

# Chub (*Leuciscus cephalus*) Management Plan

## 1. Aim

The aim of this plan is to set in place the protocols needed to manage the known populations of chub. This plan also establishes the requirements for the prevention of further spread and introductions in Ireland.

## 2. Priorities

- Implement the management plan in association with angling representative bodies with the aim of eradicating chub in Ireland.
- Increase awareness with anglers and the public of threats posed by non-native fish species introductions and transfer between waterbodies.

## 3. Introduction

The chub is a slender-bodied member of the carp family that reaches an average length of 30-45 cm (1.0-1.5kg) although fish of up to 80cm (circa 7.5kg) are known from the continent. Its scales are relatively large, bordered with black or grey, and their colour varies from grey-brown tinged with green along the back; to the lighter colour of the flanks which often have a golden hue, blending into the white of the belly. The rounded fins are a rich red in colour and they have relatively few rays. The mouth is wide and lacks barbels.

Chub are generally present in rivers with a moderate flow and occasionally in lakes. Larger individuals can be solitary and younger fish present as shoals in shallow, fast-flowing water during the summer where they will spawn from May to mid-June. They retreat to deeper water in the winter. As they mature, chub move from a diet of crustaceans, insects and detritus to one that includes small fish and frogs.

When identifying chub, confusion can occur with dace (present in the River Barrow and Blackwater, Co. Cork) and the widespread roach. The chub can be distinguished from the dace by its convex to straight anal and dorsal fins, the redder fins and wide mouth. The roach is a deeper bodied fish than the streamlined chub, with a more silvery sheen and a concave anal fin.

## 4. Invasion History

The chub (*Leuciscus cephalus*) is an abundant and widespread fish in Europe ranging from the north-east of Spain to the Ural basin, and from the south of Sweden to Italy. In Britain, it can be found in rivers throughout England and Wales as well as still waters to which it has been introduced for angling purposes. A number of fish farms in England are involved in the breeding of chub from wild stock specifically for this purpose. No fish farms in Ireland currently breed this species.

The chub is thought to have been resident in Ireland since 2001 although this date of introduction cannot be confirmed. It was first detected in the River Inny, a major tributary of the Shannon. The Inny flows through Counties Longford and Westmeath and this remains it's only known location in Ireland to date.

## 5. Pathways

In the absence of fish farms breeding chub in Ireland, intentional import is the only viable means of its introduction. Chub are likely to be introduced via a road vehicle and ferry, given the need for the maintenance of suitable conditions for their transportation at a suitable size or in suitable numbers, for bait and/or stocking.

## 6. Vectors of introduction

The chub is almost universally considered to be inedible because of its soft flesh and profusion of bones. Consequently, the introduction of chub to Ireland is associated with angling interests, for its use as live bait by pike anglers and its potential for illegal stocking as an additional 'game fish'.

## 7. Summary of impact

The potential impacts of chub on the Irish economy and environment can be summarised as follows:

- The potential associated introduction of fish diseases and parasites.
- Competition with native fish, especially salmon parr and trout.
- Hybridisation with other related species.
- A reduction in the quality of Irish game (salmonid), and potentially coarse fisheries.
- A reduction in the distinctiveness of the Irish freshwater fish fauna.
- Unpredictable and potentially wide-ranging ecological impacts.
- Economic impacts arising from the decline of Irish salmonid fisheries.

## 8. Impacts

There are no reported incidences of chub introductions to waters outside of their natural range other than to Ireland. As a result of this, the potential impacts of this species are determined and predicted from the impacts of other species of non-native fish and from our understanding of the chub's biology and ecology.

In light of the absence of suitable controls on the origins and quality of illegally imported chub there is a high risk of associated diseases and parasites being introduced into Ireland. These have the potential to infect other non-native cyprinids that have become naturalised and are important for the maintenance of a viable coarse fishery (i.e. bream, perch, dace, roach, rudd and tench). There is also the potential for chub to hybridise with some of these species. Although this is not a common occurrence hybrids have been confirmed with roach and rudd. Diseases and parasites that are not family-specific also have the potential to infect salmonids and other species of fish resident in Ireland.

