

## Background

It has been common practice throughout the world for fish species to be transferred outside their traditional geographic range. While 'natural' dispersal and colonisation processes occur, most changes in distribution have occurred as a direct result of intentional relocation by man, driven by motives ranging from development of new food resources, to sporting purposes, use as biological control agents, or for novelty or ornamental reasons.

Some introductions of non-native fish species have been beneficial, at least in economic terms (for example rainbow trout in the UK). However, there are numerous examples of adverse impacts resulting from introductions and it is internationally recognised that the spread of non-native fish species can have far-reaching ecological consequences for both animal and plant communities.

In order to safeguard native species and their habitat and conserve the unique diversity of animal and plant life in our rivers and stillwaters, it is vital that the spread of non-native species is controlled. This poster summarises new measures employed in England and Wales.

## The dangers

Aquatic ecosystems are complex and it is difficult to predict how introduced non-native species will perform under novel conditions, where the 'normal' checks and balances that operate within ecosystems in a species native range may not apply. Non-native fish species may impact on native flora and fauna and the natural environment in a variety of ways. These include:

- direct predation on other fish;
- competition with indigenous fish for food, cover or spawning sites;
- the introduction of diseases or parasites against which resident populations may have inadequate defences (see adjacent poster on Signal Crayfish);
- hybridisation with resident fish causing possible reduced viability and fecundity of stocks;
- habitat degradation, for example consumption or uprooting of aquatic plants, effects on water turbidity, etc.

In view of the uncertainties about the possible impacts, it is appropriate to adopt a precautionary approach in relation to the transfer and release of non-native fish species.

## Recent controls

In England and Wales, previous controls were not entirely successful in preventing the unauthorised spread of non-native fish to many waters. New measures (set out in the Prohibition of Keeping or Release of Live Fish (Specified Species) Order 1998) were therefore recently introduced to reduce direct effects on native fish and their habitat and to make it easier to prevent illegal movements of non-native species. These measures came into force in 1998 under the Import of Live Fish (England and Wales) Act (1980) (ILFA) and make it an offence to release and/or keep specified non-native fish species without a licence.

The Order covers non-native freshwater fish species already known to be present in the UK, non-native cold-water species being kept for ornamental purposes and certain other non-native species thought to have the potential to survive and possibly thrive in the wild in the UK. The species currently covered by the measures are listed in Table 1; new species can be added if they are considered to pose a potential threat.

Table 1. Species covered by the Prohibition of Keeping or Release of Live Fish (Specified Species) Order 1998

Common Name	Species Name
<b>Salmonids</b>	
American brook trout	<i>Salvelinus fontinalis</i>
Landlocked salmon	Non-anadromous varieties of the species <i>Salmo salar</i>
Pacific salmon	Species of the genus <i>Oncorhynchus</i>
Pacific trout (excl. rainbow trout)	Species of the genus <i>Oncorhynchus</i>
Steelhead	<i>Oncorhynchus mykiss</i>
<b>Catfish</b>	
Wels catfish	<i>Silurus glanis</i>
Ameiurid (Ictalurid) catfish, including: American catfish (or Black bullhead), Brown bullhead & Channel catfish	Species of the genus <i>Ameiurus</i> ( <i>Ictalurus</i> )
<b>Sturgeons &amp; Paddlefish</b>	
Sturgeon and Sterlet	Species of the genera: <i>Acipenser</i> , <i>Huso</i> , <i>Scaphirhynchus</i> and <i>Pseudoscaphirhynchus</i> and their crosses
Paddlefish	Species of the genera: <i>Polyodon</i> and <i>Psephurus</i>
<b>Cyprinids</b>	
Grass carp	<i>Ctenopharyngodon idella</i>
Silver carp	<i>Hypophthalmichthys molitrix</i>
Chinese black (snail eating) carp	<i>Mylopharyngodon piceus</i>
Big-head carp	<i>Aristichthys nobilis</i>
Schneider	<i>Alburnoides bipunctatus</i>
Topmouth gudgeon	<i>Pseudorasbora parva</i>
Asp	<i>Aspius aspius</i>
Blageon	<i>Leuciscus souffia</i>
Blue bream	<i>Abramis ballerus</i>
Danubian bleak	<i>Chalcalburnus chalcoides</i>
Nase	<i>Chondrostoma nasus</i>
Toxostome (French nase)	<i>Chondrostoma toxostoma</i>
Vimba	<i>Vimba vimba</i>
Mediterranean barbel	<i>Barbus meridionalis</i>
Bitterling	<i>Rhodeus sericeus</i>
<b>Others</b>	
Large-mouthed black bass	<i>Micropterus salmoides</i>
Rock bass	<i>Ambloplites rupestris</i>
Pumpkinseed	<i>Lepomis gibbosus</i>
Pike-perch (incl. Zander)	Species of the genus <i>Stizostedion</i>
Burbot	<i>Lota lota</i>

