

# Stop the spread

## A GROWING PROBLEM

In recent years, the distribution of some introduced freshwater pest fish and aquatic weeds has increased in the Wellington region. These pests can have huge impacts on the environment. If they get into our rivers, lakes, wetlands and other waterbodies they will modify or destroy the natural habitat for native aquatic species, and in some cases make them locally extinct. Aquatic pests also directly impact on our recreation, industry, agriculture and tourism industries

Aquatic pests generally do not reach waterways unaided, they are moved there by people, either on purpose or accidentally by plant fragments or fish eggs snagged on boats, trailers, water skis and fishing equipment.

Department of Conservation, Greater Wellington Regional Council, Fish and Game New Zealand and MAF Biosecurity New Zealand are working together to halt their spread.

Approval from the Minister of Conservation or Minister of Fisheries is required if you want to introduce aquatic life into any waterbody. Failure to obtain the required approval can result in a fine under the Conservation Act 1987 of up to \$5000.

Koi carp, gambusia and the aquatic weeds listed in this brochure are classified as Unwanted Organisms under the Biosecurity Act 1993. People caught displaying, releasing, spreading, selling, or breeding them without an approval under the Biosecurity Act are liable, on conviction, to a fine not exceeding \$100,000 or imprisonment for a term not exceeding 5 years, or both.

Koi carp and rudd (outside of the Auckland/Waikato Fish and Game region) are classified as noxious fish under the Freshwater Fisheries Regulations 1983. People are liable to a fine of up to \$5000 who, without permission, possess, have under control, rear, raise or consign these fish.

## PLEASE HELP

It is better to prevent the introduction of these pests than try to control them once they have established. This is because once they establish in a waterbody they can easily spread into other waterbodies through floods or by hitching a ride on birds, machinery, boats or fishing equipment, and are very difficult to eradicate.

### You can help

It is not too late to prevent the further spread and establishment of these aquatic pests in Wellington. We need your help.

- Alert your nearest DOC, Greater Wellington, Fish and Game, or MAF Biosecurity NZ office if you know of anyone spreading aquatic pests, or if you suspect you may have unwanted aquatic pests in your pond..
- Contact your nearest DOC office for advice on any approval requirements before liberating any aquatic animal or plant.
- Source fish and plants from reputable outlets rather than from the wild or from friends.
- When moving from one waterway to another, always wash down all boating and fishing equipment carefully after use to prevent pest fish and aquatic weeds from hitching a ride. Put any weeds in the rubbish or compost them.
- Encourage others to take precautionary steps too.



Photo: NIWA.



### STOP THE SPREAD

Protect our waters from aquatic pests  
Do not release plants and fish  
into waterways



### STOP THE SPREAD

Protect our waters from  
aquatic hitchhikers  
Remove all waterweed from  
boats and recreational equipment  
when leaving waterways



### STOP THE SPREAD

Protect our waters from aquatic pests  
Do not transfer plants and fish  
between waterways



Koi carp. Photo: Walter Stahel,  
Environment BOP.

# PEST FISH

## Koi carp

Koi carp are an ornamental strain of the common carp (*Cyprinus carpio*). They have significant adverse impacts on water quality and are recognised as a serious pest in both Australia and New Zealand.

Koi carp resemble large goldfish except they have two pairs of whisker-like feelers (barbels) at the corners of their mouth. They are highly variable in colour, often with irregular blotching of black, red, gold orange or pearly white. Koi carp are long-lived fish and in New Zealand grow to about 75 cm long and weigh up to 10 kg.



Photo: DOC.

Koi carp have detrimental impacts on aquatic habitats as they stir up sediments resulting in murky turbid water. They destroy native plants and fish habitat and increase the risk of toxic algal blooms. Koi carp are opportunistic feeders, eating insects, eggs, juvenile fish of native species and a diverse range of plants. They feed like a vacuum cleaner, sucking up everything and blowing out what isn't wanted.

## Gambusia (formerly known as mosquito fish)

*Gambusia affinis* are small fish introduced to New Zealand to control mosquito larvae. Ironically, they are no better at controlling mosquitoes than our native fish. Their ability to control mosquitoes has been exaggerated and they have become pests in many countries where they have been introduced. They are very aggressive and will attack fish much larger than themselves. This has led to them being nicknamed "killer guppies".



female



male

Gambusia have a greenish silvery sheen. Mature females grow to 6 cm and males to 3.5 cm. The females mature at six weeks of age and are unusual because they give birth to live young. This means that only one pregnant female is needed to start a new population. These features allow gambusia populations to build up to large numbers very quickly. They are often found shimmering in the warm shallows at the edge of the water but will dart away quickly if approached.

