

# LEARNING BY DOING

## 2018 Annual Report

Learning By Doing (LBD) is a groundbreaking collaborative effort of Colorado East Slope and West Slope water stakeholders whose goal is to maintain and, where possible, restore or enhance the aquatic habitat in Grand County. LBD emerged from intergovernmental agreements (IGAs) pertaining to Denver Water's Moffat Project (2012) and the Northern Water Municipal Subdistrict's Windy Gap Firming Project (2016). Both projects will divert water from the headwaters of the Colorado River in Grand County to East Slope water users. However, the IGAs created the LBD partnership as a new, solution-focused collaboration to safeguard the health of Grand County's river.

### LBD Partners

A Management Committee of seven partner agencies serves as LBD's governing body. Partner agencies include:

- Colorado Parks and Wildlife
- Colorado River Water Conservation District
- Denver Water
- Grand County
- Middle Park Water Conservancy District
- Northern Colorado Water Conservancy District
- Trout Unlimited

The LBD Technical Committee is made up of representatives from federal, state and local agencies, nonprofits and other groups who can offer expertise to LBD efforts. LBD Subcommittees, including the Operations Subcommittee and the Monitoring Subcommittee, are made up of representatives with specific expertise who advise the Management Committee or take on specific tasks authorized by the Management Committee.

Committed resources, including water and funding, will be awarded to LBD upon issuance and acceptance of permits associated with the Moffat and Windy Gap Firming projects. Still,

### 2018 Accomplishments

- Opened a restored 0.4-mile section of Fraser River to public fishing
- Recruited 50 volunteers and harvested, then planted some 2,000 willow stakes along section of Ranch Creek — on impaired waters list for chronic summer stream temperature exceedances
- Developed guidelines for partnering on projects with private landowners to enhance Grand County's aquatic habitat
- Coordinated water operations in the Fraser and Upper Colorado basins to respond to low precipitation, high temperatures and early runoff conditions
- Implemented a comprehensive monitoring program in LBD's cooperative effort area to gather data on stream temperature, macro-invertebrates, fish population, water quality, substrate conditions and more
- Invested \$44,067 in 2018 monitoring costs
- Removed 290 tons of traction sand deposited in the Fraser River
- Designated as recipient organization for a memorial fund
- Received financial support through a local lodging surcharge.

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LBD partners have been meeting since 2013 and are working to put systems in place, pilot projects and advance the collaborative effort's goals.

## **Coordinating Operations**

In 2018, Grand County experienced average snowpack, but an early runoff, caused by high temperatures in the spring and summer, as well as below-average precipitation, created challenges for streams with high stream temperatures negatively affecting fish populations. By mid-summer, Colorado Parks and Wildlife imposed fishing restrictions on distressed streams in Grand County and throughout the state.

Operation of the Denver Water and Subdistrict water systems typically involves a level of risk management to allow the reservoirs to fill, but not fill so fast that resulting downstream releases could cause flood damages. Operation in 2018 was more complicated than normal because of uncertainty of streamflows caused by the early runoff and high temperatures and was further complicated by relatively high storage levels in reservoirs. Dry conditions resulted in the need for more diversions from their system than Denver Water expected, but they took advantage of flexibility in their system operations and some maintenance projects leave more flows in Ranch Creek and Fraser River. The Subdistrict's initial operating plan did not anticipate pumping Windy Gap water because it was anticipated that Granby Reservoir would fill. However, because of lower inflows to Granby than anticipated, the Subdistrict pumped Windy Gap water for the first time in 5 years but determining how much and how fast to pump was a difficult decision. These diversions reduced flows in the Colorado River below Windy Gap.

In June, a "perfect storm" situation caused diminished flows and near exceedances in temperatures on the Colorado River. The Operations Subcommittee met weekly to explore ways to collaboratively address the low flows and high stream temperatures resulting from what became the second-hottest summer on record, and one of the driest. When temperatures and low flows were observed in early June in the middle and lower reaches of the Colorado River, Northern Water, Denver Water and the River District modified operations where possible to increase flows to alleviate high water temperatures. Changed operations included:

- Denver Water strategically moved a maintenance project into the summer months so that the water it bypassed — some 900 AF from July through September — enhanced flows and moderated temperatures on the Fraser River. Denver Water is not obligated to release environmental flows required under the IGAs until the Moffat Project becomes operational. However, over the last three years, Denver Water has made voluntary releases as conditions allowed. This year, Denver Water was unable

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to offer LBD any voluntary water releases to help respond to stream temperature issues but moving their maintenance project provided benefits to the river.

