



Grand River, Canada

## 5 | Emphasis on Long-term Sustainability

Achieving long-term sustainability of healthy river systems is a major challenge when we face increasing populations and pressures, but it is more difficult to plan for unexpected changes in the factors that influence river system health. A river may have been restored successfully, only to find that an unforeseen driver such as climate change, or cross-boundary issues deliver unexpected consequences that will threaten the restored river system. What steps can be put in place to reduce the threats of continuing growth and unforeseen events or circumstances on long-term sustainability of rivers? Dunlop (2006) stresses the need for long-term strategic planning in an uncertain world, and laments the absence of long-term environmental and production implications in traditional water management practices and policies. As Dunlop infers, what appears to be emerging in our times is a need to plan and prepare for increasing uncertainty around the drivers that impact upon river systems.

The Grand River Conservation Authority (GRCA) and the Tweed Shire Council (TSC) are two case studies that have implemented long-term planning and strategic approaches for the sustainable management of their rivers.

The Grand River Conservation Authority manages the Grand River Watershed in Ontario, Canada, and has in place a 50-year strategy for the sustainable management of the watershed's water resources. The Tweed Shire Council's management of the Tweed catchment in New South Wales, Australia, uses a similar approach. After addressing much of the degradation in the catchment due to agricultural misuse, they now focus on managing the watershed resources for the future. Both the GRCA and the TSC actively involve and empower the community in the management of their river systems. Community engagement and ownership is viewed as the key to effective long-term river restoration.



Tree planting at Bilambil, Tweed River Catchment

## Tweed River, New South Wales, Australia



In 1992 the Tweed River in sub-tropical eastern Australia faced poor agricultural and urban land use practices, reduced water quality for potable and recreational use, acid sulfate soils runoff, stream bank erosion and weed infestation. The Tweed Shire Council (TSC) responded and established a Tweed River Committee (TRC) to advise on river management issues, implement the Tweed River Management Plan and act as a coordinating and liaison body for all river-related issues.

As the Tweed Shire Council has responsibility for the entire Tweed Catchment, it needed to work with the community to achieve local action and wise decision making in the community catchment-wide. A specific intention was to reach a synergy between local government and the community so that both groups would work with the same planning objectives. This took much effort and persistence in education and awareness, but resulted in greater community resources being mobilised and quick progress in reaching their planned targets across the catchment.

Being a single local government responsible for the whole catchment is perhaps unique, but as the key stakeholder, this enabled the Tweed Shire Council to invest directly in the project and engage key resources, expertise or visionary individuals in the catchment. In taking a long-term strategic approach, the TRC with key community, industry and expert stakeholders, undertook an extensive planning process, which eventually brought the key players to a clear shared vision with well considered goals and well delineated targets for a series of priority programs.

Jane Lofthouse, Coordinator Tweed River Committee, stressed that this extent of forward planning was crucial. The great

advantage of long-term strategic thinking and careful target setting has been ‘a real sense of accomplishment when these goals are reached’. The success stories keep people committed and passionate about rehabilitation of their waterways: ‘Seeing trees grow and birds return to an area is a very satisfying feeling for everyone!’

Long-term planning, as opposed to short-term fixes, also resulted in a comprehensive range of water and river restoration and management projects, but they could not all be funded at once. Jane found that funding for rehabilitation projects was difficult to secure when governments and people were so focused on development of new resources. Yet, she said ‘it is really useful to have projects ready to go from “off the shelf” when short-term funding opportunities arise’.

In fostering close working relationships with the more visionary stakeholders as well as research organisations and universities, the Tweed Catchment became widely recognised as a source

River System	Tweed River, New South Wales, Australia
Length	70 km
Area	1,110 km <sup>2</sup>
Origin, Tributaries etc	Tweed River (South arm), Oxley River (Middle arm) and Rous River (North arm)
Population	80,000
Role of River System	<ul style="list-style-type: none"> <li>• Supports commercial fishing and farming</li> <li>• Supports tourism</li> <li>• Provides water supply and treated effluent discharge</li> </ul>
Riverprize	2001, 2003, 2005 National Thiess Riverprize Finalist

of leading research and practice in fields such as acid sulfate soil and coastal wetland hydrology. The knowledge generated in these studies was fed directly into management plans and on-ground initiatives for land use change, with outstanding improvements in land management practices by landholders plus reduced acid runoff.

