

EUROPEAN INLAND FISHERIES ADVISORY COMMISSION

Report of the

EIFAC Workshop on a European Cormorant Management Plan

Bonn, Germany, 20-21 November 2007



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PREPARATION OF THIS DOCUMENT

This is the report of the EIFAC Workshop on a European Cormorant Management Plan held by the EIFAC ad hoc Working Party on Prevention and Control of Bird Predation. The workshop was convened by Mr Petri Heinimaa (Finland) and attended by 29 experts from 13 EIFAC member States. It was held in Bonn, Germany, from 20 to 21 November 2007 and hosted by the Ministry of Food, Agriculture and Consumer Protection, Bonn, Germany. The workshop report was adopted by the ad hoc Working Party, and subsequently finalized by Messrs Petri Heinimaa, Daniel Gerdaux, Volker Hilge and Erich Staub.

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ABSTRACT

The EIFAC Workshop on a European Cormorant Management Plan by the EIFAC ad hoc Working Party on Prevention and Control of Bird Predation was held in Bonn, Germany, from 20 to 21 November 2007 with the participation of 29 experts from 13 EIFAC member States. The workshop discussed cormorant – fisheries issues including the legal situation for the protection and control of cormorants in the EIFAC region. On the basis of these discussions four recommendations were formulated, including the promotion of preparation and effective implementation of a European Cormorant Management Plan.

Key words: Inland fisheries, aquaculture, cormorant, bird predation, management, EIFAC, European Inland Fisheries Advisory Commission, Europe

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OPENING

1. The EIFAC Workshop on a European Cormorant Management Plan of the ad hoc Working Party on Prevention and Control of Bird Predation was held at the Ministry of Food, Agriculture and Consumer Protection, Bonn, Germany from 20 to 21 November 2007 under the chairmanship of Mr P. Heinimaa (Finland). The workshop was attended by 29 persons from 13 EIFAC member States (Annex A). The Prospectus and Agenda of the meeting can be found in Annex B. At the twenty-fourth session of EIFAC held in Mondsee, Austria, from 14 to 21 June 2006, the delegates had decided to re-establish the ad hoc Working Party on Prevention and Control of Bird Predation. They noted the need for work (elaboration of effective management measures, policy statements, etc.) and proposals for the implementation of measures at the political level.

2. In his opening remarks the chairman thanked the Ministry of Food, Agriculture and Consumer Protection for hosting the workshop. He considered the rising problems for fisheries and aquaculture due to the impact of a growing number of cormorants. Isolated actions to reduce the population size have failed. Therefore the initiative to start to work on a pan-European management plan is urgent.

3. The representative of the Ministry Mr G. Conrad welcomed the workshop participants and supported the activity to work with the cormorant issues.

OVERVIEWS OF CORMORANT – FISHERIES CONFLICTING AREAS

4. A number of presentations demonstrated the situation of the great cormorant in several European countries. The available short versions of these presentations can be found in Annex C. It is planned to post all presentations on the EIFAC home page.

5. Mr E. Staub presented an overview of the development of European cormorant populations delivered for the workshop by Mr F. Kohl. The distribution and amount of great cormorants (*Phalacrocorax carbo*) in Europe has strongly increased. Breeding birds of *P. c. sinensis* – western subpopulation has increased from 9 900 (1970) to 217 000 (2000). The *P. c. sinensis* – eastern subpopulation has increased to some 226 000 and *P. c. carbo* to approximately 78 000 breeding birds by 2000.

6. Mr D. Gerdeaux gave a brief introduction to the present situation of cormorants in Europe. The cormorants live long and they have a high survival rate making them very effective in reproduction. Their food consists mainly of fishes. Cormorants inhabit the entire European continent and the fastest growing sub-populations are in the Baltic Sea area. The interplay between culling and density-dependence in the great cormorant modelling approach lead to a recommendation, that if culling is to be continued, an adaptive and coordinated management strategy across Europe should be adopted. At present at least about 45 000 birds are shot annually in Europe, apparently with no negative effect on the size on the European populations.

7. Mr P. Heinimaa presented the development of the great cormorant population in Finland, which has rapidly increased since the first nesting in 1996. The yearly growth of the breeding pairs has been approximately 50 percent and there are some 9 900 breeding pairs along the coastal area of Finland (Annex C,5).

8. Mr H. Baktoft presented the cormorant management of Denmark. The Danish cormorant breeding population has increased dramatically since the 1980s, when the bird reappeared after national extinction. During the last decade the breeding population has stabilized at approximately 40 000 nests per year. The management plans have provided

guidelines for management, both framing the conflict politically, and outlining the possibilities and limits to a regulation. The first management plan was made in 1992 and was in favour of the cormorant, but since then the management plan has been adapted to changing conditions and turned towards a more active management. Oiling of eggs and measures against establishment of new colonies seem to be effective ways to manage the cormorant population, at least on a local/regional scale. (Annex C,2)

9. Mr D. Gerdeaux presented the great cormorant situation and management in France. The great cormorant was totally protected in France in 1981. The first damages were declared in the carp fish farms and scaring the birds was allowed on fish farms. In 1992 also shooting was allowed on fishponds. In 1995 the first national quota of birds which should be killed was decided. In 1996 there was a national agreement to stabilize the wintering population to the number of birds counted in France during winter 1996. The annual quota is the difference between the last biennial mid-January national census and the number of 75 000 birds. It was considered in 1996 that the level of the European population was safe to stop the increase of the population.

10. Mr U. Brämick presented an overview on the Cormorant Directives of the Federal States in Germany. The directives vary to a large extent. None of the directives is approaching management options except shooting. There is no definition of an acceptable number of the cormorant population neither in the Federal States nor in Germany as a whole. Regulation methods are not evaluated, adjusted nor coordinated between the Federal States. Damages by cormorants are generally not compensated for in Federal States with a cormorant directive. From this experience it is concluded that shooting in wintering areas alone is not sufficient to reduce the overabundant cormorant population in Germany. Therefore, egg manipulations in breeding colonies are an essential ingredient in any attempt to reduce and later stabilize the cormorant population size. As a consequence there is an urgent need for a coordinated European-wide cormorant management both in breeding and wintering areas. (Annex C,3)

11. Mr E. Staub presented the situation with fish eating birds in Switzerland. Number of wintering great cormorants, goosanders and grey herons has strongly increased since 1970s. The predators have increased their share of fish yield especially in running waters and anglers catch has decreased to less than half of that in 1970s. Different management practices like differences in hunting and protection timings in nearby areas cause problems and we are still missing the European Cormorant Management Plan.

12. Mr M. Čech presented the problem of losses caused by great cormorant (*Phalacrocorax carbo*) in the Czech Republic. The basic questions are: (i) how many cormorants are present on individual locality, in individual region or state and (ii) what do cormorants eat – species, size and weight proportion? The breeding population of cormorant peaked with 1 731 nesting birds in year 1991. For the year 2005 there were over 9 200 overwintering cormorants in the Czech Republic and in 2007 over 10 000 birds. In the diet of great cormorant 21 fish species up to the size of 41 cm and 735 g were found. From this work it could be summarized that: (i) great cormorants seem to consume all fish of appropriate size that they are able to catch in summer and select for larger fish in winter. (ii) During one successful capture and ingestion of a fish a cormorant gains over 3.5 times more energy in a warm winter and over 5 times more energy in a cold winter than in summer. (iii) The winter elevation of foraging efficiency described for cormorants in the literature is due to capturing larger fish not to capturing more fish. (Annex C,4)

13. Mr Z. Adamek gave a presentation on feeding habits of great cormorant (*Phalacrocorax carbo sinensis*) on Czech fishponds. The predation of migrating northern cormorant populations on commercial fish ponds creates a serious problem during the period of

the birds' spring and autumnal migration flights. The damage to fisheries caused by cormorant predation pressure consists of losses due to direct predation and subsequent indirect losses elicited by cormorant feeding activities resulting in fish wounding and stress. (Annex C,1)

14. Mr Béla Halasi-Kovács reported on the Hungarian situation. The population of cormorant substantially grew stronger within a decade since first regular detections of the species in the 1980s, and the first recorded nesting in 1992. Peak of nesting and migrant population was observed in 2004, reaching 30 000 migrating specimens at a time and having 3 500 breeding pairs at 18 sites. In the past three years the number of observed cormorants did not increase, which might be partly attributable to low precipitations. Due to mild climatic conditions, overwintering was significant (over 3 000 birds). By feeding, cormorants cause significant damages to fish fauna in both fishponds and natural waters. Cormorants cause not only economical losses, but make substantial damage to natural systems by occupying nesting sites of heron species. In the past ten years – due to cormorants taking over – two mixed heron nesting sites of European importance disappeared that used to accommodate 500 pairs of spoonbills, 400 pairs of great white egrets, 120 pairs of night herons, several pairs of pygmy cormorants, squacco herons, little egrets and glossy ibises. (Annex B,6)

15. Mr S. Nemtsov presented the international cormorant management in Ukraine-Israel. Great cormorants in Israel arrive in October and stay until March. There is no nesting population in Israel and the increasing amount of migrating birds has caused conflict at large intensive fish farms. There is an overabundant nesting population (approximately 100 000 nesting pairs) in southern Ukraine causing harm to other ground-nesting water birds, creating a conflict with fish farmers and damaging man-made forests. A project has been proposed to manage the population shared by the two countries. The goal is nature conservation in both countries by reducing the overabundant population, with stakeholder cooperation and support. Methods would be egg-oiling for ground-nesting and lasers for tree-nesting cormorants. Monitoring would be carried out in nesting and wintering grounds.