- The Subdistrict reduced pumping for several days in mid-May and early June, which allowed required higher flushing flows to be met during the summer. In addition, Grand County took advantage of an option to pump 1,000 AF of water from Windy Gap for storage in Granby Reservoir. This Grand County water was released over a period of 25 days from mid-August through mid-September to help optimize the benefits to aquatic and recreational resources and improve Colorado River flows in Grand County.
- The River District was able to discharge 300 cfs from mid-July until September into Muddy Creek during its maintenance project, which significantly helped with low flow and high temperatures issues in the middle and lower Colorado River and provided critical water for Endangered Fish in the 15 Mile Reach.
- In late summer, several exchanges were coordinated to mitigate impacts during stream habitat enhancement activities by Denver Water below Williams Fork Reservoir. During this maintenance, exchanges were coordinated with 5412 releases from Granby Reservoir, as well as Green Mountain Reservoir releases, to meet replacement obligations in the Colorado River until the Williams Fork River restoration work was completed.

These actions, which were made as a result of the weekly LBD Operations Subcommittee meetings and their coordination with other Colorado River groups, including the weekly HUP calls as well as similar concerns downstream from the Wild and Scenic group, resulted in better aquatic habitat conditions in the LBD collaborative effort area — the Colorado, Fraser and Williams Fork river basins — than there would have been absent coordination.

The drought conditions of 2018 presented significant challenges. The Operations Subcommittee worked with limited available resources to cooperatively address drought related issues. All hydrologic years are different, and future challenges can be expected because of uncertain hydrology and water diverters exercising their water rights. Anticipation of adverse conditions, coordination and communication are key for success in dry, challenging years. Looking forward to 2019, the Operations Subcommittee will strive to anticipate adverse river conditions, improve communication and better implement coordination of operational efforts to support LBD's mission and goals.

### **Monitoring**

The collaborative partners of LBD are committed to protecting, and where possible,

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enhancing the condition of the aquatic environment in Grand County. This requires an understanding of current conditions and trends over time, informed by existing data and the collection of new data to inform prioritization of management and enhancement goals. The Management Committee has charged the LBD Monitoring Subcommittee with evaluating existing monitoring efforts and identifying monitoring gaps. The Monitoring Subcommittee uses the knowledge gained from these efforts to recommend objectives and monitoring priorities that, when approved by the Management Committee, are presented in an annual Aquatic Resource Monitoring Plan.

The Monitoring Subcommittee determined that existing monitoring efforts are carried out by 12 entities, covering 203 sites, which include monitoring parameters such as water quality, habitat, aquatic life and flow. To address gaps in the existing monitoring networks and support the annual monitoring objectives and goals, several monitoring efforts were initiated by LBD in the [2018 Aquatic Resource Monitoring Plan](#). These include:

- The addition of 4 temperature monitoring stations
- Improving the timeliness of data transmission at 4 existing temperature monitoring locations, which helped inform operational decisions during the summer months
- Maintaining substrate monitoring at 14 monitoring locations
- Maintaining core sediment sampling in 3 river reaches to assess spawning habitat
- The addition of 7 macroinvertebrate sampling sites
- Maintaining macroinvertebrate monitoring at 3 existing monitoring locations
- Continued data collection to support assessment of LBD's Fraser Flats River Habitat Project

The 2018 Aquatic Resource Monitoring Plan is funded through a cost-share arrangement among partners. LBD is also now partnering with the Irrigators of Lands in the Vicinity of Kremmling (ILVK) on macroinvertebrate and substrate monitoring sites on the Colorado River below Kemp-Breeze State Wildlife Area. The total amount that LBD partners invested in 2018 monitoring in 2018 is \$44,067.

A synopsis of 2018 LBD monitoring results appears in the Appendix section.

