The Styx
Pūrākaunui
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**"When one tugs at a single strand in nature, one finds it attached to the rest of the world."** John Muir (1838-1914)

As research continues to expose new and exciting discoveries, it is difficult not to question if we have only just begun our journey towards a better understanding the ecology of the Styx catchment, and that like the underside of an iceberg, there are far greater wonders yet waiting to be revealed. Until then, we hope you enjoy reading articles about what has been discovered involving some of the invertebrates, plants, birds and crustaceans that feature in this, the 13th edition of the Styx Newsletter.

# Surprises in the Styx

Have you ever started what looked like a routine task, only to stumble across something unusual, different and beautiful?

This is what happened recently to Environmental Scientist Dr Jens Zollhoefer when he was commissioned to develop a method for setting up a community monitoring programme for springs within the Styx Catchment.

Considering that all of Christchurch's streams and rivers are spring fed, it is surprising that over the past 100 years not a lot of work has been done on identifying and prioritising spring conservation sites. Springs form an important part of river corridor's biodiversity as they are places where water temperature remains constant and where, during times of turbulence in the main river channel such as flooding, many fish and invertebrate species find safe refuge.

Amphipods collected at the Styx headwater: Size comparison of two subterrainean species *Phreatogammarus c.f. fagilis* (body length 13 mm, overall 21 mm), *Paraleptamphopus* and *Paracalliope fluviatillis* (3mm) (top to bottom).

Jens completed the task of identifying six sites designated 'priority conservation sites' within the Styx catchment based on their physical habitat and biodiversity features. The sites range from springs in the headwaters of the Styx River, to springs within one of its main tributaries, the Kaputone Stream. It was while Jens was exploring the headwater site between Sawyers Arms Road and Gardiners Road, which incidentally contains by far the largest and most spectacular clusters of ground water vents in the Styx River, that he came across the unexpected. When investigating samples of water taken from stream vents, it is not unknown to find various subterranean amphipods brought to the surface by the movement of the water. These tiny creatures are given names that seem way out of proportion to their size, for example, one of the most common, Paracallilope fluviatilis, measures in at about 3mm. Amongst the samples taken by Jens during April 2007 were a number of amphipods known as Phreatogammarus fragilis. These can be found at a number of sites around Christchurch and occur in the South Island from Canterbury northward, although they have not yet been found in the North Island. Living deep within the groundwater they have no eyes and, not being subject to sunlight, lack pigmentation.

What surprised Jens about these particular samples was their whopping length. As can be seen from the photograph, these Phreatogammarus fragilis measured in at 21mm; many times the size than any of the subterranean crustaceans that occasionally occur in invertebrate samples taken around Christchurch.

An amphipod is any creature from a vast order of small, usually aquatic crustaceans with a laterally compressed body, for example, beach fleas.

At the moment we do not yet know why amphipods of the size found during April in the headwaters of the Styx River springs have not been recorded previously in Christchurch and what, if any, is the significance of this discovery.

What we do know however, is that it will only be by continuing to investigate, monitor and protect these sites that we will gain a better understanding of their ecological significance and value.
Jens has now developed a management plan for each of the six 'priority conservation sites'. Regular monitoring of key indicators is about to commence and who knows what exciting or significant find is yet waiting to be discovered.
It may be true to say that the more we see, the more we understand, but conversely the more we understand, the more we see.

# Fens discovered in the Styx

How often has it been said that, "Christchurch is a city built on a swamp"? In the main this is true - but what exactly is a swamp?
Terms that describe different types of wetlands, such as swamps, bogs, mires, fens marshes etc all have specialist meanings that are often not recognized and therefore misused.

The statement that, "Christchurch is a city built on a swamp", is in the main true, but the city is also built on other types of freshwater wetlands, some of which still exist, and are in the Styx catchment.

Wetlands on the Styx River and its tributaries are mostly riparian, that is along the margins of the river and associated backwaters and ponds. The wetland type of these sites are **swamps**. Plants such as raupo, flax, tussock sedge, toetoe and the introduced willows occur there. Swamps are characterised by mineral soils and high nutrients, often with through-flow of water.

