

is not trapped, the likelihood of large losses from disease and other factors increases. In the long run, therefore, more openings may result from the attempt to maintain a stable population through an annual trapping program rather than trapping in intermittent years.

4. Unfavorable weather can sometimes slow or almost prevent harvest. A freeze-up before the trapping season opens is especially bad and practically stops trapping before it can start. Most Wisconsin trappers won't trap through the ice, partly because restrictive laws greatly reduce the possibility of a profitable operation and partly because of transportation problems and unfavorable weather and ice conditions which make trapping undesirable or difficult.

Fortunately, early trapping is possible on many of the better muskrat areas through the Wisconsin fur-farm laws and special regulations in effect on several large state and federal wildlife areas.

5. Low fur prices discourage trapping with the result that many areas may not be trapped. Other areas will be trapped only as long as the daily catch remains high enough to warrant running the trap-line.

Intraspecific Strife

Considerable losses occur from fighting among the muskrats themselves. This may involve attacks of adults against adults, adults against young, or even larger young against smaller young. Kits with fresh slash wounds were captured occasionally during litter-tagging. The aggressiveness of young kits was readily observed when captured litters were confined to a pail prior to the actual tagging. Captured kits seem to have a compulsion to attack anything moving within range of their sharp teeth.

Errington (1961) found that intolerance of muskrats to one another tended to vary between periods of years. Muskrats exhibited the most tolerance in the years closest to the highs of the cycle and the least tolerance in the years about the low of the cycle. We did not work closely enough with individual muskrats to detect differences in tolerances.

MANAGEMENT IMPLICATIONS

Harvest Considerations

Wisconsin has experimented with many types of trapping seasons. Completely satisfactory regulations have not yet been found, and changes are still being made every few years. A major difficulty is the need to set seasons before it is possible to know what the muskrat crop will be. A second problem is the tremendous influence weather may have on the trapping effort. Modifying seasons after they are



Late fall trapping at a large muskrat house. The stake is set in deeper water to insure drowning.

once set is difficult, although weather conditions may be so adverse as to prevent more than a token harvest.

Modern administrative machinery is not geared to changing regulations quickly. This is especially true when the loss from insufficient trapping will not be obvious, and it is easy to assume that there is no waste when muskrats are underharvested.

The 1961 trapping season in Wisconsin is a case in point. Although the state was zoned for trapping in 1961, all the opening dates were so late as to discourage trapping of muskrats. A mistaken belief that pelt prices were still very low contributed to a statewide apathy toward trapping, especially since little open water trapping was likely. The net result was a gross underharvest of muskrats throughout the state. Attempts to obtain a statewide spring trapping season were unsuccessful except in the Mississippi River area. Here a spring season was obtained on the basis of suspected presence of Errington's disease in the river muskrats. The Mississippi River trappers were able to take a good harvest in the special spring season. Many licensed fur farmers in other parts of the state also conducted a successful spring trapping season because they knew their fall harvest was too low.

Many thousands of muskrats could have been taken in the rest of the state during the same period if the season had been opened. Spring trapping can be a special tool to use when insufficient numbers of muskrats are taken during the fall and winter trapping period. This

tool was used with notable success on Horicon Marsh where seven spring trapping seasons have been used to reduce excessive numbers of muskrats.

For some years, Wisconsin alternated between open and closed muskrat seasons. This was based on a widespread belief that a closed season automatically insured a bumper crop the next year. Ignored were the many factors which affect the welfare of muskrats and the inherent ability of muskrats to increase rapidly when conditions are favorable. This system of alternating seasons has been abandoned.

Muskrat densities may vary greatly from year to year and also in different habitats within a single year. Trapping laws cannot be expected to be changed to suit individual situations, even if it were possible to detect these population variations long before the trapping seasons.

A general principle should be followed, therefore, of setting seasons which can usually be expected to give an adequate harvest on the more heavily populated areas. Such areas exist within our state each year despite some years in which populations are generally low over the state. Low fur prices have cut down trapping pressure to the point where overtrapping of muskrats in the better habitats is not likely. Overtrapping in poor habitats is more possible. Should overtrapping occur, natural restocking can be expected to replenish the breeders.