## Controls are based on 5 risk categories

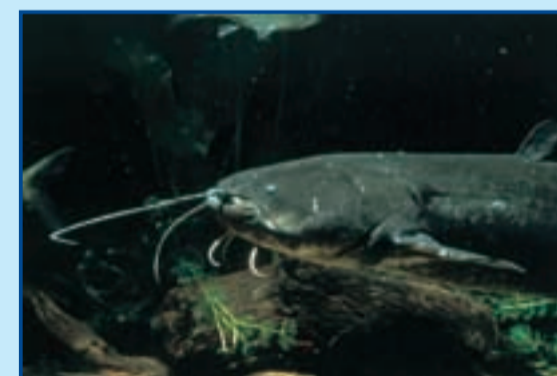
In exercising the controls under the ILFA measures, authorities have to balance the need to safeguard native species and aquatic ecosystems against the legitimate interests of those who want to keep or release non-native fish species, particularly where these practices have been long established. A complete ban on the movement of non-native fish is not possible and would be contrary to international rules governing free trade. Decisions on the issue of licences to keep and/or release non-native fish are therefore made on a case by case basis, based primarily on the perceived level of risk that the fish present. The listed species have been placed into risk categories:

- Category 1** (low risk) - releases allowed to secure enclosed waters that are not at risk from flooding; sites can have inlets/outlets provided these are fitted with appropriate screens;
- Category 2** (medium risk) - as category 1, but in view of the added risk waters must not have inlets or outlets;
- Category 3** (additional risks) - as category 2, but with additional constraints on distribution (e.g. no releases of zander allowed to any waters in catchments that do not already contain this fish);
- Category 4** (high or unknown risk) - no releases permitted to the wild, but keeping allowed for ornamental purposes;
- Category 5** (high or unknown risk) - neither keeping or release of these species is permitted.

### Category 1 example

#### Grass Carp (*Ctenopharyngodon idella*)

Originally native to SE Asia, this species has been introduced throughout the world, particularly for food and weed control purposes, but also for angling and ornamental use. It is highly unlikely that the species would ever be able to breed in the UK, so there is no danger that it will become established. Despite this, the species still poses risks (e.g. for plant species of high conservation value or where excessive reduction of weed might remove plants required by other fish for cover, spawning or food).

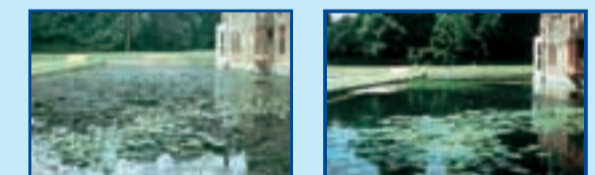


Photograph: courtesy of Nick Giles

### Category 2 example

#### Wels catfish (*Silurus glanis*)

Originally distributed throughout eastern and central Europe, this large piscivorous species has been quite widely introduced, particularly for angling purposes. The fish is able to breed in the UK, although appears to be relatively constrained by the ambient water temperatures and has remained fairly localised in distribution. There has been increasing interest in its use in specialist fisheries in recent years. Concerns remain about the potential impact of this species on native fish.



Pictures of lake before (left), and after (right) grass carp introduction.

### Category 3 example

#### Zander (*Stizostedion lucioperca*)

Originally native to E Europe and W Asia, this piscivorous species has been quite widely introduced for food and angling. The fish was first released in eastern England in 1963; it has since become established, and its range now extends to much of central and eastern England. The species is prized by some anglers. However, significant impacts on native fish populations have been reported and the species has become an unwelcome presence in many fisheries.



### Category 5 example

#### Topmouth Gudgeon (*Pseudorasbora parva*)

Originally native to SE Asia, this small fish was introduced into eastern Europe in the early 1960's and has subsequently spread across much of Europe in the last 30 to 40 years. It has recently been reported in the UK. The fish is a highly successful coloniser, although unwitting transfer has also aided its spread. The potential impact of this fish on native species is uncertain, although it is reported to compete with endemic species for prey, cover and spawning sites, to predate on fish eggs and juvenile fish and to be a 'nuisance species' in fisheries.



Photograph: courtesy of Nick Giles