Summary: Intervention & Options

Department /Agency:	Title:	
Department for Environment, Food and Rural Affairs	**Impact Assessment of declaring an aquatic animal health status for Koi herpesvirus (KHV) disease in England and Wales**	
Stage: Partial	**Version:** 1	**Date:** 19 May 2009
Related Publications: Council Directive 2006/88/EC		

Available to view or download at:

http://www.eur-lex.europa.eu/LexUriserv/LexUriServ.do?uri=OJ:L:2006:328:0014:00

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What is the problem under consideration? Why is government intervention necessary?

Council Directive 2006/88/EC requires Member States to determine a health status for each of the non-exotic disease listed. KHV disease was previosuly not included under community controls. With a small number of outbreaks seen in England fisheries, we need to decide which health status is applicable to England and Wales. We view the most appropriate status for England and Wales to be category IV (eradication programme).

What are the policy objectives and the intended effects?

The objective is to declare an appropriate health status for KHV disease in England and Wales, as required under Council Directive 2006/88/EC.

What policy options have been considered? Please justify any preferred option.

While there are five possible options under Directive 2006/88/EC for declaring a health status for KHV disease in England and Wales, only two are realsitic options at this time.

Category IV - Eradication programme

Category V - Infected

When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?

The effect of whatever health status is declared will be actively monitored. The policy is expected to be reviwed after 2 years, although significant impact of the policy will be longer term..

Ministerial Sign-off For SELECT STAGE Impact Assessments:

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible Minister:

..... Date:

Summary: Analysis & Evidence

Policy Option: 1	Description: Declaring England and Wales category IV (eradication programme) status for KHV disease

COSTS

ANNUAL COSTS	
One-off (Transition) **Yrs**	Description and scale of **key monetised costs** by 'main affected groups' (1) Buyers of carp (previously imported). This option will prevent imports from countries not KHV-free, so buyers lose as they shift to higher cost or lower quality sources (£1m-£1.1m a year). (2) Commercial carp fisheries: eradication programme (£25,000 a year). (3) Government: eradication programme (£0.45m a year)
£ 0	
Average Annual Cost (excluding one-off)	**Total Cost** (PV) **£ 22m to 25m**
£ 1.5m to £1.6m	

Other **key non-monetised costs** by 'main affected groups'

BENEFITS

ANNUAL BENEFITS	
One-off **Yrs**	Description and scale of **key monetised benefits** by 'main affected groups' If successful, eradication avoids KHV outbreak costs: (1) Commercial carp fisheries: loss of fish stock and ticket sales (£5.6m). (2) Carp anglers: loss of benefit from fishing (£0.1m - £0.6m per year). (3) General public: loss of benefit from healthy local fish (£0.05m - £0.2m). (4) Government: Disease containment (£0.1m)
£ 0	
Average Annual Benefit (excluding one-off)	**Total Benefit** (PV) **£ 0 to £111m**
£ 0 to £6.4m	

Other **key non-monetised benefits** by 'main affected groups' Protection of wild carp stocks from KHV. Risks are considered small. Wild carp are non-native and of minor ecological importance, but of great interest to a large proportion of anglers.

Key Assumptions/Sensitivities/Risks KHV can be eradicated by the measures envisaged under status IV, but without eradication poses a growing threat. Buyers of imported carp from countries not KHV-free can obtain substitutes, but from higher cost or lower quality suppliers. Koi make up 90%-100% by value of imports. Government funds FHI inputs to eradication

Price Base Year 2009	Time Period Years 20	**Net Benefit Range** (NPV) **£ -22m to +£86m**	**NET BENEFIT** (NPV Best estimate) **£ 3.7m (Risk avoided)**

What is the geographic coverage of the policy/option?			England and Wales	
On what date will the policy be implemented?			July 2009	
Which organisation(s) will enforce the policy?			Defra (FHI)	
What is the total annual cost of enforcement for these organisations?			£	
Does enforcement comply with Hampton principles?			Yes	
Will implementation go beyond minimum EU requirements?			No	
What is the value of the proposed offsetting measure per year?			£	
What is the value of changes in greenhouse gas emissions?			£	
Will the proposal have a significant impact on competition?			Yes/No	
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?	Yes/No	Yes/No	N/A	N/A

Impact on Admin Burdens Baseline (2005 Prices) (Increase - Decrease)

Increase of £ Decrease of £ **Net Impact** **£**

Key: **Annual costs and benefits: Constant Prices** **(Net) Present Value**

[Use this space (with a recommended maximum of 30 pages) to set out the evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Ensure that the information is organised in such a way as to explain clearly the summary information on the preceding pages of this form.]

