A study of mink movements and populations on the lower Madison River, Montana
by James L Mitchell

A THESIS Submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of Master of Science in Fish and Wildlife Management
Montana State University

Abstract:
A mink (Mustela vison energumenas) live-trapping study was conducted on the lower Madison River near Three Forks, Montana, during various seasons of the year from 1955 to 1957, to determine movements and populations. Live-trapped minks were marked in each ear with numbered strap type tags. Fifteen of 42 tagged animals were live-trapped more than once. Different type traps and baits are evaluated. One adult female's home range was determined by several captures at different trap sites. Movements of other individuals are recorded. Only a small percentage of the area's total population of minks was thought to have been live-trapped.

By use of the Lincoln Index, the total population of the area was calculated for two different years. The adult female to juvenile ratio for the area was found to be lower than the statewide ratio. Average weights of the live-trapped minks were determined and weight variations are discussed.

39

A STUDY OF MINK MOVEMENTS AND POPULATIONS ON THE LOWER MADISON RIVER, MONTANA

by

JAMES L. MITCHELL

A THESIS

Submitted to the Graduate Faculty

in

partial fulfillment of the requirements

for the degree of

Master of Science in Fish and Wildlife Management

at

Montana State College

Approved:

J. A. Pepper
Head, Major Department

Don S. Quimby
Chairman, Examining Committee

Leon H. Thomas
Dean, Graduate Division

Bozeman, Montana
May, 1957

TABLE OF CONTENTS

	Page
Abstract	3
Introduction	4
Description of the area	4
Methods	6
Results	10
Trapping success	10
Movements and home ranges	11
Populations	15
Weights	17
Summary	17
Literature cited	19

ABSTRACT

A mink (Mustela vison energumenas) live-trapping study was conducted on the lower Madison River near Three Forks, Montana, during various seasons of the year from 1955 to 1957, to determine movements and populations. Live-trapped minks were marked in each ear with numbered strap type tags. Fifteen of 42 tagged animals were live-trapped more than once. Different type traps and baits are evaluated. One adult female's home range was determined by several captures at different trap sites. Movements of other individuals are recorded. Only a small percentage of the area's total population of minks was thought to have been live-trapped. By use of the Lincoln Index, the total population of the area was calculated for two different years. The adult female to juvenile ratio for the area was found to be lower than the statewide ratio. Average weights of the live-trapped minks were determined and weight variations are discussed.

INTRODUCTION

A mink (Mustela vison energumenos) live-trapping program was conducted on the lower Madison River near Three Forks, Montana, during various periods from the fall of 1955, to the spring of 1957, to obtain information on movements, populations and other biological factors. Apparently very little similar work has been done as attested by the paucity of literature on the subject. Marshall (1936) and McCabe (1949) were able to delimit the approximate sizes of home ranges of female minks, in certain habitats and seasons in Michigan and Wisconsin, respectively. Since home range is known to be influenced by habitat (Burt, 1940), it seemed desirable to secure information for this local population which is subjected to an annual harvest by commercial fur trappers.

The writer wishes to extend thanks to the Montana Fish and Game Department by whom he was employed during the investigation under Project W-49-R and to Kenneth R. Greer of that department for interest and guidance during the project. Also, thanks are extended to the landowners in the study area and to the commercial trappers who cooperated so willingly. The writer is indebted to Dr. Don C. Quimby, Montana State College, for his direction of the study and aid in preparing the manuscript.

