This Report was commissioned by the Advisory Committee of the Strangford Lough and Lecale Partnership. It was researched and produced by Clear Direction who are responsible for its content.

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Summary of Major Issues and Recommendations

Summary of Major Issues

The major issues to arise from research and consultation are:

- Estimates in this report indicate that 300-580 tonnes per year of winkles are collected from the Strangford and Lecale area (this estimate does not include an estimate of the quantity of winkles collected by organised groups which usually operate under the control of unlicensed gangmasters, as it proved to be impossible to obtain this information within the timeframe of the study). The winkle fishery is not classed as a commercial fishery, but these and other estimates indicate that a commercial operation, which is operating on a largely unregulated basis, already exists - see Section 5.

- The findings of two recent or relatively recent and significant studies about winkle and shellfish harvesting and the possible impacts of this activity in Strangford Lough have been published¹. These studies, which include differing and sometimes contradictory findings, have indicated that winkle harvesting - particularly heavier and more sustained harvesting - has some impact upon the winkle population and the wider environment, but that no proof has been found of significant environmental damage caused by intertidal winkle harvesting - see Section 3.

- As the findings of only two recent studies from Strangford Lough have been published, it can be argued that more research is required to confirm the presence or absence of significant environmental impacts linked to winkle collection or shellfish collection in general.

- Scientific studies in other parts of the world have indicated that intensive human activity can have detrimental, localised impacts upon the winkle population and the general environment and ecology. For example, there is at least one UK study that shows that intensive harvesting of winkles in one small area over a long period (8 years in the case of this study) significantly reduced winkle numbers and increased algae growth in that locality.

¹ Johnson, M.P., Portig, A., Smyth, D. And Roberts, D. (2008) 'Unregulated Harvesting of Intertidal Shellfish in Strangford Lough'. This study reviewed the sustainability of shellfish harvesting, looked at socio-economic aspects of shellfish harvesting and carried out experimental work and commented upon the possible environmental impacts of this activity.

Crossthwaite, S.J., Reid, N. & Sigwart, J.D. (2012) 'Assessing the impact of shore-based shellfish collection on under-boulder communities in Strangford Lough'. This study considered the impact of winkle harvesting upon the winkle population and the wider environment including under-boulder communities.
Qualitative feedback from the scientific community, winkle collectors, winkle buyers, winkle wholesalers and winkle processors and the wider fishing sector indicates that, in general, there is agreement that the winkle population in the Strangford and Lecale area is not under threat of over-exploitation at current harvesting levels.

There is widespread public concern about the presence and operation of shellfish collection groups, usually formed of mainly East European people and controlled by unlicensed gangmasters (who are therefore operating illegally), in the Strangford and Lecale Coast area. The high profile of this issue and the approach of these groups to shellfish harvesting has caused concern and has focused attention on winkle and shellfish collection, the suspicion of wider criminal activity and the safety of collectors when they are collecting shellfish. No proof has been found that winkle harvesting by these groups is having a significant impact upon the winkle population or the wider environment, but this type of activity has drawn attention to the possible impacts of shellfish harvesting. It seems likely that, if this issue was addressed, there would be much less concern about winkle harvesting and shellfish harvesting in general - see Section 5 and Appendix 6.

Some winkle collectors believe that winkle harvesting is not controlled by any form of regulation, possibly because it is not a commercial fishery. Winkles are subject to regulation. EU Food Hygiene regulations require winkle collectors to register with their local Environmental Health Department and keep records of their catch. They also specify that winkles should be sold through particular types of registered and approved premises. Winkle collectors ignore, or do not know about, these regulations but there are three registered / approved winkle processor / wholesalers in the Strangford and Lecale area - see Section 4.

It would appear that other forms of regulation have, or may have, implications for winkle harvesting. For example, some elements of existing environmental protection regulation, including designated sites management, would appear to apply to winkle collection. However, those who have detailed knowledge of this area say that there are uncertainties about the legal status of winkle collection and often describe it as a 'grey area' which 'falls through' some aspects of existing environmental protection framework - see Section 6.

Some of the winkles collected in the Strangford and Lecale are sold legitimately, but there are issues with illegal operations, including the movement of winkles to buyers in the Republic of Ireland.

Winkle fisheries in other areas are subject to regulation - see Section 4.

The potential for EU infraction related to winkle harvesting exists.
Recommendations

- Classify hand collected, intertidal winkle harvesting as a commercial fishery, regulated by DARD. This will allow legitimate businesses to thrive and, with other actions, ensure the sustainability of the fishery.

- There is an argument for regulation and better management for five reasons:
  - The need to legitimise the entire winkle collection and marketing sector
  - The need / desire to reduce or end intensive harvesting by gangmasters / gangs
  - The opportunity to support, make use of and enforce existing food hygiene regulations.
  - The opportunity to take a long-term, preventative approach so that, in years to come, any possibility of favourable conservation status being lost or the fishery collapsing as a result of the impacts of intertidal shore based shellfish collection, can be avoided
  - To reduce the possibility of EU infraction related to winkle harvesting.

- Proposed Regulatory Framework for Winkle Collection:

<table>
<thead>
<tr>
<th>Elements of Regulatory Scheme</th>
<th>Comments</th>
</tr>
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<tbody>
<tr>
<td>Classify the hand collection of winkles as a commercial fishery and:</td>
<td>Allows anyone who wishes to collect winkles for personal use to do so without any form of registration.</td>
</tr>
<tr>
<td>- require all winkle collectors who collect more than 4kg / 2 litres in one tide to register with their local Environmental Health department and / or a defined government department;</td>
<td>Favours responsible winkle collectors who say that they target larger winkles.</td>
</tr>
<tr>
<td>- define a minimum size for winkle collection;</td>
<td>Supports existing food hygiene regulations and addresses possible consumer issues.</td>
</tr>
<tr>
<td>- require all commercial winkle collectors (i.e. people collecting more than 4kg / 2 litres in a single tide) to sell the winkles they collect to processors / wholesalers who are registered with and approved by their local environmental health department and / or a defined government department;</td>
<td>'Fits into' existing regulatory frameworks.</td>
</tr>
<tr>
<td>- apply Buyers and Sellers regulations to processors / wholesalers who will be required to supply statistics for the quantities of winkles passing through their premises and the place of origin of catch;</td>
<td>Requires individual members of large groups who collect winkles to register and sell winkles to approved processors / wholesalers.</td>
</tr>
<tr>
<td>- processors / wholesalers required to test winkles passing through their premises to ensure they are fit for human consumption;</td>
<td>Legitimises and regulates the market.</td>
</tr>
<tr>
<td>- enforcement / management powers for all relevant bodies - e.g. DARD, DoE, Environmental Health, other inter-tidal shore landowners.</td>
<td>Generates data that can be used to ensure sustainability.</td>
</tr>
<tr>
<td></td>
<td>Provides a basis for enforcement.</td>
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</tbody>
</table>
Further research - there are many areas in which further research might be desirable but, with reference to the management and maintenance of a sustainable winkle fishery, two areas of research should be considered:

- work to provide a reliable estimate of the total volume of winkles in the Strangford and Lecale Coast fishery; this would provide a base measure against which the annual volume of winkles being harvested could be assessed and allow informed decisions, to ensure that the fishery remains sustainable, to be taken.
- a comparative study / studies, with appropriate controls, to examine the impact of winkle collection on a heavily harvested area(s) with a lightly harvested area(s) on which harvesting ceases for the duration of the study.
1. Introduction

In February 2013, the Strangford Lough and Lecale Partnership (SLLP) commissioned Clear Direction Ltd. to complete an independent report on the Management of Shore-Base Periwinkle (i.e. *Littorina littorea*) Collection on Strangford Lough and the Lecale Coast.

The brief specified that the report should consider the following issues:

- Assess and summarise key pieces of relevant scientific research and evidence about the impacts, if any, that periwinkle (winkle) collection has been shown to have on the prey species and the wider ecology

- Recommend further specific scientific study, if required

- Identify and review existing winkle harvesting management / regulatory systems in the UK, Ireland and other countries

- Obtain socio-economic information about the level of winkle harvesting, competition, the value of the fishery to local communities, the role of processor / wholesalers, the opportunities for marketing and branding and other issues

- The environmental protection framework and how it relates to winkle harvesting

- Use evidence collated in the Report to:
  - come to conclusions about the impacts, if any, of winkle collection upon *Littorina littorea*, prey species and the wider ecology
  - comment on the need for regulation and, if necessary, make recommendations about the form such regulation may take
  - make recommendations for further specific scientific research, if required.

It is important to understand the context for the report and agreed approach.

The project was limited by both time and budget. It began with a briefing meeting at the SLLP offices in Portaferry, Co Down on 12 February 2013, with a requirement to provide SLLP with a final report by 22 March 2013.

Time and budget constraints ruled out the possibility of carrying out a major, fully-representative quantitative study. In any case it is by no means certain that such a study can be successfully completed, as it would depend on the co-operation and involvement of winkle collectors, buyers and processors. As winkle collection operates on a largely
unregulated basis it seems unlikely that many of those involved in the activity would be prepared to take part in such a study.

Consequently, the agreed approach was based on:

- Desk and online research
- Qualitative research among key stakeholders, including people involved in winkle collection and marketing
- A review of relevant scientific studies.

Definitions
In the report the following terms are used with reference to winkle collectors:

‘Gangmaster / gang’ – refers to the groups of mainly foreign nationals who harvest winkles in the Strangford Lough and Lecale Coast area, usually under the control of unlicensed gangmasters (anyone operating as a gangmaster requires a licence from the Gangmasters Licensing Authority).

‘Local collectors’ – other winkle collectors.

This distinction is important as there is widespread public concern about shellfish harvesting activity by groups controlled by unlicensed gangmasters. However, this report records the outcome of research and makes no judgements about the activity of any group or individual involved in winkle collection or marketing.
2. Methodology

The agreed approach to the research leading to the production of this report involved:

i. A Review of Relevant Scientific Studies

This was based on recommendations about key research papers from the Strangford Lough and Lecale Partnership (SLLP), partner organisations and others with an interest in winkle harvesting. There is a very large body of scientific literature and it was indicated that this review should centre on approximately 20 specified studies.

The aims of this review were to:

- Assess and summarise the main impacts, if any, of winkle collection upon the winkle population and the wider environment (in the Strangford and Lecale area and elsewhere)
- Recommend further scientific study, if necessary
- Record any relevant information about winkle collection in the Strangford and Lecale area included in these studies - e.g. volume of winkles collected, number of collectors.

ii. Desk and Online Research

This activity included:

- Identification and consultation of additional scientific studies
- Obtaining published information about estimated volumes of winkles collected in different countries / fisheries
- Consulting socio-economic studies of winkle fisheries in areas beyond Strangford and Lecale to look at issues like volumes harvested, the value of harvested winkles, numbers of winkle collectors, average quantities harvested by individual collectors, characteristics of collectors, and the structure and operation of winkle markets
- The nature and extent of regulation applied to winkle fisheries.

iii. Qualitative Research Among Key Stakeholders

This research focused on the socio-economic, environmental and regulatory issues around winkle collection and used semi-structured interviews to consult, on a representative basis, with key stakeholders:

- Winkle collectors, buyers and wholesaler / processors – this was the first occasion on which people involved in these areas were included formally in research about winkle collection. A total of 4 individuals were consulted in some depth - 2 winkle collectors, one buyer / wholesaler and one registered winkle processor. Efforts were made to include more people from these backgrounds, but others were unwilling to take part and it was suggested that it would be unwise to approach some individuals.
- Government departments and agencies - 8 interviews or meetings with relevant bodies.
- Environmental organisations - 4 interviews
Academic / scientific researchers – 4 interviews / meetings
Fishing industry representatives – 3 interviews.

Issues discussed (not everyone was in a position to comment on every topic) included:

- General views about winkle collection in the Strangford and Lecale areas
- Number and profile of collectors
- Reasons for collecting
- Frequency of harvesting by individual collectors
- Volumes harvested by individual collectors
- Role and importance of winkle collection to local communities
- Size of winkles harvested and why particular sizes are targeted
- Environmental impact of winkle collection
- Who do winkle collectors sell to?
- Price and price fluctuation
- Does a commercial fishery already exist?
- Should the fishery be recognised and regulated?
- Structure and operation of the current winkle market
- Total volumes harvested from the Strangford and Lecale area
- Destination markets
- Legitimate and illegal activity and the extent of each
- Current regulation
- Need for additional regulation and form this should take
- Issues around gang / gangmaster activity
- Marketing and the potential for more sophisticated marketing.

iv. Discussion and Feedback from a Meeting with Members of the SLLP Advisory Committee

v. Collation and Interpretation of Quantitative and Qualitative Data Generated by the Research and Consultation Process

vi. Development and Production of a Report on Winkle Harvesting

A total of 27 people participated in interviews which contributed to qualitative research. In addition, 9 people attended the meeting with SLLP Advisory Committee members.

Despite persistent efforts it proved to be impossible to speak to some potential contributors to the Report.

Some of those interviewed agreed to contribute to the consultation on a confidential basis. For this reason, the Report does not refer to particular individuals or, in general, to particular organisations.

Clear Direction wishes to thank SLLP staff members and others who helped with the organisation of research and those who contributed to the consultation.
3. Issues Emerging from Scientific Studies about the Impacts of Winkle Harvesting

Winkles have been studied extensively and many, many scientific studies have been published. As the time available to complete this report was limited, this section draws upon key papers and existing literature reviews about the possible impact of winkle harvesting upon the winkle population and upon the wide environment.

3.1 Areas of Broad Agreement

Research in the UK, Ireland and other parts of the world suggests that, among scientific researchers, there is broad agreement that:

- Heavy harvesting of winkles from the inter-tidal zone can alter the ecology of this area by allowing green algae (winkles’ main food source) to spread. There is evidence to support this contention, although the outcome of some research suggests a need for caution in some cases, as a ‘significant increase’ in a green algae cover has been defined as a 1% increase (see Johnson et al, 2008 and Humpheryes, 2002 for examples of work in this area).
- Long-term, high intensity harvesting can influence periwinkle population size and structure as large individuals tend to be replaced with a greater abundance of smaller individuals which are likely to reproduce at an earlier age (e.g. Crossthwaite et al, 2012)
- Impacts on winkle populations and the wider ecology are greatest where human activity is very intense (e.g. Addessi, 1994).

Research and developments in the populations of other species of winkle (e.g. in Australia) have supported the conclusions outlined above.

There are other areas of research, but the above observations seem to be widely accepted.