1. Summary

1.1 There are five possible health declaration options available through the introduction of Council Directive 2006/88/EC. However, only two real options are available to us, based on our past experiences of the disease, and current data available on its distribution throughout England and Wales.

1.2 The options are either introducing Category IV (eradication programme) or declaring ourselves Category V (infected).

1.3 These two options have been detailed above in the summary: analysis and evidence section and in the analysis provided later, showing the costs and benefit of introducing an eradication programme under category IV. The baseline for this analysis is the assumption that we 'do nothing', so declare ourselves category V (infected). This baseline is then what we use to compare against the idea of introducing an eradication programme under category IV.

1.4 The overall costs of declaring category V (infected) can be seen through the benefits of introducing an eradication programme through category IV and vice versa. For example, the major cost of category V and declaring ourselves infected, can be seen through the loss of revenue our fisheries would see, due to the increase that would be seen in the disease spreading and infecting new premises. However, preventing this loss of revenue, through the introduction of an eradication programme, can be seen as the major benefit of category IV.

1.5 However, as KHV disease is a relatively new problem within the aquatic industry, with outbreaks having only been recorded within the past 10 years, the amount of information and accuracy of data available for preparing this assessment has been limited. So, the following analysis might not represent the full picture, as far as the aquatic industry and trade in KHV susceptible species is concerned at this moment in time.

1.6 We would therefore very much welcome any information and evidence that should help provide a more accurate picture of the current situation and help us to evaluate in more detail, the possible impacts of introducing any of the options available.

1.7 Additionally, attached for information as an annex to this partial impact assessment, is a highly detailed and complex table outlining the mechanisms and calculations used in preparing various figures contained in the following analysis.

2. Council Directive 2006/88/EC

2.1 As part of the introduction of Council Directive 2006/88/EC on animal health requirements for aquaculture animals, and on the prevention and control of certain diseases in aquatic

animals, Member States are required to determine a health status for each of the non-exotic diseases listed in the Directive. KHV disease is being listed for the first time under Community controls, and so we must decide which of the five possible health status options, set out in the Directive, is most appropriate for England and Wales.

2.2 Under Council Directive 2006/88/EC new requirements on the registration of fisheries and authorisation of cropping waters will improve Government's capacity to track the origin of outbreaks of KHV and the speed of detection of new infected waters.

2.3 However, if in England and Wales we declare the health status under category IV, KHV susceptible species would only be imported from countries, zone or compartments, considered as free of the disease. This is thought a mechanism that will reduce the rate at which KHV compromised fish, and hence the disease, is introduced into the country, and potentially reduce the number of outbreaks, as the majority of these are considered to be due to virus introduction through imported fish.

2.4 Alternatively, if we declare category V status, which is to continue as we have in past to allow imports from countries, zone or compartments which have not declared freedom from KHV disease, it is estimated that the total number of fisheries infected per year would be between 6 and 20 to begin with, increasing by an average of 2 extra sites per year. Using a weighted average it is estimated that there will be 12 outbreaks of KHV per year. As the proportion of match fisheries to specimen fisheries in England and Wales is around 91% to 9%, then there will be on average 11 KHV outbreaks in match fisheries and 1 KHV outbreak in specimen fisheries, per year.

3. KHV Disease

3.1 The first reported case of KHV in the UK occurred in 2003 and it was made a notifiable disease in April 2007. Outbreaks have tended to occur every year, mostly in fisheries and garden ponds. The virus has also been detected in consignments of imported carp. No clinical outbreaks have been recorded in farmed carp populations or wild riverine carp. Data on KHV outbreaks in fisheries is summarised in table 1. The average number of outbreaks per year seen to date is around 10, ranging from a low of 4 to a high of 23. Outbreaks in aquaria and garden ponds are not subject to control measures (risk of spread is considered to be negligible).

Table 1 – Number of fisheries affected by KHV outbreaks in England and Wales

Year	Number of outbreaks
2003	6
2004	4
2005	6
2006	23
2007	10
2008	12

4. Private sector Costs

Import Restrictions

4.1 The largest cost of introducing an eradication programme would be through the implementation of import restrictions for KHV susceptible species. Japan and Israel are the two biggest exporters of carp to the England and Wales. Under an eradication programme, England and Wales would not be able to import KHV susceptible species from either of these countries. It is believed that producers in the UK would be able to fill this market gap within 2-3 years.

