

# **FISHER ASSESSMENT**

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Prepared by:  
Alan Clark

Maine Department of Inland Fisheries and Wildlife  
Hedin Hall, BMHI Complex  
P.O. Box 1298  
Bangor, Maine 04401

## NATURAL HISTORY

The fisher is a member of the Mustelid family along with several other common Maine furbearers including marten, skunk, weasel, mink, and otter. Generally, male fisher are about 20% longer than females and weight nearly twice as much (Coulter 1966, Rego 1984). For both males and females, adults (greater than 1 year of age) are larger than juveniles (less than 1 year of age) when captured in the fall. Although the average weight of adult males is 10-11 pounds, some exceptionally large individuals may exceed 20 pounds (Coulter 1966, Blanchard 1964).

The fur of female fisher is usually darker and silkier than the fur of males. In older males, the fur may be coarse and grizzled. For this reason, female pelts are generally worth from 1½ to 2 times male pelts. When prime, fisher pelts have stiff glossy guard hairs and dense silky under fur, and the leather side of the pelt is white. The change from summer to winter pelage begins in September and is usually complete by November. Fur quality is at its best from November to late January (Coulter 1966, Strickland et al. 1982). The timing of pelt primeness is determined by day length (Jenks and Clark 1984).

Female fisher attain sexual maturity and breed at one year of age. Males are sexually mature at one year of age, but because females are induced ovulators (the egg not being released until the stimulation of breeding) and because the baculum of young males is not fully grown they may not be effective in inducing ovulation. Fisher breed in March or April. The fertilized egg grows to approximately 1 mm in diameter (called a blastocyst) and then ceases development. This cessation of development (delayed

implantation) lasts from 10-11 months. Growth resumes with implantation in the winter and the young are born in late March or April, (Strickland et al. 1982).

Adult fisher produce an average of three young per litter with a range of 1-5. About 95% of the adult female fisher become pregnant each year. The average number of young per female and percent of females which bear young increases with age. The average number of young produced apparently does not vary between geographic regions within Maine (Shea et al. 1985). Young are born in dens which are usually cavities in large trees (Strickland et al 1982 and Steve Arthur, Pers. Comm.). Little is known about mortality of young during the first six months of life; how appear to be independent by October 1 although they may continue to temporarily associate with adults or juveniles, especially around major food sources.

Fisher habitat use is governed by the availability of food, topography, cover, den locations, and weather. Strickland et al. (1982) describe food as the most important factor. However, Allen (1983) identifies winter cover as the most important factor based on the assumption that ample food will be present wherever winter shelter is adequate.

Fisher use a wide variety of forest habitats. They avoid open areas (roads, fields, open bogs and large clear-cuts) with no overhead cover, however edges surrounding these areas are extensively used. They appear to prefer diverse mixed forest with a variety of tree species and ages (Strickland et al. 1982). Logs, brush piles, trees, and ground burrows are utilized for cover and protection while resting.

Fisher eat snowshoe hare, porcupine, small rodents, and carrion of deer, moose, and beaver (Strickland et al. 1982). Studies in Waldo County, Maine have shown that

apples and squirrels (red, gray, and flying) are also common foods in winter (Rego 1984, Steve Arthur, Pers. Comm.). Fisher are the most successful predator of porcupines and most of this predation appears to be by male fisher (Rego 1984).

Home ranges of fisher in the Northeast vary from 5-10 square miles (Kelley 1977, Steve Arthur, Pers. Comm.). Males have larger home ranges than females. Males abandon home ranges during the breeding season and travel widely. Strickland et al. (1982) hypothesized high mortality of males at this time due to fighting. Male home ranges do not appear to overlap other males, and female home ranges also appear to be exclusive (Kelley 1977, Steve Arthur, Pers. Comm.).

In summary, aspects of the life history of fisher have important management implications which include: their low reproductive rate; the importance of older males successful reproduction; and the higher economic value and fur quality of females.

## HISTORY

### Habitat Trends

For many years the fisher was thought to be an animal whose range was restricted to the most heavily wooded spruce-fur regions of Maine. However, recent population expansions have shown the fisher to be much more adaptable than previously believed.

Fisher are closely associated with forested areas throughout its range. Therefore, the amount of fisher habitat in Maine has followed the shift from forestland to farmland and back to forestland over the past 200 years. From European settlement until 1880, forestland declined with the expansion of agriculture. From 1880 to 1920, the amount of agricultural land declined rapidly when abandoned agricultural land, predominantly in southern and central Maine, reverted to forest. Since 1925, the rate of increase in forestland has slowed. By 1950, approximately 80% of Maine was forested. Since 1971, forestland has remained stable at about 90% of the land area.

Abandoned farmland with its greater diversity of food, may be more suitable for fisher than the original forests. Wild fires in the past may have initially removed areas of fisher habitat for a period, but this may have been compensated for by increased forest diversity after the burns reforested. Little is known of the impact of clear-cuts on fisher habitat but may parallel that of forest fires.

## Population Trends

The original range of fisher included at least the northern and western parts of the State. Manly Hardy, a furbuyer and trapper from Brewer during the mid-1800's to 1900, noted that although some areas of Maine had no fisher, other areas had a harvest of 3-4 fishers to every 50-100 pine marten.

Fisher populations declined to low levels by the 1920's and 30's due to heavy exploitation of the fisher and loss of forest habitat. Although extremely valuable (ranging as high as 100 dollars when weekly wages were only a few dollars), the average annual harvest for 1928-33 was only 34 animals (based on voluntary reporting). The fisher population in Maine probably reached its lowest point in the 1930's when fisher were reported as being rare or absent in all but two Warden Districts (Aldous and Mendall 1941).

The population began recovering in the early 1940's (Marston 1942). Coulter (1966) found densities of one fisher per 1-4.5 square miles in intensive tracking studies on the Moosehead plateau. The population increased and expanded westerly and southerly from the Moosehead plateau along the fringes of the western mountains. Fisher spread to southern and central sections of the State, where abandoned farmland had reverted to forests. Population irruptions occurred - first in the southerly portions and then central Maine. Following these initial irruptions, the populations stabilized at a lower level. Despite presence of a few fisher in Wildlife Management Units (WMUs) 5 and 6 and a transplant of seven animals in Milbridge in 1972, the population does not appear to have become established in eastern Maine as it has in other portions of the State.

## Use and Demand Trends

The fisher has been an important forbearer in Maine since early times. Pelt values have fluctuated with fashion trends, reaching highs of one hundred dollars even in the 1920's. During these high price periods, fisher were trapped, hunted with dogs, and pursued by men on foot who camped on their trail until they caught them. Effort declined during low price periods. During the past 15 years, pelt prices steadily increased; trapping methods became more effective; and consequently the annual harvest in some areas has exceeded previously estimated densities for this species.

## *Harvest Regulations*

The history of fisher harvest regulations has been characterized by a period of increasing protection and more intensive management (Table 1). Open seasons on fisher were held each year from the beginning of our records (1866-67) until 1937. During this time fisher could be hunted and trapped. Season length was gradually shortened from an initial 228 days to 45 days the year prior to the 1937 closure. The season was reopened in 1950 for the month of January with a provision that all pelts be tagged, The season was closed again from 1951 to 1955. Between 1955 and 1975, the seasons on fisher varied from one to four months. The Department gained regulatory authority for setting fisher seasons on January 1, 1972 and maintained a November trapping season.

