Orari River Catchment Management Strategy

Prepared by the Orari ICM Community Group

Contents

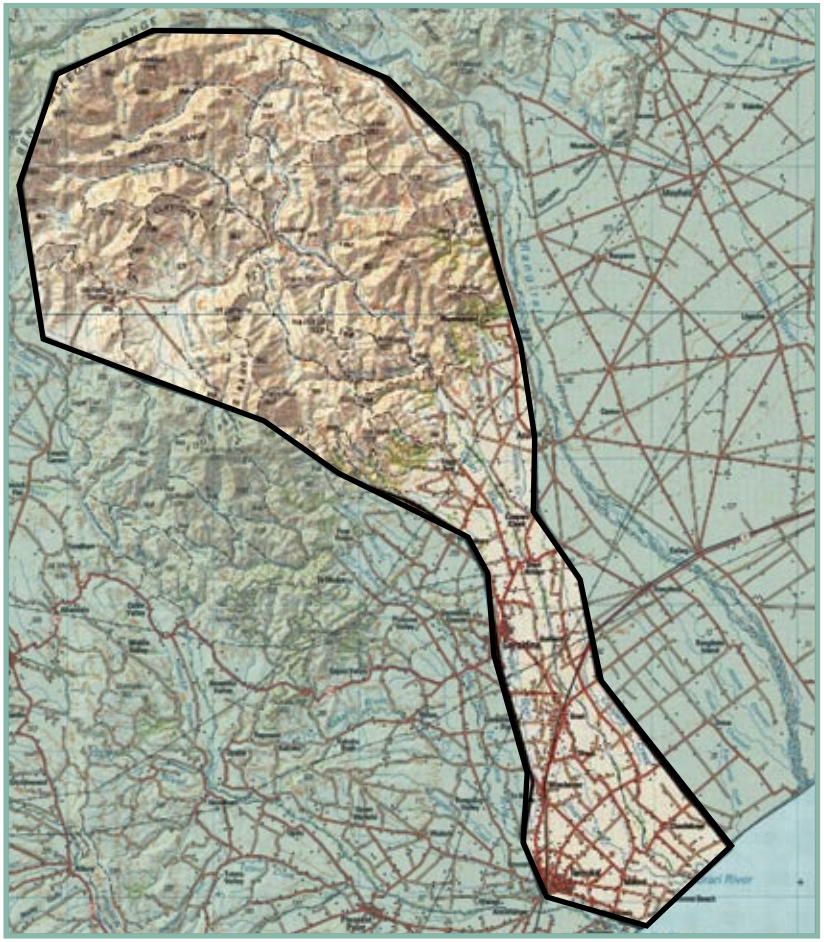
Introduction

In May 2005, a public meeting held in Geraldine resolved that a management strategy was needed for the Orari River and its catchment, from its headwaters to the sea.

What is the Orari River Catchment Management Strategy?

- It is a vision for the future, and a detailed set of actions aimed to achieve this vision.
- It has been drafted by the community and fine-tuned by an elected committee of community representatives.
- It is non-statutory, i.e. it has no legal standing and cannot be enforced. It depends on goodwill, co-operation, participation, and commitment from those identified as responsible for carrying out the actions.
- It is a “living document” and will be reviewed regularly as new information and insights become available.

The Orari River Catchment boundary



Catchment

Catchment describes the area which is drained by a river.

The process

Series of public meetings

Heard science, factual information, viewpoints and wish lists from everyone

Community workshops held to create a draft plan

Steering Committee elected to fine tune the plan and set timelines and priorities

The steering committee represented groups such as landholders, Tangata Whenua, industry, recreationalists and environmentalists.

Community approved plan

At a public meeting in March 2008, the plan was formally adopted by the community

Implementation phase (Now!)

The next page describes how you can be involved in making it happen

How can I help out?

prepare submissions, apply for funding, provide advice and prepare strategies

protect water quality and native species

control pests and weeds

increase understanding and the sustainable management of the water resource

Refer to the action list on the following pages. Is there anything that you might be able to help with? If so, **we want to hear from you**.

