

BEFORE THE COLORADO WATER QUALITY CONTROL COMMISSION
Department of Public Health and Environment, State of Colorado

REBUTTAL STATEMENT OF THE BEAR CREEK WATERSHED ASSOCIATION

IN THE MATTER OF THE RULEMAKING HEARING FOR CONSIDERATION OF REVISIONS AND ADOPTION OF THE 2012 LIST OF WATER-QUALITY-LIMITED SEGMENTS REQUIRING TOTAL MAXIMUM DAILY LOADS AND COLORADO'S MONITORING AND EVALUATION LIST (REGULATION NO. 93)

The Bear Creek Watershed Association (hereinafter "BCWA") presents its Rebuttal Statement in the above referenced matter.

I. Statement of Factual and Legal Claims.

The BCWA is responsible for watershed management, restoration and implementation within the context of a management agency and the Bear Creek Control Regulation (Control Regulation 74, 5 CCR 1002-74). The Association provides information in the form of this rebuttal statement on the proposed changes to Regulation #93.

The BCWA met with Water Quality Control Division (Division) staff to review and discuss differences between the Division and BCWA proposals for proposed changes to Regulation #93. The BCWA rebuttal statement reflects those points of agreement and remaining issues with the Division. The rebuttal statement reflects the BCWA recommendations for segments 1a, 1e and 2 within the Bear Creek Watershed.

II. BCWA Summary Position.

There were three new proposed 303(d) listing segments within the Bear Creek Watershed as contained in the Water Quality Control Division Proponent Prehearing Statement. The Division and the BCWA reviewed these segments and Table 1 reflects the jointly agreed changes and remaining issues between the Association and the Division. With the exception of the proposed temperature listing on Segment 1e (Table 1), the BCWA and Division are in general agreement. The BCWA recommends temperature for Segment 1e be included on the Monitoring and Evaluation List, while the Division supports listing temperature as a parameter of concern for Segment 1e. There are minor differences in the segmentation of segments 1a and 1e.

Table 1 BCWA and Division Summary Position and Remaining Issues

WBID	Segment Description	Portion	BCWA and Division Joint Position and Remaining Issue(s)
COSPBE01a	Mainstem of Bear Creek from the boundary of the Mt. Evans Wilderness area to the inlet of Evergreen Lake.	<u>Issue:</u> select the segment division based on a geophysical location or a hydrologic feature.	<ol style="list-style-type: none">1. The BCWA and the Division support a provisional listing for Aquatic life as a low priority for a lower portion of the segment.2. The Division accepts the BCWA evidence that upstream macroinvertebrate sampling shows no indication of aquatic life impairment.3. The BCWA recommends for multiple reasons that the portion of the segment for provisional listing should begin at Golden Willow Road Bridge, Clear Creek County and extend downstream to the Inlet of

Rebuttal Statement Bear Creek Watershed Association

WBID	Segment Description	Portion	BCWA and Division Joint Position and Remaining Issue(s)
			<p>Evergreen Lake. The Division supports using a hydrologic feature rather than a geophysical location. The Division recommends using Witter Gulch as the hydrologic break-point.</p> <p>4. The BCWA and Division support the position that the BCWA extensive data set does not identify a parameter of concern; as such no water quality parameter will be included under the 303(d) listing.</p> <p>5. The BCWA will begin monitoring in 2012 at the Golden Willow road bridge site and investigate the potential parameters of concerns for the lower portion of the segment.</p>
COSPBE01c	Bear Creek Reservoir	all	<p><u>No Listing Issue:</u> The BCWA and Division support removing the dissolved oxygen listing from the monitoring and evaluation listing and retaining the current listing for chlorophyll a and total phosphorus.</p>
COSPBE01e	Mainstem of Bear Creek from the outlet of Evergreen Lake to the Harriman Ditch.	<p><u>Issue:</u> Only the upper portion of the segment has low MMI scores; as such only a portion of the segment should be listed. The BCWA recommends the inlet from Swede/Kerr Gulch be used as the break-point</p>	<p>1. The BCWA doesn't support the proposed aquatic life listing with a high priority with Temperature listed as the parameter causing impairment. However, the BCWA will support the Division recommendation to include a portion of segment 1e on the monitoring and evaluation list for Aquatic Life with no priority listing.</p> <p>2. Based on macroinvertebrate and fishery data, the BCWA recommends the portion of the segment from Evergreen Lake outlet to the discharge from Swede/Kerr Gulch be included on the M&E list.</p> <p>3. <u>Issue: Temperature listing on segment 1e.</u> The massive BCWA temperature data record (>708,000 measurements over 9-years) collected by the BCWA for this segment does not support temperature as the problem. The BCWA doesn't support listing temperature as a parameter of concern on the 303(d) list. However, the BCWA acknowledges that higher temperatures occur in portions of the upper stream and will support adding temperature to the M&E List for a portion of Segment 1e.</p> <p>The Division supports listing Segment 1e for Temperature.</p>
COSPBE02	Bear Creek below Bear Creek Reservoir to South Platte River	Below Kipling Parkway (CO 390)	<p><u>No Issue:</u> The BCWA supports the Division recommendation to list Aquatic Life on the M&E list for Segment 2.</p>
COSPBE05	Swede, Kerr, Sawmill, Troublesome and Cold Springs Gulches and Cub Creek	Swede/Kerr Gulch	<p><u>No Issue:</u> The BCWA continues the monitoring program on this segment and supports no change to the current listing.</p>

Table 2 BCWA Recommendations for Listings in Bear Creek Watershed for Regulation #93 2012 Listing Hearing.