In the Fall of 1976, regulations were adopted which changed the previous pattern of trapping seasons. In recognition of the fact that fisher were taken incidentally

Table 1. Fisher management history in Maine.

| Year      | Estimated <sup>1</sup><br>harvest | Estimated Effort <sup>2</sup><br>(successful trappers) | Estimated <sup>3</sup><br>price | Statutes and regulations   |              |
|-----------|-----------------------------------|--|---------------------------------|--|--------------|
|           |                                   |  |                                 | trapping   | hunting      |
| 1866-1867 |                                   |  |                                 | October 16 - May 31  | same         |
| 1878-1910 |                                   |  |                                 | October 16 - April 30  | same         |
| 1911-1912 |                                   |  |                                 | October 21 - March 31  | same         |
| 1913-1916 |                                   |  |                                 | November 1 - February 29   | same         |
| 1917-1922 |                                   |  |                                 | October 15 - February 29   | same         |
| 1927-1928 | 34                                |  |                                 | November 1 - February 14   | same         |
| 1929-1932 | 34                                |  |                                 | October 16 - January 31  | same         |
| 1933-1934 | 34                                |  |                                 | October 16 - January 31, except<br>closed in Lincoln and Sagadahoc<br>Counties   | same         |
| 1935-1936 |                                   |  |                                 | Washington, York, Androscoggin,<br>Aroostook, Cumberland, Hancock,<br>Kennebec, Piscataquis, Somerset<br>Counties November 1 - February 15   | same         |
|           |                                   |  |                                 | Oxford, Penobscot, Waldo Counties<br>October 16 - January 31   | same         |
|           |                                   |  |                                 | Franklin County<br>October 15 - February 16  | same         |
|           |                                   |  |                                 | Knox, Lincoln, Sagadahoc Counties<br>November 1 - December 15  | 11/16 - 2/15 |
| 1937-1949 |                                   |  |                                 | Closed   | same         |
| 1950      |                                   |  |                                 | January  | same         |
| 1951-1954 |                                   |  |                                 | Closed   | same         |
| 1955      | 70                                |  | \$18.75                         | North and West of line beginning<br>at the New Hampshire border formed<br>by Route 5 to Appalachian Trail to<br>Canadian Pacific RR to Bangor and<br>Aroostook RR to Route 11 to Canadian<br>border at Ft. Kent. | same         |
| 1956      | 48                                |  | 22.00                           | November 16 - December 15  | same         |
| 1957      | 179                               |  | 13.57                           | November   | same         |
| 1958      | 223                               |  | 10.00                           | November   | same         |
| 1959      | 305                               |  | 12.49                           | November   | same         |
| 1960      | 461                               |  | 12.13                           | November   | same         |
| 1961      | -                                 |  | -                               | November   | same         |
| 1962      | 561                               |  | 11.93                           | November   | same         |
| 1963      | 1,678                             |  | 14.47                           | November - February  | same         |
| 1964      | 1,734                             |  | 9.54                            | except as shortened by Commissioner  | same         |
| 1965      | 1,388                             |  | 10.70                           | November - December  | same         |
| 1966      | 1,221                             |  | 13.23                           | except as shortened by Commissioner  | same         |
| 1967      | 1,327                             |  | 11.35                           |  | same         |
| 1968      | 1,307                             |  | 15.93                           |  | same         |
| 1969      | 1,327                             |  | 24.22                           |  | same         |
| 1970      | 3,524                             |  | 25.93                           |  | same         |



Table 1. Fisher management history in Maine (continued)

| Year | Estimated <sup>1</sup><br>harvest | Estimated Effort <sup>2</sup><br>(successful trappers) | Estimated <sup>3</sup><br>price | Statutes and regulations   |         |
|------|-----------------------------------|--|---------------------------------|--|---------|
|      |                                   |  |                                 | trapping   | hunting |
| 1971 | 1,641                             |  | 31.84                           | November   | same    |
| 1972 | 2,546                             |  | 39.15                           | November by regulation in place<br>of repealed statute   | same    |
| 1973 | 2,138                             |  | 46.50                           | November   | same    |
| 1974 | 2,075                             |  | 48.00                           | November   | same    |
| 1975 | 1,809                             |  | 60.80                           | November   | same    |
| 1976 | 1,407                             | 751  | 88.80                           | October 20 - December 15 limit of<br>3 per trapper. No conibear traps.   | closed  |
| 1977 | 2,022                             | 1,021  | 97.80                           | "  | closed  |
| 1978 | 1,539                             | 707  | 99.23                           | WMU's 1-6 October 20 - November 25;<br>WMU's 7-8 October 25 - November 15  | closed  |
| 1979 | 2,235                             | 946  | 130.24                          | "  | closed  |
| 1980 | 1,941                             | 861  | 115.55                          | Northern and Western deer zones -<br>October 20 - November 30<br>Southern deer zone -<br>October 28 - November 30  | closed  |
| 1981 | 2,084                             | 894  | 131.63                          | "  | closed  |
| 1982 | 1,663                             | 799  | 102.50                          | Northern deer zone -<br>October 20 - November 30;<br>Southern and Western deer zones -<br>October 28 - November 30 | closed  |
| 1983 | 2,025                             | 804  | 115.41                          | Northern deer zone -<br>October 20 - December 4;<br>Southern and Western deer zones -<br>October 28 - December 4   | closed  |
| 1984 | 1,666                             | 687  | 119.61                          | Northern deer zone -<br>October 28 - December 15;<br>Southern deer zone -<br>October 28 - December 4               | closed  |

<sup>1</sup>Estimated harvest from: 1928-33 - voluntary reports;  
1955-72 - trapper questionnaire;  
1973-84 - pelt tagging records.

<sup>2</sup>Estimated effort from pelt tagging records.

<sup>3</sup>Estimated price from: 1957-78 - trapper questionnaire;  
1979-81 - New Hampshire trapper questionnaire;  
1982-84 - Furbuyer Survey.

throughout the season, a uniform land trapping season was adopted which lengthened the fisher season, but hunting of fisher was prohibited. An attempt was made to reduce the harvest by also adopting a land trapper season limit of three fisher and prohibiting the use of Conibear traps on land. Although the 1976 harvest was reduced, the 1977 harvest increased. In 1978, the season bag limit was eliminated following an analysis which indicated it was not effective due to multiple individuals tagging one trapper's harvest. Since 1979, land trapping seasons have been gradually lengthened, and in 1984 a uniform late opening date was adopted to improve pelt quality.

### *Harvest Trends*

Little information is available on the harvest of fisher prior to the reopening of the season in 1955. As described previously, the Maine State Planning Board report for 1934 estimated an average annual harvest of 34 fisher for the years 1928-1933. Since 1955, the estimated harvest increased dramatically except in years when the season was shortened (Table 1). Harvest estimates declined when pelt tagging, a more accurate harvest estimation procedure, was adopted.

Since 1975, there has been an annual harvest cycle. Each harvest increase has been followed by a harvest decrease the following year. The average harvest for this time period has been approximately 1,900 with a range of 1,407 to 2,235.

### *Users*

Very little information is available on the number of trappers who trap for fisher in Maine. Records are available on trapping license sales, but not all trappers trap for

fisher. The number of individuals who tag a fisher is a minimum indicator of effort because individuals who are unsuccessful, or whose fisher pelts are tagged by another trapper, are not included. A detailed user survey following the 1980 trapping season found an average of 61% of those who trap in the fall set at least one trap for fisher. This ranged from a low of 26% of the trappers who live in WMU's 5 and 6 to a high of 69% of the trappers who live in WMU's 1, 2, and 3. Since 1976, there has been no legal hunting of fisher.

An unknown number of individuals observe fisher while engaged in other outdoor activities (e.g. bear and deer hunting , camping).

### Past Management Goals

During the first planning period (1975-1979), the overall goal was to increase the abundance and harvest of fisher use by encouraging use in areas where a surplus of use opportunity exists (WMU'S 2 and 7) and by establishing populations in unoccupied habitats (WMU's 5 and 6). The harvest objective was to maintain a harvest of 4,000 fishers by 1,000 trappers. This goal and objective were not met (Table 2).

Accomplishment of the objective required the establishment of optimum (maximum) fisher populations in all available habitat. Although the number of fisher increased slightly in WMU's 5 and 6, substantial fisher population and harvest increases did not occur. Harvests did increase in WMU7, but not in WMU 2.

