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Radiological Habits Survey: Hartlepool, 2014

2015

Environment Report RL 01/15

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Radiological Habits Survey: Hartlepool, 2014

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Environment Report RL 01/15

Radiological Habits Survey: Hartlepool, 2014

C.J. Garrod, F.J. Clyne and G.P. Papworth

2015

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SUMMARY

This report presents the results of a survey conducted in 2014 to determine the habits and consumption patterns of people living, working and pursuing recreational activities in the vicinity of the Hartlepool nuclear power station. The site discharges gaseous radioactive waste via stacks to the atmosphere, liquid radioactive waste via a pipeline into Tees Bay in the North Sea and contains sources of direct radiation. Areas likely to be most affected by the discharges and sources of radiation were defined as the aquatic survey area for liquid discharges, the terrestrial survey area for the deposition from gaseous discharges, and the direct radiation survey area for ionising radiation emanating directly from the site. The occupancy data collected from the direct radiation survey area is also applicable to the direct exposure arising from gaseous releases from the site.

The following potential exposure pathways were investigated:

- The consumption of food from the aquatic survey area
- Activities and occupancy over intertidal substrates
- The handling of fishing gear and sediment
- Activities and occupancy in and on water
- The use of seaweed as a fertiliser or animal feed
- The consumption of food from the terrestrial survey area
- The use and destination of produce originating from the survey areas
- The consumption and use of groundwater and surface water in the terrestrial survey area
- The transfer of contamination off-site by wildlife
- Activities and occupancy within the direct radiation survey area
- Any new or unusual exposure pathways

Interviews were conducted with members of the public and data collected for 522 individuals are presented and discussed. High rates of consumption, intertidal occupancy and handling are identified using established methods comprising (a) a 'cut off' to define the high-rate group and (b) 97.5th percentiles. The rates so identified can be used in dose assessments. Additionally, profiles of integrated habits data are presented specifically for use in total dose assessments.

The aquatic survey area

The aquatic survey area (see Figures 1a and 1b) covered the intertidal areas along the north-east coast of England from Parton Rocks (Hartlepool) in the north, to Saltburn Scar (Saltburn-by-the-Sea) in the south, and the adjacent sea area up to 3 km offshore. The River Tees, from its mouth to the tidal barrage approximately 16 km upstream, was also included.

Foods from the aquatic survey area were consumed from the following food groups: fish; crustaceans; molluscs; wildfowl. The mean consumption rates for the adult high-rate groups for the separate aquatic consumption pathways for foods potentially affected by liquid discharges were:

- 42 kg y^{-1} for fish
- 26 kg y^{-1} for crustaceans
- 11 kg y^{-1} for molluscs
- 12 kg y^{-1} for wildfowl

The predominant foods consumed by the people in the high-rate groups were:

- For fish: cod, ling, mackerel and whiting
- For crustaceans: brown crab and common lobster
- For molluscs: whelks and winkles
- For wildfowl: Canada goose, greylag goose and mallard

The activities undertaken by adults in the high-rate groups for intertidal occupancy included angling, bait digging, boat maintenance, collecting crabs, collecting mussels, collecting winkles, collecting sea coal, dog walking, hooking for crabs, nature warden duties and setting pots on the shore. Gamma dose rate measurements were taken at most locations in the aquatic survey area where activities were occurring. The activities undertaken by adults in the high-rate group for handling fishing gear were handling pots and nets, while the activities undertaken by adults in the high-rate group for handling sediment were bait digging and collecting crabs, mussels, winkles and sea coal. The activities undertaken by people in and on the water included surfing, jet-skiing, water-skiing, kayaking, sub-aqua diving, swimming, canoeing, rowing, sailing, power boating, push netting, potting, gill netting, boat angling, boat maintenance, skippering charter boats, pleasure cruising and paddling. No use of seaweed as a fertiliser or animal feed was identified.

