

What happened on 20-21 October 2010:

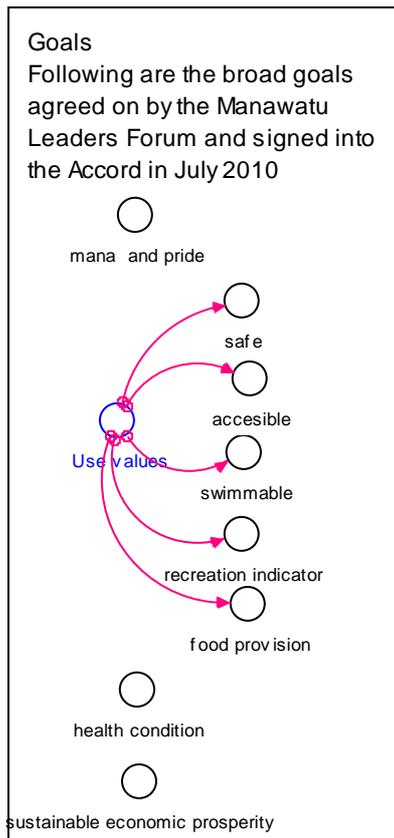
1. Overview of Integrated Freshwater Solutions project, how it aligns with the Manawatu River Leaders Accord and how Mediated Modelling workshops are structured. The workshops will be used to generate an Action Plan required by the Accord.
2. A preliminary model was presented but participants decided they would prefer to build a model from scratch for understanding. Initial model construction and discussion to identify key drivers that influence water quality, water quantity and habitat quality in the river system then took place.
3. Breakout groups to discuss: (1) Use of science and knowledge (2) Economic measures (3) Values (4) Actions and Solutions. The report back from each of these groups is documented.
4. Horizons presented data they have available and an update on work underway to improve water quality.
5. A dialogue covered the linkages between values, (health) indicators, and performance measurements. How these factors, plus causes, effects, and potential solutions, (some of which are already work in progress – e.g. riparian planting, fencing, etc) should be reflected in the model was then reviewed.
6. A list of what information is perceived to be available, and how it can be obtained as well as a list of indicators to be used to measure success was generated.
7. Breakout groups discussed Indicators and Measures of: (1) Mana and pride (2) Healthy river conditions (3) Sustainable economic prosperity. The report back from each of these groups is documented.

Summary of the discussion and the model modules that link this discussion

Aim – The Stakeholders have a mandate from the Accord to improve the river. The stakeholders unanimously expressed a desire to do something that is going to make a difference. The agreed timeframe for simulating the scenarios and solutions portfolios into the future is 1990 to 2040. The questions we would like to use the model to answer are:

- Can social, economic, cultural and natural science information be meaningfully integrated?
- How clean can the Manawatu River catchment be in 2040?
- Who will pay the cost and who will benefit?

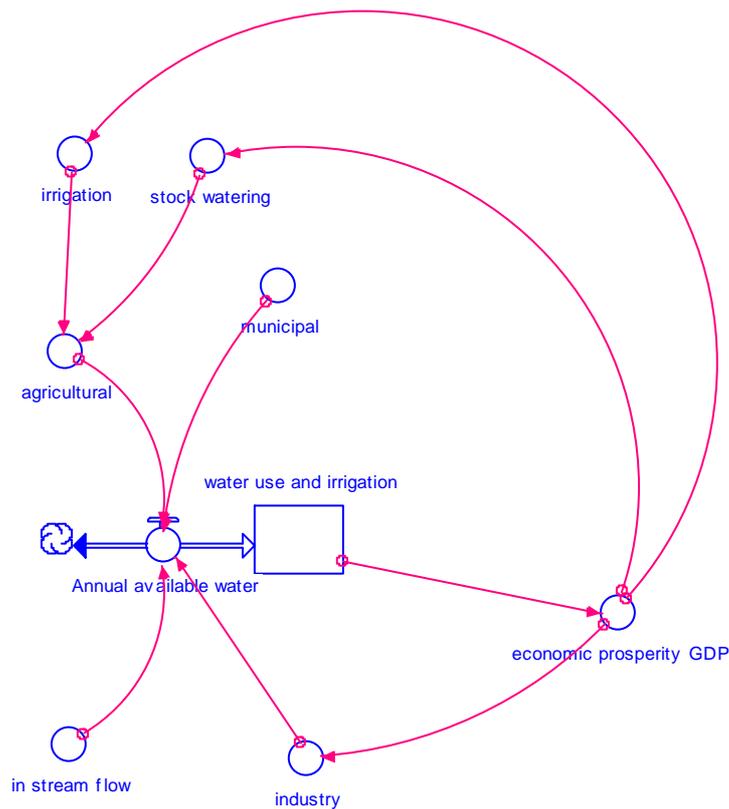
Accord goals - The Accord with its four goals indicate a broad direction of what is meant with a desirable state of the river. The Accord goals are: (1) The Manawatu River becomes a source of regional pride and mana (2) Waterways in the Manawatu Catchment are safe, accessible, swimmable, and provide good recreation and food resources (3) The Manawatu Catchment and waterways are returned to a healthy condition (4) Sustainable use of the land and water resources of the Manawatu Catchment continues to underpin the economic prosperity of the Region.



