South Platte River Urban Waters Partnership (SPRUWP)
Quarterly Meeting
February 16, 2021
Meeting Summary - FINAL

ATTENDANCE

Participants: Lubna Ahmed, Juliana Archuleta, Josh Baker, Ryan Banta, Jen Charles, Amy Conklin, Rachel Crouch, John Davenport, Stacey Eriksen, Sara Haney, Peter Ismert, Caitlin Jacobshagen, Mike McHugh, Jeff Medaugh, Abu Moulta Ali, Patrick O'Connell, Jordan Parman, Donny Roush, Nona Shipman, Travis Warziniack, Lucy Harrington, Scott Williamson, and Alison Witheridge

Facilitation: Samuel Wallace and Izzy Sofio

ACTION ITEMS

Samuel Wallace	Send a survey to begin the process of updating the SPRUWP strategic plan.

PARTNER UPDATES

Partners shared general updates. The updates are summarized below.

Barr-Lake and Milton Watershed Association (BMW)

- In 2020, DMW organized and hosted the Urban Water Cycle Tour. A film about the tour will be shown at the Colorado Environmental Film Festival. The planning for the 2021 tour has begun.
- BMW applied for a National Fish and Wildlife Foundation Five Star and Urban Waters Restoration Grant.

Aurora Water

Aurora Water received a grant from the Environmental Protection Agency (EPA) to analyze and assess the wetlands in Aurora, Colorado. The assessment is now complete. The finished report and information brochure can be found on the Colorado Natural Heritage Program website.

Denver Public Works – Water Education

On December 31, 2020, a new stormwater permit was issued by the State of Colorado. The new permit will create significant changes to stormwater monitoring and will also impact part of the education and outreach work that Denver Public Works is involved with.

Environmental Protection Agency

- The EPA has received funding and finalized the scope of work for Phase 3 of the Water Quality Assessment Tool. In Phase 3, the consultants will design the tool so that it immediately pulls data from relevant websites. The tool will include data on the headwaters of the Upper South Platte. The list of contaminants included in the tool has expanded to include metals, pH, dissolved oxygen, and a few other contaminants too. There will be an associated teacher's guide released with the tool. Phase 3 of the Water Quality Assessment Tool will begin once the EPA has awarded the contract.
- The SPRUWP Education and Outreach Committee plans to incorporate the Water Quality Assessment Tool into relevant trainings and curriculums as the committee moves forward.

NEW ZEALAND MUDSNAILS PRESENTATION

Donny Roush, Denver Public Works, shared a presentation about New Zealand mudsnails in the South Platte River. The key themes from the presentation are found below.

- On March 9, 2020, Roush collected macroinvertebrate samples from the South Platte River off of Johnson Habitat Park, located right before the South Platte River heads into Downtown Denver. Roush found 13 abnormal snails when he looked under a rock in the middle of the channel. The snails were collected, and Roush sent them to the Wildlife Aquatic Species Lab. Due to the onset of COVID-19, the results did not come back until July 2020. The results confirmed that the abnormal snails were New Zealand mudsnails.
- In August 2020, after the lab results came in, Roush went back to Johnson Habitat Park and looked for more snails. Roush, along with a team of biologists, determined that there was an established population of New Zealand mudsnails around the river access points at Johnson Habitat Park and as far as a quarter-mile down the river. They found thousands of snails within that area. They searched other segments of the river and did not find any other snail populations.
- Managing the mudsnails falls under the purview of the City and County of Denver Parks and Recreation Department. They are working on managing the new population. Roush still looks for the snails and often uses them as an educational tool.
- Denver Trout Unlimited (DTU) put a campaign together in reaction to the snails. The campaign slogan is "Clean Your Boots." DTU is spreading information about the snail population through signage and word of mouth within their community.
- DTU shared three methods for treating equipment exposed to mud snails:
    - Brush, wash, and dry equipment for ten days after use
    - Apply a copper sulfate solution to the exposed equipment (ensure that the solution runoff does not end up back in the river).
    - Place the exposed equipment in the freezer for eight hours
- In DTU's fall fishing tournament, DTU had tournament participants survey 30 different spots along the river for snails. The DTU tournament survey did not find any more snail populations.
- The South Platte River Environmental Education (SPREE) Program also put together some information for the public on the mudsnails. They plan to have students in summer camps help remove the snail population at Johnson Habitat Park.
- New Zealand mudsnails are found in various parts of Colorado, including in the Uncompahgre River, Gunnison River, Green River, Boulder Creek, and now in the South Platte River as it runs through Denver. The Denver site is the farthest downstream New Zealand mudsnails have been found.

Clarifying Questions

Meeting participants asked questions regarding the New Zealand mudsnail presentation. The questions are indicated in italics, with responses below in plain text.

Are New Zealand mudsnails edible?

