

**UPPER CLARK FORK WORKING GROUP
ONLINE ZOOM MEETING
MARCH 31, 2020**

Hosts: University of Montana: Maury Valett, Division of Biological Sciences
Geum Environmental Consulting: Tom Parker, Principal Ecologist.

Participants: Maury Valett (University of Montana)
Doug Martin (NRDP)
Nathan Cook (FWP)
Alex Leone (CFC)
Randy Apfelbeck (MT DEQ)
Wyatt Cross (Montana State University)
Marisa Sowles (Geum)
Tom Parker (Geum)

The Upper Clark Fork Working Group (UCFWG) is a collaborative with the mission to ‘...facilitate, produce, analyze, and share science-based knowledge among key participants involved in the remediation, restoration, research, and monitoring of the Upper Clark Fork River and its tributaries’ (UCFRWG Strategic Plan 2019).

The purpose of this meeting is to allow representatives from each organization share upcoming activities related to the Strategic Plan. Below activities discussed during the call are listed by organization.

University of Montana: Valett Lab

- Water Quality monitoring at 16 sites between Warm Springs Pond and Missoula is part of the Valett NSF Long Term Research in Environmental Biology (LTREB) program (see LTREB Monitoring Sites Table, sent to Marisa for locations). Sites are monitored monthly from November – March and every two weeks throughout the summer. Parameters include: temperature, electrical conductivity, soluble reactive phosphorus, ammonium, nitrate, total N, total P, pH, total alkalinity, dissolved organic carbon, and total recoverable metals (quarterly). Selected sites include algal biomass sampling as ash-free dry mass and chlorophyll a.
 - Six sites are long-term monitoring sites and are currently supported by DEQ and represent historic VNRP monitoring sites.
 - Three sites were recently added on the Little Blackfoot, Rock Creek, and Flint to characterize the major tributaries to the Clark Fork River.
 - Biomass sampling is tied to food web studies conducted by Wyatt Cross and Jose Sanchez from Montana State University Department of Ecology
- Taylor Gold Quiros, Valett PhD student, is working with FWP to research fish growth. Focal sites are located at Deer Lodge, Gold Creek, and Bear Gulch. Those locations will include growth studies and trophic basis of production analysis. Three additional sites (pH Shack, Bonita).

- Jacob Prater, Valett MS student, is monitoring algal blooms and the metabolic and nitrogen uptake behavior associated with seasonal algal proliferation. This works ties in to Clark Fork Reach C concerns regarding fish food web relationships.
- Colton Kyro, Valett MS student, is researching nitrogen sources at Lost Creek Dutchman Complex. Focus is on determining if wastewater treatment ponds act as a point source for N? What processes are occurring in the complex? Are there nutrient sinks and sources and where?
- Thomas Horner, Valett undergraduate student, is investigating the algal transformation from filamentous greens to blue-green bacteria over the course of the summer algal bloom. Focus is on the rates of N-fixation noting that harmful algal blooms can develop when N is scarce, water is warm, and P is plentiful.

Montana State University: Cross Lab

- Studying how river invertebrate community structure influences ecosystem function.
- Research is focused on how metal and nutrient contamination has influenced, and maybe simplified, the food web and what that means for energy flows from the base of the food web (primary producers, microbes) up to the top - fish.
- Monthly samples at six sites between Warm Springs Ponds and Missoula. Three of these will be studied more intensively (located at Deer Lodge, Gold Creek, Bear Mouth/Bear Gulch) by sampling for invertebrate guts contents, isotopes, and metals. Detailed food webs will be constructed in an attempt to understand key players in moving contaminants through the food web.

Fish Wildlife and Parks

- Trout abundance sampling will occur in the next few weeks (before high flows) between Warm Springs Ponds and Rock Creek. UM (Taylor Goldquiros) has been helping with sampling.
- Population estimates for Warm Springs Ponds to Rock Creek. The data is valuable right now because annual sampling sites don't overlap with phases that have been remediated or will be remediated in near future.
- FWP working with UM (Taylor Goldquiros) to survey all fish species at six sites. Knowledge of species other than trout is a big data gap.
- FWP also working with UM to collect diet information over the summer.
- Working with Clark Fork Coalition on Fish Habitat study. Hope to expand this. Will be snorkeling (3 weeks at end of summer/low flows) to observe fish numbers and species and associate the fish with habitat features.
- Talking with DEQ about collecting dissolved oxygen (DO) in Silver Bow Creek. Previous studies have shown a reach that has gone hypoxic and limits fish distribution. This might be particularly important now that treated Berkley Pit water and the improved Butte WWTP contribute to flows. There may be additional waters from Silver Lake.
- UM interested in getting some water samples correlated to fish sampling
- Working with NRDP (Beau Downing) and Clark Fork Coalition installing fish screens to demonstrate the benefit of those projects.
- Keeping an eye on efforts by Montana Resources to use Silver Lake water to feed Blacktail and Silver Bow Creeks in Butte. FWP plans to monitor this to determine benefits or damages.