Module 1 – The Accord goals

Science – Science is not just natural science but also social, cultural, economic ‘science’. It needs to come from a range of sources and conflicting data and definitions need to be sorted. There seems to be an agreement that there is a downward trend in water quality, water quantity and habitat quality. The extent of the problem and appropriate solutions is not agreed on. There is a wealth of science available for the project to draw on. There are also gaps which stakeholders are identifying. The Land and Water Forum findings relevant to the Manawatu River are to be identified and placed on www.ifs.org.nz website to work within the national context.

Water use – The economic development of the region is linked to irrigation. It was estimated that 75% of available surface water in the Manawatu catchment is currently allocated. Demands on the river will increase in the future. The cost impacts on water supply for small towns also need to be considered. Hydro electricity is generated on the river. Currently Horizon’s monitor over 60% of the Manawatu catchment’s consented surface water takes using telemetry. Since 1997 there has been an increase of 125% in the regional surface water take. Consented groundwater takes have increased 85% during this time.



Module 2 – Water use relationships

Indicators of river health – The group agreed that there is a need for a simple measure of improvement that is easy to communicate to the community on a regular basis, and that are suited to the Manawatu River. Measuring fish is expensive as it is time consuming and can be confounded by the migratory lifecycles of some iconic native fish species (migrate out to sea for part of their lifecycle). Some species which may prove appropriate include Koura and dwarf galaxias which are non migratory native species, and trout. Horizons measures the biological environment that needs to exist to provide a habitat conducive to maintaining species. Invertebrates and periphyton are also measured by Horizons and this data will be made available. Freshwater shellfish have cultural value to Maori so the re-establishment of beds in the Manawatu catchment may be a relevant indicator.

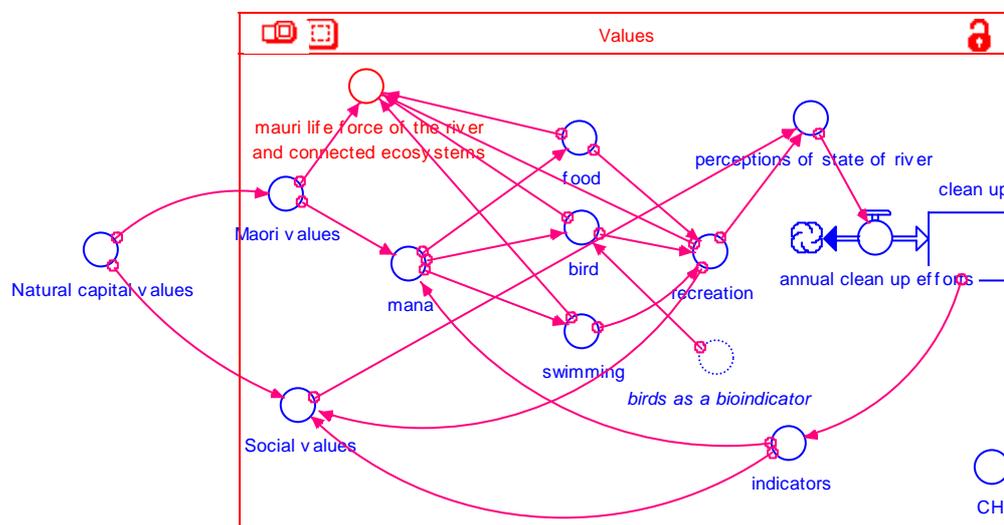
Birds are difficult to use as a direct water quality indicator because of their migratory pattern. Cultural Health Index (CHI) is used by Maori and could be used in parallel to the western science Macroinvertebrate Community Indices (MCI). The relationship between some MCI and the CHI is similar with regards to nitrogen? The CHI looks at resources available in the area. Whoever lives in area does the monitoring. The CHI includes birds as surrounding habitat counts also as a measure of a river's health. Preference is to take a holistic view and create a vision of healthy water and surrounds. Retaining RAMSAR wetland status for the estuary is an important indicator of success of river clean-up.

