



Section 4: Priority Waikato ecosystems

Swamps and bogs

Swamps and bogs are permanently or temporarily wet areas supporting plants and animals specially adapted to wet conditions. The types of plants and animals found in swamps and bogs depend on the water - its amount, depth, permanence, temperature, the chemicals found in it and its source - groundwater, surface water or rainwater.

Swamps and bogs are wetlands with dense vegetation emergent over still or slowly moving water. In the Waikato these include:

- peat bogs with jointed rushes, tangle ferns, orchids, sun dews and sphagnum moss
- sedgeland with purei (*Carex*) and reedlike *Baumea* and *Juncus*
- swamp shrublands with manuka, ferns and sedges
- swamp forests with kahikatea, cabbage tree or swamp maire
- fertile swamps with raupo or harakeke (flax).

Around 70 per cent of the Waikato's swamps and bogs have been drained since 1840, leaving some 30,000 hectares. The loss of large areas of wetland habitat and introduction of pests has threatened the survival of many native species, including the giant cane rush, the swamp helmet orchid, giant kokopu, Australasian bittern, North Island fernbird, banded rail, marsh and spotless crakes.

Threats to swamps and bogs

Drainage remains a real threat to some swamps and bogs, although it is illegal to drain wetlands without a consent from Environment Waikato. Most of the remaining swamps and bogs are threatened by:

- poor water quality
- weed invasion including willow, reed sweet grass, alder, alligator weed and yellow flag iris
- animal pests including stoats, rats, possums, cats, rabbits, hedgehogs, koi carp, deer and pigs
- grazing by farm animals
- loss of connections to streams, other wetlands and estuaries
- fire.

Which type of swamps and bogs are the most depleted in our region?

- Swamp forests, e.g. swamp maire, kahikatea forest.
- Peat bogs.
- Sedgelands, e.g. *Carex* wetlands.

How do I know what to do and when?

Use the table overleaf to help you prioritise your management actions. The actions are listed in roughly the priority order, though each site is different and will require its own assessment.



Australasian bittern
Image courtesy of Paul Schilov



Carex wetland
Image courtesy of Karen Denyer

Swamps and bogs hot tips

- Visit Environment Waikato's website and search for "Restoring a wetland". Print off a copy of the wetland management plan template: www.ew.govt.nz
- Call 0800 BIODIV (246348) or Environment Waikato's Freephone 0800 800 401 for free wetland management factsheets.
- Plant wetlands in summer when water levels are low.
- Visit the National Wetland Trust website: www.wetlandtrust.org.nz
- Visit the Weedbusters website: www.weedbusters.org.nz
- Visit the Landcare Research website and read their factsheet on how to prioritise weeds: www.landcareresearch.co.nz/research/biodiversity/landscapesprog/workshops/Stanley_WeedSheet.pdf
- Visit the Waikato Catchment Ecological Enhancement Trust website for information on funding to enhance the sustainable management of Lake Taupo and Waikato River catchment's ecological resources: www.wceet.org.nz
- Visit the New Zealand Landcare Trust website for the Biodiversity Restoring the Balance self-help kit and for community group information and resources: www.landcare.org.nz
- Visit the New Zealand Ecological Restoration Network for information on ecological restoration: www.bush.org.nz/nzern



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Choosing Actions: Swamps and bogs

Assess needs/plan

Do this before anything else! Seek professional advice if you need to identify the management issues for your site. Write up a plan of action. Get a copy of the wetland management template from www.ew.govt.nz

Seek funding

Complete this table to determine what actions are needed and how much each will cost before you apply for funding. You may need to obtain funding before you can start on the work. Call 0800 BIODIV for advice.

