

2.0 EXISTING CONDITIONS

2.1 MAIN CHANNEL AND TRIBUTARIES

The main channels and tributaries associated with the Dry Creek watershed are described below based on information in the Dry Creek Watershed Coordinated Resource Management Plan.

2.1.1 Dry Creek

Dry Creek is a second-order perennial stream that is approximately 17.6 miles long. The immediate sub-watershed area is 24.4 square miles. From the confluence of Miners Ravine and Secret Ravine, Dry Creek has relatively few meanders until Watt Avenue, after which it returns to more natural channel configurations. Dry Creek has four main tributaries consisting of nine streams, namely Miners Ravine and False Ravine; Sucker and Secret Ravines; Antelope Creek and Clover Valley; and Linda Creek, Cirby Creek, and Strap Ravine.

2.1.2 Miners Ravine and False Ravine

Miners Ravine is a perennial tributary whose main channel is approximately 15.2 miles long. It is entrenched within an alluvial valley floor, and serves to drain approximately 20.1 square miles of mixed-use land. The upper reaches of Miners Ravine are composed of intermittent drainages (8.0 miles) and the lower reach are primarily intermittent (12.1 miles) with some perennial first-order reaches (2.9 miles) and some second-order reaches (0.6 miles).

False Ravine, an approximately 1.5 mile long tributary, empties into Miners Ravine just west of East Roseville Parkway, upstream of North Sunset Avenue.

2.1.3 Secret Ravine and Sucker Ravine

Secret Ravine is a 7.8-mile long perennial stream. The contributing sub-watershed area is approximately 22.3 square miles. The upper reaches of Secret Ravine are all intermittent drainage ways (12.7 miles) and the lower reaches are intermittent (8.1 miles) and perennial (6.3 miles).

Sucker Ravine is a perennial stream and a tributary of Secret Ravine. Sucker Ravine flows from northeast to southwest within the City of Rocklin and is part of the Dry Creek watershed. The approximately five mile stream joins Secret Ravine after crossing under Interstate-80 and China Garden Road, near Greenbrae Road.

2.1.4 Antelope Creek and Clover Valley Creek

Antelope Creek is a perennial creek draining the northeast portion of the Dry Creek watershed. The mainstem is approximately 9.5 miles long and the watershed area is 21.4 square miles. The Antelope Creek system is composed of approximately 12.4 miles of intermittent tributaries in addition to a major tributary, Clover Valley Creek (7.1 miles long; watershed area of 10.2 square miles). The Aitken Reservoir is located within the Antelope Creek sub-watershed.²⁰

Clover Valley Creek drains the northwest portion of the Dry Creek watershed. Recent development in Clover Valley, including on-channel ponds and urbanization has altered the timing and quantity of streamflows. The 6.5 mile stream is bounded by hills in a narrow valley. The Clover Valley Creek joins with Antelope Creek downstream of Argonaut Avenue near Midas Avenue.

2.1.5 Cirby Creek, Linda Creek and Strap Ravine

Cirby Creek is a perennial stream approximately 2.7 miles long with a watershed area of approximately 3.4 square miles. Linda Creek comprises the upstream sub-watershed and Cirby Creek outflows directly into Dry Creek. The Cirby Creek watershed is almost entirely within the urbanized area of the City of Roseville.

Linda Creek is a perennial stream, approximately 10.8 miles long. The sub-watershed drainage area is 12.2 square miles and there are 7.3 miles of intermittent drainageways and 11.2 miles of perennial, first-order streams. Other waterbodies within this sub-watershed are Swan Lake, an unnamed reservoir, and approximately 10 unnamed ponds.

Strap Ravine is a perennial waterway that is approximately 3.6 miles long and drains an area of approximately 4.8 square miles. There are four unnamed ponds located on the USGS topographic map for this sub-watershed. Strap Ravine is a tributary to Linda Creek, and joins Linda Creek near North Cirby Way, just downstream of McLaren Drive.

