

JOB PROGRESS REPORT

State: California

Project Number: W-54-R-10 Project Title: Nongame Wildlife Investigations

Job Number: II - 1.6 Title: Sacramento Valley Muskrat Survey

Period Covered: July 1, 1977-June 30, 1978 Job Type: Survey and Inventory

SUMMARY:

A three month effort to live trap muskrats (Ondatra zibethicus) in typical Sacramento Valley agricultural habitat has led to the capture and marking of 57 individuals in three different agricultural canal types. During the spring the greatest muskrat densities were noted along a natural drain canal, followed by lower densities in a major man-made drain canal and a minor man-made drain canal. However, there is only a minor variation in density of adults in each study area. Additional data is being gathered on population fluctuations, home range size, litter size and mortality rates.

Cooperators: Conway Ranch, Woodland, California.

BACKGROUND:

The muskrat is an extremely adaptable animal, now found outside its native range almost anywhere in the Sacramento Valley. Freshwater marshes, though still occupied by muskrats in many parts of the State, have been replaced by the numerous agricultural irrigation and drainage canals as the major habitat used by muskrats.

In agricultural areas muskrats burrow into levees, gnaw water control structures, cause flooding and eat some crops. From 40,000 to 100,000 muskrats have been reported taken annually over the last 25 years in California by licensed fur trappers. This has provided the trapper with a substantial income and the farmer with a method of control for these rodents.

Numerous studies have contributed to the knowledge of muskrat behavior and population dynamics throughout its native range. Mark and recapture techniques have been used successfully to investigate the parameters of population dynamics. However, no work has been done in California on a population that is existing virtually in a man-made canal environment nor the effects that the most common control measures have on these populations.

OBJECTIVES:

1. Determine details of muskrat population dynamics including density, age and sex structure, home range and reproductive and mortality rates.
2. Determine the extent to which these parameters vary with habitat type.
3. Determine the extent that normal population control measures affect muskrat populations.

PROCEDURES:

Dennis J. Messa, a commercial muskrat trapper and graduate student in a Master of Science program in Biological Conservation at California State University, Sacramento, was contracted to perform the field investigations and laboratory analysis to determine the parameters of the muskrat population under study. The Conway Ranch, in Yolo County, was chosen as the general study area because: it is representative of the agricultural area in the Sacramento Valley; access is restricted allowing undisturbed field work; and the muskrat control is performed by a cooperative ranch employee. Muskrats were live trapped in floating cage traps and marked with ear tags and tail bands.

FINDINGS:

Initially three study areas were chosen because they represented typical muskrat habitats occurring in Sacramento Valley agricultural areas. These areas ranged from a natural water course now serving as a drain canal, to two man-made drain canals of varying sizes and water conditions. The converted natural water course has supported the highest muskrat densities (Table 1).

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Table 1. Muskrat densities and population structure on Conway Ranch, Yolo County, during Spring, 1978.

	<u>Natural Water Course</u>	<u>Main Drain Canal</u>	<u>Rice Field Drain Canal</u>
Size of study area (lin. mi.)	0.5	0.8	1.0
Total captures	77	105	52
Number of individuals	22	20	15
Muskrats/lin. mi.	44	25	15
Number of adults	10	11	9
Adult muskrats/lin. mi.	20	13.75	9
Trap nights	188	361	226
Captures/trap night	0.41	0.29	0.23

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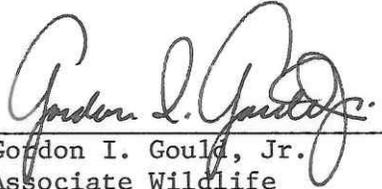
ANALYSIS:

Home range data have not been analyzed due to the initial accumulation of field data, establishing of study areas and developing of trapping procedures. Trapping methods initially were so effective that trap "addiction" and trap

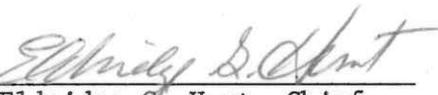
mortality became problems. This has been alleviated by changing trap design, moving traps, and including additional study sites. However, possible reductions in the normal population growth rate may have occurred due to trap mortalities and reabsorbtion or abortion of fetuses by pregnant females due to entrapment. Trapping and marking procedures are now developed enough to justify continued trapping and marking. A sufficient number of animals will have been marked by the beginning of the commercial muskrat trapping season (November 15) that the recovery of marked individuals by trappers should yield accurate data on the effect of commercial trapping on population dynamics. When followed by continued study at the beginning of next breeding season, the yearly magnitude of the yearly population cycle should be obvious.

RECOMMENDATIONS:

1. Proceed with Phase II of study, continued trapping and marking throughout pre- and post-trapping season periods and monitoring the take of the commercial trapper.

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