The terrestrial survey area

The terrestrial survey area (see Figure 2) covered the land and freshwater watercourses within 5 km of the centre of the Hartlepool site. Eight farming businesses were identified that farmed the land in the terrestrial survey area. They produced, beef cattle, lambs, wheat and oilseed rape. Hay and silage were grown on some farms for use as animal feed. Lamb that was produced commercially on land within the survey area was being consumed locally. Seven allotment sites with approximately 400 plots in total were identified where a variety of fruit and vegetables were grown. Chickens were kept for egg production at two of the allotment sites. Two beekeepers were interviewed who kept hives in the survey area and the consumption of honey was recorded. Shooting took place on farmland in the area and the shot partridge, pheasant, pigeon, woodcock, rabbits and deer were consumed. Wild/free foods and wild fungi were collected and consumed. Small quantities of brown trout were being consumed from a freshwater stream in the terrestrial survey area.

Foods from the terrestrial survey area were consumed from the following food groups: green vegetables; other vegetables; root vegetables; potato; domestic fruit; sheep meat; poultry; eggs; wild/free foods; rabbits/hares; honey; wild fungi; venison; freshwater fish. No consumption of locally produced milk, cattle meat or pig meat was identified.

No consumption of groundwater by humans or livestock was identified. All livestock were supplied with mains water for drinking but many also had access to pond, stream or ditch water.

A site representative reported that wildlife does not have access to controlled areas and therefore it is unlikely that wildlife could become contaminated and transfer contamination off-site.

The direct radiation survey area

The direct radiation survey area (see Figure 2) covered the land and water within 1 km of the Hartlepool nuclear licensed site boundary. No occupied residential properties were identified within the direct radiation survey area. Occupancy rates were obtained for people working, farming and undertaking recreational activities in the area.

The occupancy rates were analysed in zones according to the distance from the Hartlepool nuclear licensed site boundary. The highest indoor and total occupancy rates in the 0 – 0.25 km zone were for an individual who was carrying out office based nature warden duties. The highest outdoor occupancy rate in the 0 – 0.25 km zone was for an individual who was bait digging and collecting crabs, mussels and winkles. No occupancy data could be collected in the >0.25 – 0.5 km zone but based on data from the 2008 survey the highest indoor, outdoor and total occupancy rates in this zone were for people who worked in the area. The highest indoor, outdoor and total occupancy rates in the >0.5 – 1.0 km zone were for an individual who worked in the area.

Gamma dose rate measurements were taken indoors and outdoors at most properties where interviews were conducted in the direct radiation survey area. Background readings were taken over grass at distances beyond 5 km of the Hartlepool site centre. The measurements taken at the properties were not notably different from the background measurements.

Comparisons with the previous survey

Comparisons were made with the results from a previous habits survey undertaken around the Hartlepool site in 2008. The results of the comparisons are shown in Figures i to iv below. In 2014, compared to 2008, the consumption rates within the aquatic food groups increased for fish, crustaceans and molluscs but the consumption of marine plants/algae, which was identified in 2008, was not identified in 2014 (see Figure i). There were no consistent patterns to the changes in the intertidal occupancy rates and handling rates of fishing gear and sediment, or the consumption rates of terrestrial

foods, between 2008 and 2014 (see Figure ii and iii). The maximum occupancy rates in the direct radiation survey area in 2014 were generally lower than in 2008, except for outdoor occupancy in the 0 - 0.25 km zone (see Figure iv). Reasons for changes in the consumption, occupancy and handling rates were identified for certain pathways and these are presented in Section 8 of the report.