WBID	Segment Description	Portion	Colorado's Monitoring & Evaluation Parameter(s)	Clean Water Act Section 303(d) Impairment	303(d) Priority
COSPBE01a	Mainstem of Bear Creek from the boundary of the Mt. Evans Wilderness area to the inlet of Evergreen Lake.	<u>Below Golden Willow Road Bridge to the inlet of Evergreen Lake.</u>		Aquatic Life (provisional)	<u>L</u>
COSPBE01c	Bear Creek Reservoir	all	D.O.	Chl-a, phosphorus	H
COSPBE01e	Mainstem of Bear Creek from the outlet of Evergreen Lake to the Harriman Ditch.	<u>Outlet of Evergreen Lake to the Kerr/Swede Discharge into Bear Creek</u>	Aquatic Life Temperature		
COSPBE02	Bear Creek below Bear Creek Reservoir to South Platte River	Below Kipling Parkway (CO 390)	Aquatic Life	E. coli (May-Oct)	H
COSPBE05	Swede, Kerr, Sawmill, Troublesome and Cold Springs Gulches and Cub Creek	Swede/Kerr Gulch		E. coli	L

Segment 1a.

The BCWA and the Division support a provisional listing for Aquatic life listing on the 2012 303 (d) list for the lower portion of Bear Creek Segment 1a as a low priority. The Division accepts the BCWA evidence that upstream macroinvertebrate sampling shows no indication of aquatic life impairment in the middle and upper portions of Segment 1a. The one site on Segment 1a with potential aquatic life impairment is Keys-On-The-Green. This site is just upstream from the golf course and below the housing development of Upper Bear Creek. None of the upstream sites on segment 1a have show impairment and are in attainment of the aquatic life index. However, the BCWA continues to contend that anthropogenic and natural impacts at a site can greatly affect the MMI scores. The Keys-On-The-Green site is particularly venerable to anthropogenic and natural impacts. The site has a lot of fishing and recreation pressure. The wide shallow stream provides an ideal location for families to take kids to play in the stream. The area receives roadway runoff and has a higher sand composition than upstream areas.

The BCWA extensive data set collected on the lower, middle and upper portions of Segment 1a does not identify a parameter of concern; as such no water quality parameter should be included under the 303(d) listing. The BCWA monitors temperature at 4 sites along Segment 1a (Table1). Some elevated temperatures were recorded at the Keys-On-The-Green site in 2010. There is a cold season to warm season transition issue for temperature being evaluated by the BCWA. The BCWA will continue temperature monitoring to better understand the factors affecting temperature in the lower portion of Upper Bear Creek. The BCWA asserts that any water quality parameter listing, including temperature, for this Segment 1a is not appropriate based on the existing data sets.

Table 3 Temperature Measurements from Segment 1a

2010 Total Number of Measurements (Off- and Growing seasons)				
	# 30-min. Temps.	# Calculated WAT	# 2-Hr. Avgs. For DM Calculation	# Calculated DM
Segment 1a	26,286	547	76	6,565

The fishery surveys conducted by the Colorado Parks and Wildlife Division does not indicate a fishery problem at the Keys-On-The-Green site with the 2005-2010 average of 910 trout per acre, which is slightly higher than the watershed average of 856 trout per acre (Figure 1). The number of Brown Trout at this site averages 896 Brown Trout/Acre with the watershed average at 433 Brown Trout/Acre

