one of three initial management recommendations is made based upon evaluation of criteria A and B (population level and trend). This recommendation is then modified, pending evaluation of criteria C (high mortality factors). Hunting seasons will not be shortened below 4 weeks. (Final season recommendation of 2-4 weeks in length will result in a season of 4 weeks.) If the final season recommendation is less than 2 weeks in length, the hunting season will be closed.

Management Options for Initial Recommendations (Based Upon Criteria A and B

1. Reduce hunting season by 2 weeks.
2. Maintain same hunting season length as last year.
3. Increase harvest opportunity by lengthening hunting season by 2 weeks, to a maximum length of December 1 - February 28.

Modified Management Options pending Evaluation of Criteria C

1. Reduce hunting season by an additional 2 weeks.
2. Maintain same hunting season length as recommended under initial management recommendations.

CHRONOLOGY OF BOBCAT MANAGEMENT ACTIVITIES

Bobcat pelts tagged	November - February
Bobcat track survey	November - February
Harvest data entered	December - February
Pelt price survey	March
Meeting with MTA, MTHA and furbuyers	March
Calculate trapping success, other data analyzed, assess management options	April
Meeting with regional personnel	April
Recommendations for rule changes	April - June
Public hearings (if needed)	May - June
Regulation changes adopted	June

PART II. - BOBCAT MANAGEMENT DATABASE

BOBCAT DATA COLLECTION SUMMARY

Bobcat Harvest Data

Law requires that each harvested bobcat be tagged by an agent or personnel of MDIFW (Appendix I). Data recorded at the time of tagging include trapper/hunter name and license number, month of capture, and township of capture. These data are recorded in registration booklets (Appendix II). Books are inspected by the Warden Service and submitted to the Data Entry Section of the Bureau of Resource Management. There, data are entered on the IBM mainframe computer of the Bureau of Data Processing. Harvest data are analyzed and summarized by a series of computer programs (Appendix III) that provide information on total catch by township, WMU, and statewide, number of trappers/hunters catching bobcat, harvest/mi', harvest by trapper/hunter, and historical harvest summary.

Trapper Success

Each year, trapper success is calculated as the number of trappers catching at least 1 bobcat/the number of trappers catching at least 1 fox, coyote, or bobcat.

This trapper success level is used in Criteria A, by regressing the natural log of annual trapping success against year to predict the following year's trapping success [see page 7].

Effort

There is no system in use to quantitatively evaluate effort. However, several indices are used to gain insight into possible upward or downward trends in effort expended on bobcat trapping and hunting. Bobcat pelt price changes may cause trends in effort to shift. In March each year, an annual mail survey of furbuyers is conducted (Appendix IV) to estimate the average price paid to trappers/hunters for bobcat pelts.

Weather adversely affecting efficiency of trapping or running hounds during the season may also cause a downward shift in effort.

Also, a trapper logbook survey is used to calculate an index to trapper effort towards bobcats and other furbearers (Appendix' VI). The survey tracks trends in number of trap-nights expended towards bobcats-by trappers.

These indices may help explain the occurrence of a shift in effort, but will not indicate whether or not bobcat trapping/hunting effort really did change. Therefore, these indices are used as supplementary information.

Bobcat Track Survey

A statewide track survey (Appendix V) was initiated in 1993 to provide a more direct index to bobcat population trends and distribution. Four years of data are needed to begin trend analyses, so the survey results will be incorporated into Criteria A in 1997.

Regional and Trapper/Hunter Observations

When harvest analyses and summaries have been completed, copies are sent to regional biologists. Meetings are held to discuss regional and trapper/hunter observations in conjunction with harvest analysis information. These meetings provide supplemental information from people that spend time in the field to help support or refute conclusions drawn from harvest data.

LITERATURE CITED

Caughley, G. and L.C. Bich. 1971. Rate of Increase. J. Wild. Manage. 35(4):658-663.

Litvaitis, J.A. 1984. Bobcat movements in relation to prey density. Ph.D. Thesis. University of Maine, Orono. 103pp.

Litvaitis, J.A., and D.J. Harrison. 1989. Bobcat-coyote niche relationships during a period of coyote population increase. Can. J. Zool. 67:In press.

LIST OF APPENDICES

APPENDIX I. Rules Governing the Tagging of Bobcat Pelts.

