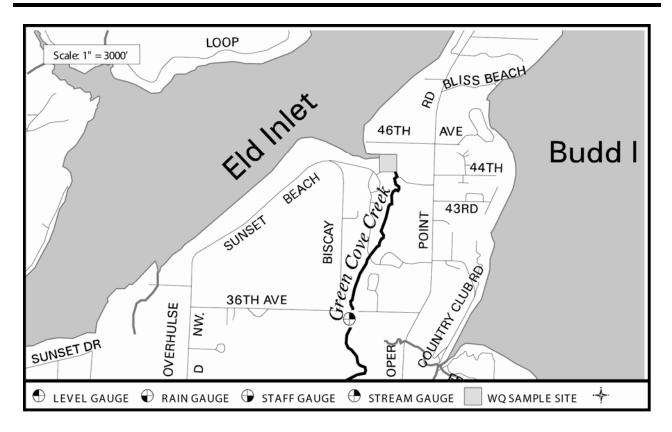
# Eld Inlet Watershed WRIA 13

**Chapter Includes:** 

**Green Cove Creek McLane Creek Perry Creek** 



#### PART OF ELD WATERSHED

**LENGTH OF CREEK:** 3.6 miles

**BASIN SIZE**: 3.5 square miles

**STREAM ORDER: 2** 

#### **PRIMARY LAND USES:**

Agriculture Rural residential

FISHERIES RESOURCES: (From A Catalog of Washington Streams and Salmon Utilization, WDOF)

Coho Chum

#### **GENERAL TOPOGRAPHY:**

This creek originates in Lake Louise and associated wetlands and flows under Evergreen Parkway. The creek then flows through a ravine and empties into Eld Inlet at Green Cove.

**GENERAL WATER QUALITY:** (Excellent, Good, Fair, Poor)

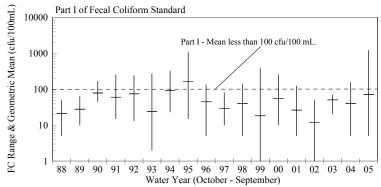
Good - Part II of the fecal coliform standard was violated in 2004/05 water year. All other standards were met.

#### **OTHER DATA:**

Thurston County Environmental Health Division, (360) 754-4111 or www.geodata.org/swater

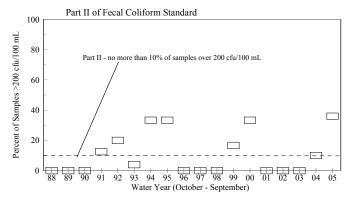
Thurston County Water and Waste Management Department, (360) 357-2491 or www.co.thurston.wa.us/monitoring

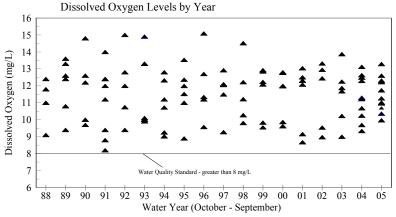
#### **Green Cove Creek**



The water quality standard for fecal coliform bacteria has two parts: part I - the geometric mean shall not exceed 100 organisms per 100 milliliters of sample *and*, part II - no more than 10% of the samples shall exceed 200 org/100 mL.

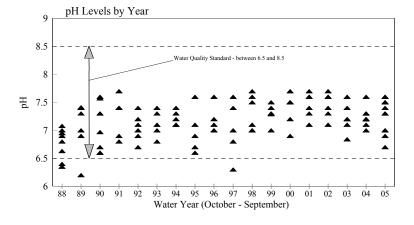
Green Cove Creek usually meets part I of the bacteria standard, but occasionally fails part II. In water year 2003/04 the creek met both parts. In 2004/05 it met part I and failed part II with 17% of the samples greater than 200 organisms per 100 ml.





The water quality standard for dissolved oxygen is a lowest one-day minimum of 8.0 mg/L. There have been no recorded dissolved oxygen violations since 1988.

The standard for pH requires the pH to be within the range of 6.5 to 8.5. The pH measurements have been within the acceptable range since 1998. Only four measurements in the entire data record were outside the pH standard range.



Green Cove Creek has been monitored by Thurston County since 1988, when the Early Action Watershed Planning effort was underway for Eld Inlet. The creek flows through rural areas as well as the more densely developed residential areas. The City of Olympia and Thurston County have adopted special stormwater and land use regulations to protect Green Cove Creek from being degraded.