3.2 Issues and Concerns About which Scientific Evidence is Inconclusive or the Available Evidence is Anecdotal

- Some papers state that intertidal harvesting has a negative effect on the environment (Agri-Food and Bioscience Institute Aquatic Ecosystems Branch, 2013). As indicated in Section 3.1 there is broad agreement about the nature of some of these impacts. However, in the Strangford and Lecale area, no proof of significant environmental damage caused by intertidal winkle harvesting has been found and one piece of Strangford-specific research states that the impact of current harvesting levels on winkles and cockles is minor (Johnson et al, 2008).
- Winkle collection and associated trampling and disturbance may cause disturbance to bird species and seals and reduce biodiversity on disturbed boulders. There are genuine concerns in some of these areas. For example, there are reports – e.g. from observations made by wardens working for environmental bodies - of winkle collectors forcing grey seal pups into the water or on to pladdies where they are at risk of death. The evidence about the extent or consequences of boulder disturbance, disturbance to birds or the availability of prey
species for birds is inconclusive (Crossthwaite et al, 2012). In fact, one piece of research about Strangford states that bird counts do not suggest a conflict with harvesting practices and that changes in other rocky shore species, in association with a decline in larger winkles, were minor or not significant (Johnson et al, 2008)¹.

- Inexperienced pickers tend to cause more damage as they tend to turn stones over.
- Spread of non-native biofoulant species when undersized winkles are returned to the shore by wholesalers, but to different areas from where they were picked - e.g. this does not always happen as a wholesaler who contributed to the consultation returns undersized winkles to their place of origin.
- There is some suggestion that winkle stocks in more heavily harvested areas are replaced and maintained by stock in more isolated locations.

The above issues are valid concerns, but it has not been proven that intertidal winkle harvesting does impact significantly on these matters.

It should be noted there are many other studies in this field, which were beyond the scope of this report, but which indicate that there can be a fine natural balance - e.g. Firstater, F.N., Hidalgo, F.J., Lomovasky, B.J. & Iribarne, O.O., 2012; Buschbaum, C., 2000.

### 3.3 Other Key Points from Scientific Studies

- There is no proof from the UK, Ireland or the north-east United States (where *Littorina littorea* is an invasive species) that winkle populations are under serious pressure or threat from harvesting. There is evidence of localised decline - e.g. at Foreness Point, Margate (Humpheryes, 2002). In the Republic of Ireland, official figures for winkle landings showed an increase in the 1970s, a decline in the 1980s and an increase in the 1990s (Cummins et al, 2002) and the Irish Marine Institute (2011) has suggested that this may point towards a cyclical pattern in winkle stocks. A Canadian study on the Bay of Fundy (New Brunswick / Nova Scotia), estimated the total winkle biomass in the fishery, stated that there is a large breeding reserve, pointed out that winkle harvesting was confined to a small area and concluded that it was impossible to say if the species was locally overfished (Canadian Department of Fisheries and Oceans, 1998). An Irish study in 2002 found no conclusive evidence to suggest that winkle stocks were overpicked, pointing out that picking levels were more intense in the 1900s (Cummins et al, 2002).
- There is evidence that winkle stocks (not *Littorina littorea*) are under threat in some parts of the word - e.g. the Tasmanian Dive Fishery.

¹Studies focusing upon both seals and birds in Strangford Lough have been published, but few appear to have considered issues related to shellfish harvesting in depth. One report (McClean et al, 2005) indicated that Oystercatcher numbers had increased and Johnston et al, 2008, while not ruling out the possibility that a shellfish harvesting impact may be involved, reported that a decline in Knot and Dunlin populations could be related to ‘other factors’. Other examples of studies of birds and seals include Mathers et al, 1998; West et al, 2002; Portig et al, 1994; Montgomery, 1998; Strangford Lough Management Committee, 2004.
• Winkle harvesting effort is sensitive to market prices.
• Official statistics and estimates about winkle landings (in most countries) are unreliable and are likely to underestimate the real volume of harvesting.
• Some fisheries do regulate winkle harvesting, in some cases quite extensively (e.g. Maine, USA).
• As demand can outstrip supply at times there may be potential for winkle ongrowing and polyculture - this was one conclusion of an Irish study (Cummins et al, 2002), while a Scottish Seafish report, in 1998, said that 5-20% of collected winkles were too small for market, suggested that there may be a consequent opportunity for ongrowing winkles and reported on the outcome of experimental work (Cashmore and Burton, 1998) - see Appendix 2.
• Fisheries in different parts of the world report different spawning periods for winkles. On the eastern coast of Canada and north-east coast of the United States, spawning is generally said to take place between April and July, although a newspaper report about winkle harvesting in Cobscook Bay, Maine, reported that spawning takes place in late winter and early spring. In Ireland spawning is reported between January and April, while harvesters in the Strangford and Lecale areas say that spawning occurs in March and April.

3.4 Research in Strangford has Generated Some Conflicting Results

Study of the possible impacts of winkle harvesting in the Strangford area suggests that there are few certainties.

For example, it seems that potentially conflicting findings and claims have been generated by some Strangford-specific studies (Johnson et al, 2008; Crossthwaite et al, 2012).

Comments in these studies include a suggestion that some form of regulation for winkle harvesting would be desirable, while also saying that the impact of current levels of harvesting is low for winkle stocks.

There is a suggestion that winkle collection may reduce the size and number of winkles, cause disturbance to bird species and seal colonies, reduce biodiversity on disturbed boulders and increase algae cover on shore.

On the other hand it was pointed out that changes in other rocky shore species in association with a decline in larger winkles were minor or not significant and that bird counts do not suggest a conflict with harvesting practices.

Despite recognising that the impact of current harvesting levels are minor, one report suggests that it would seem undesirable for harvesting to occur throughout the Lough, as there would be no refuge for vulnerable or long-lived species (e.g. common seals which are declining in number). Although such an argument may appear to be logical, it has not be
proven that such action is required. For example, one study stated that it was beyond its scope to evaluate the decline common seal numbers in relation to unregulated shellfish harvesting, while suggesting separating shellfish harvesting from important haul out sites, particularly during pupping, as a precautionary measure.

There was a suggestion that setting the minimum winkle harvest size to 20mm could help restore the age structure of the winkle population. On the other hand one winkle processor reported that his business is receiving more large winkles than ever and, in other UK winkle fisheries where minimum winkle sizes are prescribed, the minimum harvest size is usually set at 16mm.

These observations are made, not to be disparaging about research which has been conducted in an appropriate way, but to show that differing conclusions can emerge and point out that more research is needed to support or refute some of the suggestions emerging from studies of winkle harvesting in the Strangford area.

When discussing an activity like winkle harvesting, which has been taking place in the Strangford and Lecale area for centuries, it is important that decisions are taken on a sound basis.

3.5 Conclusions about Evidence from Scientific Studies

Studies have shown that high intensity human activity does have localised impacts on winkle populations and the wider ecology and that heavy winkle harvesting can promote the growth of green algae.

In the Northern Hemisphere, no proof that current levels of winkle harvesting pose a threat to the winkle population has been found.

Similarly, the suggestion that trampling, boulder turning and general disturbance related to shellfish harvesting has a major impact upon marine species that prey upon winkles, birds and the wider ecology remains unproven.

Research has shown that relatively intense harvesting can, over a period of time, alter the structure of winkle populations as larger winkles, when picked, tend to be replaced with a larger number of smaller animals.

There is a case for further research to support or disprove some of the genuinely-held concerns about the possible impacts of winkle harvesting.
4. Winkle Harvesting Management / Regulatory Systems

This section summarises the management and regulatory systems for winkle fisheries in countries in the EU and in other countries. It looks briefly at:

- EU Regulation
- Winkle Regulation in Other Parts of the UK
- Republic of Ireland
- Examples of Winkle Regulation from Other Countries
- Summary of Main Features of Winkle Fishery Regulation.

More detail about some of the above areas and additional information about winkle and shellfish regulation is available in Appendix 1.

4.1 EU Regulation

Some people believe that winkle harvesting in the UK, Ireland and across the EU is largely unregulated, except for provisions under Gangmasters legislation. Many winkle harvesters believe that this is the case.

In fact, winkle harvesting is subject to EU food hygiene controls - Regulation (EC) No. 853 / 2004, administered by the Food Standards Agency (FSA) in GB and NI. In addition, some UK regions do regulate winkle harvesting, using bye laws, EU food hygiene controls (including Regulations (EC) No. 853 / 2004 & No. 854 / 2004) and the classification of sites to do so.

Under EU food hygiene controls, winkle harvesters are classed as food process operators and, as such, are required to reach certain standards to market their product. Individual harvesters are required to register with the Environmental Health Department in their local council.

An Environmental Health Officer (EHO) issues Registration Documents which registered harvesters are required to complete (including the location of each harvest and quantity harvested). These Documents are supposed to accompany the catch from when and where it is gathered on the shore to its final destination, to ensure traceability.

Regulation (EC) No. 853 / 2004 also stipulates that winkles must be sold through one of three types of approved establishment:

- a processing hall
- an auction house
- a despatch centre.

The regulations also require that winkle samples should be tested regularly, mainly for e coli.
Although these regulations exist they appear to have little impact, as no individuals are registered for winkle harvesting with Ards, Down or Newry and Mourne Councils. These Councils have approved some businesses for the reception, grading, storage and despatch of winkles, up to a defined weekly quantity.

The FSA say that they have been trying to inform winkle collectors of their position and responsibilities for a long time, but that collectors 'don't want to know' about their legal responsibility. In the course of research, one EHO said that the FSA has indicated that they should do more to register winkle harvesters.

The system described above (registration and completing Registration Documents for every catch) provides a theoretical framework for the recording of quantities of winkles harvested in the Strangford and Lecale areas. In reality, the 'system' does not work, as winkle collectors do not register, Environmental Health departments do not keep records of winkle quantities shipped from approved premises and not all Strangford and Lecale winkles pass through approved local premises.

4.2 Winkle Regulation in Other Parts of the UK

In addition to EU-wide food hygiene controls, some fishing areas in other parts of the UK have their own regulation related to periwinkle harvesting and some do not. For example, most of England's Inshore Fisheries and Conservation Authorities (IFCAs) have some form of regulation, while winkle harvesting in Scotland appears to be largely unregulated.

Among IFCAs in England, periwinkle-related regulation is often 'light' although there are some examples of more extensive controls - see Table 1, p17.
Table 1: Examples of Periwinkle Harvesting Regulations in IFCA and IFCA Sub-Areas in England

<table>
<thead>
<tr>
<th>Region / Area</th>
<th>Nature of Regulation</th>
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<tbody>
<tr>
<td>Eastern IFCA</td>
<td>Minimum harvesting size - winkles which pass easily through a gauge with a square opening of 16mm should not be removed from the fishery.</td>
</tr>
<tr>
<td>Cornwall IFCA</td>
<td>As above</td>
</tr>
<tr>
<td>Devon and Severn IFCA</td>
<td>As above</td>
</tr>
<tr>
<td>North West IFCA</td>
<td>As above</td>
</tr>
<tr>
<td>Kent and Essex IFCA</td>
<td>Only hand picking of winkles permitted, no other restrictions.</td>
</tr>
<tr>
<td>Southern IFCA</td>
<td>Only hand picking of winkles permitted; Closed season from 15 May to 15 September.</td>
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</table>
| Cumbria Sea Fisheries Committee - byelaws | 1) No person shall fish for or remove from any fishery from within the district, winkles (*Littorina littorea*) except by hand.  
                                             2) No person shall remove from a fishery any winkle (*Littorina littorea*) which will pass through a gauge having a square aperture of 16 millimetres measured over each side of the square. Explanatory Note: This byelaw sets the minimum removal size and removal method for winkles. The measure is designed to protect small and immature stock that has not had a chance to spawn and enhance the bio-mass of the species. |
| Dorset                             | Dorset Wildlife Trust reports that winkle harvesting is 'light',                    |
|                                    | concentrated in one area and has a closed season from 15 May to 15 September.       |

Even when not stated, it can be assumed that harvesting winkles by hand is the norm in the above areas.

Compared to regulations about other species, IFCA winkle regulation is limited - see Appendix 1(a) for examples of controls on whelk and cockle fishing.

**4.3 Republic of Ireland**

In the Republic of Ireland periwinkle harvesting is unregulated - apart from EU food hygiene regulations - and, in 2011, the Food Science Services of the Irish Marine Institute called for a size limit that should be established and enforced in a way which ensures undersized winkles are not removed from the sea shore.

It also said that consideration should be given to establishing a closed season in the months of June and July, or from May to August when high temperatures cause mortalities, or between January and April when spawning is taking place.

**4.4 Examples of Winkle Regulation from Other Countries**

a) Periwinkle Harvesting in Maine, USA - US Department of Marine Regulations
- Year round season.
- Harvested by hand or with a 6’ or smaller drag.
- Recreational harvest limited to 2 quarts of periwinkles per day for personal use without a licence.
- Licence required for commercial fishing - fee required
- Size limit determined by a numerical count based on a random one quart sample from the bulk pile and then counting the periwinkles to determine the amount of periwinkles in the one quart container. If the one quart sample contains more than 220 periwinkles they are considered undersize. This method of measurement results in an average size, taken at the narrowest diameter of the girth, of 9/16” or less.
- Harvesting prohibited at night.

This is the most extensive set of winkle harvesting regulations revealed by the research. See Appendix 1(b) for a complete version of these regulations.

b) Australia

Australia has a total allowable catch (TAC) of 30,000 tonnes of periwinkles per year (for Turbo undalates, commonly called 'turbos'), representing 75% of the average annual catch for the previous 5 years. A minimum size of 30mm was set in 2006 and increased to 40mm in 2009.

i. Tasmanian Dive Fishery

In Australia, action taken at national level was partly a response to changes in the periwinkle population in the Tasmanian Dive Fishery. The number of periwinkle licences in the fishery fell, from over 300 in 1980, to 55 in 2000. Currently, only 10 periwinkle licences are issued in the fishery.

Fishers reported that the fishery used to consist mainly of large winkles (over 50mm) but, over ten years, this changed. They now report a different age range, with many smaller winkles (5-10mm).

Summary of Tasmanian Periwinkle Regulations:

- Licence required for vessel
- Licence required for diver
- Total Allowable Catch
- Size Limits
- Zonal Management.

Australian periwinkles sell to the public in restaurants for $45.00 per kg (i.e. Australian Dollars) = £30.00 per kg.

ii. South Australia
The Government of South Australia has made it illegal to remove periwinkles and other defined organisms from any inter-tidal reef in South Australia from the high water mark to a water depth of 2 metres.