DESCRIPTION OF THE AREA

The study area is a six mile (airline) section of the Madison River extending from a point six miles south of Three Forks to the Highway 10 bridge, one mile east of this city (Fig. 1). Within the area, the river varies in width from 40 yards in single channel, to over 100 yards where

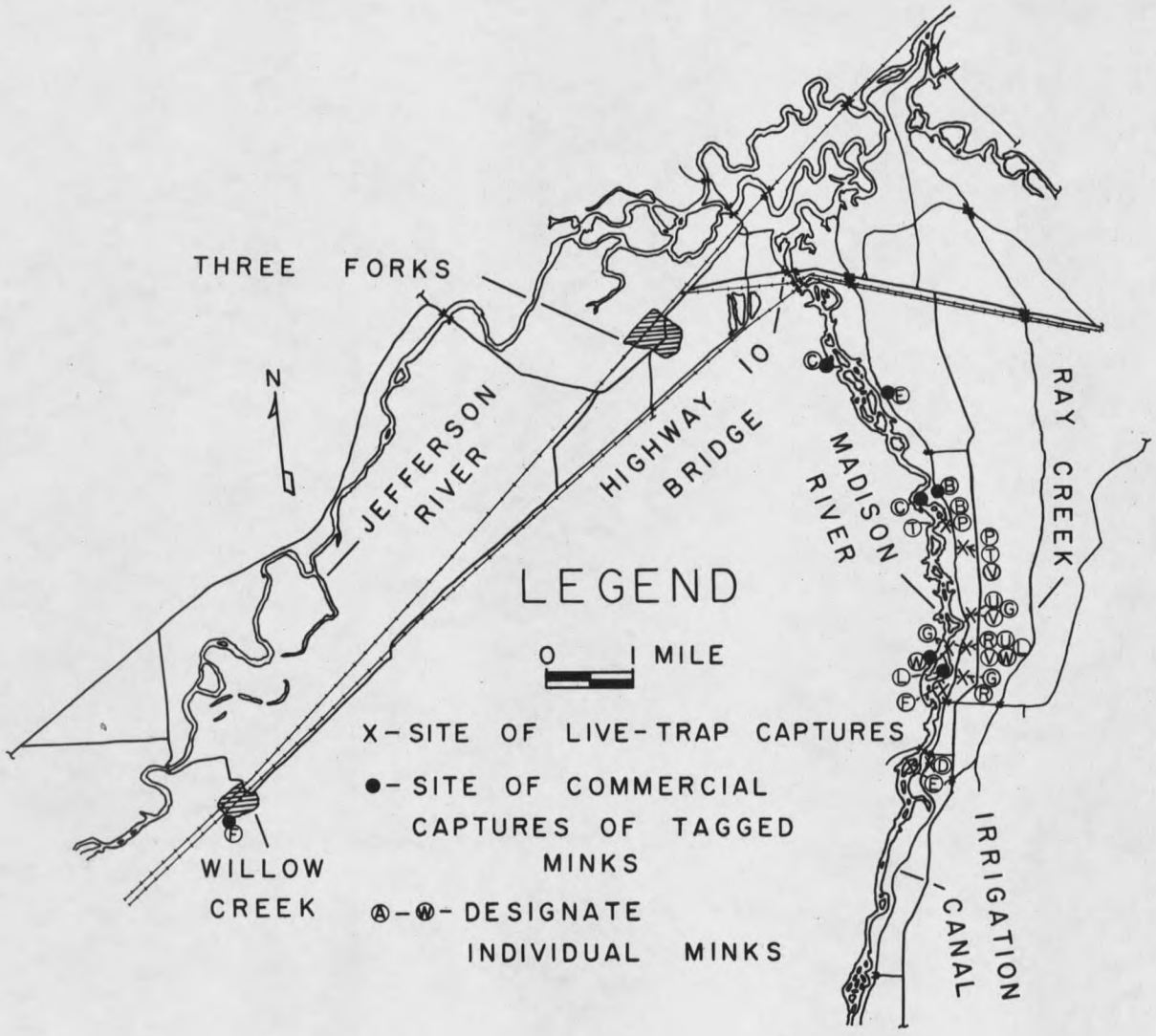

Fig. 1. A map of the study area.

the course is interrupted by numerous islands. Shallow, rapid areas less than a foot in depth are common. Depths of over five feet are rare. Severe gouging by ice-jams in winter forms new channels and obliterates old ones with debris or huge rock bars. The current is swift; the gradient being 16 feet per mile and the waterflow is kept almost constant by a dam located above the area, except during spring runoff. The main channel closely follows the western edge of the valley floor. An irrigation canal and Ray Creek parallel the river to the east (Fig. 1). There is no inflowing water from streams.