## **Major Issues:**

- Urban development
- Stormwater runoff

## **Funding Sources:**

■ Local Storm and Surface Water Utility

# Water Quality Summary Conventional Parameters

# **Green Cove Creek**

		WQ Standard			/ater Year Data 5/2004 & 2004/2		Cumulative Data: 1988-2003		
Parameter	Units	WAC 173-201A	Water Year	Mean	Range	# samples violating standard	Mean	Range	
Temperature	EC	Highest 7-DAD Max of 17.5EC	03/04 04/05		5.2 – 15.41 3.26 – 14.07	0 of 10 0 of 12		0.40 - 17.40	
Dissolved Oxygen	mg/L	Lowest one-day minimum of 8.0	03/04 04/05		9.34 – 13.12 9.97 – 13.3	0 of 10 0 of 11		8.2 – 15.1	
Conductivity	F mhos/c m		03/04 04/05	105 96	51 - 152 57 - 160		93	25 – 239	
pH		6.5 - 8.5	03/04 04/05	7.2* 7.3*	7 - 7.6 6.7 - 7.6	0 of 10 0 of 612		6.2 - 7.7	
Turbidity	NTU	not to exceed 5 NTU over background	03/04 04/05	1.5 2.9	0.7 - 3.3 $1.1 - 6.5$	0 of 10 0 of 12	3.6	0.5 - 60.0	
Fecal Coliform	org / 100 ml	GMV: ≤100 and ≤ 10% not to exceed 200	03/04 04/05	40** 71**	5 - 155 5 - 1200	% exceeding 200 0% 17%	37**	0 - 1080	
Total Phosphorus	mg/L		03/04 04/05	0.045 0.051	0.025 - 0.083 0.028 - 0.086	2,7,0	0.037	0.011 - 0.170	
Nitrate + Nitrite- nitrogen	mg/L		03/04 04/05	0.687 0.518	0.223 - 1.17 $0.169 - 1.38$		0.549	0.195 - 1.34	
Ammonia	mg/L						0.016	<0.010 - 0.041	

<sup>\*</sup> Median \*\* Geometric mean value (GMV)

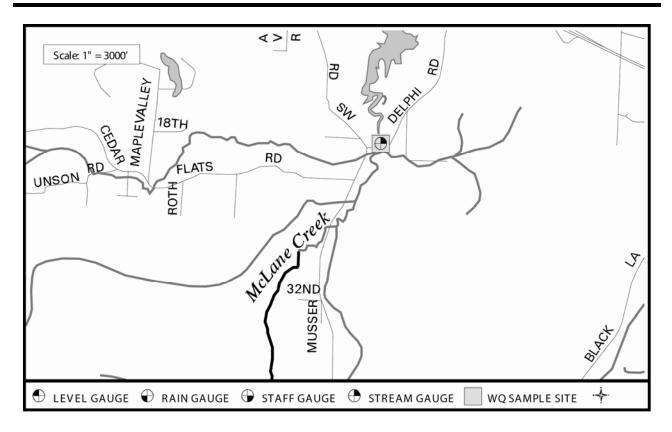
# Green Cove Creek #0133

Thurston County Water Resources Monitoring Report 2003 - 2004 Green Cove Creek @ Mouth

Date	Time	Temp C	pН	DO mg/L	Cond @25c umhos/cm	FC cfu/100mL	Turb NTU	Flow cfs	TP mg/L	NOx mg/L	COMMENTS
12/16/2003	3:30:00 PM	6.12	7.3	12.48	51	75	3.3	10.5	0.030	0.223	Gravel filling in around staff gage. Question accuracy. Water is reddish-brown.
1/21/2004	3:15:00 PM	6.56	7.2	13.12	62	10	2.2	5.2	0.025	0.334	
2/17/2004	12:00:00 PM	5.20	7.0	12.63	64	20	2.6	9.8	0.027	0.330	gage - no longer in main channel
3/15/2004	1:45:00 PM	9.02	7.6	12.29	82	30	1.2	2.8	0.029	0.434	
4/19/2004	3:30:00 PM	10.27	7.2	11.22	95	35	0.7	1.7	0.033	0.497	
5/17/2004	9:45:00 AM	11.17	7.2	10.68	118	5	1.0	0.7	0.045	0.832	
6/22/2004	12:00:00 PM	13.96	7.3	10.24	140	85	1.0	0.4	0.057	1.120	
7/15/2004	3:45:00 PM	15.30	7.3	9.69	152	60	0.8	0.5	0.057	1.100	75 degrees
8/24/2004	3:50:00 PM	15.41	7.2	9.34	151	100	0.8	0.2	0.062	1.170	
9/22/2004	11:40:00 AM	11.76	7.1	11.30	135	155	1.7	0.4	0.083	0.834	