Northern Water's plans for Fish and Aquatic Invertebrate monitoring, part of its required mitigation on the Colorado River, were approved in 2018 by LBD. The Fish monitoring will include a Fish Movement Study in cooperation with Colorado Parks & Wildlife, which will monitor fish movement prior to and following construction of the Connectivity Channel around Windy Gap Reservoir. The Connectivity Channel was approved for implementation beginning in late 2020 or 2021. This project will modify Windy Gap Reservoir by constructing a channel to connect the Colorado River above and below the reservoir.

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Implementation of the 2018 Aquatic Resource Monitoring Plan informed the LBD Operations Subcommittee in terms of where to direct flushing flows or to augment flows that could assist in cooling stream temperatures. Additionally, it informed LBD about measure of stream health and provided a tool to evaluate the effectiveness of LBD projects, such as the 2017 Fraser Flats River Habitat Project stream restoration on the Fraser River.

In 2019, the Monitoring Subcommittee will continue to identify potential gaps in the existing monitoring network and focus on additional monitoring efforts to support restoration and enhancement projects. Monitoring recommendations will be informed by how data collected in 2018 were utilized by LBD to support operational decisions. In addition to developing monitoring plans, the Monitoring Subcommittee will be investigating how to combine all the data collected for LBD in a comprehensive report.

## **Planning and Implementing Projects**

Ranch Creek - In partnership with Trout Unlimited's Colorado River Headwaters Chapter, LBD members participated in three volunteer workdays held in June to re-vegetate a 1-mile section of Ranch Creek. Bank degradation from cattle operations and low stream flows from diversions have made this open-meadow section of Ranch Creek vulnerable to warm stream temperatures. Ranch Creek had recently been added to the State of Colorado's 303(d) list of impaired waters due to its chronic summer stream temperatures that exceed standards set for aquatic life.



With the support of a Patagonia Enviro grant, the TU chapter recruited 50 volunteers and provided them with tools to harvest and plant some 2,000 willow stakes along the impaired stream's banks. A follow-up planting will take place in spring 2019 to fill in any gaps along

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the shoreline with additional willows to ensure future bank stability and provide shade for this stretch of river.

Fraser Flats River Habitat Project - Following LBD's pilot river restoration project in 2017 on a 0.9-mile section of the Fraser River, LBD installed an interpretive sign near the new trailhead and parking area. In May, LBD officially opened 0.4 miles of the project to public fishing with a dedication ceremony attended by local officials and stakeholders. This new public access section became instantly popular with anglers, prompting Colorado Parks and Wildlife to place a public fishing survey at the access point in order to manage the fishery.

LBD continued to monitor the post-project condition of the Fraser Flats project in 2018 by collecting data on the fish population, riparian vegetation, stream temperature, macro-invertebrates and substrate conditions with the goal of tracking improvements to the aquatic habitat resulting from the project. Before the project, this reach yielded the poorest trout estimates of any location in the Fraser River basin sampled by Colorado Parks and Wildlife. One year of post-project data show a four-fold increase in the amount of trout biomass as compared to pre-project conditions. A survey of the condition of the willow planting along the project reach, which were planted by a group of volunteers in May 2017, found nearly 56 percent survivorship after one year. LBD will continue to monitor the condition of the willow plantings and will plan to add additional plantings in future years to increase the willow density along the project corridor. No stream temperature exceedances were recorded in the project reach in 2018. A survey of the macroinvertebrate life at the project reach found numbers to be in attainment with state standards.

Denver Water's Williams Fork River Restoration Project - Denver Water completed the first phase of its Williams Fork River Restoration Project in 2018, which totaled 0.88 mile of river improvements located below Williams Fork Dam in Grand County. A component of Denver Water's Final Mitigation Plan for the Gross Reservoir Expansion Project, the goal of this river restoration project is to improve low flow conditions, instream aquatic habitat diversity, channel stability and streamside vegetation. Restoration of the instream habitat is expected to promote a healthy fishery, offering valuable benefits to the aquatic environment and water quality in the long term. Additional benefits of this project include the future opening of new public fishing access to 1.2 miles of the Williams Fork River on Denver Water property upstream of Williams Fork Reservoir. The second phase of this river restoration project will continue in the fall of 2019. In total, this project will create 2.08 miles of targeted restoration to sections of the Williams Fork River where there are opportunities for ecological uplift and improved instream habitat for trout and aquatic insects.

