1.3 What is River Health?

1.3.1 Ecological concepts

A river or waterway is defined as the channel, the riparian zone including floodplains and floodplain wetlands, and the estuary. River health can be defined as: ‘The ability of the aquatic ecosystem to support and maintain key ecological processes and a community of organisms with a species composition, diversity, and functional organisation as comparable as possible to that of undisturbed habitats within the region’ [Schofield and Davies 1996 after Karr and Dudley 1981:55-68].

An ecologically healthy river will have flow regimes, water quality and channel characteristics such that:

• in the river and riparian zone, the majority of plant and animal species are native and the presence of exotic species is not a significant threat to the ecological integrity of the system;
• natural ecosystem processes are maintained;
• major natural habitat features are represented and are maintained over time;
• native riparian vegetation communities exist sustainably for the majority of the river’s length;
• native fish and other fauna can move and migrate up and down the river;
• linkages between river and floodplain and associated wetlands are able to maintain ecological processes;
• natural linkages with the sea or terminal lakes are maintained; and
• associated estuaries and terminal lake systems are productive ecosystems (State of Victoria Department of Natural Resources and Environment, 2002:2).

Prawn and squid trawling on the Hawkesbury River is the second largest estuarine trawl industry in NSW

Glenbrook Creek entering the Nepean River above Penrith

Healthy saltmarsh on Berowra Creek
River health is impacted by human activity and associated impacts on flow, land use in the catchment and direct management in the channel. Many social and economic drivers of river management will involve moving the waterways away from an ecologically healthy state – either through loss of biodiversity or loss of river functioning. Rivers can be ecologically healthy without being pristine. In a highly modified catchment such as the Hawkesbury Nepean which supports essential economic and social activity, it is important to recognise the importance of these social and economic values of the river and that it is unrealistic to expect that rivers can be returned to a near natural state. However, strategies and programs for river health can aim to move waterways characteristics towards those of ecologically healthy rivers.

1.3.2 The vision for the rivers of the Hawkesbury Nepean

The vision of a healthy, productive and diverse catchment and river system, which recognises the need to balance environmental, economic and social values, includes:

- Clean, healthy surface and groundwater - suitable for continued productivity and for people to use and enjoy
- Diverse native plants and animals with productive and protective vegetation and soil in ecological balance
- The cultural heritage values within the catchment are acknowledged, respected, maintained and enhanced
- The beauty and natural processes of the catchment are protected while providing for social and economic needs
- Everyone is working together – individuals, community groups, business and government (NSW Department of Land and Water Conservation, 2003:10 and 2003a:13).
1.3.3 Managing for river health

The health of the Hawkesbury Nepean River is the responsibility of many organisations with individual charters and responsibilities. The complexity of the institutional arrangements for managing the river and its health has long been an issue for discussion.

New South Wales State Government

Natural resource management in the catchment is undertaken by a number of NSW State Government agencies and corporations. Examples of those that play a major role in river health include the Department of Natural Resources, the Department of Environment and Conservation, the Department of Primary Industries and the Department of Planning. Activities of these departments include, but are by no means limited to, management of: water licensing, rivers and foreshores, biodiversity and threatened species, water quality, fisheries and fish habitat and the impacts of urban development, industry and agriculture.

The complexity of management for river health is demonstrated by the example of water management which involves the Departments listed as well as others. The NSW Water Management Act 2000 focuses on improving the health of waterways through sustainable management of water resources and provision of water for the environment. The Hawkesbury Nepean River Management Forum made recommendations on these matters as they apply to the Hawkesbury Nepean catchment to the New South Wales Government in March 2004 (Department of Infrastructure, Planning and Natural Resources, 2004).

The 2006 Metropolitan Water Plan is the NSW Government’s plan to secure Sydney’s water needs in drought and for the future and contains a range of strategies and actions to balance supply and demand and to improve catchment and river health (Department of Infrastructure, Planning and Natural Resources, 2006).

The future water sharing plan for the Sydney Region being developed under the provisions of NSW Water Management Act 2000 will provide for the establishment and implementation of formal rules for protecting environmental water i.e. water that is required to meet fundamental ecosystem needs. The water sharing plan will also provide for the sharing of water between users.

