MURRAY-DARLING BASIN COMMISSION

FACT SHEET:

SUSTAINABLE RIVERS AUDIT - REPORT 1, MAY 2008

The Sustainable Rivers Audit (SRA) is an initiative of the Murray–Darling Basin Commission, supported by the governments of the five Basin states and territory and the Australian Government.

Its first report, released in June 2008, presents "report cards" on river ecosystem health for each of the 23 valleys in the Basin. The reports are based on observations of fish, macroinvertebrates and hydrology from 2004 to 2007.

The audit is overseen and the report written by an independent group of river ecologists, the Independent Sustainable Rivers Audit Group (ISRAG). The group comprises Dr Peter Davies (Chairman), Dr John Harris, Dr Terry Hillman, Associate Professor Keith Walker.

This fact sheet presents the main findings from SRA Report 1: A Report on the Ecological Health of Rivers in the Murray–Darling Basin, 2004–2007. It also outlines the nature of the Audit and the ways that environmental data is used to assess ecosystem health.

How the audit works

The audit gathers quantitative information on environmental indicators in valleys throughout the Basin. The indicators provide 'windows' on particular components of the river ecosystems, and are grouped in the following themes:

- fish;
- macroinvertebrates; and
- hydrology.

Two more themes, vegetation and physical form, will be added to the next report, due in 2011.

Future reports will also describe trends, showing how river ecosystem health changes from one Audit to the next, and over longer periods of time.

The data is gathered systematically using agreed protocols, with quality assurance.

Within each Valley there are one to four zones, defined in most cases by altitude. Sampling sites are located randomly within zones, to enable unbiased statistical analyses and representative reporting.

The indicators are combined to form quantitative measures of 'condition' for each theme, and theme condition ratings are combined to assess ecosystem health.

Condition assessments for each valley are related to a benchmark called 'reference condition'. This estimates the status of a component (for example, the fish community) as it would be if there had not been any significant human intervention in the landscape.

Reference condition is a benchmark representing the river ecosystem in good health, but is not a target for management.

Condition is rated on a five-point scale from good to moderate, poor, very poor to extremely poor, depending on how different the theme components are from their respective benchmarks. The same scale is applied to ecosystem health.

MAIN FINDINGS OF THE AUDIT

While the continuing record drought limited the availability of sampling sites in some valleys, it is too soon to say how much the drought has affected fish and macroinvertebrate communities.

Assessments of condition and ecosystem health for each of the 23 Valleys in the Basin are shown in the table below.

Rank	Valley	Ecosystem	Fish	Macro-invertebrates	Hydrology
1	Paroo	Good	Moderate	Moderate	Good
2	Border Rivers	Moderate	Moderate	Moderate	Moderate to Good
2	Condamine	Moderate	Moderate	Poor	Moderate to Good
3	Namoi	Poor	Poor	Poor	Good
3	Ovens	Poor	Poor	Poor	Good
3	Warrego	Poor	Poor	Poor	Good
4	Gwydir	Poor	Poor	Poor	Moderate to Good
5	Darling	Poor	Poor	Poor	Poor
5	Murray, Lower	Poor	Poor	Poor	Poor
5	Murray, Central	Poor	Poor	Poor	Moderate
6	Murray, Upper	Very Poor	Extremely Poor	Moderate	Moderate to Good
6	Wimmera	Very Poor	Poor	Very Poor	Poor
7	Avoca	Very Poor	Poor	Very Poor	Moderate to Good
7	Broken	Very Poor	Very Poor	Poor	Moderate to Good
7	Macquarie	Very Poor	Very Poor	Poor	Moderate to Good
8	Campaspe	Very Poor	Extremely Poor	Poor	Moderate
8	Castlereagh	Very Poor	Extremely Poor	Poor	Good
8	Kiewa	Very Poor	Very Poor	Poor	Good
8	Lachlan	Very Poor	Extremely Poor	Poor	Moderate to Good
8	Loddon	Very Poor	Extremely Poor	Poor	Moderate
8	Mitta Mitta	Very Poor	Extremely Poor	Poor	Good
9	Goulburn	Very Poor	Extremely Poor	Poor	Poor
9	Murrumbidgee	Very Poor	Extremely Poor	Poor	Poor to Moderate

CONDITION OF FISH

Fish sampling at 487 sites yielded more than 60,600 individuals in 38 species, weighing more than 4 tonnes.

Twenty eight of these were native, many of them small species, contributing 57% of individuals but only 32% of biomass. All fish were returned to the water after measurement (except for pest species in some States).