2.2 LOCAL AND REGIONAL STRUCTURAL FLOOD CONTROL PROJECTS COMPLETED SINCE 1992

The Miners Ravine Off-Channel Detention Basin is the only regional flood control project that has been implemented within the Dry Creek watershed. Numerous local structural flood control projects, including stream crossings and conveyance improvements have been implemented since 1992. Selected earlier projects are listed for historical reference. On-site detention associated with specific development projects are categorized as non-structural floodplain management measures and are not listed in this section.

²⁰ ECORP Consulting, Inc., Dry Creek Watershed Coordinated Resource Management Plan, 2003.



2.2.1 Miners Ravine Off-Channel Detention Basin

The District completed the Miners Ravine Off-Channel Detention Basin in 2007. This project includes a basin that covers approximately 12 acres on a 26-acre parcel just west of Sierra College Boulevard near the intersection of Olympus Drive. The project includes an embankment that is approximately 18 feet high that is designed to impound up to 122 acre-feet of flood flows below the basin's spillway crest. The project provides mitigation for some of the increased flows within the Dry Creek watershed caused by development since the 1992 Plan. The project uses an off-channel detention basin to temporarily detain a portion of peak flood flows for a few hours in order to slow the release of the waters back into Miners Ravine. The gravity-draining design did not raise floodplain elevations outside of the basin, and limits the potential for trapping fish. Stormwater runoff in the main channel of Miners Ravine flows through the area unimpeded by the project when high water flows are not present.

The Miners Ravine Off-Channel Detention Basin project was designed to provide flood control benefit over a wide range of flow conditions along Miners Ravine, from the 2-year up to the 100-year event. The design report indicated that the project would provide a 263 cfs reduction in the 100-year storm event peak discharge at Vernon Street based on a modified 1992 Plan hydrology model with the storm centered to produce the maximum discharges at Vernon Street and the project hydraulic model simulations. The model that was used as a basis for design of the Miners Ravine project indicated a peak 100-year discharge at Sierra College Boulevard of 3,788 cfs, which happens to correspond closely to the flow capacity of the Sierra College Boulevard culvert before roadway overtopping. This flow rate of 3,788 cfs is lower than the 1992 Plan 100-year future conditions flow rate of 4,465 cfs and the FEMA 100-year flow rate of 4,900 cfs. The basin is configured to provide maximum flood attenuation for a storm event with a maximum flood stage that would almost overtop Sierra College Boulevard.

2.2.2 Local Structural Flood Control Projects

Sixteen flood control projects within the Dry Creek watershed have been completed since 1986. These flood control projects consisted of various culvert improvements, replacements, and/or removals; channel modifications; bridge replacements; and floodwall installations. Table D.1, included in Appendix D, provides a chronological listing of local flood control projects.

2.3 NON-STRUCTURAL IMPROVEMENTS SINCE 1992

Non-structural improvements that have been implemented and/or maintained since 1992 include building elevation projects, residential buy-outs, an ALERT flood warning

²¹ RBF Consulting, Miners Ravine Off-Channel Detention Basin Hydrology and Hydraulic Design Report, September 2007, p. 31-32.

system, streambed maintenance and local detention. Local detention projects are discussed in Section 3.9.1.2.

2.3.1 Building Elevation Projects

In 2001, FEMA funded 75 percent of this \$1 million program to elevate flood-prone homes. These are structures that would not be brought completely out of the floodplain by construction of our flood control project. Homeowner participation was voluntary. 27 of 44 homeowners on the list elevated their homes via this program. Most of those 27 are located in the Folsom/Maciel neighborhood along Dry Creek.

