# All-Ireland Species Action Plan

## Pollan

*Coregonus autumnalis*

AN RÓINN COMHSHAOIL, OIDHREACHTA AGUS RIALTAIS ÁITIÚIL
DEPARTMENT OF THE ENVIRONMENT, HERITAGE AND LOCAL GOVERNMENT

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# Pollan
# *Coregonus autumnalis*

## 1. Current status

1.1. The pollan *Coregonus autumnalis* is the only member of the whitefish family found in Ireland. Four large lakes in Ireland contain the only European populations - Lough Neagh, Lower Lough Erne, Lough Ree and Lough Derg on the main stem of the Shannon system. Pollan were once present in other Irish lakes. The species is now known to be distinct from the other European coregonids *C. albula* and *C. lavaretus*. Outside Ireland, the species is called the arctic cisco and is found in arctic Canada, Russia and Alaska, where it is anadromous, (living in the sea and migrating to freshwater rivers to breed).

1.2. Lough Neagh has the only remaining abundant population of pollan, and still supports a small scale commercial fishery. Although there are no firm data on trends in abundance, catches are known to be much reduced from former levels. There has been a reduction in the size of spawners over the past decade, indicating some stress on this population. The Shannon lakes populations of pollan are down to 1% or less of total fish biomass from known former levels of at least 5% to 9%. Recent gill-net surveys (Griffiths *et al.*, 1997) captured no pollan in Lough Derg and only 15 specimens in a survey of Lough Ree. The Lower Lough Erne population of pollan is severely reduced, a major decline having occurred sometime between 1960 and 1990. Prior to 1960 an occasional commercial fishery existed, capturing significant quantities for local consumption and for baiting eel lines.

1.3. The pollan is a regulated commercial species in Northern Ireland and is subject to a closed season in the Republic of Ireland. It is listed on Annex V of the EU Habitats Directive (92/43/EEC) and is listed in the Irish Red Data Book as Endangered.

## 2. Current factors causing loss or decline

2.1. Eutrophication - may act against pollan in a variety of ways. Enrichment of lakes from mesotrophic to eutrophic states tends to favour dominance of recently (1960s) introduced roach over other fish including pollan and perch. The effect of eutrophication is not a simple one - Lough Neagh, the site of the largest remaining pollan stock, has a higher trophic status than the three lakes where pollan have declined. There is a view that Lough Neagh is a special case due to its high degree of wind-driven mixing, giving it a limnology more typical of oligotrophic systems (Gibson & Stewart, 1993). Nutrient loads to the lakes containing pollan are increasing, largely due to run-off from intensive agriculture (Foy *et al.*, 2003).

2.2. Introduced species - roach are a potential competitor with pollan for zooplankton food, particularly when they occupy the same space outside the summer months. Roach are now the dominant species by biomass component of all lakes containing pollan, while they were absent as recently as 1950 (Harrod *et al.*, 2002, Maitland & Campbell, 1993, and Rosell, 1994). Roach introduction and population growth correlate with pollan decline in the Shannon lakes and Lower Lough Erne.

2.3. Introduced species - the zebra mussel *Dreissena polymorpha* was accidentally introduced into the Shannon system circa 1993/4 and has spread rapidly throughout the navigable reaches of the Shannon/Erne waterways (McCarthy & Fitzgerald, 1997, Rosell *et al.*, 2003). Within four years of introduction to the Erne system there has been a population explosion of this non-indigenous filter-feeding bivalve which clarifies the water column by removal of

algae (Maguire *et al.*, 2003). The reduced phytoplankton population and altered food web (from pelagic to benthic carbon pathways) is now showing signs of affecting fish populations. Fish appear to be responding to the zebra mussel invasion as they would to reduction of trophic status, but brought about by grazing of phytoplankton by zebra mussels rather than by nutrient reduction (Rosell *et al.*, 2003). The Zebra Mussels themselves cover rocky and gravelly areas, including potential pollan spawning ground. It is not yet possible to determine whether or not zebra mussel impact on pollan will be positive, negative or neutral, but they must be considered as a very real threat to the already reduced pollan population of Lough Ree, Lough Derg and Lower Lough Erne. The zebra mussel has not yet reached Lough Neagh.

