

Case Study: 1. The Clarence River Catchment

The NSW coastline is a great natural asset, making an enormous contribution to the economy. The resources of coastal catchments such as the Clarence River Catchment, especially their estuaries and floodplains, collectively support around 90% of the NSW population.

Human activities are placing unprecedented pressure on these coastal resources. There are conflicts over the competing needs of urban development, business, tourism, recreation and conservation.

The coast must be managed effectively to ensure sustainability of these resources. A healthy coast is particularly significant to, tourism, agriculture, aquaculture, recreational and commercial fisheries as well as biodiversity.

Important Features of the Clarence River Catchment

The Clarence River is the largest of all NSW coastal rivers in both catchment area and river discharge. The 250km long river, located on the far north coast of NSW, has a catchment area of approximately 22,400 square kilometres.

The Clarence River Catchment is defined by the following divides:

- the Macpherson Ranges (North);
- the Baldblair and Doughboy Ranges and the Dorrigo Plateau (South); and
- the Great Dividing Range (West).

A large proportion of the Clarence River Catchment is National Park (20%) and State Forest (30%). These protected areas have helped to reduce human impacts on the River.

The Clarence **floodplain** consists of low lying, flat alluvial plains, intersected by lagoons, channels and creeks. The 800 square kilometre floodplain supports the largest commercial fishing region in the State as well as significant sugar cane, timber and beef cattle industries. There is a growing tourist industry focused around water activities such as recreational fishing, swimming, boating and surfing.

The mouth of the river is located between the towns of Yamba and Iluka, with the tidal limit (estuary) reaching 108 km inland to Copmanhurst. The towns of Grafton, Maclean, Yamba and Iluka are the main centres of population along the estuary.

In the **upper catchment** activities such as forestry, farming, water extraction, mining, septic sewage treatment and infrastructure development have an impact on water quantity and quality downstream.

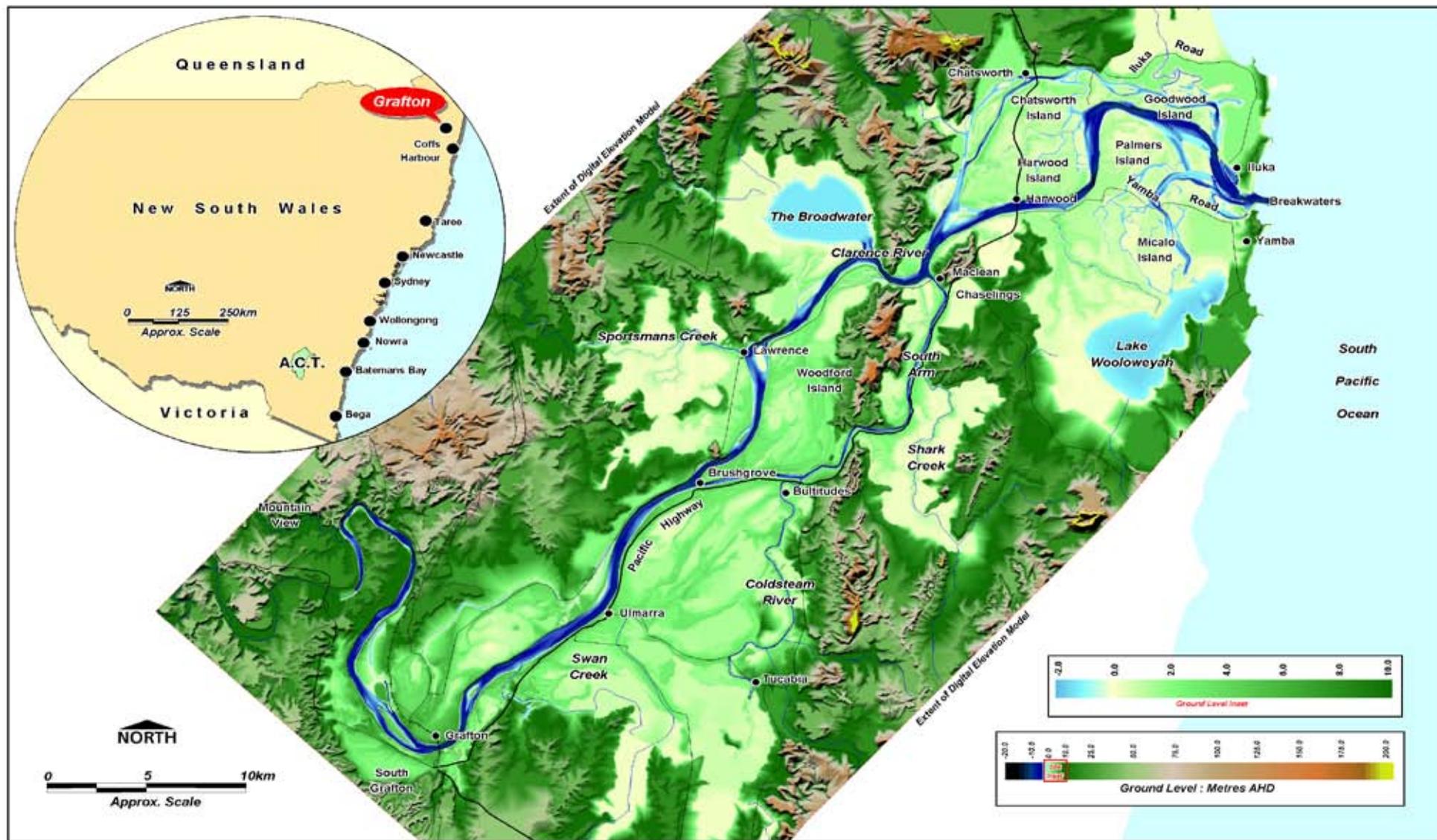
Within the **lower catchment** the loss of wetlands and riparian vegetation, flood mitigation and drainage works, dredging, pollution and associated eutrophication, urban development, commercial and recreational fishing, waste disposal and the exposure of acid sulfate soils have impacted on water quality, estuarine ecosystems and resources.



