

**Marine Stewardship Council (MSC) Reduced Re-  
Assessment Public Certification Report**

**Dee Cockle Fishery**

**On behalf of  
Cyfoeth Naturiol Cymru/Natural Resources Wales**

**Prepared by ME Certification Ltd**

**JULY 2017**

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## Glossary

Acronym	Definition
BFM	Bird Food Model
CAB	Conformity Assessment Body
DEFRA	Department for Environment Food and Rural Affairs
EC	European Commissions
EA	Environment Agency
ETP	Endangered, Threatened, Protected Species
FCS	Favourable Conservation Status
HRA	Habitats Regulation Assessment
MSC	Marine Stewardship Council
MEC	ME Certification Ltd
MLS	Minimum Legal Size
NRW	Natural Resources Wales
SPA	Special Protection Area
SAC	Special Area of Conservation
SSSI	Site of Special Scientific Interest
TAC	Total Allowable Catch

# 1. Authorship and Peer Reviewers

The assessment team for this reduced re-assessment consisted of:

**Dr Jo Gascoigne:** Dr Joanna Gascoigne acted as team leader with overall responsibility for this re-assessment. Additionally, she had responsibility primarily for the assessment of Principle 1 and 3. Jo is a former research lecturer in marine biology at Bangor University, Wales and a shellfisheries expert, with over 25 years' experience working in the fisheries sector. She is a specific expert in bivalves and has a PhD from the Virginia Institute of Marine Science in the USA, which was completed on the Allee effects of the queen conch, *Strombus gigas*. Between 2003 and 2007 Jo completed postdoctoral research looking at the Menai strait mussel. This work considered all areas mussel culture and specifically looked at the carrying capacity of the system for shellfish culture and effects on stock and reproduction relating to fishing effort. Jo's work also involved detailed study of the management and policies used in the fishery and its implications. Dr Gascoigne meets the 5-year competency requirement for P1 and P3 experience.

**Dr Matthew Doggett:** Dr Matthew Doggett has a PhD in marine ecology with 10 years' experience in understanding the interactions of marine species in both temperate and tropical environments. Matt has worked specifically in the coastal environment (including the intertidal) where he has led trawl surveys, mammal observations, habitat surveys, intertidal sampling and benthic studies for environmental impact assessments and research for coastal industries. He is an expert in ecosystem interactions and the effects on anthropogenic inputs upon those interactions. Dr Doggett was primarily responsible for the Principle 2 scoring in this fishery.

**Dr Hugh Jones:** Dr Hugh Jones has a PhD in ecotoxicology and a strong background in marine research including publications and reports on ecotoxicology, environmental risk assessments and fisheries research. Prior to joining MEC he was employed as a fisheries scientist in the development of an empirical harvest strategy for commercial abalone fisheries and fisheries assessments of estuarine bivalves. This included work on population metrics (recruitment, growth), harvest dynamics (catch rates, market selectivity), and the use of fine scale geospatial techniques as performance measures to assess stock sustainability. Hugh contributed to the Principal 1 and 2 aspects of the assessment.

The peer reviewer for this assessment was:

## **Dr Robert Blyth-Skyrme**

Dr Blyth-Skyrme started his professional career in finfish mariculture in 1996, before switching to a focus on the science, management and policy of wild fisheries. Following his PhD, which considered biological and socio-economic aspects of an inshore shellfish fishery, he worked as the Senior Environment Officer and then Deputy Chief Fishery Officer at the Eastern Sea Fisheries Joint Committee, the largest regional fisheries management organization in England. Rob then became Natural England's senior advisor to the UK Government on marine fisheries and environmental issues, leading a team dealing with fisheries policy, science and nationally significant fisheries casework. Since the end of 2008, Rob has run Ichthys Marine Ecological Consulting Ltd., a consultancy providing marine fisheries and environmental advice to a variety of governmental and industry clients.

Rob has undertaken all facets of MSC work as a Lead Assessor, expert team member and peer reviewer, across varied fisheries including those for Alaska pollock, Pacific cod, Atlantic cod, Pacific salmon, albacore tuna, yellowtail flounder, Arctic surfclam, American lobster, pink shrimp, Japanese scallop, sea scallop and blue mussels.

The RBF was not used in this reassessment.

## 2 Changes since Initial Assessment

### 2.1 Overview

MEC confirms that the fishery under assessment is within the scope of the MSC Fisheries Standard (FCR 7.4 of the MSC Certification Requirements v2.0):

- The target species is not an amphibian, reptile, bird or mammal;
- The fishery does not use poisons or explosives;
- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- The client or client group does not include an entity that has been successfully prosecuted for a forced labour violation in the last 2 years;
- The fishery has in place a mechanism for resolving disputes, and disputes do not overwhelm the fishery;
- The fishery is not an enhanced fishery as per the MSC FCR 7.4.3.
- The fishery is not an introduced species-based fishery as per the MSC FCR 7.4.4.

### 2.2 Unit of Assessment

There are no changes to the Unit of Assessment (UoA) since the initial assessment.

The UoC and UoA are the same in this assessment as there are no other eligible fishers.

**Table 1. Unit of Assessment**

<b>Species</b>	Cockle ( <i>Cerastoderma edule</i> )
<b>Geographical range</b>	FAO statistical area 27
<b>Stock</b>	Dee Estuary, UK
<b>Method of Capture</b>	Hand-Raking
<b>Management Systems</b>	National legislation (Natural Resources Wales, Environment Agency (England), Dee Estuary Sea Fishery Liaison Group, DEFRA and Welsh Government).
<b>Client Group</b>	Licensed fishers for hand raking of cockle ( <i>Cerastoderma edule</i> ) within the Dee Estuary.
<b>Other eligible fishers</b>	None

## 2.3 Criteria for reduced re-assessment

This fishery meets the criteria for reduced re-assessment as set out in FCR 7.24.6 on the basis that:

- The fishery was covered under a previous certification (certificate code: MEC-F-033).
- The fishery was certified with no conditions and therefore meets the criteria of having no conditions remaining after the 3<sup>rd</sup> surveillance audit.
- No stakeholder comments were received in relation to the fishery under the old certification therefore this fishery meets the standard of addressing all stakeholder by the 3<sup>rd</sup> surveillance audit by default.

## 2.4 Harmonisation

There is no harmonisation requirement between this and any other MSC fishery.

## 2.5 TAC and Catch Data

**Table 2. TAC and Catch Data \* Following September resurvey in 2016 NRW agreed with DESFLG to allow the daily catch limit to be extended to 1800 tonnes. \*\*year to date data as of 29/11/2016.**

	Year	Tonnes
<b>TAC</b>	2016	1200
	2015	600
	2014	2000
<b>UoA share of TAC</b>	2016	1200
	2015	600
	2014	2000
<b>UoC share of total TAC</b>	2016	1200*
	2015	600
	2014	2000
<b>Total green weight catch by UoC</b>	2016	1324**
	2015	248
	2014	1565

## 2.6 Specific Changes since Initial Assessment

### 2.6.1 Overall

Overall, the fishery has remained as it was when first assessed five years ago (Hough & Holt 2012). Changes and updates specific to the scoring of Performance Indicators are detailed for Principles 1 to 3 below.

Management operation: There have been no major changes to legislation or to the management system since the last surveillance audit, and the management operates broadly according to the management plan in operation when the fishery was certified (SFEW 2008; Hough & Holt 2012).

Species types: No change.

Fishing practices: No change.

Legal / administrative status: No changes.

Involvement of other entities: No changes.

Harmonisation: No changes.

## 2.7 Principle 1

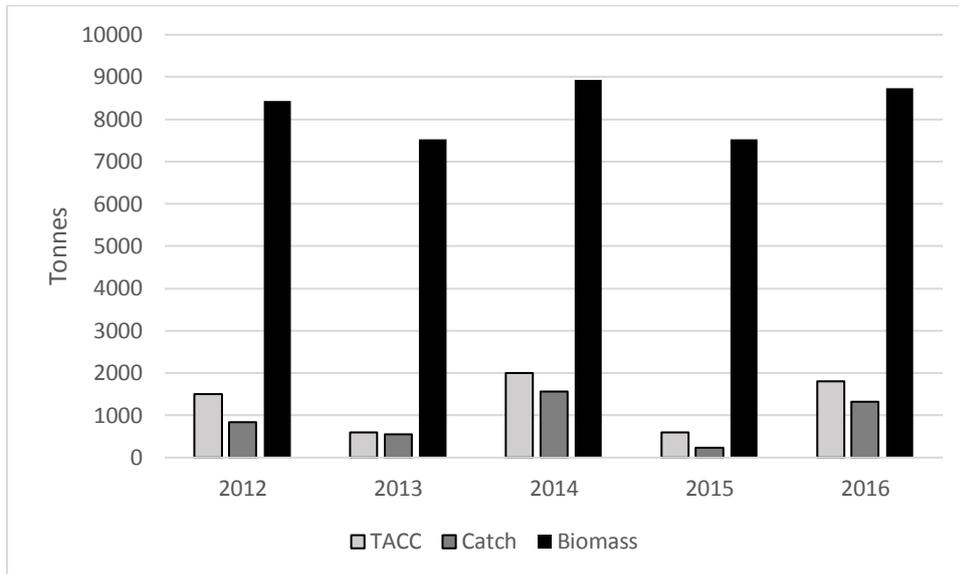
There have been no significant changes to the survey timing, or to the model used to evaluate the TAC since the first assessment (Hough & Holt 2012). The spatial extent of the cockle fishery beds along with the density and abundance of cockles within the fishery continue to be closely monitored by Natural Resources Wales (NRW) using methods (West 2003) which allow application of the Stillman bird food model (BFM) developed specifically for allocation of TAC in cockle fisheries (Stillman 2013; Jones 2015).

The Bird Food Model (BFM) for the Dee Estuary can be summarised as follows

- A bird food requirement is estimated for the estuary using an individual-based model (Stillman 2013); it utilises the mean peak number of birds (overwintering in this case) multiplied by their physiological requirements and a factor which scales this to their 'ecological requirements' (ER) (since not all food is available) to estimate the number of cockles required to maintain this population over winter. For the Dee Estuary an ER of 2.5 is applied which incorporates tolerances for mortality and reproduction (Jones 2015). For the Dee Estuary, the mean peak number of birds is the 5-year mean population of oystercatchers (*Haematopus ostralegus*) ( $n = 16,813$ ). The Special Protection Area (SPA) Conservation Objective which is for a peak mean population of oystercatchers of  $n = 22,667$  is anticipated to be reached at some point over each winter provided that sufficient food is available for the mean peak number of birds (Jones 2015). The current model is precautionary, in that it assumes that all the food requirements need to be met by cockles, whereas in practice it is known that oystercatchers also eat other species; also it is based on peak mean oystercatcher numbers rather than mean numbers over the season.
- An annual spring survey of cockle abundance and density by size class is carried out in April/May, and the model applies a fixed percentage of mortality for each age class (based on prior experience) and the ER for birds in order to come up with a figure for the initial TAC, which will be applied at the start of the fishing season (1<sup>st</sup> July).
- The Dee Estuary has been known to suffer summer cockle mortality, and therefore there is an additional survey in September which is used to estimate rates of summer mortality; based on which the TAC can be adjusted if necessary (either up or down).

TAC calculations estimated through the Stillman bird food model have suggested sufficient cockle biomass was available to allow the fishery to open each year between 2012 - 2016. The available TAC per annum has varied considerably (Figure 1Table 2) and this is likely a result of variation in inter-annual spat settlement success, a common trait in this species (Tyler-Walters 2007) and of bivalve species in general. Cockles are highly fecund and capable of producing large spat populations from low adult numbers arising from both natural (mass-mortality) and fishery mortality events (Southall & Tully 2014; Malham et al. 2012), meaning that estimations of stock size at the point where recruitment would be impaired (PRI) are likely

very low. More likely the limiting factor in settlement success are the conditions at time of recruitment and within the first few months after settlement (Tyler-Walters 2007). These can significantly impact survival rates and stock size irrespective of fishing mortality rates.



**Figure 1. TAC, annual catch and biomass estimate of commercial fishing from the Dee Estuary UK between 2012 and 2016. Note: 2016 catch is year-to-date as of 29/11/16. 2016 TAC was initially set at 1200 t - a conservative estimate given that the bird model estimated >1800 t available biomass for 2016. Following September resurveys NRW agreed with DESFLG to allow the daily catch limit to run until further notice up to the 1700 t limit (R. Prichard (NRW) pers. Comm).**

Prior to the start of each fishing season a Habitats Regulations Assessment (HRA) is carried out to determine the effects of the cockle licence conditions (notably the TAC) on the relevant features of the European Site (primarily oystercatchers, but also habitat designations) (NRW 2016d). The model is used to predict a baseline-mortality without fishing and tests fishing mortality to the end of the fishing year based on daily catch limits and whether this significantly impacts bird condition. Depending on stock levels and the presence of any other significant effects, the duration of fishing and/or the daily catch can be adjusted until no significant effect is predicted to occur. The critical test is to assess how any variation in cockle mortality could have a significant adverse effect on the oystercatcher population of the Dee Estuary. Once the model and annual TAC has been verified the NRW consult with the Dee Estuary Sea Fishery Liaison Group (DESFLG) over the specifics of a daily catch limit which acts as a harvest rate control tool to ensure the TAC is spread evenly across the fishing season and that annual catches are ≤ the TAC.

In 2015, the NRW moved to a bag TAC method for reporting of catch using bespoke bag sizes built to hold the daily catch limit. The bags are tailored according to daily TAC limits each year (2015 = 300 kg, 2016 = 500 kg) (Figure 2). Fishers are issued with four bags at the start of the fishing year and must use these in association with registration document at first point of sale (Figure 3). Use of the bag TAC instead of timely and costly direct weight TAC measurements reduces the ability of fishers to over-catch daily catch limits where daily enforcement is not always practical (NRW 2015). Introduction of the bag TAC reduces uncertainty in the exploitation rate of cockles per day, allows NRW staff to more easily monitor non-compliance and reduces the likelihood of annual catches exceeding the agreed TAC.



Figure 2: Custom made daily catch limit bags used for maintaining exploitation at regulated level. Example shown is a 500 kg bag for 2016 fishing season (R. Prichard (NRW) pers. Comm at site visit).

	08253		
<p><b>LIVE BIVALVE MOLLUSCS / LIVE SHELLFISH REGISTRATION DOCUMENT / COCKLE RETURN</b></p> <p>(Regulation (EC) No. 853/2004 – Article 7 / Annex III, Section VII, Chapter I) (Dee Estuary Cockle Fishery Order 2008)</p>			
NAME OF GATHERER		LICENCE NO	
ADDRESS OF GATHERER			
		POSTCODE	
BUYER DETAILS		DESTINATION	
		SIGNATURE OF BUYER/AGENT	
DATE OF GATHERING		TOTAL LIVE WEIGHT	
			Kgs
AREA OR BED HARVESTED		BED CLASSIFICATION (PLEASE CIRCLE) A, B OR C	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px dashed black; padding: 2px;">A</div> <div style="border: 1px dashed black; padding: 2px;">B</div> <div style="border: 1px dashed black; padding: 2px;">C</div> </div>
FOOD AUTHORITY WHERE SHELLFISH LANDED (PLEASE CIRCLE)		<div style="display: flex; justify-content: space-around;"> <div style="border: 1px dashed black; padding: 2px;">Flintshire</div> <div style="border: 1px dashed black; padding: 2px;">Wirral</div> </div>	
I CONFIRM THAT THIS IS A TRUE AND ACCURATE RECORD OF MY COCKLE LANDINGS FOR THE DATES SPECIFIED.		SIGNATURE OF GATHERER	
<p><small>WHITE COPY – to accompany the cockles to destination. YELLOW COPY – to be posted in Environment Agency mailbox at the end of each day. Failure to provide a daily return (including a nil return) will result in suspension from the fishery until a return is provided. PINK COPY – to be retained by the licence holder.</small></p> <p><small>REMINDER – This document is to be kept by the person receiving the shellfish for a period of not less than 12 months and the gatherer is to keep a copy for the same period.</small></p>			

Figure 3. Example registration document of cockle return information for the Dee Estuary. Documents are produced in triplicate (see text on document for further information).

Despite peer review in scientific journals the bird-food model is currently under review for cockle fisheries across the whole of England and Wales, with consultant inputs provided by R. Stillman, J. Goss-Custard, and with NRW, Natural England and the RSPB all involved in the process. The objective of the review is to update the model to take into account the most recent scientific information. The review is at an early stage currently, but the eventual plan is to have a base model which is then adjusted according to local conditions observed during the winter at each site. The key points under consideration for this review are reported to be the following (Rowland Sharp, NRW, pers. comm.):

- Bird diet: the species mixture in the diet at different life stages, with different availabilities and under different environmental conditions (rather than assuming that all oystercatchers eat cockles all the time);
- Environmental conditions: temperature affects the energetic requirements, also the species mix in the diet (e.g. worms come to the surface during milder periods); prolonged periods of frozen ground also have an impact on the ability to feed (although this is rare in west Wales);
- Movement of birds between adjacent sites (rather than management in isolation);
- Patchiness: if cockles are very patchily distributed, there is strong competition and the less dominant birds lose out.

## 2.8 Principle 2

As described by (Hough & Holt 2012) “*The Dee Estuary is a tidal mixed estuary located on the English-Welsh border (North East Wales and Cheshire). It is characterised by wide sandflats and mudflats with extensive areas of saltmarsh predominantly on the English shore. The estuary supports a typical coastal-estuarine invertebrate infauna (including the significant cockle populations).*”

Specific changes and information updates to Principle 2 are considered in this section. Principle 2 assesses the following interactions of the fishery with species, habitats and the ecosystem of the Dee Estuary, specifically:

- primary species;
- secondary species;
- ETP species;
- habitats; and
- ecosystems.

Any changes in the activities / operational areas of the fishery with respect to the Principle 2 topics since the initial assessment are addressed below as well as additional considerations not addressed in the original assessment.

### 2.8.1 Primary species

Primary species are non-target species managed by stock assessments and associated reference points, which usually have commercial value to the UoA.

The fishery continues as a hand-raked operation with cockles sieved and bagged also by hand. The Management Plan and Licence Conditions (renewed annually) determine hand-

gathering as the only method of collection permitted, although a 'jumbo' (adhering to specified dimensions) may be used to agitate the sand and bring cockles to the surface. Given the Management Plan and gathering practices in place, each fisher's catch is essentially 100% cockle and there continues to be no primary species associated with the fishing practices of this UoA which require consideration within Principle 2 of the MSC assessment.

