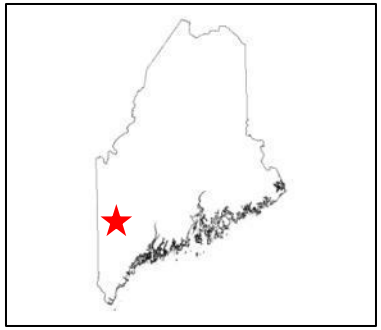
Maine Geologic Facts and Localities

April, 2013

Sandy River Bank Erosion, Avon, Maine – 2nd Update



44° 48’ 11.88” N, 70° 17’ 11.67” W

Text by
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Introduction

The Sandy River extends from its origin at Sandy River Ponds in Sandy River Plantation in Franklin County to its confluence with the Kennebec River in the town of Madison in Somerset County a total of 73.3 miles. This very dynamic and ever-changing river has been the subject of numerous newspaper headlines over the years because of issues associated with stream bank erosion. This discussion is an update to the Sandy River's movements in the town of Avon as outlined in two previous Sites of the Month Engineered Solutions to Stream Bank Erosion: A Case Study, Februrary 2001 and Natural Processes Affecting Stream Bank Erosion: An Update to "Engineered Solutions to Stream Bank Erosion", April 2006. The site is situated approximately 3.6 miles upstream of the bridge crossing in Strong near what is referred to as the VoterVale Farm in Avon, Maine.

Figure 1. Site Location (upstream and downstream of VoterVale Farm)

Erosion, Sedimentation, and Changing River Channels

The Sandy River adjacent to the VoterVale Farm has seen significant changes over time. Back in 1998, the Maine Geological Survey was asked to comment on a proposal to remove sand and gravel from three point bars in an attempt to alleviate erosion on a cut bank which was threatening the property south of the VoterVale Farm (north of Route 4). Rather than remove material from these bars, a more direct and effective approach would have been to excavate a former channel which would cut off the meander and thus render this section of the river an eventual oxbow or at least a backwater channel in the short term. This appeared to be an environmentally prudent act since the river would eventually choose this course of action anyway.

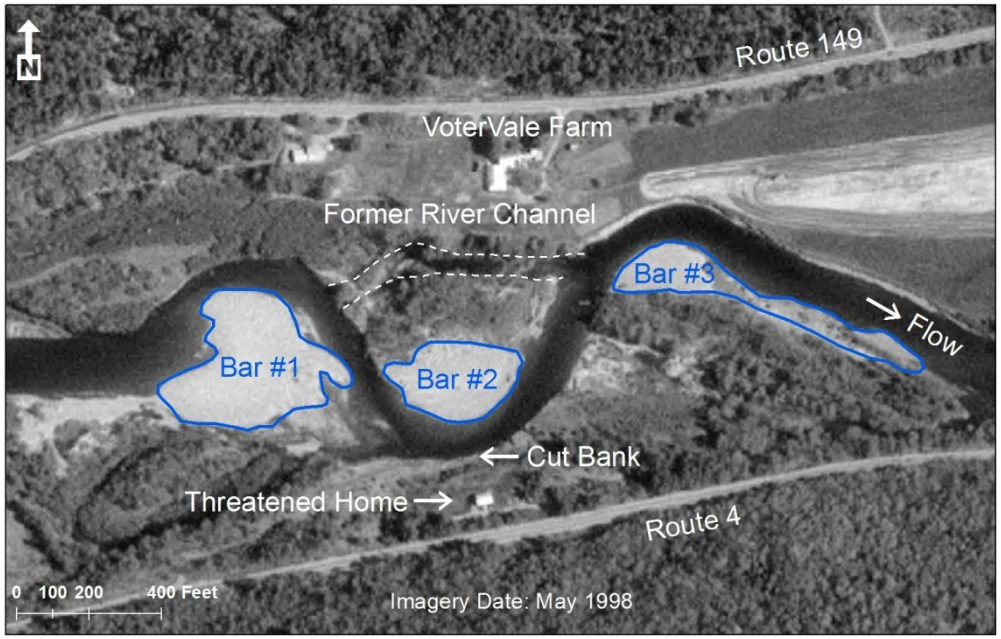


Figure 2. Image of site depicting point bars, cut bank, and potentially threatened home in 1998. Also shown is a former river channel where dredging was proposed to cut off the meander.