Another unique feature of the Tweed Catchment is the foresight of the local government to take on a 'whole systems' approach in their long-term planning, which resulted in forward thinking and contemporary concepts such as 'integrated water cycle management' and 'water sensitive urban design' (integration of water cycle management into urban planning and design for sustainable use of water resources). New urban developments in the catchment now incorporate these designs into storm water and sewage.

### The Future

The Tweed Shire Council was a finalist of the National Thiess Riverprize in 2001, 2003 and 2005, which is significant acknowledgement of their total catchment management model and long-term sustainability and visionary approach.

Urban storm water remains one of their biggest concerns, and the principles of integrated water cycle management and water sensitive urban design are now prevalent in newly developed regions of the catchment. The TSC are also working very closely with the sugarcane industry to address acid sulfate soil issues and with the cattle farmers to initiate measures to prevent sediments and soil from the farmland entering the river.

The Council recognised and promoted the link between water supply, water use, and the health of the river. Now, greater community acknowledgement of this has paved the way for the Council's water and sewerage supply program to help fund other river health initiatives.



## Lessons learnt

The Tweed River Committee believes that their long-term and sustainable use approach helped them to think of many options that they otherwise would have missed, but in the process they discovered several key areas that should be given particular emphasis:

### Strategic Planning

Good strategic planning and a list of prioritised projects will ensure that rehabilitation works are focussed and undertaken with the purpose of creating powerful outcomes. This is worth particular attention because local government projects can often be reactive rather than proactive. It is important to get good people engaged in the strategic planning to ensure that work is focussed where it will provide the best value for limited resources.

### Spend the time to locate resources

A great deal of time and financial resources are required to establish projects (particularly on private land). However, when this investment is made the projects create healthy negotiation, leveraging of information and skills base, strong links to expertise, and result in landholders being more enthusiastic and committed to ongoing restoration work.

### Have a component of self-generated funds if possible

Funding must be long-term and reliable to enable proper planning and consistency of river system management. A reliable funding source across the catchment and shire provides

some continuity for lean times, but more importantly enables the TRC to pursue additional funding using their guaranteed co-contribution.

*'It is very useful to plan some "off the shelf" projects. The ability to undertake a project at short notice that has been identified as part of an adopted plan or strategy enables you to take advantage of all funding opportunities that may arise.'*

**Jane Lofthouse**

COORDINATOR, TWEED RIVER COMMITTEE

### Community engagement

A product of the TRC's long-term visioning was a strong realisation that to have sustainable land use practices prevail well into the future, they needed to help create a community that was more connected to the environment, with a real appreciation of the critical role of water systems and biodiversity in their lives and lifestyles. They also needed the community and industries to be completely up to speed and mirroring the Council's overall directions. The Council has been generating this mindset through imaginative, comprehensive and persistent education and awareness programs, and through involvement of community at every step of the way.

*'Projects need a long-term maintenance commitment from council and the community.'*

**Jane Lofthouse**

COORDINATOR, TWEED RIVER COMMITTEE





The city of Cambridge, Ontario, along the Grand River

## Grand River, Canada

Prior to World War II, exploitation of natural resources across the landscape through increased rural and urban growth left the Grand River subject to both devastating floods and low flows.

The Grand River Conservation Authority (GRCA) was formed in 1966 as an amalgamation of several preceding river conservation organisations, and presently consists of representatives of each of the 36 municipalities, regions and counties within the watershed. The GRCA has established strong and enduring partnerships not only among its member municipalities, the Province of Ontario, and non-government organisations, but also with industry, agriculture, community groups, First Nations (indigenous Canadians), angling groups and universities.