H. Tagging Procedure

It shall be unlawful for any person to possess, sell, give away, buy, accept as a gift, offer for transportation or transport any raw fox, bobcat, marten, fisher, coyote, raccoon, beaver, mink, or otter skins unless each skin is tagged.

All raw skins of these species must be presented to a warden, or other agent designated by the Commissioner, and each raw skin legally presented shall be tagged. All information requested relating to the taking of each skin shall be accurately and truthfully reported. A fee of 25¢ shall be paid for each skin tagged.

All raw fox, marten, fisher, coyote, raccoon, bobcat, beaver, mink, and otter skins shall be presented for tagging within 10 days after the closing of the open season thereon, except the raw skins of all bobcat taken during the open bobcat hunting season shall be presented, by the person who killed said bobcat, for tagging within 72 hours of killing said animal.

Any raw skins of these species that come into this State in any manner from any other state, country, or province shall bear the official stamp, tag, or seal of such other state, country, or province. Any suck skins that does not require an official stamp, tag, or seal, shall be tagged in accordance with this section by the person possessing such raw skins. The fee for tagging such imported raw skins shall be 25¢ for each tag so issued. Licensed taxidermists who import raw skins for the purpose of taxidermy are exempt from the provisions of this paragraph.

I. Raccoons

Raccoons may be hunted at night during the open season only when the hunter (i) is accompanied by a dog, (ii), uses an electric flashlight to locate raccoons that are treed, or held at bay, by a dog or dogs, and (iii) is in possession of, an uses a rifle, pistol, or revolver of no greater power or caliber than one which uses.22 caliber long rifle ammunition; said rifle to be loaded only when being used to dispatch a raccoon that is treed or held at bay by a dog or dogs.

J. Size of Traps

Animals may be trapped with any common ordinary steel trap.

APPENDIX II. Sample Page from Pelt Tagging Registration Book.

FUR TAGGING SHEET

(see instructions outside and inside front cover)

License Type [1]	License Number [2]	Seal Number [3]	Species [4]	Month [5]	Year [6]	Town Caught (use complete Township ID) [7]	County [8]	Beaver Size
41	T-7029	719666	Coon	11	86	JACKMAN	Somerset	
41	T-7029	719667	Coon	11	86	JACKMAN.	Somerset	
94	------	719688	Coyote	11	86	Long Pond	Somerset	
94	------	719699	Coyote	11	86	Long Pond	Somerset	
41	T-6312	719700	Coyote	11	86	Moose River	Somerset	
41	T-6312	719701	Marten	11	86	" "	Somerset	
41	T-1081	719702	MINK	11	86	HOLEB	Somerset	
41	T-1673	719703	FISHER	11	86	MOOSE RIVER	11	
41	T-1673	719704	COYOTE	11	86	THORNDIKE	11	
41	T-1673	719705	11	11	86	MOOSE RIVER	11	

APPENDIX III. Summary of Computer Programs and Analyses applied to Bobcat Harvest and Trapper Data.

Description of furbearer data analysis and information system.

Program	Input Data	Outputs	Users
TRAPLIST SAS	License data (tape)	Alphabetical listing by county of trapping license holders.	Requests from outside sources.
LISTTRAP SAS	License data (tape)	Numerical listing by license and alphabetical listing by name of trapping license holders.	1) Furbearer Project 2) Warden Service
LICSUM SAS	License data (tape) Township data (disk)	Summary of licenses by type by by region and WMU.	1) Furbearer Project 2) Regions 3) Administration
PRELIMHV SAS	Harvest data (tape)	Summary of harvest by WMU for each species.	1) Furbearer Project 2) Regions 3) Administration 4) Public
COUNTYHV SAS	Harvest data (tape)	Summary of harvest by county for each species.	Requests from outside sources.
TAPEFIX1 SAS	Harvest data (tape) License data (tape)	Correct license type in harvest file and create disk file.	
TAPEFIX2 SAS	Harvest data (tape)	Write corrected harvest file back onto tape.	
LANDSUC SAS	Harvest data (tape)	Number of successful bobcat trappers, bobcat harvest, number of successful fox, coyote, and bobcat trappers.	Bobcat Management System

