

LEARNING BY DOING – MONITORING YEAR 2018 SNAPSHOT

For its sixth consecutive year, Learning By Doing (LBD) continued to monitor the health of aquatic resources within the Colorado, Fraser, and Williams Fork River basins in 2018. A snapshot of the 2018 results is below, followed by individual metric summaries.

RESULTS			
	Observations	Colorado River Basin, including Williams Fork	Fraser River Basin, including Ranch Creek
Stream Temperature	In 2018 there were 65 sites monitored, including sites on the Colorado and Fraser Rivers and 19 tributaries. Of the sites monitored, 11 exceeded the state temperature thresholds: 4 sites in the Colorado River and 7 sites in 4 tributaries. Spikes in temperature occurred in July resulting in exceedances of temperature thresholds. Exceedances also occurred in the spring and fall when the standard value abruptly changed from winter to summer thresholds.	Of the 33 sites monitored in the Colorado River basin, 22 sites were in attainment with state temperature standards Three sites exceeded the state temperature threshold for acute (1-day) exposure: <ul style="list-style-type: none"> Colorado River below Shadow Mountain Reservoir to Granby Reservoir (1 of 2 sites) Willow Creek downstream of Willow Creek Reservoir to Colorado River (2 of 3 sites) Eight sites exceeded the state temperature threshold for chronic (7-day) exposure: <ul style="list-style-type: none"> Arapaho Creek downstream of Monarch Lake Willow Creek downstream of Willow Creek Reservoir to Colorado River (3 sites) Colorado River downstream of Shadow Mountain Reservoir to Granby Reservoir (2 sites) Colorado River at Lone Buck Colorado River upstream of Williams Fork 	Of the 32 sites monitored in the Fraser River basin, 29 sites were in attainment with state temperature standards. Three sites exceeded the state temperature threshold for acute (1-day) exposure: <ul style="list-style-type: none"> Ranch Creek below CR 8315 Meadow Creek Ranch Creek downstream of Meadow Creek
Macroinvertebrates	In 2018, bioassessments were conducted at 23 sites in the CEA. 4 sites had MMI scores that were in the grey zone, a score that falls between the attainment and impairment thresholds. MMI scores in the grey zone require assessment of two auxiliary metrics; HBI and SDI; if these metrics meet an acceptable threshold, the site is not considered impaired. 1 site had a MMI score that indicated impairment for aquatic life.	Of the 14 sites monitored in the Colorado River Basin, 13 sites had MMI scores that were in attainment of state standards. <ul style="list-style-type: none"> Sites in this basin not influenced by reservoir releases generally support a relatively healthy macroinvertebrate community. Macroinvertebrate communities are greatly influenced downstream from deep-release reservoirs such as Granby and Williams Fork. The site downstream of Shadow Mountain Reservoir had a MMI score that indicated impairment, low counts of sensitive species taxa a high number of pollution tolerant species (HBI). Three sites had MMI scores that were in the grey zone, but scores for the auxiliary metrics were in attainment <ul style="list-style-type: none"> Colorado River downstream of Granby Reservoir Colorado River upstream of the Blue River Williams Fork downstream of Williams Fork Reservoir The site directly below the Williams Fork Reservoir (Macro site WF-2) barely attains state standards, and has low biodiversity (low MMI and SDI), low proportion of sensitive species (%EPT excluding Baetidae), and a high number of pollution tolerant species (HBI). Results were similar for the new Colorado River site (CR 1.7) in the ILVK reach.	Of the 9 sites monitored in the Fraser basin, all were in attainment with state standards in 2018 and appear to support healthy macroinvertebrate populations. <ul style="list-style-type: none"> Fraser River at Rendezvous Bridge had a MMI score that was in the grey zone, but scores for the auxiliary metrics were in attainment Most metrics indicated an increase in stress at the site directly downstream of the Union Pacific Railroad Moffat Tunnel discharge. However, improvements in health of the aquatic communities were observed downstream, especially downstream of the Fraser Flats Restoration Project. The new Fraser River site upstream of Jim Creek was in attainment and most metrics demonstrate a healthy macroinvertebrate community, however a low diversity index was reported for this site. The other metrics for macroinvertebrate populations at this site indicate a healthy population and do not align with the low SDI number.
