UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

FLOODS OF JANUARY 15-17, 1974, IN NORTHWESTERN MONTANA

by

M. V. Johnson and R. J. Omang

OFR 74-38

Prepared in cooperation with the

U.S. Department of Agriculture, Forest Service

Open-file Report 74-38

Helena, Montana

1974

Contents

Illustrations

Table

FLOODS OF JANUARY 15-17, 1974,

IN NORTHWESTERN MONTANA

Introduction

Rain and snowmelt caused several streams in northwestern Montana to flood during January 15-17, 1974. The flooding was caused by a major rainstorm that extended from Montana through Idaho and Washington. The most damage occurred in the Kootenai River drainage (fig. 1), centering around the town of Libby. Also, unusually high flows occurred on some streams in the Clark Fork basin. Throughout the area, ice jams contributed to much of the overbank flooding.

Both the towns of Troy and Libby were partly flooded, but damage was greatest in and near Libby. In the Libby area, two houses and six mobile homes were swept away by floodwaters. In Troy an Amtrak train with 92 passengers aboard was stranded from Tuesday night to Thursday because of floodwaters and mud slides. The American Red Cross reported that 1,500 people in the Libby area were evacuated and 200 homes were flood damaged. Much of northwestern Montana was subsequently given "national disaster area" status. The Governor of Montana estimated total flood damage to be $4.9 million. No flood fatalities were listed.

