

Banks Peninsula - Voluntary Community Approaches and Ecological Engineering



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Some words about geography and geology...

Banks Peninsula is located in the Canterbury region on the East Coast of the South Island of New Zealand, partly surrounded by the Pacific Ocean, and adjacent to the largest city in the South Island, Christchurch, which has approximately 340,000 residents.

Fig. 1: Farm scene on Banks Peninsula, NZ



Banks Peninsula is special and unique. It is geologically, ecologically, and culturally interesting with its volcanic and coastal landscape. This sub-region has rich Maori (the indigenous people of New Zealand), French, and Pakeha (New Zealand European) histories. Banks Peninsula has an intricate network of volcanic ridgelines and valleys, a higher rainfall than the nearby Canterbury plains, and a number of microclimates that allow a diverse range of land uses.

Geologically, the Peninsula is the eroded remnants of two large stratovolcanoes (Lyttelton first, then Akaroa). These were formed by intraplate volcanism between approximately eleven and eight million years ago (Miocene) on a continental crust. The Peninsula formed as offshore islands, with the volcanoes reaching to about 1,500 m above sea level. Two dominant valleys formed Lyttelton and Akaroa Harbours. The Canterbury Plains formed from the erosion of the Southern Alps (an extensive and high mountain range caused by the meeting of the Indo-Australian and Pacific tectonic plates) and from the alluvial fans created by large braided rivers, and are at their widest point where they meet the hilly sub-region of Banks Peninsula. One person said about Banks Peninsula to Andrew Dakers:

In my experience, one of the major things that Banks Peninsula has not taken full advantage of yet is its unique beauty. I think this is quite possibly because to those who are local, it is special, but it isn't all that different than other places in New Zealand. The reality, however, is that in the scope of the entire world, Banks Peninsula is incredibly unique.

Land use on Banks Peninsula and related topics

Examples of land uses on the Peninsula include: cattle and sheep farming; dairy farming; forestry; wineries and vineyards; olive tree growing; herb growing; marine aquaculture and fishing; arts, craft and cottage industries; cheese making; eco-tourism; outdoor tourist activities; and traditional tourism. The Peninsula is a playground for nearby Christchurch residents. Tourism (national and international) is increasing and is economically important.

This tourism demands a high standard of services and infrastructure (water, waste, roading). Because of its close proximity to Christchurch City, many tourists are day visitors, and it is difficult to capture (particularly in terms of accommodation) the tourist dollar. The option of combining the Banks Peninsula District Council and the Christchurch City Council has been discussed and debated several times, with the benefits being that the Christchurch residents who use the Peninsula pay more for the services and recreational opportunities it provides. Potential downsides are a loss of identity on the Peninsula and greater decision making about the future and possibilities of the rural Peninsula by city residents.

There are issues of water quantity, quality, and unreliability of supply. Most water is supplied from surface waters and some from groundwater. There are also wastewater management problems. There is a low population in a large area of land and a number of low density and small towns. There are a number of isolated bays that provide unique quiet settings for farming and places to live. Banks Peninsula has a resident population of 7,600 people. Some of the small towns are populated by people on medium to low income, with many retired residents.

The spread of small communities means that water and waste services can be expensive. A low rating base results in a lack of resources on the Peninsula to maintain or build infrastructure. Issues of reliability and costs result from the severe climate, steep slopes, erodible soils, and flooding. There are coastal and marine issues with pollution from boat discharges and point discharges, seaweed invasion, and the growing popularity of marine aquaculture farming. Land-use constraints include floods, erosion, and rockfall hazards. There are limited supplies of groundwater in the valleys. Some of the springs are important for supplying base flows for surface streams. Conventional septic tank disposal fields can be difficult, and there is a preference for small package treatment plants. Communication issues arise because of poor email and mobile phone services to some areas.

Fig. 2: Aerial view of Banks Peninsula, NZ



The Banks Peninsula landscape is highly modified. Indigenous vegetation on the Peninsula was once approximately 98%. This dropped to approximately 2% as a consequence of forestry and agriculture, but this has recovered somewhat to 12% through regeneration and restoration. There has been corresponding losses of biodiversity and disruption of the natural hydrological and nutrient cycles. Erosion is caused by the climate, soil, geological structure, topography, and land management. Hugh Wilson (Land Notes, Banks Peninsula Conservation Trust: Summer 2001) notes that:

Human settlement over the last 1,000 years has ripped away much of the original vegetation and wildlife. Old growth forests, for example, once covered nearly all of the Peninsula's 100,000 ha, but it is reduced to less than one percent (800 ha). Few plant species were completely lost, but fauna fared very badly. Among the birds, for example, moa, eagle, pelican, swan, goose, parrots, parakeets, kiwi, kokako, saddleback, piopio, takahe, weka, mohua, and fernbird no longer share the Peninsula with us. It is a huge loss.