Continued

Program	Input Data	Outputs	Users
FURTAG SAS	Harvest data (tape) Township data (disk)	Harvest data are summarized by township in data set on disk (FURBEAR. TWNHRVnn). Harvest and harvest/mi^2 listing is produced by township, WMU, region, WMU within region, and statewide.	1) Furbearer Project 2) Regions 3) Public
TOWNSUM SAS	FURBEAR. TWNHRVnn data sets (disk) Township data (disk)	Harvest and harvest/mi^2 listing is produced for all years since 1976. Long term and short term averages are computed for all groupings. Summary data set is produced (FURBEAR. TOWNSUM).	1) Project 2) Regions 3) Administration
TOWNSUM2 SAS	FURBEAR. TWNHRVnn data sets (disk)	Harvest listing is produced for last 2 years by township within region.	Lists are used by regional biologists and public in providing information to Wardens.
LICTAG SASNEW	Harvest data (tape) License data (tape) Township (disk)	Harvest by WMU by harvester (trapper, hunter and combined) data set is created (FURBEAR. TRPHRVnn). Trapper listing by WMU is produced. Summary of harvest in WMU by region of residence (carpetbagger) is produced to monitor trapper movement.	1) Regions 2) Project

Continued

Program	Input Data	Outputs	Users
TYPETAG SASNEW	FURBEAR. TRPHRVnn data set (disk)	Listing of harvest, catch/successful harvester, and successful harvesters by license type and general category by WMU and statewide is produced. Summary data set is created (FURBEAR. TYPHRVnn).	Project
HARUSUM SAS	FURBEAR. TRPHRVnn data sets (disk)	Tables of historical harvest and success rate by general category and produced by WMU and statewide and plots of harvest, successful users, and success rate statewide.	1) Region 2) Project 3) Administration
WARDNTAG SAS	Harvest data (tape) License data (tape) Township data (disk)	Summary of harvest by individual within each warden district is produced. A summary of pelts tagged by warden district and division is produced.	Warden Service
TGSEARCH SAS	Harvest data (tape)	Search for all information on specific tag number.	Warden Service
TRSEARCH SAS	Harvest data (tape)	Search for all information on specific trapper.	Warden Service
BIOLIST SAS	Biological data (tape) Township data (disk)	Biological data file for all years is created on tape (FURBEAR. BIODATA). A listing by ID number within township is produced.	1) Project 2) Regions 3) Public (age requests)

Continued

Program	Input Data	Outputs	Users
BIODATA SAS	FURBEAR.BIODATA (disk)	Complete tables of sex and age data are produced. Reproductive data are summarized.	Project
HRVWEEK SAS	FURBEAR.BIODATA (disk)	Tables of frequency of juvenile harvest by sex by date are produced. Tables of sex and age breakdown by week of fall season are produced.	Project
HRVCHRON SAS	FURBEAR.BIODATA (disk)	Bar graphs of chronology of harvest and produced by WMU and statewide.	1) Project 2) Regions
MCIRMOD SAS FCIRMOD SAS MCIRJUV SAS FCIRJUV SAS	Biological data output Warden data output License data output (data form)	Change-in-ratio model to estimate exploitation rate for males and females of juvenile and older age classes	Project
POPMODEL SAS	Biological data output Harvest data output Exploitation rate output (data form).	Life equation type population model used to evaluate management options.	Project
TRAPLONG SAS	Trapper Longevity File	Updates longevity file with current year's license sales.	Project

Continued

Program	Input Data	Outputs	Users
TRAPLONG PRINT	Trapper Longevity File Trapper Listings	Update longevity file when license number is unknown.	Project
TRAPLONG MODEL	Trapper Longevity File	Life equation type population model of trappers.	Project
QUESTnn SAS	Trapper Questionnaire File	Analysis of trapper questionnaire data.	1) Project 2) Administration

APPENDIX IV. Annual Pelt Value Mail Survey Form.

The slope of the regression of the natural log of trapping success is the rate of increase (or decrease). This is used to predict next year's trapping success. For most ROTs predicted trapping success is used as an indicator (albeit less direct) of population trend because it is more important to take protective action when the population is likely to fall below target or return to target levels than if this is unlikely to occur. Using an anticipated success rate allows protective action to occur before there is a problem without needlessly reducing opportunity on a population that is high but declining, possibly due to factors other than hunting. Comparing predicted and actual success gives a somewhat better picture of what the population is doing now rather than what it was doing over the past 4 years and is used to indicate if restricting opportunity has been sufficient to halt the decline or if additional protection is needed. Similarly at high populations ROT 3b offers a little more protection to the resource by not further increasing opportunity when the population has begun to level off even thought he 4 year regression may still indicate an increasing population.

