

# Wet & Wild!



NEWSLETTER OF THE NATIONAL WETLAND TRUST

No. 8, Winter 2003

[www.wetlandtrust.org.nz](http://www.wetlandtrust.org.nz)

**Welcome** to the winter edition of Wet and Wild! which has a major focus on wetland restoration. We are excited to have a report on the amazing wetland restoration work that has been going on in the Hawke's Bay, where the local regional council has really got down to business systematically protecting and restoring it's highest priority wetlands.

We also have a report from Christchurch where 3 large-scale coastal wetland projects are all underway, following 10 years of successful restoration on freshwater wetlands with HUGE increases in the waterfowl population.

Talking ducks, Sue Moore who was our first recipient of the Golden Plover Award, gives us some interesting insights into the charming habits of pateke (brown teal) including their favourite foods (clover!!).

In wetland snippets this month we also have a rundown of a whole lot of restoration activities going on around the country and Dr Bog answers some commonly asked questions about the nutrient stripping abilities of native plants.

*We hope you enjoy the newsletter.*

## AGM 2003

The 2003 Annual General Meeting of the National Wetland Trust was held on the 16 June at Mighty River Power in Hamilton.

The following trustees were elected: Ian Boothroyd, Bev Clarkson, Karen Denyer, Doug Emmett, Phillippe Gerbeaux, David Lawrie, Tahi Ngakete, Paula Reeves, Tony Roxburgh, Keith Thompson, David Sharland and Gordon Stephenson. All former trustees making it a smooth transition into another busy year of activities.

A major activity of the Trust this term will be to raise funds to enable building work to commence on the wetland education centre at Rangiriri. We are also wanting to increase access and appreciation of wetlands, particularly our Ramsar sites. To do this we will be launching information on wetland trails on our website and producing a booklet promoting Ramsar sites, the latter sponsored by the Department of Conservation (thanks DoC!).

It is clear that there has been a huge growth in interest in wetlands in the four years of the Trust's existence and that this is now providing the impetus to enable the Trust to achieve its vision.

## National Wetland Symposium 27-28 February 2004 WELLINGTON

The National Wetland Trust is thrilled to announce the first ever NATIONAL WETLAND SYMPOSIUM.

This highly practical symposium aims to bring together people committed to wetland restoration, local government and wetland scientists for 2 days full of exciting speakers, training workshops and discussion forums.

If you want to be a part of this exciting event then register your interest with Melanie Dixon at the Greater Wellington Regional Council:  
ph: 04 384 5708  
fax: 04 385 6960  
email: [wetlands@gw.govt.nz](mailto:wetlands@gw.govt.nz)



NATIONAL WETLAND TRUST OF NEW ZEALAND

# Wetland Restoration in Hawke's Bay

Garth Eyles and Ian Cairns, *Hawke's Bay Regional Council*

Protecting Hawke's Bay's wetlands has been a priority of the Hawke's Bay Regional Council since 1993. In 1995 the Council commissioned the Department of Conservation to produce a list of wetlands that should be considered for protection and enhancement. This list included open water areas such as Whakaki Lake in northern Hawke's Bay, estuarine areas at the mouths of the Ngaruroro and Tukituki rivers, and the willow choked swamp south of Hastings, known as Pekapeka. Some of these wetlands were in public ownership, but most had private or Maori title. From this list 10 priority wetlands, (now increased to 13), were selected for protection and restoration.

Council policy is to determine the values of each wetland, decide on whether it is feasible, practical and affordable to return the wetland to a state where those values are sustained. The first step in this process is to prepare a Management Plan for each wetland. The Plan identifies the key issues, develops a remedial programme and determines the Council's input. Consultation with landowners, Forest and Bird, Fish and Game, other interest groups and tangata whenua is involved and a Community Interest Group is established for each wetland. These groups provide local perspective, advice and assistance with the enhancement programme.

## **Expenditure on Wetlands**

In the 6-year period to June 2003 almost \$1 million of Council funds has been spent on wetland restoration in Hawke's Bay. Annual allocations were \$200 000, which has now increased to \$250 000 per year. The big expenses are fencing, willow removal and water level control. Land purchase is not a priority as the Council is happy to assist private owners, but it does require this assistance to be protected by a covenant such as the National Trust.

