



# Description of upcoming scenarios in the OTOP healthy catchments project

1 May 2017

This paper describes the key components and assumptions of the in-zone gains and new water scenarios. These will be finalised and reported with the scenario results.

## Scenario 2 “In zone gains”

This scenario is designed to test how the existing water resources in the zone could be used more efficiently and to optimize for better environmental outcome in the rivers.

There are no new sources of water for irrigation or augmentation.

- Canterbury Land & Water Regional Plan
  - Apply PC5 – all farms are at GMP or better
  - Orari River Flow allocation regime ( sect 14)
- Amend Opihi River Regional plan to:
  - 150-day stream depletion test for minimum flows to align with LWRP
  - incorporate OEFRAG changes to Opihi flow regime (Table 1 and Table 2)

Table 1 Minimum flow regime for the Opihi River/ Opuha shareholders

### Proposed OEFRAG

	Lake level >385m	Lake level 380m-385m	Lake level <380m
	min	min	min
January	3.50	3.40	3.40
February	3.50	3.40	3.40
March	7.50	6.40	5.40
April	8.00	8.00	5.60
May	4.50	4.50	3.90
June	4.00	4.00	3.60
July	4.00	4.00	3.60
August	4.50	4.50	3.90
September	6.00	5.30	4.60
October	8.50	7.20	5.90
November	7.00	6.10	5.10
December	6.00	5.30	4.60

Table 2 Restriction regime for the Opihi River/ Opuha shareholders

## Proposed OEFRAG

	Lake level >385m	Lake level 380m-385m	Lake level 375m-380m	Lake level 370m-375m	Lake level <370m
	% available				
January	100	75	50	25	0
February	100	75	50	25	0
March	100	75	50	25	0
April	100	100	50	25	0
May	0	0	0	0	0
June	0	0	0	0	0
July	0	0	0	0	0
August	0	0	0	0	0
September	100	75	50	25	0
October	100	75	50	25	0
November	100	75	50	25	0
December	100	75	50	25	0

- Improved irrigation efficiency ~90%
- Reduce race losses from irrigation schemes to improve reliability
- Rangitata South irrigation scheme providing high reliability water, allowing groundwater and surface water abstractions to reduce within the command area.
- Areas where surface water nitrates breach NPSFM bottom line management beyond GMP is required
- To meet the NPS national bottom line for Washdyke lagoon TN must reduce by over 300%, TP by 43% and E.coli by 6%
- To protect shallow groundwater (<20m) for drinking N load is to be reduce to an average concentration of half the Maximum Allowable Value (MAV). This is an average concentration of 5.6 mg/l.
- To meet half MAV some areas must reduce beyond GMP as follows:
  - Ashwick Flat ~9%
  - Rangitata Orton ~53%
  - Lower Opihi ~32%
- Irrigation areas are modelled as current (Figure 1)



