DRAFT

Central Plains Water Enhancement Scheme

CPW Farm Plan Template for individual farm plans
that will be prepared by all water users in the Central Plains Water Enhancement Scheme

Environmental Farm Plan for Irrigated Land Use

Technical approval
I have considered this plan and believe it to be:

1.	Technically sound and feasible	**Yes**	**No**
2.	Addressing the cause of the environmental issue	**Yes**	**No**
3.	Having a good chance of success	**Yes**	**No**

Comments:

Name: (Please print)

Signature: ***(for the Central Plains Water Enhancement Scheme)***

Date: **/** **/**

Environmental Farm Plan for Irrigated Land Use for (property name)

I confirm that the information provided in this plan is correct:

Name ..... *Signature* .....

Position (e.g. owner/manager) ..... *Date*……..

Property name							
Owner name							
Postal address							
Phone no.		**Mobile no.**		**Fax no.**			
Email address							
Contact name (if different)			**Position (e.g. manager, tenant)**				
Postal address							
Phone No.		**Mobile no.**		**Fax no.**			
Email address							
Property area (ha)							
Effective area (ha)							
Area under irrigation (ha)	**water**					**effluent**	
Irrigation type/s	**water**					**effluent**	
Enterprise type	**Cropping**	**Dairy**	**Dairy Grazing**	**Sheep**	**Beef**	**Deer**	**Other**

Our Environmental Commitment

As owners of ..... (property name) we are committed to supporting the growth and development of New Zealand's farming industry and its markets throughout the world.

We strongly believe that for a sustainable long term industry to exist it is imperative to protect and enhance the environment through modifying farm management practices.

As water users in the Central Plains Water Enhancement Scheme we are committed to meeting all scheme environmental requirements, and as a business we are committed to ensuring that all activities undertaken on our property are undertaken in an environmentally sustainable manner.

In addition, we are committed to not only managing the impacts of our farming activities but also improving the environment so that the property is in a good condition for future generations.

We will monitor our performance against our environmental objectives and targets and take appropriate action where necessary to address those areas where an improvement in performance is required.

Signature (Owner) **Date:** / /

Purpose of plan

Each water user in the Central Plains Water Enhancement Scheme is required to prepare and implement an Environmental Farm Plan for Irrigated Land Use to demonstrate how they are actively managing their use of natural resources in order to achieve high standards of environmental management and optimise production from irrigation. The plan provides a risk management approach to environmental protection and enhancement on irrigated farms and is designed so that it can be adapted for each farm business. The plan requirements often have both economic and environmental benefits.

Monitor/Review/Revise

The farm plans are dynamic in nature and need to be updated over time as information, technology and best practice change.

Audit and Compliance

Appropriate records must be kept and produced on request. Environmental performance will be audited by an external auditor regularly. For the first 2 years of receiving scheme water the plan will be audited annually. If excellent performance is achieved, then ……(add scheme audit and compliance requirements from Protocol when complete)

Other Obligations

Preparation of and compliance with a Central Plains Water Enhancement Scheme Environmental Farm Plan will not exempt farmers from:

- their own industry quality assurance programmes, codes of practice etc.
- meeting specific regulatory/legal requirements (e.g. consent conditions for discharge of waste)

Industry Codes of Practice and Guidelines

Where industry standards and codes have been developed water users are expected to adopt these, unless due to local or scheme requirements CPW adopts different standards.