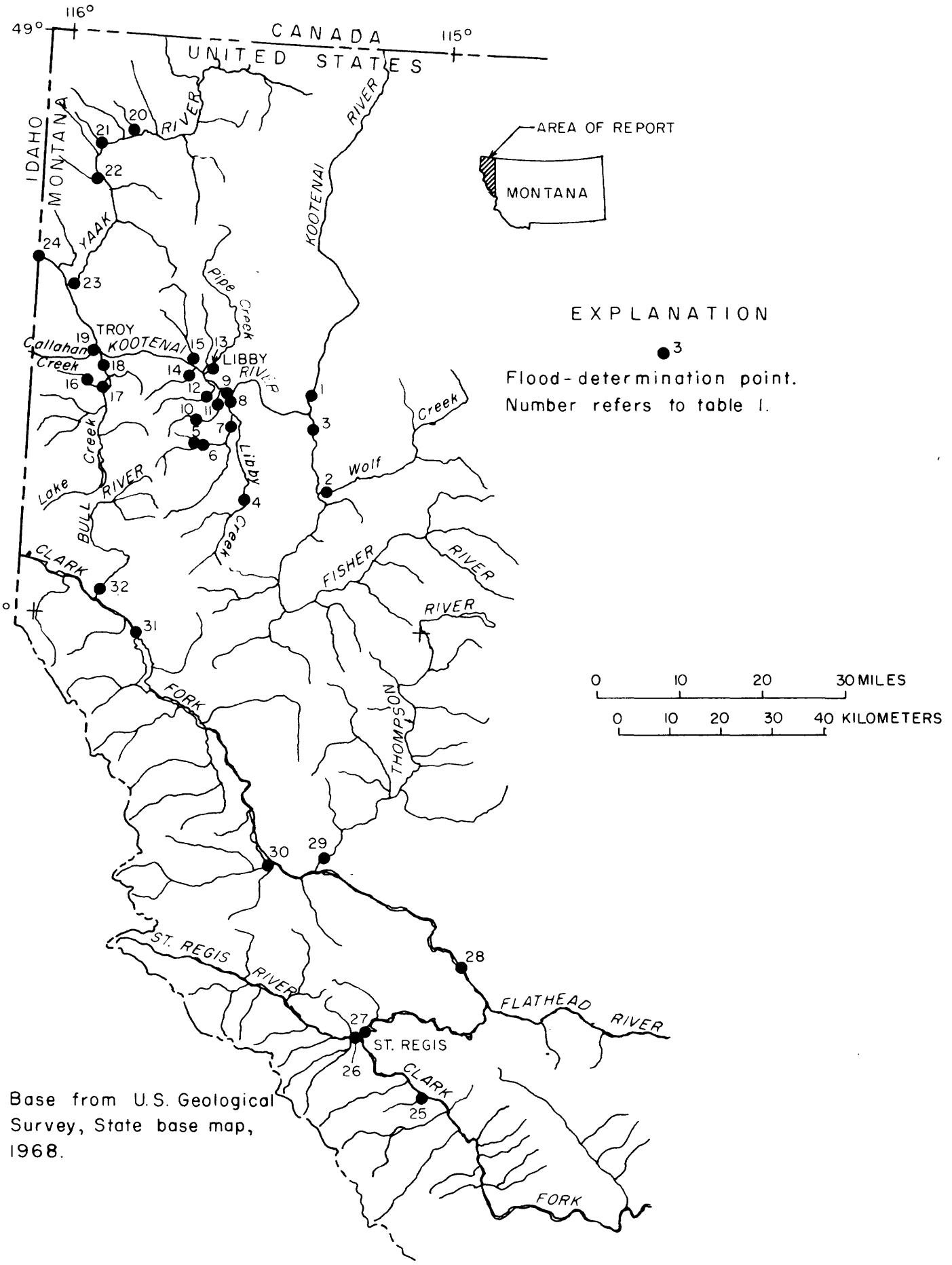

FIGURE 1.–EXTENT OF FLOOD AREA, JANUARY 15-17, 1974, NORTHWESTERN MONTANA.

The approximate area of flooding near Libby caused by Big Cherry, Flower, Libby, and Parmenter Creeks is shown in figure 2 (in pocket). Although the incorporated part of Libby did not suffer extensive flooding, water covered much of the surrounding area to the west and south where many homes and businesses are located.

Roads and bridges suffered most of the flood's damage. Preliminary estimates of damage to U.S. Forest Service roads and bridges exceeded $2 million. The Montana Highway Department estimated damage to state, county, and city roads at $900,000. U.S. Highway No. 2, a major east-west road, was closed to traffic for 5 days by mud slides and bridge washouts. Segments of U.S. Forest Service roads were completely destroyed when floodwaters covered the entire valley floors of several of the smaller streams.

Description of flood

In the Libby area flood-causing rains began January 13, 1974, and continued for 3 to 4 days at the rate of about 1 inch (20-30 mm, millimeters) per day. Unofficial reports, however, indicated greater amounts of precipitation in the Thompson Falls and Yaak areas. Preceding the flood, varying amounts of snow covered most of northwestern Montana. In the relatively low-altitude areas where snow cover was deepest, flooding was most severe. Subsequent to the peak flows, snow cover remained in nearly all areas. Continued melting of the snow caused streams to remain at flood levels for 3 days (fig. 3).

A summary of flood stages and discharges for 24 sites in the Kootenai River drainage and 8 sites in the Clark Fork drainage is given in table 1 (in pocket). Maximum flows for this flood were determined at 11 sites (numbers 4, 7, 8, 11-17, and 19) by indirect determination of peak flow and at 21 sites (numbers 1-3, 5-6, 9-10, 18, and 20-32) from existing stage-discharge relationship curves using logarithmic extensions where needed.