Figure i. Mean consumption rates for the high-rate groups for aquatic foods

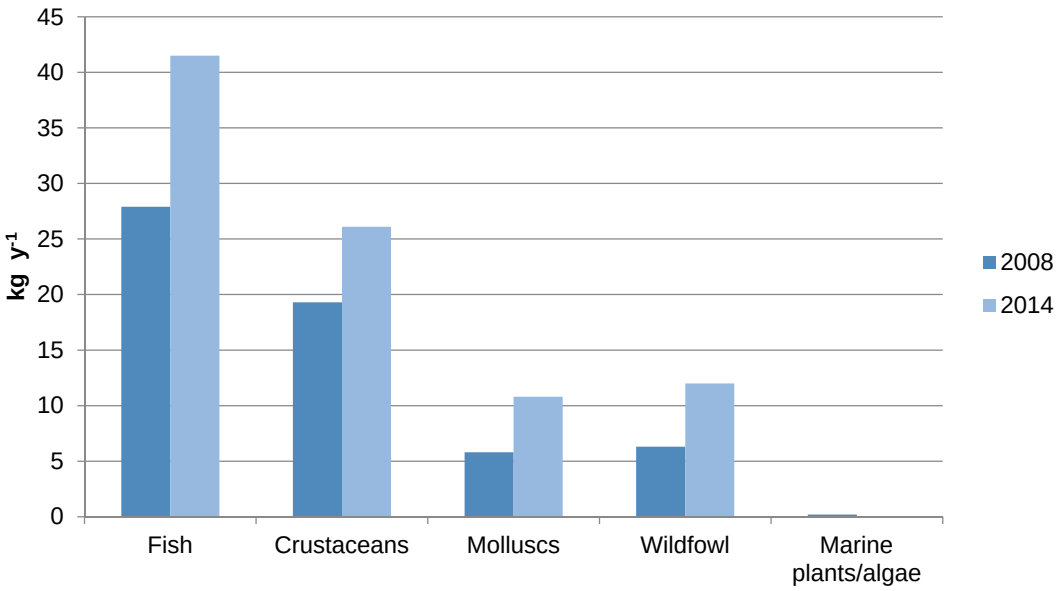