For the second planning period (1980-84) the harvest objective was revised. The management goal was to maintain statewide harvest and species abundance at 1976-78 levels. During this period the management objective to a harvest of 1,600

Table 2. Comparison of statewide fisher harvests and species plan objectives, 1975-1984.

| Year | Objective Harvest | Harvest | Deviation (%) |
|------|-------------------|---------|---------------|
| 1975 | 4,000             | 1,809   | - 54.8        |
| 1976 | 4,000             | 1,407   | - 64.8        |
| 1977 | 4,000             | 2,022   | - 49.4        |
| 1978 | 4,000             | 1,539   | - 61.5        |
| 1979 | 4,000             | 2,235   | - 44.1        |
| 1980 | 1,600             | 1,941   | + 21.3        |
| 1981 | 1,600             | 2,084   | + 30.2        |
| 1982 | 1,600             | 1,663   | + 3.9         |
| 1983 | 1,600             | 2,025   | + 26.6        |
| 1984 | 1,600             | 1,666   | + 4.1         |

annually, with the take adequately distributed among WMU's, was exceeded every year. Consequently, the harvest objective was unofficially revised upward to 1900 in 1981. The average annual harvest did not exceed the revised objective. The second part to the management objective to increase use in WMU's with surplus supplies and decrease use in WMU's experiencing excessive demand – was partially met. Fisher pelt prices continued to increase, and trapping seasons were extended, while license sales decreased. Harvest increased in underutilized WMU's 2 and 3 and decreased in overutilized WMU's 7 and 8.

## HABITAT ASSESSMENT

### Statewide

#### *Status*

The 1980 Maine Forest Resurvey (USFS, 1982) estimated that 27,420 mi<sup>2</sup> (90%) of Maine's land area was forested. Fisher are restricted to forest habitat which provides overhead cover. To accommodate this restriction, the area of forest in seedling and nonstocked stands was subtracted from the total forest area. The revised estimate of fisher habitat was calculated to be 25,606 mi<sup>2</sup> or 78% of Maine's land area (Table 3).

The quality (suitability) of Maine's fisher habitat was assessed by applying forest survey data to a Habitat Suitability Index (HSI) model. The HSI Model numerically evaluates an area's suitability for fisher based on measurable biological and physical characteristics. The limiting components of fisher habitat were assumed to be winter food and winter cover. As previously mentioned, there is no definitive information to suggest which of these is most critical, therefore an HSI was constructed for each of these components (Appendix I). The winter food HSI included habitat measures thought to be related to the abundance of major foods (e.g. snowshoe hare, squirrels, small mammals, deer carrion). These were understory density, amount of edge, tree canopy diversity, and occurrence of wild apples. The winter cover HSI included measures of softwood composition, tree canopy closure and stand size. For all WMU's, the winter food HSI was more limiting than cover. Therefore, the fisher suitability values used in this assessment are values obtained from the winter food HSI (Tables 3 and 4).

Table 3. Present fisher habitat suitability - 1985.

| Wildlife Management Unit | Total area (mi <sup>2</sup> ) | Forest area (mi <sup>2</sup> ) | Fisher habitat (mi <sup>2</sup> ) | Fisher habitat suitability index value | Number of <sup>1</sup> fisher habitat units |
|--------------------------|-------------------------------|--------------------------------|-----------------------------------|--|---|
| 1                        | 3,216                         | 2,416                          | 2,181                             | .59                                    | 1,286                                       |
| 2                        | 8,397                         | 7,908                          | 7,181                             | .50                                    | 3,594                                       |
| 3                        | 4,234                         | 3,864                          | 3,575                             | .52                                    | 1,859                                       |
| 4                        | 5,726                         | 4,839                          | 4,558                             | .58                                    | 2,643                                       |
| 5                        | 2,949                         | 2,598                          | 2,303                             | .55                                    | 1,266                                       |
| 6                        | 2,610                         | 2,181                          | 1,949                             | .54                                    | 1,052                                       |
| 7                        | 2,113                         | 1,582                          | 1,436                             | .65                                    | 933   |
| 8                        | 2,825                         | 2,032                          | 1,875                             | .61                                    | 1,143                                       |
| Statewide                | 32,070                        | 27,420                         | 25,066                            |  | 13,776                                      |

<sup>1</sup>Fisher habitat units equals fisher habitat x fisher HSI value.

Table 4. Projected fisher habitat suitability - 1990.

| Wildlife Management Unit | Total area (mi <sup>2</sup> ) | Forest area (mi <sup>2</sup> ) | Fisher habitat (mi <sup>2</sup> ) | Fisher habitat suitability index value | Number of <sup>1</sup> fisher habitat units |
|--------------------------|-------------------------------|--------------------------------|-----------------------------------|--|---|
| 1                        | 3,216                         | 2,416                          | 2,063                             | .59                                    | 1,217                                       |
| 2                        | 8,397                         | 7,908                          | 6,829                             | .50                                    | 3,414                                       |
| 3                        | 4,234                         | 3,864                          | 3,430                             | .52                                    | 1,783                                       |
| 4                        | 5,726                         | 4,839                          | 4,417                             | .58                                    | 2,562                                       |
| 5                        | 2,949                         | 2,598                          | 2,155                             | .55                                    | 1,185                                       |
| 6                        | 2,610                         | 2,181                          | 1,833                             | .54                                    | 990   |
| 7                        | 2,113                         | 1,582                          | 1,363                             | .65                                    | 885   |
| 8                        | 2,825                         | 2,032                          | 1,796                             | .61                                    | 1,095                                       |
| <b>Statewide</b>         | <b>32,070</b>                 | <b>27,420</b>                  | <b>23,886</b>                     |  | <b>13,131</b>                               |

<sup>1</sup>Fisher habitat units equals fisher habitat x fisher HSI value.



While the HSI model is useful for making general evaluations and comparisons of areas for fisher, it represents a rather gross and insensitive approximation of complexities of habitat suitability. The model indicates that almost all of Maine is fisher habitat, but the quality of this habitat is related to the amount of food it can produce for fisher. A habitat unit represents 1 mi<sup>2</sup> of prime fisher habitat.

### *Changes*

In the 1980 species assessment statewide fisher habitat was estimated to be 26,730 mi<sup>2</sup>. The current estimate is about 25,066 mi<sup>2</sup>. The reason for this decline is a difference in what is considered to be fisher habitat.

In 1980, all forest habitat in the State (based on the 1971 Forest survey) was considered to be fisher habitat. Although forest habitat increased in the 1982 forest survey which is the basis for this evaluation, fisher habitat quantity is less in 1985, because the area of forest in nonstocked and seedling habitat is no longer considered habitat and has been subtracted from total forest area/

Changes in fisher habitat quality between the 1980 and 1985 assessments are not comparable because no effort was made in 1980 to assess the quality of the fisher habitat. Also, variables used in the HSI model were not measured in the 1971 forest survey.

### *Projections*

Total area of forests will change by little by 1990; however the amount of fisher habitat is expected to decrease by approximately 5% to 23,886 mi<sup>2</sup> (Table 4). Forest

harvesting is expected to increase 50% by 1990, primarily to provide fuel wood for energy generation. Most harvesting will be by clear-cutting, resulting in an increase in nonstocked and seedling stand areas. The area in these stand size classes (which are not considered to be fisher habitat) is also expected to increase by 50%, resulting in a decrease in fisher habitat.

The quality of habitat is expected to remain constant through 1990. Currently, Maine's forests are maturing and tree growth is exceeding harvest. While long-range projections call for harvests to exceed growth in approximately 20 years, the current rate of harvest (3% of forestland annually) will not likely increase by 1990. Rather, operations will be more intensive with harvesting by mechanized harvesting equipment. This may decrease the amount of edge, but this will be offset by an increase in understory density as the clear-cuts regrow. As this pattern continues over time, diversity and fisher habitat quality may decline.