Where applicable, water users will meet the requirements of:

- "Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use)" (NZFMRA, 2007) (Provides practical and specific guidance for safe, responsible and effective nutrient management)
- Standards New Zealand: NZS8409:2004 "Management of Agrichemicals", which underpins the GROWSAFE ® Training Programme for agrichemical users and suppliers.
- The Spreadmark Code of Practice for the Placement of Fertiliser in New Zealand
  Spreadmark is a fertiliser spreading accreditation scheme that registers fertiliser-spreading companies with certified spreading machinery, trained operators and audited quality management systems.
- Local and Regional Council guidelines e.g. Environment Canterbury: "A guide to managing waterways on Canterbury farms"
- Irrigation NZ – Irrigation Code of Practice and Design Standards
- Irrigation NZ – Irrigation Evaluation Code of Practice
- Dairying and Clean Streams Accord (2003)

References

Two resources that are particularly relevant to NZ irrigation are:

- The Irrigation Guide and Environmental Checklist for Irrigated Farmers – A guide to decision-making when going irrigating
- The New Zealand IRRIGATION MANUAL (developed by the Malvern Landcare Group) – A practical guide to profitable and sustainable irrigation

Both are available from Irrigation New Zealand (www.irrigationnz.co.nz); phone : 03 379 3820 email: admin@irrigationnz.co.nz)

Farm Management Blocks

We recognise that understanding differences in the way parts of our property respond to different management practices is an important step in achieving our production goals, as well as recognising and understanding the environmental risks associated with these practices.

…….(property name) is made up of the following Farm Management Blocks [1] (See Map)

Farm Management Block A description

Farm Management Block B description

Farm Management Block C description

Farm Management Block D description

[1] *A Farm Management Block is a homogeneous block of land that responds in a similar way under similar management.*

