

Swan River Cross Section Surveys

By: Rod Burr, ESRD

Project Description: The purpose of this project is compare surveys pre and post cut off construction to assess changes and evaluate post construction channel stability following the Swan River Flood Control project in 1983. The project consisted of a series of cut-offs on the Swan River to reduce flooding of Kinuso, the Swan River First Nation reserve and agricultural lands in the M.D. of Big Lakes.

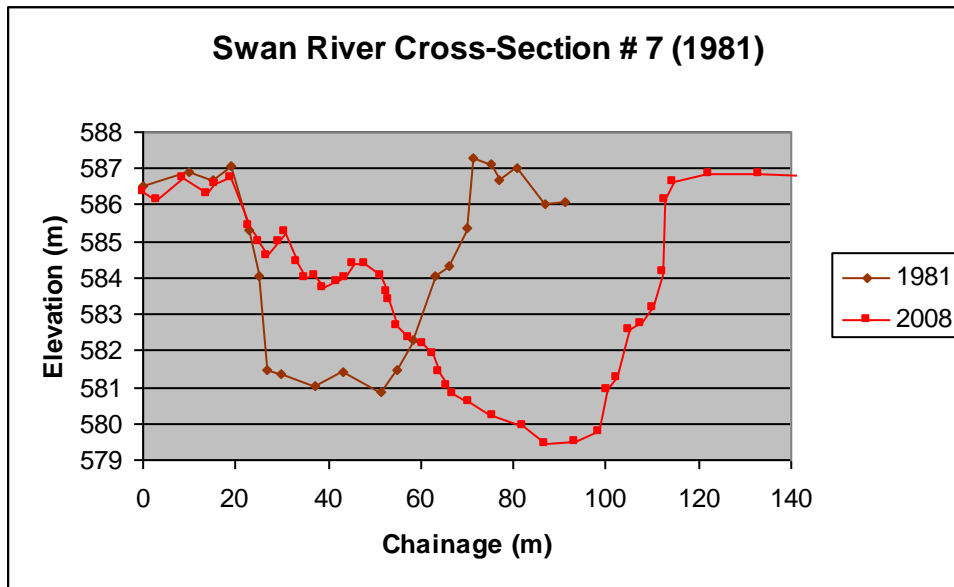
Sections along the river had been surveyed at three different times as follows:

- 1981 - These cross sections were obtained prior to the construction as part of the design work.
- 2001 - These cross sections were obtained as part of the Flood Damage Reduction Program to provide the data necessary to develop the computer models to evaluate flooding. The intent was to survey the same sections as were undertaken in 1981 but the marker pins were not located. The surveys were completed as close to the original locations as possible as suggested from the location plan.
- 2009 - These surveys were obtained to compare erosion amounts since the previous surveys so an assessment could be made to evaluate whether bed degradation (erosion) was ongoing and to assess overall channel stability. For this survey the notes from the original surveys were provided to the contractor (Charlie Goutier) and efforts were made to survey at the exact same locations.

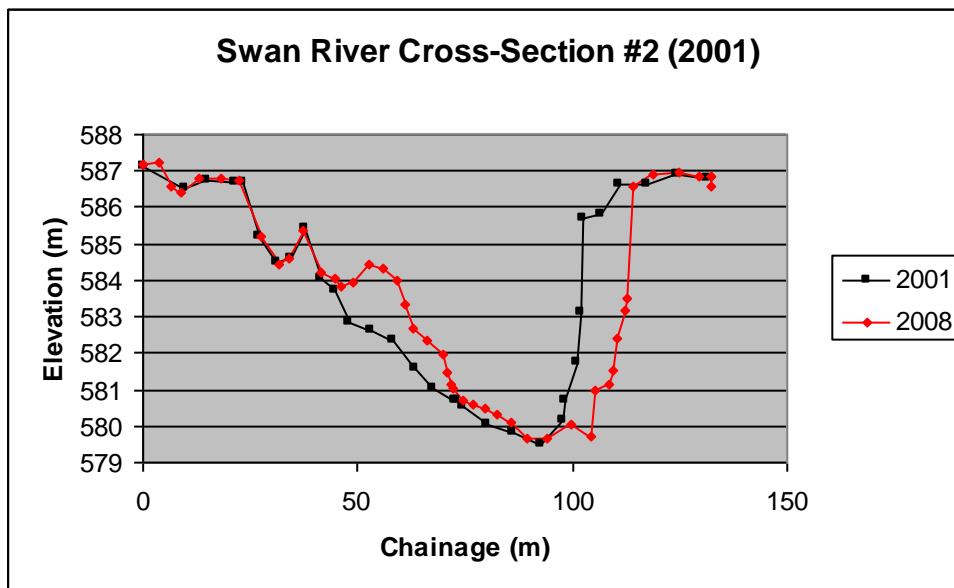
The original intent was to survey three locations downstream of the last river cut-off and three cross sections upstream of the first cut-off. The downstream sections were to provide an indication of sedimentation in the channel as this reach of the river would have seen the largest amounts of sediment deposition. The upstream sections would have shown the largest amounts of bed degradation (erosion). The pins marking the downstream sections could not be located and the original survey notes did not have sufficient information to allow accurate re-establishment of these sections. The sections upstream of the cut-offs were surveyed as described in Appendix A.