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Mission Statement

“To sustainably manage the Orari River Catchment, integrating its ecological, social, economic and cultural values”

Goals

Goal 1:	Goal 2:	Goal 3:
To sustain, protect and enhance the natural character and ecological values of the Orari River Catchment for present and future generations	To provide for safe and appropriate/balanced recreational, educational, cultural and historic opportunities	Efficient resource use to provide for economic sustainability

Action List

FOCUS: Pests and Weeds

GOAL 1:
"To sustain, protect and enhance the natural character and ecological values of the Orari River Catchment for present and future generations"

Objective 1: Coordinate pest and weed control activities of all agencies and landholders.

Performance measure: Pest and weed control is undertaken in a holistic and coordinated manner.

No.	Action	Who is responsible/explanation	Priority	Timeline	River section
1	Document and map the areas under ECan, DOC, LINZ, TDC, MDC and private jurisdiction. Identify their responsibilities in terms of the management of pests and weeds.	Group, ECan, DOC, LINZ, TDC, MDC Need for responsibilities to be clarified.	High	Within 6 months	Upper (then move down the catchment in the future)
2	From the mapping exercises, identify areas/issues where coordinated pest and weed control will have significant long-term gains.	Group, ECan, DOC, LINZ, TDC Identify areas that can easily be managed now, but have the potential to cause problems if left.	Mid/High	Within 9 months	Upper (then move down the catchment in the future)
3	Develop pest and weed control strategies for the areas/issues identified in action two, outlining priorities, responsibilities, funding requirements and work programmes.	Group, ECan, DOC, LINZ, TDC Allows for coordination and a holistic approach to control.	Mid/High	Within 9 months	Upper (then move down the catchment in the future)
4	Ensure DOC, ECan and other agencies liaise with private landholders in carrying out coordinated pest and weed control/grazing management through active liaison with farming community.	Group, ECan, DOC Personal contact is the foundation of good relationships.	Mid/High	Ongoing	All

Please note the following abbreviations:
Group - The Orari River ICM Community Group (of which you can be part), ECan - Environment Canterbury (Regional Council), DOC - Department of Conservation, TDC - Timaru District Council, MDC - Mackenzie District Council and LINZ - Land Information New Zealand

Objective 2: Minimise impacts of recreation/industry on the natural and environmental values.

Performance measure: Recreation and industry have minimal impact on spread of weeds and pests.

No.	Action	Who is responsible/explanation	Priority	Timeline	River section
5	Develop codes of practice and/or QA programme for contractors, recreation/education providers and users to ensure they are not a vector for pest and weed species spread.	ECan, contractors, Fish and Game, recreationalists, education providers, fishing guides, Biosecurity New Zealand Contractors, recreationalists and fishing guides need to ensure their equipment is free of pests and weeds.	High	Within 6 months	All
6	Erect signage and install cleaning stations at high use access and recreational points, educating users about the spread of pests and weeds.	Group, Biosecurity New Zealand Education/awareness of current and potential threats is essential.	High	Ongoing	Upper (then move down the catchment in the future)

Objective 3: Reduce or maintain current levels of pests and weeds.

Performance measure: No new pests and weeds are discovered in the catchment, and present levels are reduced or maintained.

No.	Action	Who is responsible/explanation	Priority	Timeline	River section
7	Notify landholders in the Orari catchment of any new potential pest and weed threats. Ensure they are provided with sufficient information to prevent the spread of pests and weeds.	Group, landholders, ECan, Biosecurity New Zealand Effective planning and management of pests and weeds relies on awareness of potential new threats.	High	Ongoing	All
8	Introduce biological controls where appropriate and necessary.	ECan, landholders Biological controls can be an ecologically sound and a successful alternative to herbicides.	Mid/High	Ongoing	All
9	Ensure that ECan has suitable pest and weed benchmarking and monitoring programmes in place.	ECan, landholders Baselines and ongoing monitoring are essential to assess effectiveness of current management techniques.	Mid	Ongoing	Upper

Objective 4: Interactions between river control works and weed management are acknowledged.

