

## BAD River — South Dakota

The Bad River Basin is the smallest of the major river basins which flow into the Missouri River from western South Dakota. The 3,152

22



square mile basin is mostly private land and National Grassland Administered by the U.S. Forest Service. The basin is representative of the Northern Shale Plains which covers about 67 million acres in the Northern Great Plains.

Annual precipitation in the Bad River Basin averages approximately fifteen inches with about 80% occurring between April and September. Peak rainfall months are May and June, but intense thunderstorms are common throughout the summer months.

Introduction of livestock and improper grazing practices accelerated the naturally high rate of sheet, rill and gully erosion within the drainage. Overgrazing and livestock trailing to water activated gully erosion and increased runoff from steep, weakly-developed upland soils.

Overgrazing of native grasses reduced water infiltration into the soil and exposed the soil surface to the erosive force of accelerated overland runoff. The increased rate of runoff eroded and downcut gullies and stream channels weakened

by livestock trailing and trampling and removal of riparian vegetation.

These conditions intensify the naturally extreme seasonal variations in runoff. Since 1928 Bad River flows ranged from 0 to 4,290 cubic feet per second. Exposed upland and riparian soils produce prodigious amounts of sediment and bedload material which are transported out of the Bad River Basin and eventually into the Missouri River.

During one extreme event on May 14, 1982, Bad River discharged 949,300 tons of sediment. On the average, each square mile of the basin annually produces 1,418 tons of sediment and bedload material.

Erosion in the Bad River drainage has far-reaching adverse effects. Bad River

important to the Pierre-Fort Pierre area economy. Bad River sediment deposits reduce fish production by smothering eggs. In addition, for six to eight weeks following major runoffs, suspended sediments from Bad River muddy water and greatly reduce fishing success in twenty to thirty



sediment deposits in the Missouri River restrict the channel. Resulting ice buildups reduce the water release capacity of Oahe Dam. This, in turn, results in reduced generation of electricity and periodic flooding of portions of the city of Pierre.

The poor condition of the Bad River watershed also adversely affects fishing in the Missouri River which is

miles of the Missouri River. Improved grazing strategies can significantly reduce erosion in the Bad River drainage. Moderate and flexible stocking rates are essential due to the wide fluctuations in timing and amounts of annual precipitation. Cross fencing and stock water developments can improve livestock distribution, provide better