# Thurston County Water Resources Monitoring Report 2004 - 2005 Green Cove Creek @ Mouth

Date	Time	Temp C	pН	DO mg/L	Cond @25c umhos/cm	FC cfu/100mL	Turb NTU	Flow cfs	TP mg/L	NOx mg/L	COMMENTS
10/19/2004	1:20:00 PM	11.18	7.0		107	70	1.2	1.4	0.054	0.315	D.O. did not post calibrate. Staff gage gone.
11/9/2004	12:00:00 PM	9.09	6.9	11.26	99	20	1.2	1.0	0.047	0.329	No fish here.
12/13/2004	11:00:00 AM	6.30	6.7	12.60	62	65	5.2	6.2	0.035	0.296	Water is clear and orangish brown.
1/10/2005	12:15:00 PM	3.26	7.0	12.22	74	75	2.3	3.2	0.036	0.305	
2/15/2005	2:00:00 PM	3.95	7.5	13.29	83	5	1.4	2.1	0.028	0.434	
3/14/2005	11:15:00 AM	6.84	7.5	11.74	96	13	1.1	1.0	0.037	0.598	
4/12/2005	11:15:00 AM	7.17	7.3	12.31	57	185	4.4	8.9	0.037	0.205	
5/10/2005	11:45:00 AM	12.07	7.3	10.96	75	100	6.5	8.8	0.066	0.169	
6/7/2005	1:30:00 PM	11.78	7.4	11.01	84	125	2.1	2.4	0.058	0.379	
7/11/2005	11:05:00 AM	13.98	7.5	9.97	106	1200	6.0	1.8	0.086	0.696	65 degrees, rain.
8/9/2005	11:45:00 AM	14.07	7.6	10.36	151	215	1.5	0.4	0.068	1.110	Turb standard recall of lot used to cal YSI on this date. Results could be up to 8% lower than the true turb value.
9/26/2005	3:30:00 PM	11.90	7.6	10.70	160	45	2.3	0.3	0.056	1.380	Turb standard recall of lot used to cal YSI on this date. Results could be up to 8% lower than the true turb value.
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#### PART OF ELD WATERSHED

**LENGTH OF CREEK:** 14.5 miles

**BASIN SIZE**: 11.5 square miles

**STREAM ORDER:** 3

#### **PRIMARY LAND USES:**

Rural residential Agriculture Forestry

FISHERIES RESOURCES: (From <u>A</u>
Catalog of Washington Streams and Salmon
Utilization, WDOF)

Coho Chum

**GENERAL TOPOGRAPHY:** This creek originates in the Alpine Hills area and flows through fairly level terrain, including wooded areas and open pastures. The creek empties into Eld Inlet in the Mud Bay estuary.

**GENERAL WATER QUALITY**:(Excellent, Good, Fair, Poor)

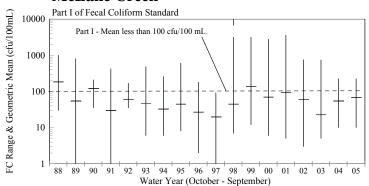
Good – The creek often fails Part II of the fecal coliform standard.

#### **OTHER DATA:**

Thurston County Environmental Health Division, (360) 754-4111 or www.geodata.org/swater

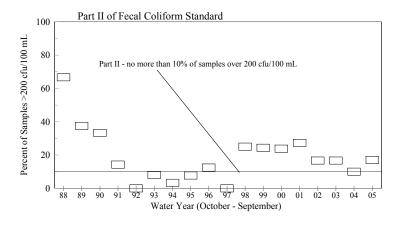
Thurston County Department of Water and Waste Management, (360) 357-2491 (flow data) or www.co.thurston.wa.us/monitoring

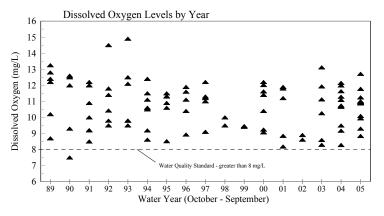
#### McLane Creek



The water quality standard for fecal coliform bacteria has two parts: part I - the geometric mean shall not exceed 100 cfu/100mL *and*; part II - no more than ten percent of the samples shall exceed 200 cfu/100mL.

