



The formation of wetlands in the lower Waikato began near the end of the last ice-age, 17,000 years ago, when a volcanic eruption changed the course of the Waikato River from the Hauraki Plains to the Waikato basin. Blocked by ash, the river spread out into a huge fan across the flat Waikato landscape, gradually developing channels in the newly formed surface. Eventually the river consolidated in its present channel, leaving a complex of lakes and swamps (both permanent and seasonal) on either side.

The Taupo eruption of 200 AD started another phase of wetland development - in particular the four peat domes of the Whangamarino wetlands complex. Once more, huge quantities of ash and pumice carried by the Waikato River were deposited, building raised river levees along its course and creating permanent swamps.

As sediment and dead plants were deposited in these new swamps, the land surface built up above the normal flooding level of the river. At this time, the wetlands changed from nutrient-rich swamps fed mainly by groundwater, to low-nutrient bogs fed by rainwater. Most of these bogs have accumulated about 3-4 metres of peat in less than 2,000 years. As some parts of the Whangamarino continue to be fed by groundwater, this wetland is a large complex of different wetland types all controlled by variations in water source and nutrient status.

Lower Waikato Wetlands

National Wetland Trust Trail Guide:



Whangamarino Wetland and Lake Waikare



Birds of the Waikato Wetlands

Low nutrient concentrations in rainwater mean the lower Waikato bogs support very specialised plants. Only about a dozen species make up the bog vegetation. While these plants do support invertebrate populations, their nutritional value is low, so only insectivorous animals such as the North Island fernbird and the black mudfish can live there. Australasian harriers however, often carry prey into the safety of the peat bogs to feed.

Areas of open water are where most water fowl are likely to be seen. Whangamarino is important for native species such as grey duck (up to 7,000 in winter), New Zealand shoveler (up to 3,000) and grey teal (up to 2,000). The introduced mallard (over 25,000) and black swan (3,000) are also common. Look carefully on and around the edges of open water and you may see a dabchick, this small member of the grebe family now only occurs in low numbers.

There may be fewer than 1,000 Australasian bittern in New Zealand, with 25% of them believed to be in the Whangamarino complex. They frequent most types of vegetation, but are not always easy to see. During the months of August and September the distinctive "boom" of the bittern can often be heard around dusk. Even more elusive are the two small crakes - spotless and marsh crake. They are more likely to occur in dense cover around swamp margins.

Other birds of the wetlands and more open areas around them include white-faced heron, pukeko, paradise duck and kingfisher. Three shag species may be seen, in particular black shag and little shag.

The wetland is also habitat to a number of native fish species including longfinned and shortfinned eel, inanga and an important population of the threatened black mudfish. A number of introduced fish species are also present in the river systems and swamp areas. These include koi carp, brown bullhead catfish, rudd and mosquito fish.

Wetland Wildlife

What is a Wetland?

A wetland is any area where water occurs at or near the ground surface for all or part of the year, and has plants and animals adapted to living in the permanently or seasonally wet conditions. Freshwater wetlands may be classified as swamps, fens or bogs, according to water supply and nutrient content. Swamps are fed by rainwater, surface water run-off and groundwater and are consequently relatively fertile, whereas at the other extreme bogs derive their nutrients and water solely from rainfall.

Swamp vegetation can range from trees such as swamp maire, cabbage tree and kahikatea, to reeds such as raupo. They may have large areas of open water, or closed areas of reedy vegetation. In bogs the water is retained within the partially decayed plant remains (i.e. peat) underlying the vegetation.

New Zealand once had extensive areas of wetlands but only 10% of these remain. A significant proportion of surviving wetlands are in the Waikato Region. The 7,000 hectare Whangamarino is Waikato's second largest freshwater wetland, exceeded only by the 8,800 ha Kopuatai peat dome on the nearby Hauraki Plains.



Use this guide to explore the Whangamarino Wetland complex. Look for the National Wetland Trust signs along the route.

The National Wetland Trust was established in 1999 to increase the appreciation of wetlands and their values by all New Zealanders.

- The Trust aims are to:**
- Increase public knowledge and appreciation of wetland values
 - Increase understanding of wetland functions and processes
 - Ensure landowners and government agencies commit to wetland protection, enhancement and restoration

The National Wetland Trust wishes to thank the following for their support in producing this brochure.



A percentage of proceeds from sales of Quarry Road Winery are donated to the National Wetland Trust.

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1 National Wetland Centre

The trail is about 50 kms full loop and will take about 1 hour, add extra time for stops. You can continue on to Auckland when you turn back onto State Highway 1 at Meremere, or loop back down the highway to return to the Wetland Centre.

