

# Fisheries and the presence of cormorants, goosanders and herons

Cormorants (*Phalacrocorax carbo carbo* and *P. c. sinensis*), goosanders (*Mergus merganser*) and, to a lesser extent, herons (*Ardea cinerea*) may cause problems at individual fisheries or fish farms, by damaging stocks of fish and by reducing catches. Like all wild birds, these piscivorous (fish-eating) birds are protected under the Wildlife and Countryside Act 1981 and cannot be killed or their eggs or nests (when in use or being built) taken or destroyed except under licence.

Predation is just one of a wide range of factors that can affect fish populations. Fish live within communities of animals and it is normal for some of them to be eaten at various stages during their life-cycles. Predation by piscivorous birds should therefore be seen as a normal part of the natural interactions between species. However, these birds can, in some circumstances, have serious impacts on fish stocks. A significant reduction in the stocks of catchable fish can have economic implications for fisheries. Under such circumstances, management action may be needed. Such action needs to balance the need to safeguard fish stocks and fisheries with the conservation of the birds, although striking such a balance may not always be easy. There may also be particular conservation concerns about populations of some rare fish species.

The purpose of this leaflet is to help fishery owners and managers in England to consider ways in which a 'problem' caused by piscivorous birds might be addressed and to outline the licensing system under the Wildlife and Countryside Act 1981.

## The problem

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Conflicts between piscivorous birds and fisheries have increased over recent years. There are a number of reasons for this:

### Population changes

#### Cormorant

- Numbers have risen rapidly throughout Europe over the past 20-30 years.
- In the UK the breeding population increased at a moderate rate (around 3% per annum) over the period 1987 to 1994. Wintering numbers inland rose more rapidly (5-10% per annum) over the same period. This may be due in part to the influx of birds from the continent (a separate subspecies).
- More recent evidence suggests that the cormorant population may now have stabilised, with a UK wintering population of around 15-16,000 birds.
- Many birds migrate away to coastal breeding sites in the Spring and Summer. However, some

cormorants breed at inland sites so the species may be found at inland fisheries throughout the year. The number of birds breeding inland in England increased from sporadic records in 1981 to c. 1,300 pairs in the mid-1990s.

- It is during the winter months, when cormorants are most numerous inland, that these birds tend to come into greatest conflict with fisheries. This may, in part, have been encouraged by the increase in the number of stillwater fisheries and the increased use of stocking. The presence of reasonable densities of fish in relatively shallow inland water bodies probably also represents an attractive food source for opportunistic predators such as the cormorant.

#### Goosander

- The goosander in the British Isles is on the south-western limit of its distribution in Europe. Numbers have increased in the UK over recent years and the birds have also extended their range into many parts of England.
- The size of the UK wintering population is currently estimated to be in the region of 8,900 birds.

- Goosanders typically breed and inhabit freshwater upland streams; breeding occurs in Spring and broods are reared over the Summer. Adult male birds migrate away each spring to moult, but some birds are resident on rivers throughout the year.
- Highest densities of goosanders on the lower reaches of rivers tend to occur in mid-Winter, with other peaks in the Summer in years with high breeding success.

### **Heron**

- Herons are widespread throughout the British Isles, occurring almost everywhere except in the most mountainous regions. However, they are most abundant at lower altitudes, along major river systems and on the coast.
- The UK heron population has been stable over recent years at around 20,000 birds
- Herons usually nest colonially, often at traditional sites with extensive, suitable foraging habitat in the vicinity. They forage in a wide variety of habitats, from rivers, estuaries and lakes, to fields and pasture.
- Although herons occasionally come into conflict with particular fisheries, problems are not considered to be widespread and tend to be more associated with fish farms.

### **Feeding behaviour**

- Cormorants, goosanders and herons are all opportunistic predators and eat a wide range of fish species. In most instances, the diet of these birds reflects the species available, with locally abundant species predominating. Herons also eat frogs and small mammals.
- Cormorants and herons tend to be mainly seen as problems at stillwater fisheries (both put-and-take trout and coarse fisheries) and on lowland (coarse) rivers, although birds are also present at other sites.
- In contrast, the preferred breeding habitat for goosanders is in the head-waters of upland rivers. This coincides with habitats suitable as rearing areas for juvenile salmon and trout, and where these fish tend to predominate. These fish can

thus comprise a high proportion of the diet of these birds.

- All these birds tend to consume predominantly smaller fish but are capable of consuming larger fish of more interest to anglers.

### **Potential for damage to fisheries**

The presence of piscivorous birds at inland sites has raised a number of concerns about losses of fish and economic damage to fisheries:

- consumption of the sizes and species of fish targeted by anglers (direct conflict);
- consumption of smaller fish and thus potential impact on future stocks and catches;
- damage to fish with an increasing risk of disease, mortality, stress and behavioural changes (fish said to be less catchable);
- an adverse effect on angler perceptions (regardless of whether a 'serious problem' actually exists) resulting in a fall in income (e.g. from permit sales) and in the capital value of the fishery;
- the costs of implementing fishery protection measures, such as scaring and proofing, can place a financial burden on the enterprise.

