



# Bedrock Creek Stream Temperature Data Summary 2000-2012

March 2013



# Bedrock Creek Stream Temperature Summary 2000-2012

Prepared by:

Jason Fales

Brianne Stubbers

Nez Perce Soil and Water Conservation District

P.O. Box 131~Culdesac, ID 83524

Phone 208.843-2931 ~ Fax 208.843.2234

<http://www.nezperceswcd.org>

Email NPSWCD@co.nezperce.id.us

Submitted to:

Idaho Governor's Office of Species Conservation

Pacific Coast Salmon Recovery Program

Attn: Terry McRoberts

304 N. 8th Street, Room 149

Boise, Idaho 83702

Project No. NA09NMF4380382

Contract No. SR 00 709 CW

## Contents

Introduction	4
Monitoring Objectives	4
Data Collection	6
Data Analysis	6
Conclusions	15
References	15

### FIGURES

1. Bedrock Creek Stream Temperature Monitoring Location	4
2. Nez Perce Soil and Water Conservation District Location Map	5
3. 2000-2002 Thermograph Chart	10
4. 2003-2004 Thermograph Chart	11
5. 2005-2007 Thermograph Chart	12
6. 2008-2011 Thermograph Chart	13
7. 2012 Thermograph Chart	14

### TABLES

1. Salmonid Spawning Data 2000-2004	7
2. Salmonid Spawning Data 2005-2011	8
3. Cold Water Biota Data 2000-2004	9
4. Cold Water Biota Data 2005-2011	9
5. Exceedance Baseline	15

## Introduction

High stream temperatures are a concern within Nez Perce County for fish habitat as well as water quality. Several streams within the county have been identified as impaired for stream temperature on Idaho's Clean Water Act 303(d) list. In addition, Nez Perce County is home to many resident and anadromous (ocean-going) fish species. One of the biological limiting factors for these species is high stream temperatures.

In order to identify which streams exceed temperature standards and prioritize areas for restoration efforts, the Nez Perce Soil and Water Conservation District (District) collects monitoring data on area streams. Stream temperature monitoring was performed at one site on creek (Figure 2—watershed number 12) as a component of a stream temperature monitoring effort within the Bedrock Creek watershed. Data sets are available on StreamNet and the District's web site at [www.nezperceswcd.org](http://www.nezperceswcd.org).

Monitoring objectives:

Objective 1 Establish baseline water temperatures within the watershed.

Objective 2 Identify timeframes where water temperatures exceed standards.

Objective 3: Determine if water temperature is a limiting factor for steelhead and other aquatic life within the watershed.

### Description

This site is located near the mouth of Bedrock Creek, where stream temperatures show the cumulative effects of land use practices in the watershed.



Figure 1. Bedrock Creek Monitoring Location.