This action was taken because of concern about the loss of food for species further up the food chain, including highly sought-after fish species.

d) New Zealand

Shellfish catch limits and regulations in the Auckland and Kermadec Area (fishing regulation is widespread in New Zealand and this is one example):

<table>
<thead>
<tr>
<th>Shellfish species</th>
<th>Daily limit per person</th>
<th>Auckland Coromandel area daily limit per person</th>
<th>Minimum size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cockle</td>
<td>150</td>
<td>50</td>
<td>none</td>
</tr>
<tr>
<td>Kina (sea eggs)</td>
<td>50</td>
<td>50</td>
<td>none</td>
</tr>
<tr>
<td>Green-lipped mussels</td>
<td>50</td>
<td>25</td>
<td>none</td>
</tr>
<tr>
<td>Oysters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Dredge* +</td>
<td>50</td>
<td>50</td>
<td>58</td>
</tr>
<tr>
<td>- Rock &amp; Pacific†</td>
<td>250</td>
<td>100</td>
<td>none</td>
</tr>
<tr>
<td>Paua</td>
<td>10</td>
<td>10</td>
<td>125</td>
</tr>
<tr>
<td>- Ordinary*</td>
<td></td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>- Yellow foot*</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Pipi</td>
<td>150</td>
<td>50</td>
<td>none</td>
</tr>
<tr>
<td>Scallops * +</td>
<td>20</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>Toheroa #</td>
<td>Prohibited</td>
<td>Prohibited</td>
<td>Prohibited</td>
</tr>
<tr>
<td>Tuatua</td>
<td>150</td>
<td>50</td>
<td>none</td>
</tr>
<tr>
<td>All Others •</td>
<td>50</td>
<td>50</td>
<td>none</td>
</tr>
</tbody>
</table>

* Dredge oyster, paua and scallop must be landed in the shell and cannot be shucked or shelled seaward of the mean high water mark. This does not include dredge oysters and scallops shucked onboard for consumption while at sea within daily bag limits.
† Rock and Pacific oysters must not be opened while they adhere to the object on which they grow
+ Limited provision allows only one diver diving from a vessel to gather extra bag limits of oysters and scallops for up to 2 other people acting in a dive safety capacity from that vessel.
# Toheroa must not be taken, possessed, or disturbed unless an open season is declared by the Director-General of the Ministry for Primary Industries.
• This is a combined, mixed-species bag limit. It applies to all shellfish species not specifically named above and includes all crabs, limpets, starfish, periwinkles, whelks, barnacles and freshwater crayfish (koura).

See Appendix 1(c) for information about recreational shellfish gathering in New Zealand

4.5 Summary of Main Features of Winkle Fishery Regulation

- Limited to handpicking
- Minimum size limits
- Closed seasons
- Night harvesting prohibited
- Limit on quantities for personal use
- Licences for commercial fishing
- Limit on commercial quantities
- Total allowable catch
- Zone restrictions.
5. Socio-Economic Aspects of Winkle Harvesting in the Strangford Lough and Lecale Coast

This section of the report is based upon qualitative research with stakeholders, alongside reference to information and statistics from published sources.

It looks at:

- The Structure and Operation of the Fishery
- Market Size - i.e. quantities harvested / market value
- Prices
- Potential for business development and more sophisticated marketing.

Information about winkle collection in the Strangford Lough and Lecale areas is imperfect to say the least. Obtaining a better understanding about the operation of the fishery involved obtaining qualitative feedback from a range of stakeholders, using available information about the market and using information from other fisheries to provide context and points of reference.

Stakeholders involved in qualitative research included:

- People involved in winkle harvesting (all local collectors), processing and marketing
- Fishing industry representatives - inshore and mainstream
- Government departments and agencies
- Representatives of scientific, academic and environmental bodies.

5.1 The Structure and Operation of the Fishery

Structure

Based on feedback from winkle collectors, buyers, wholesalers and processors and other within the fishing industry, the vast majority of those involved in winkle collection do so to make money. Few people collect winkles for purely personal use.

The fishery is structured in the following way:

i. Local Collectors - these are people from Northern Ireland who live locally, including fishers and members of families who have lived in the Strangford and Lecale areas and have been collecting winkles for generations, but including others who have become involved because of the economic downturn and consequent loss of employment and lack of alternative employment opportunities. It seems likely that there were many more local winkle collectors in the past, when many families collected winkles and other shellfish out of necessity (although this is likely to have been for personal use rather than commercial exploitation). There is no socio-economic profile of winkle collectors but it seems that local collectors are predominantly older males with relatively low incomes. One respondent
described local collectors as 'mostly people looking for a few pounds pocket money to keep them going through the week.' Local collectors say that they are aware of the needs of the market and tend to pick larger winkles selectively. They also say that they have no need to turn boulders, as this is not the best place to find winkles.

ii. Buyers / Wholesalers - industry sources report that there are a relatively small number of winkle 'buyers' and 'buyer / wholesalers' in the Strangford Lough and Lecale Coast areas (most buyers sell to buyer / wholesalers). Some operate 'officially' (i.e. are included in the UK tax regime) and it seems that some operate 'unofficially'. Buyers can enter and leave the market as conditions change, but there appear to be 8-10 buyers, including 3 buyer / wholesalers operating any point in time.

iii. Registered Winkle Processors - 3 premises are registered for winkle 'processing' in the Strangford and Lecale areas (processing usually means acting as a wholesaler that collects, grades, stores and despatches winkles). The businesses registered are:

- Ardglass Shellfish Supplies - approved to process up to 5 tonnes per week
- A Winkles, Portavogie - approved to process up to 10 tonnes per week
- North Atlantic Shellfish, Kilkeel - approved to process up to 1 tonne per week - a person associated with this business was mentioned in a newspaper story (reported in the Irish Independent on 13 Nov 2005) concerning a group of Latvian shellfish harvesters who were stranded on an uninhabited island off the north Dublin coast.

Environmental Health Officers in Ards, Down and Newry and Mourne Districts have confirmed that the premises in their areas are registered and approved.

Two people, one in Ardglass and one in Ballyhornan, are registered with Down District Council for the distribution and transport of winkles.

It appears that there is at least one other establishment (described as a 'seafood factory') which is not registered to process winkles but does so, apparently sending the product to factories in the Republic of Ireland.

See Appendix 5 for more on registered processors.

iv. Gangmaster / Gang Activity - it is common knowledge that organised / semi-organised 'gangs', usually involving people from Eastern Europe under the control of unlicensed gangmasters, have been collecting winkles and other shellfish in the Strangford Lough, Lecale and Outer Ards areas. The presence and activity of these gangs has caused huge concern because of their apparently intensive and indiscriminate approach to shellfish collection, possible links to other forms of criminal activity and the safety of harvesters. This type of activity appeared to be at its highest level in 2010-11 and was to a large degree responsible for increased interest upon winkle harvesting and its possible consequences. The Gangmasters Licensing Authority is currently prosecuting a Foreign National (Valdis Budahs) for an offence under Section 12(1) of the Gangmasters Act 2004 (relating to running
teams of shellfish gathers in NI). At the time of writing case had not been heard. The case was scheduled originally for 11 March 2013, was postponed until 8 April 2013 and, at the time of writing, is scheduled for 21 June 2013. The GLA has agreed to provide information about levels of shellfish harvesting linked gangmaster / gang activity after this case. Unfortunately this information is not yet available as a result of the postponements described above.

See Appendix 6 for more on gang activity.

v. Others - Filipino fishing crews, based mainly in Ardglass, supplement their earnings through winkle harvesting.

**Operation and Main Distribution Channels**

*A particular factory was suggested as a main outlet for winkles from Northern Ireland. Fishing industry sources and the GLA have indicated that unlicensed gangmasters sell winkles collected by gangs they control to outlets in RoI. It is possible that winkles collected by gangs are disposed of in other ways, but sales to outlets in RoI appear to be the main channel of distribution.*
One respondent reported that Cuan Sea Fisheries (now closed) was a significant buyer of winkles and that these winkles were sold mainly in south-east England, so the above diagram is likely to be a simplification which does not cater every nuance in the market.

However, the main markets for winkles are in Spain, France, Portugal and the Netherlands. This was confirmed by processors and buyer / wholesalers and collectors consulted in research.

5.2 Market Size

Research and consultation carried out for this report included, for the first time, winkle collectors, buyers and registered wholesalers / processors. This provided direct feedback and valuable information from informed sources about the number of people involved in winkle collection and the likely size of the annual market from those who are actively involved in the market.

Although information from these sources is particularly relevant, some caution must be exercised when using data from a limited number of people. As a result a number of sources of information have been considered to arrive at an estimate of the size of the annual winkle market in the Strangford and Lecale area:

i. Number of Collectors

- A report about the Unregulated Harvesting of Intertidal Shellfish in Strangford Lough (Johnson et al, 2008) estimated that, on average, 7-12 people per day collected winkles around Strangford Lough. Feedback from those involved in winkle collection and processing and fishing organisations indicates that this is an underestimate.

- People who contributed to the Clear Direction consultation provided a range of specific and general information about the number of local winkle collectors in the Strangford Lough and Lecale Coast area (i.e. excluding gang activity):
  - One person told us that there were 10-15 regular local collectors in the Portavogie area
  - One processor has 20 regular, local suppliers in the Portavogie, Ardglass and Kilkeel areas, a number that can rise to 80 when market demand is high (usually in December)
  - A respondent in Ardglass claimed that 'hundreds' of people collect winkles in that area alone and that this is having a visible impact upon the size and quantity of winkles harvested - others in Ardglass say that this is an overestimate
  - Most respondents believe that there are 'dozens' of winkle collectors in the Strangford and Lecale areas.
  - In the Republic of Ireland it has been estimated that there are 500 winkle collectors, selling to 23 wholesalers. This represents 22 people per wholesaler, which mirrors the information provided by a wholesaler in Northern Ireland.
It is important to note that people involved in winkle collection have indicated that many local winkle collectors do not harvest every day, as market demand and market prices dictate activity levels. Sometimes demand is very low and very few people harvest. Even when demand is high, wholesalers estimate that many local collectors work, at most, around 4 days per week. This could account, in part, for the relatively low number of winkle collectors recorded in the 2008 study of Unregulated Harvesting of Intertidal Shellfish in Strangford Lough (Johnson et al., 2008).

Respondents indicated that winkle collectors in the Strangford and Lecale area tend to have supply arrangements with one buyer or processor.

**As there are 3 registered processors and perhaps 3 'unofficial buyer / wholesalers', this would indicate that there may be a core of around 100 collectors in the Strangford and Lecale areas (i.e. 16 regular suppliers per buyer / wholesaler).** This figure is likely to rise to perhaps 300 people at times of peak demand.

To place these figures in context, it has been estimated that there are around 150 collectors and 10 buyers in the Bay of Fundy winkle fishery in east Canada (i.e. 15 collectors per buyer / wholesaler).

Estimates of market size in this report - based on feedback from people involved in the winkle market - have been based on an average of 16 collectors per wholesaler.

**ii. Volume of Winkles Collected by Individual Harvesters**

Most respondents indicated that local collectors collect an average of 20-25kg per harvest.

One person told us that it was possible for one person to collect 150kg in one session, but this was regarded as a gross exaggeration by most respondents.

For comparison, it was claimed that people collecting for gangs gather 30-45kg per person in one harvest, as they do not harvest selectively.

In the Bay of Fundy fishery, in east Canada, it is reported that an average adult harvester collects 27-36kg per tide, with the best harvesters collecting 50kg per tide.

In this report estimates of market size, based on feedback from people involved in the winkle market, have used 20kg as the average volume collected in a single tide.

**iii. Estimates of Harvest Size from NI and Other Fisheries**

Republic of Ireland - the winkle market in this area has been estimated at up to 7000 tonnes per year. A more recent estimate puts the recorded and unrecorded catch at 1650 tonnes (Cummins et al., 2002).
West coast of Scotland - one of the biggest winkle fisheries in the world, estimated at 4700 tonnes per year - more than twice the official reports (Cashmore and Burton, 1998).

It estimated that 500 tonnes of winkles per year are harvested in Canada's Maritime Provinces - for example 300 tonnes were harvested in Nova Scotia alone in 2000 (Department of Fisheries and Aquaculture, Govt. of Newfoundland and Labrador, 2002).

The NI Littoral Survey of 1984 reported that, in 1980 'large quantities' of NI winkles were exported to France via RoI - saying that an estimated 390 tonnes were exported in this way.

iv. Wholesaler Capacity / Throughput

A Winkles, Portavogie is approved to process up to 10 tonnes of winkles per week.

Ardglass Shellfish Supplies is approved to process up to 5 tonnes of winkles per week.

North Atlantic Shellfish, Kilkeel is permitted to handle up to 1 tonne of winkles per week.

An approved wholesaler/processor indicated that the main wholesalers, on average, process 2 tonnes of winkles per week, or about 40% of their permitted capacity.

Together the 3 processors listed above are permitted to handle up to 16 tonnes of winkles per week. This equates to an average of 5.3 tonnes per week per processor. 40% of 5.3 tonnes = an average 2.12 tonnes per wholesaler, which equates to the estimate provided by the approved wholesaler / processor.

5.3 Estimated Winkle Market Size Strangford Lough and Lecale Coast

The estimated annual volume of winkles harvested in the above areas is based on calculations using data from the sources described in Section 5.2. This approach was adopted to look for consistency in estimates generated from different sources.

Estimate 1:

80 regular local collectors (16 per buyer / wholesaler) x 20kg average harvest x 4 harvests per week x 48 weeks = 307 tonnes per year.

Estimate 2:

Processors say that they export an average of 2 tonnes per week. 2 tonnes per week x 5-6 processors and buyer / wholesalers (registered and unregistered) x 48 weeks = 480-576 tonnes.

This estimate appears to be quite high compared to other estimates of winkle volumes harvested in Northern Ireland but its source was a wholesaler who works in the market, so it
should not be dismissed, especially as it is accepted that most official estimates (in all countries) seriously underestimate the level of winkle landings.

**Estimate 3:**

Harvest in Republic of Ireland 2005 - estimated 1650 tonnes (recorded and unrecorded catch). On a pro-rata basis the NI harvest would be 660 tonnes per year.

The above figures are estimates of winkle volumes generated by local collectors and sold through both registered and unapproved premises in NI. Product from the latter is most likely sold to factories in RoI.

The figures do not include winkle volumes harvested by gangmasters / gangs. This issue was going to be addressed after the previously mentioned court case involving a Latvian man. This case was scheduled for 11 March 2013 and subsequently postponed to 8 April 2013 and most recently to 21 June 2013. The GLA has agreed to provide information about the level of gangmaster activity after this court case but this information is not yet available.

**Table 2: Estimated Size of Annual Winkle Harvest in the Strangford Lough and Lecale Areas**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Estimated Volume per Year (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collectors Supplying Registered Processors and Buyers / Wholesalers</td>
<td>300-580 tonnes</td>
</tr>
<tr>
<td>Gangmaster / Gang harvesting</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**5.4 Pricing and Estimated Value of Annual Winkle Harvest in the Strangford Lough and Lecale Coast**

Reported range of prices paid to local winkle collectors by processors / buyers:

£1.00 / kg to £2.00 / kg, depending on the time of year and market demand (one local collector said that he received over £3.00 per kg at Christmas).

Some collectors reported prices of £2.00 to £2.50 / kg for top quality winkles – i.e. large winkles often referred to as ‘jumbo winkles’.