At the opposite extreme are wetlands that are highly organic, nutrient poor and are fed by rainwater only. These are called **bogs** and they are best represented in much wetter climates such as Southland and Westland. The dry summers of Canterbury make bog formation very unlikely. But between swamps and bogs there is the intermediate wetland type called **fens**. These have peaty soils, low nutrient levels and distinctive smaller plants.

Looking around Christchurch, remains of these fens have been found in four locations and possibly a fifth. Two are in the Styx catchment, one at Styx Mill Conservation Reserve and the other at Smacks Creek. The Styx Mill fen is the largest in Christchurch as well as being in the best condition. On the swamp-fen-bog gradient is the only one of the four (or five) sites that is close to the bog conditions. It is therefore of major importance for its conservation values.

The small native creeping herb Gunnera dentata amongst sedges andgrasses. Typical of the special tiny native plants of the fen.

The Styx Mill fen contains native plants not seen elsewhere around Christchurch although some do occur at other fen sites. Styx Mill plants are mostly specialist sedges and related species such as the small sedge Schoenus apogon, the sward-forming sedge *Carex sinclairii*, the creeping herbs Gunnera dentata and Galium propinquum, and Baumea rubiginosa. There is even a small area with the moss Sphagnum cristatum, the species that so characterises bogs. The most spectacular recent find is ladies tresses orchid Spiranthes sinensis, with its tiny pink flowers that appear in autumn.

The tiny remnant fen on Smacks Creek has two species not seen at Styx Mill, the native buttercup Ranunculus glabrifolius and the bright green sedge Isolepis reticularis. Fens at the Groynes and Travis wetland have their own different and distinctive species.

The discovery of these fens, particularly the one at Styx Mill Conservation Reserve, presents new challenges regarding how these places are managed. There are considerable differences between managing fens and swamps, so firstly the "rule book" used for restoring and managing more abundant swamps needs to be set aside. Issues such as ensuring that no flowing water enters the fen system; that no nutrient-rich soils and competitive plants such as flax, cabbage tree and tussock sedge are introduced; and the eradication of grey willow *(Salix cinerea)* within the fen, make future management decisions vital to its long-term survival. It would appear that the best way to manage the Styx Mill fen is to leave it alone.

The fen at the Styx Mill Conservation Reserve is considered by some to be the "jewel in the crown" of the Styx catchment and the feature deserving of the greatest protection and conservation effort.

Contributed by Dr. Trevor Partridge, Botanist

# Styx Monitoring Co-ordinator Wins Award

Recently Victor Brown was the recipient of a Community Services Award given by members of the Shirley Papanui Community Board.

This well deserved award was in recognition of Victor's commitment to the Styx Project and, in particular, his role as Volunteer Coordinator of the Community Monitoring Programmes within the Styx catchment.

In conjunction with the Styx Living Laboratory Trust, Victor co-ordinates the three existing monitoring programmes namely Water Quality Monitoring, Water Flow Monitoring and Invertebrate Monitoring and shortly he will need more volunteers to help with the new Springs Monitoring Programme.

There is an opportunity for members of the community to become involved in these monitoring programmes so if you would like to congratulate Victor on his award, or find out more about any of the volunteer monitoring programmes, please telephone him on 960 8555.