### 2.8.2 Secondary species

Secondary species as species in the catch that are within scope of the MSC program but are not covered under P1 because they are not included in the Unit of Assessment are not considered 'primary' within the MSC definitions or are species that are out of scope of the program, but where the definition of ETP species is not applicable. They may be landed for bait or for other uses or represent incidental by-catch.

As stated above for the primary species, the landed catch remains 100% cockle and no main secondary species have been reported by fishers, within scientific surveys or by fishery inspections.

Aside from the cockles, during the hand-raking process several other infaunal species are disturbed from the top few centimetres of the sediment. The original PCR (Hough & Holt 2012) provides evidence (Kaiser et al. 2001) specific to the Dee Estuary on the rapid recovery (within one year) of other sand-dwelling taxa disturbed by the collection and sorting processes. Typically these taxa included small crustaceans (*Corophium* spp.), molluscs (*Hydrobia* spp.) and annelid worms (*Nephtys* spp.). Gillham (1978) provides additional historical data on infaunal intertidal species likely to be physically disturbed. Many of the species cited as being most abundant by Kaiser & Hall (2001) are listed in Gillham (1978) suggesting little overall change since the 1970s.

Further to the studies above, NRW and the Environment Agency conduct a monitoring programme under their commitments to the European Water Framework Directive (WFD). This programme includes intertidal core sampling which provides data on the benthic infaunal communities. Therefore, if new species should appear in the cockle beds that were at risk from the fishery, they would likely be detected at an early stage.

The total area of the Dee Estuary SAC is ~15,805 ha (JNCC 2016a). Approximately 10,656 ha fall below the level of mean high water spring (MHWS) tides with 90% of this area exposed on a low spring tide (NE/CCW 2010). The intertidal sediments (approximately 50% sand, 40% muddy sand, 10% mud) exploited by the cockle fishery at the time of certification totalled 530 ha (Hough & Holt 2012). The exact area of the cockle beds varies from year to year as stocks show natural variations in abundance and spatial occurrence and some new beds may be added from year to year. Annual stock surveys record these areas with recent estimates being 617 ha in 2015 and 638 ha in 2016. Despite this variation, the cockle beds comprise <6% of the estuarine area below MHWS, leaving extensive areas of habitat for infaunal minor secondary species away from the fishery.

### 2.8.3 Endangered, Threatened and Protected Species

The Dee Estuary/Aber Dyfrdwy Special Area of Conservation (designated under the Habitats Directive) also qualifies as an SAC for the following Annex II fish species (as listed in the EC Habitats Directive (92/43/EEC)):

- *Lampetra fluviatilis* (river lamprey)
- *Petromyzon marinus* (sea lamprey)

It is considered highly unlikely that the fishery will have any direct or indirect interaction with these two fish species as intertidal areas only are exploited and there is no impact on the food sources of the two lamprey species.

Although not specifically listed as a qualifying species for the Dee Estuary SAC, the Regulation 33 Advice for the site (NE/CCW 2010) states that, “Grey seals are a feature of the Pen Llyn a’r Sarnau SAC and reference should be made to the Regulation 33 advice for this site with respect to the grey seal population within the Dee Estuary European marine site.” This approach is owing to the highly mobile nature of the species meaning a proportion of individuals in the Dee Estuary are likely to originate from the Pen Llyn a’r Sarnau SAC.

The cockle fishery is not considered to have any direct or indirect interactions with the grey seal population in the Dee Estuary. There is no competition for food or space and disturbances of the seals by the fishery have not been reported. The seals are known to haul out on and around West Hoyle sandbank adjacent to Hilbre Island at the estuary mouth and away from cockle fishing areas (Westcott 2004). A long-term increase in the number of grey seals since the 1950s (when a maximum number of 117 was recorded) was acknowledged in 2004 by the then Countryside Council Wales (CCW) (Westcott 2004). Calibrated counts by CCW in 2003 recorded a maximum number of 330 grey seals hauled out in the estuary whilst opportunistic counts in 2002 from the Hilbre Bird Observatory recorded a maximum number of 518 in May 2002 (Westcott 2004). More recent data suggest this increase is continuing, with the most recent data available at the time of writing yielding a maximum count of 825 individuals in June 2010 (Burnett 2010).

The Dee Estuary SPA qualifies under Article 4.1 of the EU Birds Directive (2009/147/EC). The estuary supports internationally important populations of regularly occurring Annex I species including:

- Sandwich tern *Sterna sandvicensis*
- Little tern *Sterna albifrons*
- Common tern *Sterna hirundo*
- Bar-tailed godwit *Limosa lapponica*

The estuary also qualifies under Article 4.2 of the EC Birds Directive (2009/147/EC) in that it supports internationally important populations of regularly occurring migratory species including:

- Redshank *Tringa totanus*
- Shelduck *Tadorna tadorna*
- Teal *Anas crecca*
- Pintail *Anas acuta*
- Oystercatcher *Haematopus ostralegus*
- Grey Plover *Pluvialis squatarola*
- Knot *Calidris canutus islandica*
- Dunlin *Calidris alpina*
- Black-tailed godwit *Limosa limosa islandica*
- Curlew *Numenius arquata*

- An internationally important assemblage of waterbirds

Notable in relation to the cockle fishery are the oystercatcher, knot and black-tailed godwit which all exploit cockles of varying sizes.

Allocation of sufficient cockles as a food resource for over-wintering oystercatchers is the principle reason for the use of the Stillman birds model of TAC allocation (JNCC 2016b; Stillman 2013; Norris & Johnstone 1998). The conservation objective for oystercatchers to achieve 'favourable conservation status' is the 5-year peak mean population ( $n = 22,667$ ) on the site at the time of designation (1995-99); the overall 5-year mean from the same period ( $n = 16,813$ ) is the base value used to assess TAC availability within the birds model as explained in section 2.7. The 5-year peak mean bird population figures for oystercatchers derived from monthly Wetland Bird Surveys (WeBS) in the Dee Estuary show that the population has been in favourable conservation status (FCS) since 2012 with minor fluctuations prior to that date (Jones 2015; Frost et al. 2016).

A review of WeBS data (Frost et al. 2016) for the Dee Estuary lists two other bird species present in significant numbers and which exploit cockles as a food source. Black-tailed godwit and knot are part of the overwinter bird population and assemblage qualification for wetlands of international importance (Article 4 of the EC Birds Directive).

Black-tailed godwits spend most the non-breeding season in estuarine environments feeding on benthic invertebrates which can include bivalves (e.g. cockles, *Scrobicularia plana*, *Macoma balthica*, *Mya arenaria*) and polychaete worms (e.g. *Nereis diversicolor*) and molluscs (e.g. *Hydrobia* spp.) (Moreira 1994; Gill 2001). Despite the black-tailed godwit having the potential to feed on estuarine bivalves of similar size to the commercial fishery, observations have been made of the godwits trying unsuccessfully to ingest *S. plana* >20 mm with the majority of those taken being ~14 mm in length (Moreira 1994); it is therefore unlikely they will exploit a large proportion, if any, of the commercial cockle harvest in the Dee Estuary. Furthermore, many of the sightings have recorded the flocks of black-tailed godwits throughout the entire range of the estuary from Flint Sands and Heswell in the south to the outer areas of the estuary at Hoylake well beyond the commercial cockle beds, suggesting they exploit a range of food sources over the entire spatial area. At the time of SAC designation the 5-year peak mean for black-tailed godwits numbered 1,739 (1994-1999) (NE/CCW 2010) while in 2015 (latest data available) the abundance had increased and was recorded as 6,024 with a 5-year average of 5,909 (Frost et al. 2016).

Knot are also cockle feeders and had a population size of 21,556 (5-year peak mean) at the estuary at the time of SAC designation. This species feeds principally on juvenile cockles <10 mm in length and therefore is not considered to be directly or indirectly affected by commercial operations. The 5-year average of knot to 2015 has increased to 26,437. Both knot and black-tailed godwit are migratory species and unlikely to be solely dependent on the estuary for food.

As discussed above, waders such as oystercatchers are a significant feature of the site and also exploit the cockle beds as a food source. NRW works closely with organisations such as the Royal Society for the Protection of Birds (RSPB) and Natural England in managing activities within the estuary.

Impacts arising from the cockle fishery which may affect the conservation features (ETP species or habitats) include:

- removal of cockle biomass as a food resource for overwintering waders, particularly oystercatchers;
- disturbance to birds; and
- direct damage to habitat through access to beds, discards, raking, illegal fishing and removal of undersize cockle.

These potential impacts have not changed since the time of certification of the fishery. The cockle fishery Management Plan is a 'plan or project' under the Habitats Regulations. Accordingly, an annual HRA is completed (when the TAC is set) to consider if the fishery will have any adverse impact (alone or in combination with other activities) to the features of interest; this includes an assessment for all the designated bird species. The HRA considers the model outputs of the effects of fishing the TAC on oystercatcher mortality (recent iterations of which are described in section 2.7), the effects of disturbance from fishermen on the shore and the effects of sediment disturbance from hand raking and use of a jumbo. Combined effects with other activities, if relevant, are also considered (e.g. maintenance dredging for ports). Following review by Natural England, the HRA is submitted to the Welsh Government and Defra for approval prior to the fishery being opened.

Changes in fishing practice are listed as a Potentially Damaging Operation for the Dee Estuary Site of Special Scientific Interest (SSSI). Therefore, any changes in fishing practices must be granted consent from NRW for this to occur; none have occurred since the time of original certification.

The introduction of the Dee Estuary Regulating Order limits fishing for cockles to the low-impact method of hand-gathering only, limits access to a restricted number of licensed fishermen and has increased enforcement activity.

In addition, a voluntary Code of Practice has been produced for the cockle fishery. This code is reviewed on an annual basis and includes a clause that "*Wildlife must be respected; all of the seashore is legally protected by wildlife designations making it a criminal offence to harm certain animals and plants or to enter certain reserve areas. Birds' nests and eggs must not be disturbed and areas of nature reserves above the high water mark must be avoided. High and low tide roost areas for waders and wildfowl should be avoided.*"

In addition to the further consideration above given to grey seals, black-tailed godwits and knot, the only change to the management since the time of certification has been the methods by which the TAC is calculated in relation to the oystercatcher feeding requirements as described in 2.7. There have been no other significant changes in the fishery operation since the time of certification which would significantly increase any impact on ETP species.

#### **2.8.4 Habitats**

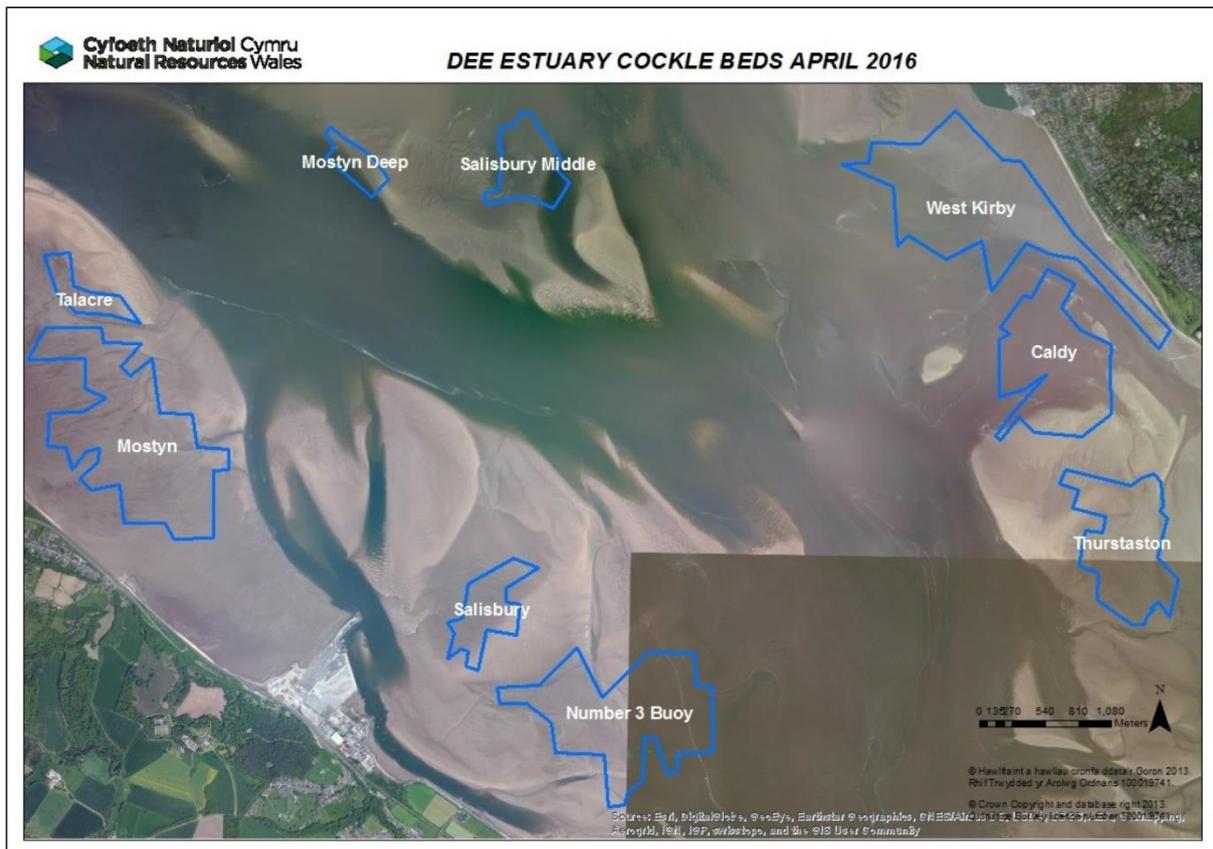
Qualifying habitat features of the Dee Estuary SAC are:

- Estuaries
- Mudflats and sandflats not covered by seawater at low tide (intertidal mudflats and sandflats)
- *Salicornia* and other annuals colonising mud and sand
- Atlantic salt meadows
- Annual vegetation of drift lines

The FCR version 2.0 requires the identification and justification of i) commonly encountered ('main') habitats, ii) vulnerable habitats ('VMEs' as defined in the FAO guidelines outlined in FCR v2.0 GSA3.13.3.2) and iii) minor habitats (being all those not included in i and ii). Since the estuarine system is largely sedimentary, the 'intertidal mudflats and sandflats' over which the fishery occurs (Figure 4) were identified as 'main' habitats. Of the remaining designated habitats within the Dee Estuary, '*Salicornia* and other annuals colonising mud and sand' and 'Atlantic salt meadows' can be defined as VMEs given their vulnerability to disturbance. However, there is no overlap of the fishery with these VME habitats. No 'minor' habitats were identified.

One definition of VMEs by the MSC includes the functional significance of a habitat for ETP species (FCR v2.0 GSA3.13.3.2). Given the reliance of over-wintering oystercatchers on the cockle beds it might be argued that the 'intertidal mudflats and sandflats' qualify as a VME in this respect. However, the communities present within these biotopes are highly representative of estuarine mudflats and sandflats in general (NE/CCW 2010) and not considered rare or vulnerable. Given that this habitat is commonly occurring and exists in a high-energy, dynamic environment subject to constant change, has been shown to recover quickly from disturbance and is characterised by short-lived, high-fecundity species it is not considered to be a VME.

Habitat impacts were considered in reference to two main activities: i) physical disturbance through fishing for cockles and ii) physical disturbance through accessing the cockle beds.



**Figure 4: Cockle beds identified in April 2016 over intertidal sediments in the Dee Estuary. Source: (NRW 2016b).**

Cockle fishing continues to occur typically over intertidal muddy sand. As outlined above under 'Secondary Species' the area of the estuarine mudflats and sandflats fished for cockles comprises only around 6% of the area falling below MHWS. The exact area covered by the beds can vary a little from year to year and is dependent on the results of the spring cockle surveys undertaken by NRW as part of the fishery Management Plan (Figure 4). These surveys provide information on the density and extent of the cockle beds allowing the annual TAC to be set and informing the HRA (described above) to determine the annual impact of the fishery on the designated habitats and species.

Kaiser et al. (2001) demonstrated that the effects of cockle collection by hand-raking on the habitats of the Dee Estuary are localised and minor with any disturbed sediments quickly redistributed by waves and currents. Impacts on infaunal communities might last up to one year following disturbance, effects on the structure and function of the habitat itself were noted to be of much shorter duration (days to weeks; (Hough & Holt 2012) pers. Obs., EAW meeting).

License conditions continue to restrict entry points to the estuary and the use of boats for access to cockle beds prevents habitat disturbance from trampling underfoot whilst the Code of Practice protects important habitats within nature reserve areas. Cockle beds are accessed at high water and the fishermen wait for the tide to fall before their boats are grounded on the sediments and hand-raking can commence.

Statutory monitoring of the SAC intertidal habitats is undertaken on a six-yearly basis by NRW and continues to provide data on habitat extent and infaunal communities in addition to monitoring undertaken to meet Water Framework Directive commitments (pers. Comm., Neil Smith and Mark Kyriacou, NRW; data available on request). The bi-annual fishery cockle surveys do not undertake any recording of additional infaunal species raked up with the cockles but if any extraordinary changes in the habitats occurred these would likely be noted during these surveys. The latest report from SAC statutory monitoring is due mid-2017, too late to be included in this report.

### **2.8.5 Ecosystem**

The ecosystem in question can be defined as that of the Dee Estuary SAC and SPA. Table SA8 of the FCR Guidance v2.0 notes that the key ecosystem features to assess are those most crucial to maintaining the integrity of its structure and function thereby ensuring that resilience and productivity are not affected. Such features include biological diversity, food web functioning, maintenance of top predator populations and the ecosystem's capacity to deliver ecosystem services, e.g. food provision or coastal defence.

As stated above, the site-specific study by Kaiser et al. (2001) demonstrated the short-term, temporary and reversible effects on intertidal benthic infauna (overall species richness and abundance) and sediments (particle size analysis) from hand-raking and the restricted spatial scale of the fishery in the context of the overall estuarine area. Data from the study are directly relevant to the wider Dee Estuary ecosystem; the resilience and rapid recovery of the benthic communities suggests an impact on the estuarine food web is unlikely as a result of the fishery's activities (Kaiser et al. 2001). The annual TAC on the cockle harvest over the small spatial footprint of the fishery and lack of significant, short-term or long-term impact on other benthic fauna ensures sufficient food resources for other top predators such as wading bird species within the estuary; the maintenance of certain populations (e.g. ETP bird species, see 2.8.3) at or above FCS provides evidence for this (Frost et al. 2016).

