

APPENDIX 6.6-D

Water Crossings Confidence Assessment



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1.0 Introduction

To confirm the validity of the desktop approach (Section 6.6.11), the data collated during the desktop assessment was compared with the results of the subset of 25% water crossings surveyed in the field in the summer of 2022 (Appendix 6.6-A). A correlation analysis was conducted between the field-collected and desktop-assessed bankfull widths. The results of the correlation analysis were used to determine whether a significant relationship exists between the field-measured and desktop-assessed bankfull widths.



2.0 Methods

Relationships between estimated bankfull width and field measured bankfull width were evaluated by calculating the Spearman rank correlation coefficient (ρ) and examining scatter-plots representing a subset of 31 water crossings. Outliers were detected by calculating the ratio between field desktop and field-measured bankfull width and removing entries where this ratio was greater than the 97.5 percentile or less than the 2.5 percentile. Spearman's ρ values were compared to two-tailed critical values at the appropriate sample size with outliers removed (Zar 1999). Spearman correlations were performed using R version 4.2.1 (R Core Team 2022).

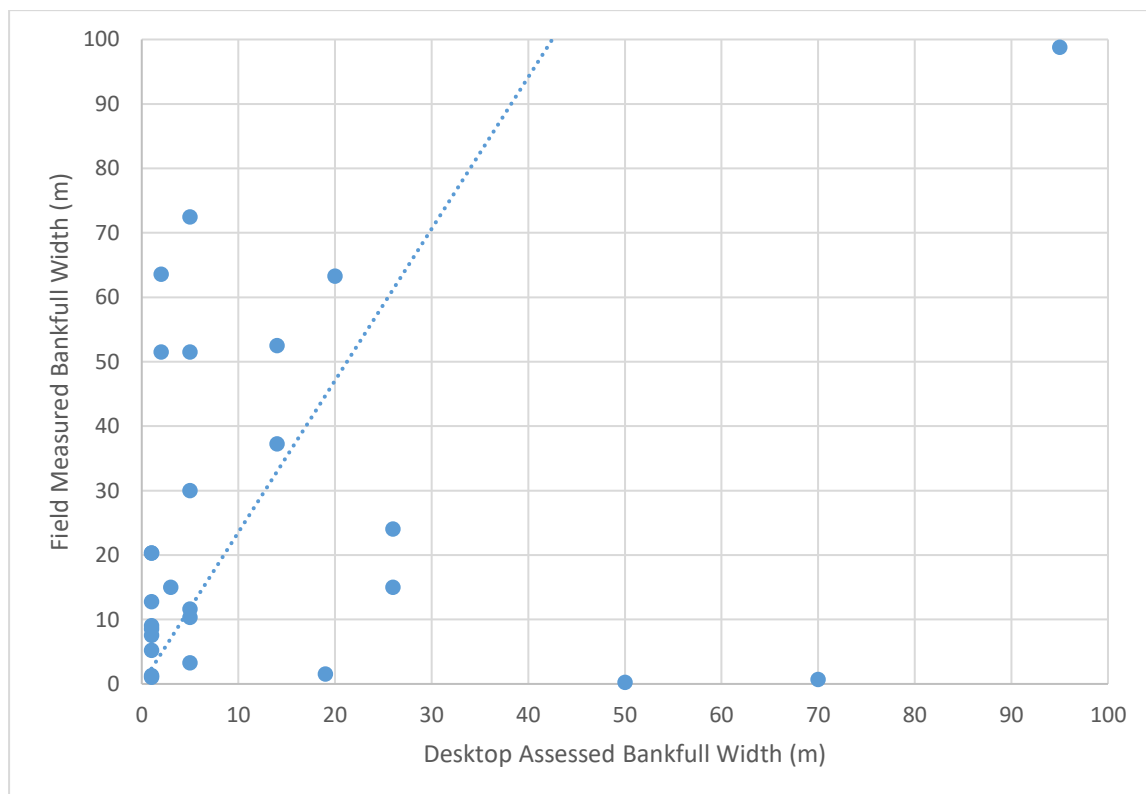


3.0 Results

Two outliers were removed from the analysis, corresponding to a wetland crossing with a poorly defined channel and a stream crossing immediately adjacent to a large wetland. A review of the water crossings that were field assessed showed some variation in bankfull width from the desktop estimated bankfull widths, but, with a calculated Spearman’s ρ of 0.495, exceeding 0.475, the critical value for a P-value less than 0.01 with a sample size of 29 (Zar 1999), the correlation between desktop-assessed and field-measured bankfull widths was significant in this statistical analysis. Given the correlation between the desktop and field values for bankfull width, we are confident that desktop-assessed bankfull widths are sufficient to describe the conditions of watercourse crossings.

The majority of the water crossings sampled along the preferred route represented small watercourses with 50% of bankfull widths less than 9 m and 25% having a bankfull width less than 2.5 m. Fifty percent of crossings surveyed in the field had wetted widths less than 6.5 m and 25% had wetted widths less than 1.7 m, although a wide range of waterbody types and sizes were sampled, including large rivers, ponds, lakes, and wetlands.

Reasonable effort was expended during water crossing selection for the field survey to meet the sampling criteria of the EA (Section 6.6).



4.0 Summary

The results of the field survey generally confirmed the results of the desktop assessment; minor discrepancies were attributed to the conservative approach used in the desktop assessment, and slight variations in locations that were assessed. However, the mitigation measures including the proposed restricted activity timing windows and crossing structures proposed are still considered applicable. Based on the results of the field survey, the approach for the desktop assessment was considered valid for the purposes of the EA, as the desktop approach was confirmed to be conservative for determining fish presence and assigning proposed restricted activity timing windows, such that effects of the Project were not underestimated.



References

R Core Team. 2022. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. <https://www.r-project.org>. Accessed: 2023-01-06

Zar JH. 1999. Biostatistical Analysis, Fourth Edition. Prentice Hall, Upper Saddle River, NJ, USA.

