



West Plum Creek SMP Field Trip

Colorado SMP Peer Learning Network

June 22-23, 2023

Castle Rock, Colorado

Post-Field Trip Notes & Online Resources

Presenters

- Boyd Wright and Elizabeth Stewart Krone, Colorado Parks and Wildlife, *West Plum Creek, Its Fishes, and the Stream Management Plan*
- Bradley Boileau, River Watch, *Macroinvertebrates Sampling Demonstration*
- Stacy Beagh, Strategic By Nature, and Chelsea Silva, River Network, *Facilitation Training 101*
- Kim Lennberg, Alba Watershed Consulting, Mickey Means-Brous, River Network, and Lorie Peterson, Colorado Department of Public Health & Environment (CDPHE), *Aquatic Habitat Training and Mock Assessment & Water Temperature Monitoring*

Online Resources Mentioned During Field Trip

- Upper Colorado Endangered Fish Recovery Program [videos about native fish species](#).
- [River Watch macroinvertebrate sampling manual](#) (see pages 25-29 for the data sheets).
- River Watch training, October 18-21 at Camp Cedaredge, [reserve your spot at the training \(scroll down the page to training section\)](#).
- CDPHE Colorado Water Quality Control Division's [ArcGIS StoryMap on Colorado Benthic Macroinvertebrates](#).
- [Facilitation skills packet](#) provided during the field trip.
- 20+ facilitation techniques from [Liberating Structures](#).
- Robust, low-cost data loggers from stream temperature, flow intermittency, and relative conductivity monitoring, Thomas P. Chapin, Andrew S. Todd, and Matthew P. Zeigler, [paper on modifying STIC \(Stream Temperature, Intermittency, and Conductivity\) loggers](#).
- CDPHE list of Standard Operating Procedures: CDPHE has created [SOPs for the Water Quality Control Division](#), including the SOP for temperature monitoring. Please contact Chris Theel, christopher.theel@state.co.us, to request an SOP or for more information.
- [Digest for a Primer on the Wood Regime](#) by Dan Scott.

Notes from the Field Trip

Notes provided below are from the field trip along West Plum Creek. Notes are not comprehensive and should be understood as a snapshot of the field trip. For additional information, please contact field trip organizer, Chelsea Silva, csilva@rivernetwork.org.

West Plum Creek, Its Fishes, and the Stream Management Plan

Boyd Wright and Liz Stewart Krone, Colorado Parks and Wildlife (CPW), provided a presentation on West Plum Creek, the fishes it supports, and how the fish relate to the West Plum Creek Stream Management Plan. Boyd is the Native Aquatics Species Biologist and Liz is a Native Aquatic Species

Technician for CPW's Northeast Region. They brought along live fish collected by CPW technicians so that field trip participants could "put a face" to the fishes of West Plum Creek.

West Plum Creek background

West Plum Creek has much higher species richness than other places. Ten species are classified as Tier I conservation need with many in decline and many others extirpated long ago. Boyd uses a "conservation triage" approach to his work – some species are already long gone and there is no hope of recovering them so trying to save them is largely a lost cause. Instead, he focusses his efforts on finding what is working and making sure he can preserve it. West Plum Creek is working – not all is lost - so he has focused on capacity building through partnership to find ways to preserve West Plum Creek.

The landscape context of West Plum Creek is characterized by small ranchettes. There is no presence of big industrial agriculture, and compared with the Front Range, there is not much urban development.

West Plum Creek is a transition zone stream. Above West Plum Creek, the headwaters are characterized by fast moving, cold water and boulders. Below West Plum Creek, flow slows and substrate is characterized by sand. West Plum Creek is right in the middle. Fish that travel through the watershed use West Plum Creek as a space for moving from cold to warm water as they head downstream. West Plum Creek runs south to north, the only watershed oriented this way in Colorado besides the North Fork of the Poudre River. Due to this orientation, the entirety of West Plum Creek cuts across the transition zone.

The ecological master factor for fish is water temperature.

Historically, the Platte River is a mile and an inch deep.

Fishes of West Plum Creek

Fish in West Plum Creek are glacier relict species that got left behind as the landscape changed during the Pleistocene, 10,000 years ago. These fishes colonized and existed during the receding glaciers and as ice receded, they remained in islands of habitat. Most of the fishes are in the minnow family, a very diverse family of fishes, most of which are small bodied. Minnows have fast swimming velocities for their size, but trout and other larger fishes are faster. Maintaining lower, slower flow rates in West Plum Creek is important for minnows.