No. Carp may be able to digest them, but studies have not yet confirmed this is the case.

What makes the New Zealand mudsnails species so concerning?

- When a population takes off, they can become 95% of the biomass of that ecosystem. They eat everything and do not leave anything else for other organisms within the ecosystem.

- The found snails were all females. When female New Zealand mudsnails like an area, they release their eggs to establish their population in an area. It is likely that dynamic is what happened with the snail population in the South Platte River.

How does cold weather affect the snail population?
The mudsnails are typically found in colder waters. In cold water, the snails are really good at burrowing into the ground below. The maximum size of one New Zealand mudsnail is six to seven millimeters; yet, they have been found to burrow as deep as three meters in the mud. It seems that higher temperatures better keep the populations in check.

Could a copper sulfate treatment be used in localized areas of the river to reduce the size of the New Zealand mudsnail population?

- DTU has been testing how much copper sulfate is needed to manage the mudsnails. They tested concentrations at the drinking level standard. Even at those very low levels, it seems to knock the snails out.
- It is hard to keep the level of contact and the concentration levels up in a flowing river. That sort of treatment works better in a lake or pond environment.

AQUATIC LIFE FINDINGS AND PROJECTS TO IMPROVE THE DENVER SOUTH PLATTE RECREATIONAL FISHERY PRESENTATION
John Davenport, DTU, shared a presentation about aquatic life and improvement projects in the Denver South Platte recreational fishery. Key themes from the presentation are found below.

- DTU strives to create a diverse recreational fishery with a healthy habitat that can support the stocked trout population.
- DTU began collecting temperature readings throughout the South Platte River in 2016. DTU uses temperature logging to measure stormwater, hail, snowmelt, and flood effects. Temperature logging also helps determine the cause of any fish kill events. In addition to temperature sensors, DTU has dissolved oxygen meters installed throughout the river.
- In 2016 and 2018, dissolved oxygen and temperature levels were at ideal levels for a female rainbow trout to initiate egg development. Temperatures need to be around 55 degrees for three to four months. Once the trout eggs are hatched in the stream, they require specific temperature and dissolved oxygen levels. The required levels were not measured in 2017 when temperatures exceeded 55 degrees.
- The inconsistency in temperature and dissolved oxygen levels in the Denver South Platte River indicate that the environment is not suitable for a self-sustaining trout population.
- Temperature variability in the Denver South Platte River is what allows trout to successfully live in the river. Sometimes the dissolved oxygen levels in the river are so low that if the trout were unable to move to different areas of the river, they would not survive. In the South Platte River, the trout are able to find parts of the river with more shade and cooler temperatures on hot days.
- In August 2020, there was a fish kill event near the Mile High Stadium. DTU suspects that the fish kill was connected to a large rainstorm at the end of August 2020. There are two ways the downpour led to the die-off event: 1) the fish had been struggling with low dissolved oxygen levels, and the sudden downpour diluted the dissolved oxygen levels, leading to the die-off, or 2) the rain had elements of 6PPD, a chemical which has been connected to salmon deaths in Washington state. There have not been many fish kill events related to low dissolved oxygen rates or high/low-temperature swings other than the one in August of 2020.

- DTU has identified several different macroinvertebrate and fish species in the river. They have not found stoneflies, but they have found a full range of other macroinvertebrates. One DTU study found over 29 varieties of fish in the South Platte River as it runs through Denver.
- Because DTU follows the catch and release method, they have been able to use photos posted by anglers to identify the same fish in several photos. These photos help provide data on fish survivability under the catch and release method.
- Trout in the Classroom is a DTU project that connects students in the classroom to trout. DTU places trout tanks in classrooms throughout Colorado. The tanks are equipped with a camera and a sensor that gathers ammonia, pH, and temperature levels. The sensor uploads the readings online, so students can always see what is happening inside the trout tanks. In the past, overfeeding, high nitrogen levels, and power outages have been the main reasons for trout failures in the classroom. The sensors help manage those problems. Trout tanks are available to any teacher in Colorado. They make a great remote learning tool due to the addition of the camera and sensor.
- DTU entered a 'trout tank' contest with Denver. If they win, they will receive a $5,000 prize. DTU plans to install an aerator and eddy tank at Overland Park Pond. The pond currently faces issues around algae blooms from nitrogen fertilizer runoff that comes from upstream.

FISH SPECIES FROM RECENT STUDIES IN SEGMENT 15 PRESENTATION

Jordan Parman, Metro Wastewater Reclamation District (MWRD), shared a presentation about Segment 15 of the Denver South Platte River. Key themes from the presentation are found below.

