

HAZARD IDENTIFICATION AND VULNERABILITY ANALYSIS (HIVA)

Walla Walla County, Washington

RIVER FLOODING

Hazard Overview

There have been three severe floods in Walla Walla County since about 1925. These floods took place in March 1931, December 1964, and February 1996.

The 1931 flood took place after heavy rains saturated the soils. It snowed about a foot of wet snow, and then it rained more with moderate Chinook conditions (warm temperatures and winds) rapidly melting the snow. The 1931 flood on Mill Creek was devastating to the City of Walla Walla. The Mill Creek Diversion and Reservoir (Bennington Lake) now protects Walla Walla during most floods.

The 1964 flood happened after warm winds and rains (Chinook conditions) occurred over snow on frozen ground, causing rapid melting. The 1996 flood occurred for the same reasons as in 1964, Chinook winds and rains rapidly melted snow over frozen ground. In some areas, after thawing out, heavy rains eventually saturated soils contributing to land slides.

The 1996 flood caused numerous damages throughout the County but the most severe impacts took place in Waitsburg and the upper Mill Creek area (Kooskooskie).

Most flooding in Walla Walla County occurs in winter and spring. Intense rainstorms, rapid snowmelt, and combinations of rain and snowmelt can cause flooding. There is also the possibility of short term flooding due to large prolonged summer thunderstorms. In Eastern Washington, the most severe floods tend to occur during periods of rapid snowmelt, sometimes in conjunction with significant rainfall, as was the case in the flood of February 1996. Frozen ground tends to increase the volume and rate of runoff during these flooding situations by preventing infiltration of melt or rain water. The very rapid melting of snow during a "Chinook" type warm wind event can cause creeks and rivers to rise rapidly. Peak flows tend to correspond with times of high temperatures. Because of the potentially large amount of water stored as snow, snowmelt flood events can last for several days or longer.

History and Probability of Occurrence

Walla Walla River Flooding: The largest recorded flood on the Walla Walla River occurred in December 1964 and was estimated to have a stage of 18.90 ft (423.90 ft MSL) and a peak discharge of 33,400 cubic feet per second (cfs) near Touchet (after confluence with Touchet River). Flooding of the Walla Walla River also occurred in January of 1965, as well as 1906, 1931, 1949, 1951, 1972, and 1996. Most flooding damages on the lower Walla Walla River are related to various types of road and bridge damages, bank and field erosion, and sediment deposition. The probability of occurrence is MEDIUM.

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Touchet River Flooding: Recorded significant floods on the Touchet River have occurred in 1906, 1931, 1949, 1951, 1964, 1965, 1972, and 1996. The maximum flood on the Touchet River occurred in December 1964 with a peak flood discharge of about 9350 cfs at Bolles Bridge (estimated 40 year event) and 11,500 cfs at Touchet (estimated 30 year event). In Walla Walla County, flooding of the Touchet River has mainly caused damages in the communities of Prescott and Waitsburg. Flooding also causes various types of road and bridge damage, bank and field erosion, and sediment deposition along the Touchet River to the Walla Walla River. Widespread severe damages and disruptions occurred in Waitsburg during the flood of February 1996. The probability of occurrence is MEDIUM.

Coppei Creek Flooding: Coppei Creek has experienced significant flooding several times. The flows and levels on Coppei Creek are not gauged. However, it is known that Coppei Creek contributed to the severe level of damages in Waitsburg during the flood of February 1996. The Creek left its channel and was diverted down Coppei Avenue where it collected behind the existing levee along the Touchet River causing damages to local structures. Other Coppei flood problems were related to road and bridge damage, bank and field erosion, and sediment deposition. Using high water marks, the U.S. Army Corps of Engineers has estimated the February 1996 peak flood discharge on Coppei Creek to have been about 1700 cfs. The probability of occurrence is MEDIUM.

Mill Creek Flooding: Due to the topography of its watershed, Mill Creek tends to have short floods. The largest of these floods are usually caused by prolonged intense rainfall on saturated soils, or rapid snowmelt in conjunction with rainfall. Flooding is a common occurrence on Mill Creek. The FEMA Flood Insurance Study reported in 1983 that the Mill Creek flow exceeded the bank-full capacity (600 cfs) 29 times out of 36 years of records. The 1931 flood was devastating to the City of Walla Walla spurring the construction of the Mill Creek Reservoir. The U.S. Army Corps of Engineers completed the Mill Creek Reservoir flood control project in 1942. During a flood, a portion of Mill Creek flow is diverted to be stored in the reservoir (Bennington Lake) decreasing discharges through Walla Walla. Flows in Garrison, Russell, and Yellowhawk Creeks are also controlled by the Corps project. The project also involved constructing a concrete floodwater conveyance channel (5400 csf capacity) through Walla Walla. Mill Creek major floods occurred in 1931 (6000 cfs with a stage of 7.5 ft in Walla Walla), 1964 (3300 csf controlled to 2400 csf by diversion), and 1996 (about 4000 cfs, both concrete channel and reservoir were reported to be at maximum capacity). Walla Walla sustained only minor damages during the February 1996 flood owing to the operation of the diversion and detention system. Mill Creek causes high levels of flood damages in the area of Kooskooskie due to residences constructed along the edge the river. Mill Creek flooding is also associated with bank erosion downstream of Walla Walla. The probability of occurrence is MEDIUM.

Yellowhawk, Cottonwood, Russell, Garrison, and Reser Creeks Flooding. There is little flooding data available regarding flows on Garrison, Yellowhawk,

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Cottonwood, Russell, and Reser Creeks. Flows in Russell, Garrison, and Yellowhawk Creeks are partially regulated by the Mill Creek Diversion and Reservoir project. In the absence of the Corps project the causes and frequency of flooding on these creeks would be expected to be similar to Mill Creek. The 1983 FEMA FIS reported that there was evidence of at least five floods in the last 50 years. These were in 1926, 1927, 1931, 1949, and 1964. The largest flood may have occurred in 1949. Only nuisance flooding was reported in these drainages during 1996. The probability of occurrence is LOW.

Overall the probability of river flooding in Walla Walla County within the next 25 years is MEDIUM.

Vulnerability

The areas of Walla Walla County listed above are vulnerable to river flooding. Future floods may damage people, homes, other structures and infrastructure that are located in the floodway and the 100-year and 500-year flood plain. Although the total population of the county is not directly exposed to this hazard the effect of the hazard will affect all residents indirectly, but not to the same degree. A worse case scenario of river flooding in Walla Walla County is likely to create a disaster of moderate to major, but not catastrophic, proportions. A MEDIUM vulnerability rating is assigned.

Risk Rating

Based on the probability of occurrence and Walla Walla County's vulnerability, a MEDIUM risk rating is assigned. There is moderate potential for a river flooding disaster of less than major proportions during the next 25 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be included in the county's emergency management training and exercise program.

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