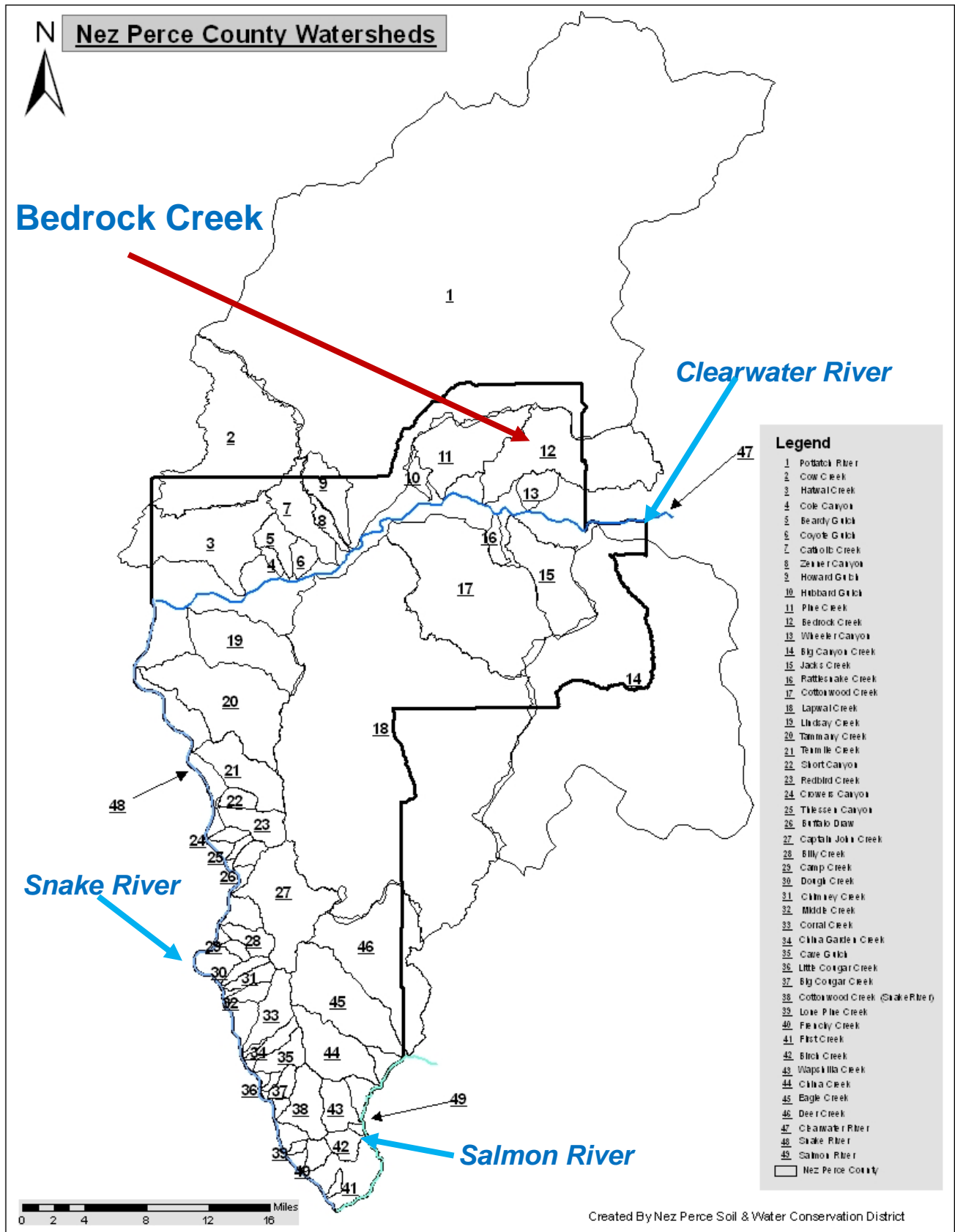


Figure 2. Nez Perce Soil and Water Conservation District Location Map

### Data Collection

Water temperature data was collected on one site within the watershed in each of the following years: 2000, 2002, 2003, 2004, 2005, 2007, 2008, 2011, and 2012. Data collection followed the Protocol for Deployment and Retrieval of Stream Temperature Monitoring within the Nez Perce Soil and Water Conservation District (NPSWCD, 2010). Generally, temperature loggers are placed in the stream in March or early April and collected in November.

### Data Analysis

Data gathered from Bedrock Creek has been compared to the State of Idaho surface water quality standards. All streams in Idaho are considered to have cold water aquatic life as an existing beneficial use, protected by temperature criteria. Salmonid spawning is considered the most sensitive of those uses covered by the cold water aquatic life designation and corresponding temperature criteria. Temperature criteria by which the data is analyzed are as follows:

Cold Water Aquatic Life: 22° C (72° F) maximum daily maximum temperature, 19° C (66° F) maximum daily average temperature.

Salmonid Spawning: 13° C (55° F) maximum daily maximum temperature, 9°C (48° F) maximum daily average temperature (IDEQ 2012).

Data is displayed in table (Tables 1-4) and graph forms (Figures 3-7). The graphs depict three lines showing daily high average and diurnal temperatures. Data is plotted by date and degree centigrade. Yellow colored areas indicate temperatures where the salmonid spawning and cold water biota criteria are exceeded. Tables 1-2 show the number of times salmonid spawning and cold water aquatic life criteria were exceeded and the percentage of the total number of sample days during which exceedances occurred.