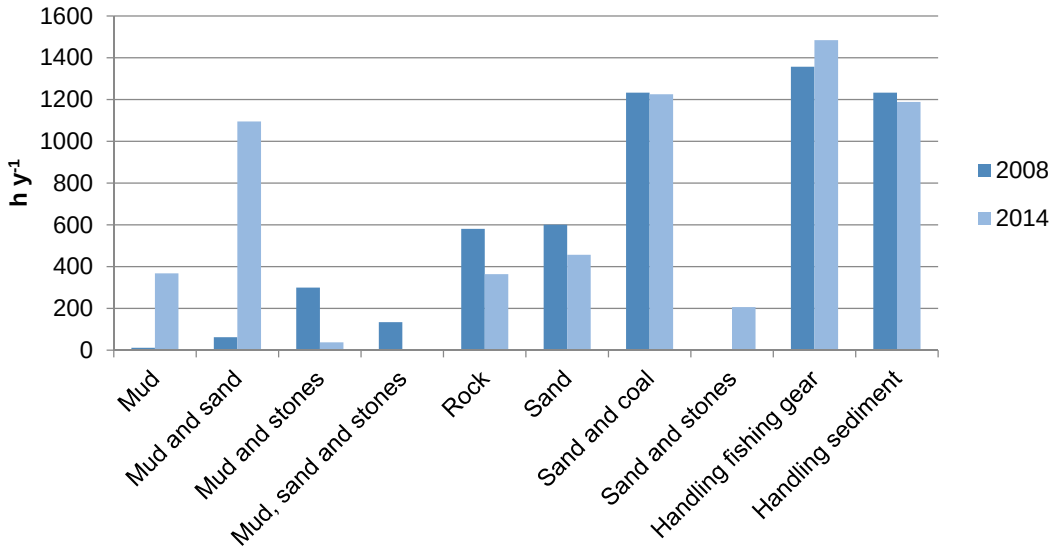
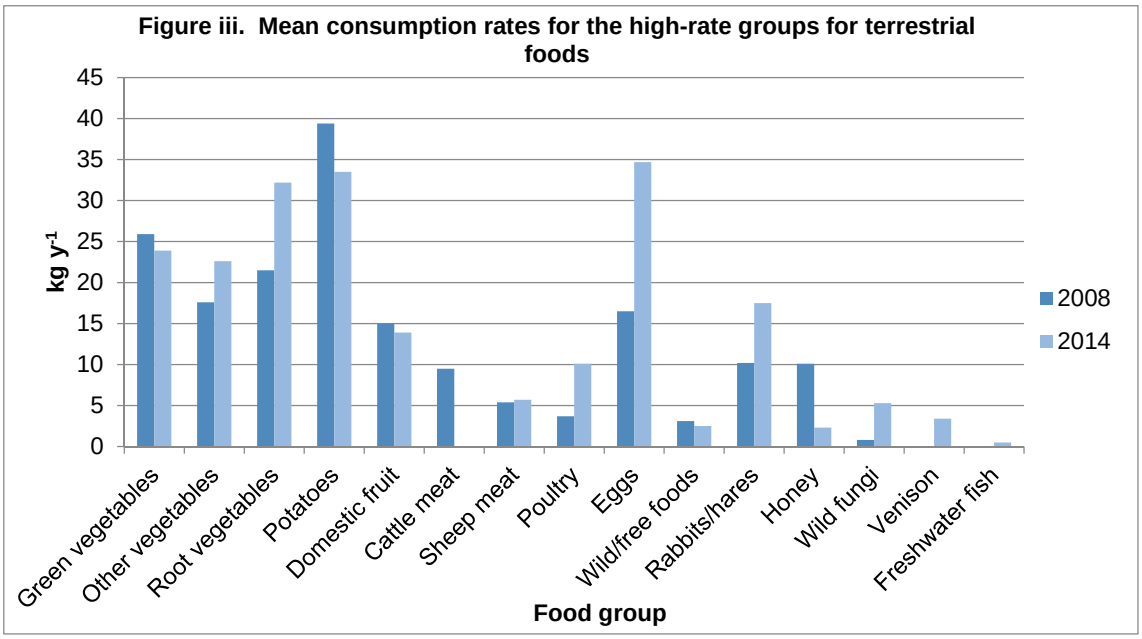
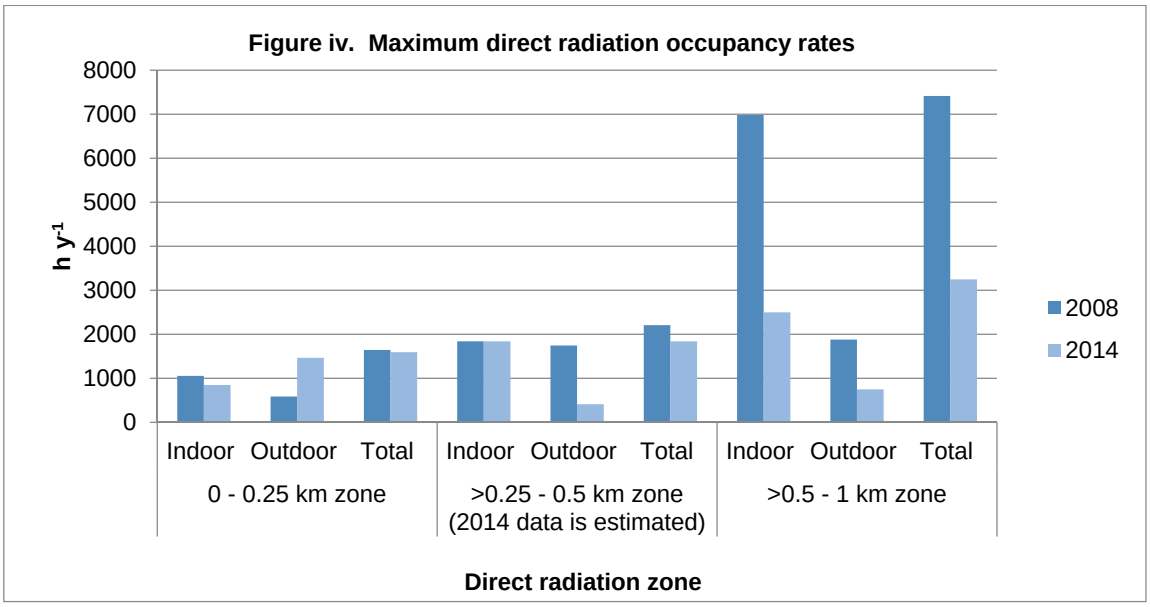