In addition to the high potential for disease and parasite transfer, salmonids are especially at risk from direct competition with chub. Salmon parr and trout occupy the same riffles and runs that are favoured by chub. Chub also has similar dietary range and requirements. The wide range of food items consumed by chub at different stages of its life means that there is also the potential for direct competition with other types of fish and for unpredictable and potentially significant ecological changes to occur.

The distinctiveness of the Irish freshwater fauna which is most notable for its diversity of trout and post-glacial relicts could also be threatened by the introduction of chub or other non-native fish species. Consequently, certain water bodies that are particularly notable for these taxa (such as Lough Melvin) would be especially sensitive to the introduction of chub. Unfortunately, secondary introductions of this species to additional waterbodies is now likely to occur as the species is present on the island of Ireland.

All of these impacts have the potential to undermine the world famous coarse and salmonid fisheries present in Ireland and ultimately, the economic activities that are supported by them.

## 9. Exclusion strategy

### 9.1. Limit further entrance of chub into Ireland.

#### Action 1. Enforcement and raise awareness of legislative powers

Legislation is already in place to prevent the release of chub in both Northern Ireland and the Republic of Ireland:

Republic of Ireland - under the Wildlife (Amendment) Act 2000 it is an offence to

- a) turn loose, willfully allow or cause to escape any species of wild animal or the spawn (offspring) of such wild animal or wild bird or the eggs of such wild bird
- b) transfers any species of wild animal or the spawn of such wild animal or wild bird or the eggs of such wild bird from any place in the State to any other place in the State for the purpose of establishing it in a wild state in such other place.

Northern Ireland - under The Wildlife (Northern Ireland) Order 1985 it is an offence to release or allow to escape into the wild any animal which

- a) is of a kind which is not ordinarily resident in and is not a regular visitor to Northern Ireland in a wild state or
- b) is included in Part I of Schedule 9.

A number of other acts currently make it an offence to release non-native fish, eggs and gametes into Northern Ireland's waters including: the Fisheries Act (Northern Ireland) 1966, the Fish Health Regulations 1992, Fish Health (Amendment) Regulations 1993-1994 and the Fish Health Regulations (Northern Ireland) 1993.

In order to make these pieces of legislation effective their existence and relevance to anglers must be highlighted through interpretive means and potentially through a high profile conviction or a well-publicised, zero-tolerance approach to introductions and the use of live bait. Wardens also need to be seen to be active on the ground in order to make anglers aware of the potential for being caught.

#### Action 2. Amend existing legislation

Legislation should be strengthened to ensure a total ban on import and possession of chub. To this end:

- Chub should be added to schedule 9 of the Wildlife (Northern Ireland) Order 1985.
- The Minister of the Environment in the Republic of Ireland has power to prohibit the possession or introduction of any species that may be detrimental to native species. Chub should be brought to the attention of the Minister and the required prohibition enacted.
- The current ban on the use of live bait for coarse and pike fishing in the Republic of Ireland and in the Foyle and Carlingford areas should be extended to all parts of Northern Ireland. This will reduce the likelihood of non-native or diseased fish being introduced into non-infected waters if the legislation is adequately publicised and policed.

### 9.2. Promote good practice and awareness of invasive aquatic species

#### Action 3. Highlight, support and promote a code of practice for anglers

Anglers have a key role to play in preventing the introduction of non-native fish species and their associated parasites. Engagement with appropriate organisations is key to any successful management and prevention strategy and must be seen as a priority for government agencies.

#### Action 4. Training of customs officials at port of entry

Customs officials at ports of entry should be trained in the identification of non-native fish species that are imported for as use as live bait or potential stocking. Awareness raising should be repeated at regular intervals to ensure the diligence of staff particularly because of the possible impacts and expense arising from introductions.

