Interim Assessment (Regulation 31) of the Impact of Clam Fishing on the Conservation Status of Waterford Estuary SAC

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Contents

1. Introduction

This document assesses the potential ecological impacts of clam fishing on the conservation objectives in the Waterford Estuary SAC and on the basis of the clam fishery management plan for 2009 which has been submitted for approval, by the Mollusc Local Advisory Committee (south east), to the Department of Agriculture Fisheries and Food (DAFF).

2. Details of the proposed operation/activity

Proposed activity

- **Location**: Waterford Estuary (SAC 2162). It is proposed to fish for and retain surf clams (*Spisula solida*) in a defined area in the Waterford estuary (Figure 1). The maximum geographic area for the proposed fishery is 1.8km^2.

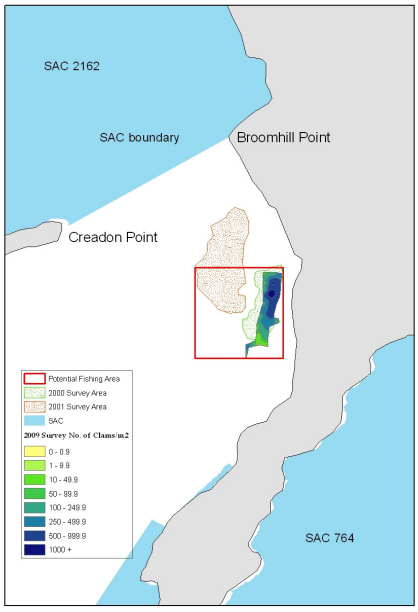

Figure 1. Location of proposed clam fishery in relation to Waterford Estuary SAC

- **Target species**: Surf clam (*Spisula solida*)

- **Fishing gear/s**: Fishing will be mainly by box dredge (FAO/ICES gear code DRT 04.1.1) per boat. There is a low likelihood of hydraulic suction, non-suction, thrust or other modified forms of dredge being used (FAO/ICES code DRM 04.1.2). Maximum dredge and blade width of 1.10m and 13mm bar spacing. A 13mm grader will be used on board all vessels. Undersized clams will be discarded at sea.

- **Duration of operation and time of year**: Sept 1st and not later than November 1st or earlier if the catch declines to 1000kg per boat per day averaged for all boats during a 5 day period (see below). The duration of the season will be reviewed after 2 weeks using catch rate data. Fishing will take place only during the hours of 07:00-13:00 Monday to Friday or by agreement of the Local

Advisory Committee on Saturday and Sunday but up to a maximum of 5 days per week.

- **Projected biomass removal of target species**: The scientific data is insufficient to calculate the biomass of clams in the proposed fishing area. In any case, as the stock recruitment relationship for this species in this area is probably dominated by environmental factors affecting spawning and settlement, a scientific quota cannot be calculated. Biomass removal and fishing mortality will be managed and limited in real time. The following restrictions are proposed

    - Maximum landings per boat per day of 2 tonnes
    - Fishery to close when the landings decline to 1 tonne per boat per day averaged over all boats for the previous 5 day period

- **Monitoring:**

    - Records of daily catch and fishing time will be maintained by all vessels and posted to the relevant authority within 48 hours to enable catch rates to be calculated
    - All vessels over 10m in length will, in addition, complete an EU logbook
    - Gatherers dockets and sales notes will be completed on landing and at first point of sale
    - GPS tracking of vessels is unnecessary as the distribution of clams is known and distinct and separate from surrounding habitats and fishing will not occur outside the boundaries of the known bed. The overall area is small and higher resolution GPS data are unnecessary.

- **List main by-catch species**: There will be no-retained by catch. Non-retained by catch includes all fauna living in the sediments in the dredge path.

3. Conservation objectives for SAC 2162

The site, which includes the Rivers Barrow and Nore, contains 12 habitats (qualifying interests) listed in the Habitats Directive

- Old sessile oak woods with *Ilex* and *Blechnum* in British Isles
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- *Salicorni*a and other annuals colonizing mud and sand
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Mediterranean salt meadows (*Juncetalia maritimi*)
- European dry heaths
- Petrifying springs with tufa formation (*Cratoneurion*)
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
- Spartina swards (*Spartinion maritimae*)
- Mudflats and sandflats not covered by seawater at low tide
- Estuaries

The site is listed for 12 Annex II species

- *Petromyzon marinus*
- *Lampetra planeri*
- *Lampetra fluviatilis*
- *Alosa fallax*
- *Salmo salar*
- *Alosa alosa*
- *Lutra lutra*
- *Austropotamobius pallipes*
- *Margaritifera margaritifera*
- *Margaritifera durrovensis*
- *Vertigo moulinsiana*
- *Trichomanes speciosum*

The site is of ornithological importance for a number of EU Birds Directive Annex I species

- Greenland white-fronted goose
- Whooper Swan
- Bewick's swan
- Bar-tailed godwit
- Peregrine falcon
- Kingfisher

Mud and sand flat and estuarine habitats were surveyed in 2008. Biotope maps were produced separately for each (ASU, 2008; ARMS 2008) (Figure 2, Figure 3).