However, the Peninsula still has 540 native "higher" plant species. Around 350 of these are endemic, native only to this country. Six are native only to Banks Peninsula (Hugh Wilson, Land Notes, Banks Peninsula Conservation Trust: Summer 2001). Hugh Wilson also states:

Nobody that I know is advocating a return to the Peninsula of 800 years ago—it is, anyway, an unrealistic and impossible dream. But a balanced, healthy, sustainable, diverse, and beautiful landscape where farming, forestry, and native ecosystems are all robustly promoted and integrated—that is a worthwhile vision for Banks Peninsula, and an achievable one. The challenge is that we still have some way to go.

The Banks Peninsula Conservation Trust

The Banks Peninsula Conservation Trust was established following widespread dissatisfaction with the district plan. There was much frustration and conflict over regulatory authorities drawing "lines on maps" around areas of native vegetation and areas with significant landscape values. A Banks Peninsula Taskforce was set up to work through the issues. This process was facilitated over a period of 18 months by the New Zealand Landcare Trust.

The Taskforce came up with a series of recommendations for the Banks Peninsula District Council, presenting these in September 1999. A major thrust of these was a move to voluntary methods as an alternative to rules, including an independent trust to assist landowners to actively manage the landscapes and natural resources of the area. Regulation is essentially a last resort to meet the objectives under the Resource Management Act 1991.

A small group of enthusiastic farming landowners took this idea and decided to set up the Banks Peninsula Conservation Trust (BPCT). The group held a public meeting to gauge support and has since grown its management committee. The BPCT was set up in mid-2001 with a vision of an environment in which indigenous biodiversity flourishes alongside a vibrant community within a healthy and evolving landscape. So far, the group has worked with little or no funding. At present, the BPCT has four trustees and a management committee of around twenty people, mostly local. The Trust has three main sub-groups: projects, communication, and resourcing. Expertise, assistance, and support will be sought from a range of agencies, organisations, and groups.

The Banks Peninsula Conservation Trust is building trust with landowners and working on ways they can raise awareness of what is special and unique about Banks Peninsula, plus the importance of biodiversity, conservation, and sustainable land management. Many members of the management committee bring an acute awareness of the need to respect private property rights. The Trust's desired outcomes include: an enthusiastic, informed, and involved wider community; widespread appreciation of what is unique and special about Banks Peninsula; to be a trusted leader that generates landowner

involvement; sustainable land management and conservation that enhance indigenous biodiversity; and widespread acceptance of non-regulatory methods. The Trust seeks to achieve these outcomes through:

- collaboration and partnerships with agencies and organisations
- linking with existing initiatives on Banks Peninsula
- developing a range of conservation options for landowners
- projects
- field days and awards, among many other methods.

Sustainable land management will be promoted across the whole of the Peninsula, with a whole-farm approach and some integrated catchment management projects. The Trust is developing a range of conservation options for bush areas from legal covenants and preservation to management agreements. The projects group is presently dialoguing with some key landowners, working on the form of agreements and covenants and prioritising areas of special significance. The resourcing group is working on funding options and applications and getting enough "people power".

The communications group has produced the first newsletter and is developing a programme for public and landowner awareness and education through field days, seminars, a library, tours and publications. The Trust recognises the need for people to learn and work together in a positive and enthusiastic way, and aims to provide opportunities for this to happen. The outcome the Trust seeks is for people to generate the ideas and action. The Trust aims to facilitate the continual progression of the vision, empowering landowners to take up opportunities in sustainable management and conservation. The Trust will encourage landowners to do it themselves with the support of others. The challenge is to identify the benefits to a farming operation of enhancing indigenous biodiversity.

The Banks Peninsula Conservation Trust is special because what it is trying to achieve has not been done by a community group in New Zealand before. The Trust will do some of the work that a District Council would usually do in meeting its obligations under New Zealand's Resource Management Act of 1991. This is especially Section 6, to recognise and protect outstanding landscapes and natural features, areas of significant indigenous vegetation, coastal character, and places of cultural importance.

A non-regulatory approach is a ambitious endeavour, relying as much (if not more) on trust, communication, group dynamics, community support, creativity, high profile, and good-will as it does on technical, scientific, and formal planning. It is special because it is landowner driven, by the community for the community, ensuring a high degree of community ownership and commitment. If the BPCT approach is not successful, a regulatory approach to achieve the same objectives would probably be re-instated.

The New Zealand Landcare Trust

The New Zealand Landcare Trust facilitated the Banks Peninsula Taskforce process and supported and assisted the establishment of the Banks Peninsula Conservation Trust. The Landcare Trust will continue to provide facilitation and help the BPCT to carry out strategic and action planning and help BPCT form strong relationships and partnerships with other agencies and organisations. The Landcare Trust will also help BPCT develop funding applications and provide assistance with preparing newsletters, establish a library, organising field days, among many other tasks. The Landcare Trust will also promote BPCT widely and provide a web site and extranet (intranet with a limited number of outside partners connected) usage.