Fish communities in the Paroo, Condamine and Border Rivers Valleys were in moderate condition, those in eight other Valleys were in extremely poor condition.

Those in the remaining Valleys were in poor or very poor condition. Communities in the northern Basin generally were in better condition than those in the southern Basin.

Native fish numbers dominated in the Lower and Central Murray, Paroo and Warrego Valleys, and by biomass in the Paroo (78%), Darling (62%) and Borders River Valleys (60%).

Golden perch were recorded in 21 of 23 Valleys, and murray cod, freshwater catfish and silver perch were in 16, 7 and 5 valleys, respectively.

Alien species rivalled or outnumbered native fish in nine of the 23 valleys, especially the Campaspe, Gwydir, Macquarie and Murrumbidgee valleys. Three alien species, carp, eastern gambusia and goldfish, were present in all rivers, and redfin perch, brown trout and rainbow trout were also widespread.

Carp were overwhelmingly dominant, being 87% of alien fish biomass and 58% of total fish biomass. In other words, carp accounted for nearly six of every 10 kilograms of fish in the Basin.

Native species were found in only 43% of valley zones where they were predicted to occur under benchmark conditions.

The Darling Valley had the highest biomass of alien and native fish (16.8 kg/site), and the highest biomass of native species (10 kg/site). The Central Murray Valley was next most productive. The Paroo Valley was least productive, yielding 0.75 kg/site of alien and native biomass, although 78% of this was native fish.

MACROINVERTEBRATES

Macroinvertebrate samples taken from 773 sites included more than 209,100 specimens of macroinvertebrates (invertebrates visible to the naked eye) in 124 families.

They include leeches and worms, shrimps, snails, beetles, bugs and the young stages of dragonflies, midges and other insects.

Two indicators based on the presence of families and the composition of communities (but not on estimates of abundance), were combined as the Sustainable Rivers Macroinvertebrate Index.

Macroinvertebrate communities in the Border Rivers, Upper Murray and Paroo Valleys were in moderate condition, and those in the Avoca and Wimmera Valleys were in very poor condition. The remaining valleys were in poor condition.

Twenty three families were recorded in all 23 valleys. A number of families were rare, including 14 that were recorded at only one site each. The common families include many species tolerant to pollution and other human disturbances, and the rare ones contain sensitive species.

In general, the communities of valleys in the northern Basin were in better condition than those in the southern Basin. In addition, upland zone communities generally were in better condition than those in lowland Zones

HYDROLOGICAL CONDITION OF VALLEYS

Data was collected and analysed for 468 sites. For each site, five indicator values were calculated, representing changes in the flow regime due to human intervention.

One third of all Valleys were rated to be in good hydrological condition, and another third were in moderate to good condition. Many of the sites in poor condition were in the lowland zones of the major rivers.

The reference condition for hydrology (the benchmark) was designed to include wet and dry periods. Condition assessments therefore, reflect the overall effects of the current level of development and water use within the Basin on the historical flow regime rather than that of the recent drought.

ECOSYSTEM HEALTH

Of the 23 valley studied, only the Paroo Valley was rated to be in good health.

The Border Rivers and Condamine Valleys were rated in moderate health. Seven other valleys were in poor health and 13 were in very poor health. No valley was rated in extremely poor health.

Of 62 zones in 23 valleys, two are in good health, eleven are in moderate health and the remaining 46 are in either poor health (19 zones) or very poor health (27 zones). Nine of 13 upland zones were in very poor or extremely poor health.

Valleys in the northern Basin generally were in better health than those in the south.

Two of nine northern valleys were rated in very poor health, compared to nine of 14 southern Valleys. The three valleys rated in moderate or good health were in the northern Basin.

PROGRESS AND PROSPECTS

The Sustainable Rivers Audit is developing into an effective tool for surveillance of the Basin's river ecosystems. Existing indicators and reference condition will be refined and future reports will describe trends in condition and health.

Sampling procedures in the fish and macroinvertebrate themes will be refined to improve consistency between agencies. Methods used for the hydrology theme will also be streamlined.

The scope of the audit will be expanded by the addition of themes for vegetation and physical form, including floodplain environments. Both are at an advanced stage of development and will be included in the next report.

The audit could also be expanded to include floodplain and terminal wetlands, including those declared as Wetlands of International Importance under the Ramsar Convention and icon sites in The Living Murray initiative.

FURTHER INFORMATION

A copy of the SRA Report 1: A Report on the Ecological Health of Rivers in the Murray–Darling Basin, 2004–2007 is available on ther MDBC website: www.mdbc.gov.au

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