Victor Brown

# Styx Diary

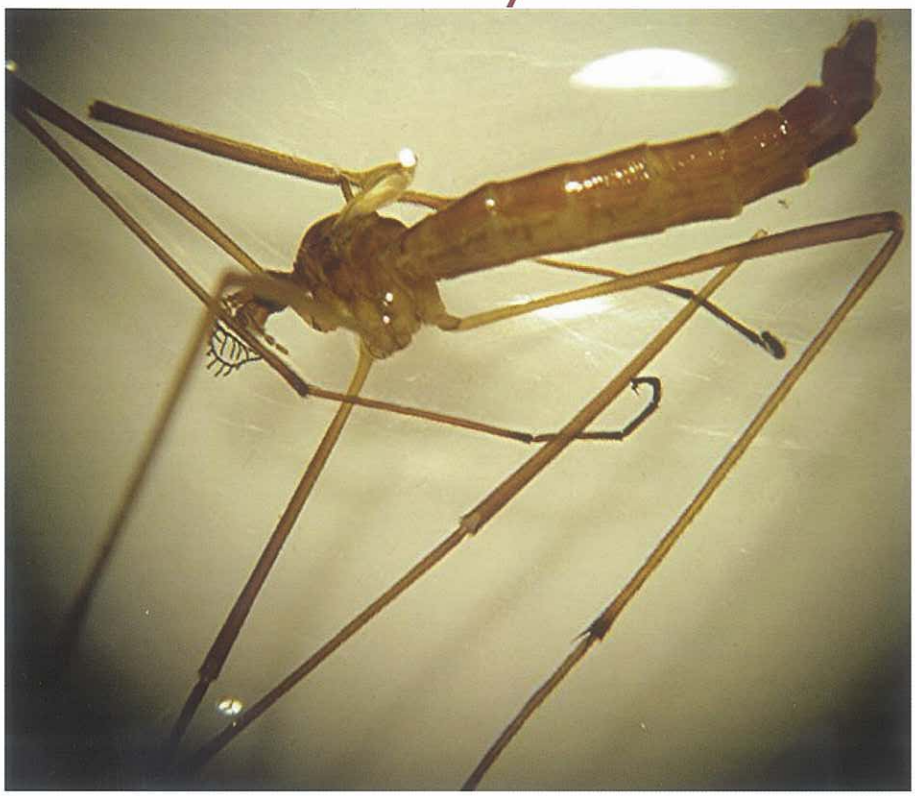
## Planting Day

**Sunday August 5th 2007**
**Between 9am and 12**
**Styx Mill Conservation Reserve.**

Meet at Hussey Rd entrance for directions to planting area.

Please bring suitable footwear as the area is wet, gumboots would be great.

# Insects in the Styx



Ceratomerus crassinervis

Surveys conducted within the Styx Mill Conservation Reserve indicate that it is 'home' to between an estimated 800 to 1000 different insect species. This has been the conclusion reached by Dr Rod Macfarlane, an Environmental Consultant who, for the past two seasons has collected over 9,300 insect and spider species from within the Reserve.

Using a variety of trapping methods has turned up some unique finds, not the least being several previously unknown, and some unidentified species. Such finds are exciting to an entomologist but such discoveries have much wider implications, particularly for animals and fish that depend on insects as a food source.
To the uninitiated, most insects appear to be reasonably similar, but listening to Dr Marfarlane explain how the flightless crane fly is brownish in colour in order to help it absorb heat, begins to open up a whole new world of discovery as well as raising some pertinent questions, for example, why have some specie seemingly disappeared in the time between surveys?

As pointed out in his report, (available in full on the Styx website at www.thestyx.org.nz ), future management will have a critical impact on the rare and diverse insect population that currently make their home in the Reserve. For example, when planting within the Reserve, the need to ensure a balance between pollen and nectar producing plants is essential for the survival of some specie.

In emphasising the importance of future decisions relating to the wetland area within the Reserve Dr Macfarlane concludes, "to try and develop a 'cathedral' structure of a re-created forest would likely result in the cathedral being less than half full of the original congregation of its more humble inhabitants."

With so much yet to be discovered and learnt about the insect community within the Styx, one could conclude that perhaps this is a case where one cathedral in Christchurch is going to be enough.

Gynoplistia pedestris

# Extinct in the Styx ?

Extinct in the Christchurch area for over 100 years, The South Island Fernbird (Bowdleria punctata punctata) or Matata is a member of the warbler family of birds.

Reintroducing fernbird to suitable local habitats has been discussed over the past 10 to 15 years, and this idea is now beginning to firm up with staff from Christchurch City Council and Environment Canterbury looking at the requirements of a release of these birds at the Styx River mouth saltmarshes.

Fernbirds require a 2-3 tiered vegetation structure, which usually comprises an understorey of rushes with an overstorey of shrubs and small trees. This combination is found in great abundance at the Styx River mouth where the curve in the Styx River below the floodgates creates a large saltmarsh peninsula. This area could be relatively easily defended from mammalian predators.

Gynoplistia pedestris

Fernbirds are secretive birds, about the size of a sparrow, but with much longer tails. They scramble about through thickets of vegetation, hunting insects and particularly nursery-web spiders, which are one of their favourite foods. On the West Coast fernbirds are still very common, but many are displaced each year by conversion of their pakihi and wetland edge shrub-land habitats into pasture.

