Burnt Bridge Creek TMDL Update Meeting

Overview of Surface Water Monitoring

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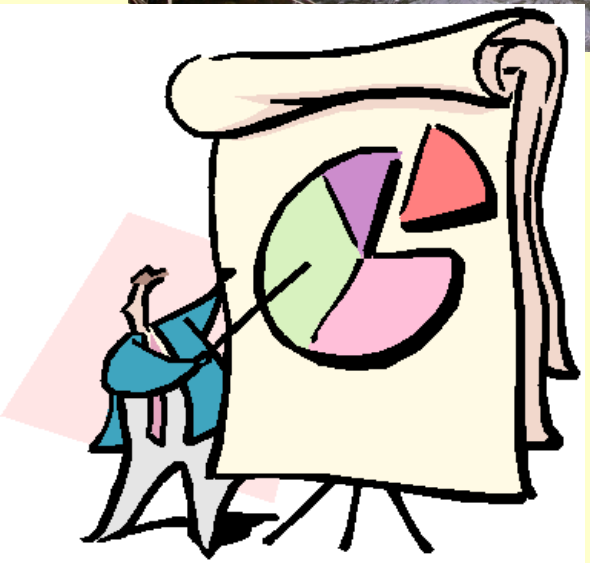
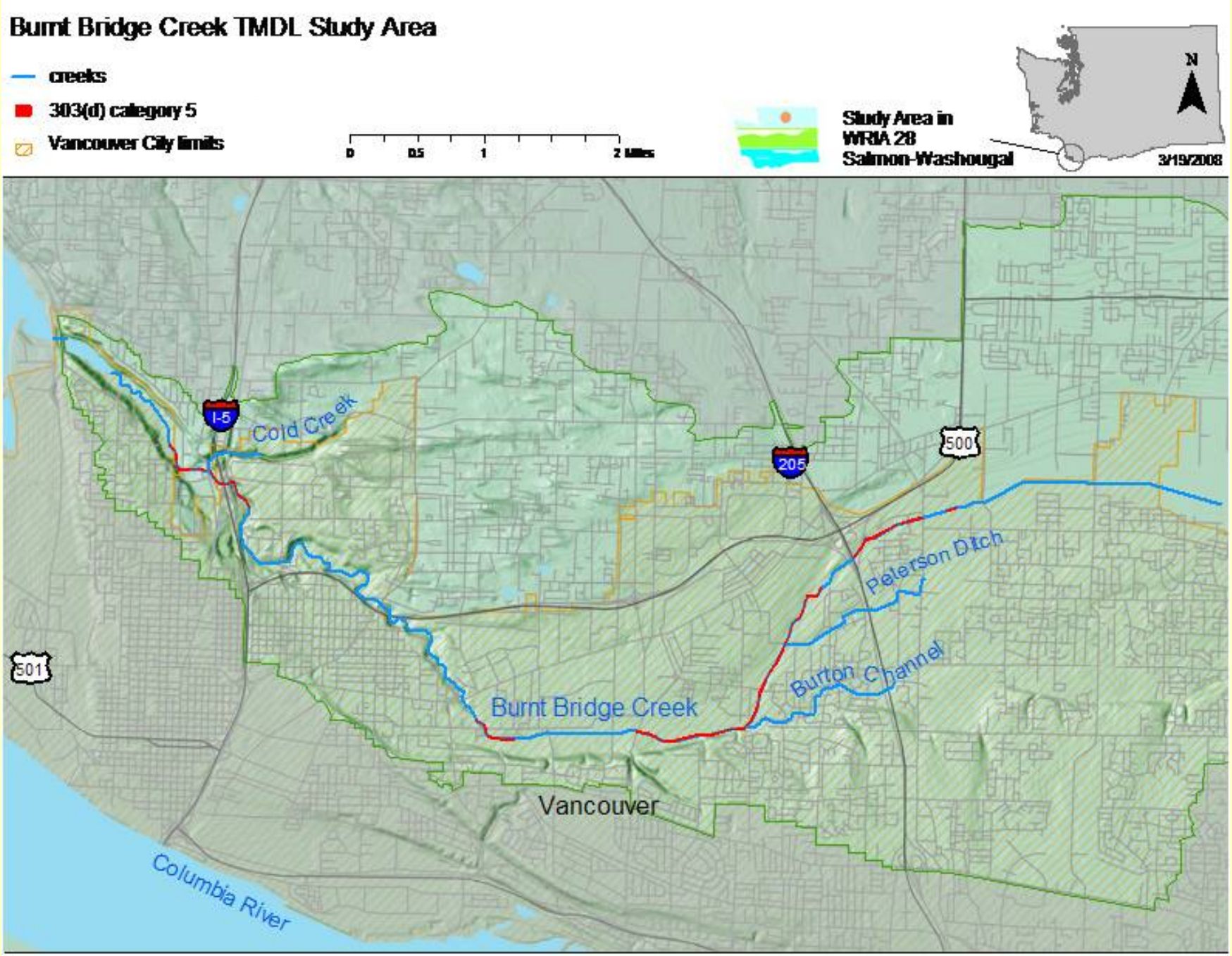
Purpose

- Sampling Locations
- Summary of Data Collection
  - Bacteria
  - Temperature
  - Dissolved Oxygen and pH
- Water Quality Criteria
- Preliminary Results
  - Bacteria
  - Temperature
  - Dissolved Oxygen & pH
- Next Steps