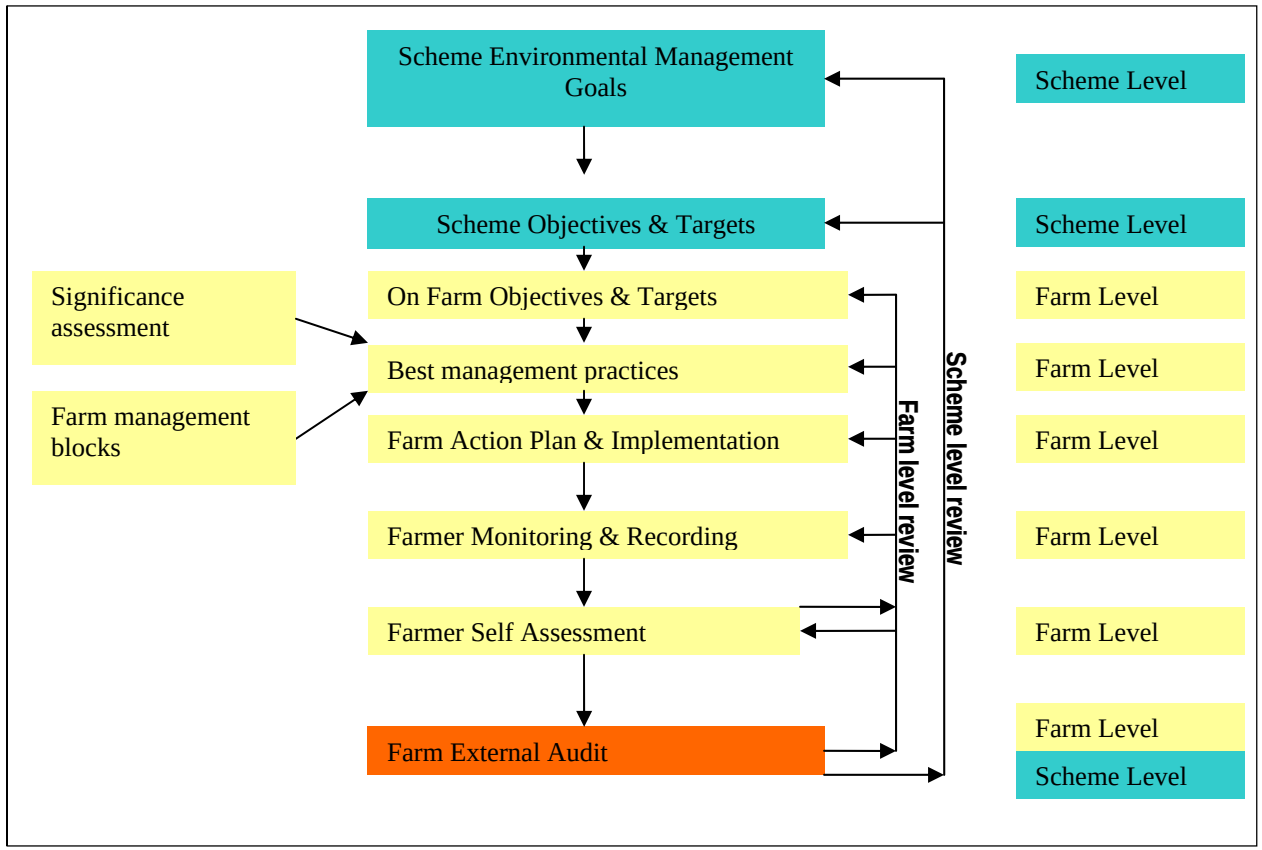
Farm Map showing Farm Management Blocks

Management areas covered by this plan

The plan covers these management areas:

Irrigation management	Soils management	Nutrient management
Collected animal effluent management	Waterway and riparian management	Biodiversity and ecosystem management

The Farm Plan Road Map below shows the steps to be covered for each topic:



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A. Irrigation Management

Our goal for best practice irrigation management is to use water efficiently, minimising runoff and drainage so as we avoid, remedy or mitigate:

- Inefficient application,
- Ponding of irrigation water
- Excessive runoff of irrigation water
- Excessive losses to groundwater
- Drainage to other properties

IRRIGATION MANAGEMENT PLAN

Irrigation Scheme Objectives and Targets					Farm Best Management Practices and Records	
Objectives	**Targets**	**Significance**			**Best management practices**	**Records that will be kept**
		L	**M**	**H**		
Objective1: **To comply with all relevant resource consent conditions for the Scheme (i.e. those that affect on-farm activities) (see Appendix 1)**	Comply with relevant farm plan conditions			✓	Specific resource consent requirements.	Records as required through consent conditions.
Objective 2: **To ensure that all irrigation systems on the property are capable of operating to meet industry & scheme standards for best practice irrigation**	**New system** – System designed by accredited designer. **Existing systems** - System evaluation undertaken by xx (Date) All upgrades will be completed no later than 24 months after receipt of the evaluation report.				**New systems** All new on-farm irrigation infrastructure to be designed by an Irrigation NZ (INZ) accredited designer to meet INZ design standards and scheme design requirements. **Existing systems** The system will be evaluated by an Irrigation NZ accredited evaluator. The report must set out the system performance, including well test and the timelines for upgrades, if required.	System design certificate System compliance certificate System evaluation report Upgrade plan with actions taken.
Objective 3: **To ensure all key staff members are fully trained in the operation & maintenance of those aspects of the irrigation system for which they are responsible.**	All key staff reach irrigation training standard.				Identify key staff members who manage and maintain the irrigation system on a daily basis. Involve these staff members in a comprehensive on-farm training programme covering all aspects of irrigation management including: - The key benefits of irrigation - Management to ensure the avoidance of runoff and ponding	Staff training records Records of staff induced irrigation incidents and actions taken.

