

MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS

FISHERIES DIVISION
JOB PERFORMANCE REPORT

STATE: Montana PROJECT TITLE: Flathead Lake Fisheries
Investigations
PROJECT NO.: F-33-R-17 JOB TITLE: Measure annual trends in re-
cruitment and migration of
JOB NO.: I-a kokanee populations & identify
major factors affecting trends
PERIOD COVERED: July 1, 1982 to June 30, 1983

OBJECTIVES

It shall be the primary objective of the job to establish relative abundance of the six major fish species with the present segment emphasizing kokanee, and to identify the environmental factors affecting population changes.

ACCOMPLISHMENTS

All the procedures outlined for the present segment of this job were accomplished. Population indices for kokanee 10 inches and larger were established for the 1982-83 season. These indices were established by reviewing portions of over 27 hours of acoustical tape data. An average of 59.6 fish/hectare (24.2 fish/surface acre) was calculated from data collected on 75 kilometers (46.7 miles) of transects conducted in early September. This density estimate of fish represents a combined value of both immature and mature salmon in the lake. This figure does not include the salmon that have left the lake on the early run to the Flathead River tributary spawning areas. Similar depth distribution and overlapping size ranges of immature and mature salmon found during the surveys did not allow complete separation of these groups by target size thresholds. However fish were separated into two groups; Group 1- fish ranging in size from 203 to 305 mm T.L. (8-12 inches), and Group 2- fish ranging in size from 305 to 432 mm (12 to 17 inches). Group 1 consists essentially of immature fish; while Group 2 represents the mature fish segment. These same fish groupings and counting techniques have been utilized during the past three seasons. The number of large-mature salmon (Group 2) has not changed significantly over the past three years. Their density numbers represented 7.52, 5.00 and 6.80 fish/acre for the years 1980, 1981, and 1982, respectively. Numbers of smaller-immature salmon (Group 1) also did not change significantly between 1980 and 1981 when densities were 9.88 and 10.67 fish/acre, respectively. However, the 1982 estimate of smaller Group 1 fish increased to 17.35 fish/acre. Assuming that these fish will experience similar mortalities prior to maturing; numbers of salmon in the lake should reflect this increase. Growth patterns of these coming year classes should also reflect these changes and will be monitored. Acoustic information on yearling salmon were collected from July through November.

Age composition of mature salmon were determined from otolith bones collected on 10 major spawning sites. The sites represented 4 river and 6 lakeshore spawning areas. Younger fish dominated the river areas where 83 percent of the fish were four year old spawners. The only major exception of this ratio was the McDonald Creek sample which was comprised of near equal ratio of 4- to 5-year old spawners. This compared to lake areas where 66 percent of the spawners were four years old. The average size of the mature males was 394 mm (15.5 inches) total length in the lake and 383 mm (15.1 inches) in the river.

Growth measurements calculated from a sample of scales collected in the midwater trawl and creel checks were analyzed and will represent the present years growth patterns.

The winter fishery for salmon in a southern bay of Flathead Lake (Skidoo Bay) was again monitored with creel checks and acoustic transects. These tight dense schools of salmon (30 to 60 feet thick) found at depths from 20 to 40 feet from the surface persisted in the area from late December through April and provided angling success rates as high as 3.5 fish per hour. These fish averaged 310 mm T.L. (12.2 inches) and mostly represented the coming years spawners. The average size of the 1982 Skidoo Bay salmon was 313 mm (12.3 inches); only slightly larger than this year fish. SCUBA divers attempted to view the compact schools but failed due elusiveness of the salmon as the divers approached. Water visibility was approximately 40 feet at the time.

The salmon spawning areas associated with the lower Swan River and its estuary area into Flathead Lake were surveyed during March and April. This work was accomplished in cooperative effort with a private power company (Pacific Power and Light Company) to improve salmon spawning areas associated with their power diversion dam. Gravel areas below the diversion were surveyed and periodic samples of eggs were checked for development and mortality. Although fry were collected below the spawning area preliminary findings showed these spawning sites experienced abnormally high mortalities during the egg to fry development stages. Causes of these mortalities will be further investigated.

Verification of fish species associated with the acoustic surveys was accomplished with a midwater trawl having a ten-foot square opening. Incidental to fish collections; specimens of mysis shrimp were collected on September 1, 1982 at two locations in the northern areas of the lake. All specimens were adult shrimp and were taken in hauls near the bottom. The two sites included an area two miles south of the mouth of the Flathead River where one specimen was taken at 90 feet (the same general area where the first shrimp were collected the previous year), and an area one-half mile east of the Somers Salmon Hatchery where six specimens were taken at 72 feet.

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Date: November 1, 1983