The governance model developed under the Conservation Authorities Act required municipalities to cooperate as one voice, with the appointment of nominees to the GRCA Board for each term of government. Municipalities in the Grand River Watershed agreed to use this governance structure more flexibly, by sometimes nominating or appointing key individuals from the community if this could bring strategic gains (e.g. for quicker and more wide spread uptake of management plans). The GRCA became a leader in adopting this model of creating very strong partnerships between stakeholders throughout the watershed, with close working relationships developing a strongly shared and long-term vision, which included representation from the whole watershed top to bottom.

Their commitment to the long-term produced workshops and planning programs that resulted in very comprehensive strategies. Broad support from stakeholders has guaranteed wide spread implementation of these strategies across the Grand River Watershed.



Three watershed-wide management plans: The Grand River Conservation Report – Hydraulics (1954), The Grand River Basin Water Management Study (1982) and most recently, The Grand Strategy (1994), which together present a comprehensive 50-year strategy for sustainable management of the watershed, have had huge success, and demonstrate that dedication to long-term planning initiatives can transform a degraded river into one of national heritage status.

Martin Neumann, Supervisor Terrestrial Resources, credits the community leaders back in the 1930s and 1940s whose foresight led to establishment of the watershed focus: ‘... their planning and forward thinking set the stage for half a

River System	Grand River, Ontario, Canada
Length	300 km
Area	7,000 km <sup>2</sup>
Origin, Tributaries etc	The Grand River flows through southwestern Ontario from the highlands of Dufferin County to Port Maitland on Lake Erie. The Grand River contributes 10% of the drainage to Lake Erie and is one of the lake's largest tributaries.
Population	925,000
Role of River System	<ul style="list-style-type: none"> <li>• Supports a large industrial base and agricultural sector</li> <li>• Contributes a great deal to Canada's GDP</li> <li>• Provides water supply to communities (dependent upon ground water, and secondarily, inland surface water)</li> </ul>
Riverprize	2000 International Thies Riverprize Winner

century of improvement. Watershed restoration on this scale requires planning, sustainability of management practices, forward thinking, community and political will, patience, and perseverance'. Keeping their eye on potential shifts in circumstances allows them to be better prepared, but they need to be able to bring the other stakeholders with them when a change in direction is needed. That is why the GRCA engages in as many aspects of the process as possible, so that they can quickly and effectively influence the evolution of practices in the river system with their tools in adaptive management.

Rather than creating a report that 'sits on the shelf' The Grand Strategy is a living, dynamic process that identifies problems, develops creative solutions, pools resources, implements action, monitors results and evaluates progress on an ongoing basis. It is so integrated into the GRCA business approach that it is not even referred to anymore as The Grand Strategy – it is just the way GRCA gets the job done. If the actions undertaken are not producing the anticipated results, the plan is adjusted so that actions that are not effective are not repeated.

The GRCA's long-term view led them to identify a comprehensive range of strategic steps and activities to alleviate flood damage, improve water quality and enhance water storage across the watershed. Activities include: reforestation, land acquisition, dam building, dyking, channelisation, erosion control, regulation of development in floodplains and wetlands, outreach programs to landowners, and the development of outdoor recreation areas.

Scenario planning was used to develop risk assessments and prioritise how to spend their limited funds. While previously 75 – 80% of funds required for the GRCA programs were sourced from the provincial government, today 80% of the annual budget is self-generated by the GRCA via levies and permits for resource use, parks and cottage lot leases according to Peter Krause, past Chair and Board Member.

Their desire to be prepared for uncertain futures also highlighted a need for technologies for predictive watershed models to test a range of scenarios. They now have an expert team using GIS models for risk management planning, monitoring and evaluation of progress, and are in a good position to adapt to change and direct funds to where the greatest effect can be expected.