### Wildlife Management Units

#### *Status*

The quantity of fisher habitat among WMU varied directly in proportion to the area in forestland and inversely to the forest area in nonstocked and seedling stands. WMU 2 has the most fisher habitat while WMU 7 has the least (Table 3).

Suitability of habitat as measured by the HSI model, also varied between WMU'S. WMU 7 received the highest suitability rating while WMU's 2 and 3 were lowest (Table 3).

### *Changes*

Wildlife management unit changes in the quantity of fisher habitat between 1980 and 1985 were not uniform. Estimates of fisher habitat substantially increased in WMU 1, but greatly decreased in WMU 2. Fisher habitat in WMU's 4, 5, 6, and 7 decreased from 6 to 10% but there was little or no change in WMU's 7 and 8.

A statement was made in the 1980 assessment that accelerating land development in WMU's 7 and 8 was expected to decrease the amount of forestland utilized by fisher. In this assessment, human population densities at levels which occur in rural Maine were not considered a factor which reduces the amount of habitat for fisher. Although quality of habitat might be affected by human population density, the exact relationship is not known.

### *Projections*

Although habitat conditions in some parts of the state will experience more change than others, such deviations are difficult to predict on a WMU basis. For this reason, the 50% increase in total area of seedling and nonstocked stands was applied to all WMU'S. This resulted in a 3 to 6% decrease in quantity of fisher habitat with WMU 4 having the least and WMU 6 the most decrease (Tables 3 and 4).

All WMU's are expected to maintain the same quality habitat.

## POPULATION ASSESSMENT - CARRYING CAPACITY

### Statewide

#### *Status*

A reliable estimate of long-term carrying capacity on optimum fisher range is not available. Both Coulter (1966) in Maine and Hamilton and Cook (1955) in New York reported maximum densities of one fisher per mi<sup>2</sup> in winter based on track counts in snow. Coulter did not believe this density could be maintained. Kelley (1977) found densities as high as 0.67 per mi<sup>2</sup> in New Hampshire. For this assessment, an estimate of 0.67 fisher/mi<sup>2</sup> (range 0.5-1/Mi<sup>2</sup>) is used as the maximum supportable fisher density on optimum range.

The number of habitat units present in each WMU (Table 3) was multiplied by the maximum supportable density to obtain an estimated maximum supportable population for the WMU (Table 5). Habitat units were obtained by combining estimates of the quantity and quality of fisher habitat (habitat units = fisher habitat x HSI) to provide a single numerical estimate of fisher habitat. one habitat unit represents 1 Mi<sup>2</sup> of prime fisher habitat. A statewide winter maximum supportable population of 9,230 fisher (range 6,890-13,770) was obtained by this procedure.

#### *Changes*

In the 1980 assessment, the maximum number of fisher that Maine's habitat could support in the fall was estimated to be 5,345 in 1980 based on one fisher per 5 square miles of habitat. The basis for this estimate was not given. The estimate used for this assessment is 72% higher than the 1980 estimate.

Table 5. Current (1985) and projected (1990) maximum supportable fisher population and density by Wildlife Management Unit in winter.

| Wildlife<br>Management<br>Unit | 1985 maximum<br><u>supportable population</u> |            | 1990 maximum<br><u>supportable population</u> |            | Fisher/mi <sup>2</sup><br>of habitat |
|--------------------------------|---|------------|---|------------|--------------------------------------|
|                                | range   | best guess | range   | best guess |                                      |
| 1                              | 640 - 1,290                                   | 860        | 630 - 1,270                                   | 820        | .39                                  |
| 2                              | 1,800 - 3,590                                 | 2,410      | 1,710 - 3,410                                 | 2,290      | .33                                  |
| 3                              | 930 - 1,860                                   | 1,250      | 890 - 1,780                                   | 1,190      | .35                                  |
| 4                              | 1,320 - 2,640                                 | 1,770      | 1,280 - 2,560                                 | 1,720      | .38                                  |
| 5                              | 630 - 1,270                                   | 850        | 590 - 1,180                                   | 790        | .34                                  |
| 6                              | 530 - 1,050                                   | 700        | 500 - 990                                     | 660        | .34                                  |
| 7                              | 470 - 930                                     | 630        | 440 - 890                                     | 590        | .44                                  |
| 8                              | 570 - 1,140                                   | 760        | 550 - 1,100                                   | 730        | .41                                  |
| Statewide                      | 6,890 -13,770                                 | 9,230      | 6,590 -13,180                                 | 8,790      | .37                                  |

### *Projections*

The quantity of fisher habitat is expected to decline by 1990 while the quality will remain constant. As a result, carrying capacity is predicted to decrease by 5% to 8,790 fishers by 1990 (Table 5).

### Wildlife Management Units

#### *Status*

Differences in carrying capacities between WMU's are the result of differences in the quantity and quality of fisher habitat. Both of these varied between WMU's (Table 3). Generally, the larger WMU's (WMU's 2, 3, and 4) have higher carrying capacities in total numbers of fisher but WMU's with better habitat (WMU's 7 and 8) can support more fisher per unit of habitat (Table 5).

#### *Changes*

Changes in estimated fisher carrying capacities between 1980 and 1985 are not comparable due to different estimation procedure.

### *Projections*

WMU projections of carrying capacity for 1990 are based on expected changes in the quantity of fisher habitat. Decreases in carrying capacity are predicted to range from 3% in WMU 4 to 6% in WMU 6 (Table 5).

## POPULATION ASSESSMENT - CURRENT ESTIMATED POPULATION

### Statewide

#### *Status*

Very little is known of fisher population densities. Coulter (1966) estimated densities of 0.2-1/mi<sup>2</sup> in the winter on the Moosehead plateau. These were believed to be very high densities. Similar peak densities were estimated in New York. Kelley (1977) estimated fisher densities of 0.33-0.67/Mi<sup>2</sup> in the White Mountains of New Hampshire. Steve Arthur (Pers. Comm.), based on a telemetry study in what is believed to be optimal fisher habitat with the highest fisher populations in Maine, estimates the fall density as 0.6-1/Mi<sup>2</sup> of fisher habitat in WMU 7. Winter track counts have been used in the Pierce Ponds area of WMU 3 (1982 and 1983) and the St. Croix Lake area of WMU 1 (1983 and 1984) to obtain an index to fisher population densities. The index is twice as high in the St. Croix study area as the Pierce Pond study area.

These studies and harvest data (harvest/mi<sup>2</sup> and harvest/user were used to estimate relative abundance among WMU's and then to estimate populations for each WMU (Table 6). An assumption was made, based on computer trials of a population model, that a harvest of more than 25-30% of the fall population will result in a population decline. Details on the procedure are contained in the WMU section. The statewide fall fisher population estimate was 8,610 and was obtained by summing the individual WMU'S. A winter population was estimated by subtracting harvest and natural mortality (40%) from the fall estimate.

Table 6. Current (1985) and projected (1990) fisher population estimates by Wildlife Management Unit.

| Wildlife Management Unit | 1985 estimated population                     |       | 1990 estimated fall population |       |        |
|--------------------------|---|-------|--------------------------------|-------|--------|
|                          | 1985 density (fisher/mi <sup>2</sup> habitat) | Fall  | Winter                         | Fall  | Winter |
| 1                        | 0.6   | 1,310 | 785                            | 1,240 | 745    |
| 2                        | 0.2   | 1,440 | 865                            | 1,360 | 815    |
| 3                        | 0.3   | 1,070 | 640                            | 1,030 | 620    |
| 4                        | 0.5   | 2,280 | 1,370                          | 2,210 | 1,325  |
| 5                        | 0.08  | 180   | 110                            | 170   | 100    |
| 6                        | 0.03  | 60    | 35                             | 50    | 30     |
| 7                        | 0.8   | 1,150 | 690                            | 1,090 | 650    |
| 8                        | 0.6   | 1,120 | 670                            | 1,080 | 650    |
| Statewide                | 0.34  | 8,610 | 5,165                          | 8,230 | 4,935  |



A range map, based on recent harvest records was prepared (Figure 1). Extensive land areas with moderate trapping effort but only occasional captures of fisher were excluded.