The area range, structure and functioning of the qualifying pysiographic habitats should be maintained in the long term compared to the baseline reference condition established in 2008.

The populations of Annex species and their essential habitat should be maintained. Activities should not cause a change in range, distribution or population structure which would result in unfavourable conditions for the future conservation interests of species.

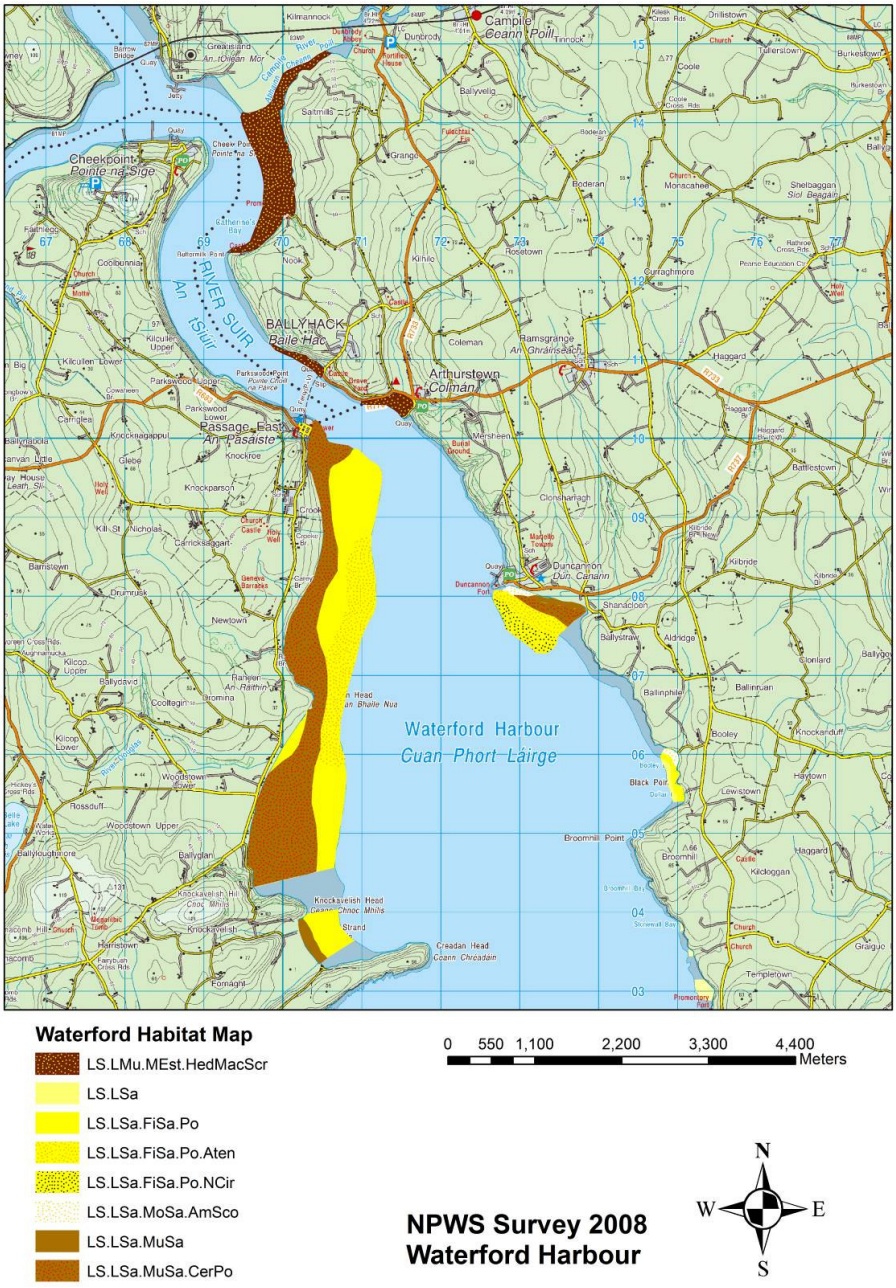

Figure 2. Distribution of inter-tidal biotopes in Waterford Estuary in 2008 (ASU 2008)

