

# **Bighill Creek Water Temperature Logger Installations, June 2020**

## **Trout Unlimited Canada Technical Report**



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Bighill Creek Preservation Society

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Trout Unlimited Canada



Truite Illimitée Canada

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## 1.0 Overview

HOBO Onset MX2202 Water temperature data loggers were installed at 11 sites on Bighill Creek on June 15, 2020 from downstream of Township Road 271A to the town of Cochrane near the confluence with the Bow River (Table 1). Trout Unlimited Canada (TUC) was contracted by the Bighill Creek Preservation Society (BCPS) to install these loggers in order to collect baseline monitoring data in Bighill Creek to support the ongoing water quality monitoring efforts by the BCPS throughout the watershed. This baseline data may also be used to determine the thermal suitability of reaches of both Bighill Creek and its major tributaries for native trout recovery and allow for modelling of future changes in thermal suitability for these and other species living in the watershed.

## 2.0 Study Area

The water temperature monitoring study area extends from the confluence of Bighill Creek and the Bow River, upstream to Township Road 271A along the Bighill Creek and several unnamed tributaries (Figure 1). Within this study area 8 temperature monitoring sites are situated along the Bighill Creek mainstem, with three sites situated on tributaries; an unnamed tributary of Bighill Creek which flows out of Bighill Springs Provincial Park, an unnamed tributary which flows into Bighill Creek upstream of Hwy 567, and an unnamed tributary which flows under Hwy 22 and past the Cochrane Ranchehouse.

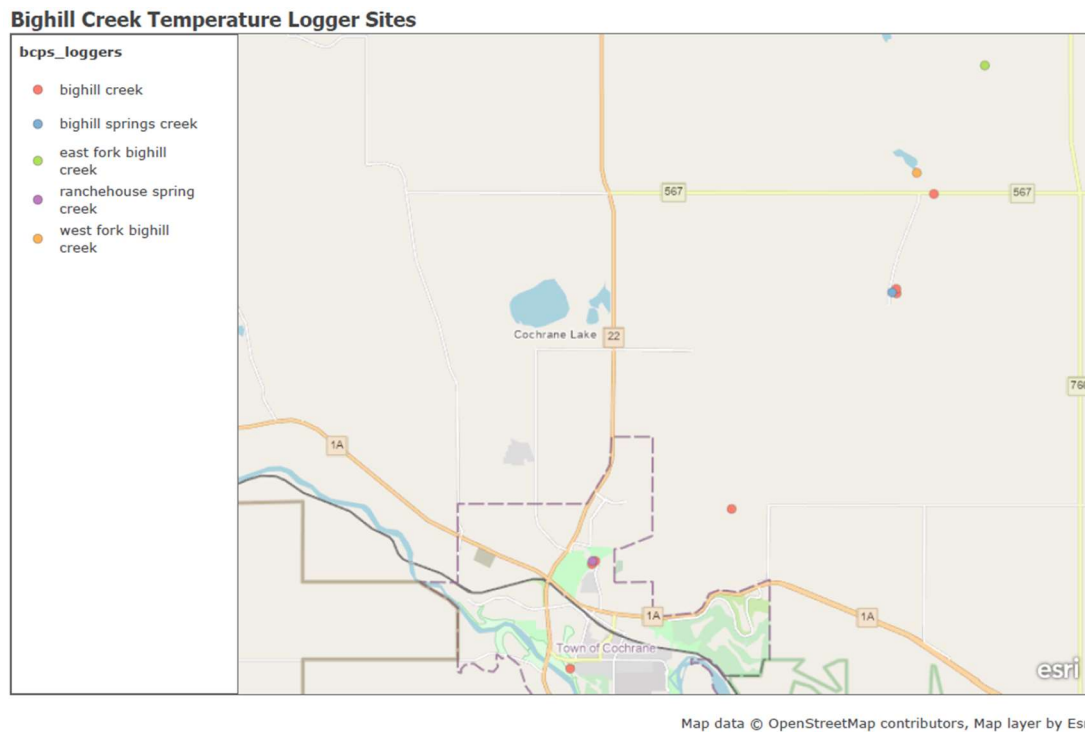


Figure 1. Site locations of electrofishing inventories within the Bighill Creek watershed conducted on June 15, 2020.