### **Action 5. Increase understanding and awareness of the impacts of non-native fish**

Active anglers are generally aware of the impacts of introducing non-native aquatic fauna through word-of-mouth, club membership and the angling media. However, there are a complex set of issues that must be understood and addressed in order to gain their compliance such as animosity to the fishery boards and between coarse and game anglers. For instance, the introduction of chub to a river may concern game anglers through the eventual loss of game species but be met with approval by coarse anglers.

### **10. Detection of spread/new introductions**

#### **Action 6. Ensure reporting by government agencies**

The presence of chub in a water body may be detected through the monitoring and survey work undertaken by a range of agencies and by the involvement of anglers. The AlienWatch page on the Invasive Species Ireland website should be publicised within agencies and personnel should be aware of and utilise this for reporting invasive alien species. Reporting of invasive alien species should also be incorporated into government funded tenders, where appropriate.

#### **Action 7. Encourage reporting of non-native fish species catches**

Encouraging the reporting of non-native fish catches by anglers, could allow for a more rapid response to be undertaken before populations spread and the difficulties of eradication becomes insurmountable or very costly in terms of the economy and the environment.

### **11. Eradicate current population and any new introductions/spread**

#### **Action 8 Undertake a high profile eradication programme**

The current population of chub in Ireland is evidently capable of maintaining a self-sustaining population and has the potential to spread more widely throughout Irish waterways. It is essential that action is undertaken to prevent any increase of this population to levels where eradication becomes impossible.

Given the current limited distribution of chub, it may be possible to eradicate it from the River Inny. This process will involve the complete removal of all of its growth stages. If this is not possible, then containment measures will be required to restrict the access of chub into unaffected areas.

A high profile eradication programme in association with angling representative bodies/groups may help to deter anglers from introducing fish in the first instance. It will also serve as a vehicle for explaining the risks involved with introducing potentially invasive, non-native species. In addition, public pressure may also be brought to bear because of unwillingness to subsidise regular eradication programmes. Several different eradication and control methods are available:

#### **11.1. Eradication options**

- **Electro-fishing:** This technique has already been applied during the survey undertaken to determine the extent of the chub population in the River Inny and it is the eradication method favoured by the Central Fisheries Board officers. Electro-fishing is suitable for capturing all age classes of chub although for its greatest efficacy to be realised, it must be continued over a few to several years, according to the capture rates of the target species.
- **Drainage:** Draining a water body and physically removing the fish that are uncovered or concentrated into the remaining pools is a practice that is applicable to small water bodies with a suitable configuration of inlets and outlets, such as reservoirs. If undertaken rapidly, the longer term, ecological impacts can be minimal.

- **Netting:** The use of nets has been employed in a variety of different settings in order to control or eradicate non-native fish. This method can have the benefit of protecting native species. However, the approach is ineffective in larger water bodies and in the capture of juveniles of the target species that are smaller than the mesh size. Due to its indiscriminate nature it can also result in damage to valued species of fish, particularly if gill nets are used, although these can normally be safely returned to the water. Netting is generally most effective where complete removal of the fish in a water body is required prior to stocking with an economically valuable game fish and as with electro-fishing, it is most successful when repeated over a few to several years.
- **Containment:** In addition to the methods outlined above, there is also the potential to develop dispersal or containment barriers although the use of these is untried and potentially limited on systems where anadromous fish species are present.

Should further introductions or spread of chub be detected in Ireland they should be eradicated as rapidly as possible, particularly in complex systems such as the Shannon where the potential for their rapid spread is very high.

## 12. Benefits of the total removal of chub and other non-native fish species

- Minimise the impact that these species will have on native biodiversity and the economy.
- Minimise the need for continuous control which will place a greater financial burden on the economy.
- Reduce the risk of the species spreading to new areas.
- Reduce the risk of associated introductions of parasites and diseases to resident stocks of fish.
- Compliance with EU directives and avoiding infraction proceedings.

## 13. Resourcing the plan

### 13.1. Education and awareness

The education and awareness strategy that is recommended for Chub can be produced at low financial cost. This will involve staff time and upload to the Invasive Species Ireland website where they can be accessed by the public and journalists alike. It is recommended that education and awareness material for a range of non-native fish species be produced.