Temperature data collected on Bedrock Creek is comparable to other Nez Perce County streams in that Bedrock Creek exceeds fall salmonid spawning temperature criteria the majority of the time. Cold water aquatic life criteria were exceeded less often, ranging from a low of 6% of the time to a high of 85%. Neither the salmonid spawning nor cold water aquatic life beneficial uses are supported by Bedrock Creek.

The logger was installed from August through October 2012, recording data that showed Fall salmonid spawning criteria were exceeded 99% of the time. Bedrock Creek exceeded cold water aquatic life criteria 18% of the time in Fall of 2012

Data collected on Bedrock Creek is limited by the time the logger was in the water. It is clear from the thermographs (Figures 3-5) that the temperature logger was out of the water in 2000, 2003 and 2005, either because the stream dried up or the logger washed out. The thermographs show that it is highly likely Bedrock Creek goes dry or flows subsurface for the majority of the month of August, no matter the year.

The data logger was deployed during dates outside the critical time period in 2002. The 2004 data set is the most complete, and was used to establish baseline temperatures at this site.

## Bedrock Creek Stream Temperature Analysis Report

Table 1. Salmonid Spawning Temperature data from 2000-2004.

Criteria	2000		2002		2003		2004	
	Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts	
	Number	%	Number	%	Number	%	Number	%
<b>SPRING</b>								
13°C Instantaneous	13	100%	0	0%	25	46%	64	84%
9°C Average	13	100%	0	0%	53	98%	76	100%
Days Evaluated & Date Range	13	4/15-7/31/00	0	Not Deployed	54	4/15-7/31/03	76	4/15-7/31/04
<b>FALL</b>								
13°C Instantaneous	61	97%	0	0%	20	100%	71	100%
9°C Average	63	100%	0	0%	20	100%	71	100%
Days Evaluated & Date Range	63	8/1-10/15/00	0	Not Deployed	20	8/1-10/15/03	71	8/1-10/15/04
<b>TOTAL</b>								
13°C Instantaneous	74	97%	0	0%	45	61%	135	92%
9°C Average	76	100%	0	0%	73	99%	147	100%
Days Evaluated & Date Range	76	4/15-10/15/00	0	Not Deployed	74	4/15-10/15/03	147	8/1-10/15/04

## Bedrock Creek Stream Temperature Analysis Report

Table 2. Salmonid Spawning Temperature data from 2005-2011.