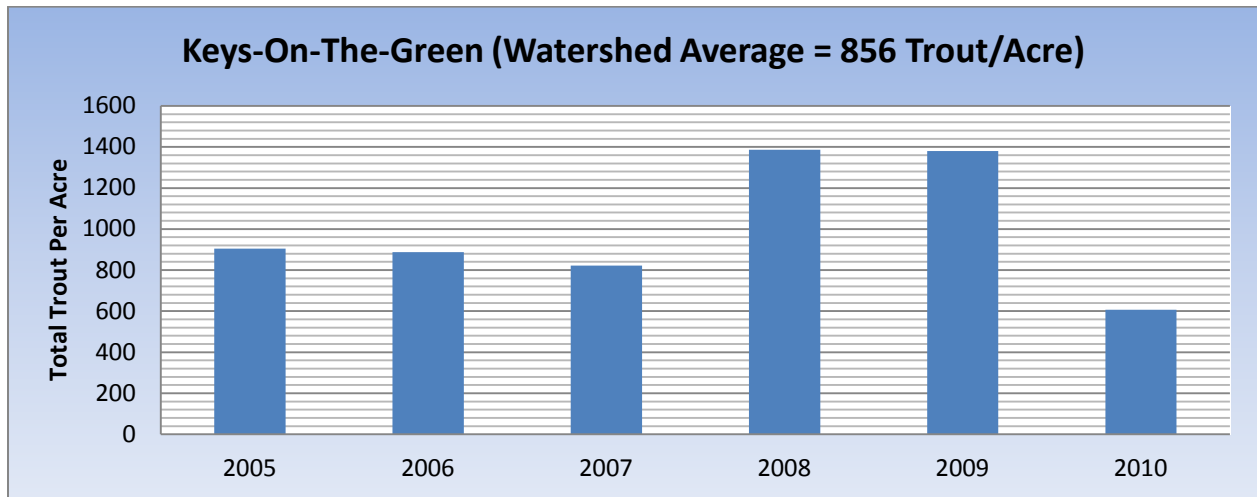


Figure 1 Total Trout per Acre at the Keys-On-The-Green Site, Segment 1a.

The BCWA recommends for multiple reasons that the portion of the Segment 1a for provisional listing should begin at Golden Willow Road Bridge, Clear Creek County (Figure 2) and extend downstream to the Inlet of Evergreen Lake:

- The site has easy access for water quality sampling along the bridge right-a-way without accessing private property.
- The site is safe for sampling personnel.
- The site is easily mapped and is a clear segmentation point.
- The site is used by Clear Creek County to load water for road-wetting and at low flow conditions can cause a significant drawn-down of Bear Creek.
- The site has a good cross-section for doing flow measurements.
- The site has good cobble substrate for future macroinvertebrate sampling.
- This area marks the extent of wastewater service to the upper Bear Creek by the Evergreen Metropolitan District and houses below this point to Evergreen Lake are sewered, except for Witter Gulch (Clear Creek County). As such, water quality upstream of this bridge will reflect a un-sewered area.

The BCWA will begin monitoring in 2012 at the Golden Willow road bridge site and investigate the potential parameters of concerns for the lower portion of the segment. This could include periodic sampling of water quality from Witter Gulch.

The Division supports using a hydrologic feature rather than a geophysical location. The Division recommends using Witter Gulch (CO RD 475) as the hydrologic break-point (Figure 2). While this site does provide a good hydrologic segmentation point, the BCWA has concerns about using this location as a sampling point:

- The site has difficult access for water quality sampling.
- It is located on private property.
- It is an un-safe location for sampling personnel to park and collect samples.
- Sampling data could be affected by flows from Witter Gulch during runoff events.
- The site has a poor cross-section for flow sampling.
- The cobble substrate is lacking due to the extensive streambed alterations done by homeowners.

