

## APPENDIX E. PERSONAL ACCOUNTS OF PREVIOUS FLOODS AT LEAVENWORTH NFH

The east slope of the Cascade Mountains and Icicle Creek experienced extremely high surface flows on November 29, 1995 and November 6, 2006 following major storm events (aka “Pineapple Express” atmospheric rivers) when Icicle Creek flows peaked at 19,800 and 14,700 cfs, respectively. The former flow is the highest ever recorded at the USGS stream gage located at RM 5.9 (rkm 9.4) approximately 1.4 miles upstream of the water intake for the hatchery. Documentation of those two high water events of Icicle Creek is largely in the form of photographs, archived in the main office building at Leavenworth NFH, and the institutional memories of USFWS employees working at the hatchery during those events. Since those times, USFWS employees at the hatchery have either moved away from the area or retired, but several former staff members still live in the Leavenworth area. In response to a query from the CCVA Team, two former employees – including the former manager of Leavenworth NFH – provided detailed accounts of those events via email correspondences. Two additional employees were interviewed by telephone with notes taken of their recollections. Those personal accounts are presented below with minor edits and inserts [in brackets] for clarity.



**Figure E1.** High water of Icicle Creek on November 6, 2006 (~14,700 cfs) looking upstream towards the bypass canal and dam (under and behind the bridge). The cyclone fence next to the fish ladder is visible to the right of the bridge below the parked vehicle. The water level downstream of the dam is nearly even with the water level in the canal upstream of the dam. See also Figures E2, E3, and E4.

#### **A. Recollections of Dan Davies, former manager of Leavenworth NFH (retired).<sup>1</sup>**

“Yes I was the manager at Leavenworth NFH at that time and I do remember most of the problems and took many pictures. I recall there were three 100-year floods while I was manager; the November 29, 1995 event was the most destructive.

Icicle Creek is a heavy gravel, cobble mover during high water events due to the steep gradient and large boulder make-up. All three [high water] events filled the intake pipe with gravel, mud and sand, from the intake [structure] to the settling basin for the hatchery. Even though we took preventive measures and turned down the Icicle Creek flow [into the intake pipe] to about 10 percent [of capacity], the intake conveyance channel and intake bars were filled with mud and gravel. The water line in the intake building was 6 to 8 feet above the intake bar rack. The large boulder in Icicle Creek by the intake dam was totally underwater by several feet. As you can well imagine, restarting the water supply took considerable time and effort.

The water level at the hatchery was even with the top of the adult [holding] pond (ground level), and there was a huge back eddy in Icicle Creek just below the concrete dam [of the bypass channel] where hundreds of logs and floating debris collected. The circle effect of the back eddy caused debris and logs to take out the cyclone fence and many yards of soil next to the fish ladder. Consequently, the fish ladder was filled with the soil, mud, gravel and debris. The water was so high, logs floating down river would launch off the dam [of the bypass canal] and hit the bridge crossing over the dam (see Figure E1).

As you can see, these were challenging times for fish culture. We were on 24-hour shifts cleaning intake screens and maintaining the water reuse system. Even though most of the pond [and raceway] drains were above the flood elevation, the pond waters backed up, especially in the Foster-Lucas ponds which only the Colville Tribe now uses. Also, the pollution abatement pond did not drain due to being several feet underwater.”

#### **B. Recollections of Corky Broadus, former Information and External Affairs (I&EA) Specialist (retired)<sup>2</sup>**

“Yes, I remember the 1995 high water and flooding that occurred all throughout the Wenatchee River Drainage and Icicle [Creek] very, very well. I actually did a bunch of videotaping of the water hurling over the canal spillway and throughout the grounds of the Hatchery for a week or so. On one morning, I had walked carefully to the bridge entry (Figure E1) and felt a very strong shaking of the bridge itself under my feet. I think Bill Thorson [Assistant Complex Manager] might have been near me. I remember my adrenalin kicking into high gear as I began making a quick turn-around and headed back to the spawning shed area for safety. If the Hatchery still has any of the videos or photos that I took (maybe also in the old Hatchery Manager’s green log books), you would see the incredible flow levels and hear the thunderous roar of water as logs came flying by. We were all worried about the bridge collapsing. We immediately closed the Hatchery for public use.