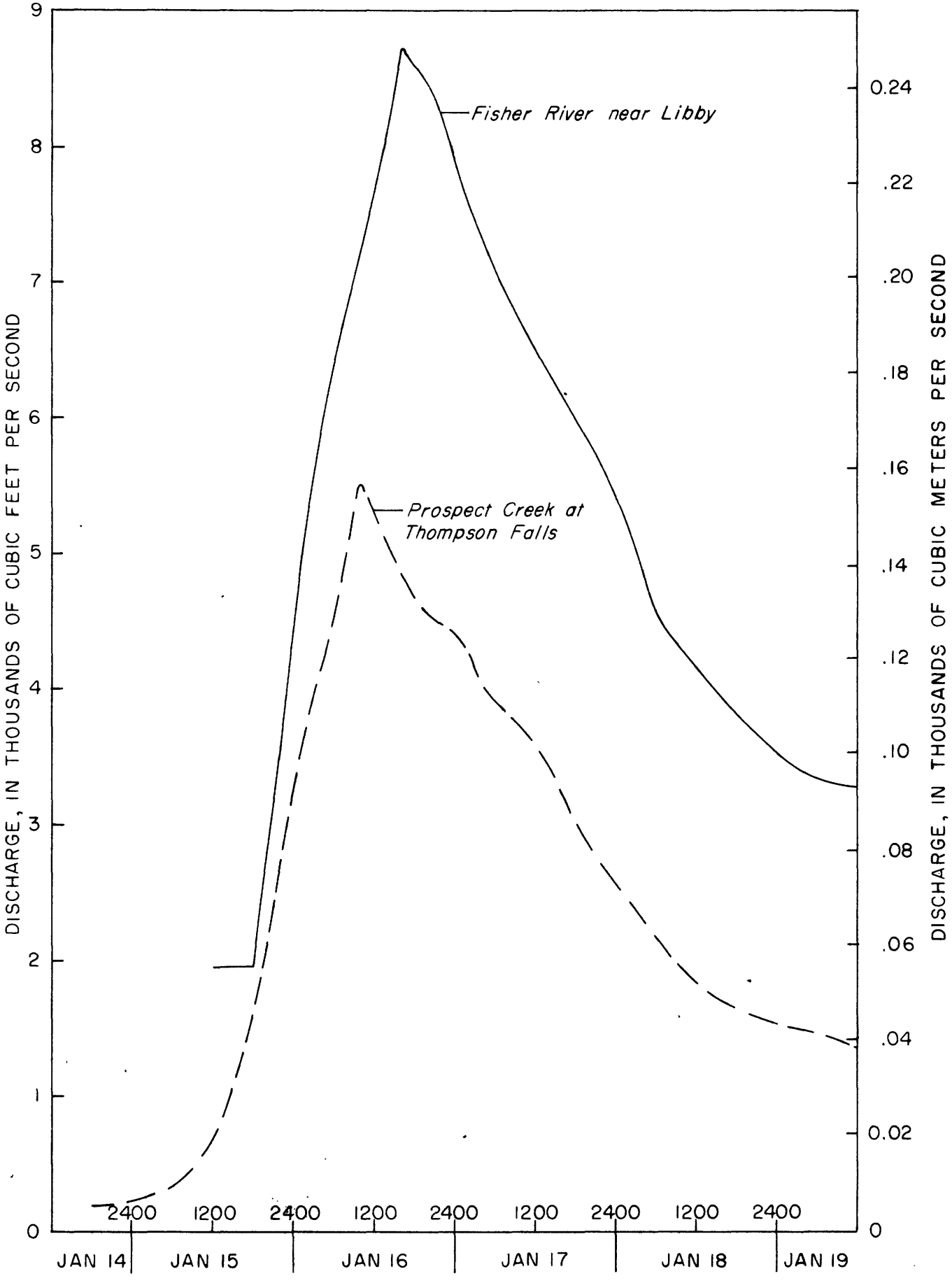

FIGURE 3.—HYDROGRAPHS, JANUARY 14-19, 1974, FOR FISHER RIVER AND PROSPECT CREEK.

A recurrence interval may be defined as the average interval, in years, in which a flood of a given magnitude will be equaled or exceeded once as an annual maximum. When the recurrence interval exceeds 50 years, it is expressed as a ratio of the flood magnitude to the 50-year flood. The recurrence intervals shown in table 1 were obtained from a frequency study by Bodhaine and Thomas (1964)[1/] except for some of the smaller drainages where sufficient record was available to develop site-frequency curves.

Although unseasonable, this flood is a hydrologically significant event. The summary of flooding (table 1) shows most of the smaller streams equaled or exceeded a 50-year flood.

1 Bodhaine, G. L., and Thomas, D. M., 1964, Magnitude and frequency of floods in the United States: U.S. Geol. Survey Water-Supply Paper 1687, 337 p.