## Field Crew

Elliot Lindsay - Project Biologist, Trout Unlimited Canada

Tim Giese - Volunteer, Cochrane Environmental Action Committee  
Ken Stevenson - Volunteer, Bighill Creek Preservation Society

### **3.0 Installing/Launching Loggers**

Water temperature data loggers were launched using the Bluetooth HOBOMobile software, which is free to download from any app store and is functional on Android and IOS operating systems. Loggers were configured to turn Bluetooth on when the center target icon/button is pushed by the user. Once a logger is detected by the HOBOMobile app, it will appear on the main menu as a detected logger and should display a small green hand icon indicating the button was pushed. The HOBOMobile app can then be used to configure and launch the logger on a given time/date, and to record at a set interval. To maintain consistency with other water temperature monitoring efforts in Alberta, loggers can be configured to begin logging at 30-minute intervals, starting on the hour or half hour. If all loggers are being launched at the same time, it will make data analysis easier if all the loggers are configured to begin logging at the same time e.g. midnight of a given day when all of the loggers will be installed and in the water when logging begins. For the purposes of this study, each logger is affixed to a PVC cap, which is threaded on to a PVC housing attached to a meter-long section of rebar.

The AEP recommended installation instructions have been appended to this report, as well as a guidance document for monitoring stream water temperatures in Alberta, as well as blank field data sheets for relaunching data loggers.

### **4.0 Downloading/Retrieving Loggers**

Water temperature data loggers may be checked as BCPS capacity allows throughout the summer and/or on an opportunistic basis when volunteers are in the area and able to retrieve and download data. In the fall loggers which are expected to be frozen or become dry due to declining stream flows should be retrieved prior to ice formation. Sites with consistent year-round flows where loggers can be installed in relatively deep flowing water will be at lower risk of becoming exposed to air, being frozen, or being washed away with very low and very high flows, and may not need to be checked as frequently. Field equipment when checking loggers should include a mobile phone with the HOBOMobile software installed, a wrench (sized according to the hardware used to secure the logger housing), as well as a small sledgehammer and the metal installation tool in case the logger needs to be hammered closer to the streambed or moved to a better location. Once connected to the logger using the Bluetooth connection via HOBOMobile, the logger data can be acquired by choosing the “readout” option. The stored data will then be downloaded to the phone and will be stored in the “files” tab of the HOBOMobile app. Accessing the files by clicking on the files tab will allow the user to share the files as a variety of file types and send to an email address using the share functionality. Sending files as .proj (HOBO project) file type will allow the user to open the files on a desktop computer using the free ONSET HOBOWare software. Be sure to relaunch the logger if needed, to continue logging after the logger is put back in the water. Reading loggers out before or after the half or whole hour mark will ensure that a temperature datapoint is not recorded during the readout process e.g. reading the logger out at 12:37 as opposed to 12:30.

Table 1. Locations of installed water temperature data loggers throughout the Bighill Creek watershed.