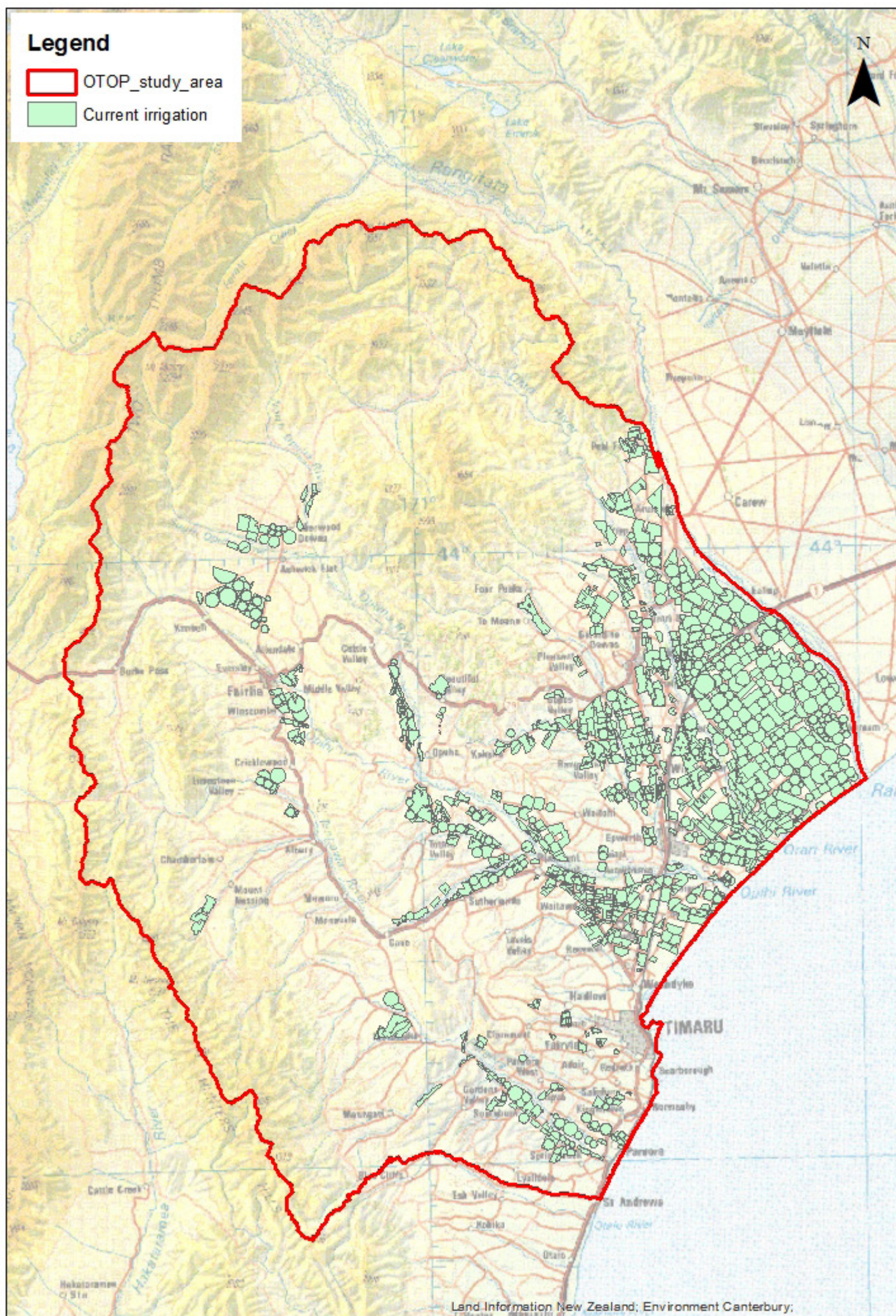


Figure 1 Irrigation areas in the in-zone gains scenario



## Scenario 3a 'New water, small scale'

This scenario will examine the consequences if the proposed irrigation schemes are fully implemented, using additional water.

- Canterbury Land & Water Regional Plan
  - Apply PC5 – all farms are at GMP
  - Orari River Flow allocation regime (sect 14) -
- Amend Opihi River Regional plan to:
  - 150-day stream depletion test for minimum flows to align with LWRP
  - incorporate OEFRAG changes to Opihi flow regime (Table 1 and Table 2)
- Existing consented schemes source new water from Rangitata River water and Waitaki River (Figure 2)
  - Hunter Downs scheme ~8300 ha in the Pareora and ~2060 ha in the Otipua catchments
  - Supply of already consented Rangitata River water results in 5680 ha of Top-up irrigation, supplanting 50% reliability of supply, modelled as 2840 ha of groundwater being replaced by high reliability alpine water in the lower Opihi/ Temuka catchments
  - Additional irrigation of approx. 1700 ha in the lower Opihi/ Temuka Catchments
- Improved irrigation efficiency ~90%
- Reduce race losses from irrigation schemes to improve reliability
- Rangitata South irrigation scheme providing high reliability water, allowing groundwater and surface water abstractions to reduce within the command area.
- New water is supplied via pipe with no losses
- New irrigation areas and replacement areas have been assigned randomly to irrigable land parcels within scheme command areas. **These do not necessarily reflect individual landowners' intentions**