Performance measure: River control works have minimal impact on the spread of weeds and pests.

No.	Action	Who is responsible/explanation	Priority	Timeline	River section
10	Ensure that plants used to prevent erosion and for river control are managed and do not become a problem.	ECan River Engineering Section/river rating district River control plant species are often invasive in their nature.	High	Ongoing	All

Objective 4: Interactions between river control works and weed management are acknowledged.

Performance measure: River control works have minimal impact on the spread of weeds and pests.

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
10	Ensure that plants used to prevent erosion and for river control are managed and do not become a problem.	ECan River Engineering Section/river rating district	River control plant species are often invasive in their nature.	High	Ongoing	All

Focus: Enhance Landscape Values and Ecological Protection

Objective 5: Protect and enhance wildlife populations and habitat diversity, especially rare and endangered species.

Performance measure: Wildlife populations and diversity maintained.

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
11	Conduct inventory of native wildlife in the catchment and requirements for each species. Prepare and implement strategies to protect wildlife.	Group, in association with DOC, Forest and Bird, NZ Ornithological Society, universities	The Orari catchment is home to extensive populations of native wildlife. For species such as blue duck, braided river nesting birds, falcon, skinks, lizards, insects, bats and fish, habitat protection is essential to their survival.	High	Within 6 months	All
12	Identify high priority areas and conduct coordinated predator control where indigenous species populations are in potential danger.	Group, ECan, DOC and landholders	Predatory species threaten native wildlife.	Mid/ High	Within 12 months	All
13	Secure government funding for pest and weed control using evidence in existing and new surveys/plans i.e. blue duck survey.	Group	Public money (through government funds) should contribute to weed and pest control.	Mid/ High	Within 12 months	All

Objective 6: Protect and enhance indigenous vegetation, particularly where rare species are involved.

Performance measure: Rare species identified. Protection and enhancement programmes initiated at selected sites.

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
14	Identify sites where protection and enhancement of indigenous flora is required. Identify measures needed and likely costs; prioritise. Initiate programmes at priority sites.	Group, DOC, other community groups and District Councils	Development in the catchment threatens indigenous vegetation.	Mid/ High	Ongoing	All
15	With regard to tall vegetation and established ground cover, investigate present controls under which this is managed.	Group, landholders	Lack of vegetation cover increases flood ramping, increases erosion, and reduces habitat for native wildlife.	Mid	Within 15 months	Upper
16	Develop and implement programmes as identified (if required).	Group, landholders	Further coordinated programmes may be required to protect and enhance the indigenous vegetation.	Mid	Within 2 years	Upper
17	Investigate possibility of obtaining funding for an independent assessor to work with councils/agencies to provide practical advice regarding tracking.	Group, landholders	Inappropriate fence line and vehicle tracking compromises landscape integrity.	Mid	Within 2 years	Upper

Objective 7: Ensure river control works are environmentally sensitive, and protect habitat, wildlife and recreation values

Performance measure: Procedures developed and implemented

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
18	Investigate present code of conduct under which river control works is managed.	Group		Mid	Within 15 months	All
19	Identify sensitive areas/species which need protection, e.g. river nesting birds.	ECan River Engineering Section/river rating district, Fish and Game, Forest and Bird		Mid	Within 15 months	All
20	Develop and implement further management procedures if identified.	Group, landholders	Further coordinated management procedures may be required to ensure river control works are environmentally sensitive.	Mid	Within 2 years	Upper
21	Develop management procedures for each facet of river control works in association with Environment Canterbury, gravel abstractors, ecologists and recreational users.	Group, ECan	Work in the river bed has the potential to have negative environmental effects.	Mid	Within 2 years	Mid and lower

Focus: Flood and Gravel Management

Objective 8: The gravel abstraction consenting process is based on sound data and current environmental conditions

Performance measure: Consenting and gravel abstraction is carried out in a manner that is sustainable for the Orari River

