

Table 1. Chronology of historical and continuing land uses that affect rivers in the Colorado Front Range (Wohl, 2001).

Land use	Chronology	Spatial extent	Influence on rivers
Beaver trapping	Primarily 1815-1840	All rivers affected	Removal of beaver dams increases flow velocity, streambed and bank erosion; decreases sediment storage, channel stability & diversity
Placer mining	1859-1940s	Primarily Boulder, Tarryall, and Clear creeks, & the North and South forks of the South Platte River	Direct effects: disrupts streambed & bank structure; increases sediment and channel mobility; alters flow regime if diversion occurs; introduces toxic contaminants (eg Hg) Indirect effects: increases population, timber harvest, transportation corridors – increases sediment and contaminants entering channels
Railroad tie drives	1860s-1890s	Poudre & Big Thompson rivers, lower St. Vrain Creek, Boulder Creek	Modification of channels prior to tie drives (removing obstructions & naturally occurring wood, blocking off overbank areas); scouring effects of pulses of water & wood
Flow regulation (diversions, dams)	1859 to present	All rivers except N. St. Vrain Creek & S. Fork Poudre River	Alters magnitude, duration, and frequency of flows, & thus sediment transport, disturbance regime, water chemistry, and water temperature
Timber harvest	1859-1940s	All rivers affected	Destabilizes hillslopes; increases water and sediment yield to rivers
Transportation corridors (roads, railroads)	1860 to present	All rivers except N. St. Vrain Creek, N. & S. forks Poudre River	Increases sediment to rivers (hillslopes destabilized, unpaved roads erode, traction sand & gravel used in winter on paved roads); reduces width of floodplain and riparian corridor
Lode mining	1859-19880s	Rivers in the central & southern portion of the Front Range	Increases sediment yield from hillslopes; introduces toxic contaminants to rivers
Urbanization	1859 to present	Affects portions of all rivers but the N. & S. forks Poudre, Tarryall Creek & S. St. Vrain Creek	Initially increases water & sediment yield to rivers, subsequent increases primarily in water yield; introduces contaminants to rivers; constrains channel & floodplain space & mobility
River recreation	1909 to present	All rivers affected by introduced fish; Poudre River by rafting	Fishing creates pressure on native species & promotes introduction of other species; whitewater rafting locally creates trampled streambanks with compaction, decreased infiltration, increased runoff and erosion, & damage to riparian vegetation
Grazing	1860 to present	Limited reaches along most rivers	Removes riparian vegetation & compacts streambanks; results in bank erosion, wider & shallower channel cross section, finer streambed substrate, increased nutrient input to river, warmer water temperatures, reduced aquatic & riparian habitat