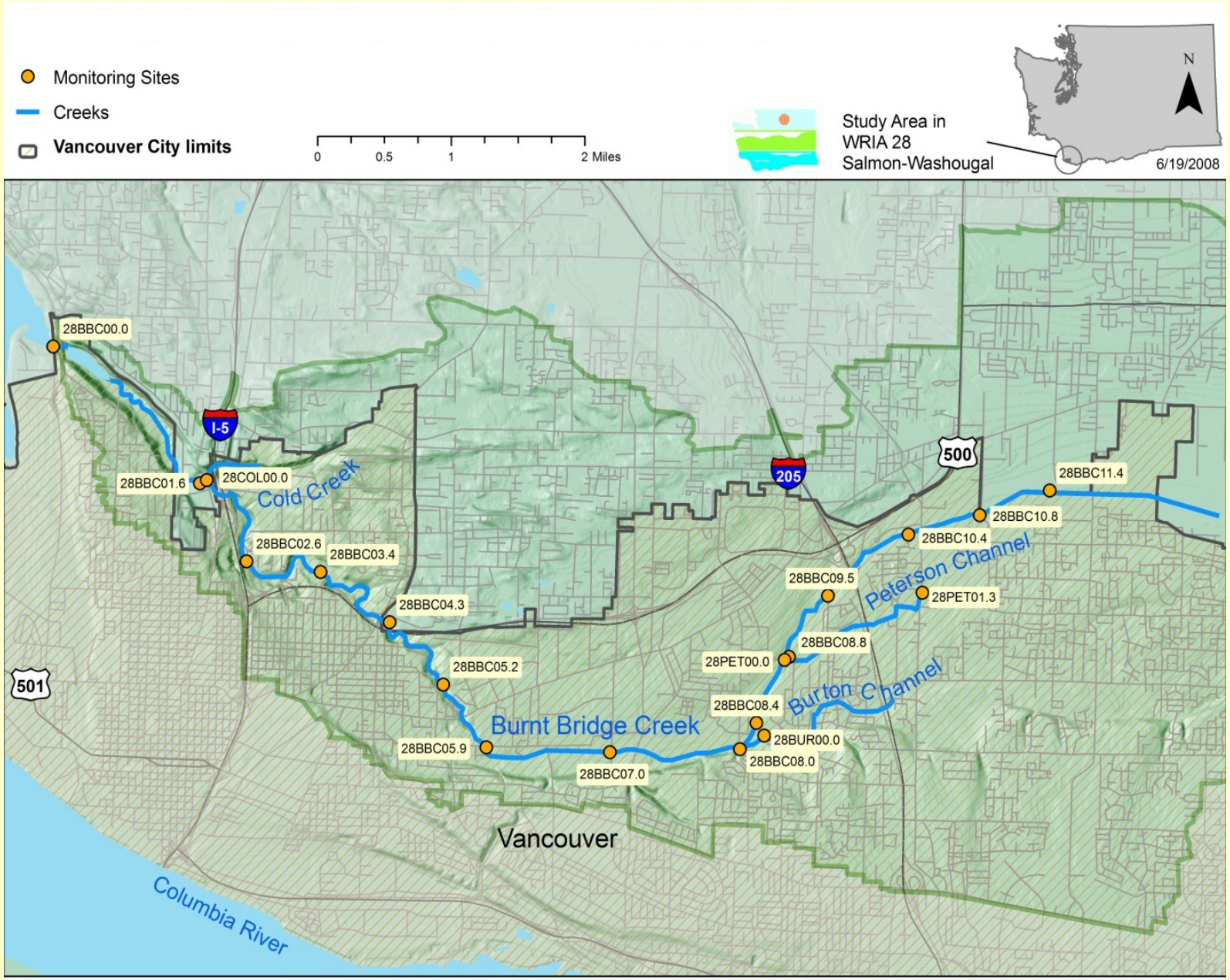

Burnt Bridge Creek TMDL Study Area
creeks
303(d) category 5
Vancouver City limits
0
0.5
1
2 Miles
Study Area in
WRIA 28
Salmon-Washougal
N
3/19/2008
I-5
Cold Creek
205
500
Peterson Ditch
Burton Channel
501
Burnt Bridge Creek
Vancouver
Columbia River

BBC Category 5 Listings

Waterbody	Parameter	2004	2008
Burnt Bridge Creek	Dissolved Oxygen	5	8
	Fecal Coliform	7	9
	Temperature	4	7
	pH		2*
Peterson Ditch	Fecal Coliform		1
	Temperature		1

