

River Relocation

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Abstract

Many rivers in the United States and the world have gone through some form of modification throughout history. Changing a channel's course, flow, or moving it to an entirely different location are many ways a stream can be modified. Changing a river channel's course is meant to avoid constructing infrastructure and mining. It can also help with flood control, land reclamation, and restoring rivers. Although there are benefits, it could come with some negative effects. Some examples may include: creating loss of habitat, increased erosion, and sediment within the channel, decreases in water quality, vegetation loss, as well as increasing the risk of downstream flooding.

Methods

This research looks at the balance between the potential benefits and negative consequences of changing a river's course based on pre-existing studies and scientific reports of stream changes. Through case studies stream modification have provided answers to different specific needs but have also created costs to the channel and its environment. By replicating a natural channel, it could be able to provide our needs, but also create minimal environmental damage.

Case Study 1: Sugar Brook River

Original Plan:

- Trapezoid, unlined alluvial design
- raise the elevation for Manchester Airport runway extension

Realization:

- Required elevation exceeded the natural beds of the river by 5m
- Clay soils was not stable
- Undercutting toes of slopes could cause collapse of high banks

Better Plan:

- Reroute valley, create stream in valley floor
- Mimic natural river – meandering
- Allow for river to naturally adjust
- Plant additional aquatic plants and tree coverage

Case Study 2: Morwell River

Previously modified to allow access coal reserves

Design:

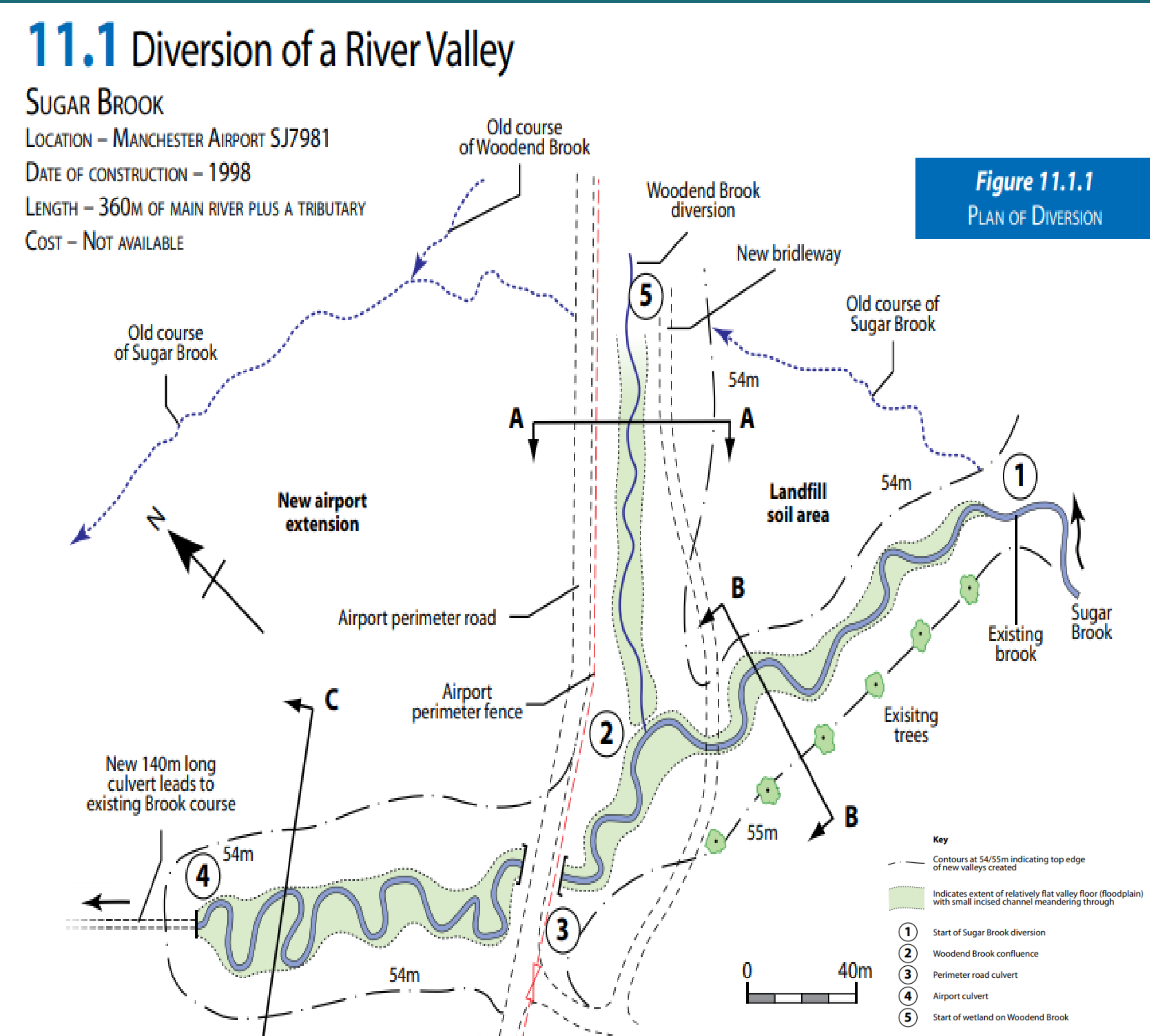
- Embankment made of access material to guide river away from Yallourn mine
- Replicate river –meandering
- Smaller floodplain

Result:

- Embankment collapsed during flood
- Latrobe river reversed direction and flowed into mine pit.
- \$109 million in damages

Literature Cited

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Conclusion

River relocation has occurred throughout time and around the world. The purpose to create a diversion could range from flood control to expanding infrastructure. In the case studies we have explored the different management and design styles of each situation. The behaviors of a river system can be greatly affected by desired modifications, whether the consequences be positive or negative. With each step of the process still runs the area of risk. Therefore, having a good understanding of the nature of rivers and the surrounding environment need to be considered in design.