CORMORANT PROTECTION AND CONTROL IN EIFAC MEMBER STATES

16. In preparation of the EIFAC Workshop on a European Cormorant Management Plan, the EIFAC national correspondents were requested to send a short description of national legislations dealing with the cormorant issues with respect to protective measures, hunting, possibilities to kill cormorants at fishing gears or aquaculture site, financial compensation for damages caused by cormorants, etc. Responses were received from nineteen countries, and these are reproduced in Annex D.

17. The responses demonstrate the highly variable situation in the member States. Sometimes there is no responsibility on a national but only on a regional, provincial or State level like in Austria, Belgium or Germany. In contrast to this Denmark developed a real national management plan between 1992 and 2002, which permitted oiling of eggs in colonies and the prevention of the establishment of new colonies.

18. Very few birds are shot legally in Finland or Estonia because the responsible authorities deal with permits in a very restrictive measure. In contrast to this, France increased the quota over the years and about 30 000 birds were shot in the 2006–2007 season.

19. No compensation for damage caused by cormorants is paid, for example, in Estonia, Germany, Ireland, the Netherlands, Norway or United Kingdom. Sometimes the possibility of compensation exists, but no case is known that they have been paid in fact (e.g. in Romania and Finland).

20. The short reports demonstrate a high variability in the national legislation of EIFAC member countries in view of the different aspects of the protection or control of cormorants. In general the situation in member States to protect aquatic life against bird predation is unsatisfactory.

FINDINGS FROM DISCUSSIONS ON CORMORANT – FISHERIES ISSUES

21. For the findings, the pyramidal learning techniques were used in which the workshop participants were divided into six groups to formulate answers to the question “What are the problems in cormorant – fisheries issues?” The groups produced five answers, which were then discussed in three joint groups and further developed into five answers per group. The work of these three groups was then presented to the whole workshop and discussed. The outcome of discussions on the findings was:

- Cormorants cause profound negative effects on fish populations especially on endangered fish species such as grayling, sturgeons, eel, salmon, marble trout and sea trout.
- Cormorants cause considerable direct and indirect losses to aquaculture pond owners, professional fishermen and anglers.
- The overabundant cormorant population inhibits important aquatic restoration projects such as fish population rehabilitation and restoration of spawning grounds.
- The overabundant cormorant population and current methods used to prevent damage, apparently impact negatively upon many other species of colonial water birds, such as endangered species of terns, gulls, herons and pelicans.
- There is a need for more revitalisation of rivers, which can exacerbate the fishery-cormorant conflict.
- The current cormorant population status endangers conservation of biodiversity in wetlands including riparian, estuarial and coastal ecosystems.
- There is sometimes disparity amongst local, national and international laws leading to difficulties in establishing and carrying out a pan-European Management Plan on great cormorants.
- There are isolated, uncoordinated prevention measures against great cormorants in most European countries, often leading to transboundary effects.
- Current efforts to mitigate damage at a local level are insufficient in managing the cormorant population on a pan-European level.
- The great cormorants of Europe should be managed as if it is one single continental population.
- A management plan has to be connected with existing instruments, e.g. Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (European Union water framework directive, WFD), the Convention on Biological Diversity, African-Eurasian Water Bird Agreement of the Convention on the Conservation of Migratory Species of Wild Animals (known also as CMS or Bonn Convention), Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR), Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (NATURA 2000), Council regulation (EC) No 1198/2006 of 27 July 2006 on the European Fisheries Fund (EFF) and European

Council (EC) regulation No 1100/2007 of 18 September 2007 on establishing measures for the recovery of the stock of European eel.

- There is a lack of available and accessible data on counts and distribution of breeding pairs and wintering cormorants, as well as their impact on fish stocks.
- There is no single coordination of compiled knowledge on pan-European population dynamics of great cormorant, neither behavioural nor ecological findings. There is a need for better and more efficient exchange of data between research institutions and stakeholders.
- There is a lack of evaluation of the results of local and regional level management efforts and their cost-efficiency.
- There is a need to determine the biological and social carrying capacity in order to establish goals for long-term cormorant population parameters.

CONCLUSIONS

22. From these findings a number of conclusions were drawn:

- The enormously increased impact of cormorant predation on fish species conservation and the losses caused to aquaculture pond owners, professional fishermen and anglers has reached unacceptable levels.
- There is a need to reduce the reproductive success of the great cormorant population in order to achieve a reduced population size and distribution, which is still compatible with a favourable conservation status, but also compatible with acceptable impacts on fish species conservation and on losses in enterprises living from fish.
- The coordination of fish and bird interests makes it necessary to explore the possibility of establishing an achievable and acceptable size and distribution for the total European breeding population.
- There is a need to explore the consequences of moving the cormorant to the status of Annex II, 2 of the EU Birds Directive 79/409/EEC (non-protected species).
- In total, there is a need for urgent and coordinated action to manage the European cormorant population in order to reduce its impact on fish species conservation and to mitigate the losses caused to aquaculture pond owners, professional fishermen and anglers.
- EIFAC should take the initiative to promote the preparation and effective implementation of a European Cormorant Management Plan (ECMP) using all information from previous projects such as FRAP, INTERCAFE and others.
- The ECMP should include elements that can be extrapolated from the local to a pan-European level. A mechanism is needed for continued monitoring, evaluation and iterative adoption of the ECMP.
- The participation of all relevant stakeholders in creation, implementation and continued monitoring of the ECMP should be assured.

RECOMMENDATIONS OF THE WORKSHOP

23. Propositions for recommendations were drafted by the steering group with the support of Messrs A. Rothuis and S. Nemtzov. These suggestions were then discussed and agreed upon in the workshop plenary. They are stated here as follows:

- i) Coordinate the isolated national efforts by promoting the preparation and implementation of an effective European Cormorant Management Plan (ECMP), involving all relevant stakeholders.
- ii) Establish a central mechanism for coordinating, monitoring and evaluating actions on cormorants.
- iii) Reduction of the reproductive success of the great cormorant population to achieve a reduced population size and distribution, still compatible with a favourable conservation status for the cormorants.
- iv) Explore the consequences of moving the cormorant to the status of Annex II, 2 of the European Union Birds Directive (not protected species).

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EUROPEAN INLAND FISHERIES ADVISORY COMMISSION (EIFAC)**Prospectus****EIFAC ad hoc Working Party on Prevention and Control of Bird Predation**

WORKSHOP ON

CORMORANT MANAGEMENT PLAN

(Bonn, Germany, 20 – 21 November 2007)

The EIFAC ad hoc Working Party on Prevention and Control of Bird Predation is organizing an international workshop on a future “Cormorant management plan” to be held during 20 and 21 November 2007 in Bonn, Germany.

Background

The amount of great cormorants (*Phalacrocorax carbo* and *sinensis*) populations have spectacularly increased in Europe during the last decades. The great cormorants favourable conservation status already justified its removal in 1997 from Annex I “species needing special conservation measures regarding their habitat” of Directive 79/409 on the conservation of wild birds.

The increased amounts of cormorants in Europe have significant impact on wild fish stocks and ecosystems and the cormorants’ predation pressure on the ecosystem is leading to loss of biodiversity. The cormorants have also caused adverse impacts on fisheries, fish stocks, fish farming, as well as on angling and wider countryside activities throughout Europe.

Many different actions to decrease the conflicts between cormorants and fisheries activities at the national level have been taken, but these have not been successful at the pan-European level. More and more cormorants are killed in increasing number of countries and it is time to coordinate the management to improve the effectiveness and to try to find the best alternative practices for future management.

Aim of the workshop

The aim of the workshop is to provide a forum to initiate the work for a pan-European management plan for cormorants, which would more appropriately take into account the aspects of management of fish stocks, fishing and aquaculture which are affected by, or vulnerable to, the cormorants.

Objectives of the workshop

The pan-European Cormorant Management Plan will be written from the fisheries (professional fishing, recreational fishing, fish stock management and fish stock conservation) and aquaculture point of view. The plan will work as a large scale management measure to

control and limit the disturbance and problems caused by the cormorants to fisheries and aquaculture. The Workshop will set out the goals for the plan and its actions. Following the Workshop the work will continue afterwards in the EIFAC ad hoc Working Party on Prevention and Control of Bird Predation.