					- Correct application rates - System maintenance - System monitoring for problem identification - Individual responsibilities and accountability. No major and no more than xx minor staff related irrigation incidents per year.	
Objective 4: **To maximise water application effectiveness while minimising excess drainage and runoff.**	Apply correct amounts of water for plant growth requirements and specific soil type properties Close adherence to listed best management practices. Significant variations noted together with reasons for variations and actions taken				Soil moisture levels between field capacity and recharge level x % of time. (e.g. 80% with tailoring to crop type and stage of growth, time of year (spring, summer, autumn), irrigation system, soil type) **Centre pivots and long lateral systems** - Monthly check measuring application rates with rain gauge - Adjust pivot speeds according to ET, rainfall and soil moisture status - Monitor pasture/crop growth and development - Check for excessive runoff and adjust system if necessary - Close down system if excessive runoff and/or ponding occurs. **Low pressure systems** - Ensure K line movement patterns are consistent run to run and paddock to paddock. (GPS on bike) - Adjust rotation according to ET, soil moisture status and rainfall - Close down system if excess runoff and/or ponding occur. Follow sprinkler line movement patterns map for paddock to paddock rotations - Move sprinkler lines to cover any dry patches that may occur - Shut down sprinkler lines where effluent spreader irrigation is being applied. **Travelling irrigators** Farmer to include appropriate Best Management Practices	Soil moisture monitoring records. Application rate testing records Rainfall records. Irrigation run-off records Irrigation records Crop records Soil type and infiltration rate mapping
Objective 5: **To implement a robust irrigation**	Irrigation equipment and maintenance programme				No major and no more than x minor mechanical failures each year caused through inadequate maintenance.	Records of mechanical failure

equipment and machinery maintenance system	displayed Close adherence to listed best management practices. Significant variations noted together with reasons for variations and actions taken				The system must be fully maintained at all times and all potential problems identified, recorded, and rectified ASAP. - Regular checks on centre pivot wheels and drive units and fittings and maintain as required - Check and maintain main pipes and sprinklers hoses on Centre Pivot - Maintain all sprinkler lines, nozzles and saddles in good working order and replace where necessary.	Machinery maintenance records

B. Soils Management

Our goal for best practice soils management is to maintain or improve the physical & biological condition of our soil so as we avoid, remedy or mitigate:

- *loss of topsoil by wind or water erosion*
- *movement of soil & contaminants into waterways*
- *damage to soil structure and health*
- *contamination of soil*

SOILS MANAGEMENT PLAN

Irrigation Scheme Objectives and Targets					Farm Best Management Practices and Records	
Objectives	**Targets**	**Significance**			**Best management practices**	**Records that will be kept**
		L	**M**	**H**		
Objective 1: **To minimise the incidence of wind and/or water erosion caused as a result of farming practices.**	Close adherence to listed best management practices. Significant variations noted together with reasons for variations and actions taken				**Wind erosion** - use appropriate seedbed preparation particularly avoiding the creation of small aggregates on exposed sites. - minimising the length of time that soils are exposed during soil cultivation - maintain soil moisture at times of high wind erosion risk. - use direct drilling in preference to conventional cultivation. **Water erosion** - use direct drilling or minimum tillage techniques in preference to conventional cultivation on sloping land with erodible soils.. - regularly check for erosion from channeled runoff, (i.e. from wheel ruts, tracks etc), and if found immediately take appropriate remedial action. - regularly check for signs of tunnel gully erosion. If found take appropriate remedial action. No major and no more than x minor erosion incidents each year	Records of management induced erosion events.
Objective2: **To optimise soil structure and soil biological activity**	Maintain or improve soil health results each year.				Soil Health testing and recording (e.g. VSA, alternative programme, photographic record, comparing hole dug by fence and in paddock)	Soil health testing results or photos

					Recognise differences in soil types and soil properties and manage accordingly to minimise soil compaction damage : - Minimise compaction by vehicles when soils are wet by: using designated vehicle tracks (show on map) - Minimise compaction by stock when soils are wet by: using safe areas for stock (show on map) using stand-off and/or wintering pads - Use soil aerator as appropriate when soil compaction diagnosed. Improve soil biological activity by: -Conserving soil organic matter by using direct drilling techniques in preference to conventional cultivation. - Incorporating stubble in preference to burning - Maintaining healthy pastures - minimising the use of agrichemicals harmful to beneficial soil organisms.	
Objective 3: **To minimise the risk of soil contamination from fertiliser inputs.**	100% Fertmark compliant products used				Use fertilisers that are 'Fertmark' compliant and/or those that can be demonstrated not to contain contaminants. Phosphate fertilisers used comply with the industry Cadmium limit (280mg of cadmium per kg of P)	Fertmark certificate