* Need to confirm; data may not be valid

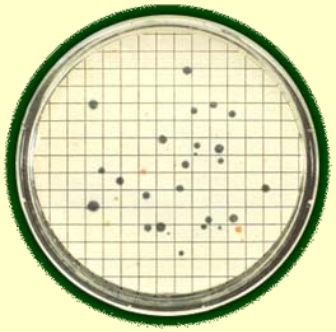
Burnt Bridge Creek Monitoring Sites



Sampling Locations

Site ID	Description	NAD 83	
		Latitude	Longitude
BBC0.0	Burnt Bridge Ck downstream of Fruit Valley Rd	45.67520	-122.69253
BBC1.6	Burnt Bridge Ck at 2nd Ave near Alki Rd	45.66137	-122.66934
COL0.0	Cold Creek at Hazel Dell Ave BBC RM 1.6	45.66174	-122.66827
BBC2.6	Burnt Bridge Ck at Leverich Park	45.65339	-122.66180
BBC3.4	Burnt Bridge Ck near SR 500 at 41st Cr	45.65250	-122.65034
BBC4.3	Burnt Bridge Ck upstream of Saint Johns Blvd	45.64745	-122.63946
BBC5.2	Burnt Bridge Ck at Rossiter Ln	45.64112	-122.63094
BBC5.9	Burnt Bridge Ck at NE 18th St	45.63469	-122.62405
BBC7.0	Burnt Bridge Ck at NE 65th Ave	45.63456	-122.60497
BBC8.0	Burnt Bridge Ck NE 86th Ave, dwn/strm of Burton Ch.	45.63523	-122.58489
BUR0.0	Burton Channel at BBC RM 8.3 19th Cr & 92nd Ave	45.63672	-122.58121
BBC8.4	Burnt Bridge Ck at NE Burton Rd, blw Peterson Ditch	45.63802	-122.58246
PET0.0	Peterson Ditch confluence at 93rd Ave, BBC RM 8.8	45.64501	-122.57767
PET1.3	Peterson Ditch at 102nd Ave (SEH outfall 001)	45.65207	-122.55736
BBC8.8	Burnt Bridge Ck above Peterson Ditch at NE 93rd Ave	45.64468	-122.57837
BBC9.5	Burnt Bridge Ck at 98th, up/strm of Royal Oaks Dr	45.65148	-122.57191
BBC10.4	Burnt Bridge Ck at NE 110th Ave	45.65809	-122.55974
BBC10.8	Burnt Bridge Ck at NE 121st Ave	45.66031	-122.54881
BBC11.4	Burnt Bridge Ck at 131st Ave	45.66308	-122.53808

Summary of Data Collection

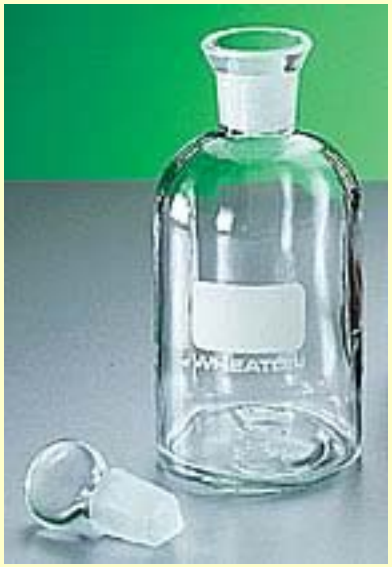


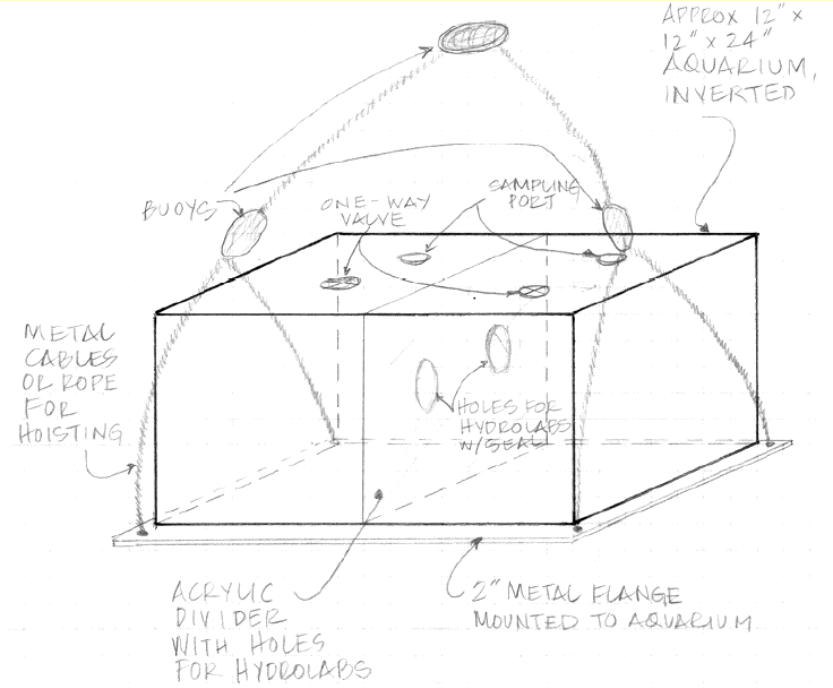
- Bacteria:
  - Sampling runs every 2 weeks (bi-weekly) from June 2008 to present.
  - Flow measurements from bi-weekly sampling runs.

- Temperature:
  - Thermistors and piezometers operational in May 2008 to present.
  - Stream channel surveys at each site
  - Riparian vegetation assessment

Summary of Data Collection, cont.

- Dissolved Oxygen & pH:
  - Periphyton sampling on July 29
  - Sediment Oxygen Demand Survey on July 28 and September 22
  - Winkler dissolved oxygen samples taken during bi-weekly sampling runs





Summary of Data Collection, cont.

- Synoptic Surveys
  - Instantaneous flow measurements
  - Temperature, dissolved oxygen, pH, and conductivity
  - Grab samples collected in AM and PM of dissolved oxygen (Winkler's), bacteria, and nutrients

- Time of Travel conducted June 28 and September 22

Summary of Data Collection, cont.