No.	Action	Who is responsible/ explanation		Priority	Timeline	River section
22	Design bed-levels in the Orari River are resurveyed and reviewed on a regular basis dependant on the river conditions.	ECan Accurate design bed levels are an essential element in the consenting process.		High	Within 2 years	Mid and lower
23	Reviewed bed-levels and their relevance to flood capacity are presented to local landholders for consultation.	ECan Local knowledge and historic data are important in determining appropriate bed levels.		High	Within 2 years	Mid and lower
24	Short term targeting of abstraction on built up areas of gravel as identified in consultation with local landholders, river rating districts, recreational users and abstractors.	ECan, abstractors Abstraction at built-up areas will help manage the river's dynamics.		High	Ongoing	Mid and lower
25	The condition that prohibits extraction within 50m of a bridge or structure is considered on a case-by-case basis.	ECan	In some cases it may be more appropriate to abstract close to structures and bridges.	High	Ongoing	Mid and lower
26	Assess the ability to stockpile after flood events when it is necessary to extract gravel quickly.	ECan	Gravel build-up after floods needs to be managed to reduce follow-on effects.	High	Ongoing	Mid and lower

Objective 9: Extraction figures are accurate, and the difference between consented and abstraction figures recognised

Performance measure: Environment Canterbury has a clear understanding of the amount of gravel actually abstracted from the river bed

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
27	A mechanism/procedure is developed to determine the difference between consented volumes and the volume abstracted.	ECan	Because abstractors have to hold a consent before they tender for a job, consented volume is considerably higher than that actually removed from the river.	High	Within 2 years	Mid and lower

Objective 10: Adequate communication networks during high rainfall and flood events

Performance measure: There are no cases where communication has broken down

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
28	Reaffirm that communication lines exist throughout the catchment and are implemented during high rainfall and flood events.	Group, Civil Defence, ECan	Reliable communication networks are crucial in a flood event.	High	Within 6 months	All

Focus: Water Quality

Objective 11: Maintain water quality and habitat in the main stem, tributaries, and hydraulically connected groundwater

Performance measure: Water quality and ecological monitoring show quality is maintained

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
29	Ensure that suitable monitoring programmes are in place; especially in at-risk areas.	Group, ECan	Water Quality programmes should be based on sound scientific information.	High	Within 6 months	All
30	Ensure water quality monitoring data is easily accessible to those in the Orari Catchment, e.g. via the Orari website.	Group, ECan		High	Within 18 months	All
31	Encourage relationships with possible programme providers to develop and implement water quality programmes.	Group, ECan		High	Within 18 months	All

Objective 12: Encourage landuse practices which minimise contamination of the river from contributing sources.

Performance measure: Contamination of river reduced due to improved land use practices.

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
32	Promote the exclusion of stock from the main stem and its tributaries. Where appropriate, advocate fencing and restoration/ re-vegetation work and stock water reticulation.	Group, ECan	Problems caused by stock grazing include: sedimentation, degraded stream life, trampling and erosion of banks, increased runoff, damage to riparian vegetation and faecal contamination.	High	Ongoing	All (where appropriate)
33	Promote Environment Canterbury's Environment Enhancement Fund (EEF) as a means of subsidising fencing and planting costs in enhancement projects.	Group, ECan	The EEF is an effective mechanism to assist in the enhancement of the Orari River catchment at a property scale.	High	Ongoing	All
34	Promote nutrient budgeting as a way of managing fertiliser inputs into the farming system and reducing losses to surface and groundwater.	Group, ECan	Phosphorus and nitrogen levels are high in some parts of the catchment	High	Ongoing	All
35	Promote the retention of extensive pastoralism in the upper Orari catchment.	Group, ECan	Vegetation cover in the catchment can have a positive impact on water quality	High	Ongoing	Upper
36	Encourage irrigators and irrigation companies to adopt best management practices at a farm level: i.e. implement Irrigation Code of Practice.	Group, ECan	Farm management plans tied to irrigation consents could be an effective mechanism for the adoption of best management practices.	High	Ongoing	All
37	Promote the uptake of sustainable farm management practices through demonstration farms, field days etc.	Group, ECan	Real life examples are an effective means of promoting sustainable farm management practices.	Mid	Ongoing	All

