



What is the name of this waterbody and why was it built? [email answer to rclayshulte@earthlink.net] [Each newsletter will feature a new picture to identify from the watershed.]

# BCWA PINNACLE



Volume 2013.1

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## Bear Creek Watershed Association, Colorado

### Water Quality Studies in Progress

*The Bear Creek Watershed Association protects and restores water and environmental quality within the Bear Creek Watershed from the effects of land use.*

- Clear Creek County
- Jefferson County
- City of Lakewood
- Town of Morrison
- Aspen Park Metropolitan District
- Bear Creek Cabins
- Brook Forest Inn
- Conifer Sanitation Association
- Conifer Metropolitan District
- Denver Water Department
- Evergreen Metropolitan District
- Forrest Hills Metropolitan District
- Genesee Sanitation & Water District
- Geneva Glen
- Jefferson County School District
- Kittredge Water & Sanitation District
- Singing River Ranch
- The Fort Restaurant
- Tiny Town Foundation, Inc.
- West Jefferson County Metropolitan District
- Evergreen Trout Unlimited
- U.S. Army Corps of Engineers

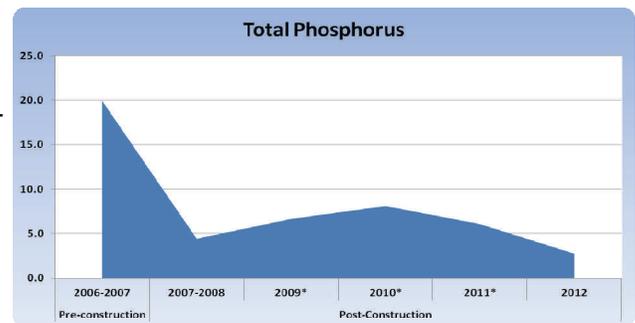
*The Bear Creek Watershed Association identifies, defines, collectively develops, maintains and implements a local environmental and water quality monitoring, management plan and watershed-based program for the Bear Creek Watershed that meets reservoir and watershed applicable water quality standards and beneficial use classifications as adopted by the Colorado Water Quality Control Commission.*

### Coyote Gulch, Bear Creek Park, Morrison

The Association is involved in a nonpoint source project originally sponsored by the City of Lakewood that restored a severely eroded section of Coyote Gulch in Bear Creek Park, which is directly tributary to Bear Creek Reservoir. Drainage from the gulch was monitored prior to restoration as a significant non-point source of total phosphorus reaching the reservoir. Coyote Gulch revegetation began in June 2007 and became well established in

2008. The Association has a paired water-sampling program, which allows a determination on the effectiveness of the restoration effort at phosphorus reduction. The Association has monitored flow and limited chemistry since March 2006. The Association Tech-

nical memorandum Coyote Gulch Summary January 2013 (TM 2012.05) provides a detailed summary of the monitoring and data. Total phosphorus reduced by the project is an *Association Trade Credit* of 89 pounds per year for use in future nutrient trades.



### Kerr/ Swede Gulch E. Coli and Septic Influence Studies

The Colorado 303(d) list lists Swede Gulch as a low priority for E. coli. The mainstem is Kerr/ Swede Gulch with the western gulch upstream of the upper confluence as Kerr Gulch and the eastern tributary as Swede Gulch. The Association committed to a 5-years

monitoring program to evaluate E. coli on Kerr/ Swede Gulch. The Association monitors E. coli at 4-sites from January (provided winter flows) through December. In 3-years of monitoring, there are no exceedances of the E. coli standard. The Kerr/ Swede Gulch Project also

focuses on a limited number of septic systems (<35) that leach to the lower portion of the drainage near the confluence. The monitoring program measures a nutrient load (total phosphorus and total nitrogen) potentially related to septic system discharges.