Criteria	2005		2007		2008		2011	
	Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts	
	Number	%	Number	%	Number	%	Number	%
<b>SPRING</b>								
13°C Instantaneous	13	100%	72	97%	69	96%	0	0%
9°C Average	13	100%	74	100%	72	100%	0	0%
Days Evaluated & Date Range	13	4/15-7/31/05	74	4/15-7/31/07	72	4/15-7/31/08	0	Not Deployed
<b>FALL</b>								
13°C Instantaneous	62	100%	72	95%	71	93%	58	100%
9°C Average	62	100%	76	100%	76	100%	58	100%
Days Evaluated & Date Range	62	8/1-10/15/07	76	8/1-10/15/07	76	8/1-10/15/08	58	8/1-10/15/11
<b>TOTAL</b>								
13°C Instantaneous	75	100%	144	96%	140	95%	58	100%
9°C Average	75	100%	150	100%	148	100%	58	100%
Days Evaluated & Date Range	75	4/15-10/15/07	150	4/15-10/15/07	148	4/15-10/15/08	58	8/1-10/15/11



## Bedrock Creek Stream Temperature Analysis Report

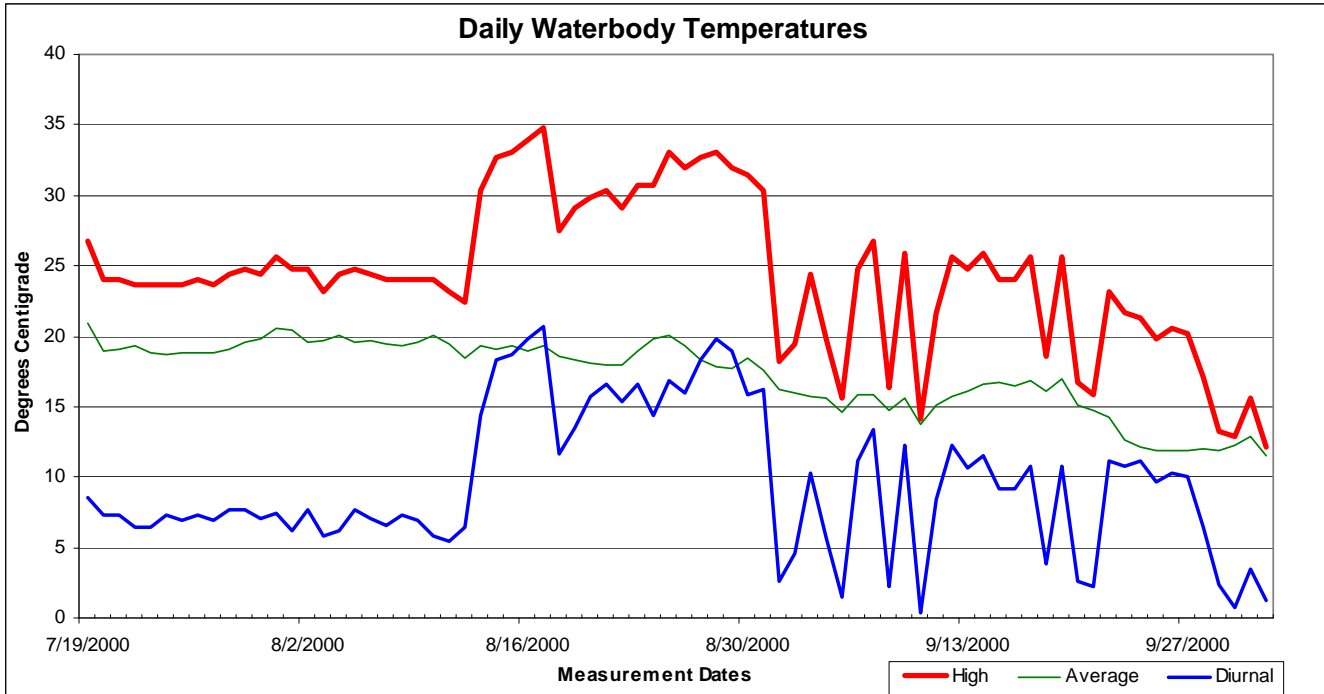
Table 3. Cold Water Aquatic Life Data Summary 2000-2004

Criteria	2000		2002		2003		2004	
	Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts	
	Number	%	Number	%	Number	%	Number	%
22°C Instantaneous	55	85%	0	0%	0	0%	4	6%
19°C Average	25	38%	0	0%	0	0%	2	3%
Days Evaluated & Date Range	65	6/22-9/21/00	0	Not deployed	0	Not deployed	66	6/22-9/21/11

Table 4. Cold Water Aquatic Life Data Summary 2005-2011.