Photos: B. O'Brien,  
University of Waikato.

Gambusia populations quickly expand to outnumber other species. They attack native fish by nipping at their fins and eyes and prey on their eggs. Native fish, such as whitebait and mudfish species, are especially vulnerable to Gambusia as they inhabit similar habitats.

## Rudd

Rudd (*Scardinius erythrophthalmus*) are considered to be pest fish everywhere in New Zealand except within the Auckland/Waikato Fish and Game region.



Photo: David Rowe, NIWA.

Rudd are a stocky, deep-bodied fish, their backs are olive, sides silver green, belly silvery white with bright orange fins. Rudd are commonly 25 cm long and weigh about 500 g. They are highly productive and females can produce 50,000 eggs per kilogram of body weight.

Rudd feed voraciously on insects, aquatic plants and other fish, competing with native species for food and damaging native fish habitat. Adult rudd feed preferentially on many native aquatic plants increasing the likelihood of invasion of pest plant species.

## Catfish

Brown bullhead catfish (*Ameiurus nebulosus*) have formed a few isolated populations around New Zealand, but are widespread in the Waikato River catchment including Lake Taupo, where they have established large populations.

Catfish are robust fish with distinctive whisker-like barbels (feelers). They have sharp spines at the front of their pectoral and pelvic fins. In New Zealand they often grow to 30 cm and 2 kg. They can survive in a wide range of temperatures and tolerate poor water quality. They are able to survive for long periods out of water and are difficult to kill.



Photo: DOC.

They stir up sediment reducing water clarity and prey on small native fish, fish eggs and are known to eat and compete with koura (native freshwater crayfish).

# AQUATIC WEEDS

Many of the aquatic weeds described below were introduced for aquariums and garden ponds. Unfortunately these weeds have been released into natural waterways and have become serious pests. Because of their adverse effects on our waterways, these weeds have been banned from sale in New Zealand.

The traits that make aquatic plants pests include: rapid growth and quick maturation, large amounts of seed, highly effective dispersal mechanisms and ability to tolerate a wide range of environmental conditions. Their effects on our waterways include:

- Reducing water flow, which increases risk of flooding
- Competing with and smothering indigenous aquatic plants
- Impeding recreational activity, such as swimming, boating and fishing
- Blocking hydro dam intakes and pump filters
- Downgrading water quality
- Rotting weeds on shore create a strong stench
- Compromising aesthetic values

## **Eelgrass *Vallisneria gigantea*** (all straight leaf varieties)

Eelgrass is an attached, submerged aquatic plant. It forms a dense mass of strap-like leaves which can grow through the entire water column in standing or flowing waters, displacing native vegetation and impeding drainage.

Photo: B. Coffey, NIWA.



Photos: Rohan Wells, NIWA.

## **Egeria *Egeria densa***

Egeria (an oxygen weed) is a bottom-rooted, submerged plant that forms dense beds of vegetation which may reach the water surface. It is larger than other oxygen weeds, with leaves 1–3 cm long, and produces conspicuous three-petalled white flowers on the water surface during summer.



Photo: Rohan Wells, NIWA.

## **Hornwort *Ceratophyllum demersum***

Hornwort is a vigorous submerged freshwater perennial, which can form dense mats that smother other species. This plant does not produce roots, but the base of the stems are lightly anchored in the sediment. It can flourish in still or slow flowing water in depths to 10 m and produce stems up to 6 m long. Its forked leaves with horn-like serrations along their edge make this easy to identify. Hornwort spreads by vegetative growth from fragments.

Hornwort is our worst submerged pest aquatic plant, impacting on indigenous biodiversity, hydro-generation and recreation.



## **Lagarosiphon *Lagarosiphon major***

Lagarosiphon is a submerged oxygen weed, which spreads from tiny fragments and grows rapidly into large, dense infestations. It is identified by its dark green leaves, which curl downwards and are arranged spirally around the stem. It can grow up to 5 m long. Lagarosiphon can spread by vegetative growth from stem fragments.