Estimated average price paid to local winkle collectors - £1.50 / kg, taking the high volume of trade at Christmas into account.

Processors / wholesalers receive a better price for larger winkles, but were unwilling to reveal their price structures for commercial reasons.

Information from other markets suggests that wholesalers may receive £2.50 / kg and up to £3.00 / kg at Christmas - an average of £2.50 / kg across the year.
Table 3: Estimated Annual Value of the Winkle Market in Strangford Lough and the Lecale Coast

<table>
<thead>
<tr>
<th>Channel</th>
<th>Estimated Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Sale - processor / buyer to local collector</td>
<td>300 to 580 tonnes @ £1.50 / kg = £450K to £870K</td>
</tr>
<tr>
<td>European wholesaler to NI processors / buyers</td>
<td>300 to 580 tonnes @ £2.50 / kg = £750K to £1.45m</td>
</tr>
<tr>
<td>Winkles collected by gangmasters / gangs</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Given the nature of the available data, it seems prudent to place the size of the annual winkle market in the Strangford and Lecale area within a range. However, as Table 3 indicates, a commercial fishery exists, especially as estimates of winkle harvests by gangs / gangmasters are not included.

To place the above market value estimates in a slightly wider context, it should be noted that the Northern Ireland Fish Producers Association (NIFPO) believe that the value of the winkle fishery for NI as a whole may be over £5m per year and approximately £2-3m per year for the Strangford Lough / Ards and Lecale area.

A different perspective is provided by DARD reported landing data for winkles (i.e. data for the whole of Northern Ireland). These show that 180 tonnes were landed in 2002 (a peak in recent years) and close to 80 tonnes were landed in 2005. As it is recognised that official estimates of periwinkles landings are extremely unreliable these figures are likely to seriously underestimate the real position.

At this point in time different sources and organisations have differing views on the volume of winkles being harvested in Strangford and Lecale (and Northern Ireland), but all estimates indicate that a commercial fishery exists. It is also important to emphasise that estimates of harvested winkle volumes generated by research for this report do not include an estimate of the volume of winkles collected by gang / gangmaster activity.

5.5 Potential for Business Development and More Sophisticated Marketing

Registered processors currently export winkles in 25kg or 30kg bags, labelled for traceability. At least one processor is exploring the possibility of developing a brand and exporting branded winkles in smaller, ready-to-sell, bags directly to retailers, to bypass wholesalers and increase margins.

At this point in time processors do not know if winkles exported from Ireland are sold to European consumers as local produce. By extension, they do not know how consumers in export markets will react to branded winkles which are obviously from Ireland. This is a key question and more research will be needed to explore this and other issues, like retail pack size, competitor activity and potential wholesaler reaction, before a decision can be taken.
One respondent suggested that targeting new export markets should be considered, arguing that winkles are a delicacy in N African and Asian cuisine. In these markets the issue of local v NI winkles would not arise as *Littorina littorea* does not exist in African or Asian waters.

The other main option for business development concerns the ongrowing of smaller winkles. One respondent reported that a licence had been granted for this type of 'marine ranching' for a project near Kilkeel. There may be potential in this activity but ongrowing winkles has its challenges - see Appendix 3.

Selling winkles to local restaurants is another possible area of business development, but it would seem that this option depends on a much larger number of European tourists coming to the Strangford and Lecale areas, as few people from Northern Ireland seem enthused by the idea of eating winkles / snails.

It is worth noting that a 2002 study about the RoI winkle market concluded that there was little potential to add value for export (Cummins *et al*, 2002). In more recent years the RoI seafood industry has been targeting export markets, including markets in Asia. Statistics published by the Irish government indicate that China, Korea and Japan now account for 5% of all Irish seafood exports (worth €21m in 2011). The Irish Seafood Exporters Directory lists 7 companies that export shellfish to Asian countries.

5.6 Conclusions

As it is based, in part, on qualitative research, the data and information in this section is imperfect but - within the time and resource constraints of the project - it provides a realistic overview of the winkle market in the Strangford Lough and Lecale Coast areas.

The activity of gangmasters /gangs has drawn public and government attention to the winkle market (and hand-harvested shellfish collection in general); without gangmaster / gang activity it is likely that the debate about the impact of winkle harvesting might not have occurred or certainly would have been much less pronounced.

The estimates of the size and value of the winkle fishery in the Strangford and Lecale areas contained in this report are larger than previous estimates – for example, a report on the Unregulated Harvesting of Intertidal Shellfish in Strangford Lough (Johnson *et al*, 2008) estimated the annual winkle harvest from Strangford Lough at 20 to 46 tonnes. The NI Littoral Survey, 1984 estimated that 390 tonnes of winkles per year were exported from NI at that time (Wilkinson *et al*, 1988) and DARD reported landings of 180 tonnes for NI in 2002.

Registered winkle processors operate legitimately and respect food hygiene regulations, but winkle collectors ignore the requirement to register with their local Environmental Health department.
Some buyer / wholesaler and many (but not all) winkle collectors appear to operate outside the UK tax regime; as there is a significant market, tax revenue is being lost and businesses trading legitimately are being disadvantaged.

The potential for additional winkle processing is very limited; the case for local branding is unproven and heavily-dependent on European consumers’ beliefs and expectations about the origin of the winkles they eat.

The identification and targeting of viable new markets (in Africa, Asia or elsewhere) could be considered, but careful research and possibly product development work will be required. The winkle industry is not in a position to do this type of work at present, but this could change with the development of a recognised and managed commercial fishery.
6.1 Introduction

Strangford Lough is an internationally important site which is governed and protected by a large volume of international, EU, UK national and NI regional legislation and regulation.

With reference to winkle collection, 6 areas of legislation, regulation and judgement are of particular relevance:

- The Fisheries Act (NI) 1966 (and subsequent amendments)
- Public Health legislation, particularly Regulation (EC) No. 853 / 2004, as described in Section 4 of the report.
- Court rulings, particularly the case of Adair v The National Trust, 1993
- Environmental legislation and regulation
- Gangmasters’ legislation
- The forthcoming NI Marine Bill.

Environmental legislation and regulation is not described in detail in this section, which focuses on the key implications of this regulation in relation to winkle collection, aided by feedback, guidance and opinion from those who contributed to the consultation. More detail about environmental legislation and regulation is provided in Appendix 2.

The key point is that, despite the large amount of fisheries and environmental legislation and regulation that exists, winkle collection is (for reasons outlined in Section 6.9) is regarded as a 'grey area' which seems largely unaffected by current fisheries' and environmental legislation and regulation.

6.2 Fisheries Legislation and Regulation

Under the Fisheries Act (NI) 1966, DARD is responsible for the supervision and protection of sea fisheries, for fostering the establishment and development of those fisheries and for the licensing of freshwater, land based and marine fish farms.

DARD Fisheries Division has responsibility for sea fisheries, aquaculture and fish health functions, under the Agreement of 18th December 1998 in relation to devolved Government in Northern Ireland.

The Fisheries Act (NI) 1966 was amended in 2001 (Fisheries Amendment Act NI 2001) to give DARD powers to regulate commercial fishing in Northern Ireland inshore waters (which includes the Intertidal zone) for environmental purposes.
Contributors to the consultation have indicated that, as far as winkle collection is concerned, the important points about fisheries legislation are:

- Hand collection of winkles is not classed as a commercial fishery by DARD and is therefore not regulated by the Department’s Fisheries Division.

- There is no licensing system which means that winkle landings do not have to be recorded. This means that there is a lack of data on quantities of winkles harvested, the location of harvesting, the sustainability of the sector and its contribution to the intertidal harvesting to Northern Ireland (volumes of winkles harvested and harvesting locations are supposed to be recorded under food hygiene regulations).

- There is no definition of the level of winkle collection that represents commercial harvesting rather than collection for personal use.

- Fisheries legislation does not discriminate between commercial and recreational fishermen who have the same rights in law.

- Licences are usually attached to boats and not people so direct regulation is difficult.

- The Fisheries (Amendment) Act NI 2001 and related orders – these introduced regulations to conserve flora or fauna, Several Orders (which can remove the public right to harvest and allocate fishing rights to a particular body or individual) and Regulating Orders (which can require licences for anyone wanting to fish).

- The 1966 Fisheries Act states that, in relation to mussels, periwinkles and cockles - Sections 131 to 137 shall apply to mussel beds and sections 131 to 137 to fisheries, periwinkle beds and fisheries and cockle beds and that ....... the Ministry is hereby empowered to grant in respect of the said beds and fisheries a licence such as is mentioned in Section 131. Close season 153.- (1) The Ministry may by regulations fix a period in each year within which it shall not be lawful to take mussels, periwinkles and cockles from any locality specified in the regulations or to have in possession or to sell mussels, periwinkles or cockles taken from that locality; and any period so fixed in relation to a locality shall be the close season for mussels, periwinkles or cockles as the case may be, in that locality.

**Buyer and Sellers Regulation**

The fisheries departments in Scotland, England, Wales, Northern Ireland and Isle of Man require all buyers of first-sale fish bought directly from fishing vessels and sellers of first-sale fish sold at a designated auction site operating in their areas to be registered with them.

A registered seller is an auction trader who sells first-sale fish by competitive bidding at a designated auction site in the UK and Isle of Man: and who is, by virtue of registered status, responsible for submission of sales notes, maintaining records and the accuracy of the
information they contain.

A registered buyer is someone who buys first-sale fish direct from a vessel or agent (that is other than by competitive bidding from a registered seller at an auction in a designated auction site) and is by virtue of registered status, responsible for submission of sales notes, maintaining records and the accuracy of the information they contain.

These regulations state that records should be maintained for all purchases of first-sale fish, including shellfish and *Nephrops*.

Registration as a buyer is not required when purchases of first-sale fish direct from a fishing vessel are wholly for private consumption and less than 25 kg is bought per day.

Clearly, regulation of this type could be applied in relation to winkle collection and selling.

**6.3 Public Health Regulation**

See Section 4

**6.4 Court Rulings**

The case of Adair v The National Trust (1993) established the public right to collect shellfish under common law. This judgment concluded that 'there is a common law right vested in the members of the public to take shell-fish from the foreshore and that this is an incident of the public right to fish'. The judgment did not state if this should apply only to shellfish for personal use or if larger-scale commercial harvesting was included.

**6.5 Environmental Regulatory Framework**

International and EU Conventions alongside EU Directives and national and regional legislation contribute to the legal and environmental protection framework which applies to Strangford Lough.

Key elements of the environmental regulatory framework include:

- International and EU Conventions
- Environment Impact Assessment
- Strangford Lough’s Environmental Designations - the area has many designations, as it is a Marine Nature Reserve (MNR), Special Protection Area (SPA), Special Area of Conservation (SAC), Area of Special Scientific Interest (ASSI), Ramsar wetland and Area of Outstanding Natural Beauty
- Northern Ireland Legislation - EC Directives are implemented through national and regional legislation and it seems that elements of existing legislation could apply to
winkle collection. For example, as well as declaring an Area of Special Scientific Interest (ASSI) at Strangford Lough (Part 1), Article 24 of the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 identified a number of operations and activities which were likely to damage the flora and fauna of the area and which required prior notification and permission from DoE. The list of operations and activities includes 'the collection of sea food and marine organisms'.

See Appendix 2 for more detailed information about the environmental protection framework.

6.6 Gangmasters Legislation

In general a gangmaster is defined as anyone who supplies a worker to a third business. Gangmasters require a licence from the Gangmasters Licensing Authority (GLA).

The definition is slightly different in relation to shellfish harvesting. In this case a person is defined as a gangmaster if they use a worker to harvest shellfish and a Licence is required in relation to the use of 1, 2 or a larger number of people. The definition of a gangmaster in relation to shellfish is quite wide, as people controlling, supervising, transporting people or handling product are all defined as gangmasters.

There are licensed gangmasters in Northern Ireland, but no individual or organisation is licensed in relation to shellfish collection.

A GLA Licence is granted after an audit of a business to ensure that it is run in a proper and legal way.

Penalties for not having a GLA Licence are potentially severe, with a maximum of 6mths imprisonment or £500 fine for offences at the Magistrates Court and up to 10 years in prison for a Crown Court indictment.

In NI, there have been successful prosecutions for non-shellfish offences. The first case about shellfish harvesting was scheduled to take place in Newtownards Magistrates Court on 11 March 2013, but was postponed until 8 April 2013 and postponed again until 21 June 2013, when it is expected to proceed. This involves a Latvian man who has lived in NI for 6 years and is said to bring foreign nationals from RoI into NI in minibuses to collect shellfish. The GLA has confirmed that these groups, apparently controlled by this man, have worked in the Strangford area in the recent past.

See Appendix 6 for more on gangmasters and related activity.

6.7 Northern Ireland Marine Bill
The Department of the Environment (DoE) has indicated that the current legislative environment will change with the enactment of the Northern Ireland Marine Bill (likely to be in 2013).

Part of this Bill concerns Marine Nature Conservation, including a provision to create Marine Conservation Zones (MCZs). Existing Marine Nature Reserves (MNRs), including the Strangford area, will become MCZs under this Marine Bill. The Bill will allow DoE to make and enforce byelaws to protect MCZs and - even though powers to create byelaws already exist - contributors to the consultation suggested that powers available under the Marine Bill will make it easier to create and enforce new byelaws.

It is worth noting that winkle regulation in England is based upon byelaws.

Within the new Marine Bill, fisheries-related byelaws in Northern Ireland will be created by DARD. It follow that the Governance system differs from that in England where byelaws are created by IFCAs (Inshore Fisheries and Conservation Authorities).

6.8 EU Infraction

EU Infraction could arise if there was a view that winkle harvesting is causing damage to a European-designated site and therefore that the site is not being protected and managed as required by EU Directives.

The Infraction process is triggered by an individual or organisation lodging a complaint. Anyone may lodge a complaint with the EU Commission against a Member State for any measure (law, regulation or administrative action) or practice attributable to a Member State which they consider incompatible with a provision or a principle of EU law.

If a complaint is lodged and ultimately pursued by the Commission, the relevant authorities would have to decide upon the course of action required, as the EU can infract member states and the European Court of Justice has the power to impose sanctions, including the possibility of large fines, until the situation is addressed.

Complaints may be submitted by letter or email or on a complaints form. If complaints are submitted by letter or email, the Commission asks those lodging the complaint to include as many relevant details as possible. The complaints form asks complainants to 'specify any documents or evidence which may be submitted in support of the complaint, including the national measures concerned' and asks for the 'fullest possible account of facts giving rise to the complaint'.

The Commission invites anyone who lodges a complaint to seek redress from national administrative or judicial authorities. The prior use of such national means of redress is advised before a complaint is lodged with the Commission and a section of the complaints form asks for details of approaches to national agencies.
The 'precautionary principle', introduced for protected areas by the EC Habitats Directive, is important in relation to issues around EU Infraction.