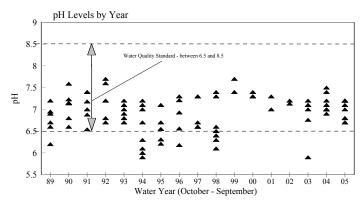
The creek met both parts of the standard in water year 2003/04. However, it failed part II in 2004/05, with 17% of the samples greater than 200 colonies per 100 mL. The creek has frequently failed part II of the bacteria in past water years.





The water quality standard for dissolved oxygen is a lowest one-day minimum of 8.0 mg/L. No violations of the standard have been recorded since 1990.

The standard for pH requires the pH to be within the range of 6.5 to 8.5. No pH violations were recorded in water years 2003/04 or 2004/05. However, there have been numerous measurements outside the pH standard, especially between 1994 and 1998.



McLane Creek has been monitored by Thurston County since 1983 when the first comprehensive water quality study work was done. This creek supports a significant fisheries resource. It is impacted primarily by agricultural sources of nonpoint pollution and forestry activities. During the 1990's many of the land owners in the basin adopted best management practices to reduce fecal coliform bacteria concentrations. Part II of the standard continues to be violated. As more summer low flow samples are collected, there appears to be a pattern of higher fecal coliform results during the dry season. The cause of this has yet to be determined.

## **Major Issues:**

- Agricultural nonpoint sources.
- Logging practices.

## **Funding Sources:**

Local Storm and Surface Water Utility

# Water Quality Summary Conventional Parameters

# McLane Creek

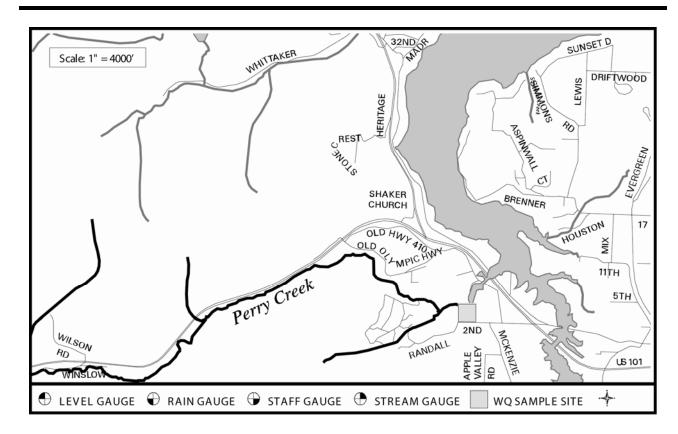
		WQ Standard			Vater Year Data 3/2004 & 2004/2		Cumulative Data: 1988-2003		
Parameter	Units	WAC 173-201A	Water Year	Mean	Range	# samples violating standard	Mean	Range	
Temperature	EC	Highest 7-DAD Max of 17.5E	03/04 04/05		6.01 – 16.61 4.69 – 14.94	0 of 10 0 of 12		2.3 – 18.17	
Dissolved Oxygen	mg/L	Lowest one-day minimum of 8.0	03/04 04/05		8.28 - 12.15 8.84 - 12.7	0 of 10 0 of 12		7.5 - 14.9	
Conductivity	F mhos/cm		03/04 04/05	70 70	48 - 92 54 - 89		67	27 – 403	
рН		6.5 - 8.5	03/04 04/05	7.0* 7.2*	6.9 - 7.5 6.7 - 7.2	0 of 10 0 of 12		5.9 - 7.7	
Turbidity	NTU	not to exceed 5 NTU over background	03/04 04/05	2.0 3.9	$0.8 - 4.1 \\ 1.2 - 10.5$	0 of 10 0 of 12	5.8	0.5 – 135	
Fecal Coliform	colonies /	GMV: $\leq 100$ and $\leq 10\%$ not to	03/04	55**	10 - 225	% exceeding 200 10%	56**	0 – 17000	
	100 1111	exceed 200	03/04 04/05	72**	10 - 223	17%			
Total Phosphorus	mg/L		03/04 04/05	0.028 0.038	0.014 - 0.05 0.021 - 0.072		0.029	<0.002 - 0.140	
Nitrate+Nitrite- nitrogen	mg/L		03/04 04/05	0.226 0.330	0.104 - 0.393 0.176 - 0.57		0.382	0.125 - 0.830	
Ammonia	mg/L						0.036	<0.010 - 0.158	