2.4. Climate change - high summer temperatures already have an effect on the growth of Lough Neagh pollan. Should climate change processes cause temperatures to rise further this could pose problems for pollan (Harrod *et al.*, 2001). High summer temperatures associated with calm weather and the eutrophic state of Lough Neagh cause some bottom layer de-oxygenation in Lough Neagh in most years (Gibson & Stewart, 1993). The upper thermal limits for pollan are variably estimated at around 20-22° C. Increases in winter temperature could conceivably interfere with pollan spawning behaviour. The tendency of deep water to de-oxygenate in summer stratified conditions in eutrophic lakes clearly reduces the quality of any deep cool summer refuge available to pollan. If climate change results in increased summer temperature this, along with continuing eutrophication, will exacerbate the problem.

2.5. Commercial fishing - a viable commercial fishery still exists for pollan in Lough Neagh, regulated by close season, gill net mesh size, and a legal minimum size limit. Fishing rights are owned by the Lough Neagh Fishermen's Co-operative Society. Licences to fish pollan are issued by the Fisheries Conservancy Board for Northern Ireland. In Lower Lough Erne, where the fishery ownership is vested in the state, the Northern Ireland Authorities suspended issue of commercial pollan gillnet permits in 1994, which had in any case become uneconomic**.** Commercial or semi-commercial fisheries also once existed in the Shannon lakes, and as late as 1959 fisheries legislation provided for a minimum size (20cm) and a close season to protect the spawning stock. There are no recent records of any enforcement of this legislation, presumably because pollan have become too rare to repay the effort in fishing for them. Commercial fisheries have probably not played a primary role in the decline of any pollan stock.

2.6. Commercial fishing - an uncontrolled commercial fishery can be a threat to a fish species. In the case of pollan a sustainably managed fishery, where there is a sustainable stock, could be a major conservation benefit. As pollan have little or no importance as an angler's fish, if not monitored by fishery or survey they tend to go unnoticed. Sustainable harvesting and consumption, particularly as a local speciality, can maintain a public perception of the value of a fish species. Once commercial fisheries decline to the point where they are no longer viable, the public perception of the value of pollan may disappear with the fishery. Commercial fishermen may also be a valuable store of information –almost all knowledge on the habits of pollan in Lower Lough Erne, including spawning areas, the depths at which they are found, and their semi-pelagic habit has been recorded as a result of interviews with retired netsmen (Rosell, 1997).

## 3. Current action

3.1. The Heritage Council in the Republic of Ireland and the Environment and Heritage Service (EHS), in Northern Ireland has jointly funded an assessment of the status and genetics of pollan in Ireland (Griffiths *et al.*, 2003).

3.2. In Northern Ireland, EHS have overall responsibility for the Northern Ireland Biodiversity Strategy (NIBS) which was launched in Sept 2002 to facilitate the implementation of the UK

Biodiversity Plan, which was published in 1994. Many of the recommendations listed in the NIBS are relevant to the conservation of pollan.

- Recommendation 35: Develop and implement a Eutrophication Control Strategy which may involve new legislation.
- Recommendation 37: Adopt stronger measures, including the enforcement of anti-pollution legislation, to minimise the entry of effluent and solid wastes into watercourses and wetlands.
- Recommendation 48: Review the past and current effects of introduced species and genetic material in Ireland, assess the risks of further introductions and apply the guiding principles of the Conference of Parties of the CBD.
- Recommendation 57: Contribute to the UK habitat and species action plans through the preparation and implementation of costed Northern Ireland components of these plans.
- Recommendation 59: Review the lists of Northern Ireland species of conservation concern and priority species, seek additional information and conduct further reviews of the lists as required.
- Recommendation 61: Prepare or update Irish Red Data Books where there is adequate data.
- Recommendation 63: Identify and promote the conservation of native gene pools in Northern Ireland.

3.3. The National Parks and Wildlife Service (NPWS) of the Department of Environment, Heritage and Local Government, have overall responsibility for implementation of the National Biodiversity Plan (NBP), published in 2002. Several specific actions listed in the NBP are relevant to the conservation of pollan.

- NBP action point 26: Identify species of highest conservation concern in Ireland and prepare, and periodically revise, Species Action Plans for them.
- NBP action point 28: Prepare strategies, in consultation with Northern Ireland, to control introduced species and to prevent, or minimise, future introductions of alien species which might threaten biodiversity…
- NBP action point 40: Prepare a prioritised and co-ordinated programme of inventories, surveys and research, and implement the first phase of the programme. Priority will be given to endangered or threatened habitats and species about which little is known, or which are of special conservation importance.
- NBP action point 82: Consider initiatives, which could be employed to enhance the conservation of freshwater fish species and communities including the need to designate sites for the conservation of important fish communities.
- NBP action point 83: Ensure water will be primarily stocked with indigenous species. Including reviewing the situation in regard to the translocation of fish between catchments and producing appropriate guidelines or other necessary regulations.

