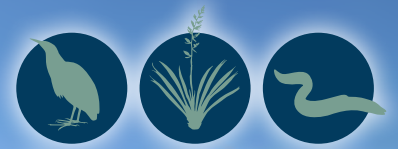


# Arawai Kākāriki 2020 Programme Update



Arawai Kākāriki  
Wetland restoration programme

Lake Heron and Mt Sugarloaf. Photo: Nancy Collis

Welcome to our annual update on the Arawai Kākāriki wetland restoration programme, which provides a summary of our conservation efforts for 2019/20. Thanks to all our partners supporting wetland conservation across New Zealand.

## Highlights from the past year

See inside for details:



**New bittern/matuku research** to understand how wetland degradation affects the food web



**Corybas carsei on the increase** in Whangamarino



**Applying thermal imagery technology** for ungulate detection at Awarua



**Blocking historical drains** to restore wetland hydrology



Volunteers **boosting planting efforts** at Ō Tū Wharekai



**New publications** supporting wetland conservation

## New research on declining nutrient intake for Australasian bittern/matuku

Research on the fat content of bone marrow in deceased bitterns has revealed the birds are very likely starving to death. Upcoming research will use stable isotope analyses of feathers to understand the birds' nutrient intake. Feathers from the last 100 years will be compared to reveal how nitrogen and carbon isotopes in bittern tissue have changed. Wetland degradation is expected to have a profound impact on the nutritional quality of the whole food web, affecting apex predators like bittern.



Australasian bittern. Credit: Colin O' Donnell.



Department of  
Conservation  
Te Papa Atawhai

## Whangamarino

### Corybas numbers on fire

Another year of controlled burning has helped increase habitat for a rare orchid found only at Whangamarino – the nationally critical *Corybas carsei*. This year saw a record number of 501 plants, up from 386 last year. The high numbers have allowed researchers from Te Papa, Victoria and Massey universities to investigate how *Corybas* is pollinated and study its relationship with a fungal species.

### Improving weed management

A new weed management plan sharpens our approach to reducing the spread of invasive weeds: willow species, yellow flag iris, alligator weed, and the parasitic golden dodder (*Cuscuta campestris*).

Golden dodder was recently detected at Whangamarino and Lake Whangape. This year, helicopter surveys have been used to assess its spread and we are working with Fish and Game on control operations.

### Connecting with the local community to protect our wetland species

To celebrate World Wetlands Day in February, the Whangamarino team held a planting event with flax weaving for young conservationists. There was a lot of interest from community members keen to find out how they could lend a hand with weed control and trapping in their own areas. Fish and Game are also helping protect our rare wetland birds – showing taxidermied bittern to make sure hunters recognise these rare birds.



# Awarua-Waituna

## Thermal imagery helps control ungulates

Deer and pigs cause widespread damage at Awarua through heavy browsing and ground disturbance. Locating them in the vast wetland is a difficult task, so this year thermal cameras were trialled as a detection method. On one aerial shooting expedition 11 deer were located and dispatched in dense vegetation, making thermal imaging an effective tool for future use.

## Automated pig detection

Pig incursions occur sporadically at Awarua, but as the wetland is over 10,000 ha they can go undetected. A recently installed pig feeder and camera system emails an image when a pig enters the feeder, alerting the rangers to set up traps. 22 pigs have been successfully removed.

## Predator trapping secures Awarua Bay

We have strengthened protection for the thousands of wading birds which make Awarua Bay internationally significant, including bar-tailed godwit, red knot, NZ dotterel, Australasian bittern, fernbird and marsh crane. Awarua Bay is now completely encircled in predator traps that are checked monthly, removing rats, cats, stoats, weasels and hedgehogs.



Thermal image of a deer. Photo: Trap and Trigger Ltd Images



The pig feeder/camera system. Photo: DOC images



## Ō Tū Wharekai



Identifying plants in kettlehole survey. Photo: DOC images

### Protecting high-country kettleholes

Kettleholes – shallow depressions that flood periodically – support individual and unique communities of turf plants. This year we re-surveyed the plant communities of eight kettleholes to detect changes in condition and adapt our management. Results show that introduced grasses are becoming more dominant, which may be due to mild winters preventing grass dieback.