Action and Priority	Comments
Manage water 1 st Monitor/assess 2 nd Restore if necessary	Wetlands need water, but not necessarily all year round. Many wetlands naturally dry out in summer. Monitor water levels for a year (put pegs in the ground after floods/heavy rains to show the high levels). Look for plants that like damp feet to tell you where the water levels come to. Check with Environment Waikato if you need to divert or dam water to restore your wetland - you will probably need a resource consent.
Reduce pollution 1 st Inflowing water 2 nd Paddock run-off	If your wetland has a stream flowing into it consider a silt trap and a planted swale to absorb excess nutrients out of the water. See "planting" below to deal with run-off.
Control stock 1 st Cattle/horses/deer 2 nd Sheep/calves	If grazing animals can enter your site they will trample and eat the plants, and their dung and urine will pollute the site. Heavier animals such as adult cattle or horses are generally more damaging than lightweight animals such as sheep and calves. Even a hot wire will be a good start to keep cattle out during the wettest parts of the year. Be ready to tackle weeds as soon as the last stock are out, as you may find the weeds 'take off' when grazing stops.
Control weeds 1 st Regional plant pests 2 nd Woody plants 3 rd Ground cover 4 th Others	<ul style="list-style-type: none"> Deal with weeds you are legally obliged to. See the plant and animal pests section in Environment Waikato's website www.ew.govt.nz In many fertile New Zealand wetlands the plants are short and need a lot of light. These wetlands are easily invaded by woody plants like willow or alder that shade out native plants over summer. Dense ground cover plants like reed sweet grass and flag iris can smother native seedlings, preventing regeneration, and should be your next priority. Be vigilant for weeds in nearby sites that are not in your wetland - yet! Note that if you intend to change the water levels this may have an effect (good or bad) on weeds. If you change water levels, wait a couple of years to see what happens to the weeds - the water may kill off some of them. Note also that getting rid of some weeds can just encourage others! Plant natives in their place. Get good advice on weed management.

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Action and Priority	Comments
<p>Control pests</p> <p>1st Hoofed animals 2nd Rabbits/hares (if planting) 3rd Possums, cats, mustelids and rodents 4th Pest fish</p>	<ul style="list-style-type: none"> • Pests in wetlands can include deer, pigs, goats, rodents, possums, mustelids (stoats, ferrets, weasels), rabbits, hares and feral cats. • Target the large animals first, as they will be easier to find and if the site is well-fenced may be able to be eliminated. Use a trained and licensed hunter to shoot deer, goats and pigs. Other pests will need on-going control. • Pest fish may also be present. Care should be taken not to transfer eggs/adults on equipment to other areas or waterways. If pest fish are present, please note that they are often difficult to control - specialist advice is required to identify methods to control pest fish. Contact your local Department of Conservation office or Environment Waikato for advice.
<p>Planting</p> <p>1st Buffer 2nd Enhance 3rd Connections 4th Maintain</p>	<ul style="list-style-type: none"> • First you should consider planting the edges of the wetland to trap sediment and run-off. • If the site is of <i>unnaturally</i> low diversity and isolated from natural seed sources, consider enhancement plantings. Make sure they are appropriate to the site - get advice. If you have to remove a lot of weeds, plant natives as soon as possible to stop another weed filling the space. If you have used herbicide wait the stated number of days before replanting. • If your site is isolated from other natural areas consider planting corridors of vegetation to encourage birds to move between them. • Keep your plantings weed free until the plants are well-established. Small plants can be smothered by rank grass. Protect from rabbits, hares and stock. • Plant ecosourced plants which are characteristic of the area you are planting (natural plant populations are placed back in their natural range). Check nearby areas for clues to the appropriate vegetation of the area.
<p>Encourage native animals</p>	<p>If the site is depleted of native animals, monitor the situation for a few years to see what turns up naturally. If you want to re-introduce wildlife you will probably need a permit from the Department of Conservation and/or the Fish and Game Council.</p>
<p>Provide fish access</p> <p>1st Downstream 2nd Upstream</p>	<p>If the waterway connections between your wetland and the sea are broken by poorly designed culverts, dams without fish passes or other barriers, talk to your council. Focus on downstream barriers first, so your fish can get to the sea and back to your wetland. Upstream connections help other wetland owners share your fish. Note that these actions may also provide access for pest fish species if not already present - see Pests above.</p>
<p>Monitoring</p> <p>Watch for new weeds!</p>	<p>Take photos of your site. Keep records of which of the plants you planted survived so you can learn for next time. Check for an increase in bird numbers and health of plants. If the project is large and needs a lot of funding, get a professional monitoring programme in place, to justify the next round of grants.</p>
<p>Legal protection</p>	<p>If a site is not legally protected, it's generally best to seek legal protection after you have restored it. However, if you are planning to protect the site and you need to fence it, contact QEII National Trust first, as they usually pay a share of the fencing costs.</p>