Figure ii. Mean rates for the high-rate groups for intertidal occupancy and handling of fishing gear and sediment







Recommendations

Recommendations for changes to the monitoring programmes are provided, based on the findings of this survey. A revised food monitoring programme was introduced in 2014 by the Food Standards Agency following a review of the way that radioactivity in food is monitored. However, in order to maintain the convention adopted for habits survey reports, the recommendations are based on the most recently published monitoring programme, which was for 2013.

It is suggested that for the 'mollusc' food group one of the samples of mussels could be replaced by a sample of whelks, and for the 'other vegetables' food group the sample of runner beans could be replaced by a sample of peas or broad beans.

1 INTRODUCTION

The public might be exposed to radiation as a result of the operations of the Hartlepool nuclear licensed site either through the permitted discharges of liquid or gaseous radioactive wastes into the local environment, or from radiation emanating directly from the site. This report provides information on activities carried out by members of the public in the vicinity of the Hartlepool site, which may influence their radiation exposure. The study has been funded by the Environment Agency and the Food Standards Agency in order to support their respective roles in protecting the public from exposure to radiation.

UK policy on the control of radiation exposure has long been based on the recommendations of the International Commission on Radiological Protection (ICRP), which embody the principles of justification of practices, optimisation of protection and dose limitation. Radiological protection of the public is based on the concept of a 'representative person'. This notional individual is defined as being representative of the more highly exposed members of the population. It follows that, if the dose to the representative person is acceptable when compared to dose limits and optimisation, other members of the public will receive acceptable doses, and overall protection to the public is provided from the effects of radiation. The term 'representative person' is equivalent to, and replaces, the term 'average member of the critical group' as recommended by ICRP (ICRP, 2006). The recommendations of the ICRP were updated in 2007 (ICRP, 2007) and, for the public, still include the principle of protecting the individuals most highly exposed to radiation, characterised by the representative person.

1.1 Regulatory framework

The Environment Agency regulates the discharges of radioactive waste under the Environmental Permitting Regulations (UK Parliament, 2010). The regulations take account of the European Union (EU) Basic Safety Standards (BSS) Directive 96/29/Euratom (Commission of the European Communities, 1996) which embody the recommendations of the ICRP, particularly ICRP 60 (ICRP, 1991). A new Basic Safety Standards (BSS) Directive (2013/59/Euratom) was adopted by the EU on 5th December 2013 and the UK Government is required to implement the Directive into UK law by 6th February 2018. Installation and operation of certain prescribed activities can only occur on sites if they are licensed under the Nuclear Installations Act 1965 (as amended) (NIA 65) (UK Parliament, 1965). Since 1st April 2011, the Office for Nuclear Regulation (ONR), has implemented this legislation and is also responsible for regulating, under the Ionising Radiations Regulations 1999 (IRR 99) (UK Parliament, 1999), the exposure of the public to direct radiation from the operations occurring on these sites. Prior to 1st April 2011 these functions were carried out by the Nuclear Installations Inspectorate of the Health and Safety Executive.

Appropriate discharge limits are set by the Environment Agency, after wide-ranging consultations that include the Food Standards Agency. The Food Standards Agency has responsibilities for ensuring that any radioactivity present in food does not compromise food safety and that permitted discharges of radioactivity do not result in unacceptable doses to consumers via the food chain. The Food Standards Agency also ensures that public radiation exposure via the food chain is within EU acceptable limits.

1.2 Radiological protection framework

Dose standards for the public are embodied in the national policy (UK Parliament, 2009), in guidance from the International Atomic Energy Agency (IAEA), in the Basic Safety Standards for Radiation Protection (IAEA, 1996) and in European Community legislation in the EU BSS Directive 96/29/Euratom (Commission of the European Communities, 1996). The public dose standards were incorporated into UK law in IRR 99. The requirement to observe the conditions laid down in the Basic Safety Standards (BSS) in England and Wales is incorporated in the Environmental Permitting Regulations 2010 (UK Parliament, 2010). These require that the environment agencies ensure, wherever applicable, that:

- All public radiation exposures from radioactive waste disposals are kept As Low As Reasonably Achievable (ALARA), with social and economic factors being taken into account
- The sum of all exposures does not exceed the dose limit of 1 mSv a year
- The dose received from any new source does not exceed 0.3 mSv a year
- The dose received from any single site does not exceed 0.5 mSv a year

The dose limit of 1 mSv per year to the public from all anthropogenic sources other than medical applications is also the recommendation made by the ICRP (ICRP, 2007).