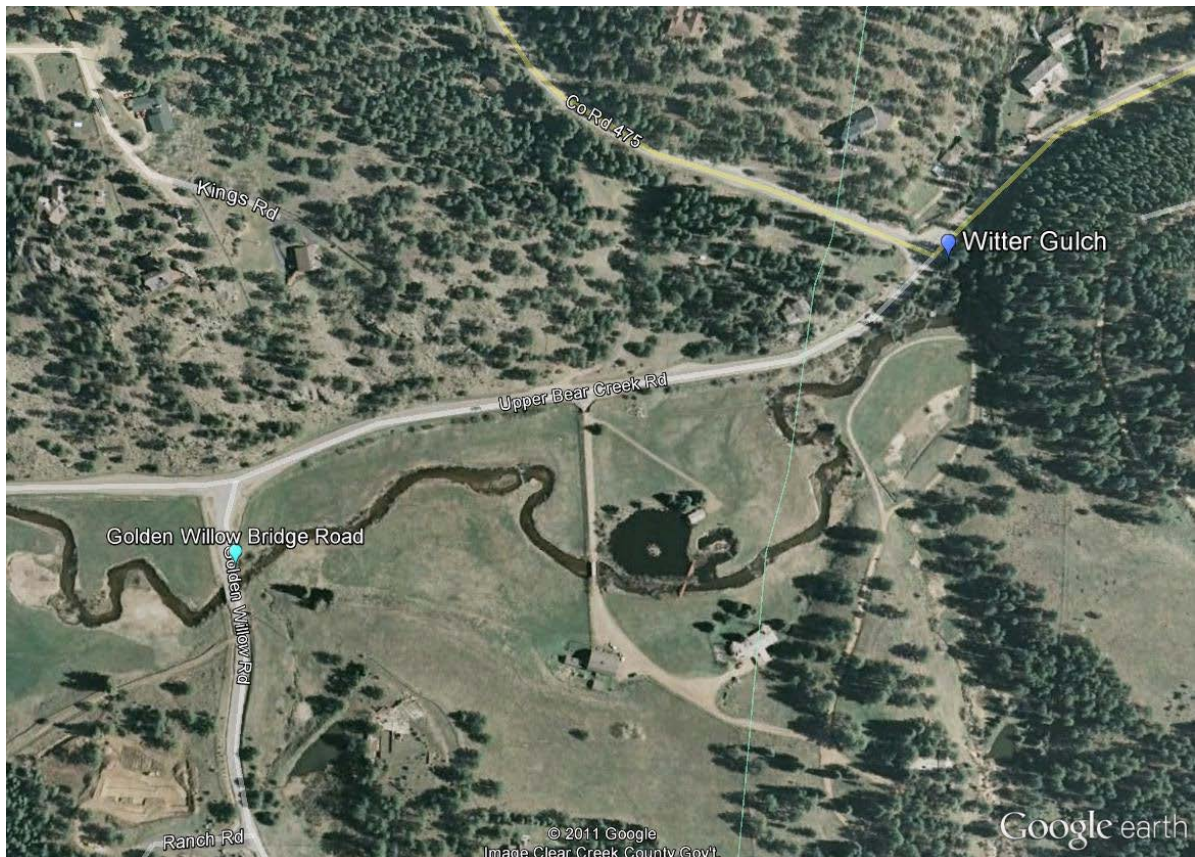


Figure 2 Segmentation Point on Bear Creek Segment 1a; The BCWA Recommends Golden Willow Bridge Road and the Division Recommends Witter Gulch (CO RD 475).

Segment 1e

The BCWA samples for water quality, flow, temperature and other parameters at 6 routine sites on Segment 1e from the outlet of Evergreen Lake to the Harriman Diversion in Morrison (Figure 3). The BCWA also has obtained temperature records at 6 additional locations along Segment 1e. There is over a 20-year water quality data record for this Segment 1e. Based on this extensive understanding of water quality on Segment 1e, the BCWA does not support the proposed aquatic life listing with a high priority with temperature listed as the parameter causing impairment.

The BCWA will support the Division recommendation to include a portion of Segment 1e on the Monitoring and Evaluation List for Aquatic Life with no priority listing for Aquatic Life. Based on water quality data, macroinvertebrate and fishery data, the BCWA recommends the portion of the segment from Evergreen Lake outlet to the discharge from Swede/Kerr Gulch, which is BCWA Site 52, be included on the M&E list for Aquatic Life (Figure 4). The Swede/Kerr Gulch is a natural hydrologic feature that easily divides Segment 1e for M&E listing for Aquatic Life. There is no reasonable hydrologic feature below this point that could be supported by the data sets.

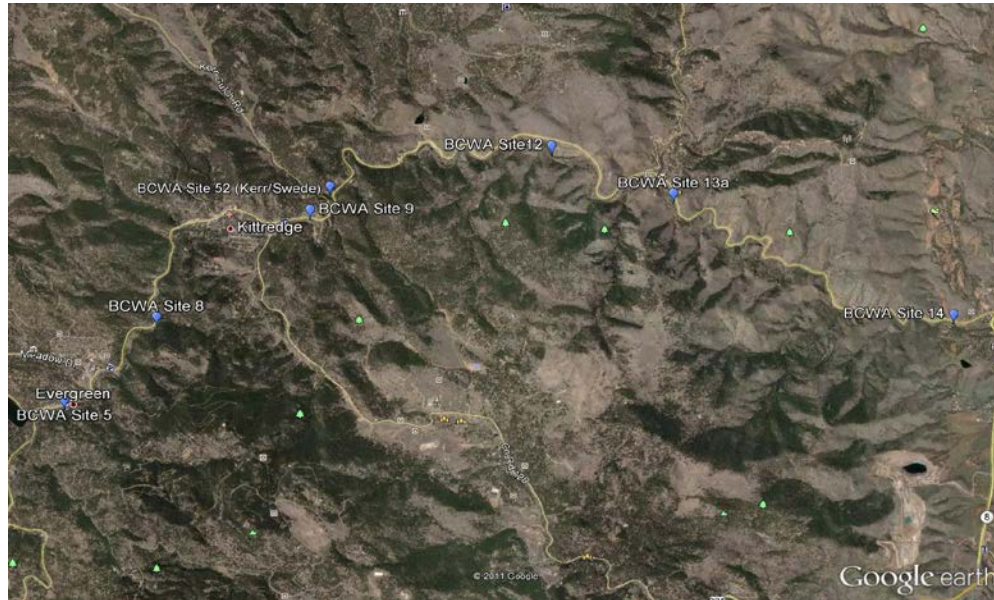


Figure 3 Bear Creek Segment 1e and BCWA Monitoring Stations



Figure 4 Proposed listing Segmentation Point at Swede/Kerr Gulch Discharge into Bear Creek (Site BCWA site 52)

Segment 1e Temperature Analysis. The massive BCWA temperature data record (>708,000 measurements over 9-years) collected by the BCWA for this segment does not support temperature as the problem (Table 4). The BCWA has collected over 2.3 million temperature measurements at over 32 sites in the watershed. The BCWA has temperature data at 12 sites along Segment 1e, plus data from all of the wastewater discharges. Temperature data is collected in both the cold and warm seasons with some sites having complete annual records. On Segment 1e, the number of temperature measurements that have exceeded the 19.3°C temperature standard is a very small fraction (Table 4) with only about 0.10 % of the individual measures exceeding the standard; and yet the segment is proposed for a temperature listing as an impairment parameter. Under the listing criteria there does not appear to be any consideration of science fact or common sense.