- Segment 15 of the South Platte River is directly downstream from Segment 14, which includes all of Downtown Denver. Most of the water flowing in Segment 14 does not make it to Segment 15 because of the Burlington Ditch. Segment 15 is primarily made up of treated effluent discharged from the District's Robert W. Hite Treatment Facility, along with tributary inputs from Sand Creek, Clear Creek, and ground water seepage.
- All of the household water used in the Denver Metro Area goes to wastewater treatment plants. Whatever treatment is done at wastewater treatment plants becomes the water for the rest of the river.
- MWRD measures metals, nutrients, and other water quality indicators in the river upstream and downstream of the treatment facility. MWRD staff takes water samples from Denver to Platteville. Once a month, staff will go to Julesburg at the Nebraska border to sample the river for nutrients as well.
- MWRD measures the temperature of the South Platte River at various locations upstream and downstream of the treatment facility. They found that during the winter months, the water temperature of the effluent can be up to four degrees C warmer than the chronic stream standard, resulting in exceedances of the temperature standard downstream to 104th Avenue. Denver metro residents use warm water in the winter and this heat is retained through the treatment process.
- In 2014, MWRD drastically reduced the amount of ammonia in their effluent due to treatment plant upgrades. As the South Plattre River is effluent dominated downstream of the treatment plant, ammonia levels in the river also decreased significantly after the treatment change. High concentrations of ammonia are known to be toxic to aquatic life. Prior to the treatment change in 2014, MWRD saw low levels of macroinvertebrate diversity in the river immediately downstream of the facility, and most of the organisms in the river were pollution tolerant. Within two years of the treatment change, organisms with low-pollution tolerance returned to the river, and there was a higher diversity of marcaroinvertebrate taxa.

- MWRD is involved with instream habitat improvement projects. In one project near 144th Avenue in Brighton, they stabilized an eroding bank, activated a secondary channel, and added constructed riffles, which introduced more habitat complexity. MWRD saw an increase in both the abundance and diversity of native fish populations in the river reach after construction of the habitat improvements. In 2020, MWRD had the highest fish counts since they started conducing fish surveys in 1986.
- MWRD conducts fish counts to identify fish abundance and fish species diversity. Fathead minnows make up about 60 percent of the fish in the river, according to their last count. There are also a lot of other small minnows, catostomids, and large carp in the river. In total, MWRD has documented 34 different species of fish over the years.
- MWRD put together a story map of their fish survey and 2020 survey results. The storymap can be found at this link.
- The National Western Complex is looking to conduct a project to draw heat out of the MWRD sewer lines in order to heat the new buildings. This will help with the high temperatures of the river water in the winter and reduce energy usage related to heating the development.

Clarifying Questions

Meeting participants asked questions regarding Jordan Parman's presentation. The questions are indicated in italics, with responses below in plain text.

Was the fish survey conducted in the summer when the river is effluent-dominated?

The MWRD always conducts fish surveys in the late-summer and fall months. During the spring, there are young fish that the MWRD does not want to disturb, and the water is also much higher in the spring and unsafe to conduct surveys in. The river is effluent dominated most months of the year.

Did any of the water quality reports show a decrease in toxins during storm events at the start of COVID-19 when there were fewer cars/almost no cars on the road?

No. MWRD did not notice any significant changes in water quality due to COVID-19. As for stormwater, a lot of stormwater that goes through Denver does not make it to Segment 15, as it is diverted into the Burlington Ditch. Stormwater can create water quality issues, but MWRD does not routinely sample during stormwater events.

Was there anyone else who might have conducted stormwater surveys during the COVID-19 lockdown?

- The Barr-Lake and Milton Watershed Association staff has collected some stormwater samples. However, there were not many storms that occurred at the beginning of the COVID-19 lockdown.
- The lack of storm events could have contributed to the high number of small fish in the fish surveys. Large stormwater events can flush small fish down the river.

Are non-native fish returned to the river after MWRD surveys the fish population of the river?

- MWRD puts all the fish they catch back in the river. It is part of their scientific approach, and their collection permit requires them to release the fish. Many of the non-native fish they catch are bass, which is not causing many ecological problems. They also see common capr, which can cause water quality concerns when present in high desnisties. MWRD is also concerned with the number of mosquitofish in the river. They are invasive species where presensce has been linked to the decline of native fish populations in the South Platte River basin.

- MWRD received a permit to remove carp from Barr Lake. Carp can cause water quality concerns because they are bottom feeders. When they burrow into the sediment at the bottom of the lake, phosphorus and other nutrients get stirred up. With the permit, MWRD does remove a lot of carp.

NEXT STEPS

- The SPRUWP Advisory Committee has recommended an update/revision of the SPRUWP strategic plan. Samuel Wallace will send a survey to begin the process of updating the SPRUWP strategic plan. The survey will focus on understanding what SPRUWP members want to do during meetings, whether there is a need for any new subcommittees, and what SPRUWP members want to get out of the Partnership. Once partners have filled out the survey, there will be a committee to help further develop the strategic plan.
- The next SPRUWP meeting will be in May.