



Water Quality Monitoring in Nez Perce National Historical Park (NEPE) - Spalding

Importance

Freshwater habitats are diverse and productive ecosystems, providing habitat for aquatic plant, invertebrate, and vertebrate species including many fishes and birds. Rivers and streams are intimately connected to riparian zones, providing habitat for many specialist species. Additionally, most upland animals rely on aquatic habitats to one degree or another.

Water resources in the semi-arid west have been strongly affected by human activity, and many Upper Columbia Basin Network (UCBN) streams and rivers are listed by states as impaired for one or more parameters. Most UCBN waterbodies and many aquatic resources, such as migratory fish, are strongly influenced by activities in the larger watersheds outside park boundaries. Understanding the current status of freshwater ecosystems will help guide management and restoration efforts and provide insight into ecosystem change in a landscape with shifting climate and dynamic human influences.



Lapwai Creek looking downstream from the water quality monitoring station, August 2011.

Status of Lapwai Creek in NEPE - Spalding

Threats to water resources in NEPE have been listed as: point and non-point discharge from upstream sources, agriculture, logging, grazing, recreation, highway runoff and urbanization. In 2010, Lapwai Creek was listed as a category 3 water by the state of Idaho meaning that it had not been assessed to determine if it meets state water quality standards (^a ID DEQ 2011). In 1998, Lapwai Creek was on the 303(d) list for pollution problems related to: bacteria, flow alteration, habitat alteration, nutrients, sediment, dissolved oxygen and temperature. In 2011, the UCBN monitored 5 core water chemistry parameters in Lapwai Creek including: dissolved oxygen, pH, specific conductance, temperature, and turbidity. Each parameter was evaluated hourly between the months of June and November using a continuous water quality monitor. In addition, aquatic macroinvertebrates were collected according to United States Forest Service (USFS) - PACFISH/INFISH Biological Opinion Effectiveness Monitoring (PIBO-EM) Program protocol. For more on macroinvertebrates please see the integrated water quality annual report for NEPE on the UCBN website listed below:

- Water temperature exceeded the state standard designated for cold water aquatic life (MDMT <22 °C and MDAT < 19 °C) during 27% and 17% of observations respectively. These data suggest the need for an increase in stream shading via riparian vegetation basin wide.
- pH levels exceeded the upper criteria of 9.0 pH units during 14% of observations and may indicate pollution from an upstream source.

UCBN water quality monitoring is conducted on a 3 year rotating panel. Lapwai Creek will be sampled for water chemistry and macroinvertebrates again in 2014. The following table is a summary of findings from 2011 monitoring along with state regulatory thresholds for Lapwai Creek.

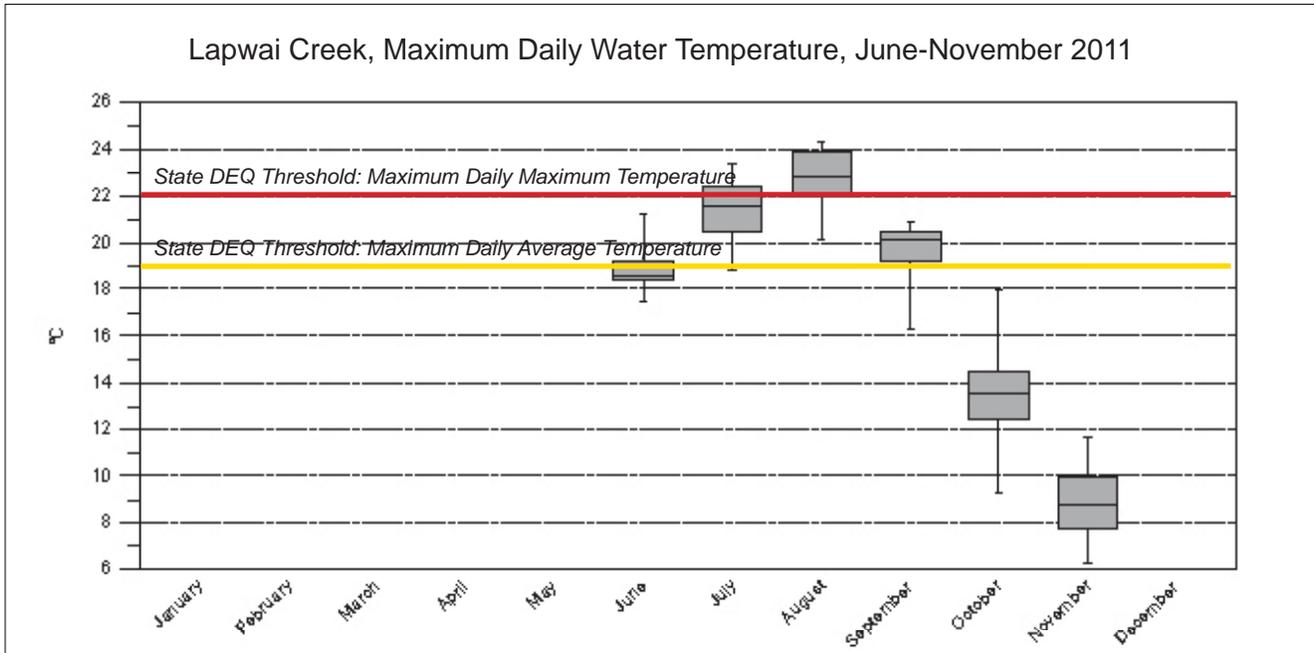
Lapwai Creek Water Chemistry Summary 2011

Measure	Current Condition (June-November, 2011)	State DEQ Thresholds ^b	% Exceedance ^c
Temperature (*MDMT, **MDAT)	*MDMT=24.31 °C **MDAT=21.04 °C	*MDMT<22 °C **MDAT<19 °C	27% 17%
Specific Conductance (mean)	273.19 µS/cm	N/A	N/A
Dissolved Oxygen (mean daily min)	8.24 mg/L	>6.0 mg/L	0%
pH (mean daily max)	9.0 pH Units	9.0 pH Units, Max	14%
pH (mean daily min)	7.9 pH Units	6.5 pH Units, Min	0%
Turbidity (mean daily max)	104.4 ^d	< 50 NTU over background (instantaneous) < 25 for 10 consecutive days	Insufficient data
<i>E. coli</i>	46.7 MPN/100 ml	< 406 <i>E. coli</i> /100 ml	0%
<i>Fecal Coliform</i>	22 MPN/100 ml	< 500 cfu/100 ml	0%

^aMDMT – Maximum Daily Maximum Temperature, ^{**}MDAT – Maximum Daily Average Temperature, ^a Idaho Department of Environmental Quality. 2011. Idaho Department of Environmental Quality. Final 2010 Integrated Report. Boise, ID: Idaho Department of Environmental Quality. ^b Criteria for cold water life designation. ^c Proportion of samples above water quality standard. ^d Mean daily max based on 2 months of data due to poor data quality.



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Lapwai Creek June 2011



Lapwai Creek- looking down stream July 2011



Monitoring station August 2011