Pakihi wetlands are rain-fed systems on mineral or sometimes peat substrate of very low fertility and low pH. They can be seasonally dry and support restiads, sedges, ferns, heathland and shrubland.

The idea would be for some of these birds to be "rescued" from habitats scheduled for destruction and transported across to Christchurch for release at the Styx River mouth. It is hoped that once a sufficient number of birds were reintroduced they would develop a self-sustaining breeding population. Ultimately, surplus birds could be reintroduced into sites such as Styx Mill Conservation R eserve, Travis Wetland and the salt marsh fringes of Brooklands Lagoon and the Avon-Heathcote Estuary.

Contributed by Andrew Crossland, Ornothologist

# Ranger's Report

## Planting Day Sunday 7th May 2007

Approximately 50 people enjoyed warm weather and great company to help with the annual planting day held on Sunday 7th May at Styx Mill Conservation Reserve.

The area planted was beside the Styx River where it is planned to continue these riparian plantings over the next five to ten years.

Thanks to the dedicated team at Trees For Canterbury who once again donated over 2000 native plants to the Styx Mill Conservation Reserve ensuring the success of this day.

## School Groups Stream Study

It has been a busy school term with many schools taking advantage of the City Council's Learning Through Action environmental education programme.

The Styx Mill Conservation Reserve is a great place to examine all those amazing insects that live in our streams.

Part of this programme involves pond sampling where students collect samples from the water and examine insects up close.

To learn more visit:
www.ccc.govt/LearningThroughAction/WaterwaysAnd Wetlands/FreshwaterFrolicking

Contributed by John Parry, Ranger

## *Report from the Styx Living Laboratory Trust*

Lesley Keast has been involved in the Styx project since it was first mooted in 1998 and willingly accepted the role of Chair of Trustees of the Styx Living Laboratory Trust when it became incorporated. Reluctantly she has decided the time has come to relinquish this role although she will still retain an interest in the Trust and the Styx project.

Leslie states:

"I have enjoyed my time these past 6 years as Chair of the Trustees of the Styx Living Laboratory Trust. I have met many wonderful people, learnt much about the environment that I previously knew nothing about, and I have had the privilege of assisting this fledgling dream to get off the ground.

The Styx will always hold special place in my heart of memories and I wish Graham Condon well on his journey assisting the Trust and volunteers to realise their dreams."

**Message from incoming Chair of Trustees, Graham Condon.**

"I have always had an interest in our waterways and Greenspace and became aware of the Styx project when I was Chairman of Council Parks and Recreation Standing Committee for 3 years. I have held the position of Councillor in the Papanui Ward for 12 years and as the Styx project is in my Ward, it seemed an opportune time to join an excellent project and its very enthusiastic team."

## *Report from the Guardians of the Styx*

Guardians of the Styx celebrate being eight years old in October. Whilst recent meetings and activities have related to plantings of various sorts, our broader aims will see more attention in the future. We seem to have slipped "out of the loop" somewhat with at least one public meeting relating to the Styx River taking place without the Guardians being involved. Along with this, the Guardians have not been consulted on resource consent applications for some time. Perhaps there have been none. Either way, we will follow this up to as it allows us to pursue one of our aims. In the last newsletter, I mentioned that a matter of concern was the way in which sub-surface water flows are disrupted by the actions of man.

Soon after, I was invited to a workshop on possibilities for the disposal of treated stormwater from the airport and John Road areas. Among the proposals were piping the water over to the Heathcote River, or using Kaputone Creek as a stormwater drain. The stormwater in question is rain that otherwise would have soaked into the ground and been part of the "feed" for the Styx River, Smacks Creek and Kaputone Stream. There are no prizes for guessing that my choice was one where the water went into the ground as it had done for a very long time.

Dennis Hills, Acting Chairman

## EDITORIAL CONTACT

The Christchurch City Council publishes the Styx Newsletter as a service to the community.

The newsletter is distributed as widely as possible through libraries, Service Centres and other such outlets.

If you would like to receive a personal copy and you live in Christchurch, it can be mailed directly to you. Back copies can also be viewed on the Styx website at www.thestyx.org.nz.

If you have any suggestions, comments, or enquiries regarding subjects mentioned in the newsletter, please contact:

Stephanie K Humphries
tel/fax: 342 9513
email: stephanie@clear.net.nz

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