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### Abstract

#### Changes in riparian area structure, channel hydraulics, and sediment yield following loss of beaver dams

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Channel structure, riparian zone structure, and sediment transport capacity were investigated for Sandown Creek, a stream in the East Kootenay region of British Columbia where beaver dams were removed in the late 1980s to "improve" fish passage and flood conveyance. A series of historical aerial photographs taken over a 36-year period between 1968 and 2004 recorded the physical changes to a 3-km section of the stream valley following removal of 18 beaver dams. In the 16 years following beaver dam removal, channel pattern changed from a multi-thread to single-thread form. The riparian area structure also changed from 69% open areas and 9% beaver ponds to 90% closed vegetation. The change in channel structure in Sandown Creek resulted in an estimated 5-times increase in the mean flow velocity and an additional 648 m<sup>3</sup> of sediment available for transport. These findings provide the empirical data needed to verify long-standing assumptions about the ability of beaver ponds to effectively trap sediment and reduce bankfull flow velocity. The results of this study also underscore the speed and magnitude of alterations in the channel and riparian area structure in response to beaver loss in British Columbia mountain valleys. While the physical removal of beavers and beaver dams may be a practice of the past, wildland managers may still be inadvertently compromising the sustainability of beavers and associated wetlands in many areas of British Columbia by failing to adequately manage riparian areas to maintain beaver habitat.

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