Outputs of the workshop

The presentations given out at the Workshop will be placed as PDF files on the website of the ad hoc EIFAC Working Party on Prevention and Control of Bird Predation. The draft of the Cormorant Management Plan will include the plan of action as well. Workshop proceedings will be published.

Themes

The workshop will initiate the work for a Cormorant Management Plan with the following thematic areas:

- 1) **Present situation of cormorant – fisheries interactions in Europe** including (i) the amount and development of cormorant populations in Europe, (ii) the situation at crucial areas of interactions between cormorant and (a) fisheries, (b) fish stocks, (c) fishermen and (d) aquaculture in Europe and (iii) the experience of the control actions taken.
- 2) **How to manage the cormorants' abundance control actions at a European level?** What are the actions a management plan could control at the European level? Which regional measures could be developed at a European level? One important question is: What is the sustainable level of the European cormorant population?
- 3) **Building up a pan-European Cormorant Management Plan** including recommendations to EIFAC for further actions. Elements of the Cormorant Management Plan.

Working sessions at the workshop

The themes in session 1 will be outlined by guest speakers giving the participants up-to-date information on the issues. In sessions 2 and 3 the workshop will focus its work on creating a basis for the pan-European Cormorant Management Plan and the participants are also encouraged to present short presentations to contribute their ideas and experiences with the issues involved.

The workshop language is English and presentations should be given using PowerPoint. The presentations will be placed as PDF files on the website of the ad hoc Working Party on Prevention and Control of Bird Predation (with the agreement of the author)

Organization

EIFAC and the ad hoc Working Party do not have the financial means to fund travel and participation of those attending the workshop. Therefore, all experts interested in participating in this Workshop are invited to find their own funding to cover for their travel and accommodation expenses.

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Agenda and timetable

Tuesday 20 November 2007

- | | | |
|-------|--|---|
| 09.00 | Morning Session | |
| | Petri Heinimaa | Opening |
| | BMELV Representative | Welcome |
| 09.10 | Daniel Gerdeaux | Present situation of cormorants in Europe |
| | Case studies | |
| 09.20 | Erich Staub | Switzerland |
| 09.30 | Henrik Baktoft | Danmark |
| 09.40 | Daniel Gerdeaux | France |
| 09.50 | Uwe Brämick | Germany |
| 10.00 | Simon Nemtsov | The Israel Ukraine cormorant problem |
| 10.15 | Elements of a pan – European Management Plan | |
| 13.00 | Lunch | |
| 14.00 | Elements (contd.) | |
| 18.00 | End of first day | |

Wednesday 21 November 2007

- | | |
|-------|--|
| 09.00 | Elements (contd.) |
| | Presentation of a first draft and discussion |
| 13.00 | Lunch |
| 14.00 | Elements (contd.) |
| | Presentation of results, discussion and adoption of final report |
| | – Management Outline |
| | – Recommendations |
| | – Following actions |
| | – Report Drafting |
| 16.00 | End of workshop |

Summaries of presentations

1. Feeding habits of great cormorant (*Phalacrocorax carbo sinensis*) on Czech fishponds (Z. Adamek)

As in many European countries, piscivorous predators cause high economic losses which diminish the profit margins of Czech fish producers. Great cormorant represents the most important fish predator at present. The Czech Fish Farmers Association (together with the national anglers' unions) monitors frequently their occurrence and compiles the reports on losses caused by predators on fish stocks in both angling grounds and fish farming facilities. The majority of these losses is eligible for compensatory payments according to the Czech Law on Recompensation of Losses Caused by Protected Animals. Current annual economic losses caused by piscivorous predators are estimated to be caused from 70, 23 and 5 percent by cormorants, otters, and herons, respectively).

Increasing occurrence of migratory great cormorants *Phalacrocorax carbo sinensis* L. associated with their increased nesting in the Czech Republic has been recorded since the end of the 1980s. This is considered as an attendant phenomenon of the current permanent expansion of this species in appropriate sites over the whole of Europe. The predation of migrating northern cormorant populations on commercial fish ponds makes a serious problem during the period of the birds' spring and autumnal migration flights. The damage to fisheries caused by cormorant predation pressure consist of losses due to direct predation and subsequent indirect losses elicited by cormorant feeding activities resulting in fish wounding and stress. Stricken fish, which have escaped from cormorant attack or which could not be swallowed due to their size, suffer from various deep and/or surface injuries, which are a frequent precursor to subsequent infection and mortality. It was documented, that particularly two- and/or three-year-old fish (200–300 g mirror carp) are threatened by cormorant flock attacks but also bigger fish (grass carp, scaly carp and bighead up to 360, 400 and 346 g respectively) were recorded with obvious injuries caused by cormorant beaks. Immediately after wounding, the damaged epithelium (scars) cover 5–35 percent, and deeper sub-dermal wounds, caused by the beak tip pervading into muscle tissue, cover an area of 1–2 percent of the total body surface. On the side impacted by cormorant lower mandible, extensive areas of epidermal contusions (scars) occur. As the time progresses, these ratios change – deeper necroses represent up to 10 percent of the total body surface and healing epithelial scars comprise just 1–2 percent. In wounded silver carp, (30–40 cm body weight, 500–700 g total length), the share of sub-dermal wounds usually does not exceed 0.5 percent due to their compact scaly cover. During pond draining due to fish harvesting, the upper size limit of wounded fish increases and may also often include bigger fish (e.g. European catfish) up to 2.2 kg.

2. Cormorant management in Denmark (H. Baktoft)

The Danish cormorant breeding population has increased dramatically since the 1980s, when the bird reappeared after national extinction. During the last decade the breeding population has stabilized at approx. 40 000 nests per year.

The EEC Bird Directive limits the possibilities of managing the cormorants. Its article 9 provides the possibility to adopt certain management options in order to avoid damages despite the protection status. This article is taken up in the Danish Hunting and Game Management Act. The Danish management plans for cormorants have been specifically formulated as conflict mitigation plans. The management plans have provided guidelines for management and frames the conflict politically, outlining the possibilities and limits to a

regulation. This is an important function in a case like the management of cormorants, which has been the subject of intense public and political debates. Furthermore, the management plan serves as a political signal to the public that the issue is being addressed. The first management plan was made in 1992 and was in favour of the cormorant, as the principle of prevention of damages rather than that of population management was important. Since then the management plan has been adapted to changing conditions and turned towards a more active management. The table below showing the inclusion of more instruments over the years illustrates this.

Main instruments available in the Danish management plans. Text in italic indicates new or changed measures.			
1980 Protection	1992 1st Management Plan	1994 Expansion of objectives	2002 2nd Management Plan
			<i>Experimental hunting</i>
			<i>Mitigate conflicts related to salmon and trout smolts</i>
		<i>Culling of eggs by oiling in colonies on state owned and private land</i>	Culling of eggs by oiling in colonies on state owned and private land
		<i>Stop for establishment of new colonies</i>	Stop for establishment of new colonies
	<i>Development of technical mitigation measures</i>	Development of technical mitigation measures	Development of technical mitigation measures
Protective hunting 100 meters from fishing nets all year (with permit)	Protective hunting 100 meters from fishing nets all year (with permit)	Protective hunting 500 m from fishing gear all year (with permit)	<i>Right to protective hunting 1000 m from fishing gear outside breeding season</i>
Permission to scare cormorants away from forestry	Permission to scare cormorants away from forestry	Permission to scare cormorants away from forestry	Permission to scare cormorants away from forestry

The Ministry of the Environment, more precisely the Forest and Nature Agency, is the authority responsible for managing the cormorants, but regional State Forest Districts carry out the majority of the actual management. In Denmark, there is a strong tradition of stakeholder consultation in general and in the process of drafting management plans and over the years, stakeholders participated in an officially appointed stakeholder advisory group.

Of the palette of available instruments in the management plans, the oiling of eggs and the attempt to stop the establishment of new colonies have been the most successful.

The effect of egg oiling is exemplified by the situation in Ringkøbing Fjord, where intensive oiling apparently has led to a decrease in breeding colony size. The oiling has an immediate effect on the intensity of cormorant predation on the fish population the same year due to the lack of nestlings and young of the year. Furthermore there seems to be a long term effect causing a reduction of colony size.

It has been attempted to stop the establishment of new colonies through e.g. scaring, egg oiling and removal of nests. In spite of the attempts, the total number of colonies has

increased. It is, however, estimated that the increase as well as the size of the new colonies would have been larger, if the measures had not been taken.

Lessons learned

Oiling of eggs and measures against establishment of new colonies seems to be effective ways to manage the cormorant population, at least on a local/regional scale.

The development of the conflict between different stakeholders in Denmark has demonstrated the importance of procuring a sufficient level of scientific knowledge as opposed to experience based knowledge.

3. Federal States Cormorant Directives in Germany (U. Brämick)

In 9 out of 16 Federal States in Germany, directives on cormorants are currently available. While the first directive had been established in 1998 already, the latest one came into force just a few months ago.