The rapid redistribution of disturbed sediments by waves and currents (Kaiser et al. 2001) also suggests natural forces exert a greater influence over the estuarine ecosystem than the hand-raking of cockles. Therefore ecosystem services such as coastal defence within the estuary are unlikely to be influenced by the fishery.

The low-impact methods used, in conjunction with the Management Plan, annual Appropriate Assessment, licence conditions and Code of Practice all contribute toward minimising any possible impact of the fishery on the structure and function of the Dee Estuary ecosystem. Indeed the annual Appropriate Assessment considers the integrity of the Dee Estuary European Marine Site as a whole as well as the individual ecosystem components (habitats and species) and concludes no significant impact on the Dee Estuary is likely to occur as a result of the fishery's activities under the present management regime (Smith 2016).

Information on the estuarine ecosystem is available through various monitoring programmes which provide an indication as to its overall health. WeBS data provide annual updates on the status of the bird populations whilst WFD and EU Marine Site SAC monitoring programmes provide sampling data on the intertidal and subtidal infaunal communities, sediment and water chemistry and fish populations. Presently the Dee Estuary is classified as being a heavily modified waterbody of 'moderate' ecological quality under the WFD criteria, having failed on a number of chemical parameters (dissolved inorganic nitrogen, mercury and brominated diphenylethers) as well as for harmful phytoplankton (UKGov 2015). The WFD target is for the Dee Estuary to attain Good ecological status by 2021 and various mitigation measures are in place throughout the Dee catchment to help achieve this (WFD 2015; NRW & EA 2015). None of the parameters causing failure of the chemical status are influenced by the fishery.

No changes have occurred in the fishery since the time of certification to increase the level of impact on the Dee Estuary Ecosystem.

## **2.9 Principle 3**

### **2.9.1 Legal framework**

The legal framework for the management of the fishery has not changed. The key document is the Dee Estuary Cockle Regulating Order (2008-2028), which was set up under the Sea Fisheries (Shellfish) Act 1967. When the Regulating Order was established, the Environment Agency was the grantee across both sides of the border, but since the Environment Agency (Wales) became part of Natural Resources Wales, procedures have been put in place to cooperate in management across the two organisations and jurisdictions via a 'service level agreement', which delegates the main functions of management to NRW. There is a management plan associated with the Regulating Order, which was last updated in 2015 (DEFRA 2015).

### **2.9.2 Dispute resolution**

There are no past or ongoing legal challenges to the management of the fishery since the introduction of the current management framework. There is currently a dispute ongoing in that the English licensees would prefer management on the English side to be by the IFCA (the English framework for management of inshore fisheries) rather than by NRW. Their participation in the Liaison Group has been limited until now but this is hoped to have changed in 2017. The response to this by NRW has been to try and encourage the Environment Agency (the grantee on the English side) to play more of a role in the oversight of the fishery; the

objective being to reassure English licensees that they are not discriminated against in any way.

### 2.9.3 Roles and responsibilities

The roles and responsibilities of the key players are set out in Table 3.

**Table 3. Roles and Responsibilities within the Dee Estuary Cockle Fishery.**

Organisation	Roles and responsibilities
Natural Resources Wales	Grantee of the Regulating Order, responsible for management of the fishery on both sides of the border, because of a service level agreement which allows for delegation of functions from the Environment Agency (England). Also responsible for conservation issues relating to the fishery; e.g. Habitats Regulation assessments, management of bird populations against SPA objectives.
Environment Agency (England)	Grantee of the Regulating Order (with NRW), but has delegated its role in management of the fishery to NRW via a service level agreement. Continues to have some oversight of management, e.g. participation in 5-year reviews of fishery.
Dee Estuary Sea Fishery Liaison Group	Stakeholder consultation group involving fishers from different areas (3 England, 3 North Wales, 3 South Wales – selected by licensees), NRW and the Environment Agency (although they do not always attend). Formed to cover all inshore fisheries but in practice cockle only.
DEFRA and Welsh Government	If NRW wants to cancel a licence (e.g. as a sanction for non-compliance), permission is required from both Ministers, regardless of the location of the licensee and the offence.

### 2.9.4 Consultation processes

The Dee Estuary Sea Fishery Liaison Group is the key body which allows for consultation with licensees and their participation in management. Their role is advisory, not decision-making. According to NRW, the Liaison Group is currently not working well as a consultation mechanism, partly because of the dispute by English licensees and partly because views of members may not be representative of licensees more widely; NRW has decided in 2017 to try a wider consultation with licensees by email, in the hope of getting a clearer perspective on the views of all the licensees.

More generally, NRW will seek and obtain feedback from fishers throughout the season on cockles densities and mortalities on each bed, and may adjust management accordingly (e.g. to make adjustments to the MLS).

In terms of conservation, ‘consultation’ is mainly internal because NRW is the regulatory body responsible for marine (and other) conservation in Wales as well as inshore fisheries management (e.g. the management of European marine sites). There is an annual assessment of the fishery against the Habitats Regulation (NRW 2016d) and the management of protected bird populations is integrated into the fishery management system (see Principles 1 and 2). On the English side, the HRA is reviewed by Natural England, since in England these functions are separate.

### 2.9.5 Objectives

The management plan established under the Regulating Order (DEFRA 2015) provides objectives for the Regulating Order as follows:

- To develop a sustainable fishery that provides a consistent, regular income for fishermen.
- To minimise the impacts to the European site and local residents arising from fishing activities
- To improve fishery management, monitoring and enforcement.

The European Marine Site also has clear objectives centred around maintaining 'favourable conservation status' for the various qualifying features (which quantitatively-defined objectives in the case of the birds).

More generally NRW has a clearly defined 'purpose' and set of objectives – see for example the Corporate Plan (2014-17).

### 2.9.6 Decision-making processes

Management decisions are taken by NRW, but there are various internal processes which are followed; examples are given below for the key decisions taken annually or periodically.

**Setting the TAC:** A quantitative survey of the beds is conducted in April/May (prior to season opening 1 July), the growth-mortality and bird-food models are applied as described above, and this provides an estimate as to how much biomass will be left for the fishery. On this basis, an initial TAC is set. The division of the TAC into a daily quota is then decided in discussion with stakeholders. There is then a mid-season survey in late August / early September which focuses on the high-density beds (the most likely to have seen change); on the basis of this, the TAC may be adjusted but the daily quota will not change since bags have been distributed.

**Revision of the management plan:** The Regulating Order did not give a way for NRW to respond to all 'exceptional circumstances'; specifically, if NRW wanted to alter regulations to take account of beds with very high densities of small cockles at risk of mass mortality. In 2015, the management plan was revised to incorporate Regulation 18: *The grantees may, in writing, exempt any person from any regulation or restriction if it is necessary for the purpose of preserving, improving, or developing the fishery or for scientific, stocking or breeding purposes.* This allows them, for example, to reduce the MLS temporarily so that such areas can be thinned out, which is known to promote survival and reduce the risk of mass mortality.

### 2.9.7 Compliance and enforcement

NRW enforcement officers are present ~2 days a week at the fishing sites; since time is limited, enforcement is intelligence-led. In their view, non-licensed fishing on the Dee is negligible; the main enforcement concerns are with licensees. The main issue is reported to be overharvesting in relation to the daily quota; e.g. overfilling the bags, 'double-tiding' (taking the quota on both low tides in a given day). There is less concern about taking cockles below the MLS – a 10% tolerance is permitted, and in any case, licensees receive a lower price for this product. In financial year 2015-16, more than 1,100 hours were spent by NRW staff on enforcement actions for this fishery.

Sanctions are available as follows: verbal or written warning, formal caution, prosecution, cancellation of licence (the last requiring permission from both Ministers). There is clear

guidance on enforcement and sanctions setting out the penalties which apply for each type of contravention under different circumstances.

### **2.9.8 Management review**

The Regulating Order runs to 2028, after which it will have to be reviewed and renewed. There are 5-yearly reviews of the fishery (the second is due to start in 2017). Individual elements are reviewed and revised as seems necessary; e.g. the bird food model has just been adjusted to take into account new research and information, the Enforcement and Sanctions Guidance was also updated in 2016. There is also an annual assessment in relation to the objectives set by the SAC and SPA under the Habitats and Birds Regulations (the HRA).

### **2.10 Previous assessments**

The Dee Estuary Cockle (*Cerastoderma edule*) fishery was certified against the MSC Principle and Criteria for Sustainable fishing in July 2012 and assessed against MSC Certification Requirements version 1.1 using MSC Full Assessment Reporting Template version 1. There were no conditions attached to this certification (certificate: MMI-F-124). The fishery was issued a new certificate in response to a change of CAB in September 2015 (certificate: MEC-F-033). The original fisheries assessment described the fishery as 'performing very strongly against all three Principles, reflecting a well-managed, small and discrete fishery with low environmental impact and was assessed using the default assessment tree (Hough & Holt 2012).

## 3 Evaluation Procedure

### 3.1 Assessment Methodologies

The fishery was assessed using FCR version 2.0 and reduced reassessment reporting template v1.0. The default assessment tree was used with no adjustments. The RBF was not used.

### 3.2 Evaluation Processes & Techniques

#### 3.2.1 Site Visits

The site visit for the fishery was held on 7<sup>th</sup> December 2016 at NRW Offices in Buckley, North Wales. The entire team attended the site visit. No requests for meetings by stakeholders were received – all meetings were initiated by the team. The team visited the office of NRW and spoke to the following individuals during the site visit:

- Rick Prichard (NRW)
- Neil Smith (NRW)
- Mark Kyriacou (NRW)

#### 3.2.2 Consultations

As well as the individuals met during the site visit, the following individuals were contacted by email or telephone and responded to the team:

- Robert Evans (NRW)
- Tom Stringell (NRW)

The information received has been summarised in the above review of changes to the fishery (Principle 2 and Principle 3).

#### 3.2.3 Evaluation Techniques

**a) Media announcements:** MEC announced the fishery on the MSC website, through a MSC press release, which targeted a wide range of stakeholders within the sustainable seafood industry. Under version 2.0 of the MSC Certification Requirements, there is not a requirement to publish the fishery announcement elsewhere.

**b) Methodology for information gathering:** Review of data and documentation.

**c) Scoring process:** Scoring was partly completed during the site visit and partly completed afterwards. Final scores were agreed by the team on 06/03/17.

The scores were decided as follows:

Note that where there is only one scoring issue in the SG, the issue can be partially scored – In this case the team used their judgement to determine what proportion of it was met, e.g. at the 100 level, a small part met = 85, about half met = 90, nearly all met = 95.

**Table 4. Example scoring process**

How many scoring issues met?	SG60	SG80	SG100
All	60	80	100
Half	FAIL	70	90
Less than half	FAIL	65	85
More than half	FAIL	75	95

**d) Decision rule for reaching the final recommendation:**

A UoA cannot be certified if:

- The weighted average score for all PIs under each Principle is less than 80 for any of the three Principles
- Any individual scoring issue is not met at the SG60 level, contributing to a score of less than 60 on any PI.

The aggregate score for each Principle is calculated by taking the average score for each Component (e.g. 1.1 – Principle 1 Outcome), followed by the average of all the Component scores (see Section 5.2).

**e) Scoring elements:**

For Principle 1, only one scoring element was considered, i.e. Cockles in Dee Estuary Stock. There were no scoring elements that were considered in the outcome PIs under primary, and ETP species in Principle 2. Under Principle 2 for secondary species sand-dwelling taxa (small crustaceans (*Corophium* spp.), molluscs (*Hydrobia* spp.) and annelid worms (*Nephtys* spp.)) are grouped and considered a minor scoring element. Habitats outcome PI the scoring element considered was intertidal mud and sand habitats, while for Ecosystem outcome PI species diversity / richness, trophic food webs (including top predators) and ecosystem services were considered the scoring elements.

## 4 Traceability

### 4.1 Eligibility Date

The fishery products are currently covered by the current fishery certificate, which is due to expire on the 02<sup>nd</sup> September 2017. This reduced re-assessment has been completed before that expiration date so there is not a lapse in certification.

### 4.2 Traceability within the Fishery

Transfer of cockles from fisher to processor at first point of sale can only be completed within a single fishery bag (Figure 2) with accompanying point of cockle transfer document (Figure 3). This point of sale is at the slipways where the vessels are landed. Each bag is individually labelled and numbered for referencing against the fisher and the accompanying document details catch date, area, landing location and catch weight. Each document is triplicate with one copy accompanying the catch, one kept by the fisher and the third returned on a monthly basis to NRW.

**Table 5. Traceability Factors within the Fishery:**

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear/s to be used within the fishery	The Unit of Assessment (UoA) for this fishery specifically includes only hand rakes as gears used by the fishers under assessment and includes all fishers licenced to take cockles from the estuary. No other gear types are permitted in the fishery and this is enforced by NRW officers. The risk of a non-certified gear being used is therefore extremely low.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	The geographical isolation of the fishery, intertidal and daylight nature of this fishery mean there is no non-UoC fishing in the area. Small boats are used to return harvested cockles to the slipways to be landed. No fishing takes place using vessels. The ability of the vessels to leave the fishery and fish elsewhere is negligible. First point of sale is at the limited number of slipways (2 in Wales, 1 in England) that serve the estuary. The processors meet the fishers at these slipways and this is the point at which this certificate finishes. It is at the slipway that the fisheries officers can inspect catch/licences etc. This risk is considered to be minimal.
Potential for vessels outside of the UoC or client group fishing the same stock	Small boats are used to return harvested cockles to the slipways to be landed. No fishing takes place using vessels and entry into the estuary is limited to a few principle slipways which are monitored by NRW. This risk is considered to be minimal.

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	The hand-gathering occurs only within the estuary, and the entire estuary is covered by the UoC, so only certified product is harvested. Ownership of cockle passes to processors (the first point of sale) is at the dockside. This risk is considered to be minimal.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	None as there is no at sea processing.
Risks of mixing between certified and non-certified catch during transhipment	No transhipment occurs within this fishery and so the risk is seen as minimal.
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	No other risks have been identified. Product is landed directly and chain of custody will be required from the first change of ownership. Risk of mixing of certified and non-certified product here is therefore minimal.

#### 4.3 Eligibility to Enter Further Chains of Custody

The fishery certification extends to the first point of sale which is at any one of the three slipways on the estuary. Product from the Dee cockle fishery landed at the slipways after the date of certification, is then eligible to enter further certified chains of custody. There are currently three processors operating at first point of sale in this fishery, none of which currently have chain of custody certification (Table 6).

**Table 6. Processors of Dee Cockles**

Processor	Details
Parsons Pickles	Ashburnham Works, Y Derwydd, Burry Port SA16 0ET. Phone: 01554 833351. <a href="http://www.parsonspickles.co.uk/products/shellfish">http://www.parsonspickles.co.uk/products/shellfish</a>
Selwyn's Seafood	Selwyn's Seafood, Lynch Factory, Marsh Rd, Llanmorlais, Swansea SA4 3TN. <a href="https://www.selwynsseaweed.com/">https://www.selwynsseaweed.com/</a>
Dani Foods Ltd	Dani Foods Ltd, No 3 Shed, Port of Boston, Boston, Lincolnshire PE21 6BN <a href="http://www.dani.es/en/company">http://www.dani.es/en/company</a>

#### 4.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to Enter Further Chains of Custody

Not applicable.

## 5 Evaluation Results

### 5.1 Principle Level Scores

The final principal scores are provided in the table below:

**Table 7. Final Principle Scores**

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	95.0
Principle 2 – Ecosystem	100.0
Principle 3 – Management System	95.2

### 5.2 Summary of Scores

**Table 8. Summary of scores**

Principle	Wt	Component	Performance Indicator (PI)		Score
One	0.33	Outcome	1.1.1	Stock status	100
			1.1.2	Stock Rebuilding	NA
	0.67	Management	1.2.1	Harvest strategy	95
			1.2.2	Harvest control rules & tools	95
			1.2.3	Information & monitoring	90
			1.2.4	Assessment of stock status	95
Two	0.2	Primary species	2.1.1	Outcome	100
			2.1.2	Management strategy	100
			2.1.3	Information/Monitoring	100
	0.2	Secondary species	2.2.1	Outcome	100
			2.2.2	Management strategy	100
			2.2.3	Information/Monitoring	100
	0.2	ETP species	2.3.1	Outcome	100
			2.3.2	Management strategy	100
			2.3.3	Information strategy	100
	0.2	Habitats	2.4.1	Outcome	100
			2.4.2	Management strategy	100
			2.4.3	Information	100

Principle	Wt	Component	Performance Indicator (PI)		Score
	0.2	Ecosystem	2.5.1	Outcome	100
			2.5.2	Management	100
			2.5.3	Information	100
Three	0.5	Governance and policy	3.1.1	Legal &/or customary framework	95
			3.1.2	Consultation, roles & responsibilities	95
			3.1.3	Long term objectives	100
	0.5	Fishery specific management system	3.2.1	Fishery specific objectives	100
			3.2.2	Decision making processes	85
			3.2.3	Compliance & enforcement	80
			3.2.4	Monitoring & management performance evaluation	100

### 5.3 Summary of Conditions

No new conditions were raised as part of the re-assessment process.

### 5.4 Recommendations

The assessment team does not have any recommendations for the fishery.

### 5.5 Determination, Formal Conclusion and Agreement

Following consideration of all stakeholders' inputs and comments to the Public Comment Draft Report (PCDR), the fishery assessment team concludes that the fishery should be certified against the MSC standard. This determination remains a recommendation pending the completion of the formal objections process and the final certification decision by the MEC official decision making entity.

The MEC Certification Decision Making entity was informed of the intention to certify the fishery on the 19th July 2017. The final certification decision was made on the 19th July 2017 with the Certification Decision Maker approving the decision to certify the fishery.