### **The impact on fisheries**

There has been considerable debate about the extent to which fisheries may be damaged by piscivorous birds. The results of a recent R&D investigation support the view that piscivorous birds present a problem for specific fisheries rather than a general problem. Birds at some sites remove a high proportion of fish, while at other sites impacts can be relatively minor. Management of the problem needs to be determined on a case by case basis.

There are various reasons why the presence of piscivorous birds at a fishery need not necessarily constitute a serious problem, including:

- not all birds may be feeding at a site; some (or all) birds may simply be resting or roosting;
- for feeding birds, the species of fish consumed may be of little commercial value at the fishery (e.g. small coarse fish at a put-and-take trout fishery);

- predation on juvenile fish may result in reduced mortality from other causes and there may be little or no effect on the number of adult fish surviving (a process known as 'compensatory survival').

The seriousness of any problem depends not just on the numbers of birds present and their feeding behaviour, but also on the range of fish species present and the status and productivity of the stocks. The level of interaction is also likely to vary over time. However, as a general rule, fish stocks that are at a low level (e.g. due to poor spawning or water quality) are likely to be less well 'buffered' against losses to predators than 'healthy' productive stocks.

## Management options

Limiting the interaction between piscivorous birds and fish might be achieved either by employing methods that keep the birds away from the fish or by making the fish less readily available. There may therefore be some potential for habitat management at a site, to make it more favourable for fish, in addition to the use of deterrents. A large number of potential deterrents have been tested on 'nuisance' bird species; many of these have been investigated as deterrents for piscivorous birds. Some of these techniques have proved ineffective or impractical but others have proved beneficial, at least in certain situations. However, it is recognised that what works at one site might not work at another.

For example, the effectiveness of potential measures is influenced greatly by the size of the site it is hoped to protect; effective deterrence is more difficult at larger sites. In addition, there are practical constraints that might limit applicability (e.g. the nature conservation status of the site, disturbance to other wildlife, and the proximity of human habitation). The presence of other feeding or roosting sites in the area is also an important factor. Birds can habituate to deterrents, and different approaches or combinations of methods may need to be explored and tailored to specific sites. However, deterrents may not be effective or practical and killing some birds (under licence) as an aid to scaring may also be necessary at some sites.

Where a predation problem has been identified, various management options should be considered.

The following is not an exhaustive list but provides some possible options that might be applicable at different sites:

### Fish farms

- The use of enclosures, such as nets and wires, is a proven technique against piscivorous birds. However, nets in particular can be costly to install and may only be applicable for smaller sites or where particularly valuable stocks are being held.
- Another option at fish farm sites is to keep valuable fish in more secure ponds closer to human habitation.

### Stillwater fisheries

- **Human disturbance** - has been shown to be a consistently effective technique for scaring cormorants away from a fishery and is not constrained on grounds of acceptability, as often applies to other techniques. However, frequent or extended periods of human presence may be required for this to be effective and this may prove to be costly or impractical; habituation to human presence has also been noted. Options to encourage or extend incidental human presence at 'problem' sites might therefore be considered.
- **Noise generating scarers** - (e.g. gas cannons which are powered by propane, controlled by electric timers and produce loud reports) are not considered effective on large bodies of water and birds may habituate quickly to their presence. However, these can be effective at smaller sites, particularly if combined with the use of mobile, visual scarers, or human disturbance, and if their location is changed frequently to decrease the risk of habituation. Use of such devices may be constrained where there are risks of disturbing other wildlife or due to the proximity of human habitation.
- **Visual scarers** - are available in various forms (e.g. 'pop-up' effigies, kites, helium balloons, etc). The most effective techniques appear to be those that simulate shooting by the use of effigies that suddenly appear from cover. One example is a model of a man with a gun that is attached to a gas cannon in such a way that the effigy appears a few

seconds before the cannon is fired. This can also be used for purely visual scaring when simultaneous use of the cannon is inappropriate. However, such measures are only thought to have an effective range up to ~200m (220 yds) and so would be of limited use on river systems or larger sites.

- **Roost management** - may be an option where it is possible to cut down or modify roosting and resting sites to stop their use or make sites less attractive. (Nests are protected under the Wildlife and Countryside Act 1981 when in use or being built but at other times they may be destroyed or removed). However, this is likely to be constrained by factors such as adverse environmental or amenity impact and will be influenced by the availability of alternative roosting sites. It is not considered a viable option for rivers or larger sites.
- **Stocking control** – is most likely to be appropriate for put-and-take trout fisheries, although this may also have applications for coarse fisheries. Whilst fish of larger size (e.g. trout >45cm (>18")) are less likely to be consumed by cormorants, the surviving fish may be more likely to be wounded than medium or small fish. Other precautionary measures that may help include: 'trickle' stocking fish, stocking at various locations, timing stocking to coincide with times when bird numbers are lowest, and using scaring devices at stocking sites.
- **'Buffer' species** – extends the stocking control options by enhancing or introducing alternative (less valuable) prey species either in the 'target' fishery or in nearby bodies of water. This is unlikely to be appropriate for rivers and costs may be prohibitive. However, the presence of coarse fish at a put-and-take trout fishery, for example, does reduce losses of trout.
- **Fish refuges** - can alter the foraging behaviour of cormorants and the incidence of damage to fish. The types of structures that might be suitable for different species is being investigated further. There are likely to be particular practical constraints regarding the use of refuge structures in rivers.
- **Shooting** - although birds are protected by law, there are provisions to be able to shoot (and kill)

