PR122 NARRATIVE

Updated 17 May 2014

Cross section PR122 was established in 1975 in the crest of a large meander bend in Powder River at the mouth of tributary Flood Creek. The bend had been migrating steadily downvalley, having shifted at least half a kilometer in 80 years (Martinson and Meade, 1983, Sheet 1; Gay *et al.*, 1998, *their* Figure 8). The 6-7-m-high left bank of the section cuts into a large deltaic fan that has formed at the mouth of Flood Creek.

The meander bend that includes section PR122 was cut off at its neck by the flood of 1978 (Meade and Moody, 2013, *their* Figures 11 and 12). But before the neck of the bend was breached, the flowing flood waters had already eroded the bend crest, removing a 7-m width of deltaic fan material from the left bank at section PR122, and adding a thickness of 0.5-1.0 m of new sand across a 40-m width (Stations 20 to 60) of the river channel.

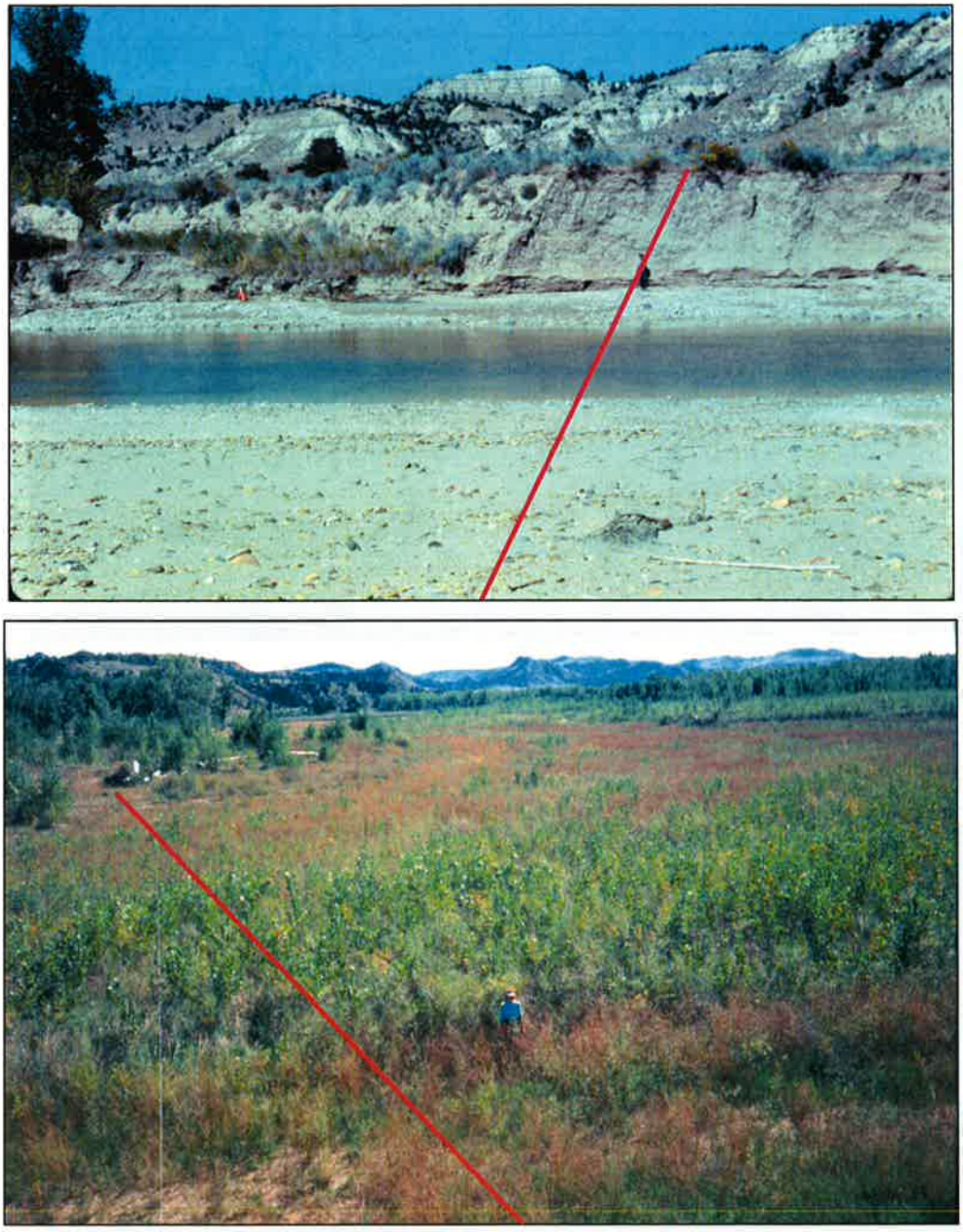
After the 1978 cutoff, section PR122 was resurveyed in 1978, 1979, 1980, 1982, 1984, 1987, 1993, and 1995. None of these resurveys showed any significant change in the cross-sectional profile. Even in the old channel, no vertical changes greater than 0.1 m were recorded.

