

## River tragedy waiting to happen

By Larry Hyslop



A diversion dam on the Humboldt River is containing a headcut

A tragedy is poised to occur on the Humboldt River. The above photo was taken upriver from Elko, close to Last Chance Road. The tragedy is evident in the above photo, but the problem is not the diversion dam, which is temporarily holding back the tragedy. It is also not the floating willow stems, apparently evidence of beaver activity upstream.

The problem shows in the difference in water levels above and below the dam. The water appears to drop about four feet as it tumbles over the boulders and concrete slabs flooring the dam.

Sherm Swanson is State Extension Range Specialist for the College of Agriculture, Biotechnology and Natural Resources at the University of Nevada, Reno. He told me this drop in water signals a headcut.

Such a headcut creates turbulence at the stream bottom, leaving behind a drop off like a small waterfall. This drop off moves upstream as swirling water erodes the bank forming the waterfall. It leaves behind an incised channel that concentrates water velocity and flood energy inside a gully. The headcut formed downstream from here, and it has moved upstream. At present, the diversion dam has temporarily stopped the headcut since the swirling water cannot easily erode through the boulders and slabs.

The fear is this headcut will escape and continue moving upstream. This will be a tragedy along the Humboldt River for several reasons. Headcuts lower the stream level and leave behind a gully. Past headcut movements are evident on many area streams, where the water now occupies a narrow gully several feet deep. The surface of any stream marks the ground water level. Lowering the stream lowers the underground water table. This often dries out wet meadows so water loving plants die out and are replaced with sagebrush or weeds. Sherm told me such headcuts often grow as they move upstream. What is now a four-foot drop could deepen once it begins to again move upstream.

One obvious result of this headcut moving upstream will be the loss of this diversion dam. Water four-foot lower will no longer flow into the ditch. Headcuts mean more sediment in the water and worse floods farther downstream after they increase flood velocity in a deep gully. Sherm is especially concerned about the effect on the Humboldt River above the North Fork of the Humboldt tributary, where the river is in good condition.

This headcut began somewhere downstream from this spot and Sherm sees four possible factors that may have contributed to its creation. Willow spraying in the 1950s and 1960s removed many willows along the river, allowing the water to move faster, a prime way to form a headcut. The river was

straightened where it flows through Elko, and flood walls along the banks constricted the river, both creating faster moving high water. Gravel pits between this spot and Elko or gravel harvesting and more river straightening just upstream from Elko may have also contributed to the problem.

As the water falls over the dam, it has created a large, deep pool. One side of this pool is close to the river above the dam. As the pool widens, the bank separating it from the flowing river could erode, allowing the river to bypass the dam and free the headcut to again move upstream. It is very difficult to control a traveling headcut and very rare to have a chance such as this to stop it. The river bank and the dam bottom need to be maintained to keep this tragedy at bay and protect the upper Humboldt River.

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