**'Scenario planning is a tool for helping managers to take a view into the future in a world of great uncertainty. It is a tool to manage strategic risks and opportunities.'**

**Juergen H. Daum**

THE NEW ECONOMY ANALYST REPORT – SEPT 08, 2001

Today, aquatic life in the Grand is thriving and world-class fly fishing is again possible in parts of the river. Flood damage has been reduced by 80% through structural and non-structural adjustments. Seven reservoirs provide flood water storage and steady year-round flow. Measures are in place to ensure river quality is improved, pollution is prevented and fisheries are managed.

The now outstanding human heritage features of the river and the diversity of recreational opportunities along the river have earned it a formal declaration as a Canadian Heritage River.

**'The GRCA has guided the restoration of the river from severe degradation and industrialisation and is keeping it healthy for future generations.'**

**Martin Neumann**

SUPERVISOR TERRESTRIAL RESOURCES, GRCA



## Lessons learnt

### Involve government

Involving government (municipality) representatives is important to maintaining government support. In the Grand River system, municipality representatives currently make up the majority of the board of the GRCA, and municipalities are levied in order to provide the GRCA with a sustainable funding source. 'One benefit in having a Board made up of municipality representatives is that we've placed a much greater emphasis on going out to the municipalities and explaining the programs we run and how the budget and our levy requests relate to that, so that they have a chance to ask questions and understand. That has led to much greater political support', said Martin Neumann.

### Educate the community

Continuous engagement and education of the community and government is very important for securing the support of these groups over the long-term. The GRCA places an emphasis on visiting communities in member municipalities, providing an opportunity to answer questions and explain GRCA programs, and how the budget and levy requests relate to these.

**'I would say if you're upstream or downstream from someone then you're part of the same watershed community, and it's only when that community works together that watershed health, or watershed sustainability can be achieved.'**

**Martin Neumann**

SUPERVISOR TERRESTRIAL RESOURCES, GRCA

## The Future

Winning the International Thies Riverprize in 2000 brought local and international credibility to the work of the GRCA and increased the engagement of the GRCA and staff in international projects. With their usual forward vision, rather than spend their prize money, they invested it into a trust fund under the Grand River Conservation Foundation for disbursing conservation grants annually to community groups throughout the watershed.

Innovations in the Grand River include a Rural Water Quality Program where a number of watershed municipalities and other governmental agencies help pay farmers in higher risk areas to implement source protection planning and land use changes. Ideally, a watershed-wide approach could be established so that lower watershed municipalities could provide funding to upper watershed farmers and land users to identify high risk areas and implement appropriate solutions. Recent work included a partnership with the Ontario Geological Society to map underground water sources, volume and flow direction to better understand the inter-watershed ground water implications. As well, moraines (recharge areas) have been identified and protection encouraged by recommending appropriate land uses.

The Grand River Conservation Authority knows that it competes with other government and community needs and values, and this spurs them to find ways to ensure that society places a higher value on the river system and water resources, in a continued effort to generate funds for river health programs. Whilst the provincial government plans to designate growth areas within the watershed to absorb development pressure and population growth, the GRCA is considering whether a property tax or levy should be applied to landholders to help pay for management of the surface and ground water resources across the river system. Their ideas also extend to the need for appropriate permit fees (reflecting the value of water) for users of surface and ground water.

Peter Krause noted that when municipalities and communities appreciate the limited availability of clean water, and are ready to place higher values on water resources, then we may see the motivation to generate greater funds for restoration of damaged water sources, instead of the traditional thinking that water resources are forever unlimited and free for exploitation.

Peter Krause sees that recent moves to establish a series of source protection areas throughout the Province of Ontario, and to develop source protection plans for each watershed in Ontario may help to create that required attitude change as the management of depleting water resources and rivers becomes the responsibility of a wider set of stakeholders. The GRCA has been stretching its mind on how society and governments might place higher values on water resources and river health, so that new commercial marketing mechanisms and economic opportunities might be established to help support river restoration and management programs as more mainstream and sustainable parts of the economy.