### *Changes*

The 1980 species update estimated a statewide population of 5,252 animals or one fisher per 5 square miles of habitat. The current population estimate is 65% higher than the previous one but does not indicate a population increase but rather a refinement in technique. Population estimates for this update are more than twice this prediction.

### *Projections*

Population densities within suitable habitat are not predicted to change over the next 5 years, but the amount of fisher habitat is expected to decline due to an increase in wood harvesting. Therefore, the fisher population for 1990 is predicted to decline to 8,230, a decrease of 4%.

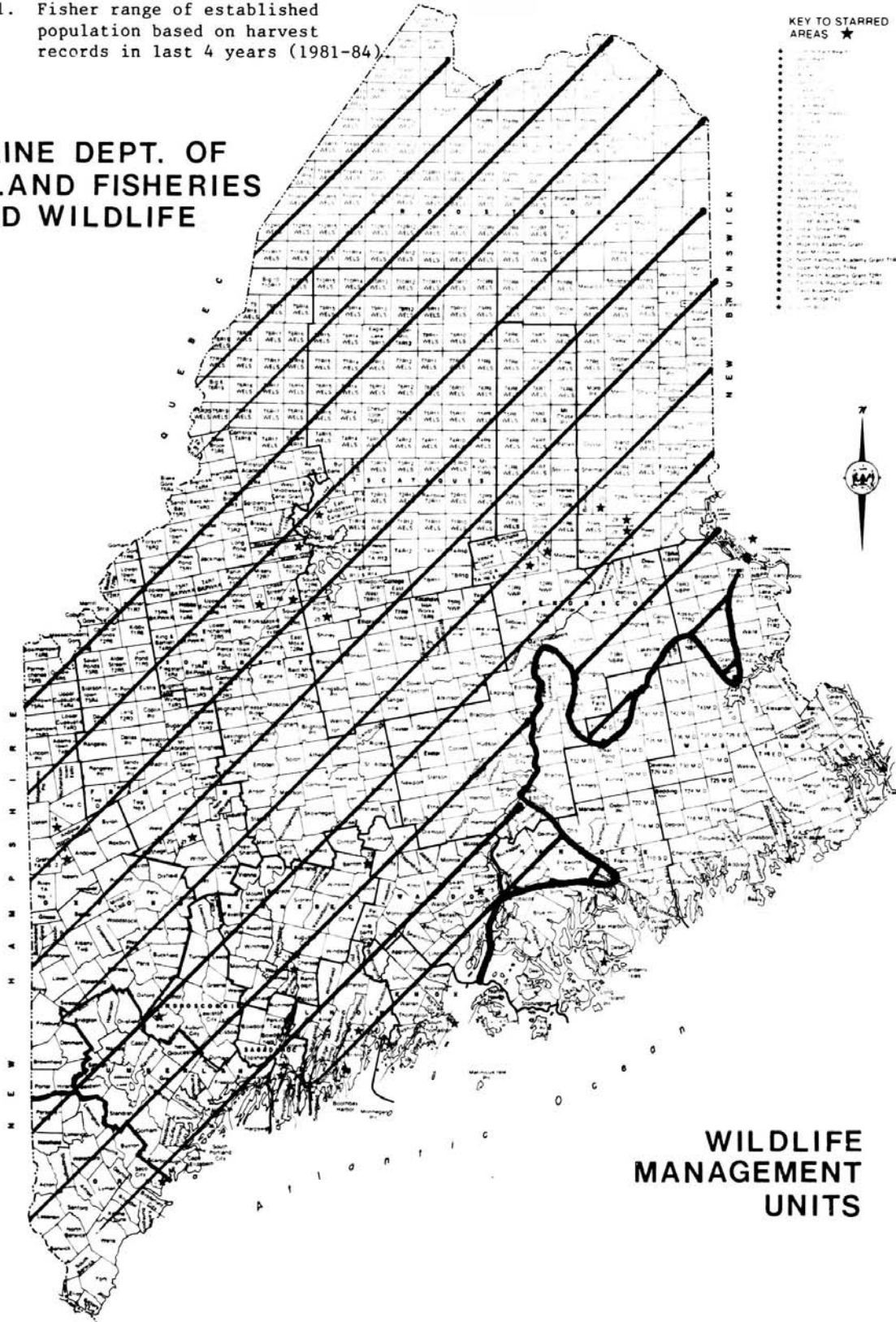
### Wildlife Management Units

#### *Status*

Fisher densities and amount of habitat are believed to vary greatly by WMU; therefore, population levels vary considerably (Table 6). Harvest, winter track counts, and telemetry information was used to estimate fisher populations by WMU.

Fig. 1. Fisher range of established population based on harvest records in last 4 years (1981-84).

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WMU 7. WMU 7 has the highest density of fisher in Maine. The fisher density, estimated from a telemetry study in Waldo County, is  $0.8/\text{Mi}^2$  of habitat in the fall.

WMU 1 and 8. Density of fisher in these units is lower than in WMU 7. Average harvest per unit of habitat in WMU 8 is higher than WMU 1; however, effort is also higher in WMU 8. Fisher densities are estimated to be  $0.6/\text{mi}^2$  of habitat in the fall.

WMU 3. Winter track counts were conducted in a study area in WMU 3 in 1981 and 1982 and a study area in WMU 1 in 1983-85. Fisher track indices for WMU 3 were approximately 50% of WMU 1, so the fisher density is estimated to be  $0.3/\text{Mi}^2$  of habitat in the fall.

WMU 2. The harvest in WMU 2, though increasing, is still lower than in WMU 3 despite intensive marten trapping in some areas and approximately the same number of users per unit of habitat as 3. Fisher density was estimated to be  $0.2/\text{mi}^2$  of habitat in the fall which is lower than WMU 3 and equivalent to the lowest reported by Coulter (1966).

WMU 4. This unit contains some of the best fisher habitat in Maine, but other portions of the unit have poorer habitat and low harvests. Harvest per unit of habitat approximates WMU 1 although effort is slightly higher than in Unit 1. Therefore, the fisher density was estimated to be  $0.5/\text{mi}^2$  of fisher habitat; slightly less than in WMU 1.

WMU 5 and 6. These units have very low fisher populations. Not all of the WMU's are occupied by reproducing populations and range may not be expanding. Harvests are low and not increasing. Therefore, it was assumed harvests are at or exceeding maximum allowable levels (25-30%) and fisher density is estimated to be  $0.08/\text{Mi}^2$  of habitat in WMU 5 and  $0.03/\text{mi}^2$  of habitat in WMU 6 in the fall.

### *Changes*

Population estimates for all WMU's except 6 are higher in this assessment than estimated in 1980. WMU 6 decreased by 33% while the remaining WMU's increased from 17% (WMU 7) to 220% (WMU 1).

Current population estimates are higher than projections made in 1980 assessment in all WMU's except 6.

### *Projections*

Fisher population densities in all WMU's are predicted to remain the same for the next 5 years. The amount of habitat is expected to decline as previously reported. As a result, fisher populations by WMU are expected to decrease by 3 to 6%.

Several factors could make this prediction inaccurate. If harvests in WMU's 7 and 8 are excessive, populations may decrease significantly in these WMU's by 1990. Several severe winters or a decline in snowshoe hare populations could also cause fisher densities to decrease in WMU's 1, 2, and 3. A population increase may be occurring in WMU 2. If this continues, populations in this unit could rapidly increase with its low exploitation rate.