All 9 directives permit to shoot cormorants outside the breeding season, mainly between August and March. In some regions, immature birds may be shot all year around. While shooting is mostly permitted in fish farm areas and on all kind of water bodies with fishing rights, it is generally forbidden in National Parks, Nature Reserves and Special Protected Areas. In some Federal States, wildlife authorities may permit single shootings in protected areas on application. In most regions, shooting may be carried out by professional hunters or fishermen holding a hunting licence. In two states, fishermen are allowed to shoot cormorants on their own waters without this licence.

The prevention of new colonies or roosting places is possible in four regions, while manipulation in existing colonies might be allowed by wildlife authorities in two states on extra permission.

All in all, the directives vary to a large extent. None of the directives is approaching management questions except shooting. There is no definition of an acceptable number of the cormorant population neither in the Federal States nor in Germany as a whole. Regulation methods are not evaluated, adjusted or coordinated between the Federal States. Damages by cormorants are generally not compensated for in Federal States with a cormorant directive.

In last winter, roughly 12 000 cormorants were reported shot in Germany, some 3 500 of them in Bavaria. Although every winter between 30 percent and 100 percent of the wintering cormorant population in Bavaria had been shot in the past, the number of birds in the following winter did not decrease significantly. From this experience it is concluded that shooting in wintering areas alone is not sufficient to reduce the overabundant cormorant population in Germany. As long as 50 000–75 000 young birds are hatching each year in Germany alone, gaps due to shooting are getting filled in short time. Therefore, egg manipulations in breeding colonies are an essential ingredient in any attempt to reduce and later stabilize the cormorant population size. As a consequence we see an urgent need for a coordinated European-wide cormorant management both in breeding and wintering areas.

4. Assessment of the predation pressure of great cormorant (*P. carbo*) on fish fauna of streams, rivers and reservoirs in the Czech Republic (M. Čech)

The problem of losses caused by great cormorant (*Phalacrocorax carbo*) could be divided into two basic questions: How many great cormorants are on individual locality, in individual region or state? And, what do great cormorants eat – species, size and weight proportion?

In the Czech Republic, there are two official estimates of numbers of breeding and overwintering great cormorants. The first one is the estimate of professional ornithologists and scientists from the Czech Society for Ornithology, Faculty of Sciences of the Charles University and Cormorant Research Group (Wetland International). Over 250 ornithologists and scientists count great cormorants on their nocturnal roosting places at one time several times a year. Whereas the breeding population of great cormorant peaked with 1 731 nesting birds in year 1991 (since 1992 the breeding population reveal consecutive decrease and in recent years seems to be stabilized), the wintering population revealed significant increase in each consecutive year. For year 2005 there were over 9 200 overwintering great cormorants in the Czech Republic and in year 2007 (winter 2006/07) over 10 000 birds (data not presented). Calculated losses caused by overwintering great cormorants on ponds, reservoirs and free flowing waters for year 2005 are from that reason approx. 5.5 tonnes of fish per day (calculated average daily fish intake 0.6 kg of fish per cormorant per day). The same trend of consecutive increase of great cormorant numbers in the Czech Republic revealed the data presented by the Czech Anglers Union (second estimate). However, there is absolutely unclear methodology how were the data gained and most probably it was using questionnaires addressed to individual local organizations. There is a strong doubt whether the data are correct. According to this speculative estimate there were almost 64 000 great cormorants (both overwintering and breeding birds) in year 2005 and over 71 000 birds in year 2007 (data not presented)! Calculated loses caused by overwintering great cormorants on ponds, reservoirs and free flowing waters for year 2005 are from that reason approx. 38.5 tonnes of fish per day.

From various studies carried out in the Vltava River Basin (both rivers and reservoirs), it is clear that great cormorant is the exclusive fish-eater (as elsewhere in the Europe). In the diet of great cormorant analysing regurgitated pellets, undigested fish remains and individual bones we have found over 2 600 individual fish of 21 fish species up to the size of 41 cm and 735 g (Čech 2004; Čech and Hladík, 2005; Čech 2007; Čech and Rusňák 2008). There are only two exceptions when in the diet of great cormorant was found frog (*Rana* sp.) – Adámek (1991), and crayfish (*Astacus* sp.) – Čech (2007).

The most recent study carried out in the Czech Republic by Čech *et al.* (2008) deals with the size selectivity in summer and winter diets of great cormorant.

Previous studies have shown that:

- 1) High energy losses during winter do not seem, in great cormorants, to be compensated for by an increase in fish intake (Johansen *et al.* 2001).
- 2) In winter, great cormorants reduce time spend diving into cold water, however, dramatically increase foraging efficiency (Grémillet *et al.* 2001).
- 3) The prey capture rate of great cormorants was estimated to be 12 g min⁻¹ in summer (Grémillet, 1997) but 60 g min⁻¹ in winter (Grémillet *et al.*, 2001).

From that reason we had practically the only one resulting question:

Do great cormorants catch more fish or do they catch larger fish in winter compared to summer?

The study was carried out at two great cormorant roosting places on two large meso- to eutrophic Czech reservoirs - Želivka Reservoir (49°40'37" N, 15°10'28" E) and Slapy Reservoir (49°44'52" N, 14°21'47" E), during summer, a warm winter and a cold winter. Both reservoirs have the same trophic status and similar fish assemblages. Using diagnostic bones (os pharyngeum, dentale, praeoperculare) and own linear regression equations, between measured dimensions of the diagnostic bone and fish total length, a total of 2 055 fish of 18 species and 4 families were identified in the diet of great cormorants and their size was reconstructed. Both fish total length and fish weight (own length to weight regression for individual species) differed significantly between seasons being, on average, 12.0 cm and 30 g during summer, 18.3 cm and 109 g during a warm winter and 22.8 cm and 157 g during the cold winter. The average weight of fish taken by great cormorants significantly increased with decreasing air temperature, which relationship was, however, slightly less apparent in the case of decreasing water temperature.

From our work it could be summarized that:

- 1) Great cormorants seem to consume all fish of appropriate size that they are able to catch in summer and select for larger fish in winter.
- 2) During one successful capture and ingestion of a fish a great cormorant gains over 3.5 times more energy in a warm winter and over 5 times more energy in a cold winter than in summer.
- 3) The winter elevation of foraging efficiency described for great cormorants in the literature is due to capturing larger fish not to capturing more fish.

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5. EIFAC Workshop on Cormorant Management Plan (P. Heinimaa)

The proposal to arrange a Workshop on Cormorant Management Plan was suggested by Volker Hilge (EIFAC National Correspondent for Germany). This initiative was supported by EIFAC/FAO with Devin Bartley, Phil Hickley and Gérard Gastelnaud taking part in decision making. The preparation of the workshop was proposed to the EIFAC ad hoc Working Party on Prevention and Control of Bird Predation, and its convenor agreed to chair the proposed workshop. The practical arrangements have been initiated in March 2007 and the Prospectus was ready for distribution in 20.8.2007.

As we are now here at the Workshop in Bonn 20 to 21 November 2007 I want to thank Volker Hilge for the initiative and Gerd Conrad from the Ministry of Food, Agriculture and Consumer Protection for hosting the workshop. There are lots of evidence of rising problems for fisheries and aquaculture due to the impact of a growing number of cormorants. Isolated national and regional actions to reduce the population size have failed. Therefore the initiative to start to work on a pan-European management plan is timely. The results of the Workshop will also affect the future work of EIFAC ad hoc Working Party on Prevention and Control of Bird Predation.

The aim of the Workshop is to provide a forum to initiate the work for a pan-European Management Plan for Cormorants, which would more appropriately take into count the aspects of management of fish stocks, fishing and aquaculture which are affected by, or vulnerable to, the cormorants.

The objective of the Workshop to create a bases for the Pan-European Cormorant Management Plan, which could work as a large scale management measure to control and limit the disturbance and problems caused by the cormorants to fisheries and aquaculture. Workshop will set out the goals for the plan and its actions. Following the Workshop the work will continue afterwards in the EIFAC ad hoc Working Party on Prevention and Control of Bird Predation.

Workshop will initiate the work for a Cormorant Management Plan with the following thematic areas:

- 1) Present situation of cormorant – fisheries interactions in Europe including (i) the amount and development of cormorant populations in Europe, (ii) the situation at crucial areas of interactions between cormorant and (a) fisheries, (b) fish stocks, (c) fishermen and (d) aquaculture in Europe and (iii) the experience of the control actions taken.
- 2) How to manage the cormorants' abundance control actions at a European level? What are the actions a management plan could control at the European level? Which regional measures could be developed at a European level? One important question is: What is the sustainable level of the European cormorant population?
- 3) Building up a pan-European Cormorant Management Plan including recommendations to EIFAC for further actions. Elements of the Cormorant Management Plan.

In Finland we have seen a quick rise in the breeding population of cormorants since 1996 when the first nesting was noticed (Figure 1). In 2007 there were some 9000 breeding pairs in 29 colonies in the coastal area of Finland (Figure 2).