The precautionary principle is detailed in Article 191 of the Treaty on the Functioning of the European Union (EU). It aims to ensure a higher level of environmental protection through preventative decision-taking in the case of risk. However, in practice, the scope of this principle is far wider and also covers consumer policy and European legislation concerning food and human, animal and plant health.

According to the EU Commission the precautionary principle may be invoked when a phenomenon, product or process may have a dangerous effect, identified by a scientific and objective evaluation, if this evaluation does not allow the risk to be determined with sufficient certainty.

In general terms it is suggested that the precautionary principle can be invoked in the absence of scientific evidence for environmental deterioration, meaning that the competent authority should take appropriate steps to stop the potentially damaging activity.

The Commission states that the precautionary principle may only be invoked in the event of a potential risk, that it can never justify arbitrary decisions and that it may only be invoked when three preliminary conditions are met:

- identification of potentially adverse effects
- evaluation of the scientific data available
- the extent of scientific uncertainty.

The precautionary principle is informed by three specific principles:

- the fullest possible scientific evaluation, the determination, as far as possible, of the degree of scientific uncertainty
- a risk evaluation and an evaluation of the potential consequences of inaction
- the participation of all interested parties in the study of precautionary measures, once the results of the scientific evaluation and/or the risk evaluation are available.

In addition, the general principles of risk management remain applicable when the precautionary principle is invoked. These are:

- proportionality between the measures taken and the chosen level of protection;
- non-discrimination in application of the measures
- consistency of the measures with similar measures already taken in similar situations or using similar approaches
- examination of the benefits and costs of action or lack of action
- review of the measures in the light of scientific developments.
The authorities responsible for risk management may decide to act or not to act, depending on the level of risk. If the risk is high, several categories of measures can be adopted, including proportionate legal acts, the financing of research programmes, public information measures and other actions.

As part of the consultation process, guidance about how the EU infraction complaints procedure functions was sought from individuals with expertise and personal experience of this area in government and environmental bodies.

Differing points of view emerged from this consultation.

One source stated that complainants need to provide evidence to support their complaint when the complaint is lodged.

Another source indicated that a complaint could be lodged without supporting evidence, but that evidence to support the complaint would be needed at a later stage in the process. This is because the Commission, if it responded to the complaint, would seek a response from the relevant national government; it would forward this to the complainant who would have to argue the case for further action if they were not happy with the government response.

Others argued that there are grounds for complaint, without the need for supporting evidence, if an assessment of a particular activity has not been carried out, as Member States are required to have in place legislation to control any potentially damaging operations. European case law has established that any environmental deterioration is significant and, in this context, the competent authority has to make the case that an activity which has the potential to cause an environmental deterioration is either not happening or can be mitigated. It follows that, if it was pointed out to the Commission that winkle harvesting was not being addressed in an appropriate way, it would be bound under European Law to start infraction proceedings by opening a Pilot Case and that UK could be infracted for non-transposition of the Habitats Directive in addition to not controlling winkle collection.

These differing perspectives, which indicate that EU Infraction may not be a 'black and white' issue, make it difficult to comment on the likelihood of EU Infraction being invoked in relation to winkle harvesting in the Strangford and Lecale areas.

The only firm conclusion that can be arrived at is that the potential for EU infraction related to winkle harvesting does exist now or in the future, should an issue around this activity or its impacts arise. It follows that there is an opportunity to ensure that this does not happen (and to maintain a sustainable fishery) by introducing appropriate regulation for winkle harvesting.
6.9 Why does Winkle Collection 'Fall Through' the Existing Legislative and Regulatory Framework?

The reasons that winkle harvesting seems largely unaffected by current fisheries' and environmental legislation and regulation include:

- The common law right to collect shellfish from the shore
- Fisheries legislation cannot discriminate between commercial and recreational fishermen who have the same rights in law
- Winkle collection is not classed as a commercial fishery and is not regulated by DARD
- Apparent uncertainty about the legal status of winkle collection and winkle collectors within the current framework of environmental legislation
- There is a belief among some that the roles and powers of the various organisations involved in the management of shellfish harvesting and other activities in the Strangford and Lecale area need to be more clearly defined - e.g. DARD, DoE, National Trust Wardens, Environmental Health Officers; the general view is that DARD should take the lead, supported by DoE, as the PSNI is reluctant to become involved in environmental matters
- It was suggested that the enactment of the NI Marine Bill may make it possible to more easily regulate winkle harvesting through byelaws, if regulation is deemed necessary (even though the power to make byelaws already exists).
7. Qualitative Feedback about the Regulation of Winkle Harvesting

This section summarises and reports upon qualitative feedback from those consulted during the research. It therefore records expressed views whether factually correct or otherwise.

7.1 The Industry View

The majority of respondents from the industry believe that, with the possible exception of gangmaster / gang activity, winkle collection has little impact upon the sustainability of the species or the wider environment.

Many people from the fishing sector believe that fishermen and shellfish harvesters tend to get the blame for environmental problems that they are, in reality, not connected to. In a similar vein it was suggested that some people from a scientific and academic background tend to look only for results that suit their theories and that action to reduce fishing activity is taken too quickly, when other potential causes exist.

To support this point of view, it was pointed out that Belfast Lough used to have a cockle harvest of 1,000 tonnes per year which has declined to teens of tonnes, but nobody knows why and that horse mussel decline is most pronounced in the upper part of Strangford Lough where effluent density is highest.

Reference was also made to 2012 byelaws stopping pot fishing and other activity on the seabed under 10m (to protect horse mussels) in a defined area of Strangford Lough. One fisher said that this development had taken away 40% of his business, after he was encouraged to invest in what he was assured was sustainable, environmentally-friendly pot fishing for live export to Europe. He found the decision to create the exclusion zone difficult to understand as, in his view, climate change and sewage pollution are more likely causes of horse mussel decline. He also pointed out that fishermen actively avoid horse mussels as they are of no value.

This person saw the creation of this exclusion zone as being symptomatic of the tendency among some in government and the scientific community to turn almost automatically and without proof to fisheries regulation and limitation to address issues which might be caused by matters unrelated to fishing and which could be addressed in other ways. It was feared that winkle harvesting could become subject to un-necessary regulation.

It was pointed out that fishermen played a big part in reintroducing the Strangford Lough oyster.

With reference to winkle harvesting, most people from the industry feel that, with the exception of gang activity, winkle collection is sustainable and has little impact upon the
environment. It was argued that the industry is self-regulating, as local collectors are interested in larger winkles because there is no market for small winkles.

It was suggested that environmental interest in winkles dates back to 1993 when the National Trust lost the Adair case and that some people believe that the Trust has been trying to 'clamp down' on winkle gathering in other ways ever since.

It was stated that there has been a decline in the amount of seaweed in Strangford Lough. The evidence for this appears to be anecdotal, but it was claimed that it is widely accepted that this is the case, although nobody knows why this has occurred. It was suggested that one possible explanation is that the number of grazers may have increased and that the winkle population has grown.

A processor said that he is receiving more large winkles than ever before and that winkle harvesting used to be much heavier in the past.

One respondent said that, in the Ardglass area, there are indications of overharvesting as, compared to the past, more effort is required to collect fewer winkles.

One person thought that winkle harvesting is not causing damage to the wider environment but that heavy harvesting by gangs may be damaging winkle stocks and that regulation is needed for commercial collection, based on limits on size and quantity collected and possibly a quota on the number of collecting days.

7.2 The Government, Scientific and Environmental Perspective

Although there is a general view that it would be desirable to regulate winkle harvesting, it is the view of many in the scientific community that the winkle stock in the Strangford and Lecale Coast area is not being overharvested at current harvesting levels, as there is a huge underlying population. In fact among people from both scientific and fishing backgrounds there is, in general, agreement that the winkle population in the Strangford and Lecale Coast area is not under threat under current conditions.

Similarly, there is no proof of significant environmental damage to the ecology of the intertidal area caused by intertidal winkle harvesting. However, there have been reports (e.g. from wardens employed by environmental bodies) that shellfish collection does cause disturbance to shore-feeding birds and to seals at haul-outs, although one piece of research about Strangford states that bird counts do not suggest a conflict with harvesting practices (Johnson et al., 2008).

Some people feel that there is a need for more extensive research to define the position and clarify the need for regulation. One body which contributed to the consultation suggested that the creation of ‘no-take zones’, which could be coincident with existing intertidal nature reserves at the Dorn, Cloghy Rocks, Granagh Bay and Killard, would protect seal haul-
outs and provide ‘control’ areas enabling comparison to be made with the ecology of intertidal areas subject to harvesting and areas where harvesting did not occur. It was also suggested that some areas are being over harvested.

There is concern about gangmaster / gang activity and this issue, including concern about the health and safety of people in gangs, has helped to focus attention on winkle harvesting in general.

Although the indications are that harvesting is not having a serious environmental impact now, it was suggested that it could have serious impacts if there was sustained overharvesting and that regulation and openness about winkle harvesting would be to the benefit of everyone. As a result, it would be in the interest of collectors to engage with government and others, or the danger is that regulation will be imposed without their input.

Suggestions about the type of research required included:

- Scale, range and seasonality of harvesting activity
- Data on total stock and sustainability
- Scientific experiments to determine impact on species and environment.

Defining the difference between harvesting for personal and commercial use was seen as an important issue by some.

Possible impacts of winkle harvesting are thought to include:

- Disturbing boulders and associated habitats and species
- Trampling
- Disturbing wildlife
- Overharvesting of winkles and possible changes to the population structure and reproductive capacity of the species
- Consumer safety issues.

Some people expressed the view that all activities in Strangford should be SAC-assessed and that any activity that has the potential to impact on a designated site is required to be the subject of a Habitat Risk Assessment.

Suggestions about a possible approach to regulation included:

- A Code of Practice for winkle collectors
- Minimum size limits
- Logging requirements
- Zoning with, for example, possible prohibition of shellfish harvesting at important seal haul-outs
- Allowance for personal use
- Licence for commercial collection
• Restricting winkle harvesting at night.

Issues surrounding regulation include:

• Who will regulate?
• What to legislate on?
• How to enforce?
• Problems include different sources of legislation (e.g. fisheries and environmental) and possible need to amend complex fisheries legislation.

A suggested approach involved:

• Determining if the winkle population is in difficulty and if it can / cannot sustain the current level of harvesting
• Introducing, evidence-based regulation, if required (it is essential to have scientific evidence)
• Improve enforcement resources and capability in NI.
8. Key Conclusions from Research and Consultation

- The annual volume of winkles harvested in the Strangford and Lecale Coast area (i.e. Strangford Lough, outer Ards and Lecale coasts) has been estimated to be in the range of 300-580 tonnes per year. This (and estimates from other sources) confirms that a commercial significant fishery exists in the Strangford Lough and Lecale Coast area. Clearly the total Northern Ireland winkle fishery is significantly bigger.

- Recent scientific studies about winkle and shellfish harvesting and the possible impacts of this activity in Strangford Lough have indicated that winkle harvesting, particularly heavier and more sustained harvesting, has some impact, but that there is no proof of significant environmental damage caused by this activity. As the findings of only two recent / relatively recent studies from Strangford Lough have been published and these studies have produced different and sometimes contradictory findings, it can be argued that more research is required to confirm the presence or absence of significant environmental impacts linked to winkle collection or shellfish collection in general.

- Research in Strangford indicates that intensive winkle harvesting over a sustained period may alter the structure of the winkle population, as larger winkles tend to be replaced with a larger number of smaller animals. It could be argued that this is an indication of a possible threat to the sustainability of the winkle population, but no proof has been found that this is the case.

- Even though one or two individuals argue that winkles are being overharvested in some areas (e.g. Ardglass), the nature of most of the qualitative feedback from the scientific community, winkle collectors, processors and the wider fishing sector indicates that, in general, there is agreement that the winkle population in the Strangford and Lecale area is not under threat of over-exploitation at current harvesting levels.

- Gangmaster / gang activity has focused public, government and scientific attention on shellfish collection and, among many people, there is concern and discomfort about the presence of gangmasters / gangs and the highly visible and apparently destructive impact of gangmaster / gang activity. However, no proof exists that this activity is having a major, long-term impact on the winkle population or the wider environment and ecology. Without gangmaster / gang activity it seems likely that much less attention would be paid to winkle collection.

- The potential for EU infraction related to winkle harvesting exists.
In this context, two priorities can be identified:

i. Winkle collection is a large and valuable market and it would seem logical to classify it as a commercial fishery
ii. Reducing or ending gangmaster / gang activity

- In the Strangford and Lecale Winkle Market:
  - Winkle collection is carried out mainly for commercial gain; few winkles are collected for personal use
  - The main ‘players’ in the market are local collectors, buyer / wholesalers, approved processors and gangmaster / gang activity
  - Approved processors operate legitimately and export traceable winkles to European wholesalers
  - Buyer / wholesalers and gangmasters sell winkles to factories in RoI
  - It follows that legitimate and illegal markets operate simultaneously
  - An estimated 300-580 tonnes of winkles are taken from the fishery each year
  - Demand and prices fluctuate, with peak demand and prices at Christmas; local collectors receive around £1.00 -£2.00 per kg depending on the time of year
  - Local collectors say that they target larger winkles as there is no market for small winkles; it is believed that gangs harvest more indiscriminately
  - Some processors grade and return undersized winkles to the shore.

With reference to the winkle market the main issues are:

i. It is a commercial market – few people collect only for personal use
ii. Is the estimated volume of the winkle harvest (which does not include estimates of gangmaster / gang collection) sustainable?
iii. Can all individuals and businesses in the market be brought within the UK tax and food regulation systems?

- Issues around the possible need for regulation include:
  - Winkle harvesting is subject to control through EC food hygiene regulations, although this system is not widely enforced
  - Winkle collection by hand is not classed as a commercial fishery and is not regulated by DARD
  - The common law right for anyone to collect shellfish from the shore, which may contribute to the legal uncertainty about the relationship of winkle collection to environmental legislation
  - There is no definition of the volume of winkle a harvester needs to collect to be viewed as a commercial collector
  - Winkle collection seems to ‘fall through’ much of the environmental regulation that applies to the Strangford area, even though it seems that elements of existing
legislation can - and some argue should - apply to winkle collection and winkle collectors
- Wildlife protection regulations clearly do apply to winkle collectors
- Arguments in favour of regulation include the desire to legitimise the entire market, consumer safety issues, environmental concerns, ending gangmaster / gang activity and the desire to have a fishery that is guaranteed to be sustainable
- Many people in the winkle industry feel that it is self-regulating and that government can be too quick to introduce regulation
- Approved winkle processors recognise the value of regulation, but see the existing food hygiene regulations as being adequate
- Suggestions for regulations include a Code of Practice for pickers, minimum size limits, logging requirements, zoning, an allowance for personal use, licences for commercial collection and restricting winkle harvesting at night
- The forthcoming NI Marine Bill will create a Marine Conservation Zone in Strangford and allow DoE to develop, apply and enforce byelaws for MCZs; existing environmental legislation includes the power to make byelaws, but there is a view that the creation of a MCZ in the Strangford area will make it easier to create and enforce byelaws
- Other winkle fisheries do have regulations; in England these are often applied through byelaws.