The need for closed seasons to produce bumper crops has been amply disproved by the large statewide harvests under consecutive open seasons in the early 1950's. Next, statewide seasons opening on November 1 were tried. Due to a difference of about three weeks in average freeze-up dates between northern and southern Wisconsin, the state was zoned and the season was opened before November 1 in the far north in order to have open-water trapping.

From 1956 to 1960, the state was zoned as follows: North of highway 64, October 20 to December 19; south of highway 60, November 5 to December 19; while the central zone ran from October 28 to December 19. In addition, there were special regulations for lands within the national wildlife refuge along the Mississippi River and a few counties in which a special long dry-set season was permitted.

Although a majority of the trappers seemed to favor these zoned, early opening seasons, some opposition arose because early-trapped mink were almost worthless. The vociferous dissatisfied swung the pendulum so that openings were made later, from November 1 in the northern zone to November 15 in the southern zone. These seasons were in effect in 1961 and 1962. The poor harvest of 1961 has already been described.

There was a general, hard freeze late in October of 1962, but warmer weather returned and open water was present most of the time until late November. Ice did hamper and discourage trapping, despite the open water since most everyone expected the permanent freeze-up to occur at any time in November. Trappers are loath to get caught with a lot of traps out at freeze-up time since it can be very difficult to recover the traps after the ice is thick enough to support walking. Therefore it is believed that the 1962 harvest was also too low despite the lateness of the freeze-up.

If mink and muskrats were not so closely related in habits, setting of trapping seasons would be much simpler. Any trap set for muskrats can also catch a mink since there seem to be no places used by muskrats not also used at times by mink. Even muskrat feeder houses are visited by mink when the only access to the feeder house is by traveling under the ice from the main muskrat house. Mink also use underwater entrances of muskrat bank dens.

Delaying the mink season till mink were closer to prime would mean that any mink caught by accident in muskrat sets would be illegal and a total waste. Wisconsin has therefore continued to have concurrent mink and muskrats wet-set seasons.

Periodic occurrence of winter runners in considerable numbers was the basis for a special dry-set season for muskrat and mink in 1946 in a block of counties near Lake Winnebago. This season extended from the end of the regular trapping season until March 15. It permitted the salvage of many muskrats which would have died shortly anyway.

This extra long season did not prove detrimental to the mink or muskrats in this block of counties. Should extra protection be desired for mink, regulations could permit the taking of runner muskrats by means other than trapping. This would give the mink complete protection during special seasons for runners. Trapping every runner muskrat would do no harm at all, but since mink can also be trapped with dry sets, the mink could conceivably be reduced too much.

The greatest danger to overtrapping mink comes from a relatively small number of trappers usually referred to as "culvert trappers." These trappers may have one or more of the following characteristics: (1) they operate out of the larger cities; (2) they operate long traplines, often extending into half a dozen or more counties; (3) they may use more than the legal limit of 75 traps (enforcement of this regulation is very difficult); (4) they make sets almost exclusively where creeks and ditches cross roads; (5) they often violate trapping or trespass laws in order to catch their furs; (6) they do not own land, pay taxes on wild land, or otherwise do anything to produce a fur

crop; (7) when operating several long traplines, they may not check traps daily, an undesirable method of trapping; and (8) by using these methods, they obtain a disproportionate share of the wild fur crop.

