



Back in the 1950s, when our family used to drive through Pekapeka swamp in January on our annual holiday to Hawke's Bay, Dad would tell us to hold our breath and he would speed up so that we could get past the stinky swamp on one breath. The stink was the hydrogen sulphide from the rotting raupo. Over the years this smell disappeared as the willows invaded, creating a willow forest. During the rehabilitation process I used to tell people we were trying to bring the stink back into Pekapeka!

To me it is a great example of what can be achieved when we all work together. We worked with the local Iwi, DOC staff were our technical advisers – ‘Old’ Internal Affairs staff, John Adams, John Cheyne and Hans Rook - while Geoff Walls set up a monitoring system. Forest and Bird volunteers did much of the planting.

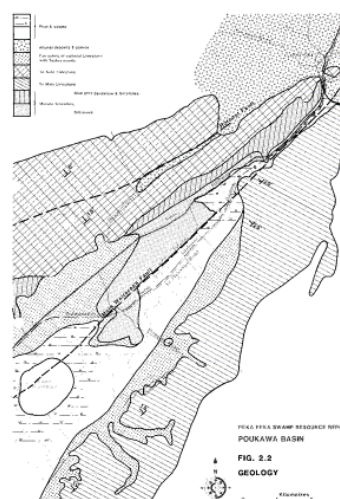


Fig 1: Simplified geological map of part of the Poukawa catchment

Pekapeka swamp lies in a faulted valley bottom bounded by limestone hills. The catchment rises south of Lake Poukawa which has existed for more than 10,000 years. The water supply to the wetland is via the Poukawa stream which rises at the lake. The swamp receives what irrigators do not take, though there is a 20l/sec minimum flow requirement. There have always been problems with adequate water supply.



Fig 2: Aerial oblique image of the southern part of Pekapeka swamp identifying the three pa sites.

The swamp was intensively used by Maori as a food source - it was their food basket. Its importance can be seen from three Pa sites being along its boundary rather than up on the surrounding hills.

With the arrival of Europeans the swamp became a rubbish dump, typical of the pioneering attitude that if it can't be drained it will be filled up with rubbish.

The main road south, now State Highway 2, was developed round the western margin by 1857 and post-war was straightened to cut through part of it.

In the early 1870s the railway line was constructed. The rail embankment cut off a meander, creating a still water area with only an outlet pipe and no inlet. Imagine trying to do this today?

In 1959 the Heretaunga Plains Flood Control Scheme developed plans to drain the swamp. By the 1970s constructed drains were moving upstream from the northern end and downstream from the southern end. But after losing a dragline in deep peat and protests from the local pig farmer this stopped.

The passing of the Resource Management Act in 1991 changed the political environment from one in which, under the 1941 Water and Soil Conservation Act, draining of wetlands for production was promoted to one where wetlands were to be protected.

In 1997 HBRC developed a policy for wetland protection and enhancement in the region.

The Department of Conservation experts identified the top 10 wetlands in the region. Of these the Lake Poukawa – Pekapeka swamp complex was ranked second.

The Council policy identified three types of wetlands:

- HBRC owned wetlands - 100% responsibility of HBRC
- significant wetlands – HBRC would develop management plans and would assist rehabilitation with financial grants
- on-farm wetlands. – provided \$5,000 grants to assist owners create or rehabilitate.

For Pekapeka, we decided upon a simple, five-part approach:

- Gain full ownership
- Retire from grazing
- Control water levels
- Control weeds
- Revegetation.

The work was based on five-year management plans. These provided detailed annual work programmes and costings. Initially each plan was approved by Council ensuring they were fully aware of what was happening and supported the work. This worked well.

The first Pekapeka swamp management plan aimed to complete the basic ‘grunt work’, stopping further degradation. Later plans concentrated more on public recreation and education. The first plan had clear objectives:

- prevent further degradation
- maintain the swamp’s natural capabilities for flood detention
- protect and enhance cultural values
- manage recreation and waterfowl hunting values
- promote public awareness and education benefits to promote public access.

We chose superficially simple processes with a minimum of science, but we did establish a monitoring programme using Geoff Walls to establish the system.

Retirement of the whole Swamp.

When we started there was multiple ownership of the swamp, so Council systematically bought the areas within the swamp. The fence line was established in consultation with the owners, the fence built and that became the surveyed boundary. In retrospect the consultation usually resulted in the fence line being too close to the edge of the swamp, as we found out later when we needed a boundary track. **A lesson learned!! Don’t let the surveyors be responsible for setting the boundary.**



Fig 3: Retirement fencing identified the new property boundary

Controlling the water level.

We knew that water was critical. Often during droughts the swamp dried out, the shooters' ponds went stagnant and stank, and no self respecting fish or bird would hang around.

We knew we had to develop structures to effectively capture sufficient water to last a summer and that this was expensive. So we had to provide an effective case to Council before they would commit to the expense of a detention dam. Only then could we apply for a consent.



Fig 4: Modelling identified the extent of inundation with the appropriate levels.

We needed to establish a water balance and so measured inflows and outflows for 3 years. To do this we constructed a weir upstream and another downstream of the swamp. With this information options for water storage and, therefore, weir heights and their impacts on water levels could be developed. Council was persuaded.

All we needed now was a consent. Sounded simple but an adjacent farmer decided the dam would significantly impact on his property, even though our calculations indicated this would be minimal and could even be beneficial. This culminated in an Environment Court hearing. Calculations indicated that construction of the weir would reduce the risk of the southern area drying out from

once in five years to once in 25 years. (Recent dry years have indicated that drying out is still a problem.)

