



Life history, habitat and distribution of the lake sturgeon *Acipenser fulvescens* in the South Saskatchewan River, Alberta
by Gordon Neal Haugen

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
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Abstract:

The life history, habitat, and distribution of the lake sturgeon in the South Saskatchewan River, Alberta were investigated during 1968 from April to November and in 1969 from June to September. A total of 223 specimens was used for an age and growth study. Sixty seven percent of the fish were in age groups III through IX and the rest were in age groups X to LI. Females were larger than males in the older age groups. The sex ratio (males to females) for all age groups was 1:1.1. Males were sexually mature in age group XIX and females in age group XXV. The number of eggs per female ranged from 117,450 to 607,400. Aquatic invertebrates were the most numerous food items found in the lake sturgeon diet. Fish were present in 25 percent of the stomachs. Fishing success was related to habitat. All lake sturgeon taken during the habitat study were in depths greater than two meters and at velocities less than 80 cm per sec. Of 56 sturgeon tagged and released only two were recaptured. The greatest distance traveled was 60 km.

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Signature Gordon Neal Haugen

Date November 17, 1969

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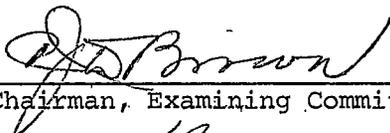
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ABSTRACT

The life history, habitat, and distribution of the lake sturgeon in the South Saskatchewan River, Alberta were investigated during 1968 from April to November and in 1969 from June to September. A total of 223 specimens was used for an age and growth study. Sixty seven percent of the fish were in age groups III through IX and the rest were in age groups X to LI. Females were larger than males in the older age groups. The sex ratio (males to females) for all age groups was 1:1.1. Males were sexually mature in age group XIX and females in age group XXV. The number of eggs per female ranged from 117,450 to 607,400. Aquatic invertebrates were the most numerous food items found in the lake sturgeon diet. Fish were present in 25 percent of the stomachs. Fishing success was related to habitat. All lake sturgeon taken during the habitat study were in depths greater than two meters and at velocities less than 80 cm per sec. Of 56 sturgeon tagged and released only two were recaptured. The greatest distance traveled was 60 km.

INTRODUCTION

The life history, habitat and distribution of the lake sturgeon, *Acipenser fulvenscens* (Rafinesque), were studied in the Alberta portion of the South Saskatchewan River during 1968 from April to November and in 1969 from June to September.

The lake sturgeon is indigenous to the Hudson Bay, St. Lawrence (including the Great Lakes), and Mississippi River drainages. The species has been depleted throughout most of its range by over-exploitation and/or by man-made environmental changes (Harkness and Dymond, 1961). In Alberta the species is known to occur in the South Saskatchewan River from the confluences of the Bow and Oldman Rivers to the Saskatchewan border. Reports of the species in the drainages above the confluences have not been confirmed. Prior to 1940 it was legal to take lake sturgeon, but after this date fishing was prohibited until 1968 when a limited fishery was permitted. The only available published work on lake sturgeon from the Saskatchewan River drainage is that of Royer (1968), who reported on age and growth of specimens taken in the Saskatchewan River Delta about 700 km downstream from the present study area. Other age and growth studies are reported for: Lake Nipigon, Ontario (Harkness, 1923); Lake St. Francis and the St. Lawrence River (Cuerrier and Roussow, 1951); Lake Winnebago Region, Wisconsin (Probst and Cooper, 1955); Nelson River, Manitoba (Sunde, 1959). The latter two studies included data on reproduction and harvest. Spawning periodicity was reported on by Roussow (1957), while the lake sturgeon, its history and problems of conservation were reviewed by Harkness and Dymond (1961).

DESCRIPTION OF AREA

The present study was confined to the South Saskatchewan River in Alberta. The drainage exclusive of the Red Deer River lies in southern Alberta and northwestern Montana and has an area of approximately 67,340 square kilometers. Its tributaries drain the east slopes of the Rocky Mountains from Glacier National Park, Montana northerly to and including Banff National Park, Alberta. The Oldman and Bow Rivers which are its two major tributaries join to form the South Saskatchewan River 14 km north of Grassy Lake, Alberta (Figure 1).