## **POPULATION ASSESSMENT - RELATIONSHIP OF ESTIMATED POPULATION TO MAXIMUM SUPPORTABLE POPULATION**

Maine's 1985 winter fisher population (5,165) is 56% of the estimated carrying capacity (9,230) (Table 7).

The 1980 population assessment estimated statewide populations to be slightly less than carrying capacity. This same update predicted future population levels in balance with carrying capacity. Estimates made in this update do not agree with these former estimates. Fisher populations are now believed to be higher than previously thought and carrying capacity is estimated to be much higher.

If assumptions listed in both the carrying capacity and actual population sections are correct, both carrying capacity and population levels will decrease proportionally by 1990.

Table 7. Current (1984) fisher harvests and trapper effort, and success rates.

| Wildlife<br>Management<br>Unit | Allowable<br>harvest <sup>1</sup> | Harvest <sup>2</sup> | Harvest/mi <sup>2</sup><br>of fisher<br>habitat | Number <sup>3</sup> of<br>users | Successful users <sup>4</sup><br>number (%) |      | Harvest/<br>successful<br>user | Users/mi <sup>2</sup><br>of fisher<br>habitat |
|--------------------------------|-----------------------------------|----------------------|---|---------------------------------|---|------|--------------------------------|---|
| 1                              | 330                               | 272                  | .12   | 295                             | 116   | (39) | 2.4                            | .14   |
| 2                              | 360                               | 234                  | .03   | 274                             | 99  | (36) | 2.4                            | .04   |
| 3                              | 270                               | 243                  | .07   | 177                             | 93  | (53) | 2.6                            | .05   |
| 4                              | 570                               | 493                  | .11   | 689                             | 217   | (31) | 2.3                            | .15   |
| 5                              | 50                                | 52                   | .02   | 173                             | 29  | (17) | 1.8                            | .08   |
| 6                              | 20                                | 18                   | .009  | 208                             | 12  | (6)  | 1.5                            | .11   |
| 7                              | 290                               | 307                  | .71   | 323                             | 130   | (40) | 2.4                            | .22   |
| 8                              | 280                               | 239                  | .13   | 409                             | 115   | (28) | 2.1                            | .22   |
| Statewide                      | 2,170                             | 1,860                |   | 2,551                           | 812   | (36) | 2.3                            | .10   |

<sup>1</sup>Twenty-five percent of estimated actual fall population in Table 7.

<sup>2</sup>Four year average, 1981-84.

<sup>3</sup>Four year average of individuals who tagged at least 1 land animal, 1981-84.

<sup>4</sup>Four year average of individuals who tagged at least 1 fisher, 1981-84.

## USE AND DEMAND ASSESSMENT - HARVEST

### Statewide

#### *Status*

Trapping seasons have gradually been lengthened and delayed over the last five years. From 1979 to 1984, the season was lengthened from 37 to 49 days in northern Maine, while southern Maine went from 22 to 38 days. The season in the western mountains was initially lengthened and then shortened to previous levels as it was assigned to southern Maine in 1982. Land and water trapping seasons were made concurrent to distribute pressure. Trapping seasons were extended into December to improve pelt primeness, but restrictions were placed on traps set above the ground or snow to protect fisher and marten. Finally in 1984, a uniform opening date was adopted statewide to also distribute pressure.

Harvests from 1979-84 have fluctuated from 2,235 (1979) to 1,663 in 1982. The mean harvest for 1981-84 was 1,860 fishers (Table 7). Since 1975, fisher harvests have shown a high low cycle (Table 1). During this ten year period, the harvest has not increased or decreased two consecutive years. The cause of this is not known. It could be the result of over-exploitation in the high harvest years so that the population is depressed the following year. Another cause could be decreased susceptibility to trapping in the low harvest years due to a change in fisher behavior (the availability of mast crops making fisher less susceptible to baiting or attracting them to different areas). Finally, the reduced harvests could be in response to lower reproduction or

survival of young. Due to this pattern of harvests, looking at a single year's harvest can be misleading.

Strickland and Douglas (1981) and Strickland et al. (1982) have suggested that the ratio of all juveniles to adult (2+ years old) females in the harvest is an index to the exploitation rate of the population. This ratio will decline when harvests are heavy and increase when exploitation is lower. This is because juveniles are believed to be more susceptible than adults. They predict a critical level of 4.0 based on Ontario data, which may not be applicable elsewhere.

Since 1979, biological samples have been taken first from WMU's 3, 6, and 8, and then statewide (Table 8). The radio tracked harvest as predicted but did not exceed the critical level identified by Ontario. Although harvest decreased nearly 20% in 1984, the ratio remained near the 1983 level.

The average annual harvest is 14% below the allowable harvest (based on a 25% harvest removal rate) which was estimated to be 2,170 (Table 7).

### *Changes*

Average fisher harvest in the 1980 assessment was based on a three-year average harvest which contain two low years. The current average harvest is 14% higher than the 1979 harvest. If the harvest in the last assessment is adjusted by adding a fourth year (1979) to the average, the current average is only 3% higher than the past (1976-79) average.

The 1979 species assessment predicted a harvest decline to 1,235 by 1982. The 1982 harvest was actually 1,663 (+35%).



Table 8. Juvenile/adult (2+ years) female ratio index and harvest for the years 1979-81.

| Year | Harvest | Ratio index |
|------|---------|-------------|
| 1980 | 1,941   | 5.4         |
| 1981 | 2,084   | 4.7         |
| 1982 | 1,663   | 7.9         |
| 1983 | 2,025   | 4.4         |
| 1984 | 1,666   | 4.7         |

## *Projections*

An estimate of the average harvest in 1990 was obtained by projecting the trend observed between the four year average harvest in the last assessment and the four year average harvest used in this assessment for each WMU and then summing for a statewide estimate. The estimated average harvest obtained was 1920 for years 1986-89, a 3% increase over the current average (Table 9).

This harvest estimate is % below the estimated allowable harvest in 1990.

## Wildlife Management Unit

### *Status*

There is considerable variation in the fisher harvest between WMU's due to differences in fisher populations, trapping effort, and access (Table 7). Harvest per unit of habitat is highest in WMU 7 and lowest in WMU's 2, 4, and 5.

Although the statewide harvest is below the allowable harvest, harvests in WMU's 5, 6, and 7 are near or exceed estimated allowable harvests.

### *Changes*

Harvest averages in 1981-84 exceeded 1976-79 levels in WMU's 1 (44%), 2 (72%), 3 (76%) while they have declined in WMU's 5 (-12%), 7 (-23%), and 8 (-25%). Harvests in WMU's 5 and 6 did not change.

Harvest projections made for 1982 in the last update were exceeded by the mean harvest in all WMU's except 6.

Table 9. Projected (1990) fisher harvests, effort, and success rate.

| Wildlife Management Unit | Allowable harvest <sup>1</sup> | Harvest <sup>2</sup> | Harvest/mi <sup>2</sup> of fisher habitat | Number <sup>3</sup> of users | Successful users <sup>4</sup><br>number (%) |      | Harvest/successful user | Users/mi <sup>2</sup> of fisher habitat |
|--------------------------|--------------------------------|----------------------|---|------------------------------|---|------|-------------------------|---|
| 1                        | 310                            | 350                  | .17                                       | 300                          | 145   | (48) | 2.4                     | .14                                     |
| 2                        | 340                            | 330                  | .05                                       | 300                          | 135   | (45) | 2.4                     | .04                                     |
| 3                        | 260                            | 350                  | .10                                       | 250                          | 135   | (54) | 2.6                     | .07                                     |
| 4                        | 550                            | 430                  | .10                                       | 650                          | 185   | (28) | 2.3                     | .15                                     |
| 5                        | 40                             | 50                   | .02                                       | 180                          | 25  | (14) | 1.8                     | .08                                     |
| 6                        | 20                             | 20                   | .01                                       | 210                          | 15  | (7)  | 1.5                     | .11                                     |
| 7                        | 270                            | 220                  | .16                                       | 250                          | 95  | (7)  | 2.4                     | .11                                     |
| 8                        | 270                            | 170                  | .09                                       | 300                          | 80  | (27) | 2.1                     | .17                                     |
| Statewide                | 2,060                          | 1,920                |   | 2,440                        | 813   | (33) | 2.3                     | .10                                     |

<sup>1</sup>Twenty-five percent of estimated actual fall population.

