



The WTT is a conservation charity that focuses on practical work to improve habitat for trout across the UK and Ireland. We work with grass roots organisations and land-owners to improve and maintain habitat of trout and all wildlife.

THE GREAT CORMORANT

- A widespread and opportunistic predator, the number and size of inland great cormorant colonies has increased since the 1980s.

GOOSANDERS

- Goosanders are mainly upland and coastal predators, they have also undergone rapid growth in both range and population size in the UK, though in recent years (1995 – 2010) this growth has tailed off.

“demonstrating the impact of cormorants in large rivers and other water-bodies is difficult because of ecological complexities” - EU REDCAFE (Reducing the conflict between cormorants and fisheries on a pan-European scale)

Wild Brown Trout & avian predation

WTT INFORMATION SHEET

Introduction

Fish populations are regulated by ‘top-down’ and ‘bottom-up’ influences. Bottom-up include environmental conditions that for example limit photosynthesis and therefore population abundance. Top-down influences regulate a population slightly differently; predation or competition between species may keep a population below a size that would otherwise be observed.

Fish-eating (piscivorous) birds in the UK include the great cormorant

(*Phalacrocorax carbo* & subspecies *P.c. sinensis*), the saw-bill ducks (the red-breasted merganser, *Mergus merganser* and the goosander, *Mergus serrator*) and the grey heron (*Ardea cinerea*). These birds are all protected by law.

All are opportunistic predators that will take advantage of high prey densities, especially where densities are artificially high (e.g. through stocking).

However it is the impact of cormorant and goosander predation on fish popula-

tions and angler catches that is perceived as significant by some of the recreational angling community across the British Isles. There is a belief in that community that bird conservation is being prioritised over that of some fish species with equal conservation designation, such as Atlantic salmon. Whilst acknowledging the importance of balanced predation, this document focuses on levels of avian predation that may cause concern during the management of biodiversity and fisheries.

Predation impacts

Cormorants in inland waters, in high numbers, have the potential to impact on fisheries. Individual adult cormorants consume large amounts of fish (around 350–585g each daily) and the potential for significant impacts on fish abundance in individual waters exists due to large flocks that have been reported to contain well over one hundred birds. These impacts can be economic (loss of fishery income), ecological (affecting fish community composition and abundance) or behavioural (fish behaviour and hence catch rates).

In some scientific studies, these potential impacts have been indicated while in oth-

ers, no discernible effects from piscivorous bird predation were detected.

This equivocal state of affairs is due to few studies being able to use the necessary controls and replication to make conclusive assessments.

Like cormorants, **goosanders** are generalist, opportunistic predators that will often aggregate in large numbers to take advantage of high prey densities. Goosander predation on fish has been less studied than cormorant predation.

Goosanders are perceived as a problem for game fisheries, especially in upland rivers and analysis of their diet has shown that juvenile salmonids

(including brown trout) are an important component of that diet in parts of the bird’s range. Smolt runs for example, are believed to be targeted by goosanders. On certain rivers, such as the Tweed in Scotland, goosander predation on the smolt run is cited as a key factor affecting smolt survival and the economic value of the salmon rod fishery.

Smolt predation has a greater effect on the overall populations than predation upon younger life stages (parr or fry) because this predation is in effect, targeting a proportion of the population that may not survive to the smolting phase (**see compensatory mortality**’).

Control options

Some fish populations in the United Kingdom are under significant pressure, due mostly to a variety of anthropogenic factors such as poor water quality and/or quantity, channel modification, barriers to migration or habitat degradation. These populations are not as resilient to in-

creased predation pressure as healthy populations would be and management measures to combat predation are an appropriate option in these circumstances. There are a suite of measures; both lethal and non lethal, that can be em-

ployed to minimise impacts where it is reliably believed that cormorants are adversely affecting a fishery (see table 1 WTT Avian predation information paper, adapted from the The Moran Committee Joint Bird Group; 2001).

Avian predation & Wild Brown Trout: WTT advice

Increased habitat complexity & predation: On occasion, the WTT has been asked during its advisory visit programme how best to protect WBT populations from cormorant and goosander predation. Good quality, accessible habitat is a profound bottom-up influence that can greatly improve the structure of a fish population and increase overall population size. Preserving and increasing habitat complexity is very much within the WTT's approach. Increasing the search time and reducing the capture efficiency of predators by increasing habitat complexity causes predators to "give up" on a patch sooner – and leave behind a greater number of would be prey. This simple fact is backed up by practical research.

WTT do's and don'ts

- DO** consider building in complex habitat into your river fishery (e.g. tree branches and roots trailing into the water, dense marginal vegetation, introduced brash 'mattresses', tree 'kickers', cover logs); this provides cover for fish whilst reducing bird hunting efficiency. Predators find it very hard to follow trout into a complex web of trailing branches and tree roots. Consider bankside brash installations – especially where other winter refuge habitat is sparse; e.g. after weed die-back (Figure 1).
- DO** consider the use of large woody debris (LWD) to create localized areas of scour. These deeper parts of the channel will provide cover for fish from predators.
- DO** maintain a good mix of 'shrubby' cover on river margins right through the year, particularly over shallow water in channel margins where juvenile trout often live.
- DO** consider employing a combination of habitat enhancements and deterrents when protecting WBT against fish-eating birds – variety is key. Piscivorous birds are clever animals, so persistence *and* variety is vital.
- DO** consider further deterrent measures (e.g. scaring) during vulnerable periods, e.g. spawning, drought and smolt runs.
- DO** consider removing bottlenecks that concentrate fish in vulnerable areas. For example, weirs have been shown to delay downstream smolt migration and increase rates of bird predation. Equally, adult fish congregating below barriers during upstream spawning migrations are an easy target.
- DO** build a good relationship with the conservation authority in your area. Maintain a dialogue if piscivorous bird predation is deemed to be an issue with your fishery and seek advice on control methods, including the process of licensing for lethal control.
- DON'T** automatically assume that bird predation may be limiting WBT production; carefully assess other potential 'bottlenecks' (see Paul Gaskell's 'Does Habitat Restoration Work?' paper elsewhere on the WTT website).



Figure 1: Large scale brash installation (Wye & Usk Foundation) responsible for increases in juvenile



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