Criteria	2005		2007		2008		2011	
	Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts		Exceed- ance Counts	
	Number	%	Number	%	Number	%	Number	%
22°C Instantaneous	38	58%	60	65%	30	33%	9	26%
19°C Average	17	26%	35	38%	17	18%	5	15%
Days Evaluated & Date Range	65	6/22-9/21/05	92	6/22-9/21/07	92	6/22-9/21/08	34	6/22-9/21/11

2000



2002

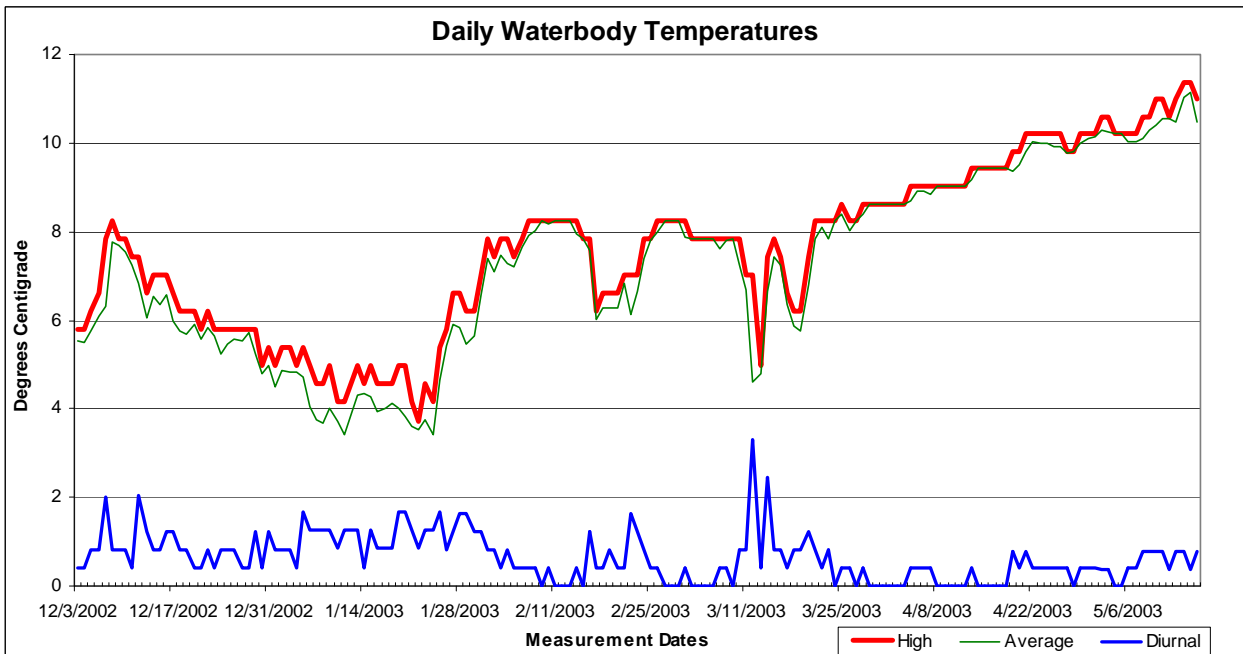
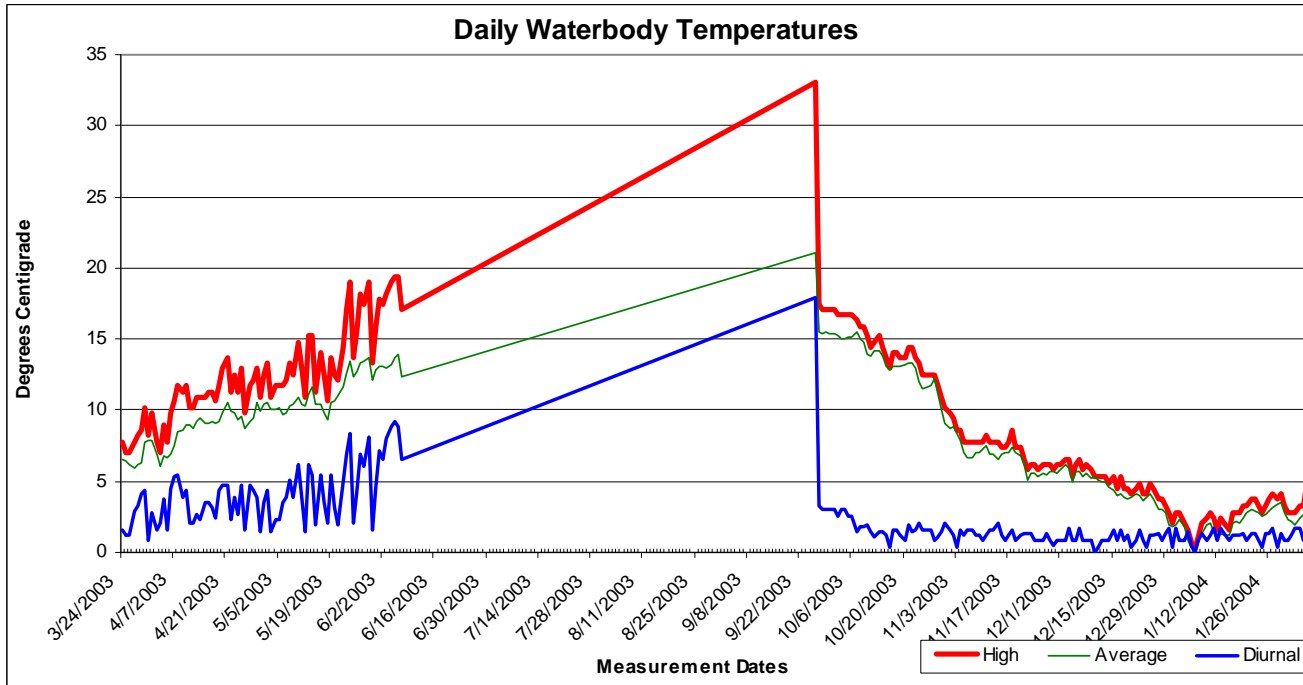