<sup>\*</sup> Median \*\* Geometric mean value (GMV)

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Date	Time	Temp C	pН	DO mg/L	Cond @25c umhos/cm	FC cfu/100mL	Turb NTU	Flow cfs	TP mg/L	NOx mg/L	COMMENTS
12/16/2003	3:00:00 PM	7.64	7.5	11.29	50	25	0.8	87.7	0.050	0.372	Many dead salmon. Not many live under bridge.
1/22/2004	9:30:00 AM	6.01	7.0	11.63	56	10	1.1	44.4	0.025	0.393	
2/17/2004	11:30:00 AM	6.70	7.2	11.99	48	15	1.1	61.6	0.014	0.367	
3/15/2004	1:15:00 PM	8.42	7.4	12.15	59	15	1.1	30.8	0.017	0.230	
4/19/2004	3:00:00 PM	10.23	7.0	11.09	66	50	1.8	21.0	0.019	0.154	
5/17/2004	10:15:00 AM	11.38	7.0	10.66	74	110	1.9	7.7	0.023	0.178	
6/22/2004	11:15:00 AM	14.93	7.1	9.49	86	120	2.8	5.4	0.032	0.145	
7/15/2004	1:15:00 PM	16.38	7.1	9.17	86	140	2.4	3.1	0.035	0.104	75 degrees
8/24/2004	3:15:00 PM	16.61	7.0	8.28	92	150	4.1	3.5	0.038	0.126	
9/22/2004	11:00:00 AM	11.29	6.9	10.74	83	225	2.6	4.9	0.023	0.192	

Date	Time	Temp C	pН	DO mg/L	Cond @25c umhos/cm	FC cfu/100mL	Turb NTU	Flow cfs	TP mg/L	NOx mg/L	COMMENTS
10/19/2004	1:00:00 PM	11.04	6.8		75	225	3.8	24.3	0.028	0.390	D.O. did not post calibrate.
11/9/2004	11:30:00 AM	9.68	6.7	10.09	65	25	4.1		0.036	0.438	No flow measurement, chum spawning.
12/13/2004	10:45:00 AM	7.90	6.7	10.91	55	10	10.5		0.072	0.570	Too fast to do flow & lots of spawning salmon.
1/10/2005	11:45:00 AM	5.10	6.8	11.00	64	30	6.2	36.2	0.062	0.532	Cloudy, 40 degrees.
2/15/2005	1:00:00 PM	4.69	7.2	12.71	65	65	1.5	22.5	0.026	0.387	38 degrees, sunny.
3/14/2005	10:40:00 AM	7.13	7.2	11.25	71	30	1.6	10.9	0.037	0.314	
4/12/2005	10:45:00 AM	7.25	7.2	11.78	54	45	2.0	57.2	0.021	0.285	
5/10/2005	11:15:00 AM	11.24	7.1	10.87	61	100	4.0	53.8	0.040	0.241	Overcast, ~55 degrees.
6/7/2005	12:35:00 PM	11.48	7.2	10.96	67	120	1.2	18.6	0.025	0.229	
7/12/2005	9:30:00 AM	13.79	7.0	9.30	81	195	2.2	11.6	0.030	0.215	~60 degrees, partly cloudy
8/9/2005	11:15:00 AM	14.94	7.2	8.84	89	100	4.5	3.1	0.042	0.188	Turb standard recall of lot used to cal YSI on this date. Results could be up to 8% lower than the true turb value.
9/27/2005	11:00:00 AM	10.35	7.2	9.94	87	400	4.9	2.4	0.031	0.176	Turb standard recall of lot used to cal YSI on this date. Results could be up to 8% lower than the true turb value.



#### PART OF ELD WATERSHED

**LENGTH OF CREEK:** 4.5 miles

**BASIN SIZE**: 4,064 acres

STREAM ORDER: 2

#### **PRIMARY LAND USES:**

Rural residential Agriculture and Forestry

FISHERIES RESOURCES: (From A Catalog of Washington Streams and Salmon Utilization, WDOF)

Coho and Chum

#### **GENERAL TOPOGRAPHY:**

This creek originates in wetlands and flows through a forested area. It winds through a gently rolling rural/residential area before dropping through wooded ravines. The creek has two falls within a mile of the mouth. The creek empties into Eld Inlet in the Mud Bay estuary.