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<sup>1</sup> Email to Don Campton, CCVA Team, September 21, 2021.

<sup>2</sup> Email to Don Campton, CCVA Team, October 4, 2021.

Safety was top priority for staff and the public. Kinda crazy times because we had just lived through the devastating forest fires of 1994, just the summer before. Tons and tons of debris and major clean-up followed. Both events took major toll on private land and the Wenatchee National Forest.”

### **C. Recollections of Hamilton (“Rocky”) McCleary, former Maintenance Supervisor (retired).<sup>3</sup>**

Rocky McCleary was interviewed by telephone in response to an email from the CCVA Team inquiring about his recollections of the November 29, 1995 flood event. His major recollections were virtually the same as those recorded via emails by Dan Davies and Corky Broaddus. His major points, recorded as notes, are listed below.

- “The intake was completely under water. The existing water intake structure for the hatchery trapped debris and diverted it towards the intake building.
- The sand-settling basin filled with debris and sediment.
- The area immediately below the bypass canal and bridge was significantly impacted by floating logs and debris.
- The fish ladder was completely underwater because the water level immediately downstream from the canal dam was nearly level with the water level upstream of the dam. This created a back eddy pool below the dam with large numbers of logs and debris. The ladder filled with debris.
- The flood waters took out the dike at the island in the back portion of the bypass canal.
- The high water took out the boat ramp downstream from the hatchery.
- High water from the Wenatchee River backed up into Icicle Creek towards the hatchery.
- Anchor ice and formation of ice dams were also problems at the hatchery in some years. In the year after the flood, heavy snow blocked access to the wells, and an ice dam formed at the head of the old creek channel. The island would have been flooded if the ice dam had not broken.”

### **D. Recollections of Chuck Hamstreet, former Fish Biologist (retired) at the Mid-Columbia Fish and Wildlife Office (FWCO) at Leavenworth NFH.<sup>4</sup>**

Chuck Hamstreet was interviewed by telephone in response to an email from the CCVA Team inquiring about his recollections of the November 29, 1995 flood event. His major recollections were virtually the same as those recorded via emails by Dan Davies and Corky Broaddus. His major points, recorded as notes, are listed below.

- “I worked at Leavenworth NFH 1985-1994 and at the Mid-Columbia FRO (FWCO) from 1994-2018. Yes, I remember the flood events very well. The 1995 event was right after Thanksgiving. [Thanksgiving that year was on Thursday, November 23.]

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<sup>3</sup> Interviewed by Don Campton, CCVA Team, September 22, 2021.

<sup>4</sup> Interviewed by Don Campton, CCVA Team, September 23, 2021.



- The intake structure was completely full of debris. The hatchery had to go on 100% well water.
- There was woody debris from the upper trash racks at [the intake of] the hatchery to the sand settling basin. The small canal from the upper trash rack to the lower trash rack was full of debris.
- 1994 was the year of the big fire [in the Icicle Creek watershed near the hatchery], and large amounts of debris were washed down Icicle Creek.
- The radial gates at Structure 2 allowed the high water to go into the old creek channel. The high water flowed over, and eroded, the roadway at Structure 2.
- The high water at the fish ladder came within about 2 feet of the concrete walls of the adult pond.
- The cyclone fence around the fish ladder and adult pond got wiped out.”



**Figure E2.** The old stream channel of Icicle Creek looking downstream from Structure 5 towards the tailrace area downstream of the canal dam during the high water event of November 6, 2006 (see also Figures B2 and B3, Appendix B). The spawning shed and main hatchery building can be seen in the far distance to the left and right, respectively, of the large conifer trees.



**Figure E3.** Icicle Creek in the tailrace area immediately downstream from the canal dam looking towards the fish ladder (marked by the cyclone fence) and spawning shed during the high water event of November 6, 2006. The superstructure of the bridge over the dam is visible near the upper-left corner of the photograph (compare to Figure E1).





**Figure E4.** Icicle Creek looking upstream from the bridge in front of the canal dam during the high water event on November 6, 2006. The lip of the dam is barely discernible because the water level downstream of the dam is nearly even with the water level in the canal (compare to Figure E1).