4.2 Israeli carp can be made 50% cheaper than carp produced within the UK market. Japanese carp have a high status attached to them and are therefore 100-200% more expensive than domestically produced carp. As consumers are willing to pay 100-200% more for these Japanese carp, rather than buy British carp, the status loss from not being able to buy Japanese carp is valued as the price difference between Japanese and British carp.

Table2: demonstrating the cost of import restrictions of live carp

Country	Total value of imported live freshwater fish	Total value of imported carp	Increase in value of carp due to UK produced carp replacing imports of Israeli carp	Loss of status due to import restriction on Japanese carp	Total cost to consumers due to import restrictions
Japan	£1,915,519	£1,915,519			
Israel	£2,157,896	£2,014,036			
UK			£503,509	£574,656	£1,078,165

4.3 To work out the cost due to import restrictions on Israeli carp the total value of live freshwater fish imported from Israel (£2,157,896) was used from the 2008 UK trade figures. Of this figure, around £2m represented the value of imported carp; the remaining £0.15m represented the value of imported Israeli goldfish. We assume that UK carp are similar in quality to Isreali carp but are produced at a price 50% higher than Israel. If consumers continued to buy the same quantity of carp but from UK producers, they'd have to pay an additional £1m (50% of £2m). However, the higher prices would cause some consumers to purchase other goods instead, so the 'welfare loss' to consumers is only a portion of that £1m. We assume that this would halve[i] the loss again to around £0.5m.

4.4 Due to the particular quality of Japanese carp, UK producers are unlikely to be able to substitute for all of Japanese imports, even at a higher price. To gain the value of UK produced carp that could potentially replace the Japanese carp imports, the value of live freshwater fish imported from Japan (£1,915,519) is reduced by 66%, 60% and 50% to gain low, medium and high estimates of the value of newly produced UK carp. These estimates are then subtracted from the figure of live freshwater fish imported from Japan and, as for Israeli carp above, halved to obtain a welfare loss for consumers which ranges from £0.5m-£0.6m a year.

4.5 The costs due to import restrictions on Israeli and Japanese carp are added together to give a total import restriction cost of **£1m-£1.1m** a year.

[1] This assumes an elasticity of demand equal to 1.[Parkin, M, Powell, M and Mathews, K (1997) Economics: Third Eds. Essex: Addison – Wesley, pp. 102, 164-165.

Q1. Are the figures and percentages detailed here, for total imports from Israel and Japan, an accurate reflection and breakdown of the actual import market from these two countries?

Q2 Are there any other major third country markets that might be affected if we opt for category IV (eradication programme) status? What is the current trade figures for these countries?

Q3 Are there any third country markets that are in a position now to continue or begin exporting KHV susceptible species to England and Wales, if we opt for category IV status?

5. Cost to an affected fishery

5.1 The cost of a KHV disease outbreak to an affected fishery varies according to whether the fishery is a match or a specimen fishery. Match fisheries are generally heavily stocked with smaller fish (<3 kg), and anglers fish in close proximity to one another. Specimen fisheries are less heavily stocked but with larger, and therefore more valuable fish. Considerably fewer day licenses are sold, although at higher costs, compared with a match fishery of a similar size.

5.2 The main costs to a fishery from a KHV disease outbreak are (i) the loss of fish, and (ii) decreased revenue from loss of day ticket sales. No restocking of any fish susceptible to KHV is allowed for a period of at least 12 months. The impact on ticket sales can be significant. Specimen carp waters may be hardest hit since their clients are not interested in fishing for other species, and because large carp may not be easily available once the 12 month moratorium on restocking ends.

5.3 If KHV persists at its current level, or alternatively if the number of new infected premises actually increases year on year, .losses of revenue would multiply. The total benefit were an eradication programme to fail would be £0. However, if eradication is successful and we assume an increase of 2 new infected premises per year would be avoided, then by year 20 we could be achieving benefits of around £7.1m per annum.

Q4 It is assumed there will be an increase of 2 new infected premises per year without an eradication programme, thus 52 new infected premises per year, by year 21. Is this a sensible assumption regarding disease spread?

5.4 The cost of a 'typical' KHV outbreak to an affected fishery has been calculated using the following parameters:

1. number of fish by weight category
2. mortality by weight category
3. value of the fish by weight category (based on available price lists)
4. cost of a day ticket
5. decrease in ticket sales by week, following an outbreak

and using a range of values for each parameter.