The Clarence River Estuary, courtesy of DECC



Clarence River floodplain, courtesy of DECC



Locality Map and Study Area

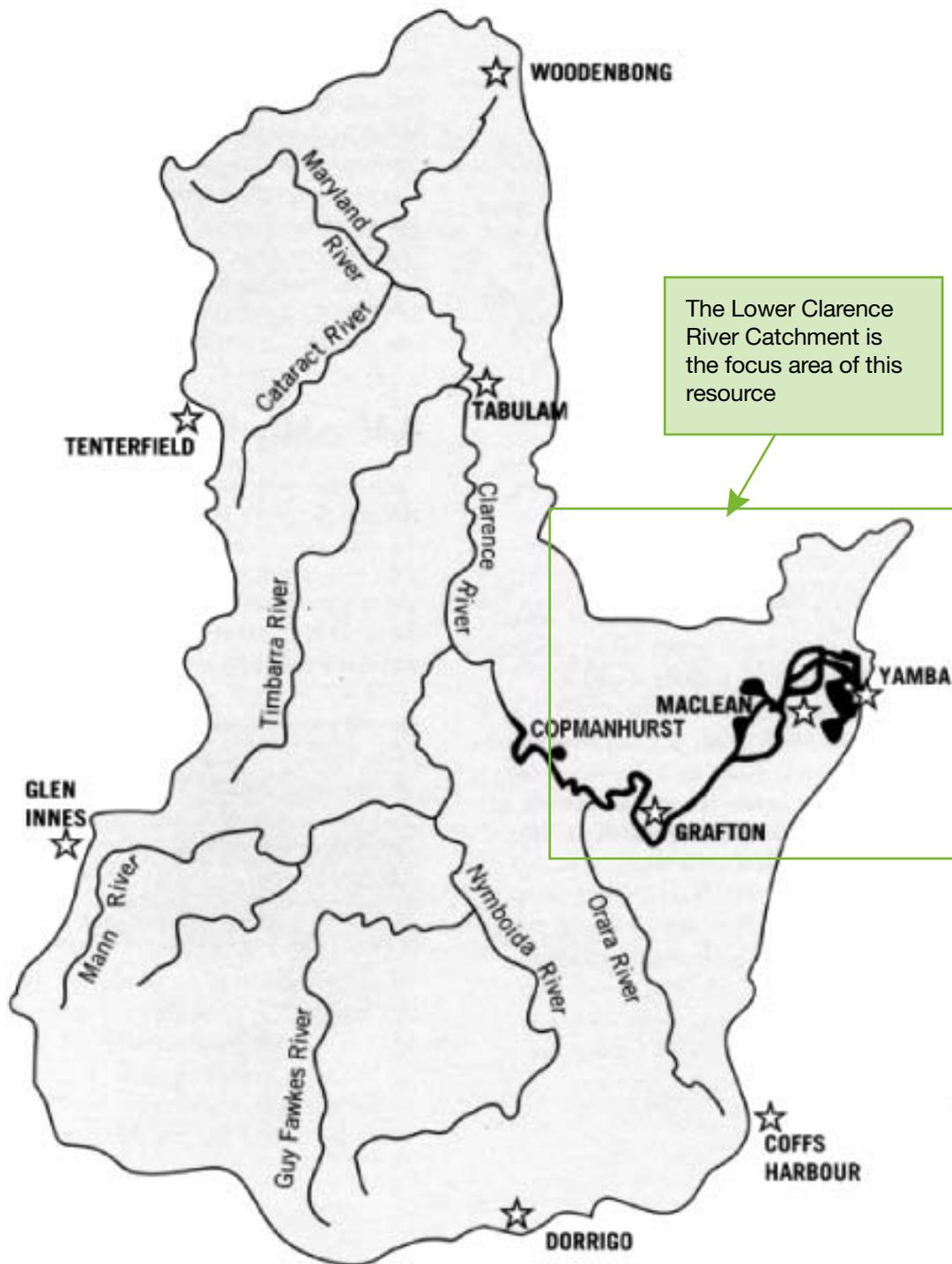
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This diagram shows the extent of the Lower Clarence River Catchment, including the estuary, wetlands and floodplain, source: Clarence Valley Council