3.4. Pollan are covered by an existing UK Biodiversity Species Action Plan, compiled in 1995 (UK Biodiversity Group, 1995). All the action from the UK pollan Species Action Plan are incorporated into this plan.

3.5. All inland fisheries legislative responsibility relating to conservation of pollan, and ownership of the fisheries of the Erne system in Northern Ireland now rests with the Department of Culture, Arts and Leisure (DCAL). The Department of Agriculture and Rural Development (DARD) retain responsibilities for aquaculture and fish health. The Fisheries Conservancy Board continue to be the enforcement and licensing agency under inland fisheries legislation.

3.6. In 2003, DOENI (Water management unit) increased the number of waters designated under the EC Freshwater fish directive. Both Lough Neagh and Lower Lough Erne are now designated salmonid waters and must meet the relevant chemical standards.

3.7. The commercial fishery for pollan in Lough Neagh continues, within the regulatory framework set and enforced by the Fisheries Conservancy Board for NI. This specifies close seasons and mesh size restrictions for gill nets restricting capture of immature fish. The University of Ulster maintains a research interest in Lough Neagh fish populations, dependent on research funding being available. Water quality is monitored in Lough Neagh by DARD scientists at two-weekly intervals throughout the year, as part of a time-series dating back to the 1970s.

3.8. DARD aquatic scientists provide a research and monitoring service to (and with the assistance of) DCAL, which includes regular monitoring of Lower Lough Erne fish stocks including pollan. DCAL have maintained the moratorium on issue of commercial pollan fishing permits in Lower Lough Erne.

3.9. A small pollan hatchery project has been carried out by personnel from a number of interested agencies in Northern Ireland namely, DCAL, EHS, DARD and the Cross Border Aquaculture Initiative (CBAIT). Ripe adult Pollan were targeted for translocation under license from their spawning grounds in November/December 2004. Eggs and milt were collected from these fish and fertilization and incubation strategies were carried out and results were recorded.

3.10. The project has achieved its two initial objectives; i.e. investigating the best fishing methods, as well as temporal and spatial considerations when obtaining pollan broodstock and also to develop on site experience within the Movanagher (DCAL) rearing facility to identify the hatchery 'bottlenecks' that are present to producing pollan fry under controlled culture conditions.

3.11. The National University of Ireland, Galway, has a strong research interest in the Shannon Lakes and in pollan in particular, and continues to monitor stocks as research opportunities arise, including targeted studies and recording by-catches in eel fisheries. Funding for research on Shannon lakes fish stocks is regularly provided by the Electricity Supply Board, as fishery owner for the lakes.

3.12. In the Republic of Ireland, the Environmental Protection Agency (EPA) has a responsibility to ensure that water quality monitoring is carried out and manages this function in co-operation with local authorities and in the Central and Regional fisheries boards. The EPA itself monitors water quality in some rivers and lakes, notably four times per year in Loughs Ree and Derg.

## 4. Action plan targets

4.1. Maintain the existing pollan stocks and prevent further decline in any of the populations.

4.2. Create 'back-up' stocks of all four pollan sub-populations by 2010.

4.3. Restore the Lower Lough Erne and Shannon lakes populations to demonstrably sustainable levels by 2015.

4.4. Restore pollan to sites where they have become extinct e.g. Upper Lough Erne by 2015.

## 5. Proposed action with lead agencies

The overall strategy for maintaining pollan stocks must be a "twin-track approach" of improving water quality to underpin the long-term survival prospects, coupled with specific targeted actions. The best means available to water managers for ensuring the future of pollan in Irish lakes, is to reduce nutrient inputs and control eutrophication. Climate change *per se* may be beyond local control, and, once present, introduced species such as roach and zebra mussels are practically impossible to control. However, the dominating effects of alien species on native aquatic biodoversity, and even some impacts of climate change, may be minimised if enrichment is abated and the lakes move towards their original trophic state.

### 5.1. Policy and legislation

5.1.1. Ensure that River Basin Management Plans developed under the requirements of the Water Framework Directive fully address the requirements of pollan.
(Action: EHS, DEHLG, DCMNR, DARD, DAF etc.)