Results

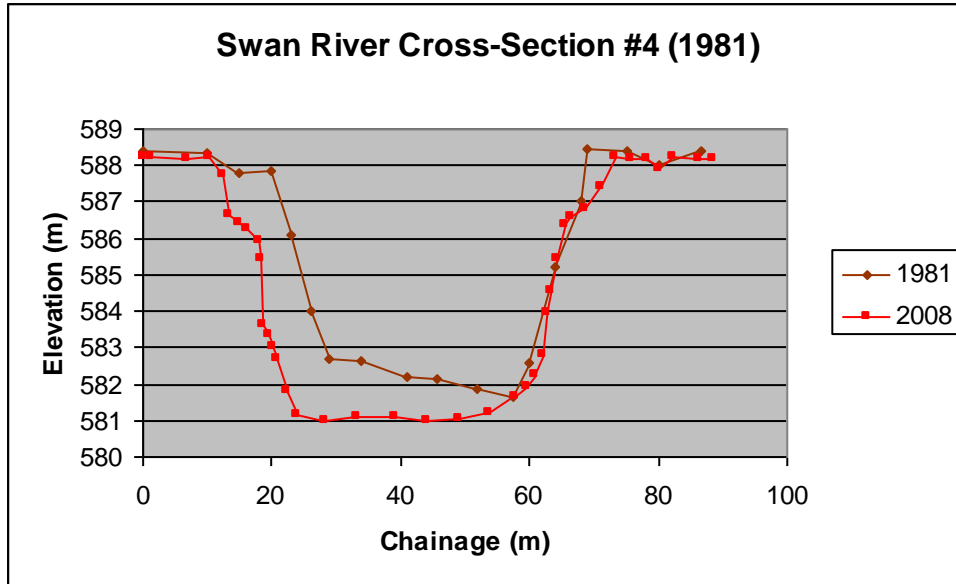
The data from all the surveys were entered into Excel and the chart function in Excel used to plot the results. The final plots ready indicate the changes at each section over time. Section #7 (1981) and section #2 (2001) and section #4 (1981) and section 5(2001) which were near the same location but were slightly skewed have also be plotted on the same chart to provide a comparison of channel changes over the entire period of time.



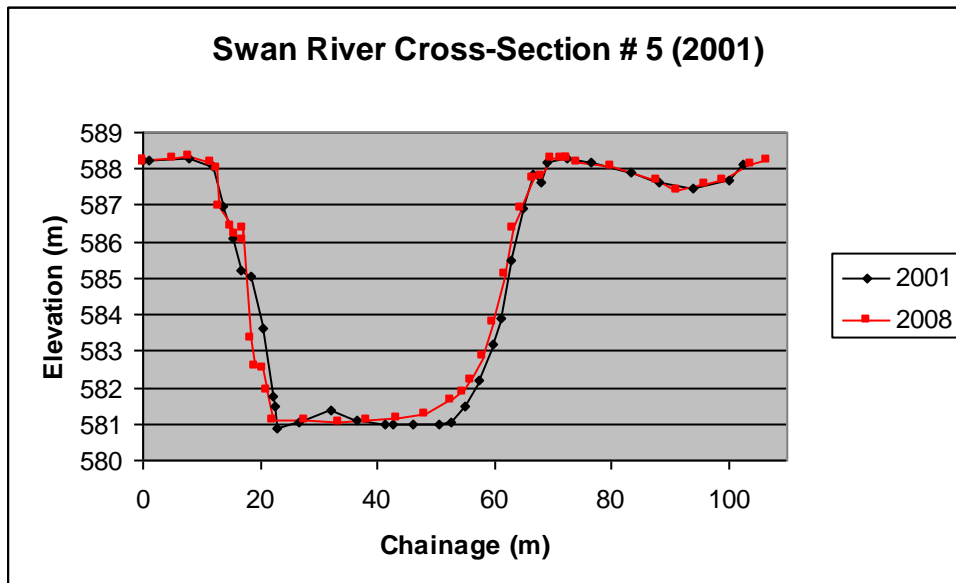
As to be expected the changes at the sections closest to the upstream most cross section were the greatest of the sections surveyed although this would be partly due to this section partly within the actual cut-off and the fact that this section is slightly skewed to the existing channel. The channel has widened considerably and has deepened by almost 1.5 meters.