# **GENERAL WATER QUALITY:** (Excellent, Good, Fair, Poor)

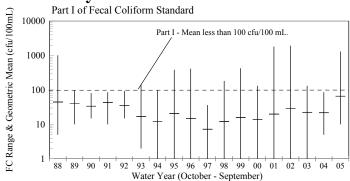
Good - Met all water quality standards except part II of the bacteria standard in 2004/05.

#### **OTHER DATA:**

Thurston County Environmental Health Division, (360) 754-4111 or www.geodata.org/swater.

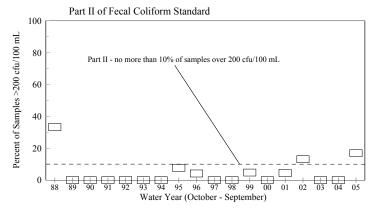
Washington Department of Ecology, Environmental Assessment Program, National Monitoring Program Project, (360) 407-6447

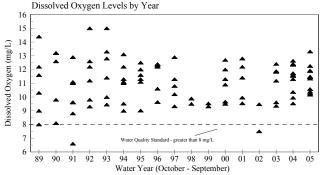
### **Perry Creek**



The water quality standard for fecal coliform bacteria has two parts: part I - the geometric mean shall not exceed 100 organisms per 100 milliliters of sample *and*, part II - no more than 10% of the samples shall exceed 200 colonies/100 mL.

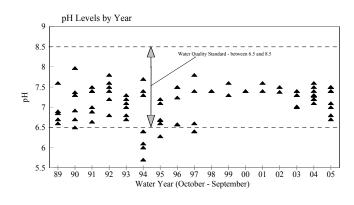
There have been no violations of part I. Part II of the standard was violated in 2005, 2002, and 1988.





The water quality standard for dissolved oxygen is a lowest one-day minimum of 8.0 mg/L. Throughout the period of record there have only been a few measurements below the minimum. There were no violations in 2003/04 or 2004/05.

The standard for pH requires the pH to be within the range of 6.5 to 8.5. Measurements have been within the pH standard range since 1997.



Perry Creek has been monitored by Thurston County since 1983. In the past, agricultural practices and septic systems have impacted this creek. In the early 1990's, a number of failing septic systems were identified and repaired. This creek supports a significant coho and chum fishery. The Washington Department of Ecology's Environmental Assessment Program had a ten year monitoring project that ended in 2002. Thurston County intends to continue long-term ambient monitoring in the basin.

## **Major Issues:**

- Agricultural nonpoint pollution
- Segments of stream have on-site septic systems in close proximity

## **Funding Sources:**

■ Local Storm and Surface Water Utility

		WQ Standard			ter Year Data 2004 & 2004/2		Cumulative Data: 1988-2003		
Parameter	Units	WAC 173-201A	Water Year	Mean	Range	# samples violating standard	Mean	Range	
Temperature	EC	Highest 7-DAD Max of 17.5EC	03/04 04/05		5.97 – 15.53 4.18 – 13.64	0 of 10 0 of 12		1.7 - 16.80	
Dissolved Oxygen	mg/L	Lowest one-day minimum of 8.0	03/04 04/05		9.53 - 12.64 10.2 - 13.3	0 of 10 0 of 11		6.6 - 15.0	
Conductivity	F mhos/cm		03/04 04/05	73 76	54 - 91 62 - 96		71	34 - 243	
pН		6.5 - 8.5	03/04 04/05	7.3* 7.4*	7.1 – 7.6 6.7 - 7.5	0 of 10 0 of 12		5.7 - 8.0	
Turbidity	NTU	not to exceed 5 NTU over background	03/04 04/05	0.63 2.9	0 – 1.2 0 – 11	0 of 10 0 of 12	4.3	0.05 - 160	
Fecal Coliform	colonies / 100 ml	GMV: ≤100 and ≤10% not to exceed 200	03/04 04/05	22** 66**	5 - 85 10 - 1300	% exceeding 200 0% 17%	17**	0 - 1900	
Total Phosphorus	mg/L		03/04 04/05	0.024 0.034	0.013 - 0.043 0.019 - 0.093		0.024	<0.002 - 0.193	
Nitrate+Nitrite- nitrogen	mg/L		03/04 04/05	0.282 0.381	0.18 - 0.374 0.258 - 0.512		0.366	0.125 - 0.599	
Ammonia	mg/L						0.023	<0.010 - 0.088	