Figure 3. Thermograph charts 2000-2002

2003



2004

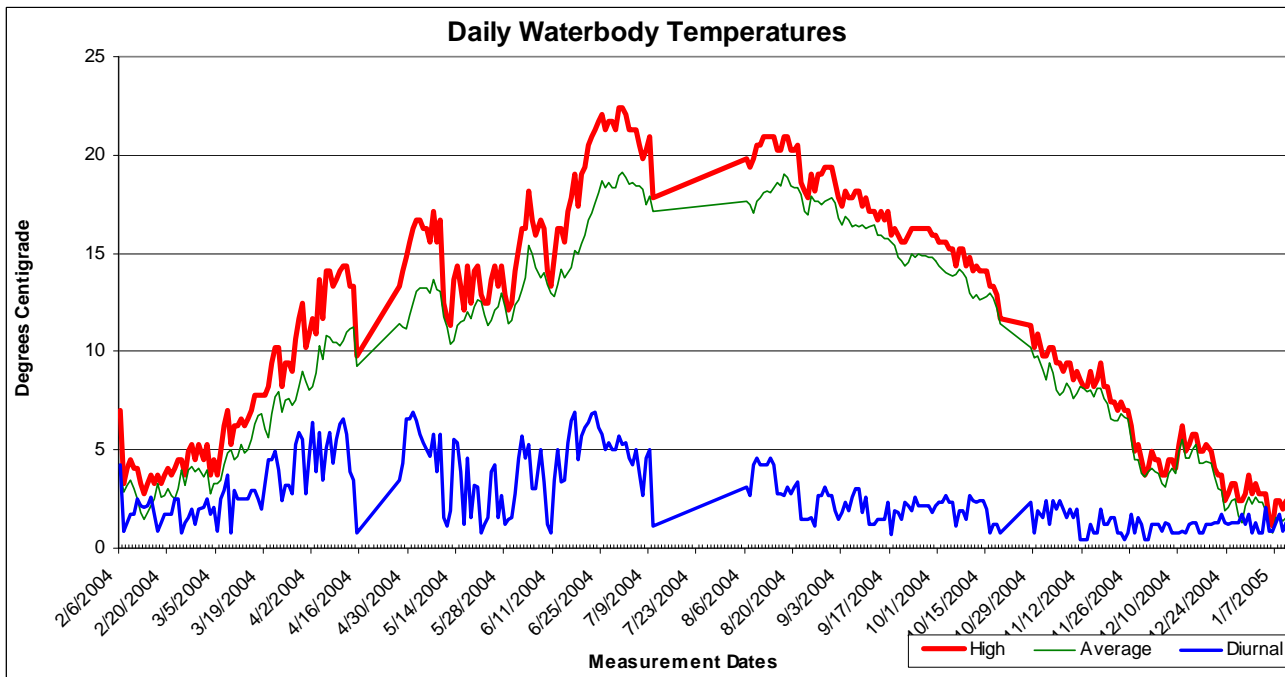
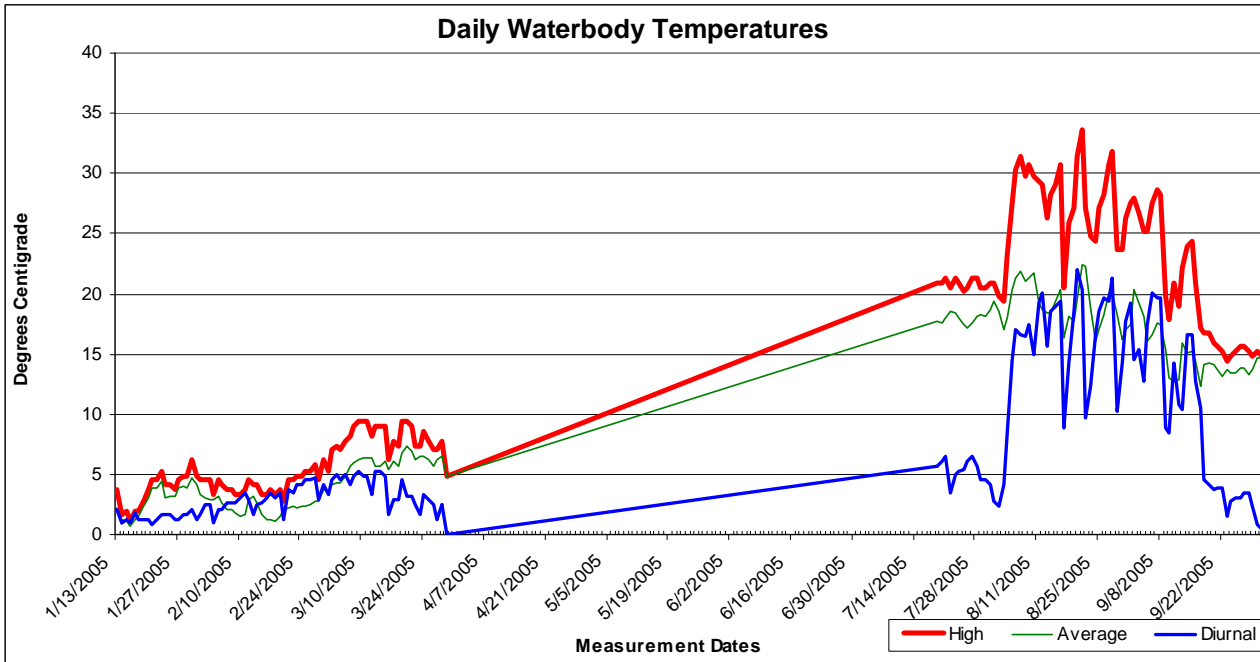