C. Nutrient management

Our goal for nutrient management is to minimise nutrient losses to water while managing soil fertility to optimise pasture and crop productivity so as we avoid, remedy or mitigate:

- *N & P losses from fertiliser & stock into groundwater and surface water*
- *Runoff, leaching*

NUTRIENT MANAGEMENT PLAN

Irrigation Scheme Objectives and Targets					Farm Best Management Practices and Records	
Objectives	**Targets**	**Significance** L	M	H	**Best management practices**	**Records that will be kept**
Objective 1: **To minimise nutrient losses to surface and ground water through the use of nutrient budgeting.**	Initial nutrient budget/s prepared for arable and non arable, effluent and non-effluent areas of farm by xxx Nutrient budgets reviewed and revised at least every two years. Comply with nutrient cap levels (catchment load levels) as set by Canterbury Regional Council for relevant farming area			✓	Separate nutrient budgets prepared for arable and non arable, effluent and non effluent areas. Budgets to take into account all nutrient inputs and outputs. Undertake regular soil testing, (including deep soil nitrogen testing for arable) and plant analysis Best available industry tools are used. Nutrient Management Plan to integrate nutrient budget and soil test results into a fertiliser programme.	Nutrient budget, soil test results, and recommended fertiliser programme. Supplements records Verification that nutrient budget completed by accredited advisor.
Objective2: **To minimise nitrate leaching and/or run-off losses to surface and ground water through careful fertiliser management.**	Close adherence to listed best management practices. Significant variations noted together with reasons for variations and actions taken				**Rate of fertiliser applications** - Rate of nitrogen applied not to exceed xx kgN/ha/year - Maximum rate per application – x kgN/ha *Rate determined by:* - soil testing and plant analysis - nutrient budget results - assessment of crop and/or pasture requirements - matching nitrogen applications in proportion to other nutrients - need for capital or maintenance fertiliser **Frequency of fertiliser applications** - lower rates of nitrogen (not exceeding xx	Nutrient budget, soil test results and recommended fertiliser programme. Nitrogen application records Best management practice variation records

					kgN/ha/application) applied to match growth cycle of the crop and/or pasture and soil moisture conditions. **Timing of application** - Nitrogen application is matched to times of high plant growth - Pasture is at least 25mm high (approx 1000kg DM/Ha) before nitrogen is applied. - Nitrogen is not applied when the 10cm soil temperature at 9am is less than 6^0C - nitrogen fertiliser is not applied when the ground is saturated and/or when the tile drains are running. **Fertiliser use and management measures** - Nitrogen fertiliser is not applied to severely compacted soils - nitrification inhibitors used on pasture and/or winter feed crops to reduce nitrate losses	
Objective 3: **To minimise phosphate run-off losses to surface water through careful fertiliser management.**	Close adherence to listed best management practices. Significant variations noted together with reasons for variations and actions taken.				**Choice of fertiliser** - slow release phosphate fertilisers used when there is a high risk of runoff. **Rate of application** determined by: - soil testing and plant analysis - nutrient budget results - assessment of crop and/or pasture requirements - matching phosphate applications in proportion to other nutrients - need for capital or maintenance fertiliser **Frequency of application** - split applications are used where the single application rate would exceed 100kgP/ha **Timing of application** - Phosphate fertiliser applied to crops via incorporating/drilling rather than surface broadcasting. - Pasture is at least 25mm high (approx 1000kg DM/ha) before P fertiliser is applied - P fertiliser is not applied when the soil is saturated.	Nutrient budget, soil test results and recommended fertiliser programme. Fertiliser application records Best management practice variation records