5.1.2. Ensure that EU Habitats Directive is fully implemented to address the requirements of pollan (Upper Lough Erne, Lough Ree and part of Lough Derg are designated as SACs.)
(ACTION: EHS, DEHLG, DCMNR)

5.1.3 Seek to achieve and enforce an appropriate level of fishery protection in areas occupied by this species.
(ACTION: DCAL, Fisheries Conservancy Board, DCMNR)

### 5.2. Site safeguard and management

5.2.1. Seek to reduce the trophic status of Lough Neagh, Lough Erne, Lough Ree and Lough Derg.
(ACTION: EHS, DEHLG, DCMNR)

5.2.2. Consider the protection of pollan habitat on Lower Lough Erne through ASSI notification.
(ACTION: EHS)

5.2.3. Continue cross-departmental and cross-border action to try to prevent the spread of zebra mussel to Lough Neagh.
(ACTION: EHS, DARD, DCAL, DRD & NWPS)

5.2.4. Ensure that any major projects, such as the construction or restoration of canals and navigation systems, take into consideration the effects they will have in moving fish and other aquatic organisms between waterways before deciding whether or not to proceed.
(ACTION: EHS, DEHLG)

### 5.3. Species management and protection

5.3.1. By 2006 undertake a translocation programme to a back-up site for Lough Neagh pollan.
(ACTION: DCAL, DARD, EHS)

5.3.2. By 2009 establish aquaculture and stocking methods to allow "reservoir" stocks of all four sub-populations of pollan to be created.
(ACTION: EHS, DARD, NPWS, DCAL, DCMNR)

5.3.3. By 2010, transfer Shannon and Erne stock to selected recipient sites which will act as reservoir sites.
(ACTION: DARD, EHS, NPWS, DCAL, DCMNR)

5.3.4. By 2015 restore a sustainable pollan population to Upper Lough Erne.
(ACTION: EHS, DARD, DCAL)

### 5.4. Advisory

5.4.1. Review the role of the existing Pollan Steering Group and ensure that all key stakeholders are involved in future meetings.
(ACTION: EHS, DARD, DCAL, DAF, DCMNR, DEHLG)

5.4.2. Continue to pass information gathered during survey and monitoring to the appropriate biological records centre so that it can be incorporated in a national database and contribute to the maintenance of an up-to-date Red List.
(ACTION: EHS, NPWS)

### 5.5. Future research and monitoring

5.5.1. Continue genetic investigations to provide a better understanding of each of the populations present in the four lakes and their interrelationships.
(ACTION: EHS, DARD, DCAL, DCMNR, NPWS, DAF)

5.5.2. Initiate hydroacoustic population monitoring in the two Shannon lakes by 2006.
(ACTION: DCMNR, NPWS)

5.5.3. Continue hydroacoustic population monitoring in Lough Erne and initiate monitoring in Lough Neagh by 2006.
(ACTION: EHS, DARD, DCAL.)

5.5.4. Continue regular water quality monitoring in all four lakes.
(ACTION: EHS, DEHLG)

5.5.5. By 2006 initiate a programme of experimental aquaculture and stocking to establish "reservoir" stocks for each lake population.
(ACTION: EHS, DARD, DCAL, NPWS, DCMNR, DAF)

5.5.6. Survey to identify the spawning grounds of the remaining pollan in Lower Lough Erne and provide more quantitative assessments of the Lough Erne stock.
(ACTION: EHS, DARD, DCAL)

5.5.7. Seek the co-operation of Lough Neagh Fishermen's Co-operative Society in monitoring the population changes through commercial fishery data.
(ACTION: EHS, DARD, DCAL)

### 5.6. Communications and publicity

5.6.1. Inform local authorities and statutory agencies of the presence of Pollan in their areas of responsibility and ensure that they are aware of the potential risks to Pollan that could be caused through inappropriate land management or development.
(ACTION: EHS, NPWS)

5.6.2. Encourage managers in Aquariums, Country Parks, to actively promote pollan, within their displays. Not only are they are a very unique Irish species and they will also make excellent aquarium displays because of their spectacular shoaling behaviour.
(ACTION: EHS, DEHLG)

5.6.3. Publicise information on pollan and its conservation requirements to generate public interest. Continue with regular press articles in key areas providing information to local communities on the importance of pollan.
(ACTION: EHS, DCAL, DARD, DEHLG)

## 6. Links with other action plans

Northern Ireland Habitat Action Plans

- Mesotropic lakes
- Eutrophic Standing Waters

## 7. References


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