Objective 13: Maintain water quality and habitat in the catchments wetlands

Performance measure: No degraded wetlands in the Orari Catchment

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
38	Promote the protection of the remaining wetlands throughout the catchment; especially in the upper catchment.	Group, landholders, ECan, Fish and Game	Intensification has increased pressure on high country wetlands.	High	Ongoing	Upper

Objective 14: Prevent the spread of unwanted invasive organisms (in particular Didymo) into the river system

Performance measure: Didymo and other invasive organisms do not invade river system

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
39	Encourage river users to Check, Clean and Dry when moving between waterways.	Group, ECan, Biosecurity New Zealand, Fish and Game	Didymo is most likely to be spread by humans moving items between waterways.	High	Ongoing	All

Focus: Water Quantity

Objective 15: Recognise and, if necessary, further investigate the interaction between ground and surface water, rainfall, recharge and abstraction.

Performance Measure: Greater understanding of interactions inherent in the entire Orari River system

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
40	Review the investigations into surface and groundwater interactions in the Orari Catchment.	ECan	A sound scientific understanding of the ground and surface water interactions is essential in the effective management of the catchment as a whole.	High	18 months	All
41	Assist Environment Canterbury in identifying and developing future investigations into the water resource.	Group	Local knowledge is a critical component of a complete and accurate study of the water resources.	High	Ongoing	All

Objective 16: Advocate for a flow regime that achieves a sustainable river system and associated values while meeting the needs of the water users

Performance Measure: Sustainable flow regime that is acceptable to all water users

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
42	Participation in committee and public meetings.	Group, ECan	Public meetings are essential to gauge the view of the community (in addition to technical information).	High	Within 18months	All
43	Community involvement in the setting of the environmental minimum flow for the Orari River and tributaries (scheduled for 2008-09) through participation in the advisory group.	Group	Local knowledge is an essential component of developing environmental flows.	High	Within 2 years	All

Objective 17: Advocate for the sustainable allocation and use of water, both in terms of its users and the parties its allocation and use will affect.

Performance Measure: Applicant/council consults the group regarding consent applications

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
44	Facilitate and advocate for the investigation and uptake of water harvesting and out-of-stream storage options as a means of alleviating the pressure of current ground and surface water resources.	ECan (facilitate), group (advocate)	Out-of-stream water storage is seen, locally and nationally, as an essential component of sustainable future water use.	High	Within 2 years	All
45	Ensure group is aware of all significant proposals and applications for water takes/use/diversions.	ECan, group.	Group must be clearly identified as an interested party by all applicants.	High	Ongoing	All
46	Submit on any resource consent application that has the potential to compromise or is consistent with the goals of the group.	Group	It is imperative that water users have an opportunity to support or oppose any future developments.	High	Ongoing	All
47	Advocate for the efficient on-farm use of water through: the promotion of water meters and soil moisture probes; the retention of shelterbelts; and the marrying of irrigation infrastructure and rates of take to the landuse and type.	ECan, group	Efficient on-farm water use reduces costs to the farmer while alleviating some of the pressure on the water resource.	Med	Ongoing	All
48	Advocate for efficient domestic use of water by both urban and rural residents.	ECan, TDC, group, wider community	Water inefficiencies also occur in the home.	Med/ High	Ongoing	All
49	Advocate and assist the establishment of water users groups to manage their water takes by rostering; reducing the likelihood of restrictions.	ECan, group, wider community	Voluntary water users groups are an often successful way of managing the water resource.	High	As needed	Mid/Lower

Objective 18: Gravel consenting and abstraction is carried out in a manner that is sustainable for, and beneficial to, the Orari River system.