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## 7 Appendices

### Appendix 1 Scoring and Rationales

#### Principle 1

##### Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Stock status relative to recruitment impairment</b>			
	<b>Guide post</b>	It is <b>likely</b> that the stock is above the point where recruitment would be impaired (PRI).	It is <b>highly likely</b> that the stock is above the PRI.	There is a <b>high degree of certainty</b> that the stock is above the PRI.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The management strategy is based on maintaining cockle populations at levels in excess of those which would have a significant effect on oystercatcher populations; only biomass surplus to these requirements (taking into account growth and mortality) may be removed by the fishery. This proxy 'limit reference point' (see paragraph below) is precautionary in terms of ecosystem effect and even more precautionary in terms of maintaining the reproductive capacity of the stock. Cockles have very high reproductive potential, even when stock numbers are low (Tyler-Walters 2007) and therefore spat settlement success is generally more significant than spawning stock size in determining recruitment to a fishery. Low biomass can be the result of natural and fishery reduced mortality, but provided environmental conditions favour cockle recovery, biomass can return to higher levels. Having said that, prior to the introduction of the Fishery Order (2008) the fishery removed a higher percent of the biomass in good years, and there was a clear pattern of boom and bust suggesting some recruitment limitation; this is no longer the case (Figure 1).</p> <p>The biomass estimates between 2012-2016 show evidence of recruitment to the fishery, sufficient to provide 6928 t of cockles (REcolC) for overwintering oystercatchers per annum and provide a TAC for fishers. REcolC is the ecological requirement of oystercatchers from cockles within the Dee Estuary and includes estimates of daily energy requirements, energy value of cockles, digestibility and competition for food. REcolC acts as a proxy for a limit reference point in that if the annual biomass estimate is at or below this value there will be no TAC for that year.</p> <p>Growth rates in this species are highly variable depending on growing conditions however average size at maturity for this species is 12-15 mm which is approximately 18 months of growth. Recent fishery-independent monitoring has demonstrated a sustained increase in the absolute abundance of sub-legal size animals (&lt;20 mm), indicating strong evidence of the stock's continued capacity to recruit to this fishery. Therefore there is a high degree of certainty that the stock is above the PRI, and <b>SG 100 is met.</b></p>		

<b>b</b>	<b>Stock status in relation to achievement of MSY</b>		
	<b>Guide post</b>		The stock is at or fluctuating around a level consistent with MSY. There is a <b>high degree of certainty</b> that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	<b>Met?</b>	Y	Y
	<b>Justification</b>	There is no explicit MSY value indicated within the bird food model, however the availability of biomass above the REcolC indicates that the stock is maintained at a level where productivity is high, which is the intent of this Scoring Guidepost. The stability of biomass estimates >7000 t since 2012 together with low percentage of TAC and fishing mortality to biomass is suggestive of a stock which is fluctuating around a level consistent with MSY, or well above that level. Since 2012 fishing mortality has been <20% of estimated biomass of cockles >10 mm shell width and TACs have been at least as precautionary as those which would limit fishing mortality to <30% of the stock (i.e. maintaining the stock at >70% of what would be a proxy for B <sub>0</sub> ). MSC's default proxy for B <sub>MSY</sub> is 40%B <sub>0</sub> (Guidance 2.2.3.1); and this stock (which is highly productive) is maintained well above that level. SG100 is met	
<b>References</b>		(Tyler-Walters 2007; Jones 2015; NRW 2016a; Malham et al. 2012)	
<b>Stock Status relative to Reference Points</b>			
	<b>Type of reference point</b>	<b>Value of reference point</b>	<b>Current stock status relative to reference point</b>
<b>Reference point used in scoring stock relative to PRI (S1a)</b>	REcolC	6928 t	The 2016 biomass estimate (8739.4 t) minus REcolC (6928 t) gives a maximum TAC for 2016 of 1812 t
<b>Reference point used in scoring stock relative to MSY (S1b)</b>	REcolC	6928 t	The 2016 biomass estimate (8739.4 t) > REcolC (6928 t).
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/a</b>

## Evaluation Table for PI 1.1.2 – Stock rebuilding (not applicable – not scored)

## Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>Harvest strategy design</b>			
	<b>Guide post</b>	The harvest strategy is <b>expected</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <b>work together</b> towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is <b>designed</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The bird model harvest strategy is designed to achieve cockle stock objectives while maintaining ecosystem objectives. It uses proxy limit reference point REcolC to maintain predator population size but in doing so prevents significant fishing mortality by protecting an estimated 6928 t of cockle biomass per annum. The harvest strategy is implemented on an annual basis in response to the stock status identified by the spring biomass estimate and the application of the bird food model. Repeat fishery independent biomass sampling in August and September allows within-year proactive responses in the TAC reducing the chances that stock status is likely to become unfavourable. Therefore, <b>SG100 is met.</b>		
<b>b</b>	<b>Harvest strategy evaluation</b>			
	<b>Guide post</b>	The harvest strategy is <b>likely</b> to work based on prior experience or plausible argument.	The harvest strategy may not have been fully <b>tested</b> but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been <b>fully evaluated</b> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	Since implementation of the harvest strategy the fishery has met one of its objectives ‘To develop a sustainable fishery that provides a consistent, regular income for fishermen.’ This has been achieved in that the grantee (NRW) has offered a commercial TAC each year since the current harvest strategy was introduced. The model has also achieved the fishery objective of ‘ensuring the features of the Dee Estuary protected area (i.e. SAC/SPA/SSSI) are not negatively impacted by the Cockle fishery’ and annual peak mean oystercatcher numbers have risen since 2013. The Stillman bird model has been implemented on other cockle fisheries within Wales (Burry Inlet) and has been internally reviewed by NRW. Some criticism of the model has been expressed by some fishers in the Dee Estuary citing a change in the REcolC between the original bird model and the current Stillman model (Rob Evans pers com.). An external review of the current model is currently being undertaken across all cockle fisheries in England and Wales, with results expected for Spring		

		2017. Therefore, <b>SG80 is met but SG100 is not yet met, pending the outcome of this review.</b>		
<b>c</b>	<b>Harvest strategy monitoring</b>			
	<b>Guide post</b>	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	<b>Met?</b>	Y		
	<b>Justification</b>	There is a well-established system of pre-season and within-season surveys, with the initial TAC reviewed in September each year in relation to changes in biomass over the start of the season. Met.		
<b>d</b>	<b>Harvest strategy review</b>			
	<b>Guide post</b>			The harvest strategy is periodically reviewed and improved as necessary.
	<b>Met?</b>			Y
	<b>Justification</b>	The management plan is reviewed at intervals of not greater than 5 years. The Bird model review is currently underway. The full formal review of the management of the fishery is due to start in 2017.		
<b>e</b>	<b>Shark finning</b>			
	<b>Guide post</b>	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	<b>Met?</b>	Not relevant	Not relevant	Not relevant
	<b>Justification</b>	The target species is not a shark – not relevant.		
<b>f</b>	<b>Review of alternative measures</b>			
	<b>Guide post</b>	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	<b>Met?</b>	Not Relevant	Not Relevant	Not Relevant
	<b>Justification</b>	The hand raking fishing method of the fishery ensures that by-catch and unwanted catch levels are negligible.		
<b>References</b>	NRW meeting Dec 2016, (Jones 2015)			

<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>	<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/a</b>

## Evaluation Table for PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>HCRs design and application</b>			
	<b>Guide post</b>	Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, most of the time.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The overall exploitation each year is responsive to stock availability and the rate reduces as the proxy LRP (REcolC) is approached. The Stillman bird model and its outputs form the basis for the HCR. The annual spring survey and the subsequent autumn survey provide the data for the model to fix a percentage of mortality for each age class (based on prior data from multiple sites) and the required energy needed for overwintering birds to produce a TAC. The daily bag limit is the tool used within the HCR to set exploitation rate and is entirely consistent with the harvest strategy. The exploitation rate based on the projected (annually surveyed) stock biomass is agreed through negotiations between NRW and DESFLG – the exploitation rate is constant (daily catch quota), but the rate is established to achieve an annual TAC that would in turn keep the stock above the REcolC at all times. The REcolC of 6928 t is an appropriate weight which accounts for the ecological role of the stock as food source for overwintering oystercatchers in a precautionary manner, and also has the effect of maintaining the biomass well above any likely proxies for B <sub>MSY</sub> (see 1.1.1b). Therefore <b>SG100 is met</b> .		
b	<b>HCRs robustness to uncertainty</b>			
	<b>Guide post</b>		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	<b>Met?</b>		Y	Y
	<b>Justification</b>	The key HCR within the Stillman bird model is the fixed mortality applied to the age classes of the cockles and the ER required for the birds. The critical uncertainty is any variation in biomass resulting from natural mortality (e.g. due to high temperatures) between the stock survey in April, from which the daily bag limit is set and the onset of oystercatcher feeding in September (typically). This is accounted for by stock surveys in September which ensure that any variations are accounted for.		

		The HCR is robust to the main uncertainty in biomass variation due to variation from unexpected mortality and NRW have the ability to reschedule additional within-season surveys and manipulate the MLS based on recruitment dynamics. Therefore <b>SG100 is met.</b>		
<b>c</b>	<b>HCRs evaluation</b>			
	<b>Guide post</b>	There is <b>some evidence</b> that tools used <b>or available</b> to implement HCRs are appropriate and effective in controlling exploitation.	<b>Available evidence indicates</b> that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	<b>Evidence clearly shows</b> that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	The tool used to implement the HCRs is the TAC, which is in turn implemented via daily bag limits. In terms of the protection of the stock it is clear that the TAC method will protect the stock but there remains some uncertainty in the daily bag limit as an effective tool for executing the HCR. Daily bag limits are implemented through the use of custom fishery bags produced annually following agreement of the daily catch limit. Bag size is determined by the average weight of cockles at the given daily catch limit. In 2016 the bag size was limited to hold only 500 kg (Figure 2). Transfer of cockles from fisher to processor at first point of sale can only be completed within a single fishery bag with accompanying point of cockle transfer document (Figure 3). Each bag is individually labelled and numbered for referencing against the fisher. Bag weight limits are considered to have reduced the incidences of 'overtopping' (taking more than the daily catch limit) and are therefore considered effective in achieving exploitation levels. Clear evidence of this is limited to verbal communications with NRW staff and limited to 2015 and 2016 fishing seasons. Comparison of daily bag weights across fishers throughout the season was not available for assessment. therefore, SG100 is not met but <b>SG80 is met.</b>		
<b>References</b>	NRW meeting, Jones 2015			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	<b>Range of information</b>			
	<b>Guide post</b>	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A <b>comprehensive range</b> of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Stock structure and productivity is monitored twice annually (together with regular walk-over surveys of the beds by EAW to monitor progress of the fishery, as well as additional surveys if required to respond to particular issues). All fishers are licensed and gear used is prescribed in license conditions. All fishers provide daily landing records. The Dee Estuary is a Special Area of Conservation and Special Protection Area for Birds (amongst other designations), a status which requires regular monitoring and reporting of the conservation status of the site by Nature Conservation agencies (NRW and Natural England). Monthly bird surveys provide estimations of overwintering oystercatchers against which the bird model is assessed. Therefore <b>SG100 is met</b>		
<b>b</b>	<b>Monitoring</b>			
	<b>Guide post</b>	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are <b>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</b> , and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	<b>All information</b> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent <b>uncertainties</b> in the information [data] and the robustness of assessment and management to this uncertainty.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	UoA removals from the fishery are monitored through the return of daily landing record sheets (Figure 3). NRW officers provide regular monitoring at the collection points where handovers between fishers and processors take place although measurement of catch (weight) is no longer recorded by NRW officers. Major		

		uncertainties in the data are understood (high temperature summer mortality, seasonal spat-fall) and a limited level of control is implemented through the September resurvey. Therefore <b>SG80 is met</b> . SG100 is not met given that landings are not being measured with any precision (assumed weight in the bag) and there are some enforcement concerns about both the landing sheets and overfilling the bags.	
<b>c</b>	<b>Comprehensiveness of information</b>		
	<b>Guide post</b>		There is good information on all other fishery removals from the stock.
	<b>Met?</b>		Y
	<b>Justification</b>	According to NRW officers there is negligible recreational fishing of the stock and without boat access there is significant access issue to the beds. NRW compliance and monitoring has improved in recent years including use of infra-red cameras for night work.	
<b>References</b>	Jones 2015, NRW meeting 07/12/16.		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/a</b>

## Evaluation Table for PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Appropriateness of assessment to stock under consideration</b>			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		Y	Y
	Justification	The surveys and oystercatcher predation model are specifically tailored for the Dee Estuary cockle fishery and are fully integrated within the harvest strategy. Therefore <b>SG100 is met.</b>		
b	<b>Assessment approach</b>			
	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	Y	Y	
	Justification	The surveys provide annually updated empirical estimation information on the stock status. The relative reference point for this fishery is the ecological reference point (REcolC), against which the stock can be assessed. The critical uncertainty is within season mortality reducing cockle biomass prior to the onset of oystercatcher feeding in September (typically). This is addressed by stock surveys in September which ensure that these variations are accounted for. <b>Therefore SG80 is met.</b>		
c	<b>Uncertainty in the assessment</b>			
	Guide post	The assessment <b>identifies major sources</b> of uncertainty.	The assessment <b>takes uncertainty into account.</b>	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a <b>probabilistic</b> way.
	Met?	Y	Y	Y
	Justification	The surveys provide annually updated empirical estimation information on the stock status. This is better than a probabilistic estimation. The critical uncertainty each year is settlement success and survival which is measured via the annual biomass survey and any variation in mortality (such as high temperatures) between the stock survey in April and onset of oystercatcher feeding in September is accounted for. Therefore <b>SG100 is met.</b>		
d	<b>Evaluation of assessment</b>			
	Guide post			The assessment has been tested and shown to be robust. Alternative

				hypotheses and assessment approaches have been rigorously explored.
	<b>Met?</b>			N
	<b>Justification</b>	The assessment model has been reviewed in peer reviewed literature and updated to improve the applicability of the model to the Dee Estuary. There is no great evidence that alternative assessment approaches have been rigorously explored beyond the bird models and therefore <b>SG100 is not met.</b>		
<b>e</b>	<b>Peer review of assessment</b>			
	<b>Guide post</b>		The assessment of stock status is subject to peer review.	The assessment has been <b>internally and externally</b> peer reviewed.
	<b>Met?</b>		Y	Y
	<b>Justification</b>	The means of monitoring stock status and allocating a TAC have been provided in the fishery management plan which is reviewed by Welsh Government and DEFRA. The oystercatcher predation model has been well established, published in peer-reviewed journals, and reviewed for its applicability in this situation by NRW internally. It is currently undergoing an internal and external review. Therefore SG100 has been met.		
	<b>References</b>	Jones 2015, NRW meeting 07/12/16.		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Principle 2

## Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Main primary species stock status</b>			
	<b>Guide post</b>	<p>Main primary species are <b>likely</b> to be above the PRI</p> <p>OR</p> <p>If the species is below the PRI, the UoA has measures in place that are <b>expected</b> to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main primary species are <b>highly likely</b> to be above the PRI</p> <p>OR</p> <p>If the species is below the PRI, there is either <b>evidence of recovery</b> or a demonstrably effective strategy in place <b>between all MSC UoAs which categorise this species as main</b>, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main primary species are above the PRI <b>and are</b> fluctuating around a level consistent with MSY.</p>
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Fishery officer observations of both hand-gathering practices and inspections of daily TAC bags have recorded zero presence of other primary species to date. There is no other commercially valuable species available or likely to be caught given the methods used by the fishery (hand-gathering only) therefore there are no main primary species (see 2.8.1) in the fishery <b>SG100 is met.</b>		
b	<b>Minor primary species stock status</b>			
	<b>Guide post</b>			<p>Minor primary species are highly likely to be above the PRI</p> <p>OR</p> <p>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species</p>
	<b>Met?</b>			Y

	<b>Justification</b>	Given the methods used by the fishery (hand-gathering only) there are no minor primary species (see 2.8.1) in the fishery; any retention that did occur would be unintentional and negligible. Therefore <b>SG100 is met.</b>
<b>References</b>	NRW re-assessment meeting 2016; Cockle Fishery Management Plan 2015	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>n/a</b>

## Evaluation Table for PI 2.1.2 – Primary species management strategy

<b>PI 2.1.2</b>		<b>There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Management strategy in place</b>			
	<b>Guide post</b>	There are <b>measures</b> in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the point where recruitment would be impaired.	There is a <b>partial strategy</b> in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired.	There is a <b>strategy</b> in place for the UoA for managing main and minor primary species.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The Management Plan for the fishery is reviewed annually. The overarching strategy behind this plan is the management objective to minimize the impacts of the fishery on the European Marine Site (SAC and SPA), Ramsar site and SSSI. The Plan and Licence Conditions state that only cockles may be taken and limit the gear use within the fishery to that of hand-gathering only with specifications of the permitted dimensions of rakes, riddles and jumbos.</p> <p>The use of daily TAC bags (the only permitted means of landings a day's catch) ensures that only cockles are landed. These bags are 'sold' direct to the buyers and therefore there is no incentive for them to hold anything other than cockles.</p> <p>An 'Enforcement and Sanctions' guidance document is sent out to all licence holders annually to inform fishers which activities are and are not permitted.</p> <p>The Management Plan, Licence Conditions, Enforcement and Sanction guidance and site conservation objectives together form a strategy to minimize mortality of unwanted catch and ensures that there are no main or minor primary species (see 2.8.1) retained in the fishery. Therefore <b>SG100 is met.</b></p>		
<b>b</b>	<b>Management strategy evaluation</b>			
	<b>Guide post</b>	The measures are considered <b>likely</b> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Hand-gathering can be observed easily by fishery officers to ensure that cockle fishers are adhering to the licence conditions. EA and NRW staff can observe the daily TAC bags at the point of landing and assess them for any additional species (primary or secondary). No primary species have ever been reported providing high		

		confidence that the management strategy described is working. Therefore <b>SG100 is met.</b>		
<b>c</b>	<b>Management strategy implementation</b>			
	<b>Guide post</b>		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully.</b>	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	<b>Met?</b>		Y	Y
	<b>Justification</b>	Enforcement of the Licence Conditions and Management Plan and field observations demonstrate the fishery is limited to hand-gathering only and thereby minimises the mortality of any unwanted catch. The lack of any main or minor primary species observed by fishery officers further demonstrates the strategy is working and therefore <b>SG100 is met.</b>		
<b>d</b>	<b>Shark finning</b>			
	<b>Guide post</b>	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	<b>Met?</b>	Not relevant	Not relevant	Not relevant
	<b>Justification</b>	No sharks are caught in the fishery; therefore this SI need not be scored.		
<b>e</b>	<b>Review of alternative measures</b>			
	<b>Guide post</b>	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	<b>Met?</b>	Not relevant	Not relevant	Not relevant
	<b>Justification</b>	The MSC Fisheries Standard GSA3.5.3 states, “ <i>If there is no unwanted catch of primary species, or no primary species at all, then the ‘Review of alternative measures’ scoring issue (e) is not scored.</i> ” Since there are no main or minor primary species, this element is not scored.		
<b>References</b>		(Kaiser et al. 2001)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 2.1.3 – Primary species information