### Working together for restoration

Community volunteers and students from Ara Institute boosted our planting efforts threefold, helping to re-establish native plant communities after willow control. Monitoring the success of these plantings will help guide future restoration, which is difficult to achieve in the extremes of the intermontane environment.



Restoration planting at Lambies stream Photo: DOC images

### Grebe hotels

Grebe are common around OTW in summer but have not been seen to breed. A lack of woody debris restricts their nesting opportunities, so in hopes of encouraging breeding we have created eight artificial nesting platforms. We will monitor the platforms over spring to see if the indigenous waterfowl check in.



Experimental Grebe platform. Photo: DOC images

## Science update

### Making wetlands wet again

Wetland drainage has led to the loss of freshwater biodiversity across New Zealand. The Arawai Kākāriki science team has been studying the impacts of drains at Moawhitu, Awarua and Kaimaumau and working with DOC Operations to use dams to restore wetland hydrology.

#### *Rewetting Moawhitu*

One year after drain blocking the indigenous vegetation cover has increased from median 40% (2018) to 84% (2020). While this is promising, there is currently large variation between plots. We are hoping in future years this result will become statistically significant.

#### *Rewetting Awarua*

Historical drainage in the Toetoe block, a large peatland in Awarua, has lowered water levels and led to gorse invasions. Our research suggests the drains draw water out of the wetland from a distance >50m. In June 2020, the Operations team installed a dam to rewet the peatland, helping re-establish the natural peat formation process and facilitate native vegetation recovery.



Rewetting Awarua (Toetoe block). DOC images.

## Partnerships

### Resilient wetlands – partnership with Manaaki Whenua | Landcare Research

Arawai Kākāriki continues to collaborate with the Resilient Wetlands research programme led by Manaaki Whenua | Landcare Research. Together we are:

- Researching how plants respond to changing nutrient inputs, which will inform nitrogen and phosphorus limits for maintaining wetlands – see our New Publications for research at Ō Tū Wharekai.
- Testing methods to upscale restoration of native kahikatea forest at Whangamarino

We look forward to continuing our partnership in new wetland projects during 2021.

### Lakes 380 partnership at Moawhitu

The Lakes380 team, led by the Cawthron Institute and GNS, collected soil cores from Lake Moawhitu to reveal how catchment vegetation has changed over the last 1000 years. The cores indicate dramatic changes in vegetation type after Māori and European arrivals - check out the factsheet in our list of new publications.

## New Publications:

Burge O R, Clarkson B R, Bodmin K A, Bartlam S, Robertson H A, Sukias J P, Tanner C C. 2020. Plant responses to nutrient addition and predictive ability of vegetation N: P ratio in an austral fen. *Freshwater Biology* 65: 646-656. See [link](#)

Holmes R. 2019. Waituna Creek restoration trial: progress report. Report prepared for the Department of Conservation. Report no: 3362. Cawthron Institute, Nelson.

De Winton M. 2020. Vegetation status in Waituna Lagoon: Summer 2020. Report prepared for the Department of Conservation. NIWA, Hamilton. See [link](#)

Tait A, Pearce P. 2019. Impacts and implications of climate change on Waituna Lagoon, Southland. *Science for Conservation* 335. Department of Conservation, Wellington. See [link](#)

Blyth J, Nation T, Taylor G. 2020. Moawhiti wetland hydrological restoration: inundation scenarios, control structures and peak flow assessment. Report prepared for the Department of Conservation. Taylor Collaborations Limited, Wellington.

Lakes380. 2020. Lake Moawhiti Factsheet: Lakes380 Our lakes' health past, present, future Me hoki whakamuri, kia haere whakamua. See [link](#)



## On the horizon

- » Lots of new report cards including Waituna Lagoon health, fernbird and crane recovery, Whangamarino weir performance and willow control trials
- » Testing methods for lowland wetland forest restoration – direct seeding or planting
- » Continuing our weed and pest animal control programmes
- » Promoting better outcomes for lakes – sharing a new report on the ‘State of Waituna Lagoon’ and keeping tabs on kakahi/freshwater mussels at Ō Tū Wharekai
- » Promoting wetlands and Arawai Kākāriki at World Wetland Day events (February 2) and international wetland conference INTECOL (October 2021, Christchurch)