



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

## 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 all 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 – Spalding, ID

## Status at Nez Perce National Historical Park (NEPE)

Threats to water resources in NEPE have been listed as: point and non-point discharge from upstream sources (Dworshak dam), agriculture, logging, grazing, recreation, highway runoff and urbanization. In addition, both Lapwai Creek and Jim Ford Creek are listed as impaired on the EPA 303(d) list. Lapwai Creek is impaired in the following areas: total dissolved gas, nutrients, bacteria, dissolved oxygen, flow alteration, habitat alteration, sediment, and temperature (Garrett et al. 2007). Jim Ford Creek is listed as impaired for: sediment/siltation. In 2008 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 from both Lapwai and Jim Ford Creeks using the EPA’s Environmental Monitoring and Assessment Program (EMAP) protocol. For more on macroinvertebrates please see the integrated water quality annual report for NEPE on the UCBN website listed below.

Results indicate that most core parameters are within state regulatory thresholds; however, sub-optimal temperatures and dissolved oxygen levels remain a concern. The following table is a basic summary of findings from 2008 monitoring along with state regulatory thresholds for Lapwai Creek.

**Lapwai Creek Water Chemistry Summary 2008**

Measure	Current Condition (June-October, 2008)	State DEQ Thresholds
Temperature (*MDMT, **MDAT)	* MDMT= 27.88 °C ** MDAT= 24.17°C	*MDMT<22 °C **MDAT<19 °C
Specific Conductance (mean)	220.56 µS/cm	N/A
Dissolved oxygen (mean daily min)	7.75 mg/L	> 6.0 mg/L
pH (mean daily max)	8.96 pH Units	9.5 pH Units, Max
pH (mean daily min)	7.95 pH Units	6.0 pH Units, Min
Turbidity (mean daily max)	10.6 NTU	< 50 NTU (instantaneous) < 25 for 10 consecutive days

\*MDMT – Maximum Daily Maximum Temperature, \*\*MDAT – Maximum Daily Average Temperature



Jim Ford Creek – Weippe Prairie, ID

## Discussion

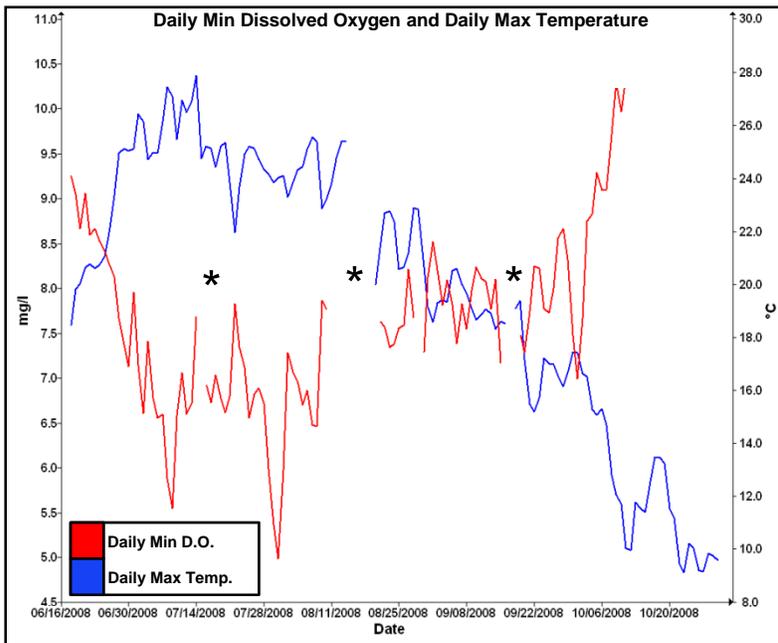
Elevated water temperatures in Lapwai Creek may indicate that riparian areas are not providing optimal shading of the stream channel upstream from NEPE. Improving water temperature in Lapwai Creek will depend on riparian improvements basin wide. For this reason cooperation with other agencies and stakeholders will be critical. Low water conditions will likely remain an issue at Jim Ford Creek and will need to be considered during future monitoring efforts. UCBN water quality monitoring is conducted on a 3 year rotating panel. Lapwai and Jim Ford Creeks will be sampled for water chemistry and macroinvertebrates again in 2011.