## **Pekapeka Wetland**

Pekapeka lies adjacent to State Highway 2 about 12 km south of Hastings. The Palmerston North to Gisborne railway crosses the wetland in several places. The wetland is located in a narrow basin, surrounded by limestone capped hills and forms part of the Poukawa basin, which drains onto the Heretaunga Plains. The former HB Catchment Board purchased parts of the wetland for flood protection in the late 1960's. At that time there were few willows evident, but in the intervening years grey and crack willow have spread and covered over 90% of the wetland prior to the restoration programme commencing. The fenced out area now totals 90ha.

A Management Plan was prepared for Pekapeka in 1998 and the Council allocated funds for land purchase, boundary fencing and willow removal. The aim is to remove as many of the willows as is possible, and to encourage wetland species such as rushes and raupo to re-establish. New planting around the margins of the wetland by Forest and Bird, the Kiwi Conservation Club and local schools, using indigenous species that would have been common in the area, is also being carried out.

The dense forest of willows has provided the Council with many challenges. Aerial spraying with glyphosate has been quite successful, but hand cutting and machine clearing has also been used. Ground water conditions can limit the areas where machinery can work and the huge piles of willow trunks and branches need to be left to dry prior to burning. Hand cutting is also used close to areas of high biodiversity or other plantings which need protection. The cut ends of the willows are treated with herbicide to prevent re-growth.

Pekapeka has always been a favoured spot for duck shooters. The Council has an agreement with the shooters, through Fish and Game, (who manage the game shooting,) to undertake restoration work. The shooters develop stand plans which cover open water development, weed control, willow re-growth and re planting. The Council assists with the supply of herbicide and plants.

## **On Farms Wetlands**

This year the Hawke's Bay Regional Council has introduced a new initiative to assist landowners with the restoration and protection of wetlands on private property. This new policy offers grants of up to \$5000 for earthworks, fencing, weed removal and planting. 38 expressions of interest were received in the first week of the policy announcement, with more coming in each day. This indicates a huge interest in biodiversity in Hawke's Bay.



**Aerially sprayed willows at Pekapeka Swamp.**



**Crack and grey willow at Pekapeka Swamp. Photo HBRC.**

# Pateke (Brown Teal) Research

Sue Moore

Pateke or Brown Teal (*Anas chlorotis*) are charming, feisty, wee ducks, which are in dire straits. Although they were once widespread throughout New Zealand and on the Chatham Islands, over the last 130 years their range has contracted so that now wild populations are effectively confined to a small area of Northland and Great Barrier Island. Even on mustelid-free Great Barrier pateke have not been managing to hold their own. The Department of Conservation's Brown Teal Recovery Programme was audited in 2000. The audit described the management and research required to reverse the decline, which if not stopped, was predicted to cause the virtual extinction of wild pateke within 15 years. My recently completed masters thesis was designed to address three research needs identified by the audit as central to pateke recovery: diet, release and post-release techniques for captive-bred teal, and identifying cause of death of pateke in the wild.

I determined the diet of wild pateke by observing feeding birds and analysing droppings, plus gut contents of dead birds recovered by Department of Conservation and Great Barrier locals.



**Pateke family, Akapoua Bay, Great Barrier Island.**

Photo by P.F. Battley

Teal had a very diverse diet: 78 taxa were recorded, including terrestrial, freshwater and marine invertebrates, fungi, and terrestrial and freshwater vegetation.

Like many dabbling ducks, pateke eat numerous small seeds, particularly those of Cyperaceae (sedges). But I was surprised to find that wild pateke were able to prise open live cockles to remove the flesh, previously only oystercatchers were known to do this (see *Waterbirds* 26: 331-334, 2003, for more details). I also hadn't expected them to eat clover leaves, but these were a favoured food.

Wild pateke had a much more varied and higher fibre diet than captive teal. The digestive tract in many animals (including pateke and humans) is morphologically flexible, and differences between captive and wild diets can cause differences in gut morphology. I compared the size and mass of the digestive organs (proventriculus, gizzard, small intestine, caeca, rectum and liver) of 57 wild, 7 captive and 4 captive-bred released teal. Captive pateke had much shorter and lighter small intestines and caeca than wild teal. These differences could reduce the ability of captive-bred teal to efficiently digest a wild diet, and make it harder for captive birds to survive in the first months after release. Increased fibre and diversity in the captive diet, plus supplementary feeding post-release, were recommended, and are already being trialed by the Pateke Recovery Group.

