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ALONGSIDE THE WATER - PAREWAI : A CONCEPT TO RESTORE
ECOLOGICAL HEALTH TO RIVERBANKS AND SIMILAR PLACES

(Short Answers in Conservation Science)

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ALONGSIDE THE WATER - PAREWAI

A concept to restore ecological health to riverbanks and similar places

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"As so many species, ecosystems and landscapes are under threat, we cannot afford pessimism. Although the doomsday alerts have been essential for action, we now need positive constructivism based on sound restoration-ecology science."

Michael J. Samways. 1994. Insect Conservation Biology, p.292. London, Chapman & Hall.

As a result of discussion between the Science and Research Division and the Public Awareness Unit (PAU), Head Office, Department of Conservation, it was suggested that riverbank restoration could be an activity for next year's Arbor Day and Conservation week campaigns under the general theme of restoring New Zealand's biodiversity. This has been approved by EMT, following consultation throughout the Department, as described in the DoC Gazette, 25 October 1994. As background, the Manager of the PAU asked me to prepare a concept statement about such a campaign. The provisional title of the campaign, "Alongside the water", "parewai", focuses on riverbanks, but also includes the margins of swamps, lakesides and even coastal land, such as estuaries. A symposium on the subject held a few years ago by the New Zealand Ecological Society was entitled "Between land and water".

Wide interest

Concern for "riparian zones" has been growing steadily, worldwide. Unesco's Man and the Biosphere programme is coordinating an international research project called "The role of land/inland water ecotones in landscape management and restoration". (An "ecotone" is the ecological zone between two other ecosystems.) New Zealand's Resource Management Act 1991, regarded worldwide as advanced environmental legislation, provides for "The preservation of the natural character of ... wetlands, and lakes, and rivers **and their margins** (my emphasis) ..." (RM Act 1991, Section 6). The National Institute of Water and Atmospheric Research (NIWA) has a significant research programme on riverbanks and water quality. The forestry industry, Fish and Game Councils and some Regional Councils (e.g. Taranaki) have guidelines for riparian management.

A range of concerns

There are many reasons why riverbanks are attracting attention. Their role in flooding has almost legendary importance throughout New Zealand, with so much engineering work having been carried out that few rivers remain in their natural condition. It is often thought that flood control works have turned our rivers into sterile ditches that are boring aesthetically and over-simplified ecologically. Farming has generally ignored Queen Victoria's edict to Governor Hobson that the riverbanks should remain in public ownership, so that the "Queens Chain" (a 20 metre-wide strip down each side of a river) would remain available for public access. Vegetation has been cleared to the water's edge and stock graze the riverbanks along most of New Zealand's lowland and hill country rivers and streams. This means that bank erosion and pollution of the water by silt and nutrients is the norm rather than the exception. Research has shown clearly that riparian vegetation can absorb nutrients from water run-off. The ecological consequences of barren riverbanks are serious. Wide fluctuations in water quality, quantity and physical aspects such as temperature, negatively influence aquatic life. Light intensity has increased, causing greater algal growth. Carbon from decomposing vegetation that falls into the water is what ultimately drives aquatic life, and the source of this carbon has changed from rainforest to willows and pasture grasses.

Rivers flow to the coast from the hilly or mountainous hinterland and therefore originally created landscape corridors. However, the destruction of natural vegetation means that habitats are now fragmented and migration pathways disrupted. Poplars and willows are commonplace along rivers, replacing the species that are naturally adapted to the landscape and sometimes causing physical problems through excessive growth and vegetative multiplication. In their pursuit of relaxation people are seldom confronted by natural scenery anywhere in the lowland environment.

Riverbanks have many virtues

There are many reasons why healthy riverbanks are desirable and why a conservation effort focused on riverbanks would be rewarding.

- Places of uniqueness: riverbanks (and other wetland margins) combine features of both terrestrial and aquatic habitats.
- High biodiversity: many species of plant and animal in New Zealand can live in riparian habitats; there are some specialist riparian species such as blue duck and Marlborough weeping broom.
- Avenues for migration: rivers flow from mountains to the coast and therefore traverse a sequence of environments, and offer corridors for the movement of plants and animals.
- The presence of fertile silt and abundant water means that restoration is more likely to succeed with minimum human effort.
- Many of the remaining fragments of natural habitat are associated with rivers and valleys (especially in hill country where fire has left remnants in gullies) and therefore restoration could link existing fragments into a greater whole.
- Valleys are avenues for human movement - recreation, tourism, services - and therefore a stable and aesthetically pleasing landscape is desirable.

- Clean water and productive soils are vital to New Zealand's well-being.
- There are many stretches of river and wetland margin that are publicly owned (riparian or marginal strip, crown strip, esplanade reserve, Queens Chain, etc.), and all water is publicly owned, so there are opportunities for restoration that do not involve private ownership.
- Rivers are often land tenure boundaries or traverse many separate land titles including private land and various types of public or corporate lands (e.g. roads); therefore, restoration can involve the broader community.