<b>PI 2.1.3</b>		<b>Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Information adequacy for assessment of impact on main primary species</b>			
	<b>Guide post</b>	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main primary species with respect to status.  OR  <b>If RBF is used to score PI 2.1.1 for the UoA:</b>  Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is <b>adequate to assess</b> the impact of the UoA on the main primary species with respect to status.  OR  <b>If RBF is used to score PI 2.1.1 for the UoA:</b>  Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main primary species with respect to status.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Fishery officer observations of both hand-gathering practices and inspections of daily TAC bags have recorded zero presence of main primary species to date. This provides a high degree of certainty that there are no main primary species in the fishery. Therefore <b>SG100 is met.</b>		
<b>b</b>	<b>Information adequacy for assessment of impact on minor primary species</b>			
	<b>Guide post</b>			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	<b>Met?</b>			Y
	<b>Justification</b>	As above, fishery officer observations of both hand-gathering practices and inspections of daily TAC bags have recorded zero presence of minor primary species to date. This provides a high degree of certainty that there are no minor primary species in the fishery. Therefore <b>SG100 is met.</b>		
<b>c</b>	<b>Information adequacy for management strategy</b>			
	<b>Guide post</b>	Information is adequate to support <b>measures</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> Primary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> primary species, and evaluate with

				a <b>high degree of certainty</b> whether the strategy is achieving its objective.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The information available on catch composition by fisheries officers from <i>ad hoc</i> inspections of daily TAC bags, from independent studies (Kaiser et al. 2001) of hand-raking impacts and from routine estuarine monitoring, demonstrate there are no main or minor primary species in the fishery and therefore the fishery poses no risk. This information is adequate to support the strategy being implemented to minimize fishery impacts and provides a high degree of certainty that the strategy is achieving its objective. Therefore <b>SG100 is met.</b>		
	<b>References</b>	(Kaiser et al. 2001)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

Evaluation Table for PI 2.2.1 – Secondary species outcome

<b>PI 2.2.1</b>		<b>The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.</b>			
<b>Scoring Issue</b>		SG 60	SG 80	SG 100	
<b>a</b>	<b>Main secondary species stock status</b>				
	<b>Guide post</b>	<p>Main Secondary species are <b>likely</b> to be within biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are <b>highly likely</b> to be above biologically based limits</p> <p>OR</p> <p>If below biologically based limits, there is either <b>evidence of recovery</b> or a <b>demonstrably effective partial strategy</b> in place such that the UoA does not hinder recovery and rebuilding.</p> <p>AND</p> <p>Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main secondary species are within biologically based limits.</p>	
	<b>Met?</b>	Y	Y	Y	
	<b>Justification</b>	<p>Fishery officer observations of both hand-gathering practices and inspections of daily TAC bags have recorded zero presence of main secondary species to date. This provides a high degree of certainty that there are no main secondary species in the fishery. Therefore <b>SG100 is met.</b></p>			
<b>b</b>	<b>Minor secondary species stock status</b>				
	<b>Guide post</b>			<p>Minor secondary species are highly likely to be above biologically based limits</p>	

				OR
				If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	<b>Met?</b>			Y
	<b>Justification</b>	<p>Fishery officer observations of both hand-gathering practices and inspections of daily TAC bags have recorded zero presence of minor secondary species (infaunal invertebrates) to date. These invertebrates are not directly exploited by any other fishery and any retention of minor secondary species that did occur would be unintentional and negligible.</p> <p>Section 2.8.2 demonstrates that the disturbance of these species is short-term and the area of their habitat exploited is low compared to that available within the estuary and in nearby coastal areas. Therefore it is considered highly likely that within the estuary minor, secondary species will be within any reasonable biologically-based limit. Therefore <b>SG100 is met.</b></p>		
	<b>References</b>	(JNCC 2016a; Kaiser et al. 2001; NE/CCW 2010)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guide post	There are <b>measures</b> in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>partial strategy</b> in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>strategy</b> in place for the UoA for managing main and minor secondary species.
Met?	Y	Y	Y
Justification	<p>The Management Plan for the fishery is reviewed annually. The overarching strategy behind this plan is the management objective to minimize the impacts of the fishery on the European Marine Site (SAC and SPA), Ramsar site and SSSI. The Plan and Licence Conditions state that only cockles may be taken and limit the gear use within the fishery to that of hand-gathering only with specifications of the permitted dimensions of rakes, riddles and jumbos.</p> <p>The use of daily TAC bags (the only permitted means of landings a day's catch) ensures that only cockles are landed. These bags are 'sold' direct to the buyers and therefore there is no incentive for them to hold anything other than cockles.</p> <p>An 'Enforcement and Sanctions' guidance document is sent out to all licence holders annually to inform fishers which activities are and are not permitted.</p> <p>The Management Plan, Licence Conditions, Enforcement and Sanction guidance and site conservation objectives together form a strategy to minimize mortality of unwanted catch and ensures that there are no main secondary species in the fishery. The strategy aims to minimise the disturbance to minor secondary species; any retention by fishers that did occur would be unintentional and negligible. Therefore <b>SG100 is met.</b></p>		
b	Management strategy evaluation		
Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is <b>some objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
Met?	Y	Y	Y

	<b>Justification</b>	<p>Hand-gathering can be observed easily by fishery officers to ensure that cockle fishers are adhering to the licence conditions. EA and NRW staff can observe the daily TAC bags at the point of landing and assess them for any secondary species. No main secondary species have been identified and none have been reported by fishery officers providing high confidence that the management strategy described is working.</p> <p>Other infaunal invertebrate species disturbed during the fishing process and identified as minor secondary species are described in the Dee-specific study by Kaiser &amp; Hall (2001). The study demonstrates rapid recovery (within one year) of the infaunal communities following disturbance from hand-raking. None have any commercial value and are not retained as main or minor secondary species.</p> <p>Based on the species-specific and site-specific information above there is high-confidence that the strategy will work and secondary species populations will be maintained and not hindered. Therefore <b>SG100 is met</b>.</p>		
<b>c</b>	<b>Management strategy implementation</b>			
	<b>Guide post</b>		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	<b>Met?</b>		Y	Y
	<b>Justification</b>	<p>Enforcement of the Licence Conditions and Management Plan as well as field observations demonstrate the fishery is limited to hand-gathering only and thereby minimises the mortality of any unwanted catch. The lack of any main or minor secondary species observed by fishery officers further demonstrates the strategy is working and the Dee-specific study on infaunal disturbance provides evidence for the rapid recovery of these communities (Kaiser et al. 2001). Therefore <b>SG100 is met</b>.</p>		
<b>d</b>	<b>Shark finning</b>			
	<b>Guide post</b>	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	<b>Met?</b>	Not relevant	Not relevant	Not relevant
	<b>Justification</b>	No sharks are caught in the fishery; therefore this SI need not be scored.		
<b>e</b>	<b>Review of alternative measures to minimise mortality of unwanted catch</b>			
	<b>Justification</b>	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of all secondary species, and they are implemented, as appropriate.

	<b>Met?</b>	Not relevant	Not relevant	Not relevant
	<b>Guide post</b>	As explained in section 2.8.2, the minor secondary species disturbed with the hand-raking of the cockles are all sorted from the main catch on-site and returned to the sediment. Although some mortality inevitably occurs, the effects on the community are only short-term (Kaiser et al. 2001) and the area fished amounts to only around 6% of the available estuarine intertidal area. The hand-raking method is also highly likely to be the lowest-impact method available of gathering cockles. On this evidence, the assessment team considers the effects on minor secondary species to be negligible and as per MSC guidance (GSA3.5.3) have used their discretion in determining that this SI does not need to be scored.		
	<b>References</b>	(Kaiser et al. 2001)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

**Evaluation Table for PI 2.2.3 – Secondary species information**

<b>PI 2.2.3</b>		<b>Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Information adequacy for assessment of impacts on main secondary species</b>			
	<b>Guide post</b>	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main secondary species with respect to status.  OR  <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and <b>adequate to assess</b> the impact of the UoA on main secondary species with respect to status.  OR  <b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	Quantitative information is available and <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main secondary species with respect to status.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Fishery officer observations of both hand-gathering practices and inspections of daily TAC bags have recorded zero presence of main secondary species to date. This provides a high degree of certainty that there are no main secondary species in the fishery. Therefore <b>SG100 is met.</b>		
<b>b</b>	<b>Information adequacy for assessment of impacts on minor secondary species</b>			
	<b>Guide post</b>			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	<b>Met?</b>			Y
	<b>Justification</b>	Accurate and verifiable information is available from direct observations of hand-raking and landings undertaken by NRW staff. Combined with studies of the ecological effects of hand-raking specific to the Dee Estuary (Kaiser et al. 2001) and the small spatial area of the cockle beds in relation to the estuarine area, this information provides a high degree of certainty that the fishery will have no adverse ecological consequences. Therefore <b>SG100 is met.</b>		
<b>Information adequacy for management strategy</b>				

<b>c</b>	<b>Guide post</b>	Information is adequate to support <b>measures</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> secondary species, and <b>evaluate</b> with a <b>high degree of certainty</b> whether the strategy is <b>achieving its objective</b> .
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The study by Kaiser et al. (2001) provides adequate information to support the management strategy in relation to secondary species by providing site-specific data on their recovery following physical disturbance.</p> <p>On-going monitoring of the SAC conservation objectives and WFD waterbody status surveys provide on-going infaunal data from the estuary. These programs provide data on the infaunal populations so if potential new secondary species colonized the sediments or existing species began to decline, these changes would be detected and the management strategy could be adapted if required.</p> <p>The data above along with observations by the fishery officers (NRW staff) is adequate to support the management strategy and provide a high degree of certainty that no minor secondary species are retained and that the strategy is achieving its objective. Therefore, <b>SG100 is met</b>.</p>		
<b>References</b>		(Kaiser et al. 2001)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1	The UoA meets national and international requirements for the protection of ETP species			
	The UoA does not hinder recovery of ETP species			
Scoring Issue	SG 60	SG 80	SG 100	
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and <b>likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, the <b>combined effects of the MSC UoAs</b> on the population/stock are known and <b>highly likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a <b>high degree of certainty</b> that the <b>combined effects of the MSC UoAs</b> are within these limits.
	Met?	Y	Y	Y
	Justification	<p>The effects of the fishery on ETP bird species (disturbance of feeding/roosting birds and removal of prey items) are considered on an annual basis via an Appropriate Assessment carried out under the Habitat Regulations. Under UK law, this assessment is reviewed by both NRW and Natural England before submission to Defra and the Welsh Government for final approval. Of the ETP bird species for which the site is designated, the oystercatcher is the only species with the potential to be significantly impacted by the commercial cockle fishery without any regulation. The Stillman bird food model described in section 0 is designed to ensure sufficient food exists for the oystercatcher population within the estuary by setting an appropriate TAC for the cockle fishery.</p> <p>Regulation 33 advice for the Dee Estuary European Marine Site (SAC, SPA, Ramsar) states that grey seals should be considered as they belong to a wider and mobile North Wales population with individuals likely belonging to the Pen Llyn a'r Sarnau SAC. Section 2.8.3 demonstrates that the seal population in the Dee Estuary is undergoing a long-term increase.</p> <p>The annual assessments undertaken and grey seal population data provide a high degree of certainty that the combined effects of the cockle fishery are within the limits set by national and international requirements. Therefore <b>SG100 is met</b>.</p>		
b	Direct effects			
	Guide post	Known direct effects of the UoA are likely to not <b>hinder recovery</b> of ETP species.	Known direct effects of the UoA are <b>highly likely</b> to not <b>hinder recovery</b> of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Y	Y	Y
	Justification	Direct effects of the cockle fishery would be disturbance of feeding or roosting wildfowl and waders and disturbance of sediments by hand-raking. The fishery has limited access to a restricted number of licensed fishers with restrictions on fishing times, permitted equipment and entry points to the estuary. The Code of Practice also aims to minimise any wildfowl and wader disturbance. These measures are		

<b>PI 2.3.1</b>		<b>The UoA meets national and international requirements for the protection of ETP species</b>	
		<b>The UoA does not hinder recovery of ETP species</b>	
		<p>reflected in the annual Appropriate Assessment; the conclusion of which (supported by this assessment team), is that this would not lead to detrimental direct effects on ETP species. Recent WeBS data indicate the oystercatcher population is at a 'favourable conservation status'. The fishery has no direct effect on the grey seal population in the Dee Estuary which is undergoing a long-term increase in numbers.</p> <p>The available data on ETP species along with the annual Appropriate Assessment of the fishery impact on the European Marine Site means that there is a high degree of confidence that there is no significant detrimental effect of the UoA on ETP species. Therefore SG100 is met.</p>	
<b>c</b>	<b>Indirect effects</b>		
	<b>Guide post</b>	Indirect effects have been considered and are thought to be <b>highly likely</b> to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	<b>Met?</b>	Y	Y
	<b>Justification</b>	<p>Indirect effects of the fishery would be removal of food items (cockles) as the over-wintering food source for wading birds, mainly oystercatchers but potentially also knot and black-tailed godwits. Section 2.8.3 determines the very unlikely impact on the latter two species given the smaller, non-commercial size of cockles they exploit and the observed increase in the 5-year peak mean population of black-tailed godwit using the estuary. The annual TAC which uses the Stillman bird food model, is calculated specifically to leave sufficient food to maintain the over-wintering oystercatcher population at or above favourable conservation status. The TAC is considered in the annual Appropriate Assessment; the conclusion of which (supported by this assessment team), is that this would not lead to detrimental direct effects on ETP species.</p> <p>As mentioned above, the grey seal population in the estuary is undergoing a long-term increase in numbers.</p> <p>Based on the above assessments, there is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species and SG100 is met.</p>	
<b>References</b>	(DEFRA 2015; Stillman 2013; Westcott 2004; NE/CCW 2010; NRW 2016c; Smith 2016)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/a</b>

## Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> <li>• meet national and international requirements;</li> <li>• ensure the UoA does not hinder recovery of ETP species.</li> </ul> <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>		
Scoring Issue	SG 60	SG 80	SG 100
<b>a</b>	<b>Management strategy in place (national and international requirements)</b>		
<b>Guide post</b>	There are <b>measures</b> in place that minimise the UoA-related mortality of ETP species, and are expected to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>comprehensive strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to <b>achieve above</b> national and international requirements for the protection of ETP species.
<b>Met?</b>	Y	Y	Y
<b>Justification</b>	<p>The Management Plan in place for the fishery is underpinned by conservation requirements for the SAC, SPA, Ramsar and SSSI designations of the Dee Estuary. These designations create the requirement for the annual Appropriate Assessment which assesses the fishery impacts on ETP species and designated habitats within the estuary. The fishery Code of Practice makes further efforts to reduce any impact on ETP species.</p> <p>Together the conservation objectives, annual Appropriate Assessment, Management Plan and Code of Practice form a comprehensive strategy which meets national and international requirements and SG100 is met.</p>		
<b>b</b>	<b>Management strategy in place (alternative)</b>		
<b>Guide post</b>	There are <b>measures</b> in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>strategy</b> in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>comprehensive strategy</b> in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
<b>Met?</b>	Not relevant	Not relevant	Not relevant
<b>Justification</b>	As there are conservation objectives set for the ETP species through the European Marine Site designations as outlined above, this SI does not need to be scored.		
<b>c</b>	<b>Management strategy evaluation</b>		
<b>Guide post</b>	The measures are <b>considered likely</b> to	There is an <b>objective basis for confidence</b> that	The strategy/comprehensive

		work, based on <b>plausible argument</b> (e.g., general experience, theory or comparison with similar fisheries/species).	the measures/strategy will work, based on <b>information</b> directly about the fishery and/or the species involved.	strategy is mainly based on information directly about the fishery and/or species involved, and a <b>quantitative analysis</b> supports <b>high confidence</b> that the strategy will work.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The management strategy is based entirely on information about the fishery. The derivation of the annual TAC uses data collected annually on the state of the cockle stocks and the oystercatcher population data are obtained on an annual basis from surveys in the estuary to determine their conservation status. The quantitative cockle data are input to the bird food model with a substantial buffer as a precautionary measure. Since the system has been in operation there have been no 'boom and bust' years and there is high confidence that the management strategy is working. Therefore, <b>SG100 is met.</b>		
<b>d</b>	<b>Management strategy implementation</b>			
	<b>Guide post</b>		There is some <b>evidence</b> that the measures/strategy is being implemented successfully.	There is <b>clear evidence</b> that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	<b>Met?</b>		Y	Y
	<b>Justification</b>	Annual documentary evidence exists demonstrating the setting of the TAC, Appropriate Assessment, opening of the fishery and biannual cockle bed surveys undertaken by the fishery management team. The September cockle surveys provide evidence of successful predictions of cockle abundance and, as mentioned in SI(c), since the strategy has been in operation there have been no 'boom and bust' years in the fishery.  The above processes provide clear evidence that the strategy is being implemented successfully and is not hindering the ETP species populations. Therefore, <b>SG100 is met.</b>		
<b>e</b>	<b>Review of alternative measures to minimize mortality of ETP species</b>			
	<b>Guide post</b>	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	<b>Met?</b>	Y	Y	Y