I also monitored the release of captive-bred pateke to Mana and Kapiti islands in 2001. Some of the birds died, but as the carcasses were extensively damaged by predators or scavengers, it was difficult to determine the cause of death. To check whether feeding difficulties had contributed to their deaths I developed a method to detect starvation using the wing fat content of pateke (see *Notornis* 50: 133-140, 2003, for a description of this). Captive-bred released pateke that had died on Mana, Kapiti, and Tiritiri Matangi islands, and Karori Wildlife Sanctuary were found to have been in very poor nutritional condition (i.e. they had starved). Since then, the wing fat method has also been used on wild pateke recovered as partial remains, and has shown that some wild teal from Great Barrier Island starved last summer. It's likely that human-induced changes to the landscape limit food availability for wild pateke, particularly during droughts.

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I'm very grateful to the Wetland Trust for supporting my work by awarding me the 2001 Golden Plover Award. I'd also like to acknowledge financial assistance received from a Julie Alley Bursary, the Department of Conservation, and a Massey Masterate Scholarship. Many people provided practical assistance for the research, especially DoC staff and Ducks Unlimited members, Ian Henderson and Ed Minot of Massey University, Colin Webb of Landcare Research, and Phil Battley of Otago University.

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## Progress at Fensham Wetland, Carterton

Sheila Stapleton, Fensham Group

Fensham Wetland is part of the Fensham Reserve which was bequeathed to the Royal Forest and Bird Protection Society by the late Mr. John Fensham. The wetland consists of three hectares and is made up of four vegetation types, an area of grassland dominated by blue sweet grass and yorkshire fog, an area of manuka/sedge shrubland dominated by manuka, *Coprosma tenuicaulis*, *C. propinqua* and *Blechnum novae-zealandia*, juncus and baumeas, an area of kahikatea/totara/matai forest with an understorey of sedges and an area of predominantly dry grassland comprising browntop and juncus. The area was grazed by cattle until it was fenced in 1997.

The aim of the Fensham group is to protect the ecosystem and restore the wetland to as representative example of the habitat type as possible. For guidance in carrying out these objectives a meeting between representatives of DOC and the then Wellington Regional Council and members of the Fensham group was held and after this meeting a Restoration plan was produced by Paula Reeves.

It was agreed that the wetland should be restored by trying to create the conditions for natural regeneration to take place. The nationally threatened brown mud fish is present in reasonably high numbers. It is considered important to maintain or if possible increase these numbers. Fencing the area and excluding stock made an immediate improvement to the area with the emergence of many seedling trees. marked increase in the vegetation in some of the plots but little change in those which contain sweet grass.

The other weed which causes some concern is the monkey musk which was growing prolifically in the kahikatea/totara/matai area. This was sprayed with herbicide initially and is subsequently hand weeded. The sedges *Carex virgata*, *Carex secta* and *Carex dissita* have been planted and the incidence of the weed is much reduced.

However, the extensive grazing in the past had opened up the area to the prevailing northwesterly winds. A barrier of

shrubs was planted against this wind, using only plants that were found within the wetland. The wetland is fed by two small streams that drain adjoining farmland. Consequently the water feeding the wetland is very nutrient rich and this has caused the proliferation of the weed, blue sweet grass. So far it has not been possible to obtain co-operation from the adjacent land owners in trying to reduce the nutrient content of the water, i.e. by fencing the streams and planting.

In order to reduce the incidence of this weed grass, sixteen plots measuring 2m x 2 m have been sprayed with herbicide and these have been planted with manuka, *Coprosma tenuicaulis*, *C. propinqua*, *Carex virgata*, *Carex secta* and *Carex dissita*. Within a year it is hoped that the shrubs will have the effect of shading out the weed grass and in two years the sedges will start to take over. Further plots will be treated similarly next summer. The nutrient levels of the water entering and leaving the wetland area are regularly monitored.

### Buffer planting for the Fensham Wetland.





#### **Re-planting and a new boardwalk taking place below several magnificent kahikatea at Fensham Reserve.**

Twelve monitoring plots were established at the time the restoration work commenced. These plots measuring 2 x 2 m are marked permanently with poles and the plants within the area listed and photographed. After two years there is an increase in native plants in some areas, however the wet grassland areas that run through the middle of the wetland remains dominated by weeds as expected.