The Sydney Catchment Authority is responsible for the management and protection of Sydney’s drinking water supply catchments, including assistance with upgrading sewage treatment plants in the upper catchment, and is the supplier of bulk water for metropolitan water needs. The Sustaining the Catchments Regional Plan, to be gazetted in 2006, will ensure that new development in the catchments of Sydney’s major drinking water reservoirs will not impact negatively on water quality in those reservoirs.

Sydney Water Corporation is responsible for the provision of drinking water to more than four million people in Sydney, Illawarra and the Blue Mountains and provision of wastewater services to the metropolitan region. This includes management of 18 major sewage treatment plants which discharge into the waterways of the Hawkesbury Nepean Catchment. Sydney Water is also responsible for water recycling and re-use programs.

Figure 3 shows the NSW Government Water Targets and the framework for achieving river health including target setting, development of plans and strategies and implementation.

State-wide targets form the basis of regional targets in Catchment Action Plans developed by Catchment Management Authorities and are set by the Natural Resources Commission (NSW Natural Resources Commission, 2005a). The State Water Management Outcomes Plan (Order made under the Water Management Act 2000 in December 2002) sets the over-arching policy context, targets and strategic outcomes for the management of the State’s water sources and promotes the objects of the Act and its water management principles for 5 years from its gazettal.
Figure 3. Diagrammatic representation of the relationship of the River Health Strategy to government water planning processes

What is river health?
**Australian Government**

To help address environmental and sustainable agriculture issues across Australia, the Australian Government and State and Territory Governments have united to fund and deliver the Natural Heritage Trust and the National Action Plan for Salinity and Water Quality.

The Australian Government has committed $12.9 million to the HNCMA during 2004-05 to 2006-07 to tackle its environmental and natural resource issues. These initiatives are based on partnerships and agreements with the New South Wales Government, which has matched the Australian Government investment through cash or in-kind support.

**Local Government**

Twenty one Councils across the catchment provide major local area and environmental management through a wide range of legislation, policy and programs including:

- Local environment planning and development control
- Implementation of the environment management provisions of the *Local Government Act 1993* and other key legislation
- Stormwater management
- Levying and expenditure of special rates and levies for stormwater and environmental works
- Management of significant areas of public reserves in riparian areas
- Development, promotion and support of community initiatives such as landcare and bushcare
- Environmental monitoring, such as water quality monitoring and environmental reporting in State of Environment Reports
- Environmental data collection such as vegetation mapping.

Some Councils in the catchment also have responsibility for provision of drinking water (e.g. Gosford Wyong Water Supply Authority) and for management of sewage treatment.
Community and non-government sector
There are extensive environmental ‘care’ activities being undertaken by individual landholders, community, landcare and bushcare groups and peak non-government associations in the catchment. There are over 100 landcare groups working on private lands, with at least as many bushcare groups working on public lands. Significant river health outcomes are achieved through activities that: manage erosion and reduce sediment and nutrient inputs to waterways, revegetate riparian lands to improve riverbank stability and habitat, and reduce stock and human damage to riverbanks. Community groups play a significant role in environmental monitoring through programs such as Streamwatch. Many community organisations, issue-specific lobby groups and regional or state-wide peak environmental associations play a powerful advocacy role for the protection and restoration of the environment.

Industry and private sector
Many private corporations in the catchment implement environmental management systems to meet legislated requirements and also to voluntarily provide for greater protection of the environment. Corporations also provide support for ‘care’ activities e.g. through funding and in-kind sponsorship, such as large scale staff planting days.

1.3.4 The role of the Hawkesbury Nepean Catchment Management Authority
The HNCMA has a charter to undertake on-ground actions to meet regionally interpreted state wide targets contained in the Hawkesbury Nepean Draft Catchment Action Plan. Two principles will guide the HNCMA in setting priorities and targets for the River Health in the Catchment Action Plan (HNCMA, 2005). These are:
• Management principles and benefits; and
• Investment principles.

The management principles include river health being protected by near intact biodiversity in the waterways and on the banks (riparian vegetation), protection of endangered species, fencing of remnant vegetation, catchment management, controlling aquatic and terrestrial weeds, and protecting the functioning of wetlands.

The investment principles include protection and enhancement of commercial and social activity, and protection of the outcomes of the investment in natural resource management that is undertaken through the HNCMA. Government frameworks for water management are essential for optimising the outcomes from this investment including policies and targets for improving water quality and for ensuring water for the environment. Investment in on-ground actions is underpinned by improvements in these larger issues.