Vegetation of the abandoned channel at section PR122 has changed markedly, as shown by repeated photographs (see, for example, Figure 13 of Meade and Moody, 2013). Seeds of willow and cottonwood trees brought in by the flood of 1978 soon sprouted in the abandoned river channel. Willows grew more rapidly during the first few years. Then cottonwoods gradually supplanted the willows. As of year 2013, cottonwood trees have grown 10 m tall in what was, before the flood of 1978, the unvegetated active channel of Powder River.

Gay, G.R., Gay, H.H., Gay, W.H., Martinson, H.A., Meade, R.H., and Moody, J.A., 1998, Evolution of cutoffs across meander necks in Powder River, Montana, USA: *Earth Surface Processes and Landforms*, v. 23, p. 651-662.

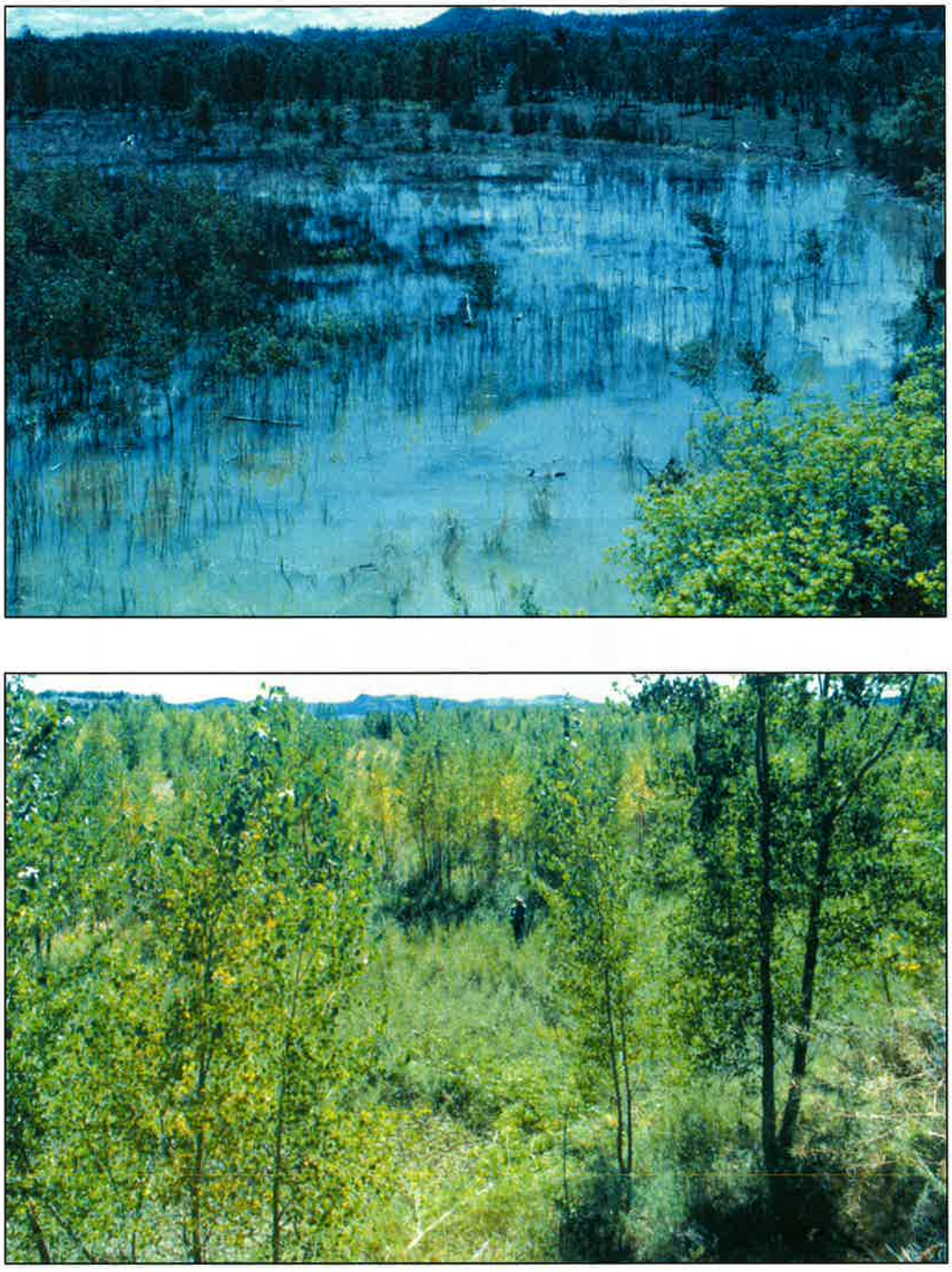
Martinson, H.A., and Meade, R.H., 1983, Channel changes of Powder River, 1938-78, Powder River County, Montana: U.S. Geological Survey Hydrologic Investigations Atlas HA-661, 3 sheets.

Meade, R.H., and Moody, J.A., 2013, Erosional and depositional changes wrought by the flood of May 1978 in the channels of Powder River, southeastern Montana: U.S. Geological Survey Scientific Investigations Report 2013-5035, 28 p., 1 plate.