Fishery Type	**Number Infected**		
Match fishery	11	Proportion of match fisheries	0.91
Specimen fishery	1	Proportion of specimen fisheries	0.09
Ornamental	0		
Fish farm	0		

High	15%	20
Medium	60%	13
Low	25%	6
	Weighted average	12.3

Q5 Is a percentage split of coarse fisheries in England and Wales, between match (91%) and specimen (9%) an accurate reflection on the proportion of actual number of fisheries?

	Low	**Most Likely**	**High**
Loss of stock (Match Fishery)	£36,080	£358,875	£1,430,000
Loss of stock (Specimen fishery)	£9,820	£207,000	£837,750
Total loss of stock	**£45,900**	**£565,875**	**£2,267,750**

(source: Cefas)

	Low	**Most Likely**	**High**
Loss of ticket sales (Match fishery)	£15,840	£72,776	£311,850
Loss of ticket sales (Specimen fishery)	£9,263	£25,050	£85,800
Total loss of ticket sales	**£25,103**	**£97,826**	**£397,650**

(Source: Cefas)

5.5 There is also a cost to government of disease containment. This includes declaring an infected farm or area; establishing a containment area, protection and surveillance zones around the farm or area; restricting the movement of aquatic animals from the containment area; and the removal and disposal of dead fish. An estimate of the costs puts it around £109,000 per annum (source: Cefas)

5.6 The cost of an eradication programme would be split between Government and commercial carp fisheries. Commercial carp fisheries would bear part of the cost, estimated to be annually around £25,000, to cover things such as costs of additional bio-security measures and retesting of stock for two years after an outbreak (Source: Cefas). Government would bare the greater amount, around £0.45m, and this would cover the Fish Health Inspectorate carrying out the necessary surveillance, testing and control procedures required under an eradication programme.

5.7 Further benefits to anglers, taking the example of their willingness to pay a certain amount extra in the future, over what they currently pay to fish, in order to keep their fisheries open and disease free. The amount that licensed anglers are willing to pay over what they are currently paying, can be used as a measurement of the loss they would feel if their fishery came down with and closed due to a KHV outbreak.

5.8 The willingness to pay value used for this impact assessment was taken from an Environment Agency report on the economic valuation of inland fisheries. However, this value is the amount anglers are willing to pay to guarantee the existing general quality of their regular site and does not separate out their willingness to pay to maintain the carp population at this site. Therefore, we halve this willingness to pay value in order to more accurately reflect angler's willingness to pay for the maintenance of carp stock in their

regular fishing site and not their willingness to pay for maintaining the general quality of this site.

5.9 The halved willingness to pay value was multiplied by the average number of trips per year of licensed anglers and then multiplied again by the number of anglers in England and Wales. This gave us a figure of £115,920,000, therefore if all fisheries in England and Wales closed due to KHV, this figure would be the economic cost. However, as only a certain percentage of coarse fisheries will be infected by KHV each year, we take a percentage of £115,920,000, which provides a cost figure per annum. The tables below demonstrate how the costs to anglers and the public are worked out in the current year. As we assume an increase of 2 new infected premises per year, the percentage of infected coarse fisheries in England and Wales will increase by 0.02% per year. The annual figures over the 20 year time period are shown in the annex.

This is broken down by:

Average anglers WTP per trip	£1.05
Average number of trips per year	48
Total number of coarse anglers in England and Wales	2,300,000
Annual angler consumer surplus	£115,920,000
Coarse fisheries in England and Wales	10,000
% of infected coarse fisheries in England and Wales	0.12%
Loss of angler consumer surplus	**£142,582**

5.10 Additionally, the general public also have a willingness to pay to improve or maintain the fish population in their nearest water body. The average household is willing to pay £3.73 (source: Environment Agency), although this applies to any local water body and not just coarse fisheries. This figure is also halved as we assume that only half of this willingness to pay value is to maintain the carp population in the nearest water body, the rest of the value is to maintain the general fish population in the nearest water body.

This is broken down by:

Average household WTP to improve or maintain the fish population in their nearest waterbody	£1.87
Number of households in England and Wales	22,150,000
Annual household consumer surplus	£41,309,750.00
Coarse fisheries in England and Wales	10,000
% of infected coarse fisheries in England and Wales	0.12%
Loss of household consumer surplus	**£50,811**

Q6 Is the figure of 10,000 total coarse fisheries in England and Wales, a fair estimate?

6. Production of KHV Susceptible Species in England and Wales

6.1 In 2004 there were 95 registered fish farms in England and Wales producing stock for ornamental purposes. Most farms are very small, with about 12 farms accounting for most of the coldwater fish production. The majority of the fish produced were Koi varieties representing around 90% of total production. Domestic production of coldwater fish reported has declined from 2001 peak (7.5million)(coinciding with the onset of KHV outbreaks) to 5.7million in 2003.