Photos: (left) Rohan Wells, NIWA; (right) John Clayton, NIWA.

The aquatic weeds described in this factsheet occur at a limited number of sites in the Wellington region. If they are left without control they have the potential to infest and destroy large areas of our waterways. With your help we can locate them and stop them before they get established.

For further information, or to report incidences of pest fish or aquatic weeds in the Wellington region, please contact one of the following offices:



Department of Conservation  
Te Papa Atawhai

Department of Conservation  
Ph: (04) 472 5821  
Website: [www.doc.govt.nz](http://www.doc.govt.nz)



greater WELLINGTON  
THE REGIONAL COUNCIL

Greater Wellington  
Regional Council  
Ph: (04) 526 5325 or  
(06) 3782 484  
Website: [www.gw.govt.nz](http://www.gw.govt.nz)



Fish and Game New Zealand  
Ph: (06) 359 0409 Website:  
[www.fishandgame.org.nz](http://www.fishandgame.org.nz)



MAF Biosecurity NZ  
To report water hyacinth only:  
Ph: 0800 809 966 Website:  
[www.biosecurity.govt.nz](http://www.biosecurity.govt.nz)

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## Sagittaria *Sagittaria platyphylla*

Sagittaria is an emergent rhizomatous aquatic plant up to 80 cm tall that can also produce submerged strap-like leaves. It forms extensive infestations in shallow waterways, where it can seriously restrict water flow, increase sedimentation, and aggravate flooding. Infestations of this plant can also displace native plants in wetland areas.

Photo: Paul Champion, NIWA.

## Senegal tea *Gymnocoronis spilanthoides*

Senegal tea is a perennial, semi-aquatic herb, growing to 1.5 m when flowering. Senegal tea is an extremely hardy plant and once established at a site it is difficult to control. In fertile situations its growth rate can exceed 15 cm a week. It forms dense floating mats which can quickly cover waterbodies, excluding other life forms as well as impeding water flow, navigation and recreational activities.

Photo: Rod Smart, ARC.



## Water hyacinth *Eichhornia crassipes*

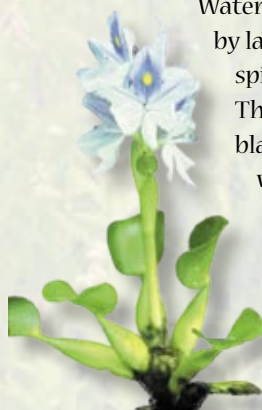


Photo: Rohan Wells, NIWA.

Water hyacinth is a free floating perennial aquatic herb, which can be identified by large blue/purple flowers (7 cm diameter) that are grouped together in a spike of up to 10 flowers. The leaves are bright green with spongy leaf stalks. The long, finely divided roots are bright purple in immature plants, turning black as the plant matures. Water hyacinth forms dense floating mats which causes deoxygenation of the water. As a result, water becomes uninhabitable for other aquatic life.

Water hyacinth is a notifiable organism. Please report any sightings to MAF Biosecurity NZ. It is considered to be almost eradicated from New Zealand, but eradication is extremely difficult because the seeds are long-lived. An infested site must be monitored for 20 years after water hyacinth has been cleared before the site can be declared free of the weed.

## Yellow flag iris *Iris pseudacorus*

Yellow flag iris is an emergent, perennial aquatic weed which grows on the margins of still and flowing water. It can be identified by distinctive large pale-yellow to golden-orange flowers which are up to 12 cm in diameter. The dark green sword-like leaves emerge in fans from a reddish base. The leaves can grow to 1 m long and tend to shred to fibres as they become older. Yellow flag iris grows quickly and can cover and exclude native plant species. It forms rafts of floating rhizomes that are strong enough to support the weight of a human. Yellow flag iris is extremely toxic to livestock.



Photo: Tom Belton, DOC.



## Purple loosestrife *Lythrum salicaria*

Purple loosestrife is a tall emergent perennial herb that grows from an extensive rootstock. A mature plant is often 2 m high and 1.5 m wide. Purple loosestrife can be identified by the dense pink-purple spikes of flowers that appear in December to February. The leaves are 3–10 cm long and vary from oblong to lance-shaped and are sometimes covered with fine hairs. The leaves and stems die off in winter to resprout in spring.

Photo: Noel Proctor, Horizons Regional Council.