Performance Measure: Gravel abstraction has a positive effect on the Orari River system

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
50	Short-term targeting of abstraction on built up areas of gravel.	ECan, abstractors	Abstraction at built-up areas will help manage river dynamics.	High	Ongoing	Mid/Lower
51	Built-up areas identified in consultation with local landholders, river rating districts, recreational users, abstractors and council.		Local knowledge and historic data are important in identifying high priority areas.	High	Ongoing	Mid/Lower

Objective 19: Advocate for a precautionary approach in terms of the effect of land development on the water resource in the Orari Catchment

Performance measure: Land development does not have a detrimental effect on the water resource

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
52	Advocate against inappropriate vegetation, i.e. exotic forestation, intensive agriculture and the removal of tussocks in the upper catchment.	ECan, group, upper catchment landholders	Land development in the high country can have detrimental spinoff effects to the water resource further down the catchment	Med	Ongoing	All

Focus: Education, Recreation and Access

GOAL 2:
"To provide for safe and appropriate recreational, educational, cultural and historic opportunities"

Objective 20: Location and requirements of appropriate access points clear to all users.

Performance measure: Access points signposted and adequate maps available.

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
53	Accurate maps with access points, queens chain, recreational areas and code of conduct to be compiled with the agreement of landholders. These are to be made available to visitors and locals, e.g. at petrol stations/ i-SITE.	Group, District Councils, Information Centre, Fish and Game	Adequate access management depends on there being clearly defined access points.	High	Within 18 months	All
54	Signs erected where local agreements allow access, explaining the significance of the environment, discouraging rubbish dumping and offering guidance on protection methods.	Group, District Councils, DOC, Fish and Game	Signage increases awareness of environmental values.	High	Within 18 months	All

Objective 21: Negotiate pedestrian and vehicle access with adjoining landholders at appropriate sites that ensure the protection of environmental and natural values and human safety.

Performance measure: Safe and environmentally friendly pedestrian and vehicle access satisfactory to landholders and users negotiated.

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
55	Identify areas where public access needs to be enhanced and, where appropriate, reinstated, whilst ensuring user groups and landholders requirements are met as far as possible.	Group, user groups, Fish and Game	Defined, well used access points are favourable to irregular access all along the river.	High	Within 18 months	All
56	Contact adjoining landholders and negotiate site-specific conditions and/or suitability of uses.	Group	Cooperation between user groups and landholders is imperative.	High	Within 18 months	All
57	Identify options and legalities to limit access at times of high risk.	Group, Fish and Game, TDC, ECan, DOC River conditions can sometimes compromise the protection of natural values and human safety.		High	Within 18 months	All

Objective 22: Facilitate the development of recreation and picnic areas with appropriate facilities

Performance measure: Recreation needs of locals and visitors are met.

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
58	Identify areas suitable for development, facilities required, responsibilities and likely management needs, i.e. rubbish bins, toilets, picnic tables.	Group, District Councils, community/user groups	Appropriate facilities can reduce the impact of river users on the environment.	High	Within 18 months	All
59	Encourage the development of identified areas.	Group, District Councils, service clubs, community groups, DOC etc		High	Within 18 months	All

Objective 23: Minimise the impacts of recreation/tourism use on natural and environmental values

Performance measure: Development has minimal intrusion, motor vehicle use is controlled, and existing values are maintained

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
60	Reduce the likelihood of didymo invasion through education, the installation of cleaning stations at designated sites, and by erecting signage: i.e. road signs.	Group, Biosecurity NZ, ECan, Guides, Fish and Game	Didymo threatens the ecological value of the entire river system.	High	Now	All
61	Identify areas where protection is required, and explore protection mechanisms.	Group, ECan, District Councils, Fish and Game	Some environmental values need to be protected from recreation and tourism activities.	High	Ongoing	Selected areas and times
62	Initiate protection of any areas identified above. E.g. erect temporary or permanent signage informing of, and roping around, bird colonies (if appropriate).	Group, landholders, District Councils, DOC, Fish and Game		High	Ongoing	Selected areas and times
63	Work with users to define rights and responsibilities through a code of conduct.	Group, user groups, Fish and Game	River users need to be aware of potential degradation to the environment of their activities, and ways to minimise these effects.	High	Within 12 months	All
64	Develop motor vehicle access policy in conjunction with access points. E.g. driving on defined tracks rather than riverbed.	Group, District Councils, Police, landholders, Fish and Game	Increasing use of 4WDs, ATVs and trail bikes in riverbed areas is a significant problem in other areas.	High	Within 12 months	All

