Richmond Catchment REPORT CARD 2014

About Ecohealth

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

Ecohealth looks at key environmental indicators including water quality, riparian (riverbank) vegetation, geomorphic (channel) condition and macroinvertebrates (waterbugs), and reports on their condition.

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 meet local and state monitoring, evaluation and reporting requirements.

Ecohealth does not attempt to report on human environmental health issues in the rivers such as drinking water quality, if it's safe for swimming, heavy metal contamination, disease, bacteria, viruses or our ability to harvest shellfish or fish.

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.

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 and 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.

Ecohealth scoring and grading

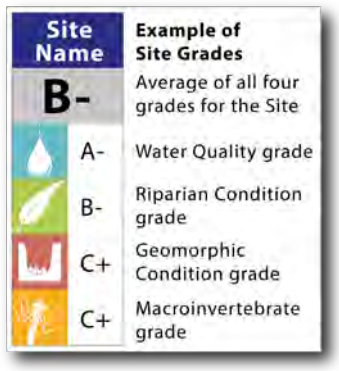
Information about each of the indicators was collected from 48 sites across the Richmond catchment over the course of 12 months. These were used to calculate scores for each indicator at each site, based on how often the measured values satisfied regional and national guidelines for healthy rivers. The 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.

Condition Score	Grade	Result
91-100	A	Excellent
76-90	B	Good
61-75	C	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 and aquatic macroinvertebrates. 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.



Further information

To access the 2014 Richmond Ecohealth Technical Report and other information about the results of this report card, go to www.rrcc.nsw.gov.au/environmental-management/water-quality-monitoring/

For more information about the Ecohealth program go to www.aerlab.com.au and click on Coastal Projects.

To see the improvements happening in your local area, go to the environment section on your local council's website.

Project partners

What action is happening?

In partnership with local landholders, state agencies and funding bodies, the local councils of the Richmond catchment are working to ensure that information on catchment condition is readily available and restoration works are targeted to key sites and issues.

Richmond Valley Council, Richmond River County Council, Kyogle Council, Lismore City Council and Ballina Shire Council all work together to manage the natural resources for local communities and industries. Office of Environment and Heritage (OEH) and National Parks and Wildlife Service (NPWS) provide technical and financial assistance to local councils through the NSW Estuary Program to improve the health of NSW estuaries. North Coast Local Land Services supports the implementation of projects by councils and other agencies to achieve best practice natural resource management and sustainable agriculture in the Richmond catchment.

The management of natural resources on the Richmond coastal floodplain is a complex arrangement of programs, organisations and funding covering issues such as drainage, acid sulfate soils, floodgate management, water quality monitoring, and estuary and wetlands management.

The Richmond Estuary Coastal Zone Management Plan (CZMP) provides a blueprint for the long-term sustainable management of the estuary. A management focus on the estuary and floodplain has resulted in the formation of the Richmond River Coastal Zone Management Reference Group to coordinate natural resource management activities and projects on the floodplain in partnership with councils, state government and the community.