The environment agencies are also required to ensure that the dose estimates are as realistic as possible for the population as a whole and for reference groups of the population. They are required to take all necessary steps to identify the reference groups of the population taking into account the effective pathways of transmission of radioactive substances. Guidance on the principles underlying prospective radiological assessment (i.e. assessments of potential future doses) has been provided by the National Dose Assessment Working Group (NDAWG), which consists of representatives of UK Government Bodies and other organisations with responsibilities for dose assessments (EA, SEPA, DoENI, NRPB and FSA, 2002). NDAWG has also published principles underlying retrospective radiological assessment (i.e. assessment of doses already received from past discharges) (Allott, 2005) and possible methods of carrying out these assessments using the data from combined habits surveys (Camplin *et al.*, 2005). NDAWG agreed that the optimal method for performing retrospective dose assessments would be to use habits profiles (profiling method). This approach is being adopted in Radioactivity in Food and the Environment (RIFE) publications, (e.g. EA, FSA, NRW, NIEA and SEPA, 2014), as combined habits surveys are completed. NDAWG has also published reports on the collection and use of habits survey data in retrospective and prospective dose assessments (NDAWG, 2005; NDAWG 2009); the principles described in these reports are consistent with those used here.

More recently, the environment agencies, the Health Protection Agency (now part of Public Health England) and the Food Standards Agency have jointly produced an update of the 2002 interim guidance and principles for assessing doses (EA, SEPA, NIEA, HPA and FSA, 2012).

2 THE SURVEY

2.1 Site activity

The Hartlepool nuclear power station is located near the mouth of the Tees Estuary, approximately 5 km south of the town of Hartlepool (see Figure 1). The station has twin Advanced Gas-cooled Reactors (AGRs) and began generating electricity in 1983. It was originally expected to shut down in 2009 but has had several extensions to its operational life and it is currently expected to continue generating electricity until at least 2019, with a possible further extension to 2024. At the time of the habits survey fieldwork both reactors were operating at nominal full load.

The site is owned and operated by EDF Energy Nuclear Generation Ltd. EDF is permitted to undertake radioactive substances activities at the site under the Radioactive Substances Regulation of the Environmental Permitting Regulations 2010. This includes permission to discharge gaseous radioactive wastes via stacks to the atmosphere and liquid radioactive wastes via an outfall into Tees Bay in the North Sea. The site is licensed for the purposes of operating certain activities prescribed under the Nuclear Installations Act, 1965. The site contains sources of direct radiation. Details of the amounts of gaseous and liquid radioactive waste discharged are published in the RIFE reports, for example, EA, FSA, NRW, NIEA and SEPA, 2014.

2.2 Survey objectives

The Centre for Environment, Fisheries & Aquaculture Science (Cefas) undertook the Hartlepool habits survey in 2014 on behalf of the Environment Agency, the Food Standards Agency, and the Office for Nuclear Regulation. The aim of the survey was to obtain comprehensive information on the habits of the public that might lead to their exposure to radiation via gaseous discharges, liquid discharges and direct radiation from the Hartlepool nuclear site.

Specifically, investigations were conducted into the following:

- The consumption of food from the aquatic survey area
- Activities and occupancy over intertidal substrates
- The handling of fishing gear and sediment
- Activities and occupancy in and on water
- The use of seaweed as a fertiliser or animal feed
- The consumption of food from the terrestrial survey area
- The use and destination of produce originating from the survey areas
- The consumption and use of groundwater and surface water in the terrestrial survey area
- The transfer of contamination off-site by wildlife

- Activities and occupancy within the direct radiation survey area
- Any new or unusual exposure pathways

No additional site-specific investigations were requested by the Environment Agency, the Food Standards Agency or the Office for Nuclear Regulation.

2.3 Survey areas

The geographic extents of potential effects from liquid discharges, from deposition from gaseous releases, and from direct radiation are different. Therefore, different survey areas were defined to cover each of these three main possible sources of exposure. These were an aquatic survey area relating to liquid discharges, a terrestrial survey area relating to deposition from gaseous discharges, and a direct radiation survey area relating to ionising radiation emanating directly from the site.

The aquatic survey area (see Figures 1a and 1b) covered the intertidal areas along the north-east coast of England from Parton Rocks (Hartlepool) in the north, to Saltburn Scar (Saltburn-by-the-Sea) in the south, and the adjacent sea area up to 3 km offshore. The River Tees, from its mouth to the tidal barrage approximately 16 km upstream, was also included. This area was taken to represent the predominant area of mixing of discharged radionuclides in seawater.

The terrestrial survey area (see Figure 2) covered the land and freshwater watercourses within 5 km of the site centre (National Grid Reference: NZ 529 269) to encompass the main areas of potential deposition from gaseous discharges.

The direct radiation survey area (see Figure 2) covered the land and water within 1 km of the nuclear licensed site boundary. The occupancy data collected from the direct radiation survey area is also applicable to inhalation and external exposure pathways arising from gaseous releases from the site.