The starting point of this wetland trail is the National Wetland Centre at Rangiriri, on the shores of Lake Kopuera. This is due to open in 2007. Visit the Centre to learn more about wetlands and see examples of a wide range of wetland types throughout New Zealand. Follow the trail in the order on the map. Look for the National Wetland Trust trail markers along the route.

- From the Wetland Centre, head past the Rangiriri Hotel to the highway. Turn right onto State Highway 1 (take care, fast traffic!) and head north 2 km to the Te Kauwhata turnoff.
- Turn right, and follow Te Kauwhata Rd through the village (last stop for petrol, food and public toilets).
- Continue through the village along Waerenga Rd to a picnic spot/ rest area on the left hand side (signposted with a wetland trail sign), about 1.5 km past Swan Rd. Stop for a good view of Lake Waikare (#2).

2 Lake Waikare

Natural stopbanks and levees formed by material from Taupo eruptions blocked tributaries of the Waikato River creating a series of lakes and shallow swamps such as Lake Waikare. Recent human activity has had a severe impact on these lakes. Seepage from Lake Waikare to the Whangamarino once occurred through a 1 km wide swamp but with the development of the lower Waikato flood control scheme in the 1960's this was redirected through an artificial channel that flows into the Pungarehu Stream.

Evidence of old swamp areas can be seen by the remaining stands of kahikatea forest, now high and dry on farmland over two metres above the channel level where once they would have been seasonally flooded. In 1965, also as part of the flood protection scheme, the lake level was fixed at a historic low level to enable it to store flood waters.

In addition to modification of the lake for flood control purposes, it has also been affected by sediment runoff from erosion and large inputs of nitrogen and phosphorus through agricultural development. By 1977 most of the native submerged plants had been replaced by the exotic oxygen weed *Egeria densa*. During the early 1980's the weed beds collapsed probably as a result of a storm event disturbing the bed sediment. This suspended sediment has reduced sunlight so that plant photosynthesis was reduced preventing plants from re-establishing. The lake has been de-vegetated ever since and is now dominated by algae.

On the south-western shore of Lake Waikare (not visible from the road) is Lake Rotokawau, a 'peat lake' (two sides are dammed by peat deposits.) It is one of about 30 of these unique wetlands in the Waikato, and one of the best examples. A narrow channel links it with Lake Waikare.

- Continue along Waerenga Rd. As you descend the hill past the Kiwi Rd turnoff you can see flat farmland to the left, the results of the Swan Rd Drainage Scheme (#3).

3 Swan Rd Drainage Scheme (Belcher Rd Turnoff)

The flat farmland you can see to the left between Kiwi Rd and Belcher Rd turnoffs was originally part of Whangamarino Wetland. Conversion of this 400 ha area of wetland to pasture was one of the last government-subsidised swamp drainage schemes in the country.

- Continue along Waerenga Rd, crossing over the Pungarehu Stream (un-named bridge), which flows from Lake Waikare to the Whangamarino River.

Lake Waikare side-trip. Some 500 m beyond the bridge is the signpost to the Lake Waikare wetland trail via Waikare Rd to the right. You can detour down Waikare Rd, and turn right down Ruahine Rd to view the water control structure where Pungarehu Stream exits the lake. Return to Waerenga Rd to continue the Whangamarino Wetland trail. (Lake Waikare Wetland Trail is a separate trail that continues along Waikare Rd from the Ruahine Rd turn-off. That route is not described in this trail brochure.)

- Continue another 3 km along Waerenga Rd and turn left into Falls Rd (signposted). Continue about 6 km along Falls Rd until you come around a sweeping right hand bend opening out onto a vista of the wetland. There is a small pull-in beside a farm driveway on the left where you can see the Whangamarino Wetland Overlook (#4).

4 Whangamarino Wetland Overlook

This stop provides a good overview of a seasonally inundated swamp. Introduced plants such as crack and grey willow and grass species dominate seasonally wet swamp vegetation. However, construction of a weir to maintain water levels, together with a willow control programme run by the Department of Conservation is assisting native species to return.



- Continue down the hill 700 m to a parking area on the left, before the one-way bridge (un-named) that crosses the Whangamarino River (#5).



5 Whangamarino River

Foot access into the wetland is possible by following the riverbank to cross a stile at the end. There is no formal walking track beyond this point. There used to be a 50 tonne per year eel catch in areas such as this, but it is now much reduced from over-fishing and competition from introduced fish species. Koi carp can often be seen close to the river banks particularly during the warmer summer months. You can travel by canoe or small boat 12 km down-river to the landing before the bridge on Island Block Rd, but beware of submerged willow logs especially during summer low-water.