					Fertiliser use and management measures - P fertiliser is not applied to severely compacted soils. - Vegetation buffer strips of at least 1-2m width are maintained adjacent to all waterways to filter any runoff.	
Objective 4: **To apply nutrients where needed to maximise impact and minimise losses to non target areas.**	Close adherence to listed best management practices. Significant variations noted together with reasons for variations and actions taken.				Application equipment used is suitable for the conditions and fertiliser type. Use only 'Spreadmark' accredited spreading companies when using contractors and apply to 'Spreadmark' standards when self application. GPS technology is used for precise application and for a digital record of fertiliser application locations.	Record of contractors Spreadmark accreditation. Best management practice variation records GPS application records

D. Collected animal effluent management

Our goal for effluent management is to manage the effluent system to optimise the productive benefits of animal effluent while taking all practical steps to avoid contamination of ground and surface water so as we avoid, remedy or mitigate:

- *Contamination of groundwater and surface water, especially faecal, N, P*

COLLECTED ANIMAL EFFLUENT MANAGEMENT PLAN

Irrigation Scheme Objectives and Targets					Farm Best Management Practices and Records	
Objectives	**Targets**	**Significance**			**Best management practices**	**Records that will be kept**
		L	**M**	**H**		
Objective 1: **To comply with all Canterbury Regional Council requirements relating to effluent management and disposal**	Full compliance with consent and/or permitted activity requirements			✓	Specific resource consent and/or permitted activity requirements.	Records as required through consent conditions. Regional Council compliance notification.
Objective 2: **To ensure all key staff members are fully trained in the operation and maintenance of the effluent application system**	All key staff reach industry effluent management training standard				Identify key staff members to manage and maintain the effluent irrigation system on a daily basis as and when required. No major and no more than x minor staff related effluent management incidents per year. Involve individual key staff members in a comprehensive on-farm training programme covering all aspects of dairy effluent management and equipment maintenance including: - The key benefits of effluent - Management to ensure the avoidance of runoff - Correct application rates - System maintenance - System monitoring for problem identification - Individual responsibilities and accountability.	Staff training records Records of staff induced effluent management incidents.
Objective 3: **To implement a robust equipment and machinery maintenance programme.**	Effluent equipment and machinery maintenance schedule displayed Close adherence to listed best				Effluent Management Plan - to include maintenance schedule – prepare, implement, display and regularly update No major and no more than x minor breakdowns caused as a result of inadequate system maintenance	Effluent Management Plan - Maintenance Schedule System maintenance records

	management practices. Significant variations noted together with reasons for variations and actions taken				The system must be fully maintained at all times as per the maintenance schedule and all potential problems identified, recorded, and rectified ASAP. Ensure that contingency plans in place to deal with breakdowns of the disposal system. Plans must be understood by all staff	Effluent management incident records.
Objective 4: **To ensure that the effluent system is set up to minimise any risks associated with effluent disposal.**	Full compliance with CRC consent and/or permitted activity requirements				The system will be designed by a suitably qualified person. The design will take into account: - Soil types - Storage requirements - System layout - Application methods - Local hazards (e.g. proximity to waterways, presence of tile and mole drainage etc) M**inimise the volume of effluent produced** Reduce the amount of effluent on the shed floors, platform and yard by careful management of herd temperament and stress influence. - Allow time for adequate paddock muster and yarding. - Be even tempered and quiet in handling on farm and in the yard. - Avoid or reduce situations that upset the cows. - Minimise slippery surfaces. - Avoid stray electricity. Reduce total volume of effluent - Divert roof water away from shed - Eliminate unnecessary water overflow around shed - Maintain pipes and hoses. - Pre-wet yard and rails around yard - Use a scrapper to remove solids from platform. - Recycle cooler water to wash down storage	Records as required through consent conditions. Regional Council compliance notification Farm observations Best management practice variation records and actions taken Upgrade plan
Objective 5: **To avoid contamination of groundwater and surface water**	Close adherence to listed best management practices. Significant variations noted together with reasons for				Using only designated disposal area for effluent irrigation - Ensure an even spread of effluent over the whole of the designated area. - Modify daily application routine to account for variation in	Effluent map Effluent diary