The riparian vegetation consists mainly of woody shrubs, with willow (Salix sp.) being the dominant type. Sparse to moderate cottonwood (Populus sp.) growths are also found (Fig. 2). Hydrophytic vegetation represented mostly by cattails (Typha sp.) and bullrushes (Scirpus sp.) in protected areas and filamentous algae (Cladophera sp.), elsewhere, is common.

METHODS

In the summer and early fall, the entire study area was traversed with a canoe-type boat. Icing conditions in winter made this type of transportation impractical, so a road was used along the top of the dike that parallels the irrigation canal to the west.

The presence of mink sign near the water's edge served as a basis for positioning traps. A record of trap locations was kept on a map of the area prepared from aerial photographs. Only the east side of the river and the irrigation canal were trapped in winter. Trap positions were

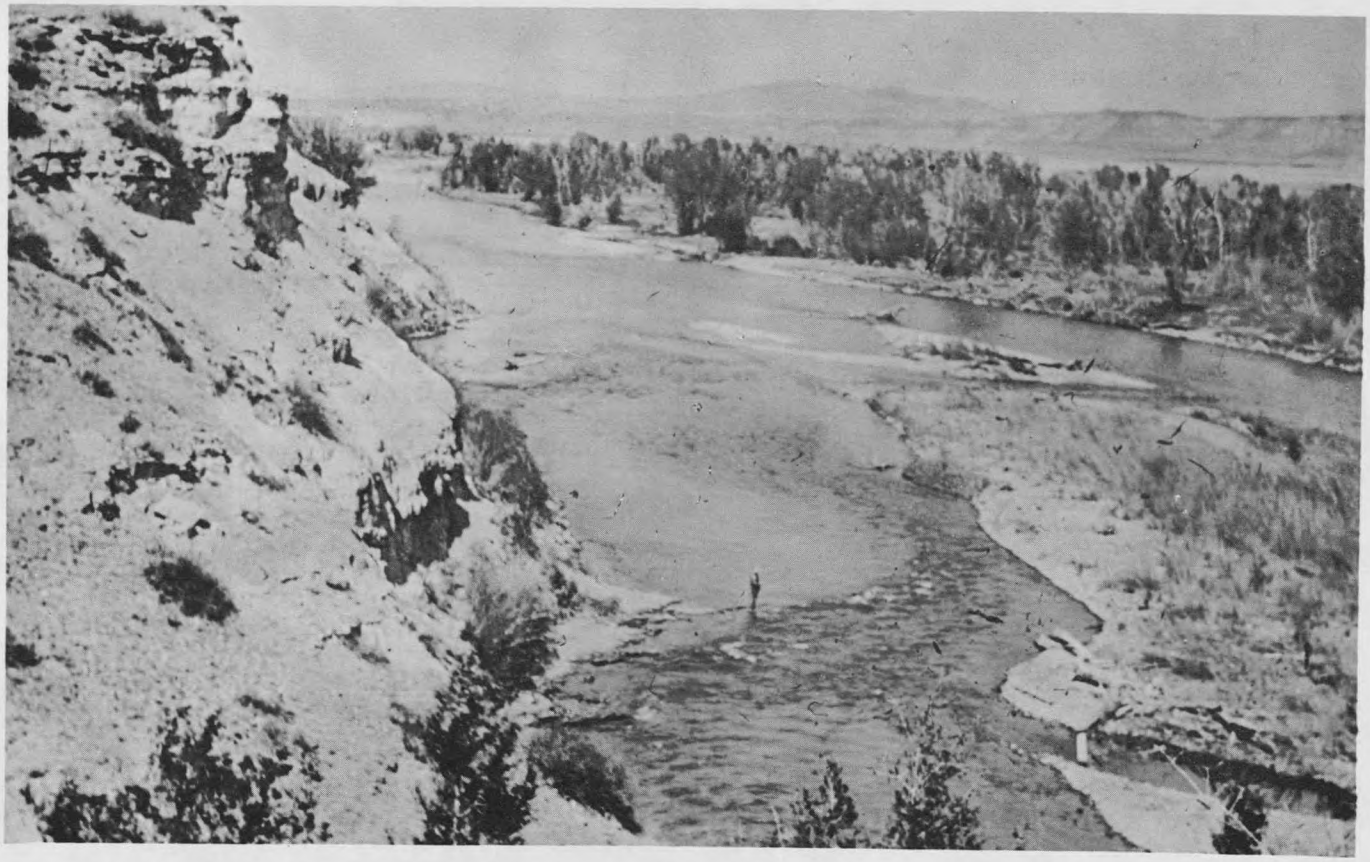

Fig. 2. A view of a section of the study area from the west side of the Madison River. The tip of an island is seen to the right.

changed frequently if unproductive. Sets were made under caved dirt banks, in rock rip-rap walls, or on level ground and all were loosely covered with grass, sticks or sod. Collapsible metal live traps produced by the National Live Trapping Company, Tomahawk, Wisconsin were most effective. They were of two types. Most success was gained using the 6" x 6" x 24" double-door model set in runways with both doors open. The 6" x 6" x 19", single-door type was somewhat successful when placed as a blind set in dirt banks or rock walls. Also used, but with little reward, was a wooden treadle-type trap.

A variety of scents and lures were employed. Female scats obtained from local mink ranchers were apparently quite successful during the breeding season. Musk glands procured from wild mink carcasses during the commercial trapping season were also suitable. Edible baits produced poor results, although many were tried. McCabe (1949) had most success with freshly killed rabbit, whereas Ritcey (1956) obtained best trapping results when using fresh fish.