	<b>Justification</b>	<p>The use of the bird food model is reviewed regularly to ensure it is fit for purpose and does not result in any fishery-related mortality of ETP species. The parameters within the model and its format for use have been revised during the last assessment period and it is presently under further review in 2017 due to concern from the licence holders that it was too conservative. The model does not have a scheduled review period, rather only being reviewed if valid concerns are raised or new methodologies become available.</p> <p>The Management Plan has undergone several revisions since 2004 (2007, 2008, 2009, 2010, 2013 and 2015) during which ETP species are also considered although this is not a scheduled biennial event. The fishery does have a scheduled 5-yearly review during which time any ETP impacts are considered and any alternative measures for their protection would be considered.</p> <p>However, the annual Appropriate Assessment is specific to ETP species and designated habitats within the estuary which could be impacted by the fishery. Given the abundant information available on ETP species status within the estuary, the annual Appropriate Assessment would determine if there was any fishery-related ETP species mortality and consider any alternative measures to minimize this. There is however, no evidence of any ETP species mortality related to the fishery. On the basis of this annual Appropriate Assessment being undertaken, <b>SG100 is met.</b></p>
<b>References</b>	(DEFRA 2015; Stillman 2013; Jones 2015; NE/CCW 2010; NRW 2016c; Smith 2016)	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/a</b>

Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> <li>Information for the development of the management strategy;</li> <li>Information to assess the effectiveness of the management strategy; and</li> <li>Information to determine the outcome status of ETP species.</li> </ul>			
	Scoring Issue	SG 60	SG 80	SG 100
a	<b>Information adequacy for assessment of impacts</b>			
	<b>Guide post</b>	<p>Qualitative information is <b>adequate to estimate</b> the UoA related mortality on ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA:</p> <p>Qualitative information is <b>adequate to estimate productivity and susceptibility</b> attributes for ETP species.</p>	<p>Some quantitative information is <b>adequate to assess</b> the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA:</p> <p>Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	<p>Quantitative information is available to assess with a high degree of certainty the <b>magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status</b> of ETP species.</p>
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The data used to set the annual TAC for the fishery uses annual quantitative information on the cockle stocks as well as quantitative data on oystercatcher energy requirements. A precautionary factor is added to the oystercatcher feeding requirements to ensure sufficient cockles are allocated to them. These data provide a high degree of certainty that the fishery will not negatively impact the oystercatcher population. Disturbance effects are not quantifiable but given the nature of access to the cockle beds (boat only over high water) and the small spatial area they cover, they are reasonably expected to be negligible. Therefore <b>SG100 is met.</b></p>		
b	<b>Information adequacy for management strategy</b>			
	<b>Guide post</b>	<p>Information is adequate to support <b>measures</b> to manage the impacts on ETP species.</p>	<p>Information is adequate to measure trends and support a <b>strategy</b> to manage impacts on ETP species.</p>	<p>Information is adequate to support a <b>comprehensive strategy</b> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a <b>high degree of certainty</b></p>

				whether a strategy is achieving its objectives.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	As mentioned above, the biannual cockle surveys provide regular and adequate information to inform the annual setting of the TAC for the fishery. Annual WeBS surveys and grey seal population data provide quantitative information that permits evaluation with a high degree of certainty that the management strategy is achieving its conservation objectives. Therefore <b>SG100 is met.</b>		
	<b>References</b>	(NRW 2016b; Frost et al. 2016; Burnett 2010; Westcott 2004)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

Evaluation Table for PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Commonly encountered habitat status</b>			
	<b>Guide post</b>	The UoA is <b>unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	A site-specific study on the effects of cockle fishing in the Dee Estuary has demonstrated that the effects of hand-raking the top few centimetres of intertidal sediment are short-term and do not reduce habitat structure and function to a point where there is serious and irreversible harm and infaunal communities recover rapidly from the disturbance to which they are exposed (Kaiser et al. 2001). Therefore <b>SG100 is met.</b>		
b	<b>VME habitat status</b>			
	<b>Guide post</b>	The UoA is <b>unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The fishery is limited to the commonly encountered ‘main’ habitats of intertidal sediments of sands and muddy-sands. Communities in these habitats exhibit a rapid recovery time following physical disturbance as outlined in SI(a) above. Access to the cockle beds is undertaken over high-water by boat and entry to and egress from the estuary is restricted to certain points (this is stipulated in the licence conditions). Fishery officer observations and the Code of Practice ensure that licence holders adhere to these rules and the vessels do not impact on saltmarsh and <i>Salicornia</i> habitats. Therefore there are no VMEs considered to overlap with the fishery or be impacted by it and therefore, <b>SG100 is met by default.</b>		
c	<b>Minor habitat status</b>			
	<b>Guide post</b>			There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where

				there would be serious or irreversible harm.
	<b>Met?</b>			Y
	<b>Justification</b>	The fishery is limited in where it can operate to the areas defined as cockle beds and its overall footprint is small. No minor habitats were identified and therefore <b>SG100 is met by default.</b>		
	<b>References</b>	(DEFRA 2015; Kaiser et al. 2001; NRW 2016c)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 2.4.2 – Habitats management strategy

<b>PI 2.4.2</b>		<b>There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.</b>		
<b>Scoring Issue</b>	SG 60	SG 80	SG 100	
<b>a</b>	<b>Management strategy in place</b>			
	<b>Guide post</b>	There are <b>measures</b> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a <b>partial strategy</b> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a <b>strategy</b> in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The Management Plan for the fishery is reviewed annually. The overarching strategy behind this plan is the management objective to minimize the impacts of the fishery on the European Marine Site (SAC and SPA), Ramsar site and SSSI. These designations mean that any activity undertaken in the estuary must be assessed for its likely impact on the designated habitats.</p> <p>The Management Plan and Licence Conditions state that only cockles may be taken and limit the gear use within the fishery to that of hand-gathering only with specifications of the permitted dimensions of rakes, riddles and jumbos. Boats must be used to access the sites and motor vehicles are not permitted. An 'Enforcement and Sanctions' guidance document is sent out to all licence holders annually to inform fishers which activities are and are not permitted.</p> <p>The Management Plan, Licence Conditions, Enforcement and Sanction guidance and site conservation objectives together form a strategy to minimise habitat disturbance from the fishery activities. The strategy aims to minimise the disturbance to minor secondary species; any retention by fishers that did occur would be unintentional and negligible. Therefore <b>SG100 is met.</b></p>		
<b>b</b>	<b>Management strategy evaluation</b>			
	<b>Guide post</b>	The measures are <b>considered likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>Hand-gathering can be observed easily by fishery officers to ensure that cockle fishers are adhering to the licence conditions in terms of the methods used, areas fished and the catch landed. EA and NRW staff can observe the daily TAC bags at the point of landing and assess them for content thereby ensuring the habitats are not being denuded of other species. This ability to observe all aspect of the fishery operation provides high confidence that the management strategy described is working.</p> <p>Infaunal invertebrate species disturbed during the fishing process are described in the Dee-specific study by Kaiser &amp; Hall (2001). The study demonstrates rapid recovery (within one year) of the infaunal habitats and communities following</p>		

<b>PI 2.4.2</b>		<b>There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.</b>	
		<p>disturbance from hand-raking – a result expected in a highly dynamic estuarine system where physical disturbance is a key driver of ecological processes.</p> <p>Based on the species-specific and site-specific information above there is high-confidence that the strategy will work and there is no risk of serious or irreversible harm to the estuarine habitats. Therefore <b>SG100 is met.</b></p>	
<b>c</b>	<b>Management strategy implementation</b>		
	<b>Guide post</b>		<p>There is <b>some quantitative evidence</b> that the measures/partial strategy is being implemented successfully.</p>
			<p>There is <b>clear quantitative evidence</b> that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).</p>
	<b>Met?</b>		Y
	<b>Justification</b>	<p>Enforcement of the Licence Conditions and Management Plan as well as field observations demonstrate the fishery is limited to hand-gathering only and thereby minimises the impact on habitats in the Dee Estuary. Regular, statutory monitoring of SAC/SPA designated habitats and assessments of their conservation status, in addition to the study by Kaiser et al. (2001) provides further quantitative evidence that the fishery is achieving its objective not to cause serious or irreversible harm to these habitats. Therefore <b>SG100 is met.</b></p>	
<b>d</b>	<b>Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs</b>		
	<b>Guide post</b>	<p>There is <b>qualitative evidence</b> that the UoA complies with its management requirements to protect VMEs.</p>	<p>There is <b>some quantitative evidence</b> that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.</p>
			<p>There is <b>clear quantitative evidence</b> that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.</p>
	<b>Met?</b>	Not relevant	Not relevant
	<b>Justification</b>	<p>FCR v2.0 Guidance SA3.14.3 states that “<i>The team shall score scoring issue (d) if the UoA impacts a VME and/or if another MSC UoA or non-MSC fishery, where relevant, impacts a VME within the UoA’s “managed area” (as defined in SA3.13.5).</i>”</p> <p>As the cockle fishery does not have an impact on any VMEs and there are no other fisheries within the estuary considered to impact the VMEs identified in section 2.8.4. Therefore this SI is not scored.</p>	
<b>References</b>		(DEFRA 2015; Kaiser et al. 2001; NRW 2016c)	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/a</b>

**Evaluation Table for PI 2.4.3 – Habitats information**

<b>PI 2.4.3</b>		<b>Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Information quality</b>			
	<b>Guide post</b>	<p>The types and distribution of the main habitats are <b>broadly understood</b>.</p> <p>OR</p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b></p> <p>Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and <b>vulnerability</b> of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p>OR</p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b></p> <p>Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The distribution of all habitat types within the Dee Estuary European Marine Site (SAC/SPA/Ramsar/SSSI) has been accurately mapped as part of the site’s statutory monitoring program. This information is available in the Regulation 33 Advice for the site (NE/CCW 2010). Therefore <b>SG100 is met</b>.</p>		
<b>b</b>	<b>Information adequacy for assessment of impacts</b>			
	<b>Guide post</b>	<p>Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.</p> <p>OR</p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b></p>	<p>Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.</p> <p>OR</p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b></p>	<p>The physical impacts of the gear on all habitats have been quantified fully.</p>

		Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The physical impacts of the gear on all habitats have been quantified fully in the site-specific study by Kaiser et al. (2001) and are considered annually in the Appropriate Assessment undertaken to assess possible fishery impacts against the site's conservation objectives (Smith 2016). Therefore <b>SG100 is met.</b>		
<b>c</b>	<b>Monitoring</b>			
	<b>Guide post</b>		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	<b>Met?</b>		Y	Y
	<b>Justification</b>	Monitoring of the conservation status of the European Marine site requires on-going, statutory, regular monitoring of any changes in habitat distributions; typically this is undertaken at least once every six years and reported in the Regulation 33 Advice document (NE/CCW 2010). The distributions of the cockle beds are also monitored annually by NRW during the spring cockle surveys and these would detect any changes should they occur. <b>SG100 is met.</b>		
<b>References</b>		(Kaiser et al. 2001; NE/CCW 2010; Smith 2016)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 2.5.1 – Ecosystem outcome

<b>PI 2.5.1</b>		<b>The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Ecosystem status</b>			
	<b>Guide post</b>	The UoA is <b>unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is <b>highly unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>Disruption by the fishery operation of habitats and intertidal invertebrates which all contribute to key ecosystem elements such as biological diversity, foodweb (trophic) functioning and physical structure has been studied in detail and is annually assessed against the conservation objectives of the Dee Estuary European Marine Site. No significant effects have been identified thereby providing evidence that key elements underlying ecosystem structure and function are not significantly affected by the fishery. This evidence and that from on-going monitoring of top predators such as wildfowl and waders and grey seals and of other estuarine habitats providing services such as coastal defence (e.g. saltmarsh) from various monitoring programmes provide evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.</p> <p>Furthermore, the annual Appropriate Assessment in particular considers the physical and biological impacts of the fishery on all elements within the Dee Estuary SAC/SPA ecosystem irrespective of whether they may or may not be affected by the fishery. Cumulative effects in combination with natural events and other nearby human activities outside the estuary as well as the reversibility of any impacts are all considered. Overall the Assessment concludes that the fishery, managed in its present state will not have any adverse effects on the integrity of the SPA or SAC features.</p> <p>Therefore <b>SG100</b> is met.</p>		
<b>References</b>		(DEFRA 2015; Kaiser et al. 2001; NRW 2016d)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 2.5.2 – Ecosystem management strategy

<b>PI 2.5.2</b>		<b>There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.</b>		
<b>Scoring Issue</b>	SG 60	SG 80	SG 100	
<b>a</b>	<b>Management strategy in place</b>			
	<b>Guide post</b>	There are <b>measures</b> in place, if necessary which take into account the <b>potential impacts</b> of the fishery on key elements of the ecosystem.	There is a <b>partial strategy</b> in place, if necessary, which takes into account <b>available information and is expected to restrain impacts</b> of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a <b>strategy</b> that consists of a <b>plan</b> , in place which contains measures to <b>address all main impacts of the UoA</b> on the ecosystem, and at least some of these measures are in place.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The Dee Estuary European Marine Site's statutory conservation objectives form a strategy against which to consider the ecosystem impacts. The fishery Management Plan and Code of Practice form the plan which addresses the impacts identified in the annual Appropriate Assessments of the fishery on all ecosystem elements based on the best available knowledge. All the measures within the plan are in place and are based on a sound understanding of the ecosystem and the potential impacts the fishery might have. Therefore <b>SG100 is met.</b>		
<b>b</b>	<b>Management strategy evaluation</b>			
	<b>Guide post</b>	The <b>measures</b> are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	There is <b>some objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	As explained for each PI above, evidence exists through fishery officer observations, field experiments, annual cockle stock assessments, modelling and on-going statutory monitoring of physical and biological components of the European Marine Site to support high confidence that the strategy will work to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function. Therefore <b>SG100 is met.</b>		
<b>c</b>	<b>Management strategy implementation</b>			
	<b>Guide post</b>		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully.</b>	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective</b>

				<b>as set out in scoring issue (a).</b>
	<b>Met?</b>		Y	Y
	<b>Justification</b>	<p>Infringements of licence conditions are not documented by fishery managers although sanctions are applied when required (Rick Pritchard, NRW, pers. Comm.). However, the enforcement of the Licence Conditions and Management Plan as well as fishery officer observations and inspections demonstrate the fishery is limited to hand-gathering only and within the permitted cockle bed areas, thereby minimising the impact on the Dee Estuary ecosystem. Regular, statutory monitoring of SAC/SPA designated habitats and species and assessments of their conservation status is undertaken and the data show in many cases that populations of birds are stable or increasing whilst that of the grey seal is also increasing. WFD monitoring also provides data on the subtidal environment and physico-chemical parameters such as water quality. These data, in addition to the study by Kaiser et al. (2001) provide quantitative evidence that the fishery is achieving its objective not to cause serious or irreversible harm to the Dee Estuary ecosystem. Therefore <b>SG100 is met.</b></p>		
	<b>References</b>	(DEFRA 2015; Frost et al. 2016; Burnett 2010; Westcott 2004)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Evaluation Table for PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Information quality</b>			
	<b>Guide post</b>	Information is adequate to <b>identify</b> the key elements of the ecosystem.	Information is adequate to <b>broadly understand</b> the key elements of the ecosystem.	
	<b>Met?</b>	Y	Y	
	<b>Justification</b>	Information on the key elements of the Dee Estuary ecosystem is extensive with the various monitoring programs previously mentioned (WFD, SAC/SPA monitoring, WeBS counts, seal counts, benthic surveys etc) all contributing to the knowledge of the ecosystem. These data are enhanced by specific studies to understand the impacts of the cockle fishery such as the bird food model and the physical disturbance investigations by Kaiser et al. (2001). Therefore <b>SG80 is met.</b>		
b	<b>Investigation of UoA impacts</b>			
	<b>Guide post</b>	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but <b>have not been investigated</b> in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and <b>some have been investigated in detail.</b>	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and <b>have been investigated in detail.</b>
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	All the main interactions of the fishery with the ecosystem components with which they interact have been investigated in detail e.g. habitat / community recovery following disturbance (Kaiser et al. 2001); bird food model to consider indirect effects on bird species (Stillman 2013; Jones 2015). Together with the annual bird surveys (WeBS counts) these data provide evidence that the trophic webs within the ecosystem are maintained and not adversely impacted by the fishery. Therefore <b>SG100 is met.</b>		
c	<b>Understanding of component functions</b>			
	<b>Guide post</b>		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are <b>known.</b>	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are <b>understood.</b>
	<b>Met?</b>		Y	Y
	<b>Justification</b>	The ecological functions of the P1 target species, primary, secondary and ETP species and habitats within the Dee Estuary are understood as are the interactions between them e.g. predator-prey relationships. Impacts of the fishery on the		

<b>PI 2.5.3</b>		<b>There is adequate knowledge of the impacts of the UoA on the ecosystem.</b>	
		ecosystem components have been identified and tested e.g. Kaiser et al. (2001). Therefore <b>SG100 is met.</b>	
<b>d</b>	<b>Information relevance</b>		
	<b>Guide post</b>	Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components <b>and elements</b> to allow the main consequences for the ecosystem to be inferred.
	<b>Met?</b>	Y	Y
	<b>Justification</b>	The study by Kaiser et al. (2001) demonstrated that the low-impact method of hand-raking had only short-term effects on the key ecosystem components and elements of the Dee Estuary ecosystem such as benthic species richness and abundance (a vital component of the estuarine food web) and the physical structure of benthic sediments. Any physical disturbance of sediments is limited to the top few centimetres of sediment over <6% of available substrate with rapid recovery taking place in what is naturally a very dynamic environment. These data allow the main consequences for the ecosystem to be both inferred and quantified by sampling if required. Potential impacts from the fishery on the ecosystem are also reviewed annually through an Appropriate Assessment and have been assessed as insignificant (Smith 2016). Therefore <b>SG100 is met.</b>	
<b>e</b>	<b>Monitoring</b>		
	<b>Guide post</b>	Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	<b>Met?</b>	Y	Y
	<b>Justification</b>	Information available on the Dee Estuary ecosystem is extensive. Consequently the fishery Management Plan in place is based on a sound understanding of the ecology of the species and habitats potentially impacted by the fishery. The information available provides an understanding of inter-specific relationships relevant to the fishery, the cockle-oystercatcher relationship in particular being key to the setting of the annual TAC. On-going monitoring by the fishery of cockle stocks and statutory monitoring of the European Marine Site mean that any changes in risk levels can be identified and responded to relatively quickly. Therefore <b>SG100 is met.</b>	
<b>References</b>		(Stillman 2013; Jones 2015; Kaiser et al. 2001; Westcott 2004; Smith 2016)	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/a</b>