2.3.2 Residential Buy-outs

In 2001, flood control improvements were completed in two areas on Linda Creek: the Champion Oaks/West Colonial Parkway area, and the Sunrise/Oakridge area. This project reduced the size of the floodplain resulting in 233 homes no longer being located in the floodplain, and reducing the risk of flooding for 44 additional homes. Cost = \$16.1 million (\$8.7 million FEMA funds, \$7.4 million City funds).²²

2.3.3 ALERT Flood Warning System

The District, the City of Roseville, and Sacramento County each own and maintain ALERT flood warning response systems within the Dry Creek watershed. The ALERT system is a radio telemetry system licensed by the Federal Communication Commission. Remote stations transmit real-time precipitation and stream level data to base stations located in Auburn, Roseville and Sacramento. Detailed information about the existing ALERT system can be found in Section 1.7 and on Plate 10.

2.3.4 Annual Streambed Maintenance Program

Placer County has a stream channel maintenance program that is managed by the District. The County's program includes up to 2 miles per year of stream channel work at critical locations to maintain channel capacity, reduce debris and reduce invasive species.

After the 1986 flood, the City of Roseville entered into a Memorandum of Understanding with the State Department of Fish & Game, to allow fallen trees and debris to be cleared from creeks, which could otherwise float downstream and block culverts and bridges. Annual cost = \$100,000.²³ The City operates a stream cleaning program in the flood prone areas of Roseville each year. Details of this program can be found in the City's Creek Maintenance Guidelines dated February 2001 and the Stream Clearing Inspection Report dated July 2001.

²² City of Roseville Website, 2010. Available at: http://www.roseville.ca.us/
²³ City of Roseville Website, 2010. Available at: http://www.roseville.ca.us/



The City of Rocklin does not have a maintenance program for our stream channels, but rather a series of "Check Lists" used by City maintenance staff. The maintenance work focuses more on the engineered drainage systems that drain, retain, or detain storm runoff. Detention and retention basins are inspected each year and necessary maintenance is scheduled. Storm drain and culvert outlets are inspected during dry months and vegetation is cleared in the area 15 to 20 feet from the pipe outlets and 10 to 15 feet from culvert inlets. Inspection of critical infrastructure occurs before, during and after rain events. The primary objective is to remove any loose or floatable debris that will obstruct flow through box culverts, culverts, drain ditches. The type of material usually removed can vary from large tree limbs, tires, pieces of plywood and discarded pallets. The inspections begin in the fall and end in the spring.²⁴

2.4 EXISTING FLOOD HAZARDS

Plate 11 illustrates the locations of identified significant flood hazards within the Dry Creek watershed. This section provides a description of key locations, but does not indicate each roadway known to have been, or expected to be, overtopped during a major flooding event. Section 4.2 and Appendix E provide information about, and listing of, the structures with known or expected overtopping issues. The numbers listed in each section correspond to locations on Plate 11.

2.4.1 Rocklin²⁵

Sucker Ravine at Dominguez Road (1): Smaller crossings downstream of Dominguez Road cause backwater problems upstream, including the Dominguez road crossing which may impact future developments.

Pacific Street near Brace Road (2): Sheet flooding in the roadway due to backwater in the western part of Sucker Ravine and inadequately sized culverts forces road closures.

Brace Road on the eastern tributary of Sucker Ravine (3): Overtopped due to an inadequately sized 24-foot corrugated metal pipe (CMP) culvert.

Sucker Ravine at Racetrack Road (4): A house adjacent to Sucker Ravine on Racetrack Road lies in the floodplain. Future development may increase flood depths and frequencies at the house.

Sucker Ravine at Sierra Meadows (5): The water surface elevations are close to overtopping the road, although it has historically not been overtopped.

Antelope Creek / Antelope Creek Tributary / Sierra Meadows / Circuit Court (6): A small creek starts west of Sierra Meadows Drive, crosses Circuit Drive, passes under Pacific

²⁵ West Yost & Associates, City of Rocklin Drainage Master Plan, February 2006.