<sup>2</sup>Linear projection of average harvests for 1976-79 and 1981-84 by WMU.

<sup>3</sup>Individuals tagging at least one land animal.

<sup>4</sup>Individuals tagging at least one fisher. Computed by dividing harvest by harvest/successful user.

### *Projections*

Harvests are projected to increase in WMU's 1 (29%), 2 (41%), and 3 (44%) while decreasing in WMU's 4 (-13%), 7 (-28%), and 8 (-29%) by 1990. WMU's 5 and 6 are not projected to change.

If the projections are accurate, WMU 1 will replace 7 as the one with the highest removal per unit of habitat. Projected harvests will exceed allowable harvests in WMU's 1, 3, and 5.

## USE AND DEMAND ASSESSMENT - TYPES OF USERS

### Statewide

#### *Status*

Fisher are secretive animals that are seldom seen in the wild. As a result, non-consumptive users are restricted to observing tracks in the winter. Trappers are the only consumptive users, since hunting has been prohibited since 1976.

Fishers are the most economically valuable furbearer in Maine. Individual pelts have averaged more than \$100. In a 1980 trapper questionnaire (Clark 1985), trappers ranked species by preference. Fisher were ranked second in areas of the State except WMU's 5 and 6 where fisher populations are low.

Fisher are captured in all types of land traps; therefore, any individual who sets a land trap can be classified as a potential fisher trapper. There are several biases in this estimate but other information indicates it is a valid estimate (Appendix 1).

From 1981-84, an average of 812 trappers tagged at least one fisher (Table 7). The average take was 2.3 fishers per trapper. Only 17% of the successful trappers catch 4 or more fisher but they account for more than one-half of the harvest.

Use opportunity is influenced by both the number and accessibility of fisher. Demand (as measured by trappers who would like to catch a fisher) exceeds the allowable harvest; therefore, use opportunity is limited (Table 7).

Accessibility is good throughout the State, but posted land or restricted access limits some opportunity to trap. Current regulations allow seasons to extend late into the year when weather conditions may limit access and trapping opportunity.

### Changes

An estimate of total users was not made in the last update. Total trapping license sales have declined by 15% since a peak in 1980.

Total successful users have remained nearly the same since the last update; 791 in 1976-78 and 812 in 1981-84. The average harvest/successful fisher trapper has increased slightly since the last update.

Use opportunity has increased statewide and estimates of fisher populations are also higher. Seasons have been liberalized in length later in the year when trapping conditions are more difficult due to inclement weather. Road access has increased while the amount of posted land has not increased significantly.

The 1980 species plan projected a decrease in use opportunity by 1982. Harvest regulations and land access were expected to be more restrictive and some type of anti-trapping legislation was anticipated. These predictions were not realized.

### *Projections*

Projections of users and use opportunity are more difficult to make. Trapping license sales have decreased as average pelt prices for all furbearers except marten and fisher have decreased. Mandatory trapper training will be in effect for first-time trappers in 1988, possibly discouraging recruitment. With these limitations plus the possibility of major use-opportunity changes, linear projections do not appear appropriate so predictions will be used.

The following assumptions will be used to guide these predictions: 1) trapping license sales will decrease by 20% by 1990 but fisher users will not decrease as much due to continued high prices, 2) changes in the number of users will not be uniform statewide, 3) and success rates will remain constant in all WMU'S.

The number of fisher trappers is expected to decrease 4% (to 2,440) in 1990 (Table 9). This is one-fifth the rate trapping license sales will decrease. Successful users will increase only slightly while harvest/successful trapper will remain the same.

Use-opportunity will decrease as the need arises to restrict harvest in face of declining harvests in more populace units. Mandatory trapper training will restrict the opportunity of some new trappers to participate. Continued development and land posting will restrict access in southern Maine. Passage of legislation restricting the use of leghold traps at the state or federal level could dramatically reduce use-opportunity.

### Wildlife Management Units

#### *Status*

Total users are highest in the southern WMU's (4, 7, and 8). Total users are lowest in WMU's 3 and 5 but users per unit area of fisher habitat is lowest in Unit 2.

Successful users are greatest in WMU's with the highest harvest. Success rate (harvest/successful trapper) is relatively uniform with the exception of WMU's 5 and 6. WMU 3 (53%) followed by 7 (40%) and 1 (39%) have the highest percent of users who are successful (as defined by tagging 1 fisher). WMU's 5 (17%) and 6 (6%) are once again the lowest.

WMU 8 followed by 7 and 4 have the most restrictions on use-opportunity due to human land development and posting. Density of deer hunters also restricts opportunity in these units. Low fisher populations reduce use-opportunity in WMU's 5 and 6. Severe weather impacts use-opportunity in WMU's 1, 2, and 3 where trapping seasons are longer.

Fisher trapping in portions of WMU's 1, 2, and 3 is incidental to the effort expended for marten.

### *Changes*

Successful users are higher than 1976-78 levels in WMU's 1, 2, and 3 while lower in WMU's 4, 7, and 8. Successful users have not changed in WMU's 5 and 6. Projections of successful users made in 1979 for 1982 were correct for WMU's 1, 2, 3, 5, and 6 but were much too high for WMU's 4, 7, and 8.

### *Projections*

Users are predicted to increase in WMU's 1, 2, 3, 5, and 6 while decreasing in WMU's 4, 7, and 8. If marten pelt price decreases, fisher use in WMU's 1 and 2 will decrease as a result.

Successful users will increase in WMU's 1, 2, and 3 in anticipation of higher harvests but will decrease in WMU's 4, 7, and 8.

Use-opportunity will decrease in WMU's 4, 7, and 8 as development and land posting will continue to remove locations to trap.



## SUMMARY AND CONCLUSIONS

The fisher is Maine's most economically valuable furbearer. Quality of the pelt makes females worth up to two times the larger male. Peak pelt primeness occurs in November and December. Although most females breed at 1 year of age, the young are not born for nearly a year. Adult males may be responsible for the majority of breeding. The young, usually 3, are raised by the female and disperse in late summer or fall.

Fisher have been an economically important furbearer since the 1800's. Fisher populations declined in the early part of this century due to limited habitat from land clearing and trapping exploitation. Populations' lows were reached by the 1930's when a closed season was declared from the mid-1930's to the mid-1950's. Population recoveries began in the 1940'S, and increases and range expansion moved from the Moosehead Plateau westerly and southerly along the western mountains. Large and rapid population increases (irruptions) occurred as fisher spread into the unoccupied habitat created by the reversion of farmland in southern and central Maine.

Fisher were hunted and trapped until 1976, when hunting was prohibited. From the reopening of the season until 1975, the season varied in length from 1 to 4 months. Since 1976, a variety of regulations (trap restrictions, limits, common season dates, etc.) have been tried to limit fisher harvests. ince 1979, seasons have been gradually lengthened and opening dates delayed. Since 1975, an annual cycling of harvests (each high year is followed by a low year) have occurred with a mean harvest of 1,900. From 700 to 1,000 individuals tag at least one fisher but over 2,000 trappers indicated

they trap for them (Table 10). Harvest objectives have varied from 4,000 to 1,600 for the two planning periods (Table 10).