- Instantaneous temperature, DO, pH, and conductivity during bi-weekly sampling runs.
- Continuous Flow Monitoring at 3 locations operational from July 2008 to present.

Water Quality Criteria

Water Quality Parameter	1997 Standards Classification	1997 Criteria [1]	2006 Use Classification	2006 Criteria [1]
Temperature	Class A	18°C 1-Dmax[2]	Salmonid Spawning, Rearing, and Migration	17.5°C 7-DADMax[3, 4]
Dissolved Oxygen		8.0 mg/L		8.0 mg/L 1-DMin[5]
pH		6.5 to 8.5 units		6.5 to 8.5 units
Fecal Coliform Bacteria		geomean: 100 cfu/100mL	Primary Contact Recreation	geomean: 100 cfu/100mL
		10% not to exceed: 200 cfu/100mL		10% not to exceed: 200 cfu/100mL

1. Criteria have been established in the existing water quality standards for specific waterbodies that differ from the general criteria shown in the above table. These special conditions can be found in WAC 173-201A-130 of the 1997 version, and WAC 173-201A-602 of the 2006 version of the standards.
2. 1-DMax means the highest annual daily maximum temperature occurring in the waterbody.
3. The 2006 corrected water quality standards rule contains supplemental spawning and incubation temperature criteria (13°C for salmon and trout, and 9°C for native char) that are to be applied to specific portions of many of these waters.
4. 7-DADMax means the highest annual running 7-day average of daily maximum temperatures.
5. 1-DMin means the lowest annual daily minimum oxygen concentration occurring in the waterbody.

River & Stream Water Quality Monitoring

Department of Ecology

environmental information > river & stream WQ monitoring > state network >

Water quality monitoring station

28C070 - Burnt Br Cr @ Mouth

Selected station details

type	class	uwa	ecoregion	county	contact	map detail
basin	A	26 mi^2	Willamette Valley	Clark	Ward	google maps®
						Maps.Live

Years when sampling has occurred:

09	08	07	06	05	04	03	02	01	00	99	98	97	96	95	94	93	92	91	90	89	88
87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66

relief x1.33 historical

WRIA: 28, Salmon-Washougal state map

5 stations (long-term or sampled since 2006)

	id	station name	type	last yr
1	28A100	Columbia R @ Vancouver	basin	2007
2	28B070	Washougal R @ Washougal	basin	2008
3	28C070	Burnt Br Cr @ Mouth	basin	2009
4	28I120	Lacamas Creek @ Goodwin Road	basin	2007
5	28J070	Little Washougal Cr. @ Blair Road	basin	2007

station overview | assessment | exceedences | finalized data | preliminary data | temperature

28C070 - Burnt Br Cr @ Mouth

Water quality assessment summary

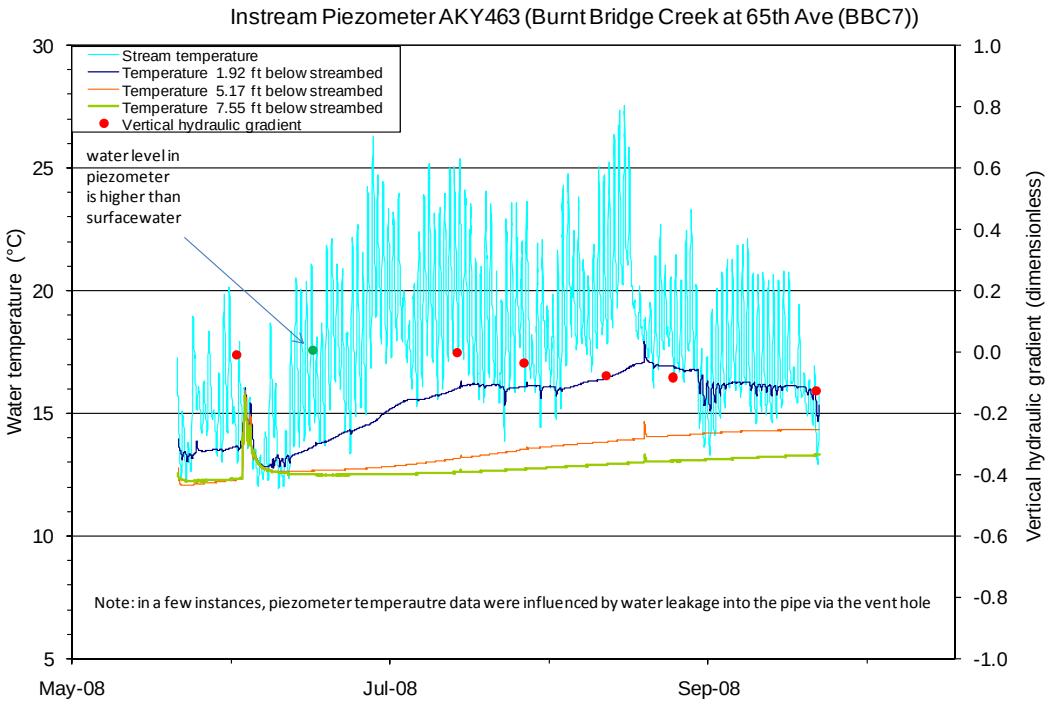
Overall water quality at this station did not meet expectations and is of highest concern. (based on water-year 2005 assessment)