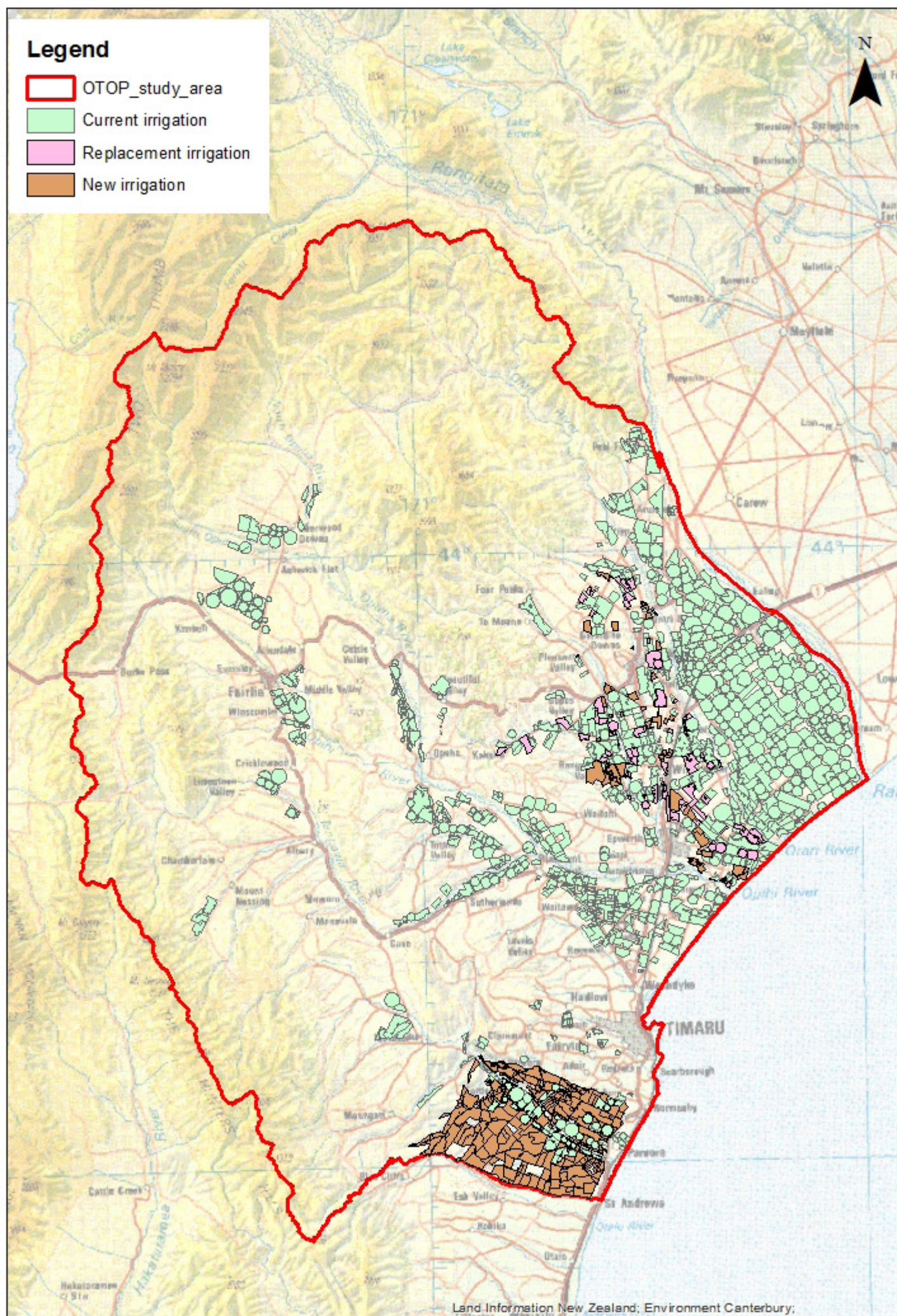


Figure 2 Irrigation areas in the 'New water small scale' scenario



## Scenario 3b 'New water, large scale'

This scenario will examine the consequences if much of the potentially irrigable land in the zone received new water from outside the zone

- Large scale irrigation implemented in the zone, from a number of potential sources
- New in-zone water infrastructure to store alpine water out of irrigation season
- Canterbury Land & Water Regional Plan
  - Apply PC5 – all farms are at GMP
  - Orari River Flow allocation regime ( sect 14)
- Amend Opihi River Regional plan to:
  - 150 day stream depletion test for minimum flows to align with LWRP
  - incorporate OEFRAG changes to Opihi flow regime (Table 1 and Table 2)
- Existing consented schemes source new water from Rangitata River water and Waitaki River (New water small scale)
  - Hunter Downs scheme ~8300 ha in the Pareora and ~2060 ha in the Otipua catchments
  - Supply of already consented Rangitata River water results in 5680 ha of Top-up irrigation, supplanting 50% reliability of supply, modelled as 2840 ha of groundwater being replaced by high reliability alpine water in the lower Opihi/ Temuka catchments
  - Additional irrigation of approx. 1700 ha in the lower Opihi/ Temuka Catchments
- New water supplied from alpine rivers to providing water for approx. 15010 ha of irrigation, this is split between 11710 ha of new irrigation area and 3300 ha of replacement irrigation. This water is not currently consented and the source is not considered in this assessment.
- Improved irrigation efficiency ~90%
- Reduce race losses from irrigation schemes to improve reliability
- Rangitata South irrigation scheme providing high reliability water, allowing groundwater and surface water abstractions to reduce within the command area.
- New water is supplied via pipe with no losses.
- New irrigation areas and replacement areas have been assigned randomly to irrigable land parcels within scheme command areas. **These do not necessarily reflect individual landowners intentions**