The same aquatic, terrestrial and direct radiation survey areas were used in the previous habits survey conducted by Cefas in the Hartlepool area, which was in 2008 (Garrod *et al.*, 2009).

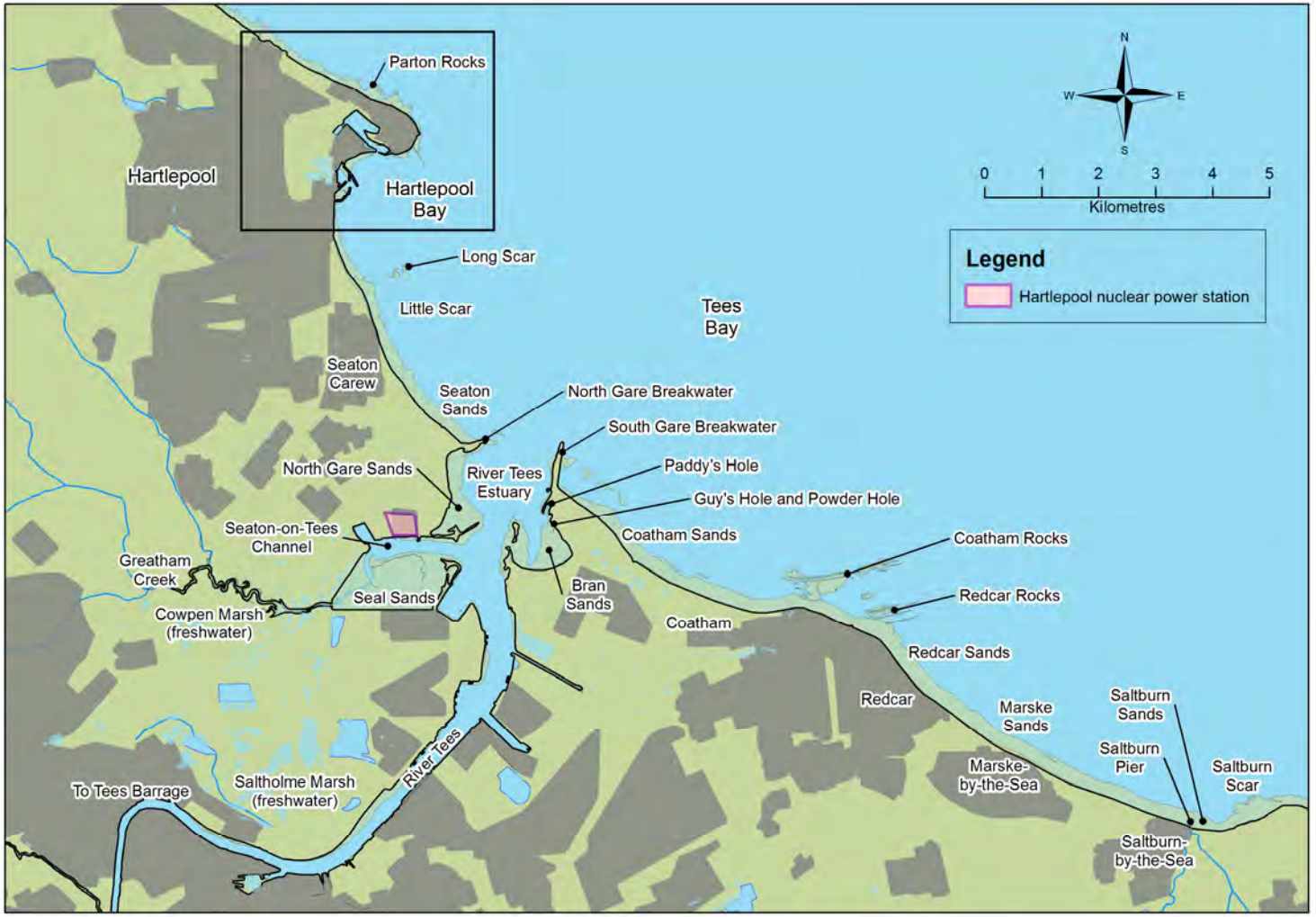


Figure 1a. The Hartlepool aquatic survey area

(See Figