

## **LARRY HENDREN**

Senior - Rangeland Ecology and Management  
Fisheries Minor  
University of Idaho College of Natural Resources

### **CNR Taylor Intern 2012 Friends of Taylor Endowment**

*A Thank You to the DeVlieg Foundation and the  
Friends of Taylor Endowment.*

My name is Larry Hendren, and I would like to thank the DeVlieg Foundation and Friends of Taylor Endowment contributors for providing me the opportunity to conduct research under Dr. Brian Kennedy at the Taylor Wilderness Research Station this past summer. In forty years of living, I have never had the opportunity to experience such a long period of time in a wilderness setting, a few weeks here and there, but rarely more than two weeks. I spent the summer installing and calibrating a new ecological monitoring system called RiverNet. It allows scientists the opportunity to access data instantly from remote locations via the internet and not having to send an individual out into the wilderness to conduct ecological monitoring. As well, RiverNet collects information every fifteen minutes in place of information for only a short period of time.

I am in my senior year at the University of Idaho majoring in Rangeland Ecology and Management and also pursuing a minor in fisheries. I believe the two are very closely connected and have a passion for both livestock and wildlife. My fisheries' interest comes in not far between the two as I have grown up around the fishing industry. As well, I have children from ages 12-22 and feel very passionate about them being able to one day take their children out to wild backcountry places and for them to have the opportunity to catch a wild salmon. Not just my children, but everyone's children and grandchildren.

The RiverNet project was essentially offered to me from Brian Kennedy, I was uncertain about taking a position in such a remote setting, but felt compelled to aside from the difficulties it would be for my children and my relationship. The opportunity was essentially offered to me from Brian provided I could do the research and monitoring efforts needed.



LARRY HENDREN

Senior - Ringgold Taylor and Management  
Fisheries Major  
University of Idaho College of Natural Resources

GR Taylor Intern 2015  
Friends of Taylor Endowment

My passion is the Taylor Endowment and I would like to thank the DeVilbiss Foundation and Friends of Taylor Endowment for providing me the opportunity to conduct research under Dr. Brian Kennedy at the Taylor Endowment.

Standing the past summer, the Taylor Endowment has provided me with the opportunity to experience a long period of time in a wilderness setting in Lew-Wealds and Lake Park study area. In two weeks, I spent time setting and collecting new ecological monitoring stations called RiverNet. It allows scientists the opportunity to access data in real time from remote locations via the internet and having to send an individual out into the wilderness to establish ecological monitoring. The RiverNet collects information over a 24-hour period in place of information for only a short period of time.

I am in my senior year at the University of Idaho majoring in Fisheries, Ecology and Management and also pursuing a minor in Fisheries. I believe the two are very closely connected and have a passion for both forest and wildlife. My fisheries interest comes from my love of fishing and growing up around the fishing industry. As well, I have children from ages 14-22 and feel very passionate about being able to one day take their children out to fish in a couple places and let them to have the opportunity to catch a wild salmon. I'm just an excited, but extreme's children and grandchild.

The RiverNet project was essentially a field to the front range from the Lew-Wealds study area. I was able to set up the stations in a remote setting but felt excited to assist in the collection of data. It would be for my undergraduate research. The opportunity was greatly offered to me and I'm grateful I could be the research and monitoring effort needed.



RiverNet Project by  
Larry Hendren



Advisor: Brian Kennedy



RiverNet

- Flathead Lake Biological Station; **Taylor Wilderness Research Station**, and Yellowstone Ecological Research Center
- Chosen due to their being some of the only pristine areas in the lower continental United States.

My Purpose

- General maintenance of instream sensors.
- Calibrate the difference between the remote sensors within the smaller tributaries of Big Creek, as well as Big Creek itself.
- With a calibration set in place, information can be analyzed in other places remotely without having to physically send an individual into the back country.

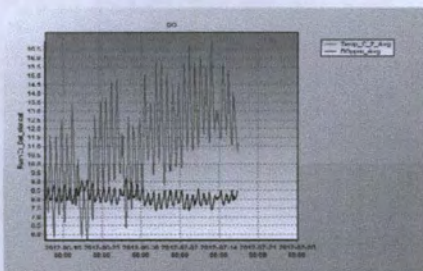
What this will mean

- Remote sensing allows scientists spatially and temporally data that may be used in a multitude of different aspects.
- Water quality is of high importance not just to the humans on our planet, but to the various species as well.

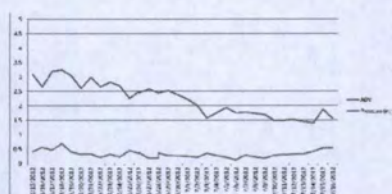
What we are Monitoring

- Stream Pressure
- Stream Temperature
- Discharge Pressure
- Dissolved Oxygen
- Conductivity

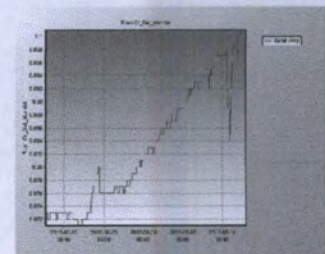
Dissolved Oxygen Levels in Relation to Temperature



Stream Pressure/Discharge Relationship



Conductivity within the Stream



## Importance to Salmon/Stealhead

- Water quality is of high importance for Salmon and Stealhead populations.
- Water quality influences the broader ecosystem.
  - e.g. Nutrients, macro & micro-invertebrates
- This data can inform restoration projects

## Collaborations at TWRS

- Liza Mitchell
  - Watershed wide nutrient dynamics.
- Emily Davis
  - Wildfire impacts upon stream metabolism.
- NOAA
  - Working to expand spatial coverage of sensors.
- MESA
  - Climatological data.

## Thank You

- Janet DeVlieg Pope and the DeVlieg Foundation.
- All interns – assistance with the installation of all of our sites in some challenging environmental conditions.
- Liza Mitchell...for being there. As well as Rick Hartson for excellent guidance.
- TWRS management and staff.
- Matt Lyon and the Baxter Lab.

## Impacts to the Future

- The RiverNet system is a useful concept.
  - Entire watershed approach with minimal on the ground labor and expense.
- Little has been done regarding the monitoring of smaller streams in such wilderness places.
- There is a high likelihood of it being used on a broader scale providing this venture is successful.