A numbered fish strap tag (size, 8 x 2 mm) with the inscription M.F.G.D. (Montana Fish and Game Department) was placed in each ear of trapped minks (Fig. 4). They were quite satisfactory, for only one known loss of a tag by an animal occurred, this on animal (E) within a 388 day period. Each animal's ventral white spot pattern was recorded as additional aid in future identification (McCabe, 1949).

A collapsible wire cone (Newby et al, 1954) made handling of trapped animals by one man comparatively easy. To the cone was attached a canvas sleeve that fitted over the end of the live trap for convenient animal

Fig. 3. A mink in a single-door metal live-trap. The canvas sleeve that is used for transfer to the cone and the cone itself are shown to the right.

Fig. 4. A mink with an identifying fingerling fish tag in its right ear.

transfer (Fig. 3). Each animal was aged (juvenile or adult), sexed, weighed (to nearest 25 grams), examined for injuries, and breeding status determined while confined in the cone. Aging of males was accomplished by palpation of the baculum (Petrides, 1950). Age determination of females was more difficult. The presence of gray hairs on the napes of their necks was considered characteristic of adults (local trappers and mink ranchers said this was due to injury of the tissue by the male's clasp during intercourse). Presence of enlarged mammae made adult identification positive in summer and early fall, or as long as the young were suckling.

Commercial trappers were given maps for plotting positions where they captured tagged minks.

RESULTS

Trapping Success

A total of 5840 trap nights (one trap set for 24 hours) captured 42 animals 78 times (Table I). Fifteen animals (35.7 percent) were recaptured. It required an average of 74.9 trap nights to capture one mink. The highest trapping success was recorded for fall, 1955; 25.8 trap nights per individual. The best success in recapturing tagged minks was realized during the winter. Four minks were captured from 23 trap units on March 21, 1957. Lowest success was realized in late summer. From August 9th, to September 10th, 1956, no minks were captured. Sex and age class of trapped animals were: 21 juvenile males, 10 juvenile females, four adult males and seven adult females.