Figure 4. Thermograph charts 2003-2004

2005



2007

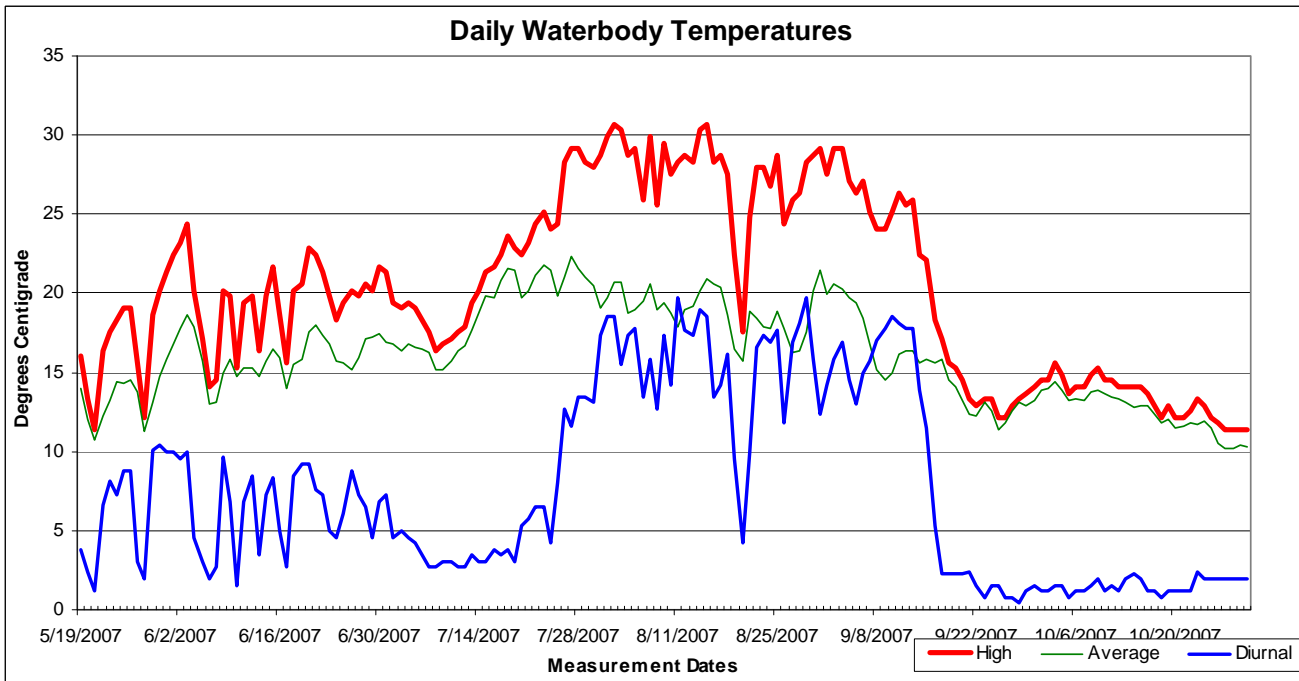
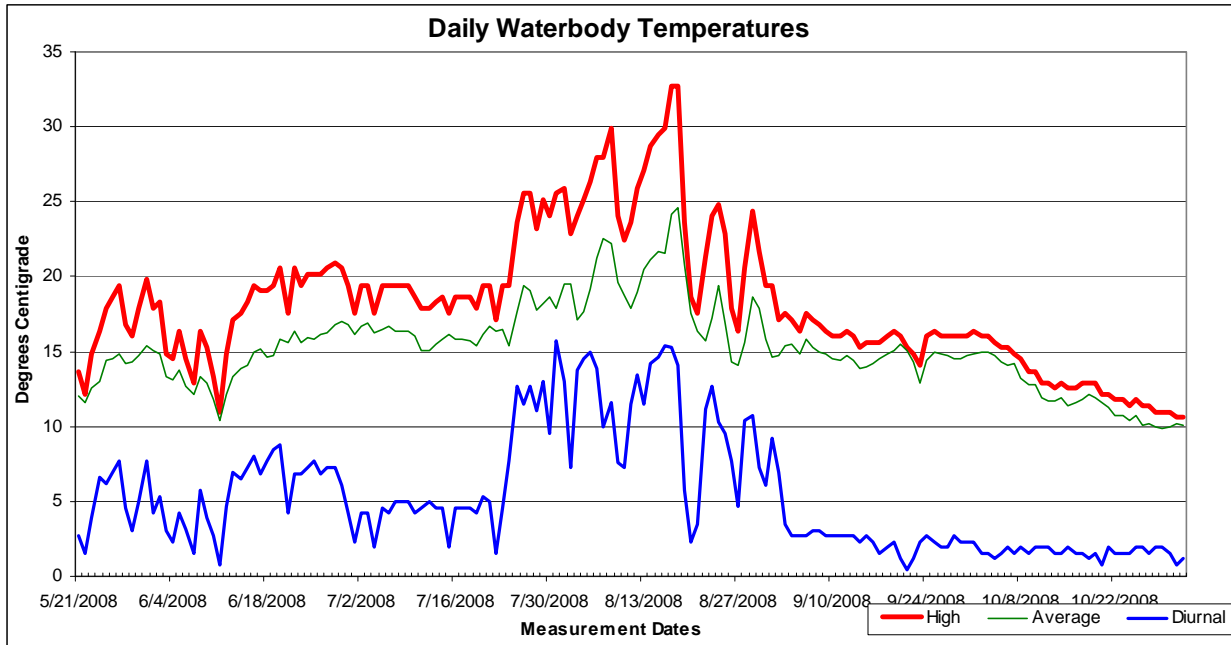