The BCWA continues to be concerned that data generated by un-calibrated temperature probes takes precedence over annually calibrated temperature probes. The BCWA has also demonstrated that the placement of the probe in the stream channel can affect the readings. It is very easy to place a probe in the stream to maximize the readings. The BCWA is careful to place the brick and probe in a similar stream environment at each site, which improves the ability to compare sites. We are plagued at certain sites by people moving the bricks and occasionally removing them from the stream. The BCWA field inspects the probes on a monthly basis. Problematic sites include BCWA Site 5 in downtown Evergreen, BCWA Site 8a at Bear Creek Cabins, and O’Fallon Park. Partially exposed bricks can result in higher temperature measures.

The BCWA doesn’t support listing temperature as a parameter of concern on the 303(d) list. However, the BCWA acknowledges that higher temperatures occur in portions of the stream segment upstream the Swede/Kerr Gulch discharge point and will support adding temperature to the M&E list for this upper portion of Segment 1e.

Table 4 Temperature Measurements in Bear Creek Watershed

	# Temperature Measurements		Temperature	Segment 1e
	Watershed	Segment 1e	>19.3°C	Percent
2007-2011	1,417,000	394,975	448	0.11%
2003-2006	911,000	312,600	268	0.09%
Total	2,328,000	707,575	716	0.10%

The data record does not support listing Segment 1e for temperature as the parameter of concern. The temperature data record shows this segment meets the temperature standard of 19.3 °C (chronic), with only a few excursions. The Association data set shows this segment will meet the acute temperature standard of 23.8 °C, except in drought years (for example 2002). In 2005-2010, the 30-minute temperature measurements used to calculate the MWAT values in Segment 1e resulted in attainment with a standard of 19.3°C MWAT over 99.9% of the time.

In 2010, there were 2 MWAT calculations that exceeded the standard in the time period of July 24 through July 30, 2010 (Table 5). One exceedance occurred at BCWA Site 5 in downtown Evergreen and the other at BCWA Site 9 at O’Fallon Park. The BCWA data set does not show an exceedance at the Bear Creek Cabin site (BCWA Site 8). Figure 5 shows the temperature trend along Segment 1e for the July 24 through July 30, 2010 time period. There is no known hydrologic condition that could have caused the temperature to decrease between sites 5 and 9 (Figure 5). There was an elevated MWAT at BCWA Site 5. This site is the major storm drainage from the downtown Evergreen public parking lot. The BCWA has collected stormwater flow from the paved areas, which can have elevated temperatures and probably has a limited impact on stream temperatures are localized sites along Segment 1e.

Table 5 MWAT Measurement on Segment 1e in 2010

Segment 1e 2010		
Site	Time Period	19.3°C MWAT
5	7-17/7-23	19.3
	7-24/7-30	19.7
	7-31/8-6	18.0
8a	7-17/7-23	19.2
	7-24/7-30	19.3
	7-31/8-6	18.9
9	7-17/7-23	19.0
	7-24/7-30	19.4
	7-31/8-6	18.1
12	7-17/7-23	18.8
	7-24/7-30	19.1
	7-31/8-6	18.8
13a	7-17/7-23	19.0
	7-24/7-30	19.2
	7-31/8-6	19.0
14	7-17/7-23	19.1
	7-24/7-30	19.2
	7-31/8-6	19.2

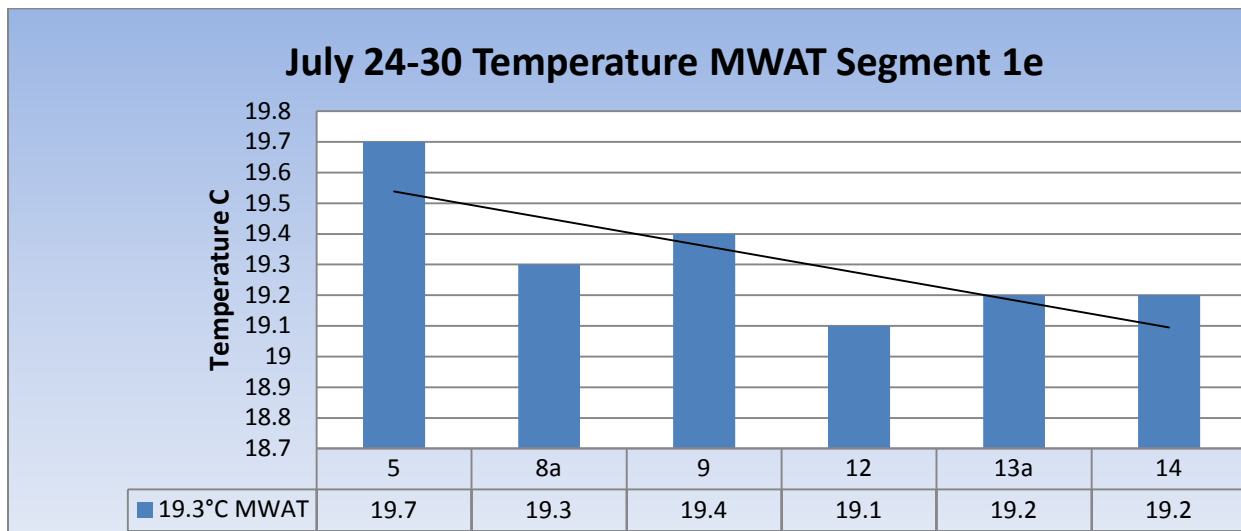


Figure 5 Temperature Trend on Bear Creek During High Temperature Week

The BCWA evaluated the air temperature and precipitation records for Evergreen during the July and August 2010 months to determine if a Regulation 31 air temperature excursion could be applied to the data record:.