The work continues and at times progress seems slow but comparing photographs taken when work commenced to those taken recently, the results are obvious.

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## **Encouraging News from Wetland Restoration Projects in Christchurch**

*Andrew Crossland, Christchurch City Council*

While news of giant coastal reclamation projects in Korea and elsewhere on the East Asian Flyway is devastating to all involved in shorebird and wetland conservation, hopefully some of the work that is currently being undertaken in Christchurch will do a small part in reversing this international trend.

Currently there are three large (by urban NZ standards) coastal wetland projects underway or about to start in Christchurch City. Earth-moving equipment has recently finished excavating the 20-30 ha Charlesworth wetlands site in

the South-West corner of the Avon-Heathcote Estuary. A large block of farmland was converted into a series of "wader scrapes", channels, pools and islands and this will shortly be connected to the Estuary via 3 large pipes to be constructed under a major arterial road (Humphreys Drive). A small scrape (viz 2 ha) created 10 years ago attracted 15+ pairs of Pied Stilt, as well as roosting flocks of Oystercatchers, herons, waterfowl, gulls, kingfishers, NZ Pipit and arctic waders, including a Lesser Yellowlegs in October 2002.

The success of this initial scrape in attracting wetland birds and the rapid natural colonisation by saltmarsh plants such as *Sarcocornia*, convinced the Christchurch City Council Parks & Waterways Unit to convert the whole Area (originally earmarked as football fields) into a tidal wetland.

Approximately 4 km further north and starting as soon resource consents are finalised is the development of another large tidal wetland, at Bexley, located adjacent to the mouth of the Avon River. Initial work at the site commenced a few years ago (a moat was created to increase tidal inflow into the site and to prevent the unrestricted movement of domestic cats into the saltmeadow areas), but stopped because ground occupied by a former car-wreckers yard was found to be contaminated. Removal of contaminated soil is about to begin and once safely removed, a series of saltmeadow/saltmarsh-covered islands, separated by tidal waterways will be created.

A third project, scheduled to commence in October is the development of a stormwater retention basin and associated tidal wetlands at Ferrymead, adjacent to the tidal reaches of the Heathcote River. Like the Charlesworth and Bexley wetlands, this site is expected to be utilised by a wide range of wetland birds. The restoration/creation of these sites is expected to generate a recovery in the populations of locally breeding birds as well as provide additional feeding and roosting habitat for migrants and seasonal visitors.

One locally-breeding species likely to benefit is the Pied Stilt. In the mid 1980's stilts were sliding toward local

extinction in the Christchurch area. A study of breeding in 1988 found that of 208 eggs laid in nests around the Avon-Heathcote Estuary, all but 6 were lost prior to fledging. Of the six chicks that fledged, only 2 survived beyond a few months. The high loss rate was due to predation, tidal flooding, nest desertion and destruction of nests by vehicles, people and animals. From this low point in the mid-late 1980s conservation measures and habitat creation became major focus of park and waterway development/enhancement in Christchurch and now the trend is reversed to the extent that some 26 native bird species are currently on the increase in Christchurch and only 1 native species (Black-billed Gull) is declining. The populations of all other bird species appear stable.

The current surge in tidal habitat restoration/creation follows on from 10 years of freshwater habitat restoration. Pond and waterway enhancement throughout the city has resulted in a major population recovery of native waterfowl. Christchurch urban waterways now support peak numbers of seasonal occurrence of both Bittern and Glossy Ibis at Travis Wetland, a 130 ha freshwater wetland in NW Christchurch that is well known as the city's flagship wetland heritage park. Also exciting has been the recent sighting of Marsh Crake at Wigram East Retention Basin, a 3.5 ha artificial wetland, which comprises a pond area and planted riparian vegetation over an enormous plastic liner that prevents ponded stormwater from filtering down to freshwater aquifers.



**Travis Wetland – Christchurch City's Flagship Wetland Heritage Park.**

Other wetland restoration/creation projects are planned or proposed by the Christchurch City Council for the next years include the inclusion of stormwater swale and retention wetland systems in new subdivisions, further development of tidal wetlands and improved management of bird breeding habitats on the Waimakariri River (in support of ECAN and DoC), and the proposed establishment of a predator-proof fence around 45ha of restored bush and wetland at the Styx Mill Basin Reserve in the NW part of the city.