Costs and benefits - Science needs to be used to clarify who, what, and where the solutions are, as well as what intended and unintended consequences may result from interventions. Are they going to be economically sustainable? Water users such as industry, farmers and towns have

had generations of getting economic benefits without paying for the ecosystem services the river provides. It is important that costs fall where most appropriate. All members of the community benefit from recreational use and the pride generated by the health of a river as unique as the Manawatu.

If nutrients from dairy sheds are used to grow grass there is a positive payback – For New Zealand it has been estimated there is potential for a \$6000 average fertiliser saving for farmers (this is a positive feedback loop). Fonterra and Horizons are both looking at on-farm practices and new initiatives. DairyNZ is also involved. Synergies will allow systems to do better.

Values - maintaining the natural capital of the river and its environs is important for both Maori values and social values. If the river has ‘mauri’ it is able to produce food, provide safe swimming, and meet spiritual needs, this increases the mana of iwi/hapu who are tangata whenua. Likewise important social values are met by other groups being able to swim, fish, watch birds, and undertake other types of recreational activity on the river.



Module 3 – How values relate to water quality

What has been done - Currently 80 farm management plans are in place for farms in the Manawatu catchment. Horizons intends to model, based on the whole farm plans, to see what difference adding extra farms makes to water quality at the catchment scale. The SLUI program end target would cover 500 farm management plans in highly erodible areas; this could achieve a 48% decrease in sediment yield from the catchment by 2030. Dannevirke and Feilding have recently put in phosphorous stripping equipment in their wastewater treatment plants, which is likely to provide a very quick improvement in discharge water quality to the river tributaries.

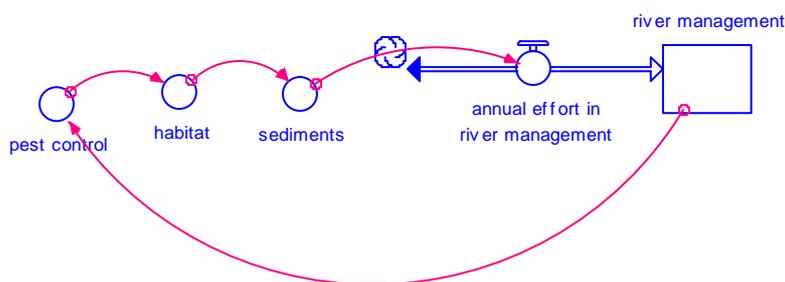
Dairy farmers used to have 419 discharges allowed into waterways. Now just half a dozen. A Dairy Effluent Storage Calculator to determine needed pond size has been developed for farmers.

For fencing off waterways Horizons have offered dairy farmers in the Tararua District a 30% subsidy for fencing (with a special deal of 50% to November 2010). A subsidy up to 75% is available if 4 or more farmers apply together to fence off a contiguous area.

River Management –

Flood Control – man made flood control measures can lead to a negative feedback loop. Up to 50% of sedimentation is assumed to come from low lands and river banks. Growing urbanisation is increasing the need for flood protection.