“i. Air temperature excursion: ambient water temperature may exceed the criteria in Table 1 or the applicable site-specific standard when the daily maximum air temperature exceeds the 90th percentile value of the monthly maximum air temperatures calculated using at least 10 years of air temperature data.”

Table 6 shows the average maximum air temperature from 1961 through 2011 for the Evergreen site with the 90th Percentile Daily Maximum. Table 6 also shows the 1997-2011 air temperature record for Golden, which is the next available downstream weather recording station. Table 7 shows the BCWA air temperature data as collected at the Evergreen Metropolitan District Wastewater Plant (Official NOAA weather station for Evergreen).

It is worth noting that maximum average air temperature trend (Figure 6) shows a significant increase in air temperature during July and August over the last 50-years. This suggests that air temperature is not in a steady state for this watershed. An underlying assumption when the site-specific temperature standard was set for Segment 1e was that air temperature was in a steady state with normal expected fluctuations. However, based on the existing criteria, the air temperature excursion does not appear to apply to the 2010 July and August water temperature record. But there are other factors that also affect temperature in the stream.

Table 6 Air Temperature Trends at Evergreen and Golden

Month	Ave Max Temp F	Mean Temp F	90th Percentile Daily Max
Air Temperature Evergreen 1961-2011			
July	80.5	64.6	85.5
August	78.4	63.1	82.7
Air Temperature Golden 1997-2011			
July	87.7	74.3	91
August	84	71.3	87.4

Table 7 Measured Air temperature Trends During High Temperature Week

Measured Temperature Evergreen		
	Max Temp F	Ave Max Temp F
7-17/7-23	92	84.4
7-24/7-30	86	81.4
7-31/8-6	89	79.4
July	92	82
August	88	80

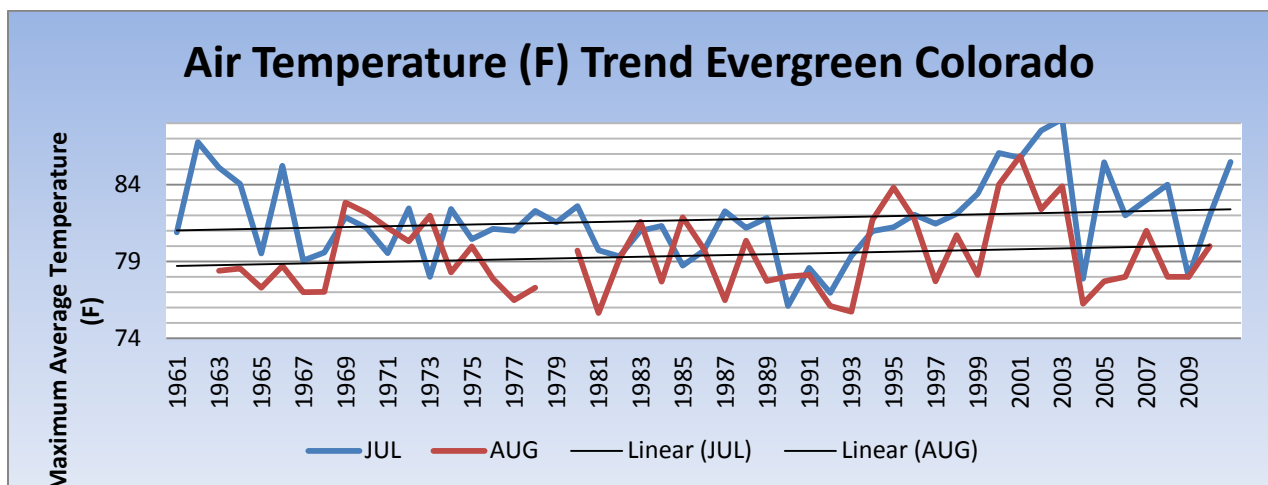


Figure 6 Air Temperature Trends at Evergreen for July and August

The BCWA also evaluated the stream flow and rainfall at BCWA Site 5 for the July and August 2010 time period (Table 8). The stream flows for this time period were well below normal. The rainfall was also well below normal for the summer months. A single larger rainfall event from August 7-10, which measured 1.07 inches, cooled the stream. In 2010, the spring runoff period (early May) was shifted over 2-weeks earlier than historic runoff. June through mid-August was a lower stream flow period for the watershed. Additionally, the flow record above Evergreen Lake shows a declining flow trend from 1985-2010 (Figure 7). It appears that there are at least four factors that influence stream temperatures in Segment 1e during the summer months: placement of the temperature probe, air temperature, stream flow (timing and volume) and rainfall (frequency, amount and showers versus events).