What we found

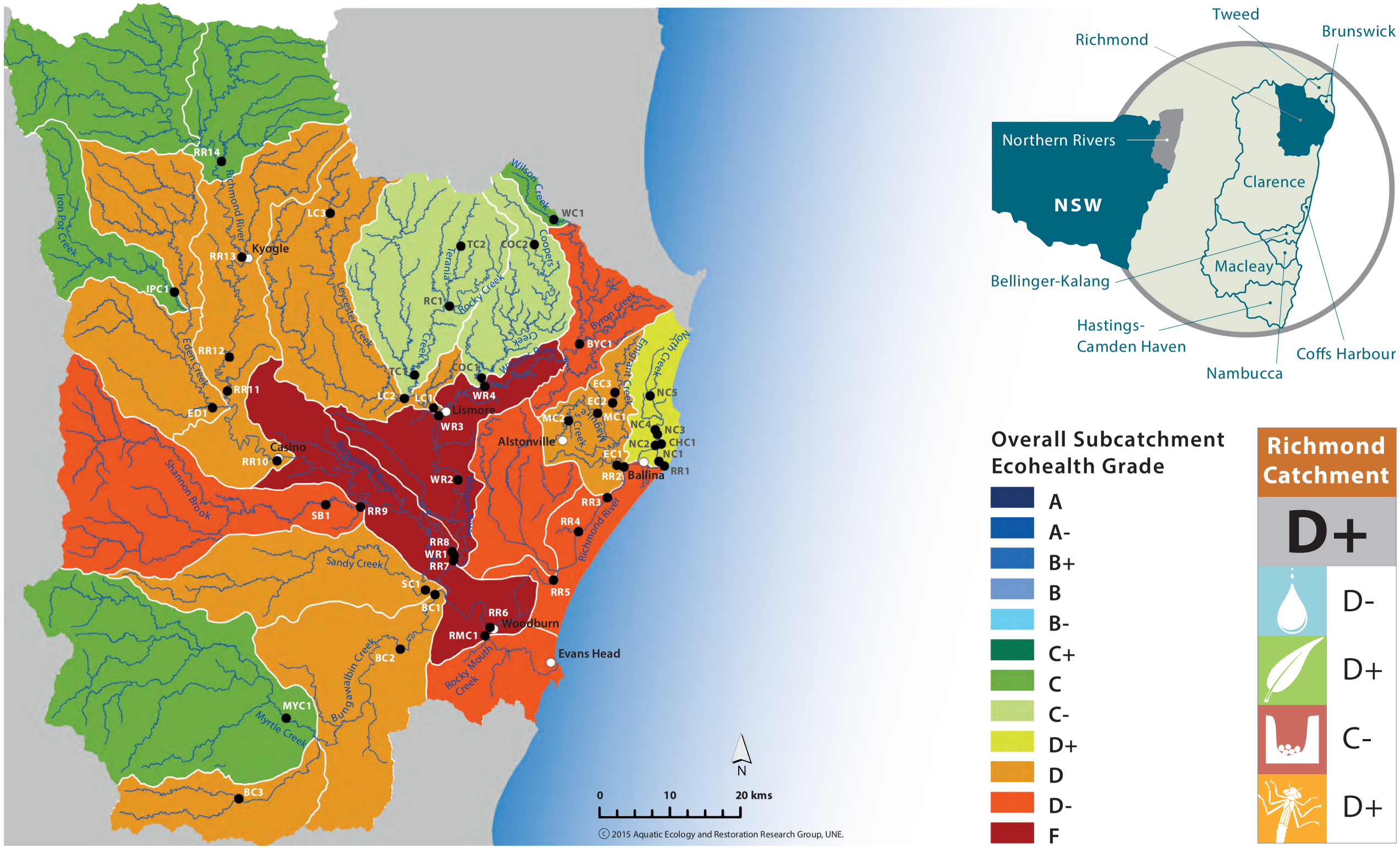
A Total of 48 sites in 17 waterways were used to calculate an overall condition of D+ for the Richmond catchment (see overleaf). This grade is consistent throughout the Richmond catchment with 12 of the 17 waterways recording a grade of D or lower. The upper freshwater reaches had better water quality, aquatic macroinvertebrates and geomorphic condition than the lower freshwater reaches, but no better riparian condition. The upper estuary (upstream of Woodburn) was consistently in the poorest condition, with very high nutrient concentrations, turbidity and algal biomass. Scores were consistent among indicators within each waterway, highlighting that water quality and physical habitat are driving the condition of streams.

Concentrations of all nutrients exceeded guideline values consistently across all sites leading to very low scores, with 9 waterways receiving an F grade. Low dissolved oxygen concentrations, low pH and high chlorophyll a (algal biomass) and nutrient concentrations were a feature of estuarine reaches, and recorded levels that would affect the health and distribution of aquatic animals. The clear pattern of deteriorating water quality with distance downstream highlights the need to improve riparian and bank condition throughout the catchment as a management priority.