<sup>\*</sup> Median \*\* Geometric mean value (GMV)

Cond @25c

umhos/cm

56

DO

mg/L

11.73

FC

cfu/100mL

40

**Turb** 

**NTU** 

1.1

Flow

cfs

**TP** 

mg/L

0.038

*NOx* 

mg/L

0.232

pH

7.5

Temp

 $\boldsymbol{\mathcal{C}}$ 

7.63

Time

2:15:00 PM

Date

12/16/2003

**COMMENTS** 

Did not measure flow. Creek was filled with live Chum.

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											New staff gauge under bridge but could not read.
1/22/2004	9:00:00 AM	5.97	7.2	12.40	59	5	1.0	21.2	0.015	0.312	
2/17/2004	10:45:00 AM	6.56	7.2	12.34	54	10	1.2	40.8	0.013	0.285	
3/15/2004	12:30:00 PM	8.24	7.6	12.64	62	5	0.3	13.3	0.016	0.199	Measured flow @ footbridge; not a very good flow site.
4/19/2004	2:15:00 PM	9.80	7.4	11.53	68	25	1.2	7.6	0.018	0.180	
5/17/2004	10:45:00 AM	11.23	7.3	11.30	78	30	0.3	3.5	0.024	0.246	
6/22/2004	10:45:00 AM	14.01	7.3	10.36	88	20	0.3	1.8	0.029	0.346	
7/15/2004	2:45:00 PM	15.12	7.3	9.94	91	85	0.0	0.9	0.043	0.282	75 degrees.
8/24/2004	2:45:00 PM	15.53	7.3	9.53	91	60	0.4	1.0	0.029	0.374	Flow is estimate due to low flow conditions.
9/22/2004	10:45:00 AM	11.42	7.1	11.62	86	15	0.5	1.2	0.016	0.362	

# Thurston County Water Resources Monitoring Report 2004 - 2005 Perry Creek off Perry Creek Rd

Date	Time	Temp C	pН	DO mg/L	Cond @25c umhos/cm	FC cfu/100mL	Turb NTU	Flow cfs	TP mg/L	NOx mg/L	COMMENTS
10/19/2004	12:20:00 PM	10.90	7.1		81	80	3.7	14.1	0.030	0.408	D.O. did not post calibrate.
11/9/2004	11:00:00 AM	9.55	6.7	10.26	75	50	4.3		0.038	0.335	Did not measure flow, chum spawning.
12/13/2004	10:30:00 AM	7.84	6.8	11.48	63	55	11.0		0.093	0.509	Did not get flow, too many fish. 1000's of fish spawning & digging causing high turb.
1/10/2005	11:30:00 AM	5.12	7.0	11.89	67	10	1.9	22.9	0.041	0.438	Lots of dead salmon. Pt. cloudy, 40 degrees.
2/15/2005	12:45:00 PM	4.18	7.5	13.31	69	25	0.9	9.6	0.021	0.335	Fish bodies around staf gage, did not read.
3/14/2005	10:00:00 AM	6.37	7.5	11.92	78	25	0.8	4.7	0.033	0.364	
4/12/2005	9:20:00 AM	6.89	7.5	12.26	62	45	2.1	31.2	0.019	0.261	40 degrees, Rain.
5/10/2005	11:00:00 AM	11.01	7.4	11.34	67	1300	4.3	22.2	0.035	0.274	Overcast, ~55 degrees.
6/7/2005	12:15:00 PM	10.94	7.5	11.45	77	45		7.3	0.019	0.258	No turbidity measurement taken.
7/11/2005	10:30:00 AM	13.39	7.4	10.39	85	230	1.9	3.1	0.025	0.372	68 degrees, cloudy, muggy.
8/9/2005	10:45:00 AM	13.64	7.5	10.17	93	95	0.6	1.1	0.032	0.506	Turb standard recall of lot used to cal YSI on this date. Results could be up to 8% lower than the true turb value.
9/27/2005	10:30:00 AM	10.34	7.4	10.58	96	60	0.0	0.7	0.027	0.512	Turb standard recall of lot used to cal YSI on this date. Results could be up to 8% lower than the true turb value.