Fisher habitat is composed of food and cover. Winter habitat is believed to be limiting for fisher. Fisher will utilize any forest habitat which provides overhead cover. Over 25,000 mi<sup>2</sup> (78%) of Maine's land area meets this requirement. The quality of fisher habitat is determined by the quantity and variety of food. Fisher habitat has decreased slightly since the last update. A 5% decrease in habitat due to increased intensive forest harvesting is expected for 1990. The best quality of fisher habitat occurs in WMU's 7 and 8. WMU's 2 and 4 have the greatest quantity.

Fisher carrying capacity based on habitat was estimated for the winter as approximately 9,000 animals. This is a large increase over the last estimate. Carrying capacity is expected to decrease slightly by 1990.

Fisher population estimates are based on population densities from radio-collared fisher in WMU 7, winter track counts, harvest levels, computer models, and personal opinion. The current fall estimate is approximately 8,500 fisher. This is much higher than the 1980 estimate. Fisher densities are highest in WMU 7 and lowest in WMU's 5 and 6. Fisher populations are estimated to be at approximately, one-half of carrying capacity. Most of this shortfall occurs in WMU's 2, 5, and 6. Populations are not expected to change significantly by 1990.

Currently, 2,500 trappers are attempting to trap fisher. Approximately 800 are successful with an average catch of 2.3 fisher resulting in a statewide harvest of 1,860. Success rates are highest in WMU's 3 and 7 and lowest in WMU 6 which has few fisher. Fisher harvests on the average have been stable since the last update as has

Table 10. Past, present and future fisher harvests (actual, allowable, and objective) and users (total and successful).

| Year | Harvest |                   |           | Users |            |
|------|---------|-------------------|-----------|-------|------------|
|      | Actual  | Maximum Allowable | Objective | Total | Successful |
| 1975 |         | 3,055             | 4,000     |       |            |
| 1976 | 1,410   | 3,055             | 4,000     | 1,428 | 771        |
| 1977 | 2,022   | 3,055             | 4,000     | 2,505 | 1,055      |
| 1978 | 1,565   | 3,055             | 4,000     | 2,322 | 733        |
| 1979 | 2,235   | 3,055             | 4,000     | 2,831 | 971        |
| 1980 | 1,941   | 1,748             | 1,600     | 2,722 | 879        |
| 1981 | 2,084   | 1,748             | 1,600     | 2,807 | 910        |
| 1982 | 1,663   | 1,748             | 1,600     | 2,663 | 817        |
| 1983 | 2,025   | 1,748             | 1,600     | 2,377 | 821        |
| 1984 | 1,666   | 1,748             | 1,600     | 2,356 | 700        |
| 1985 |         | 2,150             |           | 2,551 | 812        |
| 1990 | 1,920   | 2,060             |           | 2,440 | 813        |

successful users and success rate. This pattern is expected to continue to 1990. Total users may decrease slightly by 1990 while use-opportunity has a greater potential for decline due to land posting and development, mandatory trapper training, and more restrictive harvest regulations. Most of these changes will impact southern and central Maine (WMU's 4, 7, and 8).

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## FISHER MANAGEMENT GOALS AND OBJECTIVES 1985-1990

**GOAL:** Maintain fisher population at no lower than current (1985) levels throughout the State.

**Abundance objective:** Maintain preharvest fisher populations at no lower than 1985 levels in all WMU's (estimated at 0.8/mi<sup>2</sup> habitat in WMU 7, 0.6/mi<sup>2</sup> habitat in WMU's 1 and 8, 0.51/mi<sup>2</sup> in WMU 4, 0.3/mi<sup>2</sup> habitat in WMU 3, 0.2/mi<sup>2</sup> habitat in WMU 2, 0.08/mi<sup>2</sup> habitat in WMU 5, and 0.03/mi<sup>2</sup> habitat in WMU 6) through 1990.

**Harvest objective:** Maintain average harvest at 1,900 fisher per year or whatever level needed to stabilize the population (allow harvest to increase if population increases) and maintain use-opportunity (season length and timing) at current levels through 1990.

Capability of Habitat: The habitat is capable of supporting fisher populations at current levels in all WMU'S. The population in WMU 7 is near carrying capacity and if habitat declines, population levels may not be maintained. If development continues to increase in WMU 8, habitat quantity and quality will be degraded resulting in lowered carrying capacity and population.

Feasibility: The abundance objective can be accomplished if excessive harvests or habitat degradation due to development do not decrease fisher populations. Populations could increase in most units if estimates of population carrying capacity are reasonably accurate.

The harvest portion of the harvest objective can be accomplished if major decreases in population do not occur. If the pelt price of fisher remains high while the value of other furs declines further, harvest levels could increase beyond current levels. If populations increase, harvest could also increase over current levels. Harvests in WMU's 4, 7, and 8 could decrease due to access problems if land posting continues to increase.

The use opportunity part (maintain current seasons) of the harvest objective can be accomplished if populations do not decline, excessive harvests do not occur, or season restrictions are not required to limit the harvest of other species (marten and bobcat).

Desirability: The abundance objective would be desirable to trappers who want to harvest fisher on a long-term basis. Individuals who would like more fisher in low population areas (WMU's 5 and 6) may view this as undesirable.

The harvest objective would be desirable for trappers who want to harvest fisher, but undesirable for individuals wanting longer (or earlier) trapping seasons for other species (coyote and red fox).

Possible Consequences: This goal and its accompanying objectives appears to have few consequences. There will be some negative feeling from individuals who would like longer seasons for coyote and red fox. To maintain populations in WMU's 7 and 8 may require more emphasis on habitat protection and improvement.

There may be negative reactions from individuals in WMU 5 and 6 where fisher populations are low and from individuals who want a more active program to increase populations in these areas.

Continuing high prices for fisher without accompanying increases in pelt prices of other forbearer species may necessitate some harvest restrictions.

## Summary of working Group Concerns

### **FISHER**

#### **Habitat**

1. Forest practices including large clearcuts, mechanized harvesting and herbicides have reduced prey and habitat, particularly in northern Maine. After clearcut, it takes 10-15 years to again become fisher habitat.
2. Forests taking longer to regrow after cuts due to nutrient loss.
3. Forests are important both for cover and prey production.
4. Forest inventory did not pick up a large increase in timber harvesting in WMU 2. Perception of our people as well as public is this is wrong.
5. The effect of harvesting and herbicides needs to be explored.

#### **Population**

1. Fisher population may be limited by parasites and disease.
2. Keeping track of the sex and age ratio of fisher - more females are taken than males.
3. The exact cause of population ups and downs is not known.
4. Need better population estimates.

#### **Harvest/Use Opportunity**

1. Increase in cutting has resulted in increased road access which has increased the harvest.
2. Do not want all other trapping to revolve around fisher management.
3. Development in southern Maine effects use-opportunity more than fisher populations.
4. Leasing of land in unorganized areas may limit use opportunity.



## Fisher Problems and Strategies in Order or Priority

**Problem 1:** Lack of information on the size and dynamics of the fisher population on a WMU basis.

**Strategy 1:** Develop and implement a system to monitor populations and regulate harvests on a WMU basis.

**Problem 2:** Lack of information on whether the HSI adequately measures habitat quality and capacity on a WMU basis.

**Strategy 1:** Evaluate the existing method for measuring habitat and estimating carrying capacity (with emphasis on the effects of human development and forest management activities).

**Problem 3:** Lack of a timely measurement of the amount of fisher habitat by WMU and how it is changing.

**Strategy 1:** Implement a system to track habitat changes (clearcutting, land-clearing, land abandonment, development) by WMU more frequently and current than land use inventory.

**Problem 4:** Decreasing accessibility of private lands to trapping.

**Strategy 1:** Develop a system to monitor the amount of land being lost to public access by WMU.

**Strategy 2:** Develop and implement programs to maintain access to private lands.

**Strategy 3:** Acquire access rights to land where necessary.

**Problem 5:** Opposition to consumptive use of fisher by non-consumptive users.

**Strategy 1:** Develop programs to minimize conflicts and concerns of nonconsumptive users and maintain use opportunity.