Angus S. King, Jr.
Governor

Ray B. Owen, Jr.
Commissioner

DEPARTMENT OF INLAND FISHERIES AND WILDLIFE

Wildlife Resource Assessment Section
650 State Street
Bangor, ME 04401-5654
Telephone (207) 941-4471
FAX (207) 941-4450

March 1, 1995

Dear Fur Buyer:

The annual meeting between trappers, houndsmen, furbuyers, and the Department of Inland Fisheries and Wildlife is scheduled for 1:00 p.m. on Friday, March 24th, in the Penobscot Auditorium at the Augusta Civic Center. As always, this is a good chance for us to find out what is on your minds and discuss furbearer issues. I hope to see you there.

Also, as in previous years, the Department of Inland Fisheries and Wildlife is compiling prices paid for Maine fur. Although many buyers are buying little or no fur, we need to estimate the average value of the harvest. I am asking your help in completing the enclosed form, and returning it to me. Please provide your best estimate of the average price of each type of fur for the entire season (November through March). Please complete the form and return as soon as possible. A table of the average (mean) prices paid from 1985 until now is enclosed for your interest. This table was made up from information provided by furbuyers through this annual survey.

As in the past, all reports are confidential and are destroyed as soon as information is compiled. There is no way to track prices back to a particular buyer. The information provided by this survey is vital to our furbearer management program, as this is one of our best indices to trapper effort.

Thanks in advance for your help.

Sincerely,

Kenneth Elowe
Mammals Group Leader

KDE/llm
Enclosures

VOLUNTARY FURBUYERS REPORT

Please record the average price you paid for the pelts of each of these species bought in Maine from trappers and hunters during the season indicated. This price information will be combined with information from other buyers to develop an average statewide price. To protect your confidentiality, this report will be destroyed after recording the prices given. **If you did not purchase any pelts during the season, check "NO" and return the form anyway.** If you have any questions, please contact us by mail or phone. A stamped, addressed envelope is enclosed for this report.

Thank you for your assistance.

Wildlife Division
Maine Dept. Inland Fisheries and Wildlife
650 State Street
Bangor, ME 04401-5654

Name of Furbuyer:_____

Season: October 1994 - March 1995

Did you buy pelts during this season: YES_____ NO_____

Species	Average Price	Species	Average Price
Beaver	_____	Bobcat	_____
Coyote	_____	Grey Fox	_____
Red Fox	_____	Pine Marten	_____
Fisher: Male	_____	Mink: Male	_____
Female	_____	Female	_____
Muskrat	_____	Otter	_____
Raccoon	_____	Skunk	_____
Weasel	_____		

In order for us to know if you can provide the information we seek, please check one of the following:

- Buy Hides and Fur ☐
- Buy Hides only ☐
- Buy Fur only ☐
- Do NOT buy Hides or Fur ☐

MEAN PRICES PAID FOR PELTS OF MAINE FURBEARERS

Species	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
Beaver	32	17	20	18	10	13	9	20
Bobcat	87	69	48	30	23	38	25	30
Coyote	18	14	8	7	6	14	20	20
Gray Fox	33	26	14	12	6	8	No Info	10
Red Fox	26	18	15	12	9	13	10	14
Fisher:								
Male	95	83	35	15	10	19	12	14
Female	183	171	91	50	44	51	33	29
MEAN	139	127	63	33	27	35	23	22
Marten	27	34	38	32	27	31	22	25
Mink:								
Male	32	29	36	28	24	33	29	26
Female	15	17	19	16	13	18	16	13
MEAN	24	23	28	22	19	26	23	20
Muskrat	3.60	3.80	2.00	1.00	0.84	1.9	1.5	2
Raccoon	18	10	6	5	3	6	7	9
Otter	28	24	20	21	11	25	29	50

APPENDIX V. Track Survey Protocol.

Track Survey Protocol

Track counts are done each winter beginning in 1993-94 according to the attached protocol. Minimum distances are assigned to blocks of land based on biologist regions and WMUs to ensure statewide coverage. Each surveyor is responsible for picking routes within these blocks.

Track counts will be used to track trends in bobcat populations using a 4 year regression of

$$\ln\left(\frac{\textit{number of segments with tracks}}{\textit{number of segments surveyed} * \textit{number nights of tracking conditions}*}\right)$$

*more than 3 nights will be entered as 3

May 16,1995

TRACK SURVEYS FOR BOBCATS AND OTHER FURB

This is an outline of pilot survey techniques for bobcat and other mammals and a request for management section assistance. This is an attempt to get more direct information on these animals without a great expenditure of additional time. As suggested, it should require only a slight increase in time (mostly slowing down when traveling and record keeping.