Erosion, Sedimentation, and Changing River Channels

In the spring of 2005, the Sandy River changed course and re-occupied the former channel which cut across the meander. Clearly, this change of events significantly reduced the erosion on the cut-bank which was threatening the residence. However, erosion downstream of fields owned by the VoterVale Farm continues. An interesting outcome of abandoned channels is that they make excellent habitat for many types of wildlife.

Figure 3. Image depicting re-occupation of former channel and the abandonment of the meander to the south.

Erosion and Sedimentation Marches Onward

As a consequence of the natural change in river course across the meander, there continues to be significant erosion occurring over time that is well documented by studying aerial photographs from 1998 through 2011 (Refer to area noted in yellow on Figure 3 for location). In this analysis, a series of five aerial photographs were examined and the edge of the stream bank was delineated. The progression of these stream bank edge delineations from 1998 to 2011 can be clearly seen as a northeasterly encroachment of the Sandy River onto the VoterVale Farm field; a distance of approximately 175 feet. This resulted in a loss of approximately 1.9 acres of land.

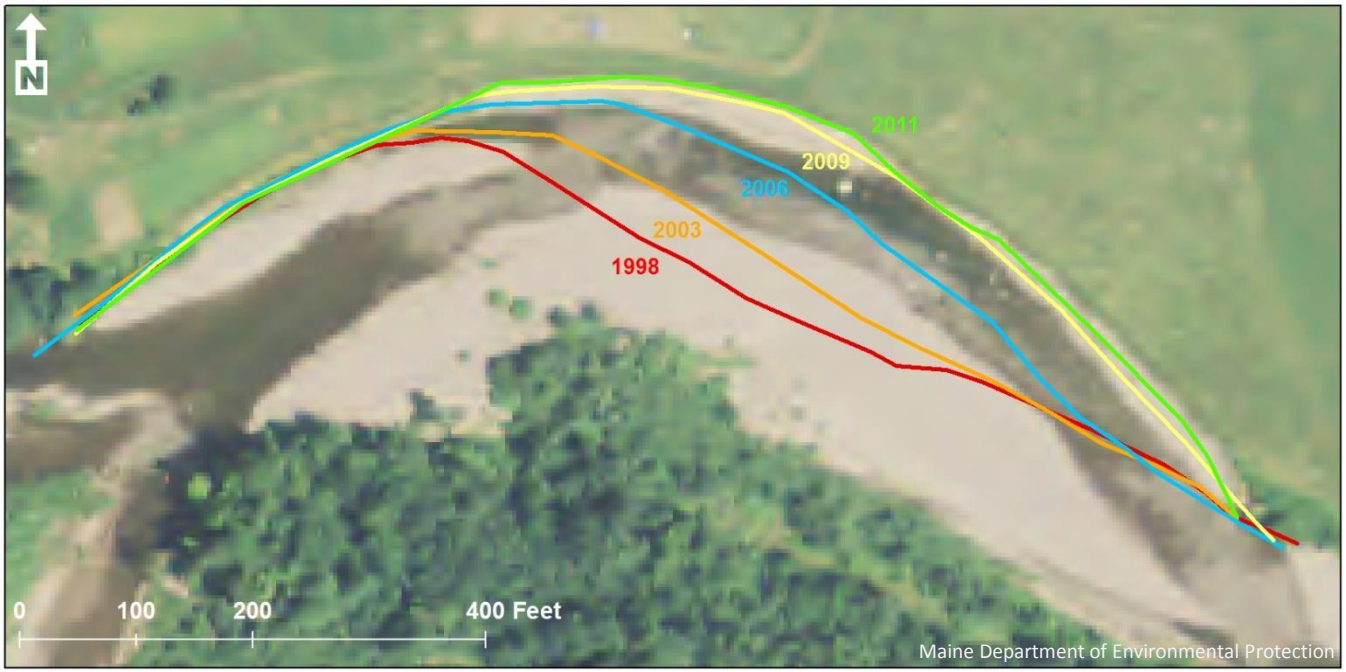
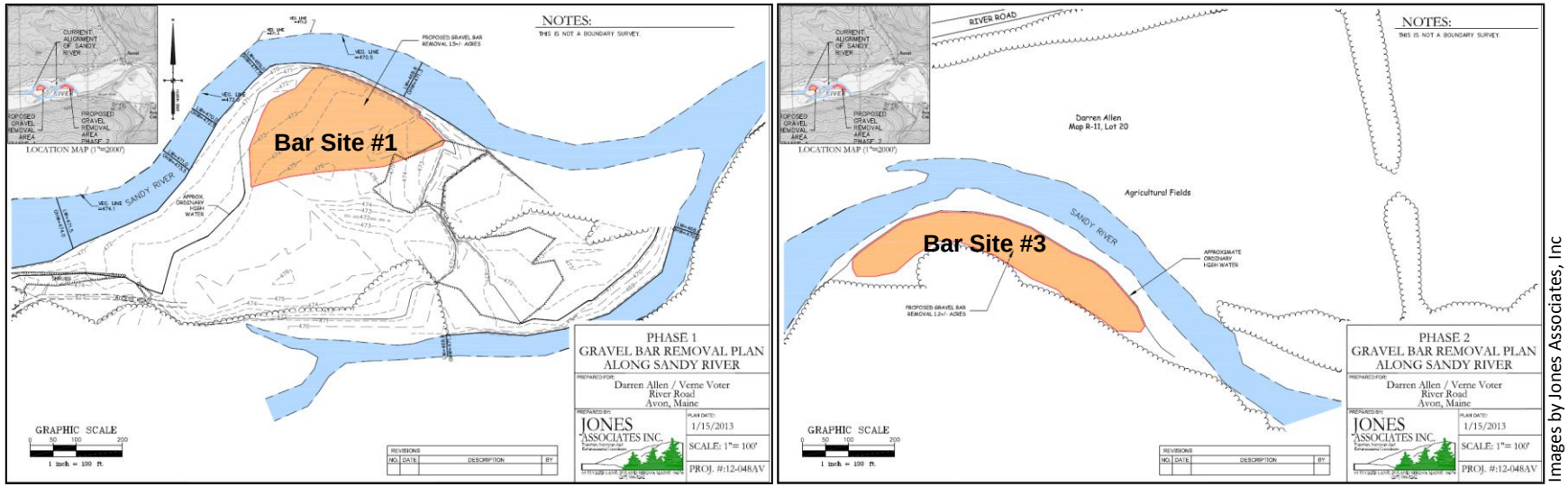