Figure 5. Thermograph charts 2005-2007

2008



2011

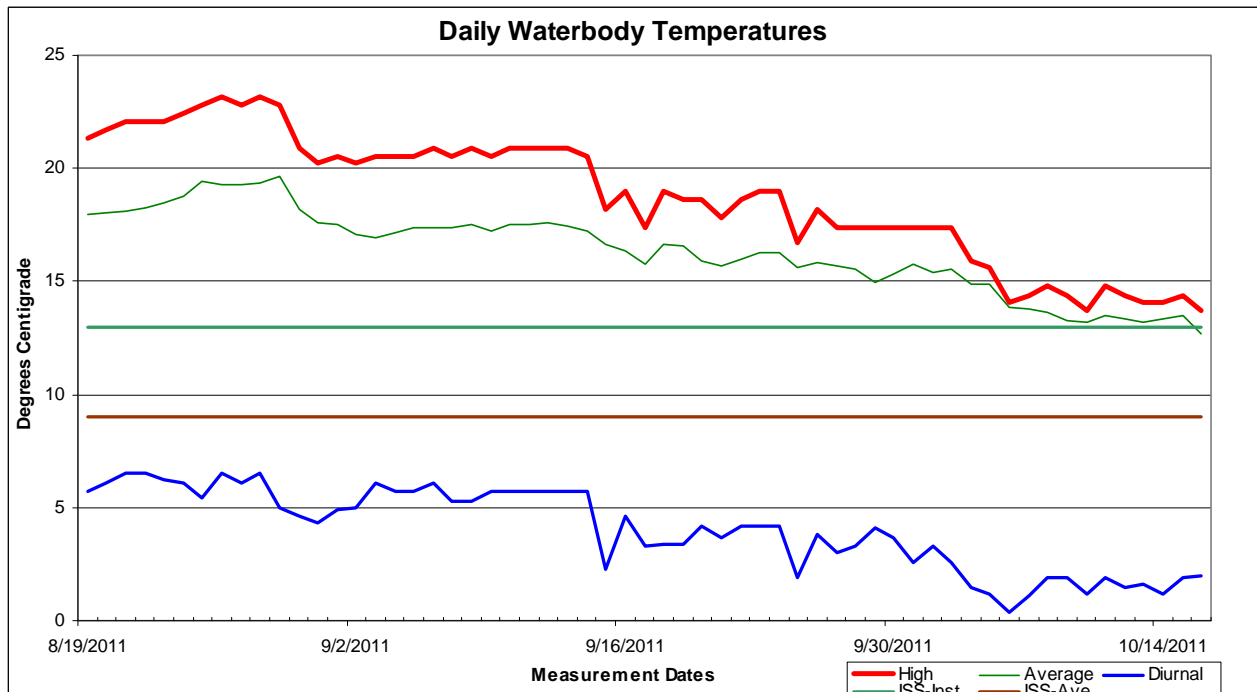


Figure 6. Thermograph charts 2008-2011

2012

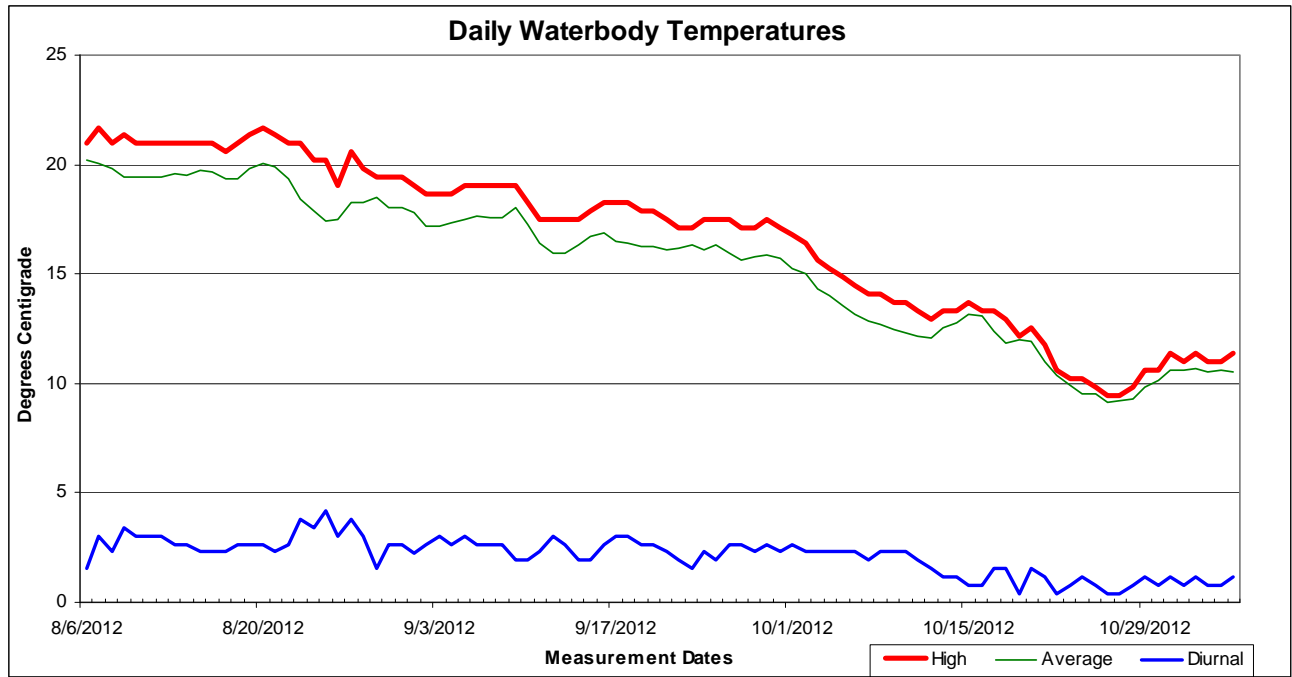


Figure 7. Thermograph charts 2012

## Conclusions

**Objective 1:** Establish baseline data.

The baseline data set established for this watershed is illustrated in Table 5.

**Objective 2:** Identify timeframes where temperatures exceed standards.

Data collected on Bedrock Creek is limited by the time the logger was in the water. It is clear from the thermographs that the temperature logger was out of the water in 2000, 2003 and 2005, either because the stream dried up or the logger washed out. From the more complete data sets, Bedrock Creek begins to exceed salmonid spawning temperatures in May and continues to exceed through October.

**Objective 3:** Determine if water temperature is a limiting factor for steelhead within the watershed.

Steelhead using Bedrock Creek for spawning and rearing could be limited by stream temperatures higher than optimum conditions. During mid to late summer, temperatures in Bedrock Creek are not consistently cool enough to support other cold water aquatic life.

Table 5. Exceedance Baseline

Criteria	Exceedance % Established as Baseline
Fall Salmonid Spawning August 1 to October 15 13°C Instantaneous	100
Fall Salmonid Spawning August 1 to October 15 9°C Average	100
Spring Salmonid Spawning April 15 to July 31 13°C Instantaneous	84
Spring Salmonid Spawning April 15 to July 31 9°C Average	100
Cold Water Aquatic Life April 15 to October 15 22°C Instantaneous	6
Cold Water Aquatic Life April 15 to October 15 19°C Average	2

## References

NPSWCD. 2010. Protocol for Deployment and Retrieval of Stream Temperature Monitoring Gages within the Nez Perce Soil and Water Conservation District. Nez Perce Soil and Water Conservation District. March 2010. Web. 10 Jan 2012. [www.nezperceswcd.org](http://www.nezperceswcd.org).