Fish	CPW's trout estimates in 2018, as captured in its <i>Colorado River at Parshall and Fraser River Fishery Management Reports</i> , showed an increase from 2017 in trout biomass estimates (or the last year data was recorded) for all but the Fraser Flats River Habitat Project Site. CPW speculates decline at the Fraser Flats may be attributable to the high level of public fishing pressure that this section experienced in 2018. If public use of this reach becomes increasingly heavy in the future, some form of access management may be advisable in order to maintain the quality of the fishery. ⁴ See the Fraser River Basin section for further details.	CPW collected trout population data on the two-mile reach of the Colorado River beginning just upstream of the "Parshall Hole" and extending downstream through the Kemp-Breeze State Wildlife Area to the irrigation diversion on the Bureau of Land Management Sunset property. Population estimates are obtained by raft electrofishing using standard mark-recapture methodology. Since 2011, and again in 2018 the trout population estimate has steadily increased. In all years since the data collection began in 2007, this estimate has generously exceeded the minimum Gold Medal criteria of at least 60 lbs/surface acre. During this period brown trout have comprised an average of 95% of this estimate while rainbows have comprised 5%. In 2018, total biomass estimates for brown trout and rainbow trout were 154 lbs/surface acre and 11 lbs/surface acre, respectively. ³	Similar to past years, CPW collected trout population data on the Fraser River at four locations: Grand County Water and Sanitation District No. 1 property (site of LBD's Fraser Flats River Habitat Project), behind the Safeway in the Town of Fraser, Confluence Park, and at the Idlewild Campground. <ul style="list-style-type: none"> Trout biomass estimates at the Safeway site increased compared to 2017 data with 217 lbs/ acre for rainbow, brown, and brook trout. Confluence Park showed an increase compared to 2017 with 65 lbs/surface acre for rainbow, brown, and brook trout. Idlewild Campground showed an increase compared to 2016, with 72 lbs/surface acre for rainbow, brown, and brook trout.⁴ For the Fraser Flats River Habitat Project site, CPW observed an immediate benefit after completion of the project, with greatly increased numbers of adult fish and a nearly fourfold increase in total trout biomass from 2016 to 2017. However, in 2018, the total biomass estimate declined by 38% from 127 to 79 lbs/surface acre for rainbow and brown trout.
Pebble Counts	Overall, the condition of the streambed substrate is characterized by low levels of sediment and low to moderate levels of aquatic vegetation. This indicates the fish spawning habitat is in good condition.	Pebble counts associated with the seven macroinvertebrate sites in the Colorado River collected in 2018 indicated between 1% – 8% embeddedness, with all pebbles falling between the 16mm – 512mm range. The percentage of aquatic vegetation at these sites ranged from a low of 2% to a high of 95%.	Pebble counts associated with the seven macroinvertebrate sites in the Fraser River collected in 2018 indicated between 1% – 11% embeddedness, with all pebbles falling between the 8mm – 512mm range. The percentage of aquatic vegetation ranged from a low of 0% to a high of 86%.
Flushing Flows ¹	Spring runoff met the county's recommended flushing flows in all but one stream in 2018.	Of the 4 sites monitored in the Colorado River Basin, only the Colorado River at Kremmling did not meet the county's recommended flushing flows in 2018.	Of the 2 sites monitored in the Fraser River Basin, both met the county's recommended flushing flows in 2018. ⁵

Notes and Citations:

¹Recommended in the Grand County Stream Management Plan (2010)

²Colorado's Multi-Metric Index (MMI) version 4.0

³Colorado Parks and Wildlife, 2019. Colorado River at Parshall Fishery Management Report. Link here: <https://cpw.state.co.us/thingstodo/Fishery%20Survey%20Summaries/ColoradoRiverNearParshall.pdf>

⁴Colorado Parks and Wildlife, 2019. Fraser River Fishery Management Report. Link here: <https://cpw.state.co.us/thingstodo/Fishery%20Survey%20Summaries/FraserRiver.pdf>

⁵Tetra Tech, 2019. 2018 Substrate Monitoring, Grand County, Colorado. Technical Memorandum prepared for Learning By Doing. April 9,2019