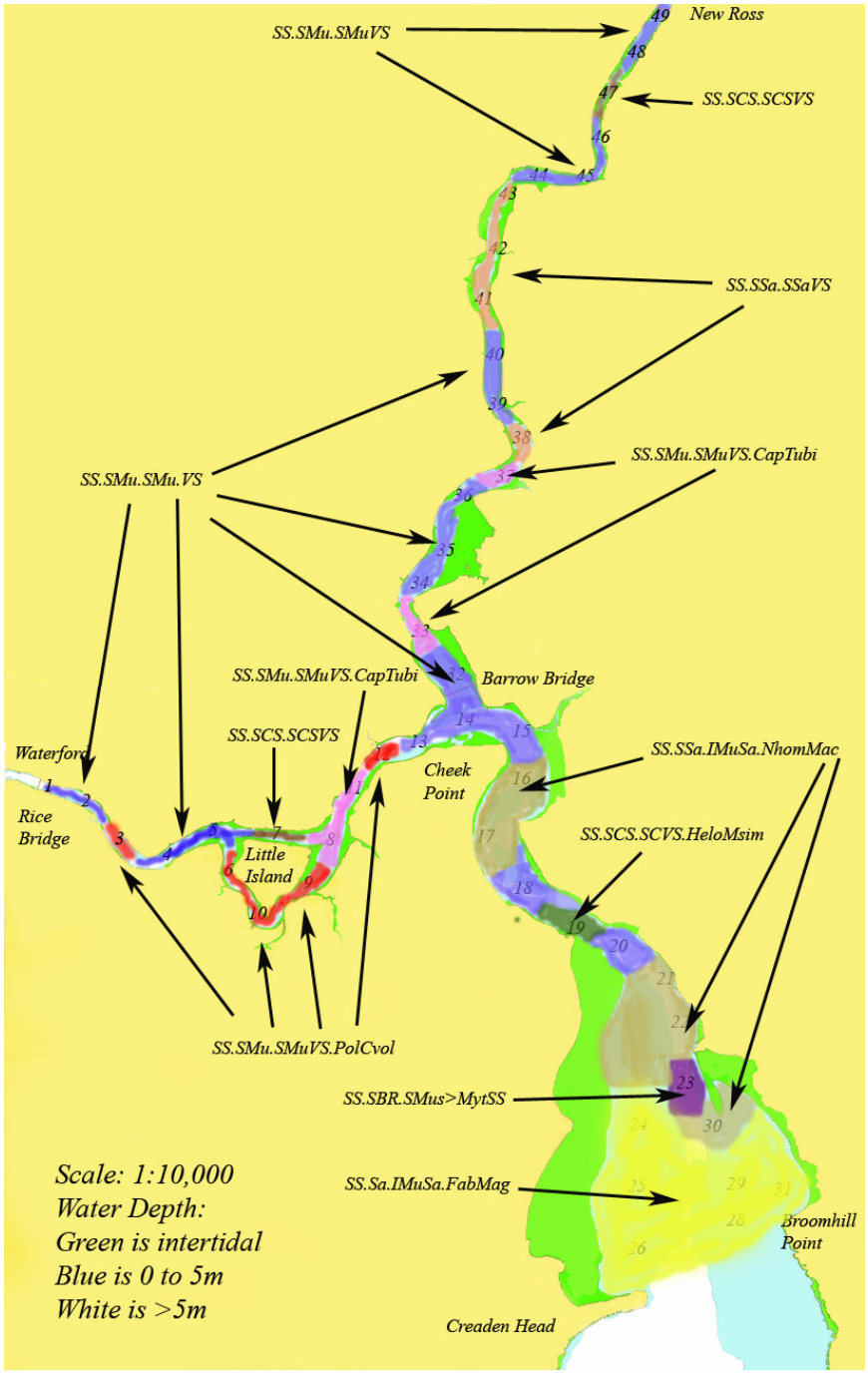

Figure 3. Distribution of sub-tidal biotopes in Waterford estuary SAC in 2008 (ARMS 2008)

4. Record the potential ecological effects of the proposed operation/activity

The potential generic ecological effects on the qualifying interests of the site relate to the physical and biological effects of box dredging on the sub-tidal invertebrate communities and biotopes (Table 1).

Table 1 Potential indicative effects of clam fishing on the conservation objectives and interests in Waterford Estuary

Main effect	**Mechanism**	**Clam dredging**
Habitat change	suspension of fine particles	
	redistribution of fine particles	
	changes in grain size distribution	
	changes in organic content	
	change in turbidity	
	localised disruption	
	compaction	
Biotope change	selective removal of species	
	Mortality of non-target species	
	smothering	
	dessication	
	abrasion/physical damage	
	disruption of functioning	
	displacement of species	

5. Initial examination of impacts (ecological effects)

Initial examination of the potential ecological effects is based on spatial overlap only as outlined in the Regulation 31 Guidance document (Anon 2009).