Who should participate?

1. All Wildlife Division personnel
2. Interested volunteers from other divisions or outside time department at a wildlife biologist's discretion.

When should transacts be done?

1. 24 or more hours after a snowfall or heavy winds when conditions are suitable for identifying tracks.
2. When you are working in the field doing something where you will be traveling at least 1 km and can see and identify tracks without jeopardizing other work (i.e. snowmobiling to a work site) .
3. When you have time to run transacts specifically for bobcats and other species.
4. Anytime you are recreating in a manner conducive to observing tracks and are feeling dedicated.
5. Spare time if any!

What areas should be done?

1. Any primarily forested areas from trails, unplowed roads, compass lines, etc.

What information should be collected? (See attached data sheet)

1. The presence or absence of bobcat tracks on each km traveled.
2. The presence or absence of the following animals on each km traveled:

   Marten

   Fisher

   Lynx

   Cottontail

   Snowshoe hare (none-rare-common-abundant)

   Wild turkey

   Moose (WMU's 4-8 only)

   anything else of interest
3. Descriptive information on enclosed sample form.

The main thrust of the survey will be bobcats, with marten, fisher, and snowshoe hare recorded as additional information. Lynx, cottontail, turkey, moose (WMU 4-8 only) and anything else of particular interest should also be recorded on the datasheet on the line for each 1 km segment.

Since we are recording only presence or absence of tracks or other sign, the age of the tracks and number of tracks seen in a 1 km segment don't matter. This simplifies the process, since there is no need to determine whether tracks were made by the same individual animal or not. The only exception is snowshoe hare, where we request that you record whether sign was nonexistent, rare, common, or especially abundant for each segment. The only weather restriction is that tracks can be identified (i.e. must have snow) and that tracking conditions were the same for at least 24 hours before the survey (i.e. 24 hrs after snowfall or significant wind that would obliterate tracks). Since the age of the tracks and number do not matter, there is no window time restriction after snowfall. As long as tracks can be identified, it doesn't matter if they are a month old on old snow. This should make the survey much easier to fit into work schedules.

In the field, survey notes may be kept on the datasheet or on maps, whichever is easier. Whichever way you record data, we will need a completed datasheet for each transect run. Also, please staple a copy of a map showing the transect route to the completed datasheet.

Transects can be run throughout the winter, as long as conditions exist for tracking. Any interested, knowledgeable folks outside the Wildlife Division should be invited to participate also, to increase the number of transects run. This could include wardens, hunters, beaver trappers, coyote snarers, knowledgeable recreational snowmobilers, cross country skiers, etc. It may be best to provide maps to outside observers to record tracks on and then transcribe their information to data sheets for them. Outside

observers should only be encouraged if they are knowledgeable and very interested, however, since the data quality may suffer with disinterest. Also, please tress that if no tracks are seen, it is every bit as important as when tracks are observed. The survey only works if we know where we did not find bobcats well as the effort involved.

Transect lines do not have to be repeated, although they may be. Please indicate on sheets whether a transect run is a repeat of a previous run.

Table 1. Minimum number of 1 kilometer segments of bobcat transect to be surveyed by WMU and Region.

Region	1	2	3	4	5	6	7	8	ALL	Miles
A	0	0	0	32	0	0	0	0	32	20
B	0	0	0	32	0	0	0	0	32	20
C	0	0	0	0	64	160	0	0	224	99
D	0	0	96	32	0	0	0	0	128	80
E	0	48	64	32	0	0	0	0	144	90
F	48	0	0	32	96	0	0	0	176	90
G	80	80	0	0	0	0	0	0	160	99
	128	128	160	160	160	160	0	0	1,088	

page ___ of ___

Bobcat Track Survey

Observer_____ Date_____ Number of nights of tracking conditions_____

Township_____

(Please record primary township for short transects - for long transects covering many towns please use a new sheet for each town)

Please describe animal travelling conditions (i.e. temperature, crusting conditions)_____

_____

_____

_____

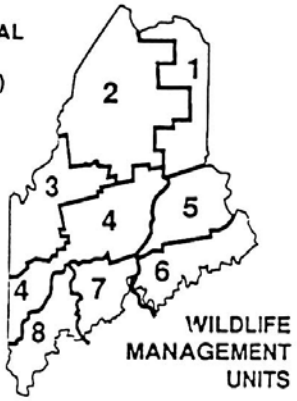
Please check if tracks are present on each 1 km segment and evaluate snowshoe hare abundance (none-rare-common).