Key issues around the possible need for regulation of winkle collection are:

i. Is regulation needed now or in the longer term?

ii. Immediate reasons for considering regulation:
- The need to legitimise the entire winkle market
- The need / desire to reduce or end intensive harvesting by gangmasters / gangs
- The opportunity to support, make use of and enforce existing food hygiene regulations
- The potential for EU infraction related to winkle harvesting.

iii. Longer term reasons for considering regulation:
- Maintaining a sustainable fishery
- The opportunity to take a long-term, preventative approach so that, in years to come, any possibility of favourable conservation status being lost or the fishery collapsing as a result of the impacts of intertidal shore based shellfish collection, can be avoided.
- A confirmed need to protect the winkle population from over-exploitation
- A confirmed need to protect the wider environment and ecology from the impacts of winkle collection.
9. An Approach to Regulation

The available evidence indicates that the volume of winkles harvested in the Strangford and Lecale area - and therefore the value of the winkle market - is significant. It follows that there is a case for regulation.

These reasons include:

- The need to legitimise the winkle market - some winkle collectors and processor / wholesalers operate within the UK tax and food regulation systems, some do not; the value of the winkle market is significant and tax revenue is being lost, significant volumes of winkles are sold in RoI with little benefit to the NI economy and food safety regulations are being bypassed by some people in the market with possible implications for the reputation of the fishery.

- The need / desire to reduce or end intensive harvesting by gangmasters / gangs - this activity has focused public attention and concern on winkle harvesting (and shellfish harvesting in general), generating concern about environmental and ecological damage and what can be perceived as the intimidating presence of large numbers of people in a small area; there are also health and safety concerns about winkle collectors, linked to gangmaster control, night collection of winkles and the use of overloaded boats; if the issue of gangmaster / gang activity is addressed it is likely that there will be much less public concern about winkle collection and much less focus on winkle collection.

- The opportunity to support, make use of and enforce existing food hygiene regulations and therefore protect both consumer safety and the reputation of the fishery.

- The opportunity to take a long-term view so that, in years to come, any possibility of favourable conservation status being lost as a result of the impacts of intertidal shore based shellfish collection can be avoided.

Other reasons to consider regulation:

- There is an opportunity to use regulation to secure a sustainable winkle fishery, without adverse effects on the fishery and before damage is done (history has shown that regulation has often been introduced as a response to over-exploitation of species)

- Conclusive evidence that winkle collection is having a significant and damaging impact upon the environment and ecology

- To reduce the possibility of EU infraction related to winkle collection.
9.1 A Proposed Approach to the Regulation of Winkle Collection

**Stage 1** - Classify the hand collection of winkles as a commercial fishery, regulated by DARD

**Stage 2** - Introduce a regulatory framework - see Table 4 (below).

### Table 4: Proposed Regulatory Framework for Winkle Collection

<table>
<thead>
<tr>
<th>Elements of Regulatory Scheme</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classify the hand collection of winkles as a commercial fishery and:</td>
<td>Allows anyone who wishes to collect winkles for personal use to do so without any form of registration.</td>
</tr>
<tr>
<td>- require all winkle collectors who collect more than 4kg / 2 litres(^1) in one tide to register with their local Environmental Health department and / or a defined government department;</td>
<td>Favours responsible winkle collectors who say that they target larger winkles.</td>
</tr>
<tr>
<td>- define a minimum size for winkle collection;</td>
<td>Supports existing food hygiene regulations and addresses possible consumer issues.</td>
</tr>
<tr>
<td>- require all commercial winkle collectors (i.e. people collecting more than 4kg / 2 litres in a single tide) to sell the winkles they collect to processors / wholesalers who are registered with and approved by their local environmental health department and / or a defined government department;</td>
<td>'Fits into' existing regulatory frameworks.</td>
</tr>
<tr>
<td>- apply Buyers and Sellers regulations to processors / wholesalers who will be required to supply statistics for the quantities of winkles passing through their premises and the place of origin of catch;</td>
<td>Requires individual members of large groups who collect winkles to register and sell winkles to approved processors / wholesalers.</td>
</tr>
<tr>
<td>- processors / wholesalers required to test winkles passing through their premises to ensure they are fit for human consumption; enforcement / management powers for all relevant bodies - e.g. DARD, DoE, Environmental Health, other inter-tidal shore landowners.</td>
<td>Legitimises and regulates the market.</td>
</tr>
<tr>
<td></td>
<td>Generates data that can be used to ensure sustainability.</td>
</tr>
<tr>
<td></td>
<td>Provides a basis for enforcement.</td>
</tr>
</tbody>
</table>

\(^1\)As there is very little winkle collection for personal use in the Strangford Lough and Lecale Coast area, the level at which this figure is set at is largely academic, as long as it is set at a level which requires commercial winkle collectors to register. Commercial harvesters will always collect more than 4kg / 2 litres and will therefore be required to register. To put the proposed 4kg / 2 litre limit in context, the winkle fishery in Maine, USA specifies that harvesters can collect up to two quarts of winkles for personal use without having a licence. Two quarts equates to approximately 4kg or 2 litres of winkles. As 4kg of winkles broadly equates to 2 litres of winkles, a measure based on litres could be used in the field if it is easier to assess volume rather than weight.
Stage 3 - Research to:

- provide a reliable estimate of the total volume of winkles in the Strangford and Lecale Coast fishery - to provide a base measure which can be used to ensure that harvested volumes of winkles, and therefore the fishery, are and remain sustainable.

- a comparative study / studies, with appropriate controls, to examine the impact of winkle collection on a heavily harvested area(s) with a lightly harvested area(s) on which harvesting ceases for the duration of the study.
Appendices

Appendix 1

Examples of Shellfish Regulation

Appendix 1(a) - English IFCA Whelk and Cockle Regulation

Kent and Essex bye-laws requirements for whelk exploitation include:

- Having a permit, costing £100 plus 30p per tag for a supply of compulsory tags
- Issuing only one permit per vessel
- Providing 300 tags per year
- A limit of 300 whelk pots per permit holder per year.

The Eastern IFCA's 2012 order for The Wash Cockle Fishery stipulates that:

- It should be a hand-worked fishery with a Total Allowable Catch of 2369 tonnes
- Beds with high numbers of juvenile cockles would be closed
- The fishery would be open on specified days and times.

The Eastern IFCA also publishes a Cockle Charter and an eight-point Cockle Handwork Fishery Code of Best Practice. The latter provides guidelines for handworking cockles in The Wash:

I. To avoid damage to the seabed from the keel and hull of the vessel do not attempt to steam off the sand before the vessel is adequately afloat
II. Ensure the area to be harvested is assessed and marked out prior to the day that harvesting occurs, in order to understand the distribution and abundance of the stock to be harvested
III. A Daily Vessel Quota (DVQ) of 2 tonnes is in operation
IV. Propeller wash activity should be restricted to one ring per tide and the minimum required to uncover the cockle that can be harvested in one day bearing in mind the DVQ. As cockles occur just below the surface, only use sufficient wash to uncover the cockles so as not to create deep rings in the sediment
V. A buoy should be used to mark out the stocks to be targeted and provide a marker around which to steer and help minimise area of impact
VI. Evenly rake any cockles left exposed (e.g. from riddling or if more cockle is exposed by propeller washing than is required) over the bed at the end of the day
VII. Fishers should avoid taking small cockle (under 14mm width) to enable this cockle to grow on for future fisheries
VIII. Raise awareness of this code with other fishers if they are not fishing in line with best practice.

Appendix 1(b) - Maine, USA - US Department of Marine Regulations for the Harvesting of Periwinkles

1. Definitions

A. “Periwinkle” means the common periwinkle of the genus Littorina.

2. Harvest restrictions DEPARTMENT OF MARINE RESOURCES Chapter 13 page 3

A. Methods of harvest prohibited

It shall be unlawful to fish for or take periwinkles by diver/diving (SCUBA or snorkel), pump, suction or any type of mechanical pumping.

B. Minimum size

It shall be unlawful to take, possess, ship, transfer, transport, buy, or sell undersize periwinkles. For the purpose of this regulation undersize periwinkles will be determined by numerical count as follows:

The numerical count shall be determined by taking a random one quart sample from the bulk pile and then counting the periwinkles to determine the amount of periwinkles in the one quart container. If the one quart sample contains more than 220 periwinkles they will be considered undersize. This method of measurement results in an average taken at the narrowest diameter of the girth of 9/16” or less.

C. Drag size

It shall be unlawful to fish for periwinkles in Maine’s territorial waters with any one combination of drags having an aggregate size in excess of 6’ in width measuring from the extreme outside edge on one side to the extreme outside edge on the opposite side.
D. Culling requirement

Undersize periwinkles as well as all bycatch must be immediately liberated into marine waters in the area where harvested.

E. Night prohibition

It shall be unlawful to fish for or take periwinkles within Maine’s territorial waters by dragging during the period ½ hour after sunset, as defined in 12 M.R.S.A. §6001(46), until ½ hour before sunrise, as defined in 12 M.R.S.A. §6001(45).

F. Personal use exemption

Recreational harvesters may possess up to 2 quarts per day of periwinkles for personal use without a license.

3. License Endorsement

It shall be unlawful to harvest periwinkles unless the harvester holds a Commercial Fishing – Single license with the Periwinkle Permit endorsement or a Commercial Fishing – Crew license with the Periwinkle Permit endorsement. There will be no additional charge for this permit.

DMR License Division telephone (207-624-6550) or for online information select the following link:

http://www.maine.gov/dmr/license/index.htm

Appendix 1 (c) - Water Quality Guidelines for Recreational Shellfish Gathering in New Zealand

Over a shellfish-gathering season, the guideline for recreational shellfish gathering water quality is:

- a median faecal coliform count not exceeding 14 per 100 mL; and
- not more than 10% of samples exceeding 43 per 100 mL.

Non-compliance with either of these parameters indicates that the water is not suitable for the purpose of recreational shellfish gathering.
In New Zealand, commercial fishers must have a current fishing permit and are subject to strict quotas or limits on how much they can catch, along with many other controls. The restrictions on recreational fishers are relatively simple. The three main points recreational fishers are asked to remember are:

- Don’t take more than the daily limit.
- Don’t take undersized fish
- Don’t sell or trade the catch.

Only people physically involved in taking particular species like finfish, rock lobster or shellfish are entitled to claim a catch within the daily limit and there are restrictions on fishing gear and methods.
Appendix 2

The Environmental Regulatory Framework

International and EU Conventions alongside EU Directives and national and regional legislation contribute to the legal and environmental protection framework which applies to Strangford Lough.

Conventions are international agreements between countries, dealing with specific subjects of common concern. European Directives are legislative texts adopted by the European Community, affecting all member states. Where necessary, the UK transposes the provisions of Conventions and European legislation into national law, to meet its obligations under these agreements.

A range of Conventions relating to nature conservation have been concluded, covering subjects which include trade in endangered species, migratory species, the marine environment, and biodiversity. European Directives have concentrated on conserving species and habitats of European Community importance, and protecting aquatic ecosystems. Implementing legislation in the UK provides protection for specified animals and plants, and enables the establishment and protection of protected sites.

i. International and EU Conventions

- Convention on Biological Diversity 1992
- Convention on Wetlands of International Importance 1971 (The Ramsar Convention)
- Council of Europe Convention on the Conservation of European Wildlife and Wildlife and Natural Habitats (The Bern Convention)
- Convention on Migratory Species of Wild Animals (Bonn Convention)
- Convention on International Trade in Endangered Species (CITES)
- United Nations Framework Convention on Climate Change
- UN Convention on the Law of the Sea (UNCLOS)
- IMO Conventions related to marine environmental protection
  - International Convention relating to Intervention on the High Seas in Cases of Oil Pollution Casualties 1969
- International Convention on Civil Liability for Oil Pollution Damage 1969
- International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage 1971
- International Convention for the Prevention of Pollution from Ships 1973/78 (MARPOL)
- International Convention for the Safety of Life at Sea 1974
- International Convention on Salvage 1989
- International Convention on Oil Pollution Preparedness, Response and Co-operation 1990

ii. EU Directives

Nature conservation in the European Union is mainly based on two pieces of binding legislation known as the Habitats Regulations:


All EU Member States must transpose the provisions of these Directives into their national legislation and must ensure proper implementation and enforcement. Strangford Lough is a Special Protection Area (SPA) under the Birds Directive and Special Area of Conservation (SAC) under the Habitats Directive.

**Birds Directive**


- The maintenance of the favourable conservation status of all wild bird species across their distributional range (Article 2) with the encouragement of various activities to that end (Article 3).
- The identification and classification of Special Protection Areas for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4). Together with Special Areas of Conservation (SACs) designated under the Habitats Directive, SPAs form a network of pan-European protected areas known as Natura 2000.
The establishment of a general scheme of protection for all wild birds (Article 5).
Restrictions on the sale and keeping of wild birds (Article 6).
Specification of the conditions under which hunting and falconry can be undertaken (Article 7). Hunttable species are listed on Annex II.1 and Annex II.2 of the Directive.
Prohibition of large-scale non-selective means of bird killing (Article 8).
Procedures under which Member States may derogate from the provisions of Articles 5-8 (Article 9) — that is, the conditions under which permission may be given for otherwise prohibited activities.
Encouragement of certain forms of relevant research (Article 10).
Requirements to ensure that introduction of non-native birds do not threaten biodiversity (Article 11).

A wide range of other statutory and non-statutory activities support the Bird Directive's implementation in the UK. This includes national bird monitoring schemes, bird conservation research, and the UK Biodiversity Action Plan which involves action for a number of bird species and the habitats which support them.

It is generally UK policy that areas classified as SPAs are first notified as Sites of Special Scientific Interest, or as Areas of Special Scientific Interest (ASSIs) in Northern Ireland, as this provides the legal underpinning for SPAs in domestic legislation. However, a few SPAs are not notified as ASSIs, and ASSI notification is not applicable to marine areas. In these cases, positive management is promoted by wider countryside measures, while protection relies on the provisions of the Habitats Regulations.

In NI, the provisions of the Birds Directive are implemented through the Wildlife (NI) Order 1985 as amended, the Nature Conservation and Amenity Lands (NI) Order 1985, as amended, and the Conservation Regulations (NI) 1995. The 'Habitats Regulations' apply to the UK land area and its territorial sea (to 12 nautical miles from the coast), and are supported by government policy guidance.

Habitats Directive

The main aim of the EC Habitats Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species at a favourable conservation status, introducing robust protection for those habitats and species of European importance. In applying these measures Member States are required to take account of economic, social and cultural requirements and regional and local characteristics.