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## Third Australian Wetland Forum ... implementing Ramsar

Rachel Kelleher, Department of Conservation Waikato

During June, Phillipe Gerbeaux (DoC West Coast), Shannon Fergie (DoC Waikato) and I were given the opportunity to attend the 3rd Australian Wetland Forum in Adelaide. The forum was an opportunity to meet with Ramsar site managers as well as networking with colleagues from State and Federal governments. It was also an opportunity to find out more about how these governmental representatives and others from NGOs, CEPA/Community Participation expert groups or private landholders are getting on implementing the Ramsar Convention in Australia at the operational, technical and public awareness levels.

During the days prior to the Forum we took the opportunity to visit the Coorong and Lakes Alexandrina and Albert Ramsar site. The area is one of Australia's most significant wetlands and because of its waterbird habitats was designated a Wetland of International Importance under the Ramsar Convention in 1985. The area supports a broad range of other activities including farming, fishing and tourism. There are many stakeholders in the region including the Ngarrindjeri people, recreational boaters and fishers, conservation groups, town residents and water users.

We also stopped at the Currency Creek Winery Complex where a 3km wetland trail ("The Black Swamp" walk) has been developed. The site is one of three Fleurieu Peninsula swamps listed on the National Estate register. Like the Banrock Station, the winery is committed to preserving and restoring the wetland, which contains in particular some rare species such as *Triglochin procerum* (water ribbon).

Wetland Care Australia, Australia's leading NGO wetland repair organisation conducted an interesting trip to Reedy creek lagoon at the end point of a freshwater tributary of the River Murray. A flow control structure made of plastic sheet piling has been installed across a section of the lagoon to recreate the natural wetting and drying regime. Fencing, re-vegetation and flora and fauna studies have also taken place with excellent support from local landowners. The control structure is also being used to help exclude koi carp from arms of the wetland as well. Major sponsors of the project are the Nature Heritage Fund and the Banrock Station (for a total budget of over \$150,000) with the project being driven by the local community.

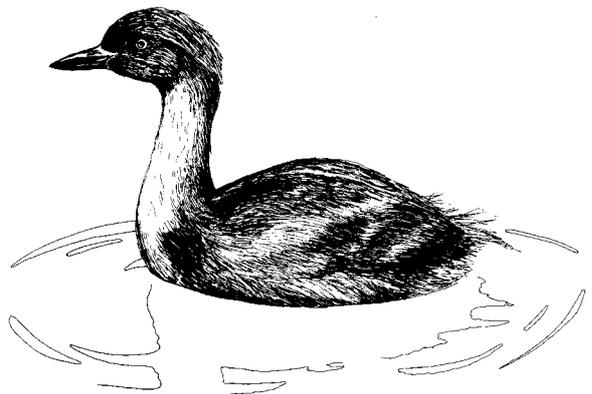


Shannon and the Banrock Station wetlands.

The Forum was held out at Banrock Station, a fantastic Ramsar site with over 7km's of boardwalks and interpretation (and the odd glass of wine!). The forum intended to raise national awareness on Wetland issues and focus on the following:

- Provide feedback and discuss the implications of resolutions made at the Ramsar Conference of Parties 8 in Spain November 2002;
- Discuss the implications of the environmental protection and biodiversity conservation Act for wetland protection and management;
- Provide linkages to the wetland outreach program for partner organisations;
- Further development of the resolutions of the Australian Wetlands Forum 2.

A number of interesting speakers gave presentations from a range of perspectives and following the late withdrawal of one of the speakers I was talked into giving a presentation on restoration in the Whangamarino Wetland which I presented last year at the United States National Symposium on Wetland Restoration. This trip certainly stimulated the three of us as far as improving New Zealand's implementation of the Ramsar convention and we were all grateful for the opportunity.



# Wetland snippets

## World Wetlands Day 2004

World Wetlands Day preparations are already under way World Wetlands Day takes place on 2 February every year, and traditionally the Ramsar Bureau provides materials for the use of everyone who will be organizing WWD activities of their own. The Ramsar Bureau has already let its website ([www.ramsar.org](http://www.ramsar.org)) readers know about preparations for World Wetlands Day 2004 which gives plenty of time for your own planning. This year the Bureau has developed a theme -- From the Mountains to the Sea - Wetlands at Work for Us -- that will allow people to focus on their own wetlands and consider how these wetlands work for their benefit both at national and local levels, and to consider too how to manage their wetlands so that they continue to deliver these benefits.