Developing Codes of Practice for will involve stakeholder engagement and electronic consultation process and production of the finalised codes. Costs associated with the code will be less than £10,000 (€12,000). After the codes have been agreed they will require the adoption by various groups. The codes are voluntary measures and as such are open to failure due to lack of uptake and acceptance. Materials and training programmes may need to be developed to support the codes to ensure successful uptake. It is estimated that this will cost less than £10,000 (€12,000). Value for money and publicity for the codes can be achieved if launched in a suitable manner.

### 13.2. Implementation of control options

The control options identified in this plan will vary in cost. Control efforts will require staff time and the purchase of equipment. Programmes will have to be deployed for a number of years with monitoring at suitable time intervals. The estimated cost per annum for the eradication programme on the River Inny is €30,000 (£25,000).

#### 14. Recommended actions and timescale

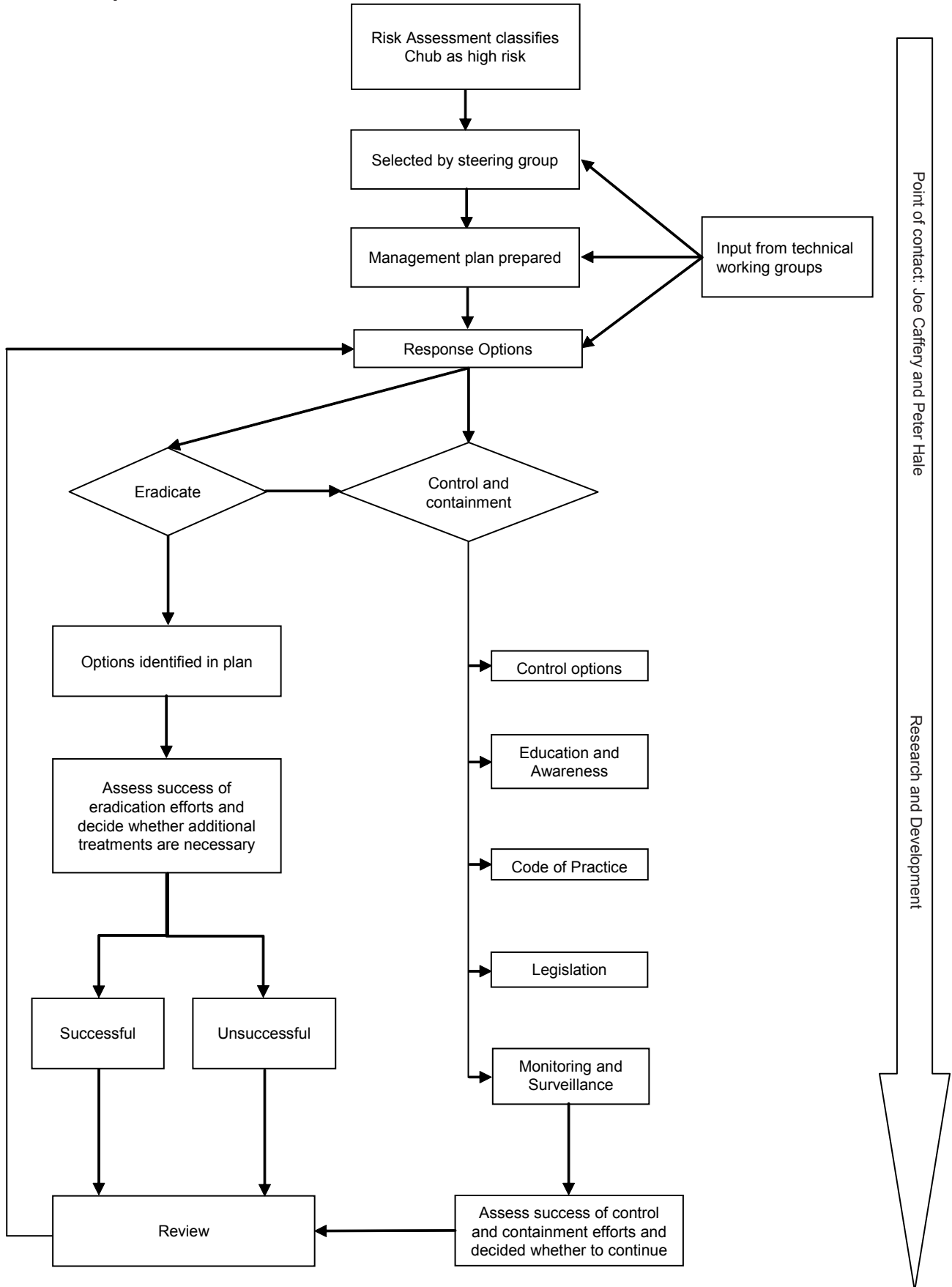
Action	Responsibility	Timescale
Eradicate the chub population currently resident in the River Inny, Co. Westmeath.	Government Agencies (Central Fisheries Board, Loughs Agency)	2008/09
Create a nominated point of contact for records and implementation of the management plan	Chair of aquatic technical working group and agency staff	Immediately
Review the Wildlife (NI) Order	NI Agencies	2008
Extend the ban on the use of live bait to all of NI	NI Agencies	2008
Raise awareness of invasive fish with customs officials	Government Agencies/Project Team	2008
Extension, enforcement and awareness of appropriate legislative powers	Government Agencies/Project Team	2008
Increase public understanding and awareness of the impacts of non-native fish	Project team	2008
Annual progress report and review to Invasive Species Forum	Nominated point of contact	Annually