Serial Number	Site ID	Latitude	Longitude	Waterbody ID	Waterbody Name	Colloquial Name	Install Notes
20555517	BC01	51.27055727	-114.3709139	133	Bighill Creek	Bighill Creek	logger installed on left downstream bank approx. 8-10 meters downstream of fenceline, downstream of Hwy 567 culvert. Soft substrate, creek high at time of installation.
20555515	BC02	51.27451243	-114.3760222	63564	unnamed	West Fork Bighill Creek	logger installed on downstream right bank underneath willow. Approximately 10m upstream of bridge, substrate gravelly with abundant fines outside of thalweg. Logger approximately 25 meters downstream of pond outflow.
20555521	BS01	51.25212079	-114.3834176	64061	unnamed	Bighill Springs Creek	logger installed along left downstream bank near large woody debris, downstream of park boundary approx 150 meters downstream from road. Logger beneath woody debris just downstream of log.
20555516	BC03	51.2519383	-114.3820951	133	Bighill Creek	Bighill Creek	logger installed on right downstream bank under willow, access by walking SE from logger BS01. Willow flagged adjacent to logger. Approx 50-60 meters downstream of confluence with Bighill Creek.
20555520	BC04	51.25276727	-114.3821627	133	Bighill Creek	Bighill Creek	logger installed along right downstream bank under overhanging willow, stream channel along east side of valley along toe of slope. Site approx 200 meters east of road to the provincial park. Willow flagged adjacent to site.

Table 1 (continued). Locations of installed water temperature data loggers throughout the Bighill Creek watershed.

Serial Number	Site ID	Latitude	Longitude	Waterbody ID	Waterbody Name	Colloquial Name	Install Notes
20555514	BC05	51.29462343	-114.3556522	133	Bighill Creek	East Fork Bighill Creek	logger installed along left downstream bank, approx. 10 meters downstream of fenceline/40 meters downstream of road culvert. Approx 15 meters upstream of power line.
20550459	BC06	51.20174682	-114.472259	133	Bighill Creek	Bighill Creek	logger installed along left downstream bank, approx 30 meters upstream of path. Installed under cutbank, willow flagged adjacent to site
20555513	BC07	51.20120219	-114.4732766	133	Bighill Creek	Bighill Creek	logger installed along downstream right bank under overhanging willow approx 30 meters downstream of pedestrian bridge. Approx 15 meters downstream of large spruce tree on right downstream bank. Willow flagged at site.
20555518	RC01	51.20175576	-114.4730889	64195	unnamed	Ranchehouse Spring Creek	logger installed along left downstream bank approx 15 meters upstream of pedestrian bridge. Near large old willow, gflagged. Young-of-year salmonids observed throughout.
20550458	BC08	51.18158242	-114.4797736	133	Bighill Creek	Bighill Creek	logger installed along left downstream bank, approximately 30 meters upstream of pedestrian bridge in Caragana stand just upstream of large poplar. Caragana flagged adjacent to site
20549540	BC09	51.21152479	-114.4314572	133	Bighill Creek	Bighill Creek	logger installed along downstream right bank, approximately 8 meters downstream from Ed's bridge. Logger beneath willows, willow flagged.

## Appendix A. Site Photos



Figure 2. Site BC01, downstream of the fenceline below Hwy 567. Looking downstream.





Figure 3. Site BC02 along the “West Fork” of Bighill Creek, upstream of bridge on Range Rd. 33A. Looking downstream.



Figure 4. Site BS01 along Bighill Springs Creek, immediately downstream of instream woody debris. Looking upstream.

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Figure 5. Site BC03 along Bighill Creek downstream of the confluence with Bighill Springs Creek.



Figure 6. Site BC04 along Bighill Creek downstream of the confluence with Bighill Springs Creek.



Figure 7. Site BC05 along the "East Fork" of Bighill Creek downstream of the road and fenceline leading to private property south of Township Road 271A . Looking downstream.



Figure 8. Site BC06 along Bighill Creek upstream of pedestrian pathway and bridge near the confluence with Ranchehouse Spring Creek. Looking downstream.



Figure 9. Site BC07 along Bighill Creek downstream of pedestrian pathway and bridge near the confluence with Ranchehouse Spring Creek. Looking downstream.



Figure 10. Site RC01 along Ranchehouse Spring Creek upstream of pedestrian pathway and bridge. Looking downstream.

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Figure 11. Site BC08 along Bighill Creek upstream of the pedestrian path and bridge, located adjacent to a large stand of caragana.



Figure 12. Site BC09 along Bighill Creek just downstream of “Ed’s Bridge”. Looking downstream.