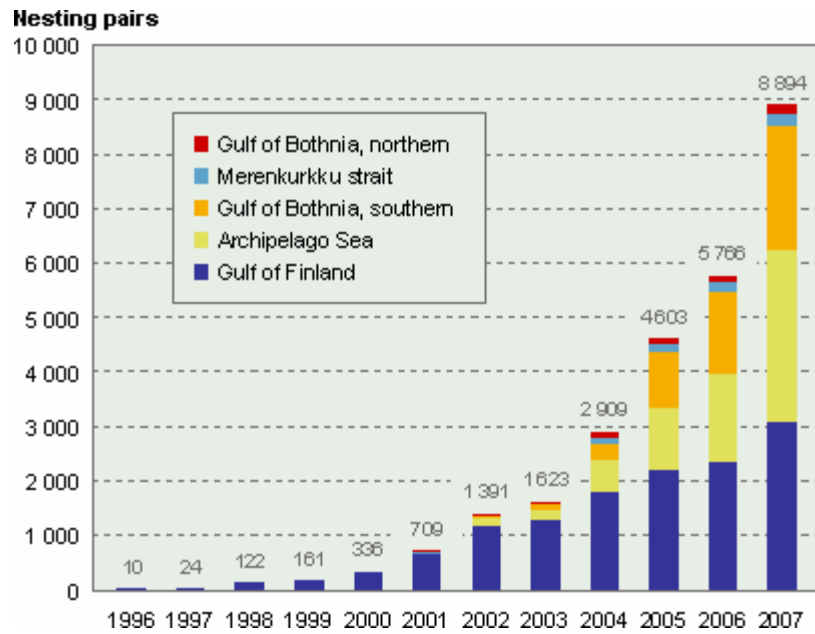


Figure 1. Breeding cormorants in Finland in 1996–2007 according to the Finnish Environment Institute (<http://www.ymparisto.fi/default.asp?contentid=244630&lan=EN>).

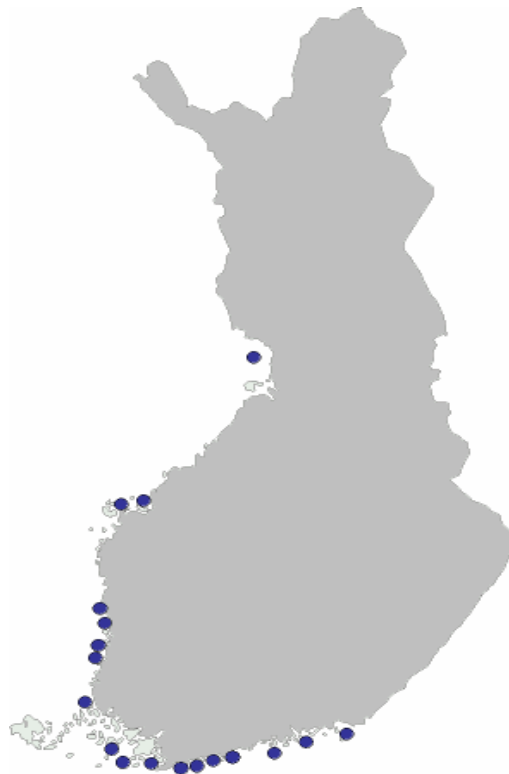


Figure 2. Breeding cormorant colonies in Finland in 2007 according to the Finnish Environment Institute (<http://www.ymparisto.fi/default.asp?contentid=244630&lan=EN>).

Source: SYKE. Map: © National Land Survey of Finland, permit 7/MYY/06.

6. Status of great cormorant in Hungary, proposals for population control in Hungary and on a European Scale (B. Halasi-Kovács)

Hungarian population of cormorant substantially grew stronger within a decade since first regular detections of the species in the 1980s, and the first recorded nesting in 1992. Peak of nesting and migrant population was observed in 2004, reaching 30 000 migrating specimens at a time and having 3 500 breeding pairs at 18 sites. In the past three years number of observed cormorants did not increase, the population is rather static, which might be partly attributable to low precipitations. Number of individuals is periodically changing, wandering immature groups add to breeding pairs and newly hatched birds starting to fly in May. Wandering specimens appear in August, while peak of migration falls between September-November. Due to mild weathers, overwintering was significant (over 3 000 birds). Spring migration represent a smaller peak in March-April. According to field observations, both subspecies are present (*sinensis*, *carbo*), however, their ratio is not yet confirmed.

Cormorant – being subject to 79/409 EEC Directive – is protected by 13/2001 Ministry for Environment Decree. Alarming and selected elimination of the species must be permitted by the regional nature protection authorities. According to Law 1996. LIII. on Nature Protection, compensation for damages caused by cormorants can be applied for areas not falling under protection, however, procedures for compensation are not yet effective.

By feeding, cormorant causes significant damages to fish fauna at both fishponds and natural waters. Based on monitoring, loss of production due to cormorants reached 600 000 euros only at Hortobagy Fish farm Cc . Though nesting sites are only partly located at fish ponds, they offer outstanding feeding areas during the reproduction season. While the migrating specimens at less ratio, overwintering specimens at significance ratio feed on natural waters.

Cormorants cause not only economical losses, but make substantial damages to natural systems in direct and indirect way also. The direct way is occupying nesting sites of heron species. In the past ten years – due to cormorants taking over – two mixed heron nesting sites of European importance disappeared that used to accommodate 500 pairs of spoonbills, 400 pairs of great white egrets, 120 pairs of night herons, several pairs of pygmy cormorants, squacco herons, little egrets and glossy ibises. The indirect way is that fishponds due to the fish farming technology used are one of the most important areas of wetlands in Hungary, and the role of fish farmers is important to maintain these areas, but their economic losses due to cormorants make it very difficult to carry on.

Means to reduce damages of the cormorant applied in Hungary are wide-spread throughout Europe: alarming with gas canon and selected elimination by shooting. In recent years experts of Hortobagy Fish farm Cc. and Hortobagy National Park Directorate invented a complex method against cormorants, applicable for fisheries located on nature protected areas. This includes modifications on fish farming technology, pond integration and creation of feeding ponds for birds. Besides, holding license from the Ministry for the Environment and Waters, eggs in a homogenous cormorant nesting site were made dead by using colorless lacquer. Although the results were effective at a local level, these methods are of limited effect at a national, or international level. Therefore long-term nation-wide and international efforts need to be implemented. This is also emphasized by the fact that cormorants constantly improve their feeding and reproduction strategies, i.e. recently discovered nesting in reeds and on ground, coordinated night-time feeding habits.

Based on field experience, the following propositions are made:

1. Carrying on Europe-wide biomonitoring of cormorant populations.

2. Completion of behavioral ecology and conservation biology studies into habitat selection, nesting success and feeding strategies of the bird. Setting up energetic models.
3. Based on field research results, determination of optimum sized cormorant populations as per individual sites.
4. Completion of methods regulating cormorant populations in accordance with both economic expectations and conservation goals.

A potentially important emerging problem is the dynamic growth of the pygmy cormorant population of Hungary since 1991, its first recorded nesting. Current observations report 350 pairs at three nesting sites, while number of migrating specimens is over 3 000. Therefore, biomonitoring of pygmy cormorant and early researches into its population control means are necessary.

Survey responses on legislation dealing with cormorants in EIFAC member States

Original information request to EIFAC National Correspondents:

For the EIFAC Workshop on Cormorant Management Plan we kindly request you to send us a short description (not more than half a A4 page) on your country's national legislations dealing with the cormorant issues (f.ex. protective measures, hunting, possibilities to kill cormorants at fishing gears or aquaculture site, financial compensation for damages caused by cormorants, etc.).

The following responses were received and are reproduced below without modification:

AUSTRIA

Albert Jagsch

In Austria cormorants can be scared and shot without baglimits. Shooting can be done by people with valid hunting licences only. In general, these regulations are area and time restricted. The aim is primarily to protect endemic trout and grayling regions, to protect more “sensitive” fish-grounds (e.g. spawning sites), inhibit the foundation of new roost-sites along small rivers and to reduce the impact of fish-eating birds on fish-species in general. Austria consists of 9 provinces; fishing, hunting and nature conservation laws are in the responsibility of the provincial governments. So there are nine different possibilities and in practice also different solutions how to deal with cormorants (text for valid regulations differ from province to province). Due to the existing legislation no overall plan on a national level exists. According to international law (EU-legislation) mitigation measures and regulations on a national level have to be in accordance with the EU Bird Directive (ref. to Art.9; incl. reporting commitment).

BELGIUM

Serge Gomes da Silva

In Belgium, environmental related policies are of regional responsibility. Each region thus manages fishery related subjects with its own jurisdiction.

Walloon Region

In 2006, in the Walloon Region, more than 5 000 wintering individuals of the black cormorant and more than 1 100 nesting couples of heron cendré were observed. Since the mid-nineties, most fishermen and fish producers demonstrate an increase in financial loss due to the predation of both those piscivorous species on their resource.

