**Response to ‘Specific comments on the research’ by Examiner 2 (Professor Naiman):**

2.) Professor Naiman recommends a number of authors who have published work which may be relevant to James’s thesis. While a number of articles by these authors may be useful to include to in introductory material, several appear to be directly relevant to riparian plant functional ecology, which is the focus of the thesis.

* James has cited JA Catford extensively through the manuscript. The examiner may be referring to the article Catford et al. “Drowned, buried and carried away: effects of plant traits on the distribution of native and alien species in riparian ecosystems” (New Phytologist, 2014). This article discusses 35 plant traits implicated in plant adaptation to riparian environments, and should be cited in introductory material.
* Pollock et al. “Plant species richness in riparian wetlands-a test of biodiversity theory” (Ecology, 1998) is an important study relating species richness with environmental heterogeneity should be cited in Chapter 4.
* S Blanch: this author has mostly published studies of flow-ecology relationships in riparian floodplain wetland systems. These systems differ substantially in nature to the systems James has studied and such studies are not directly relevant here.
* JS Bechtold: interactions between flow and soil properties described by this author are generally important to riparian plant communities but not directly within the scope of this thesis.
* K Rodgers research group: The article Van Coller AL; Rogers KH; Heritage GL “Riparian vegetation-environment relationships: complimentarity of gradients versus patch hierarchy approaches” (Journal of Vegetation Science, 2000) provides useful context for the capability of environmental gradient oriented approaches (as used in this thesis) to explain patterns of riparian vegetation. Although James designed his field sampling strategy to reduce the influence of patch effects in his field studies by focusing on only one geomorphic landform type, this article may be relevant in discussion material of Chapter 4 (for which field surveys were undertaken by another research group).
* Parsons, M., et al. “The effects of extreme floods on the biophysical heterogeneity of river landscapes” (Frontiers in Ecology and the Environment, 2005) should be cited in introductory material of Chapter 4.
* Puckeridge et al. “Flow variability and the ecology of large rivers” (Marine and Freshwater Research 1998) is an important historical study but the hydrological analyses described have been superceded by Kennard et al. (Freshwater Biology, 2010), which is also more relevant to Australian systems.
* Lake 2000 “Disturbance, patchiness, and diversity in streams” (Journal of the North American Benthological Society, 2000) is a seminal study describing how flood flows and droughts create heterogeneity the riparian landscape. This article should be cited in introductory material of Chapter 4.
* Greet, J. et al. (2011). “The importance of seasonal flow timing for riparian vegetation dynamics: a systematic review using causal criteria analysis.” Freshwater Biology, 56(7):1231-1247 is cited in Chapter 3. Greet, J., Cousens, R., and Webb, J. (2013). “More exotic and fewer native plant species: riverine vegetation patterns associated with altered seasonal flow patterns”. River Research and Applications, 29(6):686-706. Is cited in Chapter 4.
* KF Walker et al. “Environmental effects of flow regulation on the lower river Murray, Australia” (River Research and Applications, 1993) provides historical context on the ecological effects of river regulation in Australia and may be worth citing in Chapter 4.
* Kominoski et al. “Forecasting functional implications of global changes in riparian plant communities” (Frontiers in Ecology and the Environment, 2013) is cited in Chapter 1.
* J Roberts: this author’s work is somewhat relevant to the thesis, but no specific articles appear to warrant citation.
* S Capon has been cited but in Chapter 6. “Flood variability and spatial variation in plant community composition and structure on a large arid floodplain” (Journal of Arid Environments, 2004) appears to also be relevant. This article may be useful in Chapter 4, although large arid floodplains form a substantially different system to riparian zones associated with temperate and subtropical rivers which were the focus of James’s thesis.
* Campbell – It is unclear to which Campbell the examiner is referring, as several authors of that name publish on riparian ecology.

3.) James may have misframed the scope of his thesis in the title “Environmental controls on the functional ecology of riparian vegetation”. Perhaps a more appropriate title would be “Hydrological controls on the functional ecology of riparian vegetation”. I acknowledge that the factors described by Professor Naiman are important determinants of riparian vegetation structure and function, but I do not believe James’s focus on flow regime represents a misunderstanding of riparian dynamics as suggested. Flow regime is known to be a dominant control on riparian vegetation in North American and European systems, but flow-ecology relationships in Australian systems are less understood. As such it is reasonable to first establish the influence of flow regime on Australian riparian plant communities before investigating other factors. Some modification of the general introduction to clarify the scope of the thesis may alleviate this examiner’s concerns.

James’s use of soil data from the National Landscape Grid of Australia was not ideal. Unfortunately he had problems with storage of soil samples taken from field sites and analysis was not possible. Nevertheless the landscape-scale soil data was useful in providing broad detail about soil composition which could not otherwise be factored into analyses.

4.) I agree with Professor Naiman that the interplay between succession and biophysical processes is a central character of riparian ecosystems. The benefit of functional trait-based approaches is to allow assertions to be made about the responses of plant communities in which species-specific knowledge is lacking. The sort of work Professor Naiman is suggesting would require fine scale analysis of case studies, as opposed to the broader scale macroecological environmental gradient analyses described here.

1. Stem flexibility, elasticity and root architecture are of fundamental importance in mediating plant responses to fluvial disturbance. James examined wood density because wood density is well established as a key plant functional trait. A wealth of studies in the functional ecology literature describe the role of wood density in plant ecological strategy, economic spectra associated with wood density, and variation in wood density along numerous environmental and ecological gradients. Analysis of variation in wood density over hydrological gradients therefore contributes to the plant functional ecology literature in addition to the riparian ecology literature. Studies describing below-ground functional traits of riparian vegetation are sorely needed to extend riparian functional ecology, but to date have been hampered by the difficulty, cost and destructiveness of working on tree roots.
2. Examiner 1 also requested this information. James has extensive field notes describing the sites used in Chapters 2 and 3. Addition of a brief ‘landscape context’ section to the thesis would be reasonable. James does not have access to this data for Chapter 4 as the vegetation survey data used in this chapter was collected by another research group.
3. The maximum canopy height at all sites described in Chapters 2 and 3 was approximately 10 – 30 m. As such, use of 10 x 50 m plots was methodologically sound. Geomorphic homogeneity was established by visual inspection at the field site. This could be further clarified in Chapter 2. Site history is always an issue in ecological studies, and is not always trivial to characterise. James attempted to minimize the influence of site history and human alteration of river flows by choosing sites in minimally altered catchments along unregulated rivers. These criteria are described in the ‘Study site selection’ section of Chapter 2.

**Response to general comments about sampling:**

Examiners 1 and 3 commented on the use of variable transect areas described in Chapter 4. While consistent transect areas would have been ideal, hard land-use boundaries in the modified landscapes from which the data were collected made this impractical. Comments made by A/Prof. Stromberg requesting clarification of which growth forms were included in the vegetation sampling should be addressed.