## Dairying and Clean Stream Accord

Dairy giant Fonterra has signed a clean streams accord with central (MfE and MAF) and local government (Regional councils and unitary authorities), which will give farmers up to nine years to achieve clean healthy water, including streams, rivers, lakes, ground water and wetlands in dairying areas. It provides a statement of intent and framework for actions to promote sustainable dairy farming in New Zealand. It sets specific environmental targets, such as the fencing of 90 per cent of waterways in dairying areas by

2012. Some 90 per cent of significant wetlands in dairying areas must be fenced off within four years. Dairy farms will also need to have systems for minimising nutrient run-off and leaching into waterways. The company says that at some stage, farmers who fail to meet minimum standards will face having them made a condition of Fonterra accepting their milk.

Agriculture Minister Jim Sutton has warned dairy farmers that if they do not back Fonterra's clean streams accord they will face tougher Government regulation that could cost them even more.

## News from the mainland...

*Phillipe Gerbeaux, NWT & DoC West Coast*

### Canterbury

Last April the Christchurch City Council announced the development of an ambitious 1.8 million plan aimed at turning the almost 60ha Styx Mill Conservation Reserve into a wildlife sanctuary where people will be able to observe native species in their natural habitat. Under the Council's plan, a \$450,000 predator fence would be constructed around a large part of the reserve and the area developed as a core breeding and wintering site for wetland birds and bush birds. It will be the fourth most important wetland in the Christchurch area.

A new Timaru volunteer group is now dedicated to improving the Otipua wetland following a request last March by the Otipua Wetland Charitable Trust. The focus is on making the wetland a home for the birds of the region and the new group ("The Friends of the Otipua Wetland") have already plans in place including weed control and replanting of native plants.

## Nelson/Marlborough

The Murchison Community Wetland and Riparian Restoration Project has received a grant from the New Zealand National Parks and Conservation Foundation to set up a native plant nursery on public land in the town. Plants will be used to protect wetlands and streams from run-off from intensifying dairy farmland.

## West Coast

The Wadeson Island Nature project, launched in Hokitika by the Minister of Conservation is a joint venture between DOC and the Westland District Council and aims at restoring a riparian ecosystem and associated whitebait habitat. Most of West Coast DOC staff had their Conservancy day in May and started clearing weeds and replanting native wetland plants. The project will run over several years and will involve the local community including schools.

## Southland

Environment Southland launched a new booklet on Southland wetlands last April. It is aimed at developing the appreciation of wetlands in the region. Copies can be obtained from Environment Southland and local authorities.

Landcorp's Eweburn Farm near Te Anau received a corporate award in the annual environment awards for achieving a balance between productivity and good environmental practice. In the process of converting the farm from sheep and cattle farming into a deer farm, 1600ha have been fenced to protect sensitive or important areas like peatlands. More than 150ha is protected by a riparian protection zone and a DOC covenant and 60ha are under a QEII covenant. More is planned to be set aside. Landcorp has worked closely with the Waiau Fisheries and Wildlife Trust who is also very active in the region (watch this space!).

# Wetland snippets ...

## Mangarakau Swamp secured

Some of you may recall an item in a past issue about the Native Forest Restoration Trusts mission to protect the best swamp in the top of the South Island, the Mangarakau Swamp near Collingwood. We were pleased to hear the Trust has recently received funding from the Nature Heritage Fund and the Rosemary Middleton Trust enabling it to buy 147ha of the swamp and secure it's future.

## Another Ramsar site in progress

The Horowhenua Forest and Bird Society are planning to apply for the Manawatu Estuary to be designated a Ramsar Site giving it recognition as an internationally valuable wetland. The estuary is used by migrating birds, some of them rare or threatened. So far they have the support of horizons.mw, Fish and Game Council, DoC and the Horowhenua District Council. If they are successful then NZ will have 6 listed Ramsar Sites, still a long way behind our neighbours Australia with 63.

## Golden Plover Awards

Thanks to the generous support of Tony Reiger we have been able to award another Golden Plover award this year. The recipient is Alton Perrie from the University of Waikato. Alton is looking at the behaviour and ecology of the Northland and black mudfish.