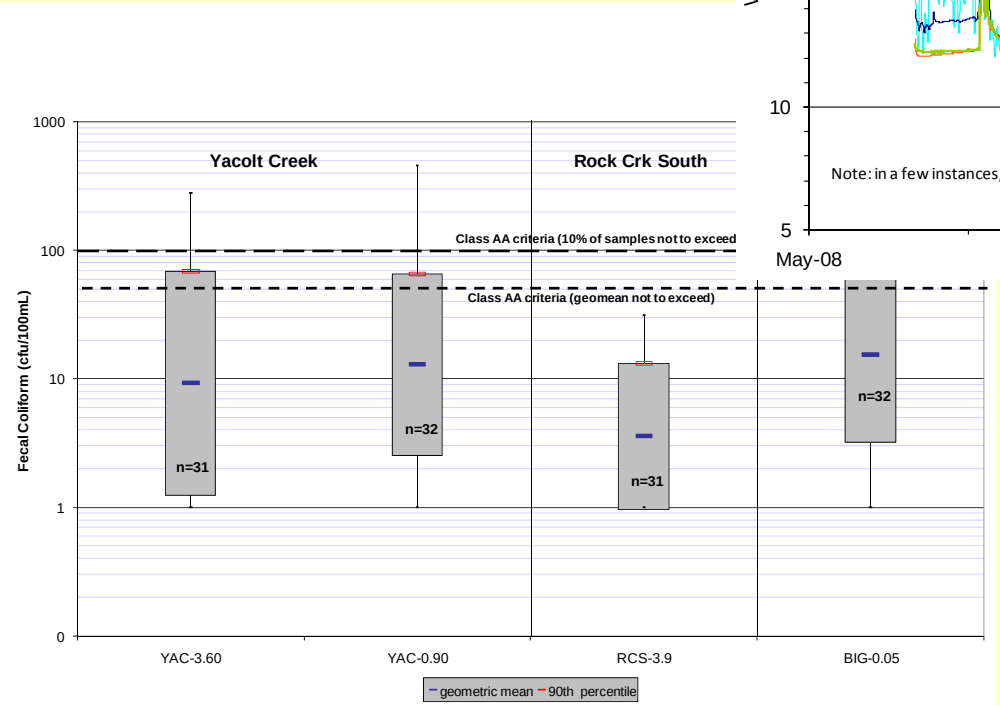
- Ecology may have conducted other studies and produced reports about this stream. These reports may be found in a list of Ecology reports pertaining to WRIA 28, Salmon-Washougal.
- This station is on the 1998 303(d) list.

A brief explanation of the Water Quality Index

Preliminary Data

- Bacteria
- Temperature
- Dissolved Oxygen
- pH





Preliminary Bacteria Results

Station ID	6/3 to 6/4/2008	6/17 to 6/18/2008	6/30 to 7/1/2008	7/15 to 7/16/2008	7/29 to 7/30/2008	8/12 to 8/13/2008	8/26 to 8/27/2008	9/9 to 9/10/2008	9/23 to 9/24/2008	10/6 to 10/7/2008	10/20 to 10/21/2008	11/3 to 11/4/2008	11/17 to 11/18/2008	12/1 to 12/2/2008	12/15 to 12/16/2008	12/28 to 12/29/2008	1/12 to 1/13/2009	1/26 to 1/27/2009	number of samples (n)	geometric mean	90th percentile	% samples exceed WQ Standard
BBC11.4	3200	120	190	80	46	22	69	29	57	26	35	47	11	3	7	400	6	4	18	40	359	11
BBC10.8	1500	85	110	96	93	47	63	31	28	41	20	20	5	6	7	200	9	8	18	37	237	6
BBC10.4	1400	92	160	100	40	220	150	40	69	190	280	120	14	10	29	560	23	11	18	82	466	22
BBC9.5	1900	46	92	81	37	100	71	41	51	88	430	210	15	7	8	680	20	3	18	60	484	22
BBC8.8	3200	38	65	35	44	75	110	40	37	63	180	140	26	21	13	570	17	8	18	61	373	11
PET1.3	880	8	5	18	27	1	11	13	3	16	3	19	280	3	1	29	1	3	18	10	99	11
PET0.0	4200	130	69	220	220	320	270	250	550	370	1100	280	250	700	63	85	120	80	18	256	995	67
BBC8.4	3000	25	96	140	85	100	100	120	180	100	300	110	110	110	15	300	34	34	18	108	467	17
BUR0.0	3900	230	140	130	170	200	990	160	200	290	6300	130	100	430	57	330	23	27	18	224	1425	39
BBC8.0	2600	110	74	67	61	77	96	160	23	79	790	69	62	16	47	350	37	20	18	89	449	17
BBC7.0	2300	25	120	63	120	160	49	7	15	44	96	400	5	290	17	260	6	15	18	57	471	22
BBC5.9	1800	850	92	96	66	79	180	100	66	46	46	620	21	160	13	100	47	9	18	92	520	17
BBC5.2	870	300	92	210	65	84	200	140	200	77	56	520	100	350	26	600	31	21	18	131	524	33
BBC4.3	1100	130	130	120	110	100	190	270	200	150	170	480	40	600	43	1400	24	54	18	162	665	28
BBC3.4	830	75	110	110	100	88	140	270	150	170	92	340	29	480	80	6700	96	43	18	162	789	28
BBC2.6	1000	280	120	230	330	170	220	280	180	120	110	310	18	500	49	12000	16	33	18	183	1280	50
COL0.0	380	85	180	510	470	420	300	260	260	220	160	340	100	180	37	350	27	110	18	189	554	56
BBC1.6	670	130	140	420	140	140	160	260	260	270	120	330	34	440	63	12000	8	36	18	180	1230	44
BBC0.0			9	65	17	13	180	37	29	36	18	240	10	33	22	230	23	43	16	36	134	13