In the Walloon region, the stake of bird predation in fish farms is different than in public water masses. Indeed, farmed fishes are considered as a product of the agriculture economy, and are therefore considered as property of the producer. This situation has motivated a decision of the Walloon Government to include the black cormorant and the grey heron in a list of protected species, whose damages on fish farms justify financial reparation (Regional law of the Walloon Region – 8 October 1998). However, the great cormoran is still considered as a protected species (regional law on wild indigenous birds of 14 July 1994). Most conflicts arise within cyprinid fisheries, where large ponds are of easy access for the birds and provide high fish density; furthermore, as profit margin is low with most cyprinid farms, even a small amount of stock loss turns is unprofitable.

Facing the damages caused by those species, which populations are steadily increasing in Belgium since the nineties, a request was formulated (1 February 2005) by the Walloon Minister for Agriculture, Rural activities, Environment and Tourism Mr Benoît Lutgen. It allows the General Inspector of the Division of Nature and Forests (branch of the Direction générale des ressources naturelles et de l'environnement) to deliver special culling authorizations for specimens of great cormorans and grey heron. Those authorizations, which solely aim at preserving income, do not impact on the conservation status of those species, and are strictly regulated in terms of number of eliminated specimens.

Also, those culling authorizations might only be delivered if all dissuasive procedures have failed on protecting the fish resource, our fishermen's source of income. In this perspective, a technical support must be brought to the professionals working on the development of new prevention measures, which must be based first on fish resource protection.

CROATIA

Tomislav Treer

The cormorants are still protected birds, but killing them is allowed at the aquaculture sites. Also, the fish-farms may ask for financial compensation for damages caused by cormorants, but in practice it is not easy to get it.

DENMARK

Henrik Baktoft

The EEC Bird Directive limits the possibilities of managing the cormorants. Its article nine provides the possibility to adopt certain management options in order to avoid damages despite the protection status. This article is taken up in the Danish Hunting and Game Management Act which sets the legal framework for the management of cormorants. Under this act the first Danish cormorant management plan was implemented in 1992. This first plan clearly favoured the cormorant, since the main objective was to prevent damage rather than manage the population. Since then the management plan has been adapted to changing conditions and turned towards a more active management. The current plan was implemented in 2002 and is currently being revised.

The Danish management plans for cormorants have been specifically formulated as conflict mitigation plans. The plans have provided guidelines for management and frames the conflict politically, outlining the possibilities and limits to regulation. The table below gives the main instruments available in the Danish Cormorant Management Plans.

Main instruments available in the Danish management plans. Text in italic indicates new or changed measures.			
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			<i>Mitigate conflicts related to salmon and trout smolts</i>
		<i>Culling of eggs by oiling in colonies on state owned and private land</i>	Culling of eggs by oiling in colonies on state owned and private land
		<i>Stop for establishment of new colonies</i>	Stop for establishment of new colonies
	<i>Development of technical mitigation measures</i>	Development of technical mitigation measures	Development of technical mitigation measures
Protective hunting 100 meters from fishing nets all year (with permit)	Protective hunting 100 meters from fishing nets all year (with permit)	Protective hunting 500 m from fishing gear all year (with permit)	<i>Right to protective hunting 1000 m from fishing gear outside breeding season</i>
Permission to scare cormorants away from forestry	Permission to scare cormorants away from forestry	Permission to scare cormorants away from forestry	Permission to scare cormorants away from forestry

ESTONIA

Redik Eschbaum

Cormorant is in the list of hunted seabirds in Estonia and shooting is allowed from 1 August till 30 November. It is not popular game bird and only about 100–150 specimens are shot every year legally. The low numbers of shot birds can be explained also by the fact that most of the breeding cormorants have left already before the hunting season starts.

Since 2005 cormorant is included to (“pest list”) of game animals, which can be hunted outside the hunting season and also in nature reserves when causing damage. When cormorants cause damage to aquaculture or damage the fish in trap nets, the local County Environmental Department can give the permission for shooting. These permissions have been asked and given very rarely. The idea of recent changes in legislation (including cormorant to the “pest list”, etc.) is to make legal basis for the national management plan, which have been prepared since 2000. Anyway, the plan is ready but still not signed because of the concern that it could be in conflict with national and EU legislation.

Practically all cormorant breeding colonies in Estonia are situated in protected or Natura 2000 areas.

About 25 percent of all Estonian colonies and nearly 12 percent of nests have regularly suffered from illegal persecution annually. Until 2004, three colonies of 30 have been abandoned due to persecution.

In Estonia we do not have compensation system for cormorant damages.

There was 11 500 breeding pairs of cormorants in Estonia in 2006.

FINLAND

Pekka Salmi

Cormorants are categorized as protected species in line with the EU legislation. The Ministry of Environment is responsible for cormorant management in Finland and has decided that in case of remarkable damages for fisheries the authorities can grant permission to disturb the bird colonies or cull the birds. The Ministry of Environment bases these local management actions on the Bird Directive (79/409/ETY), which restricts the culling of protected birds to “small numbers”. The calculations in the Ministry’s instructions concerning year 2005 resulted in the annual maximum of 53 bird individuals to be culled annually.

The Finnish environmental authorities have so far granted no permits for cormorant culling, but during the last few years several cormorant colonies have been illegally disturbed or destroyed. In principle, fish farming and forestry can be compensated for cormorant damages. This requires bookkeeping of the damages and application procedures. Until now no compensations have been paid.

The Finnish Cormorant Management Plan was published in 2005. It summarizes the situation and problems and calls for several improvements in documentation. The representatives of fishers and agricultural producers, who participated in the management plan group, opposed the plans for actions; the representatives required immediate actions in solving the local cormorant problems.

FRANCE

Daniel Gerdeaux

By law, on the 17 April 1981, great cormorant was totally protected in France. The first damages were declared in the carp fish farms in the Camargue (Rhône Delta). Scaring birds was allowed on fish farms. Then shooting was allowed on fish ponds if all other methods are not efficient (2 November 1992). The conflict became stronger from 1995 and the anglers associations claimed more regulation. Shooting was allowed on roosts. A first national quota of birds which should be killed was decided. An national expertise was done for the French Ministry for Environment in 1996 and there was a national agreement to stabilize the wintering population to the number of birds counted in France during this winter 1996 (75 000). The annual quota will be the difference between the last biennial mid-January national census and the number of 75 000 birds. It was considered in 1996 that the level of the European population was safe to stop the increase of the population. (Birdlife??)

In 1997, 1999, 2001, 2003, 2005, 2007 the number of wintering cormorants in mid-January was successively 74 874, 83 080, 85 090, 89 183, 97 977 and 99 110. The number of roosts was 467, 574, 694, 769, 802, and 820. The summary of the changes in France are summarized in the table below and some pictures are in the presentation in the pdf file.

years	1981	1992	winter 1994-199	1995-1996	1996-97	1997-98	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
legal status and French management rules	integral protection	sub-species sinensis, regulation is possible, killing allowed only on fish ponds if all other methods are not efficient,	it became easier to get this permission	first shots on roosts near fish ponds, and on rivers where there is endangered fish species		the goal is the stabilization of wintering birds in France at the number of birds in January 1997 : 75	On waterbodies not in the nearness of fish ponds, the first years of this period, only guards (hunt and fishery) were allowed to shot, and during the last years approved persons are allowed in addition.									
allowed quotas on fish ponds and near waterbodies				1236	no precise quotas			10682	12792	14823	15783	18411		21384	21384	23035
allowed quotas in other waterbodies				0	742	1215	2365	3941	3991	7774	9434	12997		12400	12400	16870
total quota				1236	6916	9710	10828	14623	16783	22597	25217	31408	31408	33784	33784	39905
total killed				3572	4480	7145	10472	12097	15693	18994	22046	25239			30861	
killed on fish ponds and near waterbodies				3572	4350	6272	8125	8755	11156	12679	14139	15170			17001	
killed on other waterbodies					130	873	2350	3256	4537	6315	7907	10069			13860	

GERMANY

Volker Hilge

The conversion of the Wild Birds Directive into national law was done through the Federal Nature Protection Law. Its present version dates from 2002. It contains rules to protect fauna and flora species. The great cormorant is a species protected like other animals and plants against deterioration caused by man and whose environment and condition of life are protected as well (§39, 1). But this bird is also among the especially protected species (§ 10, 2 (10)). It is therefore prohibited to catch, hurt or kill all of their developmental stages and to take away from nature nests, breeding-places, housing and shelter and to damage or destroy them (§ 42, 1 (1)). It is also prohibited to disturb the bird by watching, photographing or filming it or by any similar activities. Possession and trade are not allowed as well (§ 42, 2).

Article 9 of the Wild Birds Directive stipulates exceptions from the prohibition to kill cormorants. These exceptions are restrained in the Federal Nature Protection Law as compared to the Birds Directive to special cases, e.g.

- to prevent considerable damage of fisheries or other common economics or
- for the protection of native fauna.

Without going into details here on all the consequences of such restrictions it should nevertheless be noted that the protection of the native fauna does not apply when e.g. a fish population disappears locally or temporarily. In fact the whole stock must be in danger.