## Can you help?

Jeremy Busck recently purchased some suburban land at mortgagee auction to save approximately 10 acres of wetland that runs into saltmarshes and mangrove swamp that borders the Whangarei Harbour. This land was recovered from a developer who was going to drain, fill and build a 70 house subdivision on it.

His vision is that this asset gets returned to nature in the form of a stormwater polishing wetland and nature trails park but he lacks the technical knowledge and financial resources to develop a landscape plan for funding applications and bring the wetlands to fruition. Know anyone who might be able to help Jeremy? If so let him know at:

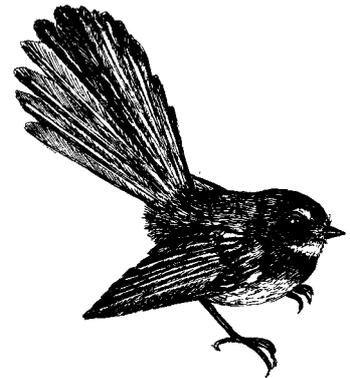
[jeremy.busck@xtra.co.nz](mailto:jeremy.busck@xtra.co.nz).

## Dear Dr Bog...

**Often I see what looks like an oil slick on the surface of water in swamps. Is this really oil or is it some kind of natural phenomenon?**

The oily slick is usually natural. What you're seeing is a scum of iron oxides. The almost neutral pH conditions combined with lots of organic matter in many swamps (including mangrove swamps) provide ideal conditions for dissolving iron into water. The dissolved iron is then oxidised at the water surface where there is plenty of available oxygen causing a scum.

The way to tell the difference between a natural 'oil scum' and a real one is to swirl a stick in it. If the scum breaks up into separate parts it's natural, if it swirls around with the stick without breaking up its a real one.



**What are the best native wetland plants to use for stripping nutrients from water in a drain (carrying dairy shed run-off) that then runs into a wetland or pond?**

This is not a straightforward question. Nutrient removal in wetlands occurs via a variety of mechanisms with direct plant uptake often accounting for only a small proportion of uptake.

Fast growing/nutrient-demanding plants especially introduced weedy species such as water cress, water celery, glyceria and parrot's feather will take up more nutrients than slower growing species, but unless they are harvested will release quite a bit of this nutrient back into the water when they die and decay. Slower growing species (including many natives) generally have lower nutrient uptake rates, but release less nutrient during their decay.

So what are the best plants for your situation? Unless the drain is large and long, and blockage of retained sediments is not a problem, then it is unlikely to be a practical means of improving treatment of high-strength wastes such as dairy shed washwater. Constructed wetlands are much more likely to be useful after treatment in waste stabilisation ponds to remove the worst of the suspended solids and organic matter. Ideas for planting in these areas can be found at:

<http://www.niwa.co.nz/rc/pollution/pubs/no8/dairywaste2/constructed.pdf>

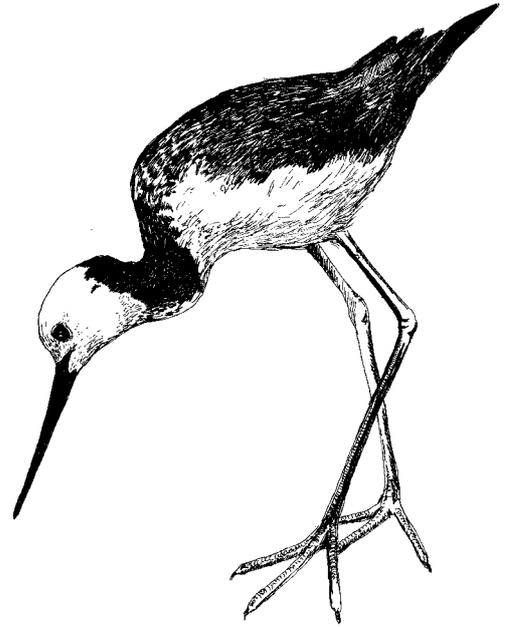
Chris Tanner, NIWA

## KEEPING IN TOUCH WITH THE TRUST

To **submit a contribution for the next newsletter** please contact:

Paula Reeves  
ph: 07 8561738  
Email: p.reeves@niwa.co.nz  
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All the wonderful images contained in the newsletter are by Sonia Frimmel. We thank Environment Waikato for making these images available to us.



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