Considering the amount of temperature data and the multiple factors that influence stream temperatures, the BCWA strongly believes it is un-scientific, not justified and counter-productive to list Bear Creek Segment 1e on the 2012 303 (d) List based only on 2 excursions in 2010. When only 0.1 percent of the water temperature measurements in Segment 1e exceed the standard, it is difficult to conclude that there is temperature impairment in the segment. Since the BCWA has committed to long-term temperature monitoring on Segment 1e and throughout the watershed, the BCWA will support adding temperature for a portion of Segment 1e (Outlet of Evergreen Lake to discharge from Swede/Kerr) on the 2012 M&E list. The BCWA does not support a temperature listing on the 303 (d) list.

Table 8 Flow and Rainfall in the Upper Bear Creek Near Evergreen

Evergreen at BCWA Site 5			
	Flow (Deviation from Normal)	Rainfall (Deviation from Normal)	Rainfall % of Average Normal
June 2010	- 56 cfs	- 0.3 in	45
July 2010	- 40 cfs	- 0.4 in	39
August 2010	- 21 cfs	+ 0.1 in	100

Note: August 7-10 rainfall event @ 1.07 in

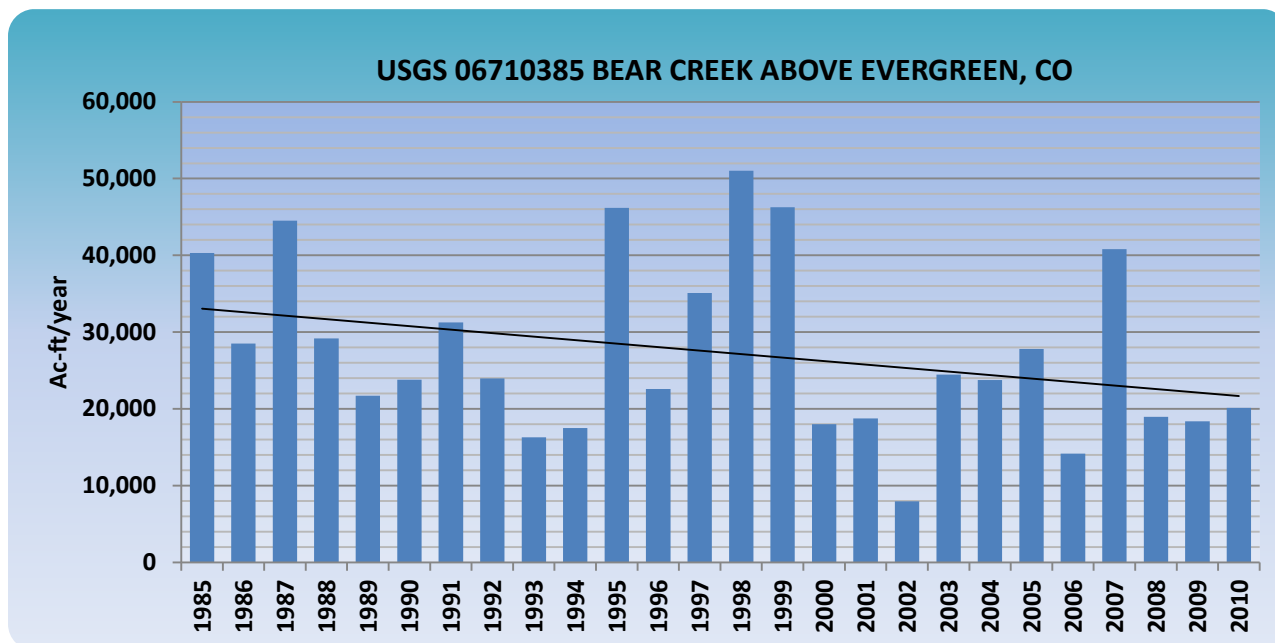


Figure 7 Flow Trend at the Evergreen Gaging Station.

A long lingering question has been about the quality of the Bear Creek fishery. The Colorado Parks and Wildlife Division has been collecting fishery data in the watershed since 1988. At the request of the BCWA, a number of new monitoring sites have been added in the last 10-years. Figure 8 shows the trend for total trout biomass (pounds/acre) in the watershed. The ongoing contention that the fishery is in peril with temperature as the impairment parameter is simply not supported by the data.

The BCWA membership has actively worked with its membership to improve stormwater management, application of best management practices, changes to county comprehensive plans directed at water quality improvements, stream bank restorations, clean-up activities, education and many other actions. These efforts are reflected in the improved fishery with 3-times more fish biomass in the watershed from 2004-2010. The Brown Trout fishery has also greatly improved (Figure 9) with 17-times more fish biomass today compared with 1988. This fishery improvement has been a community effort and the BCWA has helped make a difference. There is no evidence that temperature is impairing the fishery on Segment 1e or anywhere else in the watershed.