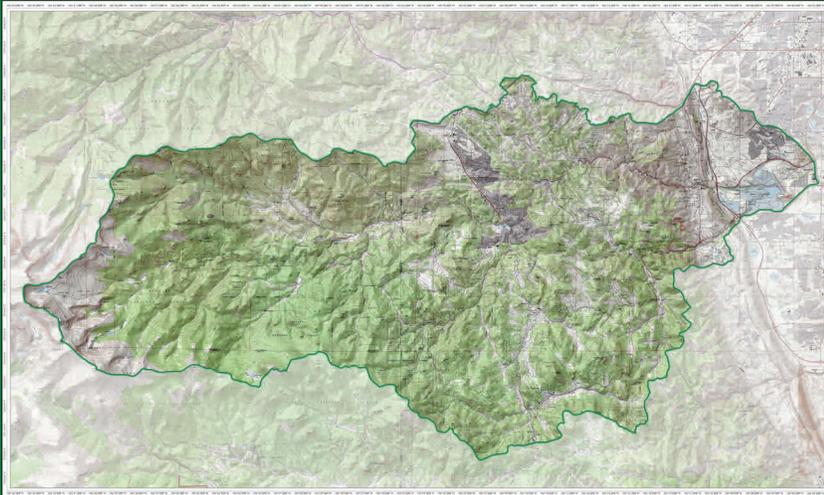
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How many sport fish species are in the watershed?

The Association helps implement the State of Colorado Bear Creek Reservoir Control Regulation #74. This regulation has water quality goals, assigns wasteload allocations to wastewater treatment plants, requires nutrient management, requires a monitoring program, and calls for the Association membership to use control strategies to protect the Bear Creek Watershed.

### Bear Creek Watershed 2011



The 236 sq.-mile watershed includes all tributary water flows that discharge into the 110 surface-acre Bear Creek Reservoir. The watershed extends from the Mount Evans Wilderness on the western end (Mt Evans elevation is 14,240 feet) to the Town of Morrison on the eastern end (elevation is 5,764 feet). The two major tributaries are Bear Creek (80% of stream flow) and Turkey Creek (20% of stream flow). There is a 100-year flow record available for Bear Creek in Morrison. This record shows a declining long-term trend in annual flow with an earlier shift in spring peak runoff, which in the last decade is almost 5-weeks earlier than historically. Did you know the road to Mt. Evans is the highest paved road in North America.



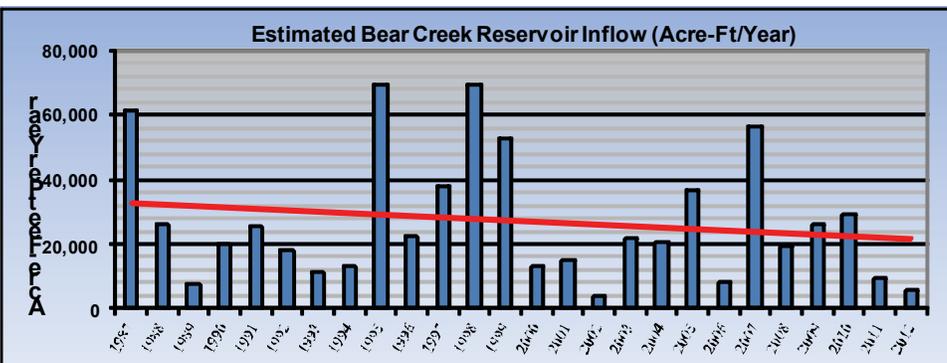
Staff Gage on Turkey Creek Drainage, Bear Creek Park, Morrison. The Association has similar staff gages on other stream segments that are operated by volunteers.

### Bear Creek Reservoir Aeration Study/Program

The reservoir aeration system reduces chlorophyll productivity, possibly through the partial control of internal nutrient loading that can trigger algal blooms. The Association adopted a policy that makes the reservoir aeration system a permanent reservoir management tool. The Association determined through ongoing monitoring that the de-stratifying aeration system is a necessary and long-term man-

agement practice necessary to protect the high quality reservoir fishery and prevent dissolved oxygen standard exceedances during summer months of June 1-September 30. Reservoir aeration is especially a critical management tool in low flow conditions. The current aeration system has been operational since the summer of 2002 and uses a fine-bubble diffusion system with aerator ports distributed across

the bottom of the reservoir. The Association & Lakewood operate the aeration system using a phased on-off cycling. The aeration system can increase the dissolved oxygen concentrations throughout the water column by about 2 mg/l within a two-week period. The aeration system has helped prevent dissolved oxygen standard problems in the reservoir, and improved the fishery quality.



The Association is monitoring bottom sediments in Bear Creek Reservoir to determine internal total phosphorus loading.