Fisheries and the presence of cormorants

Cormorants *Phalacrocorax carbo carbo* and *P. c. sinensis* 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 have significant impacts on fish stocks and cause serious damage to fisheries in specific cases. Under such circumstances, management action may be needed. Such action should 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.

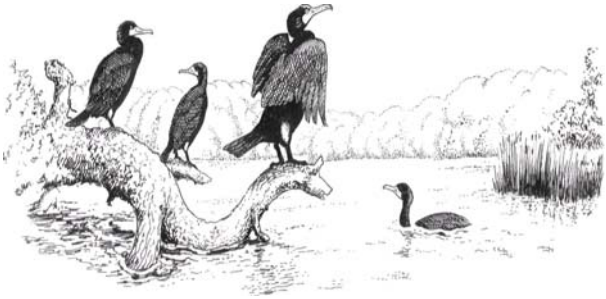
The purpose of this leaflet is to help fishery owners and managers in England to consider ways in which a problem caused by cormorants might be addressed and to outline the licensing system under the Wildlife and Countryside Act 1981.

The problem

Conflicts between cormorants 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 3per cent per annum)



over the period 1987 to 1994. Wintering numbers inland rose more rapidly (5-10per cent per annum) over the same period. This may be due in part to the influx of birds from the continent.

- More recent evidence suggests that the cormorant population may now have stabilised, with a wintering population in Great Britain of around 23,000 birds (17,000 in England).
- Many birds migrate away to coastal breeding sites in the Spring and Summer. However, some cormorants breed at inland sites which means that 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 more than 1,400 pairs at 23 sites in 1998. The most recent estimate (1998-2002) indicates there are now 1,646 pairs at inland colonies in the British Isles; the vast majority of these are in England.
- 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

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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 represents an attractive food source for opportunistic predators such as the cormorant.

Feeding behaviour

- Cormorants are 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.
- Cormorants tend to be mainly seen as problems at stillwater fisheries (both put-and-take trout and coarse fisheries) and on riverine coarse and game fisheries, although they are also present at other sites.
- Cormorants tend to consume predominantly smaller fish (average weight 35 g) but are capable of consuming larger fish.

Potential for damage to fisheries

The presence of cormorants 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; and
- damage to fish thus increasing the risk of disease, mortality, stress and behavioural changes in the fish (fish said to be less catchable).

Possible indirect effects:

- an adverse effect on angler perceptions (regardless of whether a serious problem actually exists) resulting in a fall in income (for example from permit sales) and in the capital value of the fishery; and
- 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 cormorants. Research supports the view that cormorants present a problem for specific fisheries rather than a general problem. Cormorants at some sites remove a high proportion of fish worth protecting, 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 cormorants 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 value to the fishery (for example small coarse fish at a put-and-take trout fishery); and
- 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 over the long term (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 (for example due to poor spawning or water quality) are likely to be less well buffered against losses to predators than healthy productive stocks.

Management options

This information note focuses on managing cormorants, in addition steps should be taken to address all factors which may be significantly adversely affecting the fishery. Limiting the interaction between cormorants 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 (for example using fish refuges), in addition to the use of deterrents. A large number of potential deterrents have been tested on problem bird species; many of these have been investigated as deterrents for cormorants. Some of these techniques have

proved ineffective or impractical but others have proved beneficial, in the short term and in certain situations at least. 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 (for example 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 cormorants (under licence) as an aid to scaring, or to reduce cormorant numbers at the site 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 used against piscivorous birds. However, nets in particular can be costly to install and may only be viable 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** 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 is often the case with 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** Noise generating scarers (for example 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** Visual scarers are available in various forms (for example 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 200 metres (220 yards) and so would be of limited use on river systems or larger sites.
- **Roost management** 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** 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 (for example 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** 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** Fish refuges can reduce fish losses, the foraging efficiency of cormorants and the incidence of damage to fish. However, there may be particular practical constraints regarding the use of refuge structures in rivers and larger still-waters (especially those that are also used for water-sports). The types of structures that might be suitable for different locations and species of fish is the subject of continuing research. Fish refuges are covered in more detail in TIN028 available form Natural England.
- **Shooting** Although all wild birds are protected by law, there are provisions enabling them to be shot (and killed), 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, research examining the deterrent effect of shooting found that the number of birds present was reduced at fisheries (both stillwaters and stretches of river) for the duration of the shooting period and for a period subsequently. A 45per cent average reduction in the number of birds was reported. This effect was short-lived and bird numbers recovered to pre-treatment levels over a period of a few weeks. To be effective in the longer term, shooting needs to be repeated at frequent intervals. Scaring measures should also be implemented as early as possible to prevent birds establishing a pattern of feeding at a particular site.