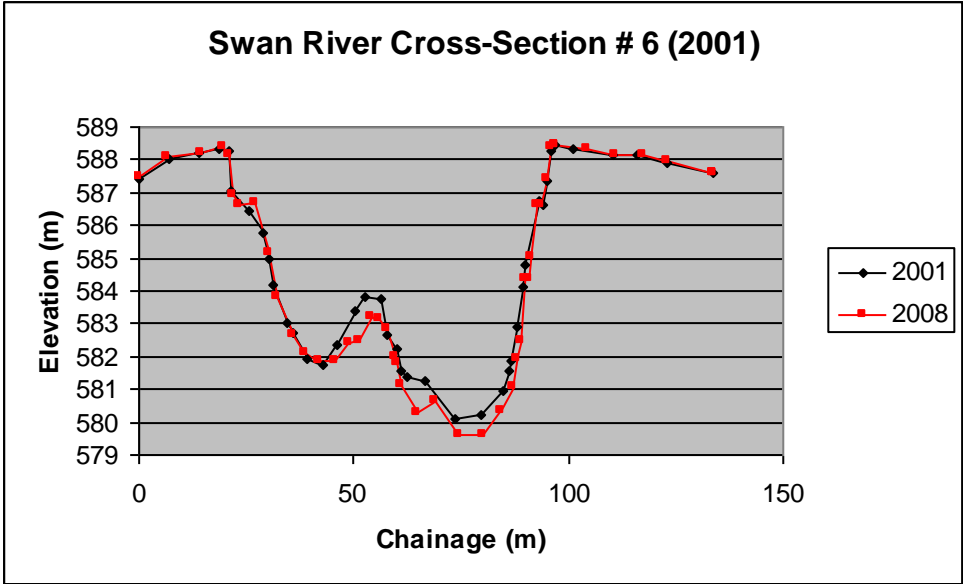
This section is near the location of section #7 (1981). The section suggests that degradation in this area may have stopped but the channel continues to widen. Because this section is skewed and not perpendicular to the flow the erosion appears greater than if the section was taken 90 degrees to the flow.



This section provides a better overall indication of changes to the channel pre and post cut-offs since was surveyed more perpendicular to the channel. There has been widening of the channel and it has degraded by about 1.5 meters at this location.

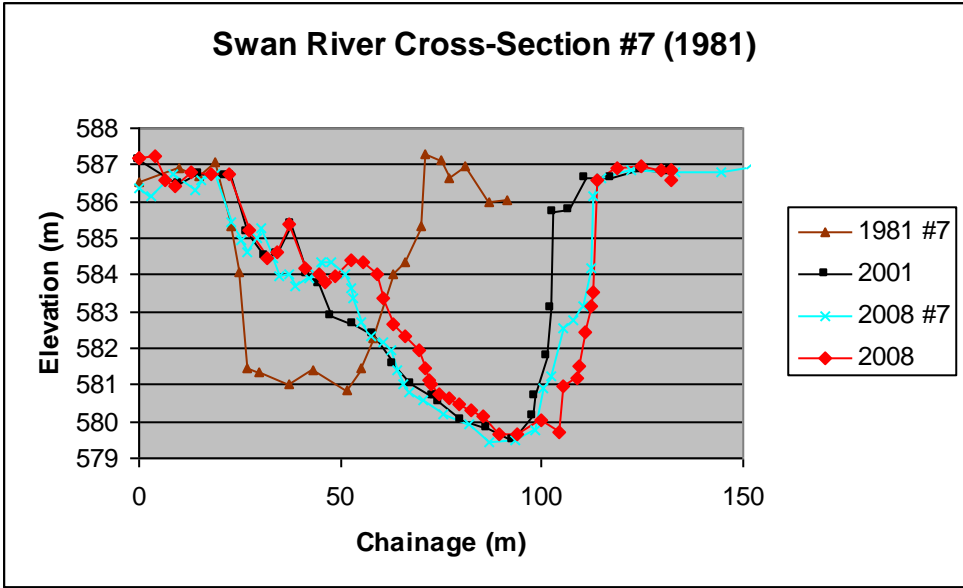


This section suggests that channel may be stable or is very nearly stable since 2001. This is important since erosion volumes will now be greatly reduced and may be approaching rates experienced prior to construction of the cut offs. (There have been a number of high water events since 2001 so the diminished erosion rate is not due the lack of any flood events.)