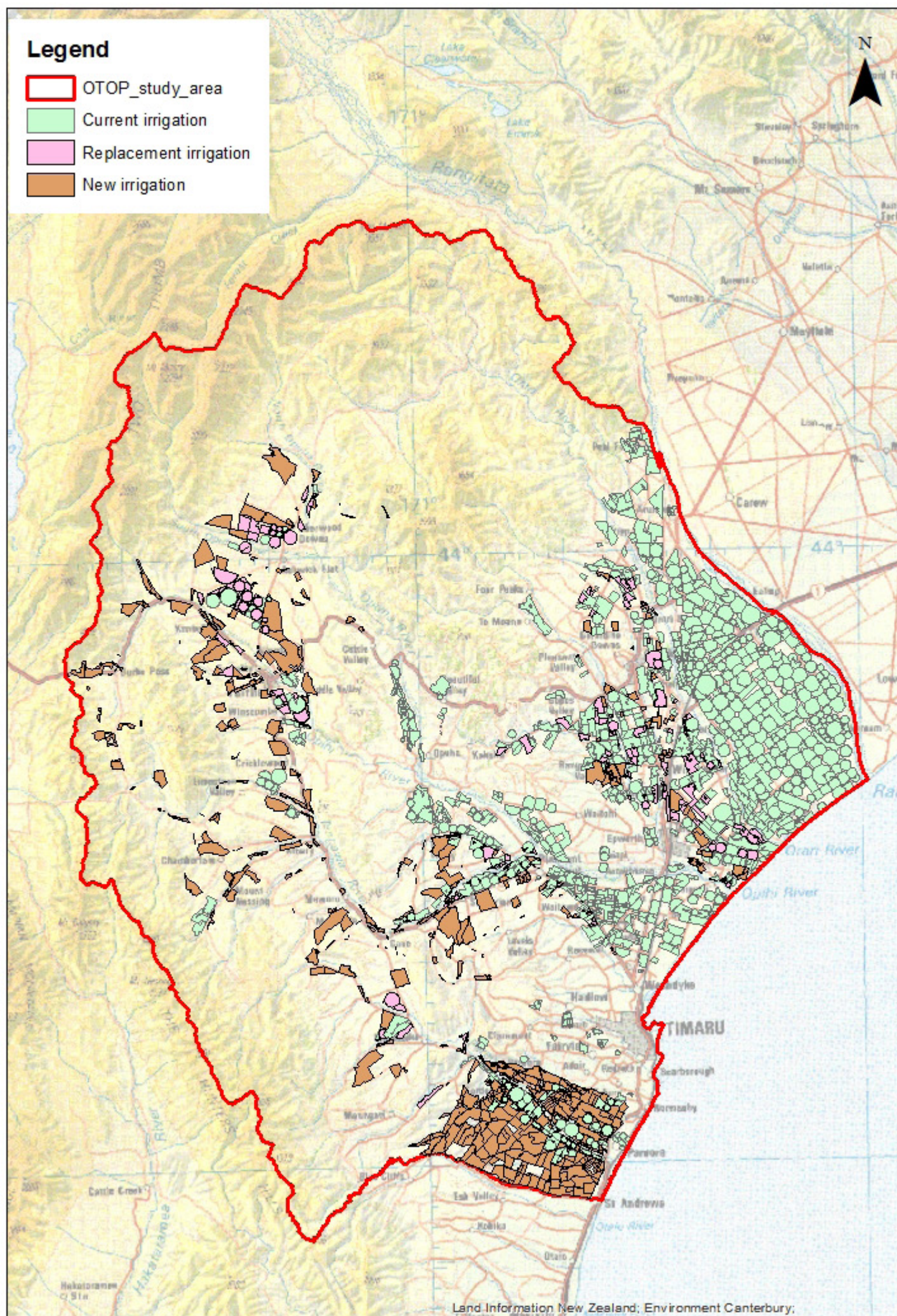


Figure 3 Irrigation areas in the 'New water large scale' scenario