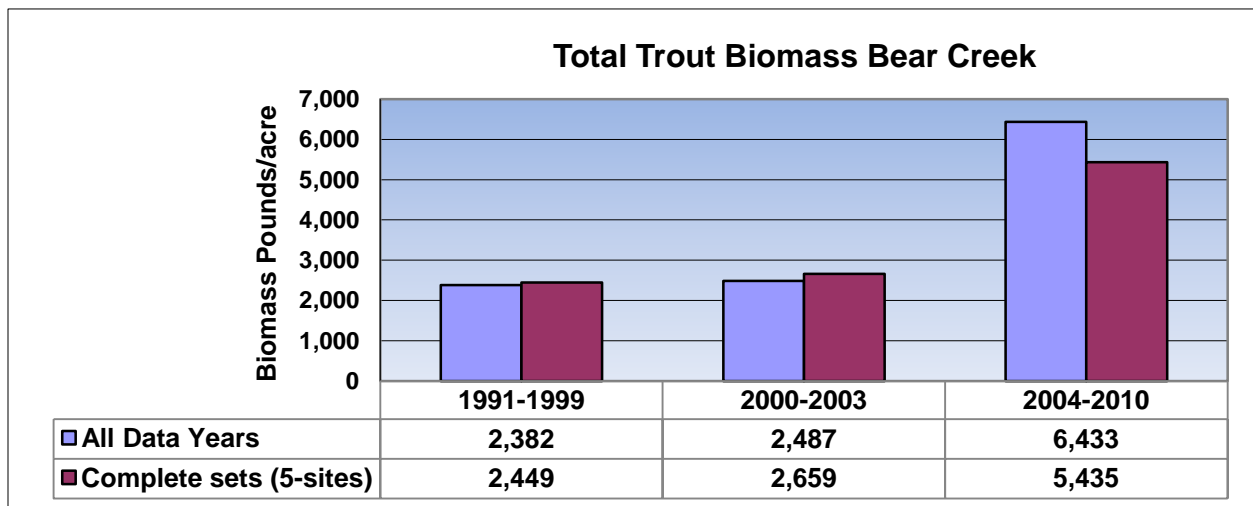


Figure 8 Fishery Biomass Trends in Bear Creek

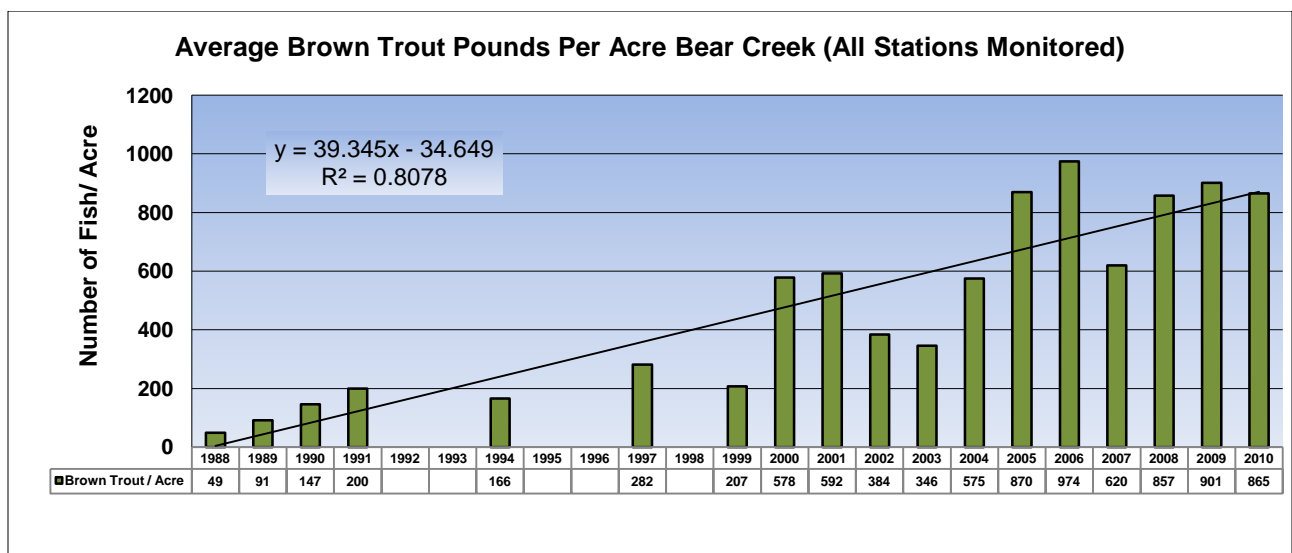


Figure 9 Brown Trout Biomass Trends in Bear Creek

CERTIFICATE OF SERVICE

I hereby certify that on this 30th day of November, 2011 the original and 13 true and correct copies of the **Rebuttal Statement For Bear Creek Watershed Association** was hand delivered to the Colorado Department of Public Health and Environment, Water Quality Control Commission.

I do hereby certify that a true and exact copy of the Bear Creek Watershed Association Rebuttal Statement in the matter of the rulemaking hearing For Consideration of Revisions and Adoption of the 2012 List of Water-Quality-Limited Segments Requiring Total Maximum Daily Loads and Colorado's Monitoring and Evaluation List (Regulation No. 93) was e-mailed to the following on the 30th day of November 2011:

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November 30, 2011