them, under licence, for the purpose of preventing serious damage to fisheries (see below). No licence is required for non-lethal shooting to scare. For cormorants, it has been demonstrated in a recent study that both shooting to scare and shooting to kill a small number of birds as an aid to scaring can reduce the number of birds present at fisheries (both stillwaters and stretches of river) for the duration of the shooting period and for a 'post-treatment' period. A 50% average reduction in the number of birds was reported, however, bird numbers recovered to pre-treatment levels over a period of a few weeks. To be effective in the longer term, such scaring would need to be repeated at regular intervals.

## River systems

The practicality and effectiveness of deterrent measures are greatly reduced at larger sites such as river catchments. Few of the above options are, therefore, likely to be applicable for rivers, other than possibly on a very localised scale. For rivers, increasing human disturbance, and shooting to scare and shooting to kill a small number of birds as an aid to scaring, appear to be the only options that may be effective. Goosanders have been observed to respond more quickly to human presence after previous exposure to shooting to kill as an aid to scaring.

For additional advice, see the organisations listed under "Further information" at the end of this leaflet.

## Licensing system

Where piscivorous birds are causing serious damage to a fishery, the Department for Environment, Food and Rural Affairs (Defra) may grant a licence to allow the shooting of a limited number of the birds to reinforce the effects of scaring measures being carried out at the site.

Licence application forms are available from Defra (for address see under 'Further Information').

Each application is considered on a case by case basis. On receipt of the application form, the applicant will be visited by a technical member of the Wildlife Management Team. These staff are professional wildlife biologists trained in wildlife management. A

decision on whether to issue a licence will be taken by the Wildlife Management Team administration unit within 30 working days of the application.

Licences are issued on a site basis where it has been demonstrated that:

- there is clear evidence that serious damage is being caused by piscivorous birds or, on recent past evidence, that it is likely to occur;
- other, non-lethal, anti-predation measures have been tried and found to be ineffective, or the methods are impracticable at the site;
- other factors are not likely to be responsible for the serious damage;
- shooting will help to prevent damage; and
- there is no other satisfactory solution.

English Nature and the Environment Agency advise as appropriate. Factors such as the breeding season, and the conservation status of the birds and the site are taken into account.

In order for Defra to assess the case, the application form asks for a range of information on:

### **Evidence of serious damage**

Applicants will need to provide as much information as possible to allow the damage caused by piscivorous birds to the fishery to be evaluated:

- the species, number, frequency and behaviour (e.g. feeding, roosting) of piscivorous birds at the site;
- the range of fish species present at the site and any available information on the status of the fish population;
- the number of fish damaged or likely to be damaged (photographs of damaged fish are helpful);
- details of changes in the fishery income and financial implications of the damage (e.g. reduced ticket sales or subscriptions, cost of stock replacement);
- information on changes in catch records, (particularly if these can be related to the time spent fishing per angler or, if not, the number of anglers), such as: summaries of the numbers,

species, and size/weight composition of the catch; and catch return rates (for put-and-take fisheries).

### **Anti-predation measures**

Applicants will need to demonstrate that they have considered alternative management measures and, where appropriate, have tested them. They will need to provide information on:

- deterrents and measures currently being used to protect the stock (e.g. scaring devices, proofing);
- methods tried and found to be ineffective or which are impracticable.

### **Any other factors affecting the fishery**

Applicants will need to provide information on any other factors that may be affecting the fishery, such as:

- presence of other predators, e.g. mink;
- changes in water level;
- poor water quality;
- changes in fishery management practices.

Where a licence is issued, a number of conditions will be attached, for example the maximum number of birds that can be shot and over what period, and the appropriate weapons to use (12, 16 or 20 bore shotgun). Shot birds should be made available to Defra for further examination, to help provide valuable background information on the sizes and species of fish that are consumed.

In some circumstances, there may be particular conservation concerns about populations of some rare fish species. English Nature are the appropriate authority for considering licences to control birds for conservation purposes.

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### **Further information**

In England, further advice on licensing or control and preventative measures, as well as problems caused by other mammals and birds can be obtained by contacting the Department for Environment, Food and Rural Affairs (Defra) Wildlife Management Team at:

Address                      Wildlife Administration Unit  
Defra, Burghill Road  
Westbury-on-Trym

Bristol, BS10 6NJ

Telephone 0845 601 4523 (local rate)

E-mail enquiries.southwest@defra.gsi.gov.uk

Further advice on fishery issues can be obtained from the local offices of the Environment Agency (see local telephone directory).

Advice on conservation matters can be obtained from local offices of English Nature (see local telephone directory).

A range of leaflets on wildlife topics is available online at: [www.defra.gov.uk/wildlife-countryside/vertebrates](http://www.defra.gov.uk/wildlife-countryside/vertebrates)

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