Recommendations

Muskrat research on Horicon Marsh points toward one policy: muskrats must be adequately harvested. With wide yearly variations in muskrat numbers, water conditions, and weather during trapping seasons, adequate annual harvests are not likely unless regulations are flexible. Chronically low fur prices have eliminated to a considerable extent the need to preserve muskrat breeding stock by means of restrictive regulations. Should fur prices collapse entirely in the future, regulations may have to be relaxed or even eliminated to preserve the interest of trappers. Assuming, however, that muskrat pelts will continue to bring an average of 80 cents or more, and that general trends in statewide muskrat populations can continue to be determined, the following recommendations for statewide muskrat and mink management are made on the basis of our investigations:

1. Muskrat and mink should continue to be trapped in joint seasons.

2. Muskrat and mink seasons should be held annually because (a) some local areas commonly have high muskrat populations even though most other areas may have generally low populations during the same period; (b) the muskrat mortality rate is so high that excessive losses result when one or more trapping seasons are skipped; (c) natural factors such as drought or freeze-outs can be expected to frequently reduce muskrat numbers prior to the next trapping season; (d) low fur prices have been the rule for some years so that trapping usually ceases long before muskrat numbers are reduced too low (It follows that quotas are not needed nor are pre-season population estimates needed to set quotas or trapping regulations.); (e) untrapped or grossly undertrapped populations are much more subject to major losses from disease; and (f) Wisconsin has so much muskrat habitat that many muskrats probably never are exposed to the hazards of trapping. Refuges specifically for muskrats therefore are not needed.

3. Muskrat seasons should be early enough to allow on the average about a week of open-water trapping. If the bulk of the muskrat crop is not taken prior to freeze-up, the chances for an adequate harvest, especially with a fixed statewide season, are remote. Zoning therefore is desirable.

4. On public lands managed primarily for waterfowl, it may be undesirable to have uncontrolled trapper activity during hunting hours. The muskrat resource can still be utilized without measurable

damage to the waterfowl program by limiting the number of trappers and their mode of operation through a permit trapping season. This is preferable to prohibiting trapping altogether, especially where muskrats are abundant.

5. State law and administrative procedure should be modified as necessary so that additional trapping can take place to remove obvious surpluses. Gross undertrapping in fall and winter can occur due to factors such as (1) very low fur prices; (2) a very high muskrat population with extensive muskrat habitats occupied; and (3) unfavorable weather factors such as high winds, very early freeze-up and abnormally heavy and early snowfalls. Further special seasons quite frequently are needed in a hurry when freeze-out conditions cause large numbers of winter runners. An alternative to the latter proposal would be an annual statewide season for taking muskrats by means other than trapping from the end of the trapping season to March 1.

6. As a sole means of taking muskrats, spring trapping is not advisable because (1) there may be large losses before spring due to freeze-out or disease; (2) spring pelts are often past their prime; (3) spring pelts tend to be heavily damaged by cuts from fighting among the muskrats themselves, resulting in the customary drastic markdown in selling price; and (3) once in a while spring break-up will be much later than usual, causing additional loss in pelt quality.

7. On larger marshes, usually publicly owned, special efforts should be made to trap extra heavily when drastic draw-downs are planned for the next summer. This should include spring trapping in addition to the heavy fall and winter trapping.

8. Greater use of the provisions of the fur-farm law should be encouraged (Sections 29.375 and 29.58, Wisconsin Statutes). The fur-farm laws not only permit better muskrat management, but in so doing, they insure dedication of many of our better wildlife habitats to production of wildlife. It would also help the problem of when to set mink trapping seasons; on licensed farms, owners could trap early or in spring, when conditions require it. All state-owned marshes should be managed as fur farms. This would allow more efficient control where muskrat damage to dikes is a major problem.

9. Small, man-made water areas are increasing rapidly in numbers. This trend is expected to continue at an accelerated pace in future years. Dikes are commonly used to create new water areas which include fish ponds, duck hunting areas, and water areas to beautify estates. Owners of these water areas very often have absolutely no interest in muskrats. Muskrats do, however, cause damage mainly in digging in dikes and banks. Eventually leaks and total water loss may

result unless time-consuming and costly repairs are repeatedly made.

Here again, rules and regulations should be changed to permit sensible and practical control. There is no justification for having state employees check every complaint and spend much time and effort to collect muskrats taken in control work. These water areas benefit so much other wildlife that their development should be encouraged, even to the point where muskrats can be controlled when necessary.

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