#### 15. Chub spawning time

<b>Chub</b>	J	F	M	A	M	J	J	A	S	O	N	D
-------------	---	---	---	---	---	---	---	---	---	---	---	---

■ Period most likely for spawning to occur

### 13. Control plan decision tree





## 14. Chub management plan

Use this template to help formulate a management plan outlining how you are going to proceed and what you will need.

Site Manager(s)/Owner(s): \_\_\_\_\_

Site Name(s): \_\_\_\_\_

Central grid reference: \_\_\_\_\_

License to proceed with plan acquired? Yes  No

### Site details

Address:	
Telephone:	
Email:	
Agencies/persons involved:	
Date:	
Species of concern:	

### Invasion history

Date of introduction:	
Original location of introduction:	
Date of first report to competent authority:	
Method of introduction:	
Additional information on introduction event:	

### Site information

Total site area:			
Total area of relevant habitats:			
<b>Designation</b>	<b>On site</b>	<b>Near site</b>	<b>None present</b>
<b>Details:</b> Establish if there is a requirement to apply for a license/notify before proceeding with plan.			
<b>Rare and threatened species</b>	<b>On site</b>	<b>Near site</b>	<b>None present</b>
<b>Red Data Book or BAP species:</b>			
<b>Other rare or threatened species:</b>			

### Data to be recorded during an eradication programme

Fish ID number:	
Date caught:	
Species:	
Sex (M/F):	
Size:	
Location and 6 figure grid reference:	
Time caught (to nearest hour):	
By-catch:	

### Human sensitivities/vested interests at site

Issue	Human receptor

### Identify requirements and best practice for collaboration with stakeholders

--

### Actions and resources

Management options	Responsibility	Date to undertake

Resources needed	Responsibility	Date to undertake

### Monitoring and evaluation

Name of person/s	Date to undertake	Report to	Additional treatments date (if required)



The Invasive Species Ireland Project is undertaken, in partnership, by  
EnviroCentre and Quercus.



[www.envirocentre.co.uk](http://www.envirocentre.co.uk)



[www.quercus.ac.uk](http://www.quercus.ac.uk)

and is funded by the National Parks and Wildlife Service and the Northern  
Ireland Environment Agency.



[www.ni-environment.gov.uk](http://www.ni-environment.gov.uk)



[www.npws.ie](http://www.npws.ie)

For more information on the Invasive Species Ireland Project please see the  
website at [www.invasivespeciesireland.com](http://www.invasivespeciesireland.com)