In 1992 the European Community adopted Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (EC Habitats Directive). This is the means by which the Community meets its obligations as a signatory of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The Directive applies to the UK and to its overseas territory of Gibraltar. The provisions of the Directive require Member States to introduce a range of measures including the protection of species listed in Annexes and to undertake surveillance of habitats and species and produce a report...
every six years on the implementation of the Directive. The 189 habitats listed in Annex I of the Directive and the 788 species listed in Annex II, are to be protected by means of a network of sites. Each Member State is required to prepare and propose a national list of sites for evaluation in order to form a European network of Sites of Community Importance (SCIs). Once adopted, these are designated by Member States as Special Areas of Conservation (SACs), and along with Special Protection Areas (SPAs) classified under the EC Birds Directive, form a network of protected areas known as Natura 2000. The Directive was amended in 1997 by a technical adaptation Directive. The annexes were further amended by the Environment Chapter of the Treaty of Accession 2003.

The Habitats Directive introduced, for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest. In such cases compensation measures will be necessary to ensure the overall integrity of network of sites. As a consequence of amendments to the Birds Directive these measures are to be applied to SPAs also. Member States must also endeavour to encourage the management of features of the landscape to support the Natura 2000 network.

In NI the Directive has been transposed into national laws by means of the Conservation (Natural Habitats, & c.) Regulations (Northern Ireland) 1995 (as amended). These are known as 'the Habitats Regulations'. Most SACs on land or freshwater areas are underpinned by notification as Areas of Special Scientific Interest (ASSIs). In the case of SACs that are not notified as ASSI, positive management is promoted by wider countryside measures, while protection relies on the provisions of the Habitats Regulations. The territorial government advisors on nature conservation advise bodies on the application of the Regulations with respect to the affect of projects on Natura 2000 sites.

In order to meet obligations to avoid deterioration to Natura 2000 sites, bodies are required to review those consents, permissions or authorisations which may affect the integrity of these sites.

**Other Relevant EU Directives**


**iii. Environment Impact Assessment (EIA)**

EIA is a procedure that must be followed for certain types of development before they are granted development consent. The requirement for EIA comes from a European Directive (85/33/EEC as amended by 97/11/EC). The procedure requires the developer to compile an Environmental Statement (ES) describing the likely significant effects of the development on the environment and proposed mitigation measures. The ES must be circulated to statutory
consultation bodies and made available to the public for comment. Its contents, together with any comments, must be taken into account by the competent authority (e.g. local planning authority) before it may grant consent.

For qualifying projects they require a planning authority to consider first whether a proposed project is likely to have a significant effect on the environment. If so, the authority must ensure that the applicant carries out an assessment and prepares and submits to the planning authority a report that identifies, describes and assesses the effects that the project is likely to have on the environment. The process is referred to as Environmental Impact Assessment (EIA), the report as the Environmental Statement (ES).

Members of the public, and statutory consultees, must be given the opportunity to comment on the ES. Before any decision to approve the application may be taken, the planning authority must take into account the ES and any representations made about the environmental effects by the public or consultees. And they must state in their decision that they have done so.

There are two classes of project. Schedule 1 of the EIA Regulations lists those for which EIA is mandatory. Schedule 2 lists those where the planning authority is required to consider whether the project is likely to have a significant effect on the environment. Where this is the case, EIA must also be carried out.

Projects of the types listed in Annex I to the Directive must always be subject to EIA. Projects of the types listed in Annex II must be subject to EIA whenever they are likely to have significant effects on the environment. A determination of whether or not EIA is required must be made for all projects of a type listed in Annex II.

iv. Strangford Lough's Environmental Designations

Strangford Lough has many designations, as it is a Marine Nature Reserve (MNR), Special Protection Area (SPA), Special Area of Conservation (SAC), Area of Special Scientific Interest (ASSI), Ramsar wetland and Area of Outstanding Natural Beauty. This sub-section comments on some of these designations.

**Marine Nature Reserve**

The Strangford Lough Marine Nature Reserve (MNR), established in 1995, includes all the waters, seabed and shores up to mean tide high water mark and an area around the mouth of the Lough (MNR’s will automatically become Marine Conservation Zones when the forthcoming NI Marine Bill is enacted).
The Strangford MNR was established under Article 20 of The Nature Conservation and Amenity Lands (NI) Order 1985 (NCALO). It imposes an obligation on the Secretary of State for Northern Ireland to manage a designated Marine Nature Reserve for the purpose of:

a. conserving marine flora, fauna or features of geological, physiographical or other scientific or special interest in the area; or

b. providing, under suitable conditions and control, special opportunities for the study of, and research into, matters relating to marine flora and fauna and the physical conditions in which they live, or for the study of features of geological, physiographical or other scientific or special interest in the area.

The Secretary of State is empowered, but not required, to install markers indicating the existence and extent of a reserve and to make byelaws.

**Byelaws - Article 21**

(1) Subject to this Article, the Secretary of State may make byelaws for the protection of any area designated as a Marine Nature Reserve under Article 20.

(2) Without prejudice to the generality of paragraph (1), byelaws made under this Article as respects a Marine Nature Reserve —

a) may provide for prohibiting or restricting, either absolutely or subject to any exceptions—
   (i) the entry into, or movement within, the Reserve of persons and vessels;
   (ii) the killing, taking, destruction, molestation or disturbance of animals or plants of any description in the Reserve, or the doing of anything therein which will interfere with the seabed or damage or disturb any object in the Reserve
   (iii) the depositing of rubbish in the Reserve;

b) may provide for the issue, on such terms and subject to such conditions as may be specified in the byelaws, of permits authorising entry into the Reserve or the doing of anything which would otherwise be unlawful under the byelaws;

c) may be so made as to apply either generally or with respect to particular parts of the Reserve or particular times of the year.

(3) Before making byelaws under this Article the Secretary of State shall consult the Council for Nature Conservation and the Countryside.

(4) Nothing in byelaws made under this Article shall—

a) prohibit or restrict the exercise of any right of passage by a vessel other than a pleasure boat; or

b) prohibit, except with respect to particular parts of the Reserve at particular times of the year, the exercise of any such right by a pleasure boat.

(5) Nothing in byelaws so made shall make unlawful—

a) anything done for the purpose of securing the safety of any vessel, or of preventing damage to any vessel or cargo, or of saving life;

b) the discharge of any substance from a vessel; or

c) anything done more than 30 metres below the sea bed.
In this Article "vessel" includes a hovercraft and any aircraft capable of landing on water and "pleasure boat" shall be construed accordingly.

References in this Article to animals or plants of any description include references to eggs, seeds, spores, larvae or other immature stages of animals or plants of that description.

Special Protection Area

SPAs are strictly protected sites classified in accordance with Article 4 of the Birds Directive, (EC Directive on the conservation of wild birds (79/409/EEC)). They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species. The directive requires that species listed on Annex I and all species of regularly occurring migratory birds shall be the subject of special conservation measures concerning their habitat.

Member States of the EU are required to classify Special Protection Areas (SPAs) for the conservation of these species. Strangford Lough has been designated as an SPA. The main provisions relating to the classification of SPAs are contained in Article 4 of the Directive.

The criteria for SPA selection are set out in Articles 4.1 and 4.2 of the Birds Directive. There are seven features for which Strangford Lough has been classified as an SPA.

Under Article 4.1 (79/409/EEC): During the breeding season the area regularly supports

Feature 1 *Sterna hirundo* Internationally important populations of breeding common tern
Feature 2 *Sterna sandvicensis* Internationally important populations of breeding Sandwich Tern
Feature 3 *Sterna paradisaea* Internationally important populations of breeding arctic tern

Under Article 4.2 (79/409/EEC): An internationally important assemblage of Birds

Feature 4 *Branta bernicla hrota* Internationally important pop of wintering Lightbellied Brent Goose
Feature 5 *Calidris canutus* Internationally important populations of wintering Knot
Feature 6 *Tringa totanus* Internationally important populations of wintering Redshank

Over winter the area regularly supports:

Feature 7 The wintering waterfowl population including, *Branta bernicla hrota*, *Calidris canutus*, *Tringa totanus*.

Special Areas of Conservation
SACs are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive. The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).

Strangford Lough is an SAC and the features for which it has been selected are:

**Annex I habitats that are a primary reason for selection of this site** -

**Mudflats and Sandflats not covered by seawater at low tide**
The intertidal mudflats and sandflats in the north of the Lough represent the largest single continuous area of such habitat in NI. There are very extensive areas of muddy sand from Newtownards to Ardmillan Bay in the west and to Greyabbey in the east. The habitat also occurs in the south-west reaches of the Lough along the northern shore of Lecale. The northern flats support luxuriant beds of the eelgrasses *Zostera noltei* and *Z. angustifolia*. Many of the invertebrate species present in muds also occur in muddy sand.

**Coastal lagoons** * Priority feature
The ‘Dorn’ is a silled lagoon on the eastern side of the Lough, and refers specifically to the channel which connects several exceptionally sheltered bays to the main area of the Lough. Rock barriers or sills hold back water as the tide falls, creating saltwater rapids, unique in Ireland. In the area of the Dorn rapids, abundant growths of sea anemones, sponges and ascidians clothe the rock and boulders. Several of the animals found in the area of the rapids normally occur in relatively deep water. The main trough of the Dorn supports a dense forest of sugar kelp *Laminaria saccharina* and sea-oak *Halidrys siliquosa*. The gravelly-sand bottom has unusually dense colonies of peacock worm *Sabella pavonina* and sand gaper *Mya arenaria*, with occasional native oysters *Ostrea edulis* and king scallops *Pecten maximus*. The gravelly-sand bottom has unusually dense colonies of peacock worm *Sabella pavonina* and sand gaper *Mya arenaria*, with occasional native oysters *Ostrea edulis* and king scallops *Pecten maximus*. The channel enables sponges to grow to exceptional proportions. The sheltered marine ‘ponds’ feature beds of common eelgrass *Zostera marina* and the green alga *Codium fragile* ssp. *tomentosoides*.

**Large shallow inlets and bays**
With a wide range of tidal stream strengths and depths, there is a remarkable marine fauna within Strangford Lough and it is one of the most diverse sea loughs in the UK. The communities present range from the very rich high-energy communities near the mouth, which depend on rapid tidal streams, to communities in extreme shelter where fine muds support burrowing brittlestars, the Dublin Bay prawn *Nephrops norvegicus*, and a rich community associated with horse mussels *Modiolus modiolus*.

**Reefs**
Reefs in Strangford Lough vary from tide-swept bedrock and large boulders in the main channel of the Narrows, through sand-scoured bedrock and boulders at either end of the channel, to more sheltered bedrock and boulders in the main central portion of the Lough and in parts of the intertidal.

**Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:**

- Annual vegetation of drift lines
- Perennial vegetation of stony banks
- *Salicornia* and other annuals colonising mud and sand
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).

Annex II species present as a qualifying feature, but not a primary reason for site selection - Common seal *Phoca vitulina*.

**Ramsar Site**

The *Convention on Wetlands of International Importance especially as Waterfowl Habitat* (otherwise known as the Ramsar Convention) is an international convention. Such sites may be designated for their waterfowl populations, important plant and animal assemblages, wetland interest or a combination of these. Governments are also encouraged to promote the conservation and ‘wise use’ of wetlands in general.

Strangford Lough satisfies criteria under the Convention and has been formally listed as a Ramsar site. The boundary of the Ramsar site is identical to that of the SPA. The four main criteria for which Strangford Lough has been classified a Ramsar site are:

- This site supports a variety of important wetland features. Areas of fringing saltmarsh and freshwater habitats support a diversity of wetland plant species. Strangford Lough supports one of the most extensive saltmarsh areas in Northern Ireland.
- This site supports an important assemblage of vulnerable and endangered wetland plants and animal species. These include a number of marine sponges, marine hydroids, marine mollusc and sea urchins which are restricted to Strangford Lough in Northern Ireland or, in some cases unknown or very rare elsewhere in the British Isles. The mudflats support luxuriant beds of eelgrass; *Zostera noltei*, *Zostera angustifolia*, *Zostera marina* and *Ruppia maritima* are all present, with the latter widespread but quite local in its distribution. Such extensive ‘beds’ are rare in the British Isles.
- The site supports vast assemblages of internationally important waterfowl, with peak species counts in the winter time of 74876. (5 year peak mean 1998/99-2002/2003)
- The site supports species and populations occurring at levels of international importance. Key species regularly supported during the breeding season are: Sandwich tern, *Sternula (Thalasseus) sandvicensis sandvicensis*, and the Common tern, *Sternula hirundo hirundo*. Species with peak counts in spring/autumn that qualify the site for Ramsar status are: Light-bellied brent goose, *Branta bernicla hrota*, Common redshank, *Tringa totanus totanus*, and Red knot, *Calidris canutus islandica*. Common shelduck, *Tadorna tadorna*, have peak counts in winter on the site.

v. Northern Ireland Legislation

EC Directives are implemented through national and regional legislation and it seems that elements of existing legislation could apply to winkle collection.

**Notifiable Operations**

For example, as well as declaring an Area of Special Scientific Interest (ASSI) at Strangford Lough (Part 1), Article 24 of the Nature Conservation and Amenity Lands (Northern Ireland)
Order 1985 identified a number of operations and activities which were likely to damage the flora and fauna of the area and which required prior notification and permission from DoE.

The list of operations and activities (often referred to as 'notifiable operations') includes 'the collection of sea food and marine organisms'.

In addition, the above Order and other legislation describes the duties of owners and occupiers of land included in an ASSI and outlines the ability of DoE to enter into management agreements with owners and occupiers and, if necessary, serve management notices.

These regulations say that the owner or occupier of any land included in an ASSI shall not carry out, or cause, or permit notifiable operations on the land without prior notice and permission. They also allow DoE to enter into management agreements with the owners or occupiers of land in an ASSI and that such management agreements may 'impose such restrictions as may be expedient on the exercise of rights of the land by persons who can be bound by the agreement'.

DoE can issue management notices if, for example, it is believed that any flora, fauna or geological, physiographical or other features are being inadequately conserved or restored.

**Byelaws**

DoE has the power to make byelaws under a number of pieces of legislation, including the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (Nature Reserves; the Conservation (Natural Habitats, etc) Regulations (Northern Ireland) 1995 (SACs / SPAs) and the Environment (Northern Ireland Order) 2002 (ASSIs).

This legislation indicates that it is possible to make byelaws that may, for example, prevent or restrict entry to protected areas or prohibit the removal, killing or disturbance of living creatures from such areas.

**Wildlife and natural Environment (NI) Act, 2011**

This Act made a number of significant changes, including giving the police, Wildlife Inspectors and the Courts additional powers to combat wildlife crime. In addition, the list of birds, animals and plant species receiving special protection was significantly enlarged.