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Fraser River Sediment Pond - A joint project with the Colorado Department of Transportation (CDOT), Denver Water, Grand County, East Grand Water Quality Board and the Town of Winter Park continued in its sixth year to remove traction sand used along Highway 40 from the Fraser River. In 2018, the pond captured and CDOT removed 290 tons of sediment. Monitoring downstream of the sediment pond shows significant habitat improvement.

Future Project Planning - Utilizing the Grand County Stream Management Plan, LBD has identified and prioritized additional projects to improve the aquatic habitat in critical areas for 2019 and beyond.

Working with Colorado Parks and Wildlife and Trout Unlimited partners, the Management Committee investigated fish entrainment in Hammond Ditch on the Fraser River and is evaluating a proposal to install a fish screen.

Additionally, LBD and the U.S. Forest Service are evaluating replacement of a road-crossing culvert with an aquatic organism passage (AOP) culvert on Cabin Creek. The existing culvert is a barrier for fish migration and an AOP culvert will provide habitat connectivity, allowing native cutthroat trout to migrate upstream more easily. In 2018, LBD evaluated the fish barrier, and Forest Service and Colorado Parks and Wildlife biologists verified that a cascade downstream serves as a barrier for non-native brook trout; only cutthroat trout were upstream of the cascade. The AOP culvert, along with a fish ladder, which Denver Water will install in the future, will allow cutthroat trout to move freely up and down 4-plus miles of stream, restoring continuity to a significant amount of previously fragmented habitat.

Public-Private Partnership Guidelines - The Management Committee developed guidelines for funding projects on stream sections that run through private land in order to ensure a public benefit. Private landowners wishing to partner with LBD to address impaired sections of river will know what conditions and contributions are expected in any joint project.

### **Creating Learning By Doing, Inc.**

After several months of investigating options, the Management Committee took steps toward creating a legal structure that will assist LBD's operations. Once incorporated, Learning By Doing, Inc. will operate under a Memorandum of Agreement (MOA) with LBD to carry on functions such as signing contracts for services and paying vendors in any future projects LBD undertakes. The Management Committee remains the governing body of LBD, and the corporation will carry out its directives in accordance with the two IGAs that created LBD, and with LBD's directive.

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It is anticipated that documents creating Learning By Doing, Inc. will be filed in early 2019.

## **Investing in LBD**

While several million dollars in dedicated LBD resources are tied to issuance of Denver Water and Northern Water's permits and benchmarks that have not yet been met, LBD was able to make headway through both shared contributions among partners, grants and community contributions.

- Shared monitoring costs among partners in 2018 totaled \$41,821
- Grand County's payment to the Municipal Subdistrict to pump 1,000 AF of Windy Gap water to be stored in Granby Reservoir in order to augment flows and maintain temperatures in the Colorado River in late summer
- A \$3,000 grant from Patagonia helped fund the Ranch Creek revegetation project
- A lodging surcharge from Devil's Thumb Ranch dedicated to LBD collected \$17,000 in 2018, and was applied to the Fraser Flats monitoring program
- LBD was the recipient of a \$2,310 memorial fund honoring former Grand County resident Dick Davis
- The partners and, in particular, Denver Water, Trout Unlimited and CPW, dedicated significant resources to oversee construction of the Fraser Flats project and the opening of the public fishing section
- Grand County Water and Sanitation District No. 1 donated an easement to allow public fishing access in the Fraser Flats project area

## **LBD's Goals for 2019**

- File for LBD incorporation
- Complete design of a fish screen on Hammond Ditch and begin discussion of improvements to Hammond Ditch diversion structure
- Complete design of an AOP culvert on Cabin Creek for 2020 implementation that will provide fish passage and sediment transport
- Prioritize, plan and pursue future projects to benefit Grand County's aquatic resources
- Follow up on LBD's 2018 revegetation project along Ranch Creek, planting additional willows to augment previous plantings
- Continue to monitor LBD's Fraser Flat River Habitat Project to determine its effectiveness in restoring aquatic health
- Develop and implement a Monitoring Plan for 2019
- Determine monitoring reporting procedures to ensure LBD can identify changes in the aquatic environment and measure the effectiveness of actions taken
- Implement a 2019 Operations Plan to coordinate partner operations for the benefit of aquatic species
- Pursue outreach opportunities to targeted water, conservation and public policy groups

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