**Principle 3**

**Evaluation Table for PI 3.1.1 – Legal and/or customary framework**

<b>PI 3.1.1</b>		<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> <li>• Is capable of delivering sustainability in the UoA(s); and</li> <li>• Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>• Incorporates an appropriate dispute resolution framework.</li> </ul>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Compatibility of laws or standards with effective management</b>			
	<b>Guide post</b>	There is an effective national legal system <b>and a framework for cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system <b>and organised and effective cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system <b>and binding procedures governing cooperation with other parties</b> which delivers management outcomes consistent with MSC Principles 1 and 2.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>Management is underpinned by a Regulating Order (2008), which is established under the Sea Fisheries (Shellfish) Act 1967, and is a common framework in the UK for the management of bivalve fisheries. The Regulating Order gives the grantees (NRW in Wales and the Environment Agency in England) the power to make such regulations as may be required for the management of the fishery (para. 3):</p> <p>(1) The grantee has the right of regulating a fishery for cockles within the fishery for a period of 20 years starting on 1st July 2008.</p> <p>(2) This right includes the right, with the consent of the appropriate national authority, to impose restrictions on, and make regulations respecting, the dredging, fishing for or taking of cockles within the limits of the fishery.</p> <p>There is a 'service-level agreement' between NRW and the Environment Agency which allows for a 'delegation of functions' from the EA to NRW such that NRW can manage the whole fishery, on both sides of the border (including enforcement), although the EA continue to play a role in oversight and review (e.g. they may attend Liaison Committee meetings, they participate in the 5-year reviews).</p> <p>On this basis, there is a clear and straightforward legal framework for the fishery, and there is organised and effective cooperation to ensure no duplication of functions between the two grantees. SG60 and SG80 are met. The EA provides some funds to NRW for management and therefore it is likely that the contractual agreement has some legally-binding status. On this basis, the team concluded that SG100 is met.</p>		
<b>b</b>	<b>Resolution of disputes</b>			
	<b>Guide post</b>	The management system incorporates or is subject by law to a <b>mechanism</b> for the resolution of legal	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the

		disputes arising within the system.	resolution of legal disputes which is <b>considered to be effective</b> in dealing with most issues and that is appropriate to the context of the UoA.	resolution of legal disputes that is appropriate to the context of the fishery and has been <b>tested and proven to be effective</b> .
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>The Regulating Order explicitly gives the grantees the power to take (and enforce) decisions on the management of the fishery – this power is delegated to NRW on both sides of the border. There is therefore no legal dispute about the power to take decisions or set regulations or the validity of regulations made by NRW. The fishery has procedures in place for stakeholder consultation, which is the most effective method for reducing and resolving legal (and other) disputes in small-scale, inshore fisheries (described below). There have been no legal disputes in the fishery; these would be dealt with through the courts in England or Wales in the usual way. Note that the service-level agreement delegates the functions of the EA in England to NRW, including legal functions such as enforcement (for offences leading to legal action, the offence would go through the courts of the jurisdiction in which the offence took place).</p> <p>Despite the fact that some licensees disagree with the management system (see below), there have not been any legal disputes which suggests that the system is effective – SG80 is met. Since there have not been any legal disputes, however, it has not been tested, so SG100 is not met.</p>		
<b>c</b>	<b>Respect for rights</b>			
	<b>Guide post</b>	The management system has a mechanism to <b>generally respect</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>observe</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>formally commit</b> to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>When the fishery moved over to management by the Regulating Order, it was decided to allocate 50 licences, based on an assessment of what the fishery could support without continuing the boom-bust cycle which had previously characterised it. There were more than 50 applications for licences, which were therefore initially allocated via a published allocation procedure, based on track record. Licences are only reallocated if they are not renewed by the existing licensee. Three ‘apprentice licences’ have also been created in addition to the 50. There is also a right for all private individuals to take up to 5kg / day for personal consumption.</p> <p>This procedure observes formally the customary rights of individuals who have depended on the fishery for (some of) their livelihoods in the past, as far as is possible consistent with more sustainable management than in the past. It also allows some</p>		

		personal take for food. On this basis, since the system is set out formally, SG100 is met.
<b>References</b>	(England & Wales. SFEW 2008; Anon 1967; NE/CCW 2010) Licence allocation procedure (section 1.1 in (DEFRA 2015))	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/a</b>

**Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities**

PI 3.1.2	<p><b>The management system has effective consultation processes that are open to interested and affected parties.</b></p> <p><b>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</b></p>			
	Scoring Issue	SG 60	SG 80	SG 100
a	<b>Roles and responsibilities</b>			
	<b>Guide post</b>	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>generally understood</b> .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for key areas</b> of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for all areas</b> of responsibility and interaction.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The organisations involved in management and their roles are set out in Table 3. Most of the management takes place internally within NRW since it is a very horizontally-integrated organisation. However, within NRW, roles are clear; for example, the HRAs are prepared by the Dee Senior Conservation Office in the regional team (Flintshire / Wrexham) and reviewed by the all-Wales team, as well as by Natural England. The division of responsibilities between Wales (NRW) and England (EA) is likewise explicit and clear as set out in 3.1.1a. The management system for the fishery is straightforward, and the assessment team could not find any area for which responsibilities are unclear – and therefore concluded that SG100 is met.		
b	<b>Consultation processes</b>			
	<b>Guide post</b>	The management system includes consultation processes that <b>obtain relevant information</b> from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information and <b>explains how it is used or not used</b> .
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The formal structure for consultation with stakeholders (licensees) is the Dee Estuary Sea Fishery Liaison Group, who meet, for example, before the start of the season to discuss the TAC and daily quota. For various reasons, however, this group is not		

		<p>functioning well at present. Licensees on the English side would prefer a stronger English role in the management of the fishery and to demonstrate their frustration are refusing to participate. More generally, however, NRW is concerned that the group participants, although selected by the licensees, may not reflect the wider viewpoint.</p> <p>NRW is trying to deal with this in two ways: they are encouraging the EA in England to exercise their oversight role more strongly day-to-day in the management of the fishery (e.g. by attending Liaison Group meetings) and they are experimenting with consulting with all licensees via email rather than relying on the Liaison Group for stakeholder input.</p> <p>Aside from the formal consultation process via the Liaison Group, NRW are in constant contact with licensees throughout the season, and may act on information received to adjust management – for example, if licensees report high densities of cockles below the MLS, they may arrange a survey and if necessary act to reduce the MLS temporarily.</p> <p>There is no system for formal engagement with NGOs in relation to the day-to-day management of the fishery, but this is more because the statutory conservation bodies are highly integrated into the management system. In Wales, this is NRW, who are the management agency – it is clear that the ‘conservation’ parts of NRW play a major role in the fishery (e.g. via the bird-food model, HRAs etc.). Natural England play less of a role, but is consulted regulation (e.g. annually on the HRA, as part of the 5-year reviews). NGOs are, however, consulted periodically – for example, RSPB is playing a role in the current review of the bird-food model (across all cockle fisheries in England and Wales).</p> <p>NRW set out in the Annual Report the input they receive from stakeholders and their response – for example, in the 2015 annual report they note that stakeholders queried the suitability of the bird-food model and provide feedback on the revision currently underway. On this basis, the management system seeks and accepts relevant information, and also has a mechanism to explain how it is used or dealt with or responded to. SG100 is met.</p>		
<b>c</b>	<b>Participation</b>			
	<b>Guide post</b>		The consultation process <b>provides opportunity</b> for all interested and affected parties to be involved.	The consultation process provides <b>opportunity and encouragement</b> for all interested and affected parties to be involved, and <b>facilitates</b> their effective engagement.
	<b>Met?</b>		Y	N
	<b>Justification</b>	Following the difficulties with the Liaison Group, it is clear that NRW is trying to find better mechanisms for consultation with licensees, and is trying out consultation of all licensees by email alongside the Liaison Group. On this basis, it is reasonable to argue that there is opportunity for interested parties to be involved; however, the deficiency in the formal structure (for various reasons) probably doesn't help in facilitating engagement, particularly since not everyone is guaranteed to have access to email. Other stakeholders such as conservation NGOs are not involved in day-to-day management (but it is not clear they want to be) but are involved in wider questions such as the revision of the bird-food model. On this basis SG80 is met but SG100 is not met.		

<b>References</b>	(NRW 2015)
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>	<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/a</b>

Evaluation Table for PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are <b>implicit</b> within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are <b>explicit</b> within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are <b>explicit</b> within <b>and required by</b> management policy.
	Met?	Y	Y	Y
	Justification	<p>Long-term objectives for the fishery are set out in several contexts: i) in the management plan for the fishery established under the Regulating Order; ii) by NRW as part of the wider framework underpinning their activities and iii) as part of the management of the SAC/SPA. The objectives set out by the fishery management plan are considered under 'fishery-species objectives' (PI 3.2.1) below, while the broader objectives are considered here.</p> <p>1. NRW objectives            NRW has established a system of 3-year Corporate Plans (current 2014-17) which sets out a framework of objectives to underpin activities and priorities. This states, for example, the Purpose of NRW as '<i>to ensure that the environment and natural resources of Wales are sustainably maintained, sustainably enhanced and sustainably used, now and in the future</i>'. This is intended to be delivered via the 'Five Goods' which are intended to set some objectives as to how NRW should act, as follows:</p> <ul style="list-style-type: none"> <li>• Good knowledge (information-gathering, evidence-based decision-making)</li> <li>• Good for the environment (resilient ecosystems, populations and landscapes)</li> <li>• Good for people (safety, sustainable use of natural resources, education)</li> <li>• Good for business (good location for business, use of best practice)</li> <li>• Good organisation (leadership, transparency, staff skills, benchmarking, continuous improvement)</li> </ul> <p>Each of the 'goods' is associated in the plan with more concrete and measureable indicators and commitments with a three-year timeframe.</p> <p>2. SAC / SPA            The SAC and SPA set objectives with which the fishery must comply; favourable conservation status for the qualifying features. For the SPA in particular, these can be translated into quantitative objectives; e.g. retaining sufficient food for 16,813 oystercatchers.            On this basis, the team concluded that SG 80 is met – objectives are clear and explicit and cover various aspects of the fishery. The objectives identified here are all 'required' although by bodies at several steps removed from the fishery itself; the Welsh Government requires NRW to develop a framework of objectives, indicators</p>		

<b>PI 3.1.3</b>	<b>The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.</b>	
		etc., and objectives for European marine sites are required by the Birds and Habitats Directives. The team concluded that this is sufficient for SG100 to be met.
<b>References</b>	(JNCC 2016a; Smith 2016; NRW 2013)	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/a</b>

**Evaluation Table for PI 3.2.1 Fishery-specific objectives**

<b>PI 3.2.1</b>		<b>The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Objectives</b>			
	<b>Guide post</b>	<b>Objectives</b> , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>implicit</b> within the fishery-specific management system.	<b>Short and long-term objectives</b> , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>explicit</b> within the fishery-specific management system.	<b>Well defined and measurable short and long-term objectives</b> , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The management plan associated with the Regulating Order (DEFRA 2015) sets fishery-specific objectives as follows:</p> <ul style="list-style-type: none"> <li>To develop a sustainable fishery that provides a consistent, regular income for fishermen</li> <li>To minimise the impacts to the European site and local residents arising from fishing activities</li> <li>To improve fishery management, monitoring and enforcement</li> </ul> <p>This addresses, quite concisely, the fishery-specific objectives for both Principle 1 (sustainable, consistent fishery), Principle 2 (European sites) and Principle 3 (improved management and enforcement). On this basis, SG80 is met. In relation to SG100, these objectives are measurable to some extent (e.g. via year-to-year fluctuations in the TAC, the HRAs, evaluations of the SAC/SPA), and in some cases, explicitly quantitative objectives are provided as set out above (e.g. 16,813 oystercatchers). There is not a quantitative objective defined for the cockle stock as and of itself (as opposed to in relation to the oystercatcher food requirements) but given the nature of these populations (highly variable in biomass, recruitment and dynamics in time and space) it seems more appropriate to measure the success of the fishery in these more indirect ways (e.g. via the year-to-year variability and the population of species dependent on cockles). On this basis, the team concluded that SG100 is met.</p>		
<b>References</b>		(DEFRA 2015; NRW 2016d)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

**Evaluation Table for PI 3.2.2 – Decision-making processes**

<b>PI 3.2.2</b>		<b>The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Decision-making processes</b>			
	<b>Guide post</b>	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are <b>established</b> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	<b>Met?</b>	Y	Y	
	<b>Justification</b>	There are established decision-making processes – the example is given as to how the decision on the TAC is taken in Section 2.7. Decision-making is mainly internal to NRW but there are structures (formal and informal) that allow for stakeholder input and review throughout the season. SG80 is met.		
<b>b</b>	<b>Responsiveness of decision-making processes</b>			
	<b>Guide post</b>	Decision-making processes respond to <b>serious issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to <b>serious and other important issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to <b>all issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	Decision-making is adaptive, both during the season (responding to input from licensees) and season to season (responding to monitoring data, new research and input from licensees). The serious / important issues raised during the season and the response of NRW is summarised in the Annual Report. As would be expected, sometimes NRW may take or change a decision to respond issues (e.g. adapting the bird food model to respond to new research and concerns of stakeholders during a poor season), and sometimes they do not – but this is explained. SG80 is met.  There may be issues to which NRW does not respond in full (e.g. the concerns of English licensees that they are somehow not represented); while attempts have been made to mitigate the problem (e.g. asking EA to become more involved, finding alternative methods of consultation), it is clear that the entire management framework is not going to be altered for their benefit.  It is a lot to ask for a management system to respond to all issues including those which are not serious and not important. SG100 is not met.		

<b>c</b>	<b>Use of precautionary approach</b>			
	<b>Guide post</b>		Decision-making processes use the precautionary approach and are based on best available information.	
	<b>Met?</b>		Y	
<b>Justification</b>	<p>The key decision-making tool is the bird-food model, which is used to set the TAC based on the food requirements of the number of oystercatchers defining 'favourable conservation status'. The current model is quite precautionary, in that it assumes that all the food requirements need to be met by cockles, whereas in practice it is known that oystercatchers also eat other species; also it is based on peak mean oystercatcher numbers rather than mean numbers over the season. The number of licences (53) defined under the Regulating Order is also precautionary – prior to the order there were several hundred permits given out each year. The nature of cockle dynamics means that this did not crash the population in the long-term, but it did result in much higher interannual variability ('boom-bust') than is the case now. Based on these two critical examples, decision-making is highly precautionary.</p> <p>There are also examples of decision-making being adaptive to new information; for example the ongoing review of the bird-food model to take new biological information into account, the ability to adjust regulations mid-season to take account of the size and distribution of cockles on the beds as reported by licensees; this is then confirmed by the annual autumn (September) survey. Met.</p>			
<b>d</b>	<b>Accountability and transparency of management system and decision-making process</b>			
	<b>Guide post</b>	Some information on the fishery's performance and management action is generally available on request to stakeholders.	<b>Information on the fishery's performance and management action is available on request,</b> and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders <b>provides comprehensive information on the fishery's performance and management actions</b> and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	<b>Met?</b>	Y	Y	N
<b>Justification</b>	<p>NRW produce an annual report which sets out the fishery performance (total catches by bed), and issues raised during the season and how management responded to them (as well as an outline of the finances of the management of the fishery). They also produce a Licence Renewal Pack before the start of each season, including all the documents the licensees need, and a covering letter summarising key points and regulations for the season.</p> <p>This constitutes formal reporting to stakeholders, although information is in summary form rather than necessarily 'comprehensive' in all areas. It is clear that NRW is in</p>			

		close contact with key stakeholders (licensees) throughout the season, with information on the fishery performance and associated decision-making flowing in both directions. It was not, however, clear to the team whether there would be comprehensive, formal reporting in all areas, such as in relation to the review of the bird food model, although it is clear that stakeholders could easily obtain such information from NRW via informal channels/ Overall, the team considered that SG80 is met but SG100 might not be met in full for all areas.		
<b>e</b>	<b>Approach to disputes</b>			
	<b>Guide post</b>	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	As noted above, there have not been any legal disputes in the fishery, suggesting that the management system is sufficiently well-considered to avoid them. Although it is clear that not all stakeholders are happy with the management framework, NRW have tried to act to resolve disputes non-legally (via consultation and communication). SG100 is met.		
<b>References</b>	(DEFRA 2015)			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

Evaluation Table for PI 3.2.3 – Compliance and enforcement

<b>PI 3.2.3</b>		<b>Monitoring, control and surveillance mechanisms ensure management measures in the fishery are enforced and complied with.</b>		
<b>Scoring Issue</b>	SG 60	SG 80	SG 100	
<b>a</b>	<b>MCS implementation</b>			
	<b>Guide post</b>	Monitoring, control and surveillance <b>mechanisms</b> exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance <b>system</b> has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A <b>comprehensive</b> monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	There is a MCS system in place as described in Section 2.7. The main concern has been overshooting of the daily quota via overfilling of the bags, but it is thought that the introduction of the new size-specific bags have been helpful in reducing this. Overall, while compliance is not perfect, NRW is of the view the non-compliance is kept to a manageable level which does not impact the achievement of the fishery-specific objectives. SG80 is met. The system is based on enforcement officers on the ground and does not rely on technology such as remote surveillance; with a presence on average 2 days/week it is not 'comprehensive' so SG100 is not met.		
<b>b</b>	<b>Sanctions</b>			
	<b>Guide post</b>	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, <b>are consistently applied</b> and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and <b>demonstrably</b> provide effective deterrence.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	Sanctions are set out in the Enforcement and Sanctions Guidance for the fishery, which will be distributed to the licensees in the Licence Renewal Pack at the start of the season. For each possible offence / breach of regulations, it sets out clear the normal enforcement response as well as possible supplementary enforcement actions.  To give an example: the taking of undersized cockles: <i>Normal enforcement response: Where we believe it was unintentional or for a first time offence - warning. Intentional or repeat offence - Formal Caution or Prosecution.</i>  <i>Potential supplementary action –</i>  <ul style="list-style-type: none"> <li>• <i>Seizure of any instruments and application to court for forfeiture.</i></li> <li>• <i>Return harvested cockle to the beds, providing safe to do so.</i> <i>OR If cockle cannot be returned, seizure and sell to a cockle processor.</i> <i>All monies to be held in accordance with financial procedures, pending enforcement outcome.</i></li> <li>• <i>Upon conviction seek consent of Ministers for cancellation of the licence</i></li> </ul>		