Macroinvertebrate scores were low throughout the catchment with 10 of the 17 river systems receiving a grade of D or lower. The number of macroinvertebrate families found ranged from a very low 5 in the lower Terania and Bungawalbin Creeks to a very high 30 families recorded in the upper Terania and Iron Pot Creeks. The poor macroinvertebrate grades reflect poor water quality and habitat conditions, particularly the erosion of river channels and smothering of habitat with fine sediment.

Riparian condition scores were poor throughout all regions of the Richmond River catchment, with 10 of the 17 river systems recording a grade of D or lower. The main stressors to riparian condition are from invasive weeds, disturbances from floodplain clearing and agriculture, and access from livestock. Strongly linked to riparian condition was the state of the riverbanks with severe bank slumping, high bank slopes and exposed tree roots in many of the streams in the Richmond catchment.

IPC1	ED1	SB1	RR14	RR13	RR12	RR11	RR10	RR9	RR8	RR7	RR6	RR5	RR4	RR3	RR2	RR1	RMC1	NC5	NC4	NC3	NC2	NC1	CHC1
C-	D-	C-	C-	D-	D-	C-	D+	F	F	F	F	D-	D	D	D+	C	D-	D-	C-	C-	C	D+	D+
D+	D-	D+	D+	D	D-	D	D-	F	F	F	F	F	F	F	D	C-	F	F	D-	D-	C-	C-	F
C	D+	C-	D	F	F	C+	C-	F	F	F	F	F	F	D-	D	D-	F	D-	C-	C-	B-	C-	D
D	D-	C+	D+	C-	D	C	B-	C	F	F	F	C	C+	C+	C+	C+	C+	C	B-	B-	B-	B-	B-
C	F	D+	B-	F	F	D+	D-	C-	F	D+	C+	C	C+	C+	C+	C+	C+	C	B-	B-	B-	B-	B-



Overall Subcatchment Ecohealth Grade

- A
- A-
- B+
- B
- B-
- C+
- C
- C-
- D+
- D
- D-
- F

Richmond Catchment
D+
D-
D+
C-
D+

WC1	BYC1	WR4	WR3	WR2	WR1	COC2	COC1	TC2	RC1	TC1	LC3	LC2	LC1	MC2	MC1	EC3	EC2	EC1	SC1	MYC1	BC3	BC2	BC1
C+	D-	D	F	F	F	C+	D+	B	B-	F	C	F	D-	C	D+	C+	D-	D	D	C	D	D-	F
C-	D-	F	F	F	F	C-	D	C	C	D	D	D	F	C-	D	C+	F	D-	F	D+	D-	D	F
B-	F	C	F	F	F	B	D+	B+	C+	F	D-	D-	D-	F	F	D+	F	F	F	B-	C	C-	D
B-	D+	D	C+	C-	F	B-	D+	B-	B-	D+	C	D+	C+	B-	C	C+	C+	C	C+	C+	C-	C-	C-
C	D-	D	F	F	D-	C	D+	B+	B	F	B-	F	C+	C	C	C	D-	C	D-	D+	D-	D-	F

What can you do?

- Conserve and maintain well-vegetated riparian (riverbank) areas, particularly deep-rooted native species that help stabilise streambanks.
- Revegetate streambanks that have been cleared or depleted of vegetation using a range of suitable, local native plant species.
- Identify and manage weeds appropriately.
- Leave woody debris and natural rock formations in waterbodies.
- Reduce nutrient and pollutant runoff into streams (e.g. fertilisers, chemicals or cleaning products).
- Control and manage stock access to streams by fencing riparian areas and providing off-stream stock watering points and shade areas.
- Reduce soil erosion and sedimentation of streams by retaining groundcover and vegetation buffers (e.g. through rotational grazing, stubble retention and head-row buffers).
- Obtain advice and necessary approvals from local or state governments before undertaking any infrastructure works near or in streams (e.g. modifying a stream crossing).
- Reduce water consumption.

Riparian revegetation. Photo © NSW Department of Primary Industries.

une University of New England
Aquatic Ecology and Restoration RESEARCH GROUP