Segment Number	Bobcat	Marten	Fisher	Hare * NRCA	Comments (List unusual tracks by species)
					(Summary = total segments done and number with tracks)
Number of blocks where hare are: None _____ Rare _____ Common _____ Abundant _____					

* N = no tracks R = 1-5 tracks C = 6-19 tracks A = ≥ 20 tracks

APPENDIX VI. Trapper Logbook Survey.

TRAPPING EFFORT SUMMARY
***Do Not put your name on this page: STRICTLY CONFIDENTIAL**



Please fill in this page completely, tear out, fold, tape, and mail (results will be mailed to you next fall)
Please send in this sheet even if you did not trap or if you did not catch anything.

1. Did you trap this year? YES NO If no, please answer no.'s 4, 5, and 6.

2. Which category best describes the time that you spend trapping? (circle letter)
   A. Trapping is my primary job
   B. Time before and after work at my primary job
   C. Shorter work days at my primary job
   D. Vacation from my primary job
   E. Weekends
   F. Retired or other

3. Give approximate beginning and ending trapping dates:

   Fall _____ to _____ Beaver: _____ to _____

4. Please circle all Wildlife Management Units where you set traps during this past season (or where you live if you did not trap).
   WMU 1 2 3 4 5 6 7 8

5. Were Beechnuts rare common abundant don't know in your area this year, compared to other years? (Circle one)

6. Were snowshoe rabbits rare common abundant don't know in your area this year, compared to other years?

7. **Trap set summary:** List the average **number of traps** set primarily for each animal each night, **how many nights** you set traps for each animal, and **how many of each animal you caught. (SEE INSTRUCTION PAGE)**

TARGET ANIMAL	# OF TRAPS	# OF NIGHTS	# CAUGHT
Coyote			
Fox (red/gray)			
Raccoon			
Bobcat			
Fisher			

TARGET ANIMAL	# OF TRAPS	# OF NIGHTS	# CAUGHT
Marten			
Mink			
Otter			
Beaver			
Muskrat			

COMMENTS, OBSERVATIONS, AND SUGGESTIONS _____

DETACH HERE

APPENDIX VII. Application of Management System to historical data.

Tables 1 and 2 summarize the calculations and proposed actions from the management system on historical data. It should be noted that Table 2 does not show any effect of this system because the action was not actually taken.

Table 1. Number of High Mortality Factors (HMF) calculated by the bobcat management system using historical data.

	Total Kill	Months ≥ 10 Inches Sinking Depth	HMF Total
1978	*278	0	1
1979	*318	0	1
1980	*385	1	2
1981	*345	2	3
1982	*311	0	1
1983	248	0	0
1984	270	0	0
1985	*277	1	2
1986	179	3	3
1987	91	1	1
1988	89	0	0
1989	152	2	2
1990	113	0	0
1991	119	0	0
1992	123	2	2
1993	180	1	1

Table 2. Criteria, population status and trends, and hypothetical bobcat hunting season recommendations, 1989-1993 based upon this management system and beginning with a 9 week (Dec. 1 - Jan. 31) season in 1988.

Year	Criteria A		Criteria B		Initial Recommendation			Criteria C		Final Recommendation Season Length In Weeks
	Trapper success	Pop'n Status	Slope of Success	Pop'n trend	Mgt Option	Action	Season Length (weeks)	HMFs	HMF Modification	
1989	5.2	Below	.18	Increase	1	Maintain	9	2	-2 add. wks.	7
1990	4.3	Below	.03	Stable	1	Reduce 2 wks	7	0	None	7
1991	9.2	On	.13	Increase	2	Maintain	7	0	None	7
1992	9.5	Above	.25	Increase	3	Increase 2 wks	9	2	None	9
1993	7.4	On	.16	Increase	2	Maintain	9	1	None	9

Table 3. Criteria, population status and trends, and hypothetical bobcat hunting season recommendations, based upon this management system and beginning with a 9 week (Dec. 1 - Jan. 31) season.