Do the potential ecological effects, identified in Step 4, of the proposed operation/activity, or its likely impact footprint, on its own or in combination with other operations/activities spatially overlap with:

a) The special conservation interests or their habitats in the Special Protection Area

No. The populations of Birds Directive Annex I species at the site are not sea birds and do not significantly use the habitat in the area of the proposed activity.

The likelihood of significant effect on those interests can therefore be excluded.

b) any highly sensitive and/or rarely recorded species or communities in Special Areas of Conservation (Regulation 31 Guidance Table 2)?

No. Communities/Species in Table 2 of the Regulation 31 Guidance are not listed for Waterford Estuary.

c) Annex I qualifying interests or the principal constituent communities of physiographic Annex I marine habitats in Special Areas of Conservation (Regulation 31 Guidance Table 1)?

Yes. In the case of Estuaries although the proposed fishery does not overlap with the SAC the footprint of the fishery, through sediment mobilisation and transport, could possibly overlap with the estuarine biotopes on the southern part of the SAC.

Further assessment of this possibility is required.

No. On the basis that clam fishing is restricted to the areas outlined in (Figure 1) it can be assumed that there is no spatial overlap with the following qualifying interests and their constituent fauna and flora as outlined above

- Old sessile oak woods with *Ilex* and *Blechnum* in British Isles
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
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- Spartina swards (*Spartinion maritimae*)
- Mudflats and sandflats not covered by seawater at low tide

The likelihood of significant effect on those interests can therefore be excluded.

d) Annex II qualifying interests or their habitats in Special Areas of Conservation?

Yes. The proposed fishery may overlap with populations of some Annex II species if these populations migrate or move outside of the boundaries of the site. Further assessment of this overlap is required

- *Petromyzon marinus*
- *Lampetra planeri*
- *Lampetra fluviatilis*
- *Alosa fallax*
- *Salmo salar*
- *Alosa alosa*

No. The proposed fishery does not overlap with the following species and the likelihood of significant effect on those interests can, therefore, be excluded

- *Austropotamobius pallipes*
- *Margaritifera margaritifera*
- *Margaritifera durrovensis*
- *Vertigo moulinsiana*
- *Trichomanes speciosum*

e) Otter, Leatherback Turtles or Cetacea (Annex IV species) including their resting, feeding, breeding, or migration routes?

Yes. Dolphin, porpoise, sei whale, humpback whale and other unidentified species of whale have been observed south of the SAC in the area where the fishery is proposed.

Further assessment of the impact of the fishery on cetaceans is required

No. Otter distribution and habitat does not overlap with the proposed fishery and the likelihood of significant effect can be excluded

6. Assessment of likelihood of significance of ecological effects

The likelihood of significant effects of clam fishing on the Special Conservation Objectives of the SAC

Estuaries

The nearest straight line distance from the northern limit of the proposed fishery to the southern boundary of the SAC is 1.5km. The biotope at the southern end of the SAC is JNCC level 5 community SS.SSa.IMuSa.FfabMag or *Fabulina fabula* and *Magelona mirabilis* with venerid bivalves and amphipods in infralittoral compacted fine muddy sand. Substrates in the area of the proposed fishery are coarse sand, gravel and shell. Surf clam is only found in these coarse substrates (*Spisula* sands). The distribution of *Spisula* in the area is limited by the presence of these substrates.

Coarse substrates in the clam bed will be disturbed by dredging. This disturbed material is unlikely to be transported 1.5km to the southern edge of the SAC and into the fine muddy sand community. There is no evidence that this occurred during previous fisheries for clams in this area in the period 2000-2007. The biotopes in the SAC were mapped in 2008. The opposite effects may occur. Fahey *et al*. (2003) report that fine material disturbed by earthworks upstream were transported to the clam bed and lead to a shift in the distribution of the bed to shallower waters (Figure 1)

The likelihood of significant effects of clam fishing south of the SAC on estuarine biotopes in the SAC can reasonably be excluded

Annex II species: Petromyzon marinus, Lampetra planeri, Lampetra fluviatilis, Alosa fallax, Alosa alosa, Salmo salar

Petromyzon marinus, *Lampetra planeri*, *Lampetra fluviatilis (Lamprey)*
There are no specific data on populations of Sea Lamprey or River Lamprey in Waterford estuary. However, clam fishing activities are unlikely to have any impact on these populations. These species are parasitic on fish and are, therefore, directly impacted by the status of such fish populations in freshwater and estuarine systems. Clam fishing poses no risk to freshwater or marine fish populations.

