

Testimony of Gordon Grant before the Energy and Natural Resources Committee of the Oregon
Senate

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My name is Gordon Grant, and I am a Research Hydrologist and geomorphologist with the USDA Forest Service, Pacific Northwest Research Station in Corvallis, Oregon. I am also a Courtesy Professor of Geosciences at Oregon State University. My testimony here is intended to provide context and technical background to the bill under consideration; my position as a Federal scientist specifically prohibits me from advocating for or against legislation.

The broader context that motivates this bill is the current status of streams and watersheds throughout eastern Oregon and the American West. Many of the streams you see today in this region have undergone significant changes over the past century or more. Specifically, many of the streams and valleys that today appear as deeply cut down or incised gullies or arroyos bordered by wide valleys of sagebrush were once wet or marshy meadows, filled with wetland vegetation and grasses, and drained by wandering shallow streams punctuated by beaver dams and ponds. We know this because of the record of old volcanic ash and ponded silts and muds, now visible in the steep gully walls.

The causes of these incised channels have been hotly debated since the incision began over a century ago. Cattle and sheep grazing, changes in the climate, human activities to ditch and drain meadows for agriculture, and widespread trapping and decimation of beaver populations have all been implicated, and the jury is still out as to what the dominant mechanisms were. But there is no doubt that loss of the beaver and their dams that ponded water, stored sediment, and built up the valley bottoms was a major factor in transforming these waterways.

Because these channels have cut down 5, 15, or even 30 feet or more in places, the channels now flow at elevations far below their former floodplains, which have become terraces. Without deliberate, thoughtful, and fairly large scale interventions that raise the water level back to the former floodplains, they cannot return to their previous levels and recover their function. A number of different strategies have been proposed and, in places, implemented to accomplish this, and the jury is still out on the most effective approaches.

One plausible and, in my view, particularly successful strategy has been to build so-called "artificial beaver dams", small, low-head weirs made of natural materials of rock, wood, or some combination thereof. The purpose of these "ABD's" is severalfold. First, much like beaver dams, they impede the flow, creating a chain of ponds interspersed by small steps. If properly engineered, these ponds raise the water table back up to the level of the valley floor, killing the valley sagebrush and other dryland species, and making it possible for wet meadow vegetation and grasses to grow once again adjacent to the channel. This introduces both hydraulic and ecologic complexity into previously rather barren channelways, and makes it possible for aquatic and riparian habitats for fish, beavers, and other species to become re-established. Building these structures first is a necessary condition for reintroducing beavers

into these areas; without their preferred habitat the beavers cannot build the dams by themselves and will not reoccupy the channels, even if deliberately reintroduced. But once the ABDs are in place, native species that are an essential part of beaver diets can become established, and the beavers will return, and often occupy and maintain the ABDs as if they had built them in the first place.

Although the effects of building ABDs are striking, and dramatically change landscapes rather rapidly (within 1-3 years), the full consequences of this restoration strategy are not well understood. To address this, a consortium of scientists representing a diverse set of scientific institutions, including the PNW Research Station and Oregon State University, have established the Cottonwood Creek Watershed Observatory in the Silvies River Valley. The purpose of this observatory is to evaluate the effects of ABDs and other restoration strategies on water supply, ecosystem functions and health, and habitat for a wide range of organisms. Results of this research will be widely available to the public, other ranchers, land managers, and the regulatory community to help guide new approaches and strategies for restoring watersheds. From my perspective, the challenge of restoring eastern Oregon waterways and habitats can be achieved, but will require innovative strategies, collaboration, and experimentation.