Gray shaded cells exceed 200 cfu/100 mL and **yellow shaded cells** exceed the WQ criteria

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Preliminary Temperature Results

Station	Days 7DADM above 17.5 deg-C	Number of Days on Record	% WQ Standard Violated
BBC11.4	11	154	7%
BBC10.8	9	154	6%
BBC10.4	7	154	5%
BBC9.5	26	154	17%
BBC8.8	85	153	56%
PET1.3*	10	155	6%
PET0.0	87	153	57%
BBC8.4	94	153	61%
BUR0.0	26	113	23%
BBC8.0	95	138	69%
BBC7.0	109	153	71%
BBC5.9	103	153	67%
BBC5.2	92	152	61%
BBC4.3	86	152	57%
BBC3.4	93	152	61%
BBC2.6	92	155	59%
COL0.0	0	142	0%
BBC1.6	83	155	54%
BBC0.0	66	84	79%

*PET1.3 compared to NPDES Permit Limit of 21 C

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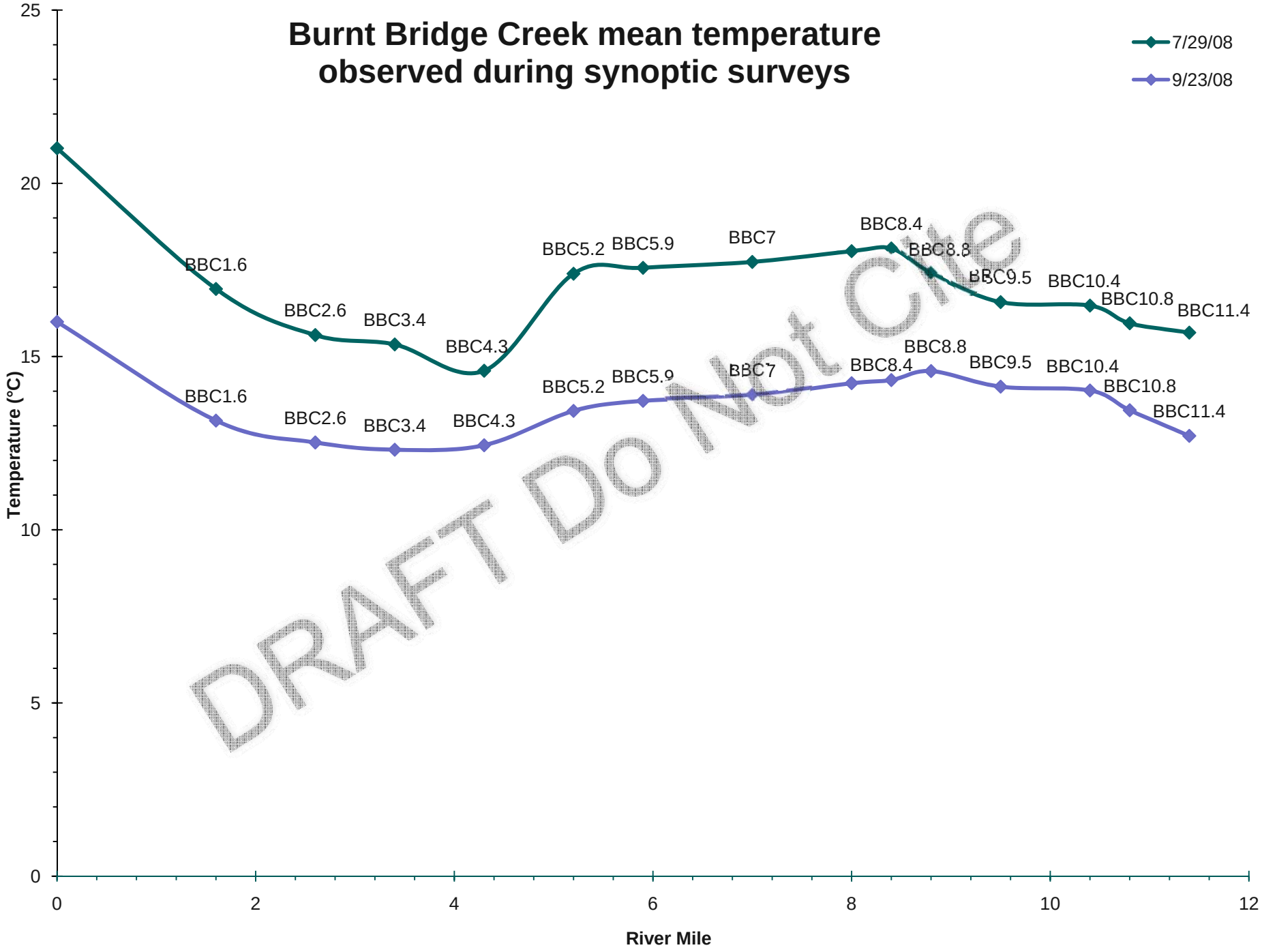