Figure 4. This image depicts a detailed analysis of five delineated stream bank edges from aerial photographs dated 5/12/1998, 5/19/2003, 8/9/2006, 8/14/2009, and 7/16/2011.

Finding a Reasonable and Effective Solution to the Farm Field Erosion

Recognizing that point bars typically form on the opposite side from eroding cut banks, it is appropriate in this case to "surgically skim" this material from defined locations to about 6 inches above the seasonal low water level. This would broaden the cross-section of the stream at high stages, and disperse the stream's energy so that erosion of the cut banks would be reduced. Ultimately, it was decided that portions of point bars situated at bar sites #1 and #3 (Figure 2) should be surgically skimmed (Figure 5). A procedure for monitoring the effectiveness of this work has also been established.



Images by Jones Associates, Inc

Figure 5. These engineering drawings, Phase 1 and 2, depict locations (in orange) where gravel is to be extracted down to approximately 6 inches above the seasonal low water level. Phase 2 also depicts the bar formed in Figure 4 as the river bend shifted northeasterly.

References and Additional Information

Engineered Solutions to Stream Bank Erosion: A Case Study, Maine Geological Survey web site, February 2001

Jones Associates, Inc., 2012, Application for a Natural Resources Protection Act permit (L-23486-L6-B-N), Gravel bar removal, Sandy River, River Road, Avon, Maine. Submitted to the Maine Department of Environmental Protection, Bureau of Land and Water Quality.

Natural Processes Affecting Stream Bank Erosion: An Update to "Engineered Solutions to Stream Bank Erosion", Maine Geological Survey web site, April 2006