- Common shiner are not so "common" in Colorado, but they are very common in the Midwest. They used to be found in St. Vrain Creek but have not been seen since the flood of 2023. Common shiners have big eyes compared with other minnows.
- Red belly dace are only found in West Plum Creek in Colorado. They live in off channel spring fed ponds. They are state endangered.
- Largemouth bass are found in the creek but are invasive.
- Fat headed minnows have a blunt head and can tolerate hot tub-level temperatures.
- Iowa darter has Bronco colors and is state listed.
- Jonny darters are transition zone obligates with "w" markings.

- White sucker are native to the West Slope. They mate with other suckers. In the Yampa in the east, they cause a lot of problems, but not in West Plum Creek.
- Green sunfish
- Central stoneroller can get up to 8 inches long. They have big tubercles that look like horns. They build their spawning nests out of gravel and other fish then use those same spaces to spawn.
- Creek chub gets 8-10 inches long and is the top predator with its bigger mouth.
- Brook stickleback has spines that stick straight up. They are thought to have come into the watershed as fish bait.
- Amphibians, turtles: Northern leopard frog (which is declining); Bullfrogs also live in the watershed which is unique – usually bullfrogs take over the leopard frog, but not in West Plum Creek. Bullfrogs are huge as tadpoles.

Boyd had been wanting to launch a fish conservation plan for West Plum Creek for years. He had not considered using a Stream Management Plan as a tool because he had heard frustration that SMPs lack fish focus and only focus on recreation. He got out in front of it, though, and put fish at the forefront of the SMP.

Inspired by a conference presentation, Boyd asked himself, “How do we focus on fish, give them a seat at the table, when civilization, human health, and communities are declining?” His response was to initiate an SMP for West Plum Creek. This is the first SMP led by Colorado Parks and Wildlife. Increased funding from fishing licenses allowed CPW to throw money at the SMP. At first CPW finance team was uncertain about asking for funding from a sister agency. At that point, Boyd reached out to Nicole Seltzer at River Network for support and ideas. Nicole was interested in novel approaches to SMPs and agreed to partner with Boyd on the SMP.

Approach to landowner outreach

Liz joined the team midway through the first year of the SMP to help with landowner outreach and the river health assessment. She sought to understand what had worked with landowner outreach and how to organize landowner outreach. Her first goal was to update the landowner outreach spreadsheet to align everyone’s fieldwork in one place. Now, the spreadsheet shows access information (access approved, denied, pending) as well as what field work had been conducted or still needs to be done.

Landowners live out in West Plum Creek because they want to be away from other people, they want privacy. Liz used to be a teacher, so she knows when people (landowners) zone out during conversations. She picks up on landowner interests and focuses on figuring out how people can or might want to get involved with the SMP. She emphasizes how the SMP can work for both the landowner and the SMP team, how we can help fund projects on their land. Another tactic Liz uses for landowner outreach is sharing about herself and creating trust through human connection, something she would do in any interaction, with landowners or otherwise. Liz knows the area through her work, which helps her connect with folks through her personal relationship to the creek.

Challenge #1: government skepticism

Government skepticism is common in the valley. Liz approaches this in two ways. First, she listens to gauge perception and learn where landowners are coming from. Then, she provides education where

there are questions or misunderstandings about the project. She uses the question, “What do you know about the creek?” to gauge perceptions and initiate casual conversations with folks on the side of the road. Liz’s background in agriculture helps – she can understand worries about haying season or moving cattle around the property. Liz can also pull skills from her background in fisheries. The second way Liz addresses skepticism is by talking about transparency in the project and demonstrating transparency in landowner outreach activities. For instance, she sends introductory letters and thank you letters to landowners that include her contact information, preliminary findings, and the open invitation to reach out with any questions.

One advantage that CPW has over other government agencies is that they are an enterprise agency. This means that the funding for their programs comes from recreation fees and other sources (GOCO, federal) rather than state tax funds. Prior to the SMP, CPW had really strong ties in the valley with landowners. However, when they brought up their involvement/collaboration with other entities, folks got skeptical about the SMP being used to take their water. The best approach to address this is transparency.

Challenge #2: Lack of local coalition

The West Plum Creek SMP does not have a local community coalition that is “championing” the plan which makes building trust with landowners more difficult. The project partners have found that having CPW lead the process is important. Also, working with the water commissioner is helpful, although turnover in the water commissioner position locally has been difficult.

Challenge #3: State versus federal threatened and endangered species

Landowners have a lot of skepticism about threatened and endangered (T&E) species, but most do not understand that there is a difference between state and federal T&E species. Many landowners in West Plum Creek are familiar with the Preble’s jumping mouse which is threatened under the federal Endangered Species Act. Preble’s has a bad reputation in the area because its listing has caused building delays. One component of landowner outreach is answering the question, “What happens if you find something on my property (Preble’s, state T&E species, etc.)?” The answer? Nothing. The SMP is not a regulatory tool. Any action taken due to the SMP will only be done in collaboration and agreement with local landowners.