## Contact Information

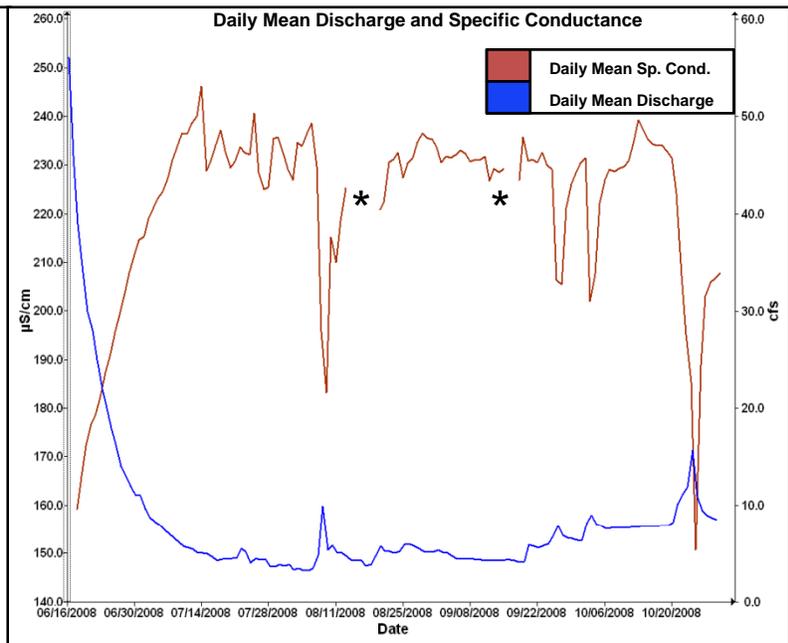
Eric Starkey, [estarkey@uidaho.edu](mailto:estarkey@uidaho.edu)



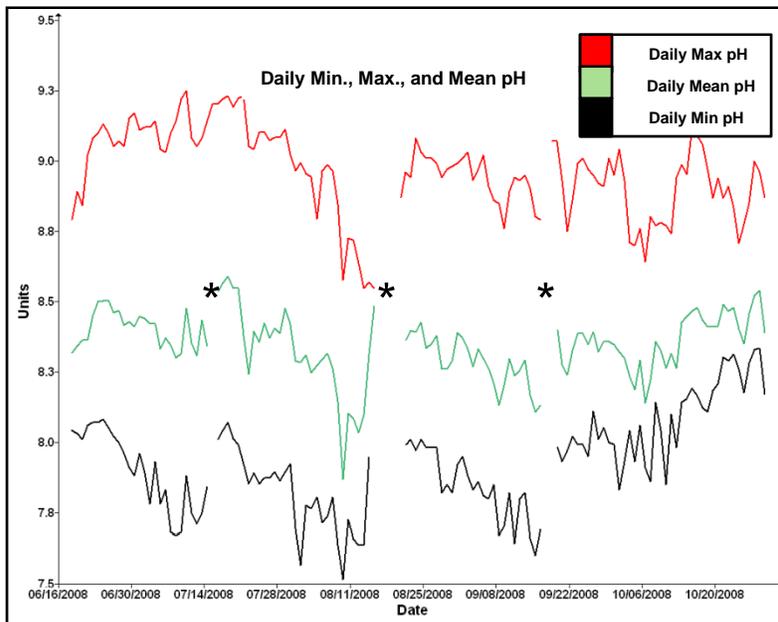
### Monitoring Data for Lapwai Creek (NEPE), 2008



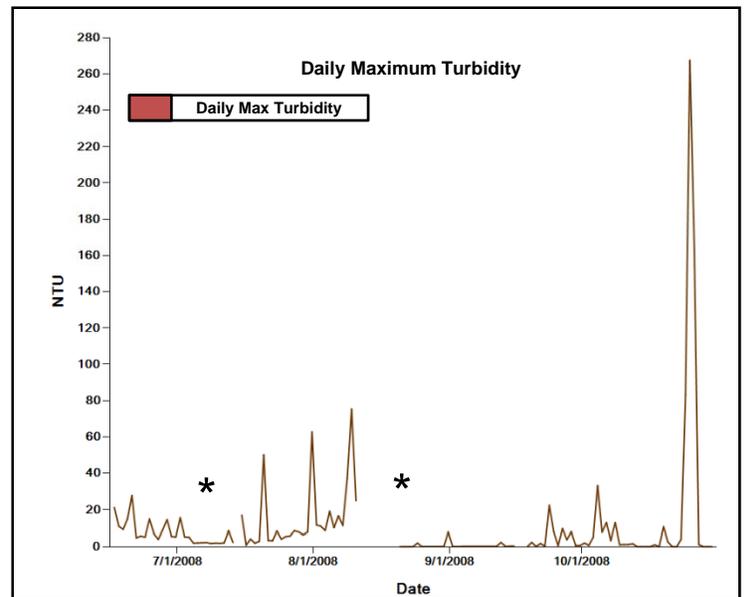
Note that temperature exceeded the regulatory threshold daily maximum of 22 °C on 50 days. Daily minimum dissolved oxygen dipped below the recommended threshold (6.0 mg/L) on 7 days.



The mean specific conductance was 220.56 µS/cm. There is no established threshold for specific conductance. The inverse relationship between discharge and specific conductance is typical for streams.



The minimum and maximum pH were never outside the acceptable regulatory thresholds of 6.0-9.5 pH units and the mean was always well within this range.



Maximum turbidity ranged from 0 NTU to 267 NTU. Spikes in turbidity should be viewed with some caution as fouling likely contributed to most spikes. The increased turbidity in October correspond to rain events. In addition, the increase in turbidity from mid July until August is artificial. Instantaneous turbidity values occasionally exceeded 50 NTU but with the exception of October were likely caused by fouling or low battery power.

#### Important Notes:

\* Indicates a break in data due to service dates and/or a loss of battery power.

All data has been corrected for fouling and drift error according to guidelines established by the USGS.