Ecohealth &

An aquatic | Nambucca River and Deep Creek ecosystem check for the CATCHMENT REPORT CARD 2018

About Ecohealth

Ecohealth is an aquatic ecosystem monitoring program that measures the health of our rivers and estuaries for the plants and animals that live in them.

Ecohealth reports on the condition of key environmental indicators including water quality, riparian (riverbank) vegetation, geomorphology (channel shape), estuarine zooplankton, and freshwater macroinvertebrate (waterbug) and fish communities.

This information enables natural resource managers to determine where our rivers are under stress and where to invest in environmental management activities. It also helps Councils and State Government agencies to meet local and state monitoring, evaluation and reporting requirements.

Ecohealth does not comprehensively assess human health issues in catchments such as drinking water quality, if it's safe for swimming, heavy metal contamination, disease, viruses or our ability to harvest shellfish or fish.

What we found

A total of 31 sites in 14 waterways was used to calculate an overall moderate condition of C- for the Nambucca and Deep Creek catchments (see map below).

Geomorphic condition was moderate in the Catchment, with most (76%) stream channels in good or moderate condition. However, Missabotti Creek and South Creek had more than 50% of their stream channels in poor condition. These subcatchments have experienced significant clearing of catchment vegetation and riparian vegetation was cleared in the reaches with poor geomorphic condition. This highlights the importance of maintaining healthy native vegetation to promote bank stability.

Riparian condition was moderate in the Catchment. Warrell and Deep Creeks had good riparian condition, although

What action is happening?

Nambucca Shire Council is involved with riparian improvement works throughout the Nambucca and Deep Creek Catchments. Current projects include:

- Removal of Camphor Laurel and revegetation of native species near Bowraville Town Centre on South Creek.
- Monitoring and management of Gumma Wetland.
- Bank stabilisation works, weed control and riparian improvement with landholders in the Connecting Coastal Habitats Mt Yarrahapinni to Warrell Creek project.
- Improving urban stormwater management, e.g. in Dawkins Park, Macksville.
- Annual budget allocation to the Public Reserve Restoration and Rehabilitation program, e.g. riparian improvement on Deep Creek





Ecohealth indicators

Scientists and natural resource managers use the health of particular components of an ecosystem to indicate if there are stresses to the habitat as a whole. The Ecohealth team has ensured that the selection of indicators used in the Ecohealth program have been subject to a scientific review

process. The Nambucca Ecohealth program comprised five indicators:

Water Quality provides an understanding of how changes in land use practices within the catchment are affecting the health of our rivers and estuaries. Ecohealth measures oxygen level, salinity, acidity, murkiness (turbidity) and nutrients in our waterways.

Riparian vegetation is important for maintaining good water quality, stabilising riverbanks and providing habitat for animals including macroinvertebrates and fish. Ecohealth looks at the occurrence of weeds, structure of riparian vegetation, habitat (e.g. fallen logs) and current management (e.g. fencing).

Geomorphic condition assesses bank condition (e.g. slope, bank failure, exposed tree roots and undercutting), bed condition (e.g. active erosion, smothering of the bed substrate by high loads of fine sediment), and trampling by stock.

Macroinvertebrates are waterbugs such as worms, beetles, mayflies and shrimps that are sensitive to changes in aquatic habitat, pollution and poor water quality. Ecohealth looks at the types of waterbugs occurring at different freshwater sites in our rivers. Waterbugs are not assessed in estuaries.

Fish provide a longer-term measure of river condition as they are highly mobile, require good habitat to breed, are long-lived and occur at the top of



disturbance intensified in the freshwater reaches. Similarly, the freshwater reaches of Taylors Arm and North Arm (Nambucca River) were more disturbed than the estuarine reaches. The main stressors to riparian condition were the prevalence of invasive weeds, clearing of riparian vegetation and livestock.

Water quality was poor across the Catchment, with a grade of D. Water quality was lowest in Newee Creek overall and Taylors Arm estuaries. Low concentrations of dissolved oxygen were frequent and likely due to below average streamflow during the study period (see climate conditions in map panel below). Many sites consistently exceeded nutrient guideline values, especially nitrogen, and reducing non-point source inputs of nitrogen in most subcatchments would significantly improve water quality in the Nambucca Catchment.

Aquatic macroinvertebrate condition was poor (D+) in the Nambucca Catchment. Thumb Creek and upper Buckrabendinni Creek had the greatest diversity and included species that require good water quality. Tom Maras Creek had poor abundance and only species that can withstand pollutants.

Freshwater fish communities were in good condition, particularly in North Arm, Taylors Arm, Missabotti Creek and upper South Creek. The freshwater reach of Warrell Creek had a moderate fish community, the lowest recorded for the Catchment.





at the Valla Beach footbridge.

- Annual budget allocation to riverbank stabilisation, including riparian fencing to exclude stock, revegetation of native riparian species and creation of fish habitat.
- Collaboration with Conservation Volunteers Australia for rehabilitation works in wetlands and Endangered Ecological Communities such as saltmarsh.
- Collaboration with Nambucca Valley Landcare, NSW Office of Environment and Heritage, NSW DPI (Fisheries), North Coast Local Land Services, NSW Roads and Maritime Services and numerous landholders to deliver environmental rehabilitation projects.

How can you be involved?

- Control and manage stock access to streams by fencing riparian areas and providing off-stream stock watering points and shade access.
- Reduce nutrient and pollutant runoff into streams (e.g. fertilisers, chemicals or cleaning products).
- Conserve and maintain well-vegetated riparian areas, particularly deep-rooted native species that help stabilise streambanks.
- Revegetate streambanks that have been cleared or depleted of riparian vegetation using a range of suitable local native plant species.
- Leave woody debris and natural rock formations in waterbodies.

Bank stabilisation works in Nambucca River estuary

- Identify and manage weeds appropriately. Council or North Coast Local Land Services can help you with this.



Reduce water consumption.







the food chain. Ecohealth samples the type and number of freshwater fish occurring in our rivers.



Ecohealth scoring and grading

Information about each of the indicators was collected from 31 sites across the Nambucca and Deep Creek catchments over the course of 12 months. This was used to calculate scores for each indicator at each site, based on how often the measured values satisfied regional and national guidelines for healthy rivers and estuaries. The condition scores were then given a corresponding grade (see below).



This scoring and grading system is based on the traditional format of a school report card, with ratings ranging from a high of 'A', through intermediate ratings of 'B', 'C' and 'D', to the lowest possible score of an 'F'. Secondary grades of + and - are included to provide greater resolution within a grade, and to help show improvements over time.

Riparian revegetation at Valla Beach footbridge



- Please don't litter take all rubbish with you.
- Report any rubbish dumping to Council dumping garden waste is a main cause in the spread of weeds.
- Keep to designated paths in recreation areas to minimise soil erosion and compaction and to avoid trampling native vegetation.

Project partners

This project was funded by Nambucca Shire Council and NSW Office of Environment and Heritage through the OEH Estuary Management Program. NSW DPI Fisheries assessed freshwater fish communities funded through the North Coast Local Land Services.



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76 - 90	В	Good
61 - 75	С	Fair
46 - 60	D	Poor
0 - 45	F	Very Poor

Interpreting the results

The diagram to the right shows the Ecohealth grading system, where a grade is given for water quality, riparian condition, geomorphic condition, aquatic macroinvertebrates and freshwater fish. Based on the average of these grades, an overall grade is awarded to the site. Overall grades are then also awarded for each river system, subcatchment, and for all freshwater and estuarine sites.