CPW communicates that the fishes of interest under the SMP are unique to the area and not likely to be federally listed in our lifetime. They are a “great natural heritage”. CPW’s greatest interest is keeping species off the Endangered Species Act. The SMP is an opportunity to work collaboratively with landowners to make sure species are not listed.

Macroinvertebrate Demonstration

Bradley Boileau with River Watch provided background and a demonstration on macroinvertebrate sampling.

River Watch and macroinvertebrate background

River Watch has collected over 2,000 samples across the state with help from volunteers at over 115 groups. Historically, the program only focused on the chemical aspects of water, but now they are also focusing on the physical aspects. River Watch has funding from CWCB to do macroinvertebrate sampling with groups across the state.

The goal of their program is to support groups to collect baseline data. Most groups that work with River Watch stick with them. They work with high schools, Trout Unlimited, and many others. River Watch produces raw macroinvertebrate counts. This data can be entered into CDPHE's Ecological Data Application System (EDAS) to get a score for water quality.

“Macro” refers to being able to see with the naked eye. Macroinvertebrates are benthic – meaning that they live in the water as bottom dwelling creatures. They are excellent indicators of water quality. They survive about one year and are only in their adult stage for up to two weeks. Diversity of macroinvertebrates in a river is important – presence of different types of macroinvertebrates means that there is diversity of habitat. Macroinvertebrates are in groups based on their feeding methods.

Macroinvertebrates in West Plum Creek

According to data collected by CDPHE nearly 10 years ago, almost all of the tributaries in the watershed had water quality concerns. Last year, the West Plum Creek SMP team sampled for macroinvertebrates to determine if there were changes. The site visited during the field trip for macroinvertebrate sampling, called “Club Med”, was the only site that had decent water quality. The West Plum Creek team found three new species at Club Med which is on Gove Creek.

Macroinvertebrate sampling

Read about how to do macroinvertebrate sampling in [River Watch's water quality sampling manual](#).

River Watch does a 3.5-day macroinvertebrate training every fall. Once groups go through these trainings, River Watch lends out over \$2,000 in equipment to the groups to use for sampling. Groups can use the sampling as match for grants. [Learn more about their trainings](#).

News about macroinvertebrates

One field trip participant shared a success story about macroinvertebrates.

- [Windy Gap Bypass Project led by Trout Unlimited](#): Fisherman began to notice a decline in the stonefly in a common fishing spot and then took action to save them.

Facilitation 101 Training

Please see the [facilitation skills packet](#).

Aquatic Habitat Training & Mock Assessment

Kim Lennberg, Alba Watershed Consulting, and Mickey Means-Brous, River Network, provided background and training on aquatic habitat assessments. See the [modified habitat assessment field form](#) used for the demonstration. Lore Peterson, CPDHE, provided a short presentation on the statewide effort on temperature monitoring. See [CDPHE's list of SOPs, including one for temperature monitoring](#).

Background for West Plum Creek SMP

The West Plum Creek stream health assessment (SHA) focuses on 10-11 indicators of river health from the Colorado Stream Health Assessment Framework. The framework provides some ideas for metrics.

CPW has been collecting fish data in West Plum Creek for over twelve years. They broke up the watershed into 45 reaches. The team will focus on doing fisheries for the SMP on 20 of these reaches.

The aquatic habitat assessment focuses on both macro and micro aspects of structural complexity. In addition, there are temperature gauges and pressure transducers installed throughout the watershed.

Temperature monitoring

Lorie studies water temperature using modified Onset HOBO Pendant waterproof temperature loggers. These loggers can be purchased for less than \$100 and modified for about \$10. The modification allows the device to log relative conductivity so that when the creek is dry the reading is zero, indicating a dry creek bed. This provides information about stream intermittency.

HOBOs can be secured to PVC and rebar in a creek. Other times, they are lodged under rock. If they are exposed to cold air, the battery drains quickly.

Aquatic habitat training

During this portion of the field trip, the group split into two smaller groups. Mickey led a group through understanding the following sections of the modified aquatic habitat assessment data sheet: woody material, observations, bedform diversity, and canopy cover. Wood provides nutrients and habitat and is considered good substrate for colonizing, shade, and cover. Riparian vegetation is considered part of the wood regime. Pools, riffles, runs, and glides make up bedform diversity. Pools provide important fish habitat and a refuge during low flows. Riffles replenish oxygen in the creek, provide habitat for spawning, and provide habitat for macroinvertebrates. Canopy cover is measured using a densiometer.

Kim walked through group through pebble counts and embeddedness. The West Plum Creek SMP uses the modified Wolman pebble count to conduct the count. The count involves walking across the creek bed in a line and randomly picking rocks from the bed. Each rock is measured at intermediate length.