Figure 1.1: Clarence River Catchment



The Clarence River Catchment and Lower Clarence River Catchment, source: modified from "Independent Inquiry Into The Clarence River System" Final Report November 1999, Healthy Rivers Commission of New South Wales NSW

Snapshot on Important Aquatic Habitats of the Lower Clarence River

The Clarence Estuary has a wealth of aquatic habitats that support many species of fish (e.g. mullet, flathead and bream) as well as crustaceans and also supports the most productive estuarine wild catch fishery in the State. It features:

- the 2nd largest area of seagrass (0.826 square km of *Zostera* and *Halophila*, excluding *Ruppia* which is sometimes classified as seagrass as well);
- the 4th largest area of mangroves (7.653 square kilometres); and
- the 8th largest area of saltmarsh (2.91 square kilometres).

Mangrove and saltmarsh are also significant habitats for waterbirds, many of which are threatened.

These areas have been mapped by NSW Department of Primary Industries as part of the NSW Comprehensive Coastal Assessment. See below:

<http://www.naturalresources.nsw.gov.au/estuaries/inventory/data/vegetation/clarence.shtml>

The Lower Clarence Catchment also features saltwater wetlands (in the estuary) and freshwater wetlands (just above the estuary). These include:

- **Wooloweyah Lagoon** – covers an area of 2390 ha and supports large areas of seagrass, mangroves and saltmarsh. It is an important habitat for many species of migratory waders and commercial fish species.
- **The Broadwater** – a large tidal waterbody of the Clarence estuary fringed by mangroves and supporting seagrass and saltmarsh communities. It provides a drought refuge for migratory species and is an important habitat for many commercial fish species.
- **Everlasting Swamp** – a freshwater wetland with vegetation including Swamp Oak, Spike-rush, Water Couch, Common Reed and Spiny Mudgrass.

However, many of these habitats have experienced decline in recent years, with seagrass declining by 80% between 1940 and 1986 and by 50% in the last 20 years. This has serious consequences for marine biodiversity, the viability of the fishing industry and for the community in terms of reduced availability of fresh local wild caught seafood in the region.

This has largely been caused by agricultural, industrial and urban development through land clearing (particularly removal of vegetation from riverbanks), nutrient and sediment rich runoff from developed land, dredging, land reclamation and flood mitigation works.

Thus it is important to understand that all activities within a catchment cumulatively impact on land and water resources downstream, particularly on aquatic habitats including saltmarsh, seagrass, mangroves and the fisheries they support and thus must be managed to minimise such negative impacts that result in declines in these habitats (see facts sheets on *Estuaries and Land and Water Management in the Lower Clarence River Catchment*).



Mangroves in the Clarence River Estuary, source: Clarence Valley Council



Mangroves and saltmarsh on Wooloweyah Lagoon, source: Clarence Valley Council

What Are Some of the Natural Resource Management Issues of the Lower Clarence River Catchment?

Some of these issues include:

- managing floodplain activities that impact on water quality in the estuary;
- maintaining riparian and estuarine wetland ecosystems necessary to support the professional and recreational fishing industries;
- minimising the impacts of floods on local towns and agricultural productivity without interrupting water supply;
- ensuring sustainable fishing practices;
- minimising waste created by different land and water uses;
- management of coastal landforms and marine environments; and
- sustainable urban growth.



Fishing boat on the Clarence River, source: Debra Novak

These issues are being addressed by legislation, policy and a variety of management plans and strategies such as Coastal Management Plans (NSW DECC), Catchment Action Plans (CMAs), Regional Growth Strategies (NSW Department of Planning) and Regional Biodiversity Conservation Plans (NSW DECC) and by encouraging many other sustainable practices by everyone operating within the catchment. See fact sheets on *Land and Water Management Issues in the Lower Clarence River Catchment*, *The Lower Clarence River Catchment Fishing Industry* and *Waste Management in the Lower Clarence River Catchment*.