Burnt Bridge Creek mean temperature observed during synoptic surveys
7/29/08
9/23/08
Temperature (°C)
River Mile
0
5
10
15
20
25
0
2
4
6
8
10
12
BBC1.6
BBC2.6
BBC3.4
BBC4.3
BBC5.2
BBC5.9
BBC7
BBC8.4
BBC8.8
BBC9.5
BBC10.4
BBC10.8
BBC11.4
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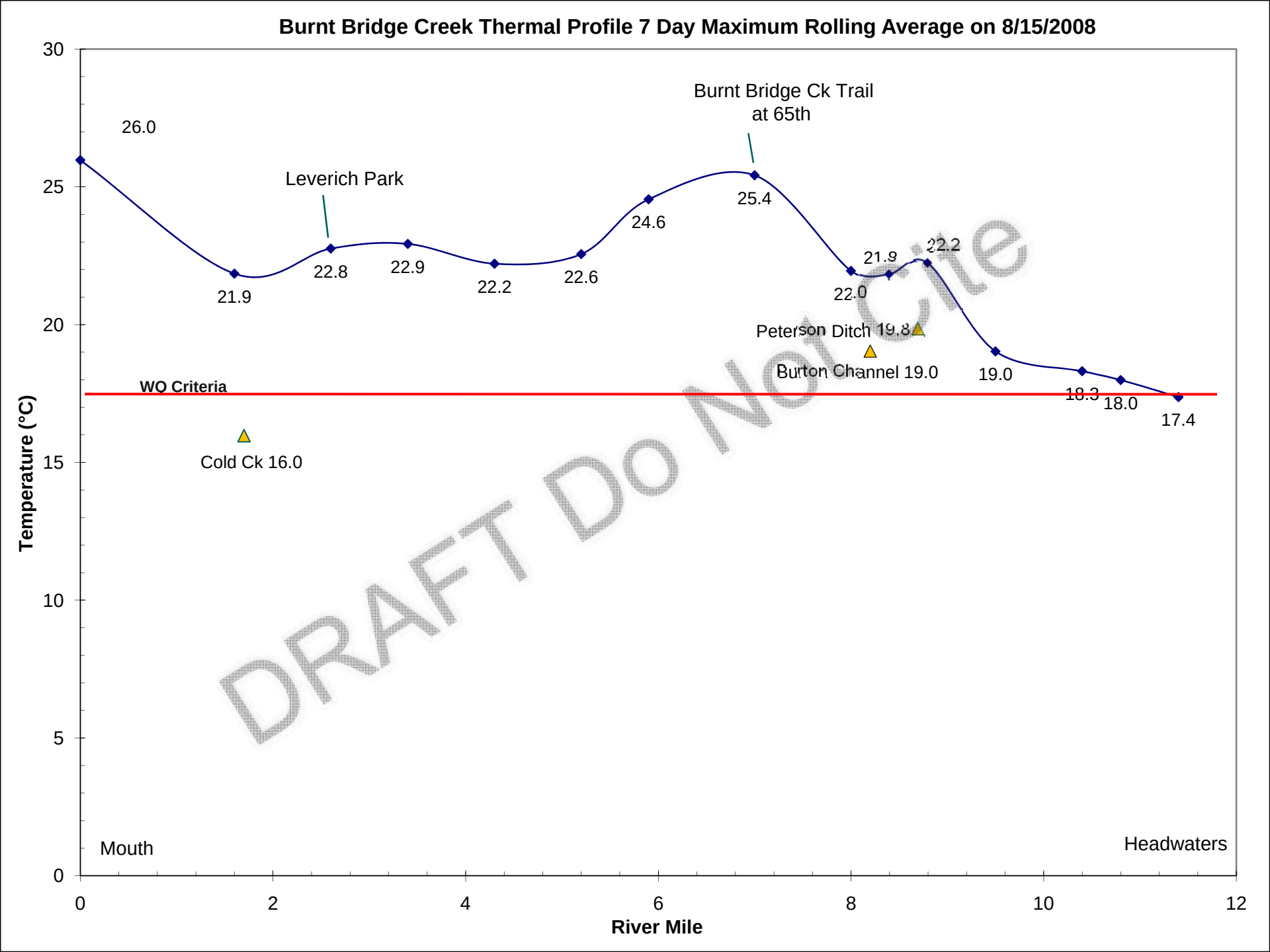
Burnt Bridge Creek Thermal Profile 7 Day Maximum Rolling Average on 8/15/2008
Temperature (°C)
River Mile
30
25
20
15
10
5
0
0
2
4
6
8
10
12
26.0
21.9
22.8
22.9
22.2
22.6
24.6
25.4
22.0
21.9
22.2
19.0
18.3
18.0
17.4
Leverich Park
Burnt Bridge Ck Trail
at 65th
Peterson Ditch 19.8
Burton Channel 19.0
Cold Ck 16.0
WQ Criteria
Mouth
Headwaters
DRAFT Do Not Cite