A vision

The ecological processes that created and maintained nature in New Zealand and supported human culture, have largely been destroyed over most of the lowlands. Why not bring nature out of the mountains and down the valleys to interlink the fragments of nature and make the landscape sustainable again? This is a vision, and will never be fully achieved in our lifetimes. But a journey of a thousand miles begins with the first step, and every step along the way is also a conclusion in itself, at least in a local sense.

The Otago Conservancy plans to implement a 100 km riverbank restoration scheme, for a period of 10 years. Because the landscape is fragmented by land ownership and economic imperatives, the riverbanks offer the only feasible opportunity for ecological restoration on a significant scale.

Ecological restoration cannot be achieved without wide community support. For conservation to be sustained as a philosophy, the community at large (both urban and rural) has to believe in it. At present it is probably true to say that public support for conservation lacks understanding and commitment. A vision to return viable ecological processes to the landscape as a whole necessitates community involvement and long term commitment. Restoring ecology "alongside the water" offers a sufficiently grand yet tangible concept to achieve community support.

What will be done

There are soft and hard aspects of conservation, both essential and complementary, but differing in their time-frames, audiences and costs.

The soft conservation objective is to educate and influence attitudes: in modern terms, these activities involve information transfer, environmental education and conservation psychology. Probably in overall importance and the temporal sequence of activities the reverse order is more appropriate: change in attitude is the foremost need followed by education about ecological realities and their relationship to society, and lastly, what physical changes need to be made and how they are made. For example, a campaign might begin by encouraging awareness that the status quo of riparian management on the farm and in the town is unacceptable. Why? Because it causes on-site instability, reduced biodiversity, loss of long-term economic sustainability; off-site it causes pollution, contributes to an uninspiring landscape and maintains a non-sustainable ecological pattern of fragmentation. Information on how to change is necessary,

including not only engineering and ecological aspects but the social considerations - funding, labour, materials, monitoring and reporting. Not the least important in this range of actions is involvement by the community, including getting the young people involved so that the process will continue, indefinitely.

The hard conservation activities involve the actual implementation of a conservation plan for a stretch of riverbank. Reshaping the bank and course of the river may be needed and various physical devices designed and built to ensure stability. Farming activities may need to change, to allow the vulnerable areas to be retired from stock grazing, and therefore for alternative stock watering facilities to be created. Fencing will probably be required. Weeds and pests will become evident on retired land, and a management programme will have to be rigidly implemented or else goodwill will be jeopardized. A succession towards vegetation that is stable in the long term needs to be started. There is ample information on how to do this, but it is surprising how little knowledge has become firmly rooted at the local level, or indeed at the policy and planning levels. In most New Zealand situations the "ultimate" vegetation will be bush, but the character of this and the details of change over time will vary according to place (north to south, and east to west) and the particular physical environment of each particular place (e.g. the geological, soil and water conditions). There will be places where non-forest vegetation is favoured; for instance around estuaries, or in urban areas or specific soil conditions that may favour grassland or shrubland. Many of our threatened species occupy specialized habitats that are inherently scattered and local in occurrence.

Sometimes, protection, retirement and pest management alone will be adequate for the re-establishment of stable riparian ecosystems. But active planting will also be required where seed sources are too distant. Plants are expensive. The many thousands, indeed millions, of plants that would be needed for significant restoration poses the problem of who grows them and pays for them. The restraints imposed by the need to maintain the integrity of the natural genetic landscape, means that local plant growers would be needed. There is a huge opportunity for the setting up of community nurseries, managed by service organisations, schools, marae and local councils, perhaps guided by the Department of Conservation. The training and employment opportunities that these could provide are important in themselves.

Sponsorship by local businesses and individuals is another community action that is essential to the initiation and survival of a restoration programme alongside our waters. There are examples of local support scattered throughout the country and even landcare groups are beginning to form centres that stimulate sponsorship and other aspects. An important step is to provide demonstration sites where efforts can be observed.

There are impediments

It will not be easy to change a widespread attitude to our rivers and streams, if only because it costs money to change. Landowners will lose land from grazing or tree growing, fencing is expensive and plants take time and money to establish and maintain. Farm management (water, tracks and fences) will be modified, and weeds and pests will need to be controlled. Greater access by the public could threaten the security of rural

people and there will inevitably be planning and servicing that will take up valuable time. These problems are surmountable, however, if the protagonists listen, the local community is empowered, and the benefits sustained.

Conclusion

It is no surprise that we have let our riparian zones become ravaged through disinterest. It is very difficult to stop and reverse resource management habits, let alone rebuild a system of ecological processes. A programme such as restoration alongside the water is not a simple campaign designed to create a couple of illustrative examples. That is part of it, but the motive is born from a dire need to start up the process of sustainable land management. Ecological, economic, social and cultural aspects are interrelated. The concept or vision is holistic. The Department of Conservation occupies a position of responsibility, it sees what is needed, it knows what has to be done, and it has the task of stimulating the community into lasting action. Atawhai parewai!

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