Nevertheless, to avoid commercial fishery losses or to protect endangered fish stocks exceptions from § 42 are allowed (§ 43, 8 (1); § 62, 1). Based on this legislation most of the 16 states created their own cormorant management legislation. Unfortunately, they differ extremely. Damage of cormorants on wild fish stocks are not compensated for, while in some federal states damage in fish farms, when proven, may result in compensation payment. (Details on the different regulations in the federal states will be given during the workshop).

HUNGARY

Béla Halasi-Kovács

In Hungary the great cormorant – being subject to 79/409 EEC Directive – is protected by 13/2001 Ministry for Environment Decree. Alarming and shooting of the species at the fishponds and natural water bodies must be permitted at the regional nature protection authorities, and the regional hunting authorities. For this reason there can be arose different restrictions at the regional authorities. Those fish farmers who are taking part in the National Environmental Management Program have to make yearly cormorant management plan. It is also permitted by the regional authorities. Shooting can be done only by hunting licensed people. Recently in Hungary is not national level management plan to regulate neither the breeding (about 3 500 pair at 18 colonies), nor migrating (about 26 000 pcs) cormorant populations. According to Law 1996 LIII on nature protection, compensation for damages caused by cormorants can be applied for areas not falling under protection, however, procedures for compensation are not yet effective.

IRELAND

Ger Rogan and Russell Poole

The endemic subspecies of the great cormorant breeding in Ireland is *Phalacrocorax carbo carbo*. The EU Habitats Directive requires that these birds are maintained at “favourable conservation status” by Member States. In Ireland, the Wildlife Act (1976, 2000) provides full protection for cormorants, As such, cormorants can only be disturbed or shot by license in exceptional circumstances under Section 42 of the Act. The National Parks and Wildlife Division of the Department of Environment, Heritage and Local Government is responsible for the issuing of licences. The number of applications to shoot cormorants in recent years has been low and the number of cormorants permitted to be shot has not exceeded 150 birds in any one year.

There is no provision for financial compensation for damages caused by cormorants in Ireland. In most cases there is a lack of scientific data with regards to the actual impact of cormorants on fish stocks compared to other potential mortality factors. The Marine Institute has been a partner representing Ireland in the EU REDCAFE Cost Action (Carss, 2003; Carss and Marzano, 2005) and is currently a partner in the EU INTERCAFE Cost Action project.

Useful Information & Websites

Department of Environment, Heritage & Local Government [http://www.viron.ie/en/](http://www.environ.ie/en/)

National Parks & Wildlife Service www.npws.ie

The Central Fisheries Board www.CFB.ie

The Marine Institute www.marine.ie

Wildlife Act, 1976, <http://www.irishstatutebook.ie/1976/en/act/pub/0039/index.html>

Wildlife Amendment Act, 2000

<http://www.irishstatutebook.ie/2000/en/act/pub/0038/index.html>

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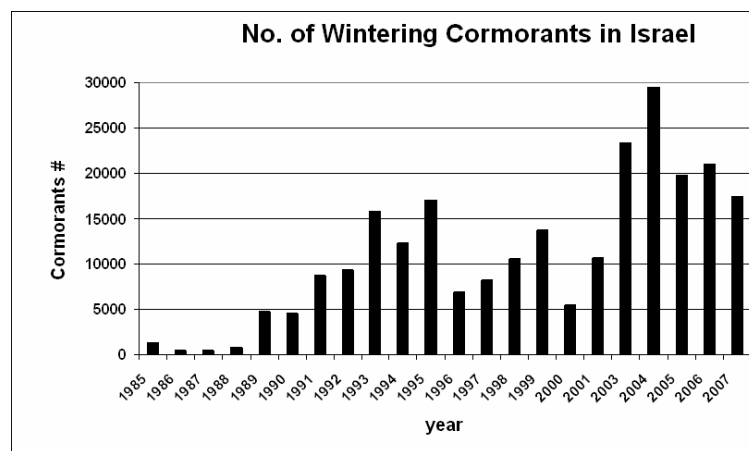
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ISRAEL

Simon C. Nemtsov and Igal Magen

Since the mid-1980s there has been a steady rise in the numbers of great cormorants arriving to overwinter each year in Israel. Winter counts in recent years have shown about 15 000 to 20 000 great cormorants overwintering in Israel annually (see graph, right, based on Hatzofe, 2007).

Arriving in October, they stay in Israel until March, roosting in large colonies along the Mediterranean and Red Sea coasts, and at inland streams and wetlands. Over the years these overwintering colonies, each of which can consist of as many as 5 000 individuals,



come into conflict with fish-farmers. The fish-farms in Israel are in the form of local concentrations of open earthen ponds, where very high concentrations of fish are raised for food, mainly carp, tilapia, grass carp and mullet. Over the years many attempts have been made to reduce the negative impact of these overwintering great cormorants on the commercial fish-farms in Israel. Among these, are lethal and non-lethal methods, such as:

Non-lethal methods: pyrotechnics, gas cannon, scarecrows, mirrors, lasers, fish refuges, regional scaring (by day at fish farms, but especially at night roosts up to 20 km from fish farms), and overhead netting.

Lethal methods: Permits have been issued each year by the Israel Nature and Parks Authority (INPA) allowing each fish-farm to shoot up to 6 cormorants per fish-farm per day from October to March.

None of these methods, lethal or non-lethal, have proven to be entirely successful or without concomitant problems, so we are continually looking for new methods or techniques that can reduce the conflict (Davidson and Hatzofe, 2006).

More detailed information on the fish farms in Israel and the nature of the cormorant-fisheries conflict in this small country, have been described in detail in the report of the INTERCAFE case-study meeting which took place in Israel's Hula Valley in January 2006: http://www.intercafeproject.net/workshops_reports/documents/Israel_Meeting_Summary.pdf

Among the findings discussed in the INTERCAFE Hula Valley meeting was the observation presented by Ohad Hatzofe of the INPA that over 50 ringing returns from the last two decades

have shown that the great cormorants that overwinter in Israel originate in the area around the northern Black Sea and Sea of Azov.

Great cormorant populations in the Azov-Black Sea region have increased over the last few decades to the point that there are apparently now about 200 000 great cormorants around the Azov-Black Sea region, with about 85 percent of them nesting in and around the Crimean Peninsula in southern Ukraine (Schogolev *et al.*, 2005). It is clear that not all nesting colonies are known, and new ones are constantly being discovered, especially as great cormorants are moving more and more into inland rivers and wetlands over recent years. The ornithologists and nature reserve biologists view the cormorants as an overabundant species causing conflicts as follows in order of importance (with the 1st being most important):

- a. Large and expanding colonies of ground-nesting cormorants on islands and coastal areas harm endangered and rare species of other ground-nesting waterbirds, such as the black-headed gull (*Larus ichthyaetus*) and rare species of herons (Rudenko and Yaremchenko, 2005).
- b. Large populations of cormorants have caused negative impacts on fishermen in the sea and in inland fish-farms.
- c. Large populations of tree-nesting cormorants damage trees in man-made forests near coastal areas.

A new cooperative programme for bi-national management of this population of great cormorants is now being established between Israel and Ukraine. The project will try to limit nesting success in the southern Ukraine through a variety of methods. The Israeli stakeholders involved in the project are: the INPA, the Israeli Fishgrowers Association, the Ministry of Agriculture, the Ministry of Environmental Protection, and the Foreign Ministry. In Ukraine, the project is being supported so far by the Ukrainian Academy of Sciences, the Azov-Black Sea Ornithological Station (Azblackornis), and Birdlife of Ukraine. The cooperative project is seeking international support from MEA's such as AEWA, the EIFAC, and the Bucharest Convention, and from NGO's such as Birdlife International.

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- Hatzofe, O. 2007. Summary of the January 2006 winter waterbird count in Israel. Internal Report of the Israel Nature and Parks Authority [in Hebrew].
- Rudenko, A.G. and Yaremchenko, O.A. 2005. Breeding history and dynamics of colonial settlements of Great Cormorant (*Phalacrocorax carbo*) in the Black Sea Biosphere Reserve.
- Schogolev, I., Rudenko, A. and Crivelli, A.J. 2005. Status of pelicans and cormorants on the northern Black Sea. Bird Conservation International 15: 63-71.

LATVIA

Normunds Riekstins

Cormorants in Latvia are not included in the list of game species. The list of game species under the "Hunting Regulations" covers only the bird species which are included in Annex II/1 or Annex II/2 of Birds Directive.

Cormorants can be taken and used in accordance with the Cabinet of Ministers Regulations "On Issuance of Permits for Taking of Non-Game Species from Wild", "Introduction of Wild Species that are Alien to Latvia (Introduction) as well as for Restoration of Previously Extinct Population of Species"(Re-introduction)".

Permits for taking (killing) of cormorants are issued by the Nature Protection Board under the Ministry of Environment. Compensation for damage is planned, but not in operation yet.

NETHERLANDS

Arjo Rothuis

The species is protected through the national "flora and fauna act". Consequently it is prohibited to disturb the birds and their nests.