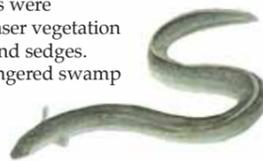
Continuing along Falls Rd, views of the wetland are blocked by grey willow trees beside the road. The wetland margins, near rivers, roads and farmland, are rich in nutrients from run-off, and are more susceptible to invasion by plant pests such as willow. Willow changes the nature of these areas by out-competing native plants, adding to nutrient levels through leaf loss in autumn and reducing habitat for native birds. Another aggressive weed, reed sweetgrass (*Glyceria maxima*), can also rapidly invade swampland, reducing plant diversity and once established is difficult to eradicate.

- Continue along Falls Rd another 4 km to the Island Block Rd turn-off.
- Turn left into Island Block Rd. The road follows a 'spine' or small ridge of mineral ground. An example of farming on drained peatland can be seen at the beginning of Island Block Rd. While the original habitat has been removed, black mudfish and eels persist in the drains. Drive 4 km to where a small rise gives you a good view of the peat bog vegetation on both sides of the road from Island Block Road Overlook (#6).

6 Island Block Road Overlook

Near the site of an old school (about 4 km from the start of Island Block Rd), a good example of a restiad bog can be seen on both sides of the road. In the Northern Hemisphere peat bogs are formed by build up of sphagnum moss, but in New Zealand rushes from the restiad family are important peat formers. The wire rush (*Empodisma minus*) is the main peat former in Whangamarino Wetland. Bog plants have special adaptations to conserve water, allowing bogs to form in areas that can be seasonally dry.

In 1989 fire burned over 2,000 ha of bog vegetation in this area. No lasting damage was done and vegetation recovered quickly from adjacent seed sources. In the early stages of re-vegetation, a huge number of orchids were found. These were later shaded out by denser vegetation such as wire rush, swamp umbrella fern and sedges. The Whangamarino is habitat to the endangered swamp helmet orchid (*Anzybas carsei*) which is found nowhere else in New Zealand.



- Continue along Island Block Rd for 4 km to a sharp left hand bend, with a gravel road on the right (**dangerous bend, don't stop here!**). This is the entrance to a causeway which was constructed in the 1950's to carry the overhead cableways that transported coal from Kopuku to the, now decommissioned, Meremere power station. The cableway has since been dismantled and the causeway cannot be accessed without permission. The causeway disrupted natural water flows within the wetland, and nutrient levels are now different on either side resulting in marked changes in the vegetation.

- Continue another kilometre beyond the sharp left hand bend to the one-way bridge over the Whangamarino River.
- Pull into the gravel carpark on the left to view the River.
- Cross the road to the concrete pad near a wooden jetty (**keep off the jetty!**). Look down-river (to the left) and you may see where the water becomes turbulent indicating the location of the Whangamarino Weir (#7).

7 Whangamarino Weir

As part of wetland restoration efforts by the Department of Conservation and Auckland/Waikato Fish and Game Council, a weir has been constructed across the Whangamarino River outlet. The purpose of the weir is to improve habitat values for waterfowl and protect plant communities by restoring summer water levels to those prior to land development in the 1960s.



Downstream from the weir (not visible from this site) is a control gate on the Whangamarino River, just before it flows under State Highway 1 into the Waikato River. In this area, the Waikato River flow is slow, and subject to frequent flooding. The control gate was built across the Whangamarino River to prevent the Waikato River backing up into the wetland and inundating surrounding farmland during periods of flood.

This is part of a wider flood control scheme that also uses Lake Waikare. In flood conditions, water spills from the Waikato River across State Highway 1, south of Rangiriri, into Lake Waikare. Control gates on the Pungarehu Stream are closed to hold water in the lake. The control structure on the Whangamarino River, downstream of the weir, is also closed. Once the flood peak has passed, both control gates are opened, allowing stored flood water to flow from Lake Waikare, through Whangamarino Wetland, and back into the Waikato River.

- Continue for another 2 km along Island Block Rd back to State Highway 1 beside the decommissioned Meremere Power Station, once fired by coal that developed in the wetland over millions of years.
- To head towards Auckland turn right onto the highway - **take care, fast traffic!**
- To return to the National Wetland Centre, turn left onto the highway **take care, fast traffic!** and follow the Waikato River back to Rangiriri.