

APPENDIX A – KEY DATA/REPORTS FOR THE BRE.

1. Coastal and Marine Geosciences, in association with Environmental Sciences and Engineering P/L (2000) *Bega River Estuary Sediment Study*. Prepared for Bega Valley Shire Council. Copy held by DIPNR.

The BRE Sediment Study provides a review of the existing geomorphic and hydrodynamic data for the lower Bega River valley and facilitates the collection of critical baseline information on estuarine bathymetry and stratigraphy. The investigations focused on evidence of estuarine infilling triggered by the release of large volumes of coarse grained sediment (sand) from the Bega River catchment over the past 200 years in response to European clearing and farming practices.

A review of changes in estuarine water depths between 1870 and 1999, an examination of estuarine morphologic change recorded in aerial photographs from the mid 1900's to the present day and radiocarbon dating of a 50m thick river/estuarine valley-fill sediment sequence in the lower Bega River valley provide no clear evidence of recent or accelerated rates of estuarine infilling. In fact, the available information suggests that the estuary was largely infilled with river sediments some 3,500 to 4,000 years ago and the Bega River has since been delivering river sands to the coast and adjacent continental shelf.

Sediment transport modelling provides further support for this conclusion. An analysis of modelled river discharges at selected critical cross sections and bed load sediment transport estimates show that the Bega River morphology is not limited by the sediment delivery rate. Rather, the scour potential of the large floods is sufficient to transport the bed load material through the system and maintain a fairly stable morphology. Even if the sediment delivery has increased dramatically over the past 200 years, the transport potential within the estuary is sufficient to remove this extra material during the major floods.

While there is some consistency in the results of these investigations, it is clear that there is considerable scope to develop a fuller understanding of estuarine dynamics and linkages with the fluvial processes operating immediately upstream. An understanding of these linkages will be fundamental in assessing the impact of channel clearing (removal of exotic weed and trees) on estuarine sedimentation. A modest program of channel monitoring (dimension and sediment types) is recommended as a means of assessing the short term (years to decade) sensitivity of the BRE to channel clearing. A further recommendation is made for monitoring entrance conditions, frequencies of opening and closure and their influence on water quality in the Mogareeka Inlet.

2. Brooks, A. (1994) *Vegetation and Channel Morphodynamics along the Lower Bega River*. BSc (Honours) Thesis. School of Earth Sciences, Macquarie University.

This thesis is predominantly concerned with the role of riparian vegetation in influencing channel dynamics. Also included is a general background to the physical settings of the catchment, including, catchment size, geology and its control on

sediment availability, geomorphology, rainfall and flood record, followed by a brief history of European catchment development. The thesis then describes in detail the morphological channel changes that have occurred since European settlement using a number of sources. The relationship between vegetation assemblages and channel common geomorphic unit association is then examined upstream of the old North Bega bridge site. The relationship between in-channel exotic vegetation and bar accumulation is then investigated. This study found that vegetation played an important role in determining the changing character of the Lower Bega River. Firstly, forest clearance dramatically altering the runoff characteristics and the sediment supply regime. Secondly, the colonisation of the exotic vegetation in the channel results in a reduction in channel capacity by as much as 50%.

3. Healthy Rivers Commission of New South Wales (2000) *Independent Inquiry into the Bega River System: Final Report* (P. J. Crawford, Commissioner), Sydney, Australia. Copy held by DIPNR.

This report represents the conclusions of the Commission's Inquiry into the Bega River system, following consultation with the Bega River community. The report deals with the whole of the Bega River system, including the estuary and entrance conditions.

This report identifies a number of issues that have been identified by government and the community as most crucial to the future of the Bega River System. Issues include river corridors, water use, the estuary and local management structures.

In terms of the BRE, most concerns arise in relation to sedimentation, entrance conditions, continued development, sewage/pollution, wetlands and water quality. Due to these issues, the Commission has recommended that the development of an Estuary Management Plan and preparation by the council of an Integrated Planning Strategy and an estuary sewage plan. Other more detailed recommendations flow from these, to ensure adequate wastewater (sewage) management, direct development to the most suitable areas, reduce the impacts of development on river health and to address specific development proposals.

Community views concerning a number of themes appropriate to the Bega River System are also presented. Themes include catchment management, management of sedimentation and erosion, river corridor management, water availability, water quality, estuary management, aquatic plants and animals, planning and development, and responsibility for improving river health. Comments concerning estuary management noted that the current estuary condition is good, however, sedimentation, entrance conditions and pollution were of concern. Few submissions exhibited confidence in the current management of the estuary.

Four developments have been identified as having potential impacts on future estuary health. These include the Tathra River Estate, the Tathra sewage treatment plant (STP), on-site sewerage systems and the Tathra Country Club golf course.

The inquiry also makes recommendations regarding estuary management. These include the production and implementation of an estuary management plan as well as

controls on further development in the estuary area until adequate sewage treatment is in place and only with certain conditions and principles.

4. NSW Department of Land and Water Conservation (1998) *Riverine Habitat Assessment of the Bega River System*, Sydney South Coast Region, Wollongong.

Although this report is concerned exclusively with the non-tidal reaches of the river, it still presents an extremely comprehensive study of the present condition of the Bega River Catchment. Using the Riverine Habitat Audit Procedures (RHAP) developed by Dr John Anderson, an overview of the riverine habitat condition throughout the catchment can be gathered. These results can then be compared with future surveys using the method to assess the trends in the changing condition of the area. The entire catchment was assessed in terms of the reach environs, channel habitat, bank condition, bed and bar condition, riparian and aquatic vegetation, aquatic habitat and scenic, recreation and conservation values.

This study found that habitat condition varied within and between sub-catchments. It was found that there were relatively pristine upland areas, midstream sections in relatively good condition, midstream sections with degraded reach environs and/or affected by siltation, and heavily degraded lowland sections. This study also assessed the condition of individual sub-catchments.

5. Green, Dayle (1999) *A Survey of Wetlands in the Bega Valley*. Department of Land and Water Conservation. Sydney South Coast Region. November 1999. Copy held by DIPNR.
6. Healthy Rivers Commission of NSW (1999) *Bega River Expert Panel Report*. Sydney, Australia. Copy held by DIPNR.
7. Sinclair Knight Mertz Pty Ltd (1997) *Tathra Sewerage Augmentation. Environmental Impact Statement*. Prepared for Bega Valley Shire Council and The Department of Land and Water Conservation. p4-10.