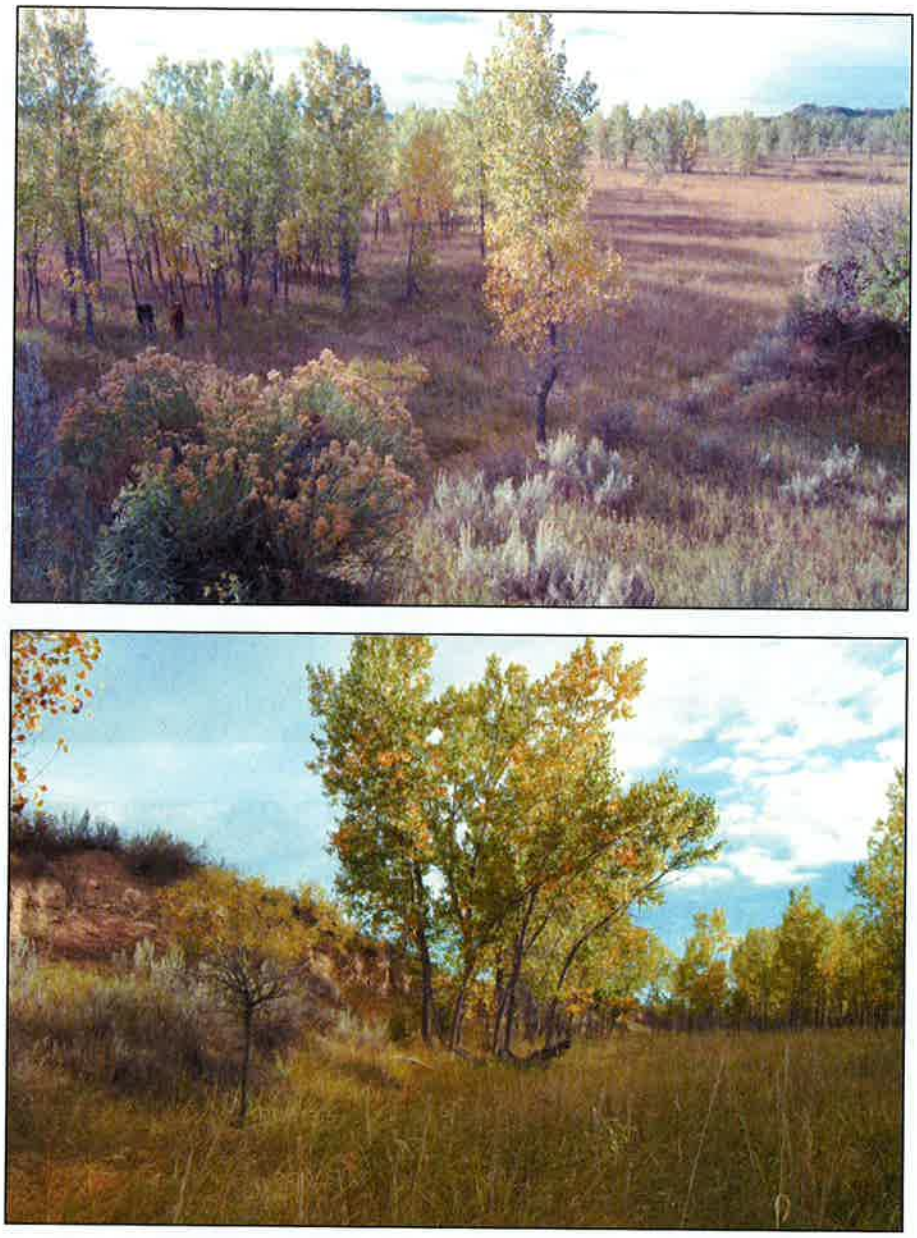


PR122. **Top**. 5 September 1975. Cross-channel view from right bank toward left bank along the line of section. N. Andrews is standing on section and is about 1.7m tall. **Bottom**. 17 September 1982. View from top of left bank of new vegetation in cutoff. S. Stewart (about 1.5 m tall) is 6 m upriver from station 30. Red line shows approximate line of section

PR122. **Top**. 3 September 1984. View from top of left bank of vegetation in cutoff. J. Moody (~1.9 m tall) is 6 m upriver from station 30. **Bottom**. 17 August 1986. Red line shows approximate line of section.



PR122. **Top.** 9 June 1993. View is upriver from PR122 showing water in the channel that was abandoned by Powder River during the Flood of 1978. **Bottom.** 26 September 1995. View is from the left bank along the line of section. J. Moody is standing between stations 20 and 30.



PR122. **Top.** 29 September 2013. View is upriver from PR122 showing channel abandoned during the Flood of 1978. J. Moody is standing between stations 20 and 30. Distant skyline is no longer clearly visible because of the height of the cottonwoods. **Bottom.** 29 September 2013. Downriver view through section PR122, showing the left bank of the pre-flood channel (in the alluvial fan of Flood Creek) that was eroded back 7 m during the Flood of 1978 (see Fig. 6 of Meade and Moody, 2013). Clump of cottonwood trees in center of photo grew since the Flood of 1978 (at approximately the same location where N. Andrews was standing in the photo taken on 5 September 1975).