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, non-lethal shooting to scare and shooting to kill (either to reinforce scaring or reduce cormorant numbers at the site) appear to be the only options that may be effective.

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

Licensing system

Where cormorants are causing serious damage to a fishery, or are likely to do so, Natural England may grant a licence to allow the shooting of a specified number of birds in order to prevent the serious damage from occurring. These licences can be granted to shoot cormorants to reinforce the effects of scaring measures or to limit the number of cormorants feeding at a site.

Natural England is also the licensing authority where there are particular conservation concerns about the impact of cormorants on populations of rare fish species.

Duration

Licences will normally be issued for up to one season, to run between 1 September and 15 April. If the circumstances warrant it licences may be granted outside this period, for example to protect the smolt run.

How to apply for a licence

Licence application forms and accompanying guidance notes are available from Natural England (see Further information below).

Each application is considered on a case by case basis. Following receipt of the completed application form, all new applications will be visited by a technical member of the Wildlife Management and Licensing team. These staff

are professional wildlife biologists trained in wildlife management. A decision on whether or not to grant a licence will be taken by the Wildlife Licensing Unit, usually within 30 working days of the application.

In order for a licence to be granted, the applicant must satisfy three fundamental tests:

- Serious damage is being, or is likely to be, caused by cormorants at the site.
- All other non-lethal anti-predation measures have either been tried and found to be ineffective or are impracticable at the site.
- It is reasonable to consider that shooting cormorants will reduce, or prevent from increasing, the level of damage (whether through scaring or direct reduction of numbers).

If the application fails to meet any one of these fundamental tests a licence will not be granted.

The Environment Agency advise on licence applications as appropriate. Factors such as the breeding season, and the conservation status of both the birds and the site are taken into account.

In order for Natural England to assess a request for a licence, applicants are asked to provide information on the damage caused by the cormorants, anti-predation measures which have been tested and found to be ineffective or which have been considered to be impracticable at the site and other factors that may affect the fishery.

Evidence of serious damage

To be eligible for a licence, a fishery resource must be potentially vulnerable to predation by cormorants and it must be worth protecting.

As much information as possible should be provided to allow damage (actual or potential) to be evaluated. All applicants are **required** to provide information on:

- the species, number, frequency and behaviour (for example feeding, roosting) of cormorants at the site; and
- the size range and variety of fish species present at the site and any available information on the status of the fish population or fishery;

It is recommended that the following, additional information is also provided:

- the number of fish damaged or likely to be damaged (photographs of damaged fish are helpful);
- changes in the fishery income and financial implications of the damage (for example reduced ticket sales or subscriptions, cost of stock replacement);
- 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 (for example scaring devices, proofing); and
- 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, for example mink, other piscivorous birds;
- changes in water level;
- poor water quality; and
- changes in fishery management practices.

Licence conditions

Where a licence is granted, a number of conditions will be attached, for example the maximum number of birds that can be shot, over what period and, where appropriate, the weapons that may be used. A return of numbers

of birds shot under licence must be sent to Natural England. This information is required under European legislation and is essential for Natural England to be able to monitor the impact of licensed shooting on the populations of piscivorous birds.

Failure to comply with licence conditions may result in revocation of the licence and refusal of future applications.

Further information

Natural England Technical Information Notes are available to download from the Natural England website: **www.naturalengland.org.uk**.

For information on other Natural England publications contact the Natural England Enquiry Service on 0845 600 3078 or e-mail **enquiries@naturalengland.org.uk.**

In England, further advice on managing wildlife problems and applying for licences can be obtained by contacting Natural England's Wildlife Licensing Unit at:

Natural England, Wildlife Licensing Unit,
First Floor, Temple Quay House,
2 The Square, Bristol, BS1 6EB
Telephone: 0845 601 4523 (local rate)
E-mail: wildlife@naturalengland.org.uk

A range of leaflets on wildlife topics is available at:
www.naturalengland.org.uk/conservation/wildlife-management-licensing

Fisheries and Angling Conservation Trust (FACT)
[This was previously the Moran Committee]
Address: c/o The Salmon & Trout Association, Fishmongers Hall, London EC4R 9EL
Telephone: 020 7283 5838

The Moran Committee Joint Bird Group published the following leaflets that are available from the Natural England website:

- *Protecting your fishery from cormorants*
- *Cormorants - The Facts*
- *Goosanders and Mergansers - The Facts*

Environment Agency
Further advice on fishery issues can be obtained from local offices (refer to telephone directory or website).
HQ address: Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, BS32 4UD
Telephone: 01454 624400
Web: www.environment-agency.gov.uk

Authors
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