Objective 24: Maintain the educational value of the Orari River System

Performance measure: The Orari River continues to be used for educational purposes

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
65	Coordinate activities, signage and booklets geared at educating users about ecological damage and environmental enhancement.	Group, ECan, DOC	River users need to be aware of the potential degradation to the environment from their activities, and ways to minimise these effects.	High	Ongoing	All
66	Encourage schools to incorporate environmental education into their teaching; through ECan's Education for Sustainability team, and Museum and DOC staff.	ECan, Timaru Museum, DOC	Education needs to reach all generations.	High	Ongoing	All
67	Encourage User Groups to consider and mitigate environmental effects as part of the educational or physical activity experience.	Group, user groups	User groups are a good way to influence a lot of people.	Med	Ongoing	All

Focus: Economic Use and Development

GOAL 3:
"Efficient resource use to provide for economic sustainability"

Objective 25: Build and maintain an economically strong and vibrant community

Performance measure: The economic viability of the Orari Catchment is maintained and enhanced

No.	Action	Who is responsible/explanation		Priority	Timeline	River section
68	Recognise and advocate management of the tourism potential while protecting the recreational values of the Orari Catchment.	Group, ECan, District Council	Recreation, tourism, fishing, camping, kayaking etc all have economic spinoffs.	High	Ongoing	Upper catchment (incl. gorge) and mouth
69	Protect and enhance the water quality within the Orari catchment; including both surface water (main stem and tributaries, water for stock) and ground water.	ECan, group, wider community	Maintain highest natural quality of the water.	High	Ongoing	Catchments for drinking water and economic use
70	Advocate for sustainable land use in the Orari catchment.	ECan, group, wider community, landholders	While it is recognised that land development, e.g. irrigation, boosts the economy, any development needs to be carried out in a sustainable way.	High	Ongoing	All

The following presentations were made at community meetings:

Orari River system: natural behaviour	Tim Davies
Hydrology of the Orari River	John Waugh and Frank Scarf
The Orari River Protection Group	Ad Sintenie, Bruce Allan, Drew Brown, Wayne King, Martin Rupert
Orari River gravel extraction	Ian Heslop
The Waitaki experience	Bill Penno
Upper catchment landowner perspective	Donald Aubrey
Surface and groundwater quality in the Orari River Catchment	Zella Smith
Central South Island Fish and Game	Mark Webb
Riverbed birds of the Orari River	Jim Jolly
Orari-Waihi-Temuka River Rating District	George Leslie
Royal Forest and Bird Protection Society	Eugenie Sage, Fraser Ross
Water supply and demand	John Bright
Economics of water for irrigation	John Greer
Roles and responsibilities of the Timaru District Council	Andrew Hammond
Dairy farming at the Orari River mouth	Mark Houston
Orari Catchment hydrological study	Graeme Horrell
South Canterbury Federated Farmers	David Moore
Native freshwater fish of the Orari River	Sjaan Charteris
Department of Conservation	Adrian Cogle
Environment Canterbury roles and responsibilities	Dr. Bryan Jenkins
Non-statutory plans	Rob Gerard
Canterbury Strategic Water Study Stage II	John Bright
Rangitata South Irrigation Ltd Scheme	Ian Morten
Biodiversity Strategy for the Canterbury Region	Tamsin Page
Sustainable dairying	Lew Metcalfe
ECan Kakahu block: significant indigenous vegetation	Mike Harding

Workshops were held for each of the main issues in the catchment:

- Pests and weeds
- Flood and gravel management
- Water quality
- Water quantity and allocation
- Recreation, education and access
- Landscape values and ecological protection

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Environment Canterbury
Your regional council