Preliminary data compared to WQ Criteria for Bacteria, Temperature, DO and pH

Site ID	Total number of days above water quality criteria			
	Bacteria > 200 cfu/100mL	Temperature[1] > 17.5°C	Dissolved Oxygen < 8 mg/L	pH 6.5 - 8.5
BBC11.4	2	11	16	1
BBC10.8	1	9	15	1
BBC10.4	4	7	15	1
BBC9.5	4	26	12	0
BBC8.8	2	85	1	0
PET1.3	2	10 (>21°C)	4	0
PET0	12	87	2	0
BBC8.4	3	94	3	1
BUR0	7	26	6	1
BBC8	3	95	5	0
BBC7	4	109	9	4
BBC5.9	3	103	11	0
BBC5.2	6	92	1	0
BBC4.3	5	86	0	1
BBC3.4	5	93	0	1
BBC2.6	9	92	0	1
COL0	10	0	0	1
BBC1.6	8	83	0	1
BBC0	2	66	1	4

[1] The highest annual running 7-day average of maximum temperatures.

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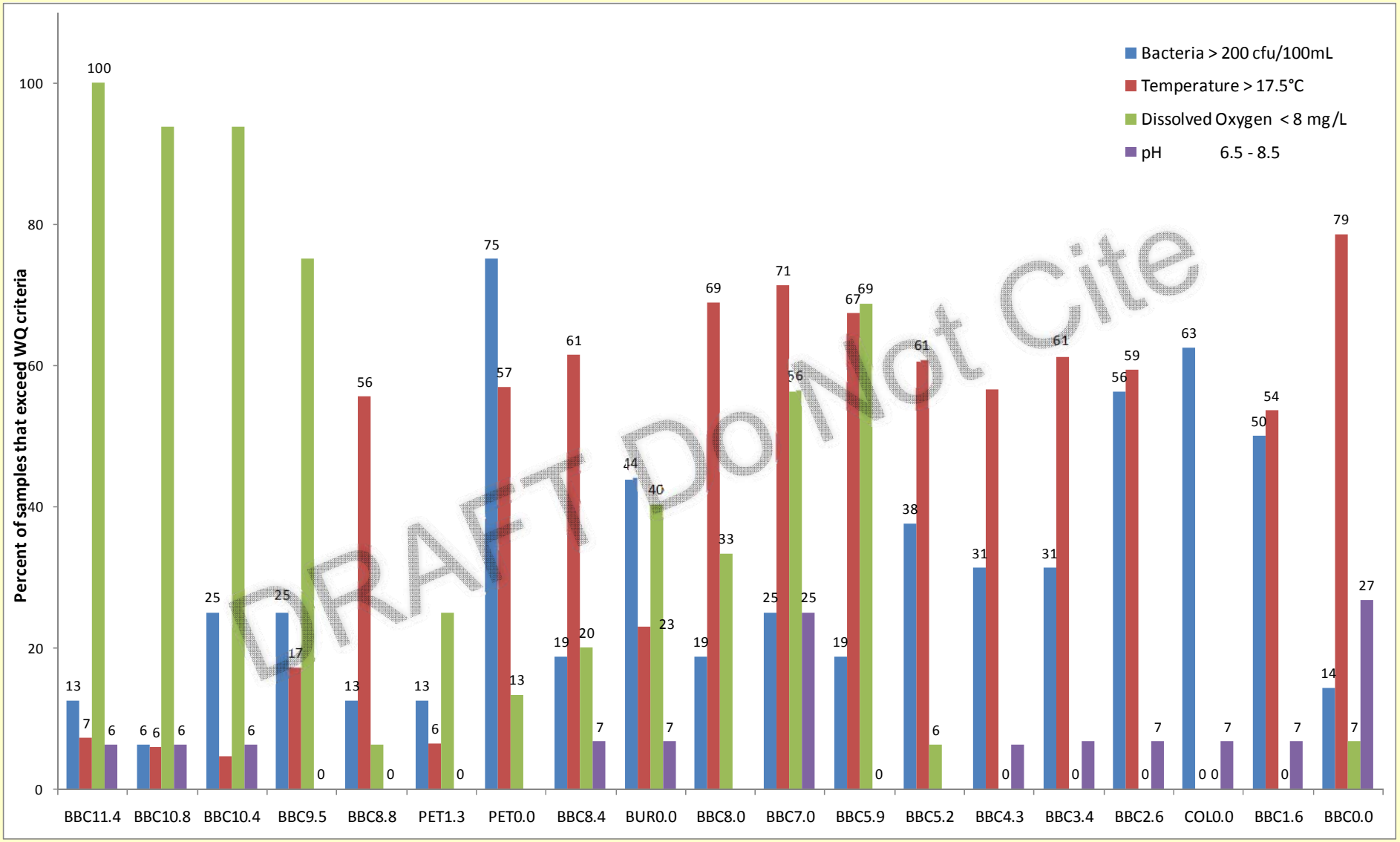
Percent Exceedance of WQ Criteria



Next steps…

- Routine bacteria and streamflow sampling continues through August 2009
- Periodic downloads of instream and piezometer thermistors
- Target two stormwater sampling events

Overall TMDL
Process and Timeline

- May 2008 → December 2010 - Ecology conducts study and modeling to determine how much pollution reduction is needed
- 2011 - Ecology and stakeholders develop a cleanup strategy
- 2012 - Ecology and stakeholders develop a detailed list of cleanup actions (who, what, when, where)
- 2013+ - Follow up to determine if strategy is working and make adjustments as needed

Thanks!

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