The likelihood of significant impacts of clam fishing on Lamprey can reasonably be excluded.

Alosa fallax, *Alosa alosa (Shad)*

Shad spend most of their lives at sea but migrate into estuaries to breed. The Barrown-Nore-Suir River system is known to hold spawning populations of these species. Water quality downstream of these spawning areas is considered to constitute good nursery habitat. No negative trends in the range or distribution of these species appears to have occurred since 1994, at least, although breeding of twaite Shad (*A. fallax*) is considered irregular and their populations status may therefore be poor (King and Roche, in press).

The main pressures on Shad populations are professional fishing, drift net fishing, leisure fishing, water pollution, modification of hydrographic functioning and genetic pollution (NPWS 2008).

The likelihood of significant impacts of clam fishing on Shad can reasonably be excluded

Salmo salar(Salmon)
The numbers of adult salmon returning to the River Nore increased to over 20000 in 2007 compared to less than 5000 in 2006. Conservation limits, to allow optimum levels of spawning, were achieved in the period 2007-2009.

The main threats to salmon populations are over exploitation and deterioration in river water quality and destruction of freshwater habitat.

The likelihood of significant impacts of clam fishing on Salmon can reasonably be excluded

Cetacea
Various species of Cetacea have been sighted in the Waterford estuary (Table 2). Species include harbour porpoise, common dolphin, bottlenose dolphin, fin whale, humpback whale, minke whale and possibly other species of large whale.

Threats to whales and dolphins from fishing include direct capture in fishing gear such as drift nets, pelagic trawls and to a lesser extent bottom trawls. Cetaceans also interact with line and lure fisheries and with trawl fisheries where there are feeding opportunities. Intensive fishing may cause disturbance to cetaceans and their use of local habitat.

The clam fishery will cover a maximum area of 1.8km^2 and involve a small number of dredging vessels under 12m in length fishing for 6 hours per day for a maximum of 5 days per week or 17% of the potential habitat use time by cetaceans and in less than 10% of the area of the Estuary. There is no threat of direct capture or any likelihood of feeding interactions around the vessels which are fishing only for clams.

The likelihood of significant impacts of clam fishing on Cetacea can reasonably be excluded.

Table 2. Record of cetacean sightings at Waterford Harbour. All records are validated and available on www.iwdg.ie

Date of sighting	Species	Number of individuals
13-Oct-92	minke whale	1
15-Oct-99	common dolphin	1
03-Nov-99	common dolphin	1
24-Aug-03	large whale species	1
11-Nov-03	sei, fin or blue whale	1
19-Nov-03	sei, fin or blue whale	2
23-Nov-03	fin whale	2
27-Dec-03	sei, fin or blue whale	4
28-Dec-03	fin whale	4
29-Dec-03	common dolphin	40
20-Jan-04	large whale species	1
10-Feb-04	fin whale	1
02-May-04	common dolphin	12
19-Jan-06	common dolphin	25
31-Jul-07	humpback whale	1
02-Aug-07	bottlenose dolphin	11
07-Oct-07	bottlenose dolphin	6
28-Apr-08	harbour porpoise	2
10-Dec-08	large whale species	1
	Total individuals	**117**

Impact of clam fishing on the conservation status of the SAC: Conclusions

Impact significance	Rationale	Uncertainty	Recommendation
None	▪ No spatial overlap of activity and qualifying interests ▪ Impact on Annex species in the area is not expected due to nature and scale of the activity	Low. The activity is sufficiently remote from the site.	

7. References

Anon (2009). Regulation 31 Guidance for the ecological assessment of aquaculture and fisheries. Marine Institute and National Parks and Wildlife Service.

ASU (2009). A survey of mudflats and sandflats in Ireland: An intertidal soft sediment survey of Castlemaine Harbour. A report to the NPWS, 23pp.

ARMS (2009). Benthic Biotope classification of subtidal sedimentary habitats in the Lower River Suir candidate Special Area of Conservation and the River Nore and River Barrow candidate Special Area of Conservation (July 2008). A report to the NPWS, 33pp.

King, J.J. and Roche W.K. (in press). Aspects of anadromous Allis shad (*Alosa alosa* L.) and Twaite shad (*Alosa fallax* Lacepede) biology in four Irish special areas of conservation (SAC): status, spawning indications and implications for conservation designation. *Hydrobiologia*.

NPWS (2008). Allis shad (*Alosa alosa*) (1102) Conservation Status Assessment Report.