	variations and actions taken. Designated disposal area marked on map with high risk areas identified.				risk areas. - Modify daily application routine to allow for wet weather. - Retain effluent in storage if soils at or above field capacity and/or tile drains are running. Ensure that effluent disposal does not occur: - Within 20m of any surface waterway (including open drains) - Within 30 m of any bore or spring Avoid any ponding or runoff of effluent	Best management practice variation records and actions taken GPS application records
Objective 6: **To Implement specific procedures for dealing with leakage or spillage from any part of the disposal system.**	100% adherence to the procedures				Effluent Management Plan- to include effluent incident procedures – prepare, implement, display and regularly update Take immediate action if incident occurs including: - notify the Regional Council - rectify the problem - clean up if possible - take action to minimise the risk of the incident occurring again	Effluent Management Plan – effluent incident procedures Incident record

E. Waterway & Riparian management

Our goal is to protect the waterways on our farm so as we avoid, remedy, or mitigate:

- *Stock damage to banks, causing sedimentation*
- *Contamination of water by stock or agrichemicals*
- *Soil loss causing sedimentation of waterways*
- *Poor water quality and stream life*

WATERWAY AND RIPARIAN MANAGEMENT PLAN

Irrigation Scheme Objectives and Targets					Farm Best Management Practices and Records	
Objectives	**Targets**	**Significance** L	M	H	**Best management practices**	**Records that will be kept**
Objective 1: **To exclude all cattle and deer from waterways**[2]	100% cattle and deer exclusion from waterways Comply with relevant requirements as set by Canterbury Regional Council for relevant farming area				Exclude cattle and deer from all waterways on property including farm drains. Leave a riparian margin of at least 1-2m on flat land.	No records required. Field observation.
Objective 2: **To minimise soil loss and contamination of waterways**	Close adherence to listed best management practices. Significant variations noted together with reasons for variations and actions taken.				Use a wide riparian buffer to provide a filter at low points where there is a risk of runoff from paddocks. Ensure that runoff from stock races and tracks does not flow directly into waterways. Where necessary direct any run-off to open pasture. When cultivating a paddock, leave a buffer uncultivated beside the stream to filter any runoff. The steeper the paddock the wider the buffer. Buffers range from a minimum of 2m on flat land to at least 5m on sloping land. When using stock grazing for weed control within riparian margin, graze only young or dry stock at low stocking rates.	Field observation. Best management practice variation records
Objective 3:	Close adherence to listed best				Plant suitable trees and shrubs on waterway margins.	Planting plan and map.

[2] For the purposes of this plan a waterway includes all streams, creeks and rivers, farm drains, and significant wetlands (as identified by ECan).

To enhance water quality and stream life	management practices. Significant variations noted together with reasons for variations and actions taken.				x % of riparian margins on the main waterways on property planted by xxx.	Field observation.

F. Biodiversity and ecosystem management

Our goal is to include biodiversity and ecosystem management as an integral part of our farm management so as we avoid, remedy, or mitigate:

- *Loss of native plants and native animals and their habitats;*
- *Loss of ecosystem diversity*
- *Loss of habitat for pollinators, beneficial birds, insects etc*
- *Loss of shelter for stock, crops and soil conservation*

BIODIVERSITY AND ECOSYSTEM MANAGEMENT PLAN

Irrigation Scheme Objectives and Targets					Farm Best Management Practices and Records	
Objectives	**Targets**	**Significance** L	M	H	**Best management practices**	**Records that will be kept**
Objective 1: **To protect moderate and high value biodiversity sites**[3]	Protect identified sites as required by the Canterbury Biodiversity Strategy.				Identify and manage important native species or habitats	Keep records of any specific sites and their management

[3] As identified by ECan

APPENDICES

1. Summary of all relevant Canterbury Regional Council resource consent conditions relating to the supply of irrigation water that affect on-farm activities