The 2011 Act also introduced a new statutory duty upon government departments and all public bodies, in exercising their functions, to take action to further the conservation of biodiversity.

vi. Winkle Harvesting and the Current Environmental Protection Framework

Despite the presence of an apparently comprehensive raft of environmental regulation and control, those with knowledge and experience of the development and application of
environmental regulation describe winkle harvesting as 'a grey area' and it seems that
government departments and agencies are uncertain if the activity is covered by either MNR
or ASSI regulations.

For example, a report on 'Unregulated Harvesting of Intertidal Shellfish in Strangford Lough'
(Johnston et al, 2008) states that the public right to harvest shellfish from the foreshore
cannot generally be removed by regulation or byelaw.

As described in Section 6.7, ASSI regulations refer to 'identifiable operations' and say that
notification and permission is required to carry out any activity that has the potential to
impact upon a designated feature of the area. However, feedback from those who work in
this area indicates that the activity would have to be declared as a 'threat' and therefore
classed as a 'notifiable operation' when the ASSI was set up and that there is uncertainty
that winkle collection is classified as such (even though Article 24 of the Nature
Conservation and Amenity Lands (Northern Ireland) Order 1985 does list
'the collection of sea food and marine organisms' as a notifiable operation).

It was also indicated that regulations about 'identifiable operations' apply to land owners /
occupiers rather than individuals who visit the area, like shellfish collectors (again
regulations say that the owner or occupier of any land included in an ASSI shall not carry
out, or cause, or permit identifiable operations on the land without prior notice and
permission).

The 'identifiable operations' regulations have not been tested in Northern Ireland and, as
the above comments suggest, there seems to be some doubt about the legal status of
winkle collection and winkle collectors.

There is no ambiguity about the application of other areas of legislation, as it is an offence
to disturb protected wildlife under the Wildlife (NI) Order 1985 and related legislation.

As far as winkle collectors are concerned, the key features of regulation around the
protection of wildlife are:

**Protection of certain wild animals, their nests and eggs**

A person will be guilty of an offence if they intentionally or recklessly disturb:

- any wild bird while it is building a nest or is in, on, or near a nest containing young;
- the dependant young of such a bird.

It is possible for DoE NI make an order which protects particular wild birds by providing
them with a period of special protection (up to 14 days) outside of their close season.

**Protection of certain wild animals, including the common and grey seal**
Under these Regulations it is an offence to deliberately:

- disturb such an animal
- while it is occupying a structure or place for shelter or protection
- in a way which may affect its local distribution or abundance
- in a way which may impair its ability to breed, reproduce or rear or care for its young
- in a way which may impair its ability to hibernate or migrate
- take or destroy the eggs of such an animal obstruct access to a breeding site or resting place of such an animal or
- damage or destroy a breeding site or resting place of such an animal.

The enforcement and regulation of wildlife protection legislation is the responsibility of the PSNI and DoE who tend to have other priorities.
Appendix 3


This report (Cashmore and Burton, 1998) concerns the winkle fishery on the west coast of Scotland - one of the biggest in the world, estimated at 4700 tonnes per year (more than twice the official reports).

The study points out that 5-20% of the catch is too small for the market (there was no minimum landing size), resulting in waste (economic and of animals) even though some are returned to the shore. Therefore it concluded that, at least in theory, there was potential for ongrowing.

Key issues for ongrowing identified as:

- dietary regimes
- separation of sexes (females grew better alone)
- submersion time
- parasitic infection
- geographic population differences.

Large variations in individual growth rates were found, related in part to gender and spawning condition. Seasonal constraints, growth rate, market price and availability of algae also required further consideration.

The study recommended further research in the following areas:

- a pilot commercial study
- investigate the dietary requirements of winkles, feeding regimes, dietary supplements
- effects of parasitism and intra-specific competition upon individual growth rates
- determine stocking densities
- determine seasonal patterns of growth and potential returns over 12 months to determine when the greatest benefits accrue
- compare shell morphology, dietary preferences and growth rate of geographically separated periwinkle populations to determine whether differences exist and their implications for on-growing different stocks
- Developing methods for harvesting and storing appropriate types of algae to ensure food availability outside the summer season
- Develop facilities for commercial scale extensive growing.

This study states that winkles can live up to 20 years - other papers say 4-5 years and usually 3 years.
Appendix 4

Data about other Winkle Fisheries

i. Republic of Ireland

The most substantive work about any winkle fishery is a study conducted in Ireland in 2002 - 'An Assessment of the Potential for the Sustainable Development of the Edible Periwinkle, Littorina littorea, Industry in Ireland'.

Market Size and Value

Information about market size came from official statistics from the Irish Department of Marine and Natural Resources (DMNR), estimates from wholesalers and from a wholesaler survey carried out as part of the research and consultation programme for this project.

1970s - average 2370 tonnes exported per year (DMNR), with a peak of 2995 tonnes in 1978

1980s - average 1604 tonnes exported per year (DMNR)

1998 - 2635 Tonnes exported per annum (DMNR).

DMNR estimates are considered to considerably underestimate the real size of the market. For example, a wholesaler speaking at the AGM of the Shellfish Association stated that 7,000 tonnes of winkles were exported from Ireland in 1997.

In general DMNR estimates of quantities exported rose in 1990s, while wholesaler estimates generally declined over the same period.

1994 export value - €6.34m / £5m per year, based on DMNR estimates.

2002 - 3650 tonnes (estimate from wholesaler survey) but an underestimate as some product was exported directly to France or Belgium on black market - total export market estimated at 4000 tonnes / year - worth £7m.

The Irish market is largely unregulated, as winkles are regarded as a non-pressure stock.

Winkles can live up to 20 years and the biggest specimen recorded was 52.8mm in height (Scotland).

Number and Profile of Pickers

Estimated 500 pickers in Ireland in 2002; the number of pickers fluctuates and generally falls as economic conditions and opportunities improve. There were many more pickers in, for example, the 1900s.
Profile:

Male - 80%
Local - 93%
Over 40 - 81%

Most pickers are part-time, using winkles to supplement their income and many are part-time fishers. Most pickers tend to be low income and there are some full-time harvesters.

Prices

Prices (in 2002) ranged from £1400 per tonne to £2200 per tonne at Christmas.

It was estimated that a picker might receive £0.80 per kg to £1.50 per kg at Christmas.

Wholesalers received £2.10 per kg for <13mm winkles and £2.50 per kilo for >15mm.

Transport costs ranged from 12p per kg + VAT to 22p per kg + VAT groupage.

Hygiene Regulations

Winkles are subject to the EU Directive on Shellfish Hygiene, which requires registration and Harvester Book records. Wholesalers have to be registered as a despatch centre and must have a veterinary number, as this is required to get an export licence and to confirm hygiene standards.

Distribution of Winkles

Abundance lower in winter, possibly related to sub-tidal migration and / or peak harvesting times. Larger winkles are lower on the shore, which is why harvesting is most intense at spring tides.

Issues and Concerns

- Some product was exported was without grading, meaning that smaller sizes winkles were eaten or dumped; however, it was recognised that some wholesalers who grade winkles return smaller winkles to the shore
- Pollution - TBT-based antifoulants (e.g. from leisure craft) may affect the reproductive capacity of winkles
- Localised over picking.

Conclusions and Recommendations from 2002 Report

- No conclusive evidence to suggest that winkle stocks are overpicked - e.g. picking levels were more intense in the 1900s
- Regulation - pickers and harvesters favour a summer closed season if there was to be control, but this wouldn't benefit the species
- There is little potential to add value for export
- Demand outstrips supply at times - ongrowing and polyculture may become viable if prices rise
- Some potential to sell to local restaurants, especially if there are more French and Spanish tourists
- No immediate action required about protective legislation (e.g. closed season, catch size or catch limitations)

**ii. Bay of Fundy Periwinkle Fishery, East Canada**

Data from a 1998 report by the Canadian Dept of Fisheries and Oceans.

Maximum shell height 37mm, usually less than 25mm; females mature at 14mm, releasing eggs into the plankton between April and July; larvae remain the plankton for 4 weeks and recruitment occurs in July-August or August-September.

Winkles usually live for 3 years and 20mm shell height but can survive for 4-5 years.

The market has two size categories -

- Jumbo - >19mm
- Small - 13-19mm

Prices (1998) were $1.76 to $1.00 per kg (i.e. Canadian dollars). Premium price paid for animals over 19mm, but animals down to 12.7mm shell height are purchased. Harvesters select individuals over 12.7mm in size, which limits the catch to 52-56% of the total winkle population by number and 79% by weight.

Fishing effort was very sensitive to market prices.

An average adult harvester collected 27-36kg per tide, with the best harvesters collecting 50kg per tide. School children collected up to 20kg per tide.

There were at least 10 buyers, 150 regular harvesters and hundreds of occasional harvesters.

Landing statistics were regarded as being dubious in some cases.

This study attempted to estimate the total biomass number of individual winkles in the fishery, while recognising the difficulties posed by significant variations in winkle density. It concluded that the area of exploitation is very small, while the total biomass is spread over the entire area.

Harvesting was commercially viable only on sites which were accessible by walking and had a critical density of animals - densities usually greater than 30 m⁻² were commercial.
Winkles reach 12.7mm in their 2nd year. Egg production increases directly with shell height - females in the 14mm class release less than 1000 embryos; those over 19mm release over 50,000.

Yield per recruit increases at least 3 fold if harvesting if directed at 19mm animals in their fourth year.

Conclusions

- The study concluded that it was not possible to determine if the species was overfished locally (levels of exploitation were limited to 17% of the harvestable stock under the management plan), but recognised that harvesting was very localised and that there was a large breeding reserve.
- Landing figures were unreliable
- Harvesting winkles over 19mm was not considered optimal for reproduction or yield results.

iii. Newfoundland and Labrador

Information from a report on Periwinkle Quality Analysis by the Department of Fisheries and Aquaculture, Newfoundland and Labrador, 2002

The study reported on work carried out to establish a commercial winkle fishery in Newfoundland and Labrador.

It estimated that 500 tonnes of winkles per year were harvested in Canada’s Maritime Provinces - for example 300 tonnes were harvested in Nova Scotia alone in 2000.

Prices in 2002 - $1.00 (i.e. Canadian dollars) per pound for periwinkles larger than 3/4 of an inch = $2.20 per kg = £1.41 per kg (at 2013 exchange rates).

The study found that winkles in the area were fit for human consumption.

iv. Cobscook Bay, Maine, USA

'Wrinkles' - Periwinkle harvesting in Cobscook Bay, Published in the Quoddy Tides, October, 2000

This newspaper article reported that periwinkles are typically harvested by hand or with lightweight drags. It said that Russell Wright, a marine patrol officer for the Cobscook Bay area, had seen an increase in the number of pickers out on the beaches - 'Typically you might have one or two pickers on a beach, and now there's six to ten on a beach.'

He added, 'During a good tide, 40, 50, 60 pounds is the best they can do. Usually, they can do 100-200 pounds in a day on the big tides.'
Appendix 5

How Registered Winkle Processors / Wholesalers Operate

One processor and one processor employee contributed to the consultation. This section summarises his comments.

This processor is supplied by a core group of 20 pickers, which can rise to 80 people at times, depending on market conditions. Regular harvesters are mostly from local families who have been involved in harvesting for generations; probably harvest 4 times a week when market demand permits, are responsible (i.e. they pick larger winkles) and have a vested interest in a sustainable fishery. They are mostly people looking for a few pounds pocket money to keep them going through the week - the average harvester would collect 15-20kg per harvest. Market demand means that the business is seasonal and economic conditions can mean that it is not worth harvesting - e.g. his business was not working when visited on 4 March 2013.

Collectors are paid in cash, but this processor issues invoices. Collecting areas are numbered 1 to 13 and winkle collection points are recorded on registration documents for traceability. This wholesalers says that there are some areas (e.g. beside sewage plants) which should not be used for winkle collection.

The wholesaler collects from harvesters in Kilkeel, Portavogie and Ardglass, paying £1 to £2 per kg depending on market demand / time of year.

Winkles are tested regularly for *e-coli* in particular and never been a problem with product quality.

This wholesaler has a grading machine that grades winkles into 3 categories - <11mm (returned to shore of origin), 11-15mm, 16mm + - he would not disclose exact grade sizes for commercial reasons, but he showed samples which looked like the sizes mentioned above.

An average of 2 tonnes per week (with large seasonal variation) pass though the premises and winkles are exported, with traceability labels, in 25 or 30kg bags (depending on customer preference) to wholesalers, mainly in Spain.

In the experience of this wholesaler, winkles have been coming and going from the same beaches from centuries. There is no sign of a decline in average size and there are more large winkles than ever. There is a large 'sub-tidal' reservoir and it is believed that winkles spawn in March / April, as spawn is visible on the shore.
There is an unsavoury side to the market. Gang activity is seen as a major problem and this wholesaler was physically assaulted and 'warned off' when he entered the winkle market as a wholesaler / processor (he had been a winkle collector for many years).
Appendix 6

Gangmaster / Gang Activity

Intensive shellfish harvesting by gangs is a matter for concern for everyone associated with winkles collection in the Strangford and Lecale areas. Most people believe that activity by gangs, who are often controlled by unlicensed gangmasters, is undesirable and destructive and references to gangs 'stripping beaches' are commonplace. Operating as an unlicensed gangmaster is illegal.

It seems that gangmaster / gang activity was most intensive in 2010-11. Fishing industry bodies have been working with government agencies and they believe that gang activity has reduced (especially activity by gangs 'coming in' from the Republic of Ireland to harvest shellfish in different parts of NI).

Gangs (consisting it seems mainly of people of Eastern European origin) are still operating and people in the fishing industry and government agencies are aware of three groups operating in the Strangford and Lecale areas.

One group is organised by a Latvian man, who has already been convicted of possession of an unregistered firearm and was due to appear in Ards Magistrates' Court on 11 March 2013 for gangmaster related activities, but the case was postponed.

Another group, made up of Eastern Europeans and previously associated with the Latvian man mentioned above, work from Downpatrick. A third group (again Eastern Europeans), organised by someone from Northern Ireland, live and work from a house in Killyleagh.

Concerns about gangs and gangmasters include suspicions of more extensive and more sinister activities, their supposedly indiscriminate and intensive approach to harvesting, possible damage to the environment and wider ecosystem and concerns about worker safety.

Some people, including those from a scientific background, have pointed to the need for a sense of perspective about gang activity. They suggest that there is not necessarily much evidence that the overall level of winkles harvesting has increased and that we need to be careful about giving too much credence to stories about gang activity, as these people may be replacing others who used to collect. They also point out that there are inaccessible areas which aren't harvested or are lightly harvested and that talk of a black market may be exaggerated.
Appendix 7

Points of Reference

The following materials are referred to in the report, or were consulted as part of the research process.


Agri-Food and Biosciences Institute Aquatic Ecosystems Branch (2013) 'Northern Ireland Inshore Fisheries'. Report prepared by AFBI Fisheries and Aquatic Ecosystems Branch for DARD Fisheries Division.


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