The habitat of the cormorant is protected through national legislation based on the European Bird and Habitat Directive. Within this legislation measures have to be taken to maintain a certain number of cormorants: 20 000 breeding pairs and 24 500 non-breeding pairs. These figures correspond more or less to the actual numbers of cormorants in the Netherlands.

Reduction of the cormorant population through hunting, destruction of nests or eggs etc. is not allowed.

There are currently no facilities for financial compensation for fisherman or fish farmers of damage caused by cormorants.

NORWAY

Arild R. Espelien

The Management Authority in Norway consider cormorants as a valuable game species that should be managed in such a way that sustainable populations are maintained in all parts of the distribution area. The species are included in the national monitoring program for seabirds. The hunting season are regulated at five year intervals. The hunting regulations are based on the results from the monitoring program.

During the present hunting period, the regulations are as follows. In Møre og Romsdal and Sør-Trøndelag county (except the municipalities of Osen, Roan, Åfjord, Bjugn, Ørland and Rissa) hunting are allowed on young cormorants (with white underparts) during 1 october – 30 November. In the rest of Norway hunting is allowed on both young and adults in the same period of time. There are no bag limits.

Cormorants that cause damage to economic activity can be killed, after permission has been given from the local management authority.

During the breeding season there is a general prohibition to disturb colonies. Many/most of the colonies are situated within special protected areas, mostly nature reserves.

There is no financial compensation for damages caused by cormorants.

ROMANIA

Ion Năvodaru

In Romania, the great cormorant is not especially protected (before European Union joining of first January 2007). However, all bird is protected in strictly core protected area declared in Danube Delta Biosphere Reserve and other protected area (Natura 2000 just government approval), where they nesting and breeding together with other protected birds.

The Romanian Law of Game Protection, no 407/12006 includes the cormorant in the Appendices 1 of wild fauna of hunting interests allowed for hunting. The hunting season is open between September first and 28 February. However, this species is not hunted by hunters because is not edible according with Romanian food tradition. The Pigmy Cormorant is in Annex 1 and is forbidden to be hunt. May be after EU joining, legislation concerning great cormorant should be change and put also this species in Annex 1.

The new Hunting Law 406/2006 gives some statement regarding damage compensation by wild animals in Art 13 as follow:

- If game fauna produces damage of agriculture fields or domestic animals it is give compensations by Ministry of Agriculture.
- The compensation for game fauna forbidden to hunt will be in responsibility of Ministry of Environment.

The rules for given compensation will be established by Government Order in 60 days (60 days passed, but regulation is not yet released on May 2007)

National Strategy Plan for Fishing and Operational Program for Fishing 2007-2013 include some measure and action for mitigation of fisheries –cormorant conflict as follow:

- The European Fisheries Fund will grant 45 percent for investment in sustainable use of aquaculture for:
 - protection of aquaculture against predators birds
 - compensation for maximum 2 years for designation of farms as Natura 2000

In stead there are some legislative means to ask compensation for damage produced by fauna, no any case are known for cormorants damage compensation.

Also cormorant population regulation that practiced before 1989 no any more applied after that. However, some illegal hunting by fish farmers it occur to defend fish pond.

SLOVAKIA

Boris Chládecký

Protection of great cormorant is regulated by the Act of Nature and Landscape Protection. Pursuant to that it is prohibited to disturb birds in general, i.e. to catch, to hurt, to kill them, to disturb them in their natural growth (in particular during reproduction season or migration) including destroying their eggs, to deteriorate their habitat, etc. Considering protection of fish assemblages in fishing grounds and aquaculture, exception from present restrictions can be given by issuing of decision of the Ministry of Environment on national level. Imposing of the exception is only possible under specific conditions when there is no other alternative – in order to prevent serious damage on livestock, fisheries (fish farming) and water, to ensure the protection of particular species and natural habitats, and others (not relevant to cormorants).

As regard to compensation for the damage on fish caused by protected species, this refers to the aquaculture only and it can not be provided if damage occurred out of the protection period of the protected species (in case of cormorants it is year round) or if it was in the area where the exception (for shooting, scaring or other disturbance) was given. Extent of the compensation must be proved by expert`s opinion in each case.

Simultaneously, great cormorant is also protected by legislation in the field of hunting. Pursuant to that cormorants are yearly protected, too, excluding fingerling ponds and ponds producing fish for stocking the fishing grounds (angling) where it is allowed to hunt this species year-round and other ponds where hunting is legal from 1st August to 30th November.

Hence, in order to obtain permission for shooting cormorants at open waters (fishing grounds) exception given by both of Ministry of Environment as well as Ministry of Agriculture is necessary. At the ponds specified in the Decree exception of Ministry of Environment is needed only.

SWEDEN

Agnetha Alriksson

The latest inventory of the great cormorant in Sweden was carried out in 2006. The number of pairs was estimated to be near 45 000 distributed at around 200 colonies. Most colonies, and also the largest ones, were present along the south Swedish East Coast and at the Island of Gotland. Substantial numbers of cormorants are also found in several of the largest lakes in south Sweden. The cormorant population in Sweden is likely to be the largest in Europe at the moment. In several of the core areas in south Sweden cormorants are no longer increasing and probably also the overall population is close to saturation.

Measures to control cormorants in Sweden are given by the County Administrative Boards. Legal control measures related to cormorants have been decided upon for more than 10 years. The measures include shooting of birds at or near standing fishing gears, eggs pricking, and deliberate disturbance at potential breeding sites. Up to now control measures have been carried out in most provinces where cormorants regularly occur or breed. Reported shooting in the most recent years have amounted around 5 000 birds annually, and egg pricking more than 10 000 eggs in one season. There are few studies on the impact of the various control measures on the population. In addition to actions approved by the County Administrative Boards illegal actions against cormorants have taken place especially in the beginning of the 1990 in the South Swedish East Coast. It seems, however, as if local reduction in number of breeding pairs in some of the sites have occurred, whereas no (significant) effect has been recorded if taking the regional or the whole Swedish population into accounts. Actions are requested from fisheries and other parts.

SWITZERLAND

Erich Staub

Since 15 years, the number of wintering cormorants recorded in Switzerland is stable at about 5 000–6 000 birds. In 2001 cormorants started to breed, leading to a fast increasing presence also in summer: 338 pairs in 2007.

Cormorants can be hunted from the beginning of September until the end of January, and after the hunting season additional shots can be admitted by the local hunting authorities (in total: about 1000 cormorants are shot per year). All mitigation activities are area restricted, according to the Swiss cormorant management plan which is based on two guiding principles:

- a) deterring cormorants along rivers and lakes up to 50 ha,
- b) no deterring activities on and along larger lakes and dammed rivers.

The management plan aims to influence the cormorants' distribution in order to reduce its effects on fishes (no cormorants on the especially sensitive running waters) and, at the same time, to guarantee minimal disturbance of the feeding and resting grounds of other waterfowl.

On lakes, there is a strong impact on fishing nets of professional fishermen without any compensation for this damage. An adaptation of the current legislation is planned.

UNITED KINGDOM

Miran Aprahamian

Cormorants in the UK, are protected under the Wildlife and Countryside Act 1981, which implements the EC Birds Directive (79/409), and cannot be killed, or their eggs or nests (when in use or being built) taken or destroyed, except under licence. 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. No licence is required for non-lethal shooting to scare.

Research in UK has confirmed that cormorants can remove a high proportion of fish at some sites, while at other sites impacts can be relatively minor. Management of the problem is thus determined on a case by case basis. Where piscivorous birds are causing serious damage to a fishery, or are likely to do so, the relevant authorities may grant a licence to allow the shooting of a specified number of birds. Applicants have to satisfy a number of criteria before a licence is issued. For example, licences are issued where:

- birds are causing, or are likely to cause serious damage to fish stocks or fisheries;
- 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.

Thus applicants are required to provide information on:

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

Applicants also need to provide information on any other factors that may be affecting the fishery, such as; presence of other predators, changes in water level, poor water quality and changes in fishery management practices.

Similar considerations are believed to apply in other parts of the UK.

Where a license is issued, a number of conditions will be attached, for example the maximum number of birds that can be shot and over what period. A return of numbers of birds shot under license must be sent to the appropriate authorities. This information is required under European legislation and is essential to monitor the impact of licensed shooting on the populations of piscivorous birds. Failure to comply with license conditions may result in revocation of the licence and refusal of future applications or prosecution.

There is no financial compensation for any damage caused by cormorants.

A workshop on a European Cormorant Management Plan was held by the EIFAC ad hoc Working Party on Prevention and Control of Bird Predation in Bonn, Germany from 20 to 21 November 2007 with the participation of 29 representatives from 13 EIFAC member states. The ad hoc Working Party discussed cormorant – fisheries issues and reviewed the legal situation for the protection and control of cormorants in EIFAC member countries. On the basis of these discussions four recommendations were formulated, including the promotion of preparation and effective implementation of a European Cormorant Management Plan.