²⁴ E-mail from Kent Foster, Director of General Service, City of Rocklin

Street and continues west where it enters Antelope Creek near Yankee Hill Road. Culverts under Circuit Drive are undersized for the current runoff from an industrial area on Sierra Meadows Drive. If a larger culvert is constructed under Circuit Court, channel restoration and enlarged culverts between Circuit Drive and Antelope Creek need to be constructed.

Sucker Ravine at Rocklin Road (including I-80, Lakeside Drive, and Sierra Lakes Mobile Home Park) (7): Sierra Lakes Mobile Home Park flooded in the February 1986 storm, resulting in the need to evacuate residents under emergency conditions.²⁶ Extensive flooding may occur in the Sierra Lakes Mobile Home Park due to backwater from the I-80 culvert. The City of Rocklin Drainage Master Plan indicates that Rocklin Road may be overtopped by one to two feet causing disruption to a major artery.

Midas Avenue upstream to Del Mar Avenue (8): All the bridges including, and between, these two bridges are overtopped by 2.25-6.47 feet of water in 100-year event.

2.4.2 Roseville

Royer Park on Dry Creek (9): Multiple houses are adjacent to the FEMA floodplain and are subject to flooding.

Folsom Road on Dry Creek (10): The houses upstream from Folsom Road have been subject to historical flooding. Several have been elevated.

Riverside Avenue on Dry Creek (11): Several parcels are within the FEMA floodplain and are subject to flooding.

Oakridge Drive between Cirby Creek and Linda Creek (12): Over 100 homes flooded in the February 1986 storm event. Several of the flooded homes have been elevated. Channel modifications, including an added floodwall, bypass pipes, and a bypass channel were completed on Cirby and Linda Creeks in the 1990's.

2.4.3 Loomis²⁷

Sucker Ravine (13): Sucker Ravine's major crossings are at King Road, Saunders Avenue, Sierra College Boulevard, and Bankhead Road. The culvert at Kings Road backs floodwater. At Saunders Avenue, the road is overtopped flood flow; and Sierra College Boulevard backs water up during flood runoff.

Secret Ravine (14): Secret Ravine crosses Horseshoe Bar Road, Brace Road, and Gade Lane. Each of these bridges is overtopped during at 100-year event. Brace Road would be overtopped by about three feet.

West Yost & Associates, *Town of Loomis Drainage Master Plan*, November 2001.



²⁶ City of Rocklin, Request for Proposal Engineering Deisgn Services for Central Rocklin Drainage Improvements (Sucker Ravine), August 2010.

Antelope Creek (15): Antelope Creek has major crossings at King Road, Sierra College Boulevard, and Delmar Avenue. Two or three homes are located in the flood plain upstream of King Road. The 100-year runoff will overtop the road. The floodplain widens upstream of Sierra College Boulevard during a 100-year runoff event; however, the road is not overtopped. At Delmar Road, the 100-year runoff will overtop the road; however, no homes are within the floodplain.

2.4.4 Placer County

Miners Ravine (16): Problem areas for flooding are upstream of Sierra College Boulevard, near Joe Rodgers Road, and at the bridges of Leibinger Lane, Carolinda Drive, and Itchy Acres Road.²⁸

Secret Ravine (17): Three properties on Rustic Hills Drive have reported flood damages.

Linda Creek below Auburn-Folsom Road (18): Numerous properties in the Troy/Purdy Lane area are adjacent to the 100-year floodplain and are subject to flooding.

Lower Dry Creek between Roseville and Sacramento County (19): Several homes were flooded during the February 1986 storm event.

2.4.5 Sacramento County

Dry Creek (20): Flooding has occurred along most of Elkhorn Boulevard, including many residences, schools and businesses. Over 200 homes and business were flooded along Elkhorn Boulevard during the February 1986 storm event.²⁹

²⁹ James M. Montgomery, Dry Creek Watershed Flood Control Plan, 1992,



ECORP Consulting, Inc., Dry Creek Watershed Coordinated Resource Management Plan, 2003.