

Water In, Water Out, But From Where?

The Putah Creek watershed lies on the eastern slope of the Coast Range, south of the Cache Creek drainage and north of Napa Valley. The drainage encompasses southern Lake County, the northern half of Napa County, and small portions of Yolo and Solano Counties. Putah Creek originates from the northwestern corner of the drainage, off Cobb Mountain in Lake County, and flows southeastward, into the Yolo Bypass near Davis. For management purposes, the Putah Creek watershed is typically divided into the "Upper Drainage", which encompasses the 568-square mile area upstream of Monticello Dam, and the "Lower Drainage", which consists of a considerably smaller but less precisely defined area between Monticello Dam and the Yolo Bypass. Approximately 90% of the total annual flow of Putah Creek measured at the confluence of Putah Creek and the Yolo Bypass originates from the Upper Drainage.

The Solano County Water Agency provides water to Lower Putah Creek for environmental protection and to meet valid water rights. Downstream of Monticello Dam, Putah Creek leaves Napa County and becomes the boundary between Yolo and Solano Counties. The stream continues east along State Route 128, meeting Pleasants, McCune, and Dry Creeks and passing through the town of Winters to reach Interstate 505.

The natural flow pattern of Putah Creek has been altered by water storage in Lake Berryessa, and spring through fall irrigation releases. Flows from Monticello Dam are high in summer and low in winter in all but the wettest years. The largest diversion is the Putah South Canal diversion at Putah Diversion Dam; this and other irrigation diversions reduce flows to very low levels in all but wet years. Until recently, flows near Davis were very low during summer and fall, generally 0 to 60 CFS. These lengthy periods of drying resulted in substantial fish deaths and a general depression of the overall fish population to the dismay of Creekside landowners, conservationists, birders, nature lovers, and environmentalists.

On May 23, 2000, following 10 years of litigation related to stream flows for supporting fish and other natural resources, Putah Creek Council, City of Davis, and UC Davis signed on to a historic water accord with the Solano County Water Agency, Solano Irrigation District, and other Solano water interests to establish permanent surface water flows for the 23 miles of Putah Creek below the Putah Diversion Dam. Approximately 32,000 acre-feet per year is required to be passed below the dam for environmental purposes. Another 200,000 acre-feet of Putah Creek water per year is diverted to Solano County farmers (about 75%) and urban users (about 25%).

The rain causing the rapid increase in 2017 lake levels raised questions for some about where all the water comes from and where it goes. The lake was rising and lower Putah Creek was flowing fast, but not much water was being released from the dam. And some people questioned why any water was being released from Lake Berryessa when it was not yet full.

Many people don't understand that Lake Berryessa was created for: 1. Irrigation in Solano County, 2. Drinking water (now for 500,000 people). Recreational use was not considered a priority because of the large swings in water level expected. Many also don't realize that Napa County gets little of Lake Berryessa water except for the small villages scattered around the lake like the Berryessa Highlands, Spanish Flat, Berryessa Pines, and Berryessa Estates.

Although water may be flowing in Lower Putah Creek, nearly 90% of the Putah Creek watershed is above Lake Berryessa. Most of the rain flows into Lake Berryessa, not out of it. The flow in Putah Creek near Winters is predominantly from the main creeks below Lake Berryessa. For example, the total flow out of Lake Berryessa was 1,625 acre-feet (AF) for January 2017. During that same period, the lake's capacity rose by 399,970 AF. The output was only 0.4% of the input. (1 CFS = 1.98 acre-feet per day; 1 AF = 325,851 US gallons per day) The Solano Irrigation District monitors this and reduces flows from the bottom of Lake Berryessa during rain events to conserve as much water as possible in the lake. But the flow needs to be at

least 45 CFS in order to properly operate the powerhouse - this was the average outflow every day for the full month of January 2017.

There are four main creeks below Berryessa. They are Wildhorse Creek (Cold Creek) right next to the Monticello Dam, Pleasants Creek which empties into Lake Solano, and McCune Creek and Dry Creek below the Diversion Dam just upstream of the railroad bridge at Winters. These creeks can contribute significant inflow to the system before entering Winters. It is estimated that during the January 8, 2017, storm the flow through Winters was between 2,500 and 3,000 CFS.

Combined, there is normally 2100 CFS of water flowing underneath the bridge at Winters during the winter rains, which is much higher than the normal flow 25 CFS in the same spot seen during summer. All of this water entered the system from tributaries below the Monticello Dam, not from Lake Berryessa. Since there is no need for irrigation flows during rain events, and to keep the diversion canal free of silt and mud, nearly all the water from Pleasants Creek and Wildhorse Creek flows over the Diversion Dam at Lake Solano and continues downstream towards Winters.

When flood water is entering the system the Diversion Dam operators release the water through flood gates into Putah Creek to prevent the dam from being overtopped. The water being released is what has entered the system below the Monticello Dam and does not affect the storage in the lake at all. A good example is that during the January 8-9, 2017, storm the flood releases from the Diversion Dam to Putah Creek was around 1,800 CFS, while the estimated inflow to Lake Berryessa was above 40,000 CFS.