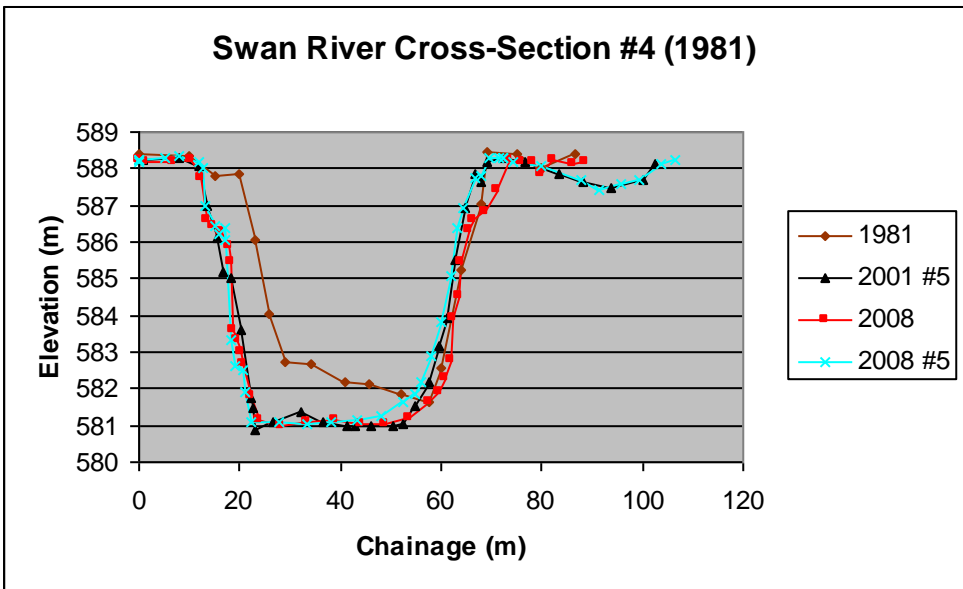


Similar comments to Section #5 (2001)

Swan River Cross-Section #7 (1981)



Swan River Cross-Section #4 (1981)



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Appendix A

Swan River X-Sections (2008)

X-Section # 2 (2001)

This x-section was re-established as per the (2001) survey notes, control pin 2.2 with marker post was found. Control pin 2.1 and marker post was missing. The alignment of the x-section was established by using the field notes from (2001). A re-bar pin and marker post (2 LT) was established on the left side of the river when you are facing down stream.

X-Section # 5 (2001)

This x-section was re-established as per the (2001) survey notes, control pins #5.1 and #5.2 with marker posts were found.

X-Section # 6 (2001)

This x-section was re-established as per the (2001) survey notes, control pins #6.1 and # 6.2 with marker posts were found.

X-Section # 4 (1981)

This x-section was re-established as per the (1981) survey notes, control pin 4 LT with marker post and pin 4RT were found as per the calculations in the field notes. Establish marker post at 4 RT.

X-Section # 7 (1981)

This x- section was re-established as per the (1981) survey notes, control pin 7 RT and marker was missing, control pin 7 LT with marker post was found on the left side of the river. Established temporary point (nail) at 7 RT and established a new 7 RT point on the production on alignment , new re-bar pin and marker post was established on top of the right bank.

X-Section # 37

This x-section which is # 37 down stream of cut-off # 9 as per the aerial photo which is also x-section # 29 as per the survey notes of (1981). Nothing found, this x-section was not re-established.

X-Section # 38

This x-section which is # 38 as per aerial photo is x-section # 30 as per survey notes of (1981). Nothing was found, this x-section was not re-established.

X-Section # 39

This x-section which is # 39 as per aerial photo is x-section # 31 as per survey notes of (1981). Nothing was found, this x-section was not re-established.



Swan River Survey Cross Section Locations
(1981) + (2001)

Handwritten annotations on the map include:
- 8 (1981)
- 4 (1981)
- 5 (1981)
- 2 (2001)
- 3 (2001)
- 4 (2001)
- 5 (2001)

2