Year	Criteria A		Criteria B		Initial Recommendation			Criteria C		Final Recommendation Season Length In Weeks
	Trapper success	Pop'n Status	Slope of Success	Pop'n trend	Mgt Option	Action	Season Length (weeks)	HMFs	HMF Modification	
1	9.0	On	.04	Stable	2	Maintain	9	1	None	9
2	8.0	On	-.01	Stable	2	Maintain	9	3	-2 wks	7
3	7.0	On	-.12	Decrease	2	Maintain	9	0	-2 wks	7
4	5.0	Below	-.15	Decrease	1	Reduce 2 wks	7	2	-2 wks	5
5	4.0	Below	-.13	Decrease	1	Reduce 2 wks	5	3	-2 wks	4
6	5.0	Below	.01	Stable	1	Reduce 2 wks	*(3)4	1	-2 wks	*(1) CLOSE
7	6.0	Below	.07	Stable	1	Reduce 2 wks	(2)4	0	-2 wks	(0) CLOSE
8	8.0	On	.12	Increase	2	Maintain	4	2	-2 wks	(0) CLOSE
9	10.0	On	.15	Increase	2	Maintain	4	0	-2 wks	(2) 4
10	9.5	Above	.12	Increase	3	Increase 2 wks	6	3	-2 wks	4

* Numbers in parentheses indicate the number of weeks of season prior to incorporating the requirement for a minimum 4-week season from all 2-4 week season recommendations; and closure of the hunting season for recommendations of 1 week or less.

STATE OF MAINE

Inter-Departmental Memorandum

Date April 20, 1995

To Wildlife Division Dept. Inland Fisheries and Wildlife

From Mammal Group Dept. Inland Fisheries and Wildlife

Subject Bobcat Management System and 1994 Fur Harvest Data

Enclosed is information to be reviewed for our combination fur proposal meeting/bobcat management system meeting in Bangor on Wednesday, May 3 at 9:30 a.m.. Included are copies of the revised bobcat management system, management system results for marten and fisher, 10 year harvest summary, pelt price survey information, a proposal for early muskrat season from MTA, and some of the latest, in-print fur research from Maine. Please be familiar with everything so that we can discuss anything!

The bobcat system has changed radically, so please give it a thorough look. The last appendix gives examples of system recommendations via inputs for different years. Applying the new system to this year's trapping success (10.1%) with no HMF's (read system to find out about these) would mean our recommendation would be to increase the hunting season by 2 weeks this year. The system addresses bobcat goals with a change in philosophy that is explained in the introduction.

Other than bobcats and muskrats, things are either stable or quiet on the fur front. If you have any questions or topics, we can discuss them on the 3rd.

KDE/llm
Enclosures

Maine Group Sierra Club

May 23, 1986

COMMENTS TO THE DEPARTMENT OF INLAND FISHERIES AND WILDLIFE ON THE ASSESSMENT - 1985 FOR

BOBCAT

This species is of special interest to our organization. We agree with Ted Williams who wrote in the November, 1985 Audubon magazine,

> "Small cats, forgotten and exploited....the U.S. at least in the case of its native bobcat has elaborate regulatory machinery but is about as strict as a baby-sitter bound and gagged...the U.S. still trades heavily in bobcat and Canada lynx....the poor example it has set for the world by first failing to strictly regulate bobcat harvest and then by institutionalizing that failure with recent amendment to its Endangered Species Act (to exclude bobcats)....has obscured the fact that the act itself is a very good one."

The Maine Group of the Sierra Club believes that the American bobcat deserves listing and protection under both the ESA and CITES (it was considered for listing on Maine's threatened and endangered list) because of its precarious population size and the continuing pressure for pelts from overseas where it is a substitute for other cats which have the benefit of protection under the International Convention.

We, therefore, would like to see Maine's management of this species be much more conservative than it is presently. To permit one third of the estimated population to be harvested, in our opinion, does not take seriously enough such factors as natural mortality, low reproduction and habitat loss. A harvest reduction to 15% or 20% at the most would be preferable.

The statement on p.5 also raises a problem, "bobcat hunting is done as much or more for the sporting or trophy value as for the fur." It is our concern that these trophy animals may avoid tagging as Maine law demands because the pelts are not being sold. This could seriously affect population estimates and projections.

We recommend that the Department err on the side of caution in the management of the bobcat.

Cherie Mason, Executive Committee
Sunset, ME 04683

...To explore, enjoy and preserve the nation's forests, waters, wildlife, and wilderness...