		On this basis, sanctions are clear and consistently applied; the view of NRW is that they are relatively effective. SG80 is met. There remains, however, some level of non-compliance in the fishery in their view, so SG100 is not met.																											
<b>c</b>	<b>Compliance</b>																												
	<b>Guide post</b>	Fishers are <b>generally thought</b> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	<b>Some evidence exists</b> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a <b>high degree of confidence</b> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.																									
	<b>Met?</b>	Y	Y	N																									
	<b>Justification</b>	<p>Compliance statistics from 2016 are not yet available. Statistics from 2012-15 are given below (source NRW):</p> <table border="1"> <thead> <tr> <th>Enforcement action</th> <th>2012</th> <th>2013</th> <th>2014</th> <th>2015</th> </tr> </thead> <tbody> <tr> <td>Prosecution</td> <td>3</td> <td>1</td> <td>16</td> <td>0</td> </tr> <tr> <td>Formal Caution</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>Warning Letter</td> <td>0</td> <td>3</td> <td>10</td> <td>3</td> </tr> <tr> <td>Suspension</td> <td>2</td> <td>1</td> <td>10</td> <td>0</td> </tr> </tbody> </table> <p>There was a spike in detected non-compliance in 2014; reportedly, high prices and high availability (good stocks) plus strong pressure from some buyers for additional supply, resulted in a strong incentive to overcrop the daily quotas. NRW responded to this with a strong effort towards targeted enforcement, resulting in an unusually high number of prosecutions. This situation was a key driver for the introduction of the bag TAC, which makes overcropping much easier to detect and prosecute; one of the reasons why there have been few prosecutions since then (none in 2015; data from 2016 are not yet available but it was reported anecdotally to have been a 'quiet year').</p> <p>In relation to providing information, it is an offence not to submit a landings sheet. The usual sanction is licence suspension until compliance, followed up with warning letters, formal caution and eventually prosecution and cancellation of the licence. Generally, the licence suspension is thought to be effective, but there was one case of suspension in 2014 which went as far as a formal caution in 2015 before compliance was achieved.</p> <p>Clearly compliance in this fishery is not perfect, and there remains the possibility that a set of circumstances such as occurred to 2014 could lead to high levels of non-compliance again, despite the sanctions. The team, however, took into consideration that NRW reacted to that situation by changing the management of the fishery to a situation which is more enforceable, and on this basis concluded that there is 'some evidence' that compliance has improved and is now at acceptable levels. SG80 is met. There is not, however, a 'high degree of confidence', so SG100 is not met.</p>				Enforcement action	2012	2013	2014	2015	Prosecution	3	1	16	0	Formal Caution	0	0	0	1	Warning Letter	0	3	10	3	Suspension	2	1	10
Enforcement action	2012	2013	2014	2015																									
Prosecution	3	1	16	0																									
Formal Caution	0	0	0	1																									
Warning Letter	0	3	10	3																									
Suspension	2	1	10	0																									
<b>Systematic non-compliance</b>																													

<b>d</b>	<b>Guide post</b>		There is no evidence of systematic non-compliance.	
	<b>Met?</b>		Y	
	<b>Justification</b>	<p>The main issue with systematic non-compliance is overcropping (taking more than the daily quota); according to NRW this has in the past been 'significant'. The move to the bag TAC in 2015 has, however, improved things considerably (as noted above). Unfortunately, it is not possible to tell from the statistics above which offences relate to overcropping, although anything constituting deliberate exceeding of the bag TAC (e.g. landing of more than one bag at a time) would result in a straight prosecution, of which there were none in 2015.</p> <p>On this basis, the team was prepared to accept NRW's view that systematic non-compliance is a thing of the past in this fishery. Met.</p>		
<b>References</b>	NRW Meetings and data 07/12/17.			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

**Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation**

<b>PI 3.2.4</b>		<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	<b>Evaluation coverage</b>			
	<b>Guide post</b>	There are mechanisms in place to evaluate <b>some</b> parts of the fishery-specific management system.	There are mechanisms in place to evaluate <b>key</b> parts of the fishery-specific management system	There are mechanisms in place to evaluate <b>all</b> parts of the fishery-specific management system.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The second 5-year review of the fishery is starting in 2017; NRW report that any aspect of the management system is up for consultation and review. In the previous review (2012) the following aspects of the management system were reviewed:</p> <ul style="list-style-type: none"> <li>• regulations (e.g. change to the way that the MLS is measured – via a gauge rather than directly; new regulation 18 as described above and various other items)</li> <li>• licence conditions (e.g. making it an offence not to submit a landings declaration)</li> <li>• licence fees (various options reviewed)</li> <li>• enforcement policy (updated)</li> <li>• science policy (updated)</li> <li>• licence allocation procedure (use of waiting list revised – subsequently abolished)</li> </ul> <p>On this basis, the team concluded that all parts of the management system are at least potentially available for review. SG100 is met.</p>		
<b>b</b>	<b>Internal and/or external review</b>			
	<b>Guide post</b>	The fishery-specific management system is subject to <b>occasional internal</b> review.	The fishery-specific management system is subject to <b>regular internal and occasional external</b> review.	The fishery-specific management system is subject to <b>regular internal and external</b> review.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The 5-year review is internally-run by NRW, but solicits input from external stakeholders. There are also some elements of external review, however; for example, the process for reviewing the bird-food model is a collaboration with external scientists and other bodies (Natural England, RSPB). The management is highly adaptive and open to external input as required. The team concluded that overall this constitutes 'regular internal and external', meeting the requirements of SG100.</p>		
<b>References</b>		(NRW 2015)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/a</b>

## Appendix 2. Peer Review Reports

### Summary of Peer Reviewer Opinion

<b><i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i></b>	<b>Yes</b>	<b>CAB Response</b>
<u>Justification:</u>  There are a few relatively minor points that require addressing, but the report is well-written and has come to an appropriate conclusion – there is no doubt the fishery should be recertified.  I have some concerns about the traceability section (which increasingly feels like a ‘Principle 4’), however – see ‘general comments’, below.		MEC have reviewed the traceability section in light of the peer review and agree with their concerns. How these have been addressed is given below in general comments.

<b><i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCR 7.11.1 and sub-clauses]</i></b>	<b>N/A</b>	<b>CAB Response</b>
<u>Justification:</u>  No conditions were set on the fishery, which is appropriate.		

If included:

<b><i>Do you think the client action plan is sufficient to close the conditions raised? [Reference FCR 7.11.2-7.11.3 and sub-clauses]</i></b>	<b>N/A</b>	<b>CAB Response</b>
<u>Justification:</u>  No conditions were set on the fishery, which is appropriate		

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Yes	Yes	N/A	The report states that “Cockles have very high reproductive potential, even when stock numbers are low (Tyler-Walters 2007)”, but I note that Tyler-Walters 2007 is a literature review rather than an original reference, and that the evidence of high recruitment with low adult biomass appears to be limited to years following very hard winters, which impacts the cockles but also their predators. This is not the same situation as if the stock has been fished excessively. That being said, it appears that relatively little emphasis has been placed on the recruitment potential from low stock sizes, which is appropriate.	The team notes the reviewer's comments regarding the use of a review article to highlight the recovery potential of cockle populations from low stock numbers. In order to address this comment the team has revised the text to include peer-reviewed evidence of recovery of cockle biomass from both natural and fishery induced situations and evidence from the Dee fishery itself where biomass has previously been low and has now recovered.
1.1.2	Not scored as not rebuilding	Not scored as not rebuilding	Not scored as not rebuilding	Nothing to add.	
1.2.1	Yes	Yes	N/A	Nothing to add.	

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.2	Yes	Not specifically, although I think the required information is presented elsewhere	N/A	<p>In several places the text states or otherwise indicates that: "The key HCR is the daily bag limit..."</p> <p>However, the daily bag limit is a tool, not a rule.</p> <p>instead, although the actual mortality rates aren't indicated in the report, it is the Stillman bird model and its outputs that form the basis for the HCR. I.e, in the introductory sections, the report indicates "An annual spring survey of cockle abundance and density by size class is carried out in April/May, and the model applies a fixed percentage of mortality for each age class (based on prior experience) and the ER for birds in order to come up with a figure for the initial TAC."</p> <p>That being said, assuming that adjustments to the text are made, I have no problem with the score.</p>	<p>The team notes the reviewers comments and have made the required adjustments to the text:</p> <p>1.2.2a 'The overall exploitation each year is responsive to stock availability and the rate reduces as ecological reference point (REcolC) is approached. The Stillman bird model and its outputs form the basis for the HCR. The annual spring survey and the subsequent autumn survey provide the data for the model to fix a percentage of mortality for each age class (based on prior data from multiple sites) and the required energy needed for overwintering birds to produce a TAC.'.....</p> <p>1.2.2b 'The key HCR within the Stillman bird model is the fixed mortality applied to the age classes of the cockles and the ER required for the birds....'</p>

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.3	Yes	Yes	N/A	Not related to scoring, but note comment on traceability section (below) that links to text in this PI.	
1.2.4	Yes	Mostly yes.	N/A	Slb is the stock assessment approach, and at SG80 it requires that "The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.". However, the text does not address this at all, and in fact appears to be targeted at Slc, when it refers to probabilistic estimation of stock status.	The team notes that there appears to be an error in 1.2.4b where the original text has been replaced by the wording for 1.2.4c this has now been corrected: 'The surveys provide annually-updated empirical estimation information on the stock status. The relative reference point for this fishery is the ecological reference point (REcolC), against which the stock can be assessed. The critical uncertainty is within season mortality reducing cockle biomass prior to the onset of oystercatcher feeding in September (typically). This is addressed by stock surveys in September which ensure that these variations are accounted for.'
2.1.1	Yes	Yes	N/A	Nothing to add.	
2.1.2	Yes	Yes	N/A	Nothing to add.	

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.3	Yes	Yes	N/A	Nothing to add.	
2.2.1	Yes	Yes	N/A	Nothing to add.	
2.2.2	Yes	Yes	N/A	Nothing to add.	
2.2.3	Yes	Yes	N/A	Nothing to add.	
2.3.1	Yes	Yes	N/A	Nothing to add.	
2.3.2	Yes	Yes	N/A	Nothing to add.	
2.3.3	Yes	Yes	N/A	Nothing to add.	
2.4.1	Yes	Yes, although note comment against 2.4.2, which has implications for attributing habitats to elements, but not for scoring.	N/A	Nothing to add.	See response below

2.4.2	Yes	Yes, in my opinion, but a clarification is needed.	N/A	<p>In the introductory sections, the report notes: “One definition of VMEs by the MSC includes the functional significance of a habitat for ETP species (FCR v2.0 GSA3.13.3.2). Given the reliance of over-wintering oystercatchers on the cockle beds it could be argued that the ‘intertidal mudflats and sandflats’ qualify as a VME in this respect. However, as this habitat is the ‘main’ and indeed only habitat encountered by the fishery it is assessed under the classification of a ‘main’ habitat. ”</p> <p>However, within PI 2.4.2, SId is specific to VMEs, only. As such, if the cockle beds are considered to be a VME (and I would argue that they should <u>not</u> be, given that they are not remotely unique, rare, fragile or structurally complex) then they have to be scored as VMEs – it is not OK just to say they are being scored anyway as a main habitat.</p> <p>Essentially, either the fishery targets a VME and you have to call it as such in order to score it as intended, or cockle beds are not a VME.</p>	<p>Agreed. The argument against classifying cockle beds as a VME has been tightened up based on the helpful and constructive comments given.</p>
2.4.3	Yes	Yes	N/A	Nothing to add.	
2.5.1	Yes	Generally, yes	N/A	<p>The SGs here all refer to the ‘key ecosystem elements’, but these are not defined. This makes it difficult to determine what is actually being scored and whether or not this section is simply replicating the scoring of other PIs (noting that SA3.16.1 states this is not the intent, here).</p>	<p>The key ecosystem elements are now defined as species diversity / richness, trophic food webs (including top predators) and ecosystem services.</p> <p>It is difficult not to refer to certain elements of previous sections in order to provide</p>

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				<p>I.e., "Disruption by the fishery operation of habitats, predators and intertidal invertebrates which all contribute to ecosystem function ...." doesn't get to the issue, because 'disruption to habitats, predators and intertidal invertebrates' is already scored elsewhere under P2 outcome PIs, and 'ecosystem function' isn't a feature that is (SA3.16.3) "<i>most crucial to maintaining the integrity of its [the ecosystem's] structure and functions and the key determinants of the ecosystem resilience and productivity.</i>"</p> <p>As such, what else are the key ecosystem elements?</p>	<p>evidence for lack of ecosystem impact but the team hopes the distinctions are now clear.</p>

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.5.2	I suspect 'Yes', but comments against 2.5.1 may be relevant w.r.t. the key ecosystem elements being addressed appropriately.	Probably Yes.	N/A	If 2.5.1 is addressed, then a few edits should also be made, here.	Minor edits have been made.
2.5.3	I suspect 'Yes', but comments against 2.5.1 may be relevant w.r.t. the key ecosystem elements being addressed appropriately.	Probably Yes.	N/A	If 2.5.1 is addressed, then a few edits should also be made, here.	Minor edits have been made.
3.1.1	Yes	Yes	N/A	Nothing to add.	
3.1.2	Yes	Yes	N/A	Nothing to add.	

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.3	Yes	Yes	N/A	Nothing to add.	
3.2.1	Yes	Yes	N/A	Nothing to add.	
3.2.2	Yes	Yes	N/A	Nothing to add.	
3.2.3	Yes	Yes	N/A	Nothing to add.	
3.2.4	Yes	Yes	N/A	Nothing to add.	

**General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) can be added below and on additional pages**

Some points on the traceability section:

- 1) Against the risk ‘Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)’, the report notes that “*No fishing takes place using vessels. The ability of the vessels to leave the fishery and fish elsewhere is negligible*”. However, given that the fishery is hand-worked, the issue here is not whether vessels from the Dee could access other grounds, it’s whether fishers could fish outside the UoA (including on different trips/days) and present their cockles as being from the UoA. I don’t see that this risk has been considered appropriately.
- 2) On a related point, against the risk of ‘Mixing between certified and non-certified catch during storage, transport or handling, the report notes: “*Not before the first change of ownership. The hand-gathering occurs only within the estuary, and the entire estuary is covered by the UoC, so only certified product is harvested. Ownership of cockle passes to processors (the first point of sale) either at the dockside (usually) or at the processors grading yard.*” However, the Dee is in North Wales and of the three processors listed, two are based in south Wales and one is based in Lincolnshire, and there is no evidence presented that traceability between the point of capture and the processors’ yards is covered appropriately.

On the same point, PI 1.2.3 SIb states “*UoA removals from the fishery are monitored through the return of daily landing record sheets (Figure 3). NRW officers provide regular monitoring at the collection points where handovers between fishers and processors take place*”. However, I’d find it highly surprising if NRW officers were checking cockle deliveries in Lincolnshire! Given that the report notes “*Ownership of cockle passes to processors (the first point of sale) either at the dockside (usually) or at the processors grading yard*”, this is an important point, though – how is traceability assured for product that doesn’t change hands until the processors’ yards?

**Team response** – The team within the report had overlooked the identification of the point of first sale and the location of the transaction. This takes place at one of the limited number of slipways on the Dee estuary (two on the Welsh side, one on the English side) where the processors drive to meet the fishers. It is at this point that fisheries inspectors from NRW can inspect the catch, its documentation and the licenses of the fishers. The nature of the boats and the distances required to travel beyond the UoA rule out the chance of the fisher’s landing non-certified fish. Equally this information provides the background needed to highlight why point 2 above is not applicable. The team has addressed these comments by adding additional text to the traceability section.

### Appendix 3. Stakeholder submissions

There were no written submissions from stakeholders raised before or within the public comment draft report period. Technical oversights received from MSC are detailed below.

MainID	SubID	Page Reference	Grade	Requirement Version	Oversight Description	PI	CAB Comment
22319	27059	Page 24	Guidance	FCR_7.12.1.5.b v2.0	In Section 4.2 the report details the first point of sale is at the limited three slipways but on Section 4.3 fishery certification extends to the first point of sale at one of the three slipways. Please clarify that all three slipways are included in the fishery certificate. If this is the case, please amend the language in the eligibility section 4.3 to something like "at any of the three slipways".	N/A	The CAB have adjusted the text in Section 4.3 as suggested by the MSC: <i>'The fishery certification extends to the first point of sale which is at any one of the three slipways on the estuary.'</i>
22319	27060	Page 24	Guidance	FCR-7.12.1.5c v2.0	Although this is a re-assessment, the processors listed within Table 6 are not MSC CoC holders yet? Are they under a different name on MSC certification for CoC? Please confirm.	N/A	The CAB have added the following sentence to Section 4.3 highlighting that none of the three processors listed have CoC certification: <i>'There are currently three processors operating at first point of sale in this fishery, none of which currently have chain of custody certification.'</i>

## Appendix 4. Surveillance Frequency

Following the successful outcome of this assessment, the surveillance for this fishery has been set as level 1, requiring 1 on site surveillance audit, 2 off-site surveillance audits and 2 reviews of information. In accordance with FCR 7.23.4.3 level 1 has been selected based on this re-certification of the Dee Estuary cockle fishery having no conditions and evidence that the fishery hasn't had any conditions since the initial certification. Rationale for the adoption of the reduced surveillance level is that the client for the fishery is NRW which are also the principle regulating body of the fishery. NRW has provided excellent communication throughout this assessment and can provide all required information (catch data/compliance/stock assessments/HRA's) via electronic/remote communication therefore the team believe 7.23.4.3 is met. In accordance with 7.23.4.2 a reduced team of 1 auditor will be used to assess the fishery at each surveillance.

Deviations from the standard surveillance schedule (i.e. annually, by the anniversary date of the certificate) are currently not foreseen.

The fishery surveillance programme is shown below.

**Table 9. Surveillance level rationale**

Year	Surveillance activity	Number of auditors	Rationale
1	Review of Information	1	NRW to provide catch data/compliance/stock assessments/HRA's via electronic/remote communication.

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	July 2018	August 2018	'An Assessment of the Current Status of the Dee Estuary Cockle Stocks' for 2018 will be available along with 2017 Annual Report by August 2018.

Surveillance Level	Year 1	Year 2	Year 3	Year 4
1	Review of information	of Off-site	Review of information	of On-site and Reassessment

## Appendix 5. Objections Process

No objections were received.