6.2 It is believed that any additionally demand in the market for KHV susceptible species, due to a lack of imports, and over a short period of 2 or 3 years, can be met thought domestic production, particularly the market demand for small fish. It may take a year or two longer to deal with demand for larger fish. The price of these fish is likely to be well below current prices of Japanese fish, but higher than for fish produced in other countries such as Israel.

7. Conclusion

7.1 At the moment the issue revolves around a trade off between anglers/fishery owners and ornamental fish owners and importers. The eradication program is preferable for anglers as they are free to fish in their local fishery without the disruption KHV causes. It is also beneficial to fishery owners as they do not experience a loss of revenue if KHV is eradicated. The eradication programme however, is extremely costly to ornamental fish owners, as it potentially starves them of cheap carp from Israel and status koi by owners of Japanese fish.

7.2 The conclusion depends on a number of factors. Category IV (eradication programm) would deliver net benefits to society if we are to accept the medium or higher estimates regarding the loss of revenue per infected fishery, an increase of 2 IP's a year, and we also assume that the eradication programme has an 80%-100% chance of success. We can also assume a net benefit using the assumption that the number of new IP's would stay constant, providing the high cost estimates are used and we assume an 80%-100% chance of successful eradication.

7.3 However, if we are to use the low and medium cost estimate regarding the loss of revenue per infected fishery, and we assume a constant number of new IP's a year, society will suffer a net cost; even if we are 100% sure that eradication will work.

7.4 Using the most likely cost estimates regarding the loss of revenue per infected fishery, assuming an 80% chance of successful eradication, and assuming an increase of 2 new infected premises per year if we declare category V status and thus infected, the total cost of category IV is **£23.6m** over the 21 year time period, while the total benefit of category IV is **£27.3m** over the same time period. This provides a net benefit to society of **£3.7m** over a 21 year time period.

Competition and Small Firms Assessment

In terms of competition, the final option we declare might impact on the certain elements of the import industry, and restrict areas where KHV susceptible species can be sourced from. The options will not close the door completely to imports, and will encourage traders to seek sources of fish which are known to have a high health status. It is hoped that any shortfall in imported numbers, can eventually be made up through an increasing domestic suppliers.

Sustainable Development

The proposal is fully compliant with the principles of sustainable development, ensuring the use of sound science evidence to closely align the level of controls proportionate to the risk.

Legal Aid

The proposal does not create any new criminal sanctions or civil penalties, so does not affect current legal aid requirements.

Carbon Assessment

The proposal will have no significant effect on carbon emissions within the aquatic industry. There is potential for individual winners and losers in terms of an increase/decrease in trade opportunities from countries outside the EU, but the carbon footprint of certain individual trading businesses is unlikely to increase. We may even see a slight decrease in third country imports for a short period of time, potentially decreasing certain businesses carbon footprint.

Other Environment

The proposal is unlikely to have any significant impact on climate change, landscapes, water and floods, habitat and wildlife or noise pollution.

Health Impact Assessment

The proposal will not directly impact on health or well-being and will not result in any health inequalities.

Race/Disability/Gender

There are no limitations on meeting the requirements of the proposal on the grounds of race, disability or gender. The proposal does not impose any restriction or involve any requirement that a person of a particular racial background, disability or gender would find difficult to comply with. Conditions apply equally to all individuals and businesses involved in the activities covered by the proposal.

Human Rights

The proposal is consistent with the Human Rights Act 1998.

Rural Proofing

The majority of fisheries stocking KHV susceptible species are based in rural areas. The proposal and designating of a health status for KHV, is designed to help these activities and assist in hopefully achieving a disease free status. The angling industry free of KHV disease would be of great benefit to rural communities, promoting the angling industry and proving assistance to these areas.

Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.

Type of testing undertaken	*Results in Evidence Base?*	*Results annexed?*
Competition Assessment	No	Yes/No
Small Firms Impact Test	No	Yes/No
Legal Aid	No	Yes/No
Sustainable Development	No	Yes/No
Carbon Assessment	No	Yes/No
Other Environment	No	Yes/No
Health Impact Assessment	No	Yes/No
Race Equality	No	Yes/No
Disability Equality	No	Yes/No
Gender Equality	No	Yes/No
Human Rights	No	Yes/No
Rural Proofing	No	Yes/No

Annexes

[i] This assumes an elasticity of demand equal to [what] [insert cross-ref to economics text discussing consumer surplus)