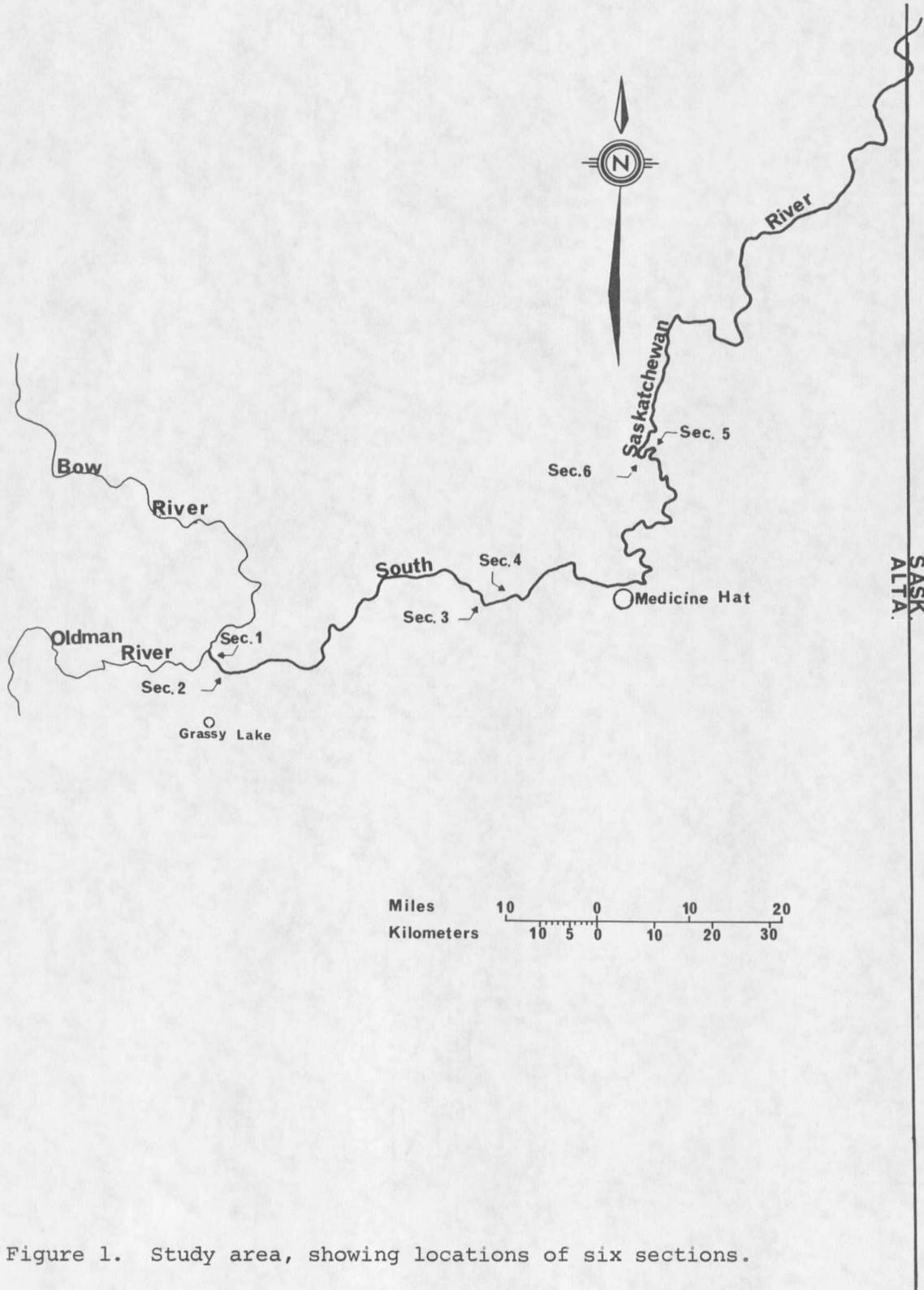


Figure 1. Study area, showing locations of six sections.

METHODS

Attempts were made to catch lake sturgeon using set lines, gill nets, seines, and poison, but the set line was the only effective method. Each consisted of a nylon line (25-100 meters in length) rigged with 3 to 50 hooks (size 6/0 and 8/0), baited with minnows. Set lines were fished in back waters during peak river discharge and in the main channel after high water subsided.

Total and fork lengths of sturgeon were secured to the nearest millimeter and weights to the nearest 0.10 kilogram for those less than 5 kilograms in weight and to the nearest 0.25 kilogram for larger fish.

Age determinations followed the method of Cuerrier (1951) with minor modifications. Pectoral fins were removed at their articulation with the body and dried. The first pectoral ray of each fin was sectioned (0.2 to 0.5 mm) at right angles to the long axis with a single carborundum blade. Sections were then emersed in 70 percent alcohol prior to annulus determination. Annuli were considered to be the narrow dark concentric rings (Figure 2). These were more easily distinguished at their greatest curvature on the ventral-radial axis of the arrow-shaped sections. Growth rates were determined from empirical total lengths and not by back calculation because of the extreme variation in the shape of pectoral rays.

Sex determinations were made by examination of the gonads. Gonads were then weighed to the nearest gram. Sexual maturity stages followed the criteria described by Roussow (1957).