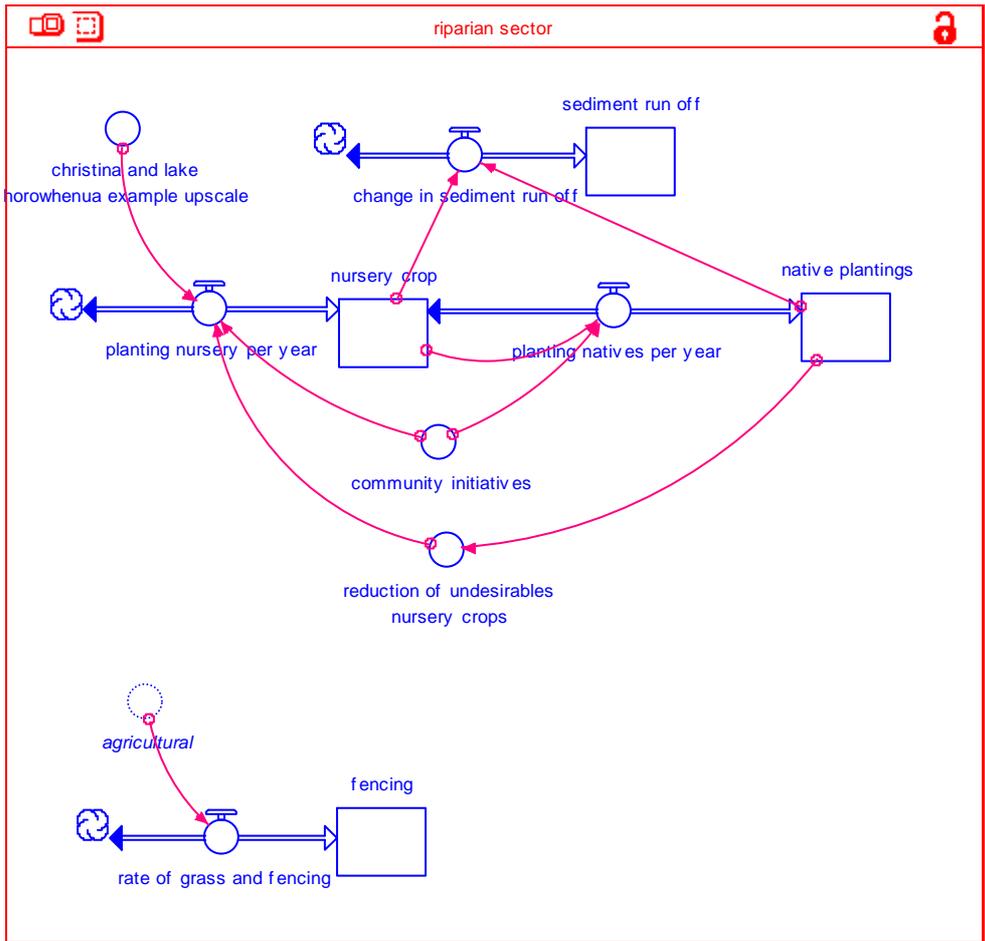
Riparian Planting – Iwi prefer native planting along waterways and a holistic approach to improving the river ecosystems. Riparian planting can encourage weeds and provide habitat for pests such as possums (negative feedback loop).



Module 4 – The required link between river management and pest control

Pest control is linked to improved biodiversity and healthy vegetation. Die back of large trees is an issue in the Ruahines, e.g. around Rangī Hut. Roots hold soil in place especially in areas with steep slopes and high rainfall. In the short term exotic plant species can be used to stabilize erodible areas in order to establish more desirable plant species in the long term. Council owned land could be used for species diversity that will provide habitat corridors for native plants and animals which form most of the cultural native Waahi taonga inventory. Nurseries and community supported planting events were mentioned as catalysts for riparian management for which there are examples that could be upscaled.

On flat land (<10% slope) the riparian margin needs to be at least 1 metre of ungrazed vegetation. For dairy cattle it is possible to fence using a 2 wire fence with the protected strip left in grass. Unless a very wide strip is fenced off the riparian margin will not take out nitrogen leached into soil. On steeper slopes (>10% slope) at least a 5 metre strip is required. Grass is a good vegetation cover as does not impede water flow in flood conditions. Tall woody vegetation can blow over and block water ways, cause bare patches, and provide shelter for stock which draws stock closer to the water. Ways to prevent weed establishment is a big issue. For sheep and beef farmers the key is to keep cattle out which can be done with a 1 or 2 wire fence or by provision of water troughs away from small streams.



Module 4 – Riparian Planting Relationships