Incidentally one of the most costly components of our development work was getting consents from our own organisation. To be transparent we were treated as outsiders and had to make sure that all our applications were squeaky clean. We therefore had to work through consultants and these cost significant money.

Pest control – plants and animals.

Willows. A 1939 aerial photograph indicates there were very few, if any, willows in the swamp. Over the years, willows have moved downstream and spread throughout the swamp so that by the 1980s we had about 75% willow canopy cover. Pussy willow spread throughout the swamp with Crack willow mainly round the margins.



Fig 5: A complete willow canopy cover in the northern part of the swamp in the 1990s.
Pussy willow is green and Crack willow brown.

We decided the only effective measures were to boom spray with Roundup, using a helicopter, all areas where canopy cover of willows occurred.



Fig 6: An aerial shot of the previous year's spraying.



Fig 7: Felling willows in a swamp is not easy!

Areas adjacent to boundary fences, SH 2, the railway and lifestyle blocks were ground cleared. The final year's aerial spraying programme was adjacent to the State Highway. We did this so that if we did receive complaints from the public it would be when the programme was almost finished. However, amazingly, the only complaint we ever received was from someone on the railway.

I was very surprised that the canopy spraying caused only minimal damage to the ground cover. However, regrowth and regeneration of the willows were problems. The pussy willow, especially, while seemingly dead, seemed to sprout from the butt after 2 to 3 years requiring further spraying.

Where regrowth was extensive we had to use the boom again and this did cause significant collateral damage to ground cover. Where regrowth was isolated we used a bucket hanging underneath the chopper. Where we had ground cleared we had to use students over a three-year period to systematically cut and hand paint any regrowth. We found broken branches sprouted.

Willows in a swamp are like thistles in pasture, they will appear annually. Consequently, there is a need for a regular control programme.

Old Man's Beard, Japanese Honeysuckle, Blackberry, Arum lily and Water Celery occurred in patches with Water Celery now an extensive *Carex* smothering nuisance.

It's interesting to see the increasing numbers of *Coprosma repens* and cabbage trees appearing in the swamp. I wonder if they will become a plant pest at some stage in the future?

Animal pests. An initial pest control programme in 1999, before willow clearance, resulted in 766 dead possums, 50 hedgehogs, 76 rats and 12 feral cats.

Members of The Pekapeka Shooters' Association have, since 2012, looked after pest control in the southern area of the swamp. In the four year period from 2012 to 2015 their kills averaged four stoats and one ferret, five rats and four possums each year.

In the water *Gambusia* (mosquito fish) is common at the northern end of the swamp but had not been identified in earlier monitoring surveys.

Revegetation

One of our prime objectives was to return the swamp to a more natural wetland ecosystem. Leaders in this project have been the Hastings Branch of Forest and Bird and rural primary schools in Central Hawke's Bay. Looking from State Highway 2, native vegetation can now be seen around most of the margins of the swamp.



Fig 8: Hastings Branch of Forest and Bird planting and maintaining plant in the northern access to the wetland.

Public use

Up until 2004 there was no public access to the swamp so in that year we acquired from Transit New Zealand a licence to occupy an area in the central part immediately adjacent to State Highway 2. This area is the education focus of the swamp with a parking area, interpretation signs explaining the natural history, the development and other educational features with tracks radiating out both upstream and downstream.



Fig 9: The centre of the swamp showing the Interpretation area and two Pa sites.

This development was not cheap, estimated to cost just under \$600,000. As Council was only willing to pay up to 50% of this, finance was needed. This was achieved through the Hawke's Bay Community Foundation and the Friends of Pekapeka combining with the Regional Council to submit a bid to the Lottery Commission. This resulted in a grant of \$317,000, allowing the education complex to be constructed.

This work required a further consent. Another Environment Court hearing resulted as the Historic Places Trust was concerned that using explosives to create open water areas (as had been done in the past) would destroy Taonga, even though the local Maori said that as the swamp was their larder they would not have stored their Toanga there. A consultant report identified that there was no evidence of any Toanga **but there could conceivably be**. Also, our adjacent farmer was concerned that walking tracks close to his boundary would disturb his stock. Consent was achieved. After I retired, Council staff decided against using explosives to create open water areas – very disappointing as I would love to have watched.

The swamp has always been a mecca for shooters. We had the choice of removing them or using them! So, the shooters became a significant component of the management of the southern part of the swamp. We gave them 10 year occupancy with the condition they looked after their open water areas and managed any weeds in their site. This has worked very well as many guys seem to enjoy the opportunity to escape from their families for the weekend 'to do essential maintenance'.



Fig 10: A shooting site. The occupier is not walking on water!

Summary

This is a very brief summary of a long-term project. To me the rehabilitation programme highlights a number of issues:

- On the surface, rehabilitating a swamp is a simple exercise, all it requires is for the area to be retired, the water level to be controlled and weeds annihilated. Actually, it is a long-term and expensive process.
- A lot of science is not needed. It should only be used to make better decisions. Science costs a lot of money.
- Rehabilitating a wetland is a long-term process and, therefore, is difficult for community groups to do alone. An organisation like a Regional Council has access to money, professional staff and is there for the long term. Whereas community groups start off with a lot of energy but usually struggle in the long-term to maintain that energy and to keep the money coming in. An association with a local government organisation should be the ideal combination.
- **Remember you'll never get a better deal than this book to see how we have rehabilitated a dying wetland. It is easy to read but contains most of the information you will need to know if you are planning to do a similar exercise. A copy can be bought from the HBRC.**