The New Zealand Landcare Trust is a non-governmental organisation with a vision of sustainable land management through community involvement. It works with Landcare or community groups around the country, fostering sustainable land management and biodiversity initiatives. The Trust helps groups establish, plan, develop networks, and to become effective in Landcare. It is also a key information broker on sustainable land management and biodiversity issues and encourages participatory collaborative research.

The Trust is governed by representatives from agricultural production, outdoor recreation, and environmental interests. Co-ordinators provide support and encouragement to Landcare groups around the country. Landcare groups generate enthusiasm, and provide communities with the collective power for effective Landcare. Groups are as diverse as the areas they represent. Groups are encouraged to set their own agendas and develop action plans, with the support of Trust staff.

Ecological engineering opportunities for the Peninsula

Ecological engineering is a relatively new interdisciplinary that aims to provide an ecosystem focussed decision-making framework for the design, redesign, building, and management of engineering facilities and services. Ecological engineering ideas are more likely to be adopted once their worth has been demonstrated and feasible funding options are being actively arranged.

As indicated in the report resulting from the Banks Peninsula workshop (facilitated by Dr Johannes Heeb and Chaired by Andrew Dakers) within the International Ecological Engineering Conference held in Lincoln, Canterbury, New Zealand, it would be useful to prepare real-world case studies that incorporate the details and issues highlighted by the community, from within Banks Peninsula and some use of national and international examples. These should cover all the different practical steps and aspects a person or group on Banks Peninsula would have to consider and implement when embarking down the ecological engineering line.

The full Ecological Engineering Conference workshop report is available from the International Ecological Engineering Society (IEES) website ([click here](#)). A conclusion of this workshop was that Banks Peninsula is considered a unique and very special ecological region in the world. The aim of the workshop was to evolve an ecological engineering strategy that could contribute to the facilitation of and support for the necessary economic activities of a vibrant, secure and healthy society at the same time preserving and

conserving the unique Banks Peninsula ecosystems. Recommendations from the workshop included:

- (1) facilitate identification of local issues and problems and formulation of ecologically integrated development ideas, using informed community participation processes such as the stakeholder platform;
- (2) education through the demonstration of real ecologically engineered projects;
- (3) establishment of innovation networks; and
- (4) establishment of an appropriate financing structure for ecologically integrated initiatives.

At the conference, Professor Winfried Blum from Vienna, stated:

The Banks Peninsula is an ecological treasure, because of its beautiful and rich environment and its very special and unique potential to serve for local residents as well as for visitors with benefits for both. Because of its ecological fragility, e.g., very special coastal and marine environments, very accentuated geomorphology with steep slopes and special rock and soil cover prone to erosion and degradation, and a very specific and unique biodiversity, it is absolutely necessary to harmonize the social and economic development with the ecological and cultural assets. This region is so interesting, important, and unique that the international scientific community is willing to co-operate in the future development of the Peninsula.

Conclusion

All human communities are embedded within an ecosystem. We are totally dependent on the many products and services provided by these ecosystems – such as water and nutrient recycling, oxygen to breathe, shelter, climate regulation, generation of topsoil, food and fibre production, pollination and seed dispersal, protection from ultra-violet sun rays, and so-on. Over the last nearly 5 billion years these ecosystems have evolved from space dust to lava, to topsoil, and to the very intricate and complex web of interconnected biological, physical, chemical components that make up the world we see and enjoy today.

It is this living, dynamic, and continually evolving environment that not only provides us with the fundamental requirements for living, but the beauty and inspiration that makes life so awesome. Humans can choose to plan, engineer (design and build), and manage their societies, with their farms, forests, buildings, cities, roads, water and wastewater systems and dams, with a detached disinterest or deliberate disregard for the natural world about them, or they can consciously integrate their developing towns, villages, factories, schools, farms and forestry with the ecosystem within which they are embedded to ensure sustainable living.

There is clearly an opportunity for the people of Banks Peninsula to work towards integrating their economic, social, and cultural activities with the Peninsula's unique ecosystems. This will ensure long-term security and well-being. But it will mean doing things differently. It will mean planning, designing, building, and managing respective projects and services with a better understanding of the dynamic and intricate nature of the Banks Peninsula's natural ecosystems. It will require a collective willingness to adopt sound innovations that fit these ecosystems.

And this is as much about effective communication, education, research, co-operation, trust building, and conflict management as it is about the development and adoption of appropriate technologies. It will require the different stakeholders forging a common and pragmatic vision for their region. It will require the local and national political representatives and community leaders and decision makers and regulators to share and support this vision. It will need an interdisciplinary team of scientists, engineers, and technologist to provide the necessary professional expertise.

The Banks Peninsula community are already partway down this track with the setting up of the Banks Peninsula Conservation Trust, with the support from the New Zealand Landcare Trust and the district and regional councils and their representatives and the recent input from the interdisciplinary team of ecological engineers. Let us hope that greater things are yet to happen for the Banks Peninsula community, visitors, and environment.