Clark Fork Coalition

- Conducting annual nutrient sampling with DEQ.
- Continuing monitoring of long-term sites looking at seasonal flows and temperatures. Most of these locations are project related. There are over 40 sites in Clark Fork and Blackfoot.
- On the mainstem there are 4 sites (Galen, Racetrack, near Valiton diversion on Long property, and at Sager lane). Data loggers installed May – November, collecting temperature and flow.
- New studies are scheduled looking into the Hearst Lake drainage and Warm Springs Creek. Hearst Lake has not monitored since mine was abandoned.
- Repeating and expanding a habitat study conducted last summer coordinating with FWP and University of Montana Western. These data will go up on the online GIS map. This year there will be a 3 week snorkeling effort later in the summer during low flow to count fish and tie their location to habitat features.
- Working with Montana Tech (Robert Pal's master student) looking into how post remediated groundwater levels settle out in floodplains.
- In the fall, Clark Fork Coalition will work with University of Montana Western (Robert Thomas and class of 20 students) to perform a baseline assessment of invertebrates in phases 3 and 4.

MT DEQ

- Conducting long-term trend monitoring and contracting with the Clark Fork Coalition for long term trend monitoring for nutrients, July through September twice a month at 12 sites from Silver Bow Creek to Cabinet Gorge Dam. The last three sites near Cabinet Gorge are monitored by Avista. The upper nine sites between the Flathead River confluence up to Silver Bow Creek are monitored by the DEQ.
- Algae monitoring at seven sites between Deer Lodge and the Flathead River led by Vicki Watson (University of Montana). Monitoring occurs two times per year in August and September.
- Loaning data loggers to FWP this year for dissolved oxygen monitoring.

Natural Resource Damage Program

- NRDP is funding much of FWP work as well as the Clark Fork Coalition flow monitoring.
- NRDP mainstem work includes:
 - Conducting a data gaps study:
 - Working with Geum and TetraTech to try and characterize how much contamination remains in the floodplain in unremediated phases. Potential opportunity for additional sediment samples by other interested parties.
 - Brian Bartkowiak is tracking flow at several stations along the main stem and working to establish two USGS stations near Warm Springs that would be funded by ARCO.
 - Building a hydraulic model for Reach A. Beau Downing is coordinating this with River Design Group as the contractor.
 - Geum, as contractor to NRDP, is investigating unique habitats and plant communities on the floodplain.
 - Supporting MT university fish studies.
- Looking into risk of berm failures.

- Working with TU to negotiate a flow release from Silver Lake to Warm Springs Creek during mid-July, August and September and monitoring responses to those flows. Flows were released last year equating to about 70 ac-ft or about 30cfs.
- Working with RESPEC to monitoring and identify concerns around Warm Springs Ponds.
- Keeping an eye on efforts by Montana Resources to use Silver Lake water to feed Blacktail and Silver Bow Creeks in Butte. FWP plans to monitor this to determine benefits or damages.

Potential Coordination or Additional Monitoring

- Collection of water chemistry by Montana University to complement FWP dissolved oxygen monitoring in Silver Bow Creek. May need to coordinate with RESPEC and DEQ who are also doing sampling in this area.
- Monitoring of material exchange between the floodplain and the channel. Currently limited by the ability to measure discharge and landowner access. Possible task for hydrology sub group.
- Vegetation Monitoring: may be addressed somewhat in the NRDP data gaps for existing vegetation. For remediated areas and the vegetative response there is a Qualitative Rapid Assessment (QRA) performed in 2015-2018. Could use this format or adapt it to gather floodplain data.

Next Steps

- Review and revise Strategic Plan goals and objectives. **Doug and Maury, 4/1/2020**
 - Consider incorporating tributaries as a focus. FWP is already monitoring tributaries to determine how fish interact with the main stem and this would also influence the food web.
- Distribute summaries of activities to all to review and revise. **All, review this document and send back to Marisa (msowles@geumconsulting.com) by Monday, April 6, 5 PM.** Marisa will compile edits and send to Andrew and Maury for posting to the web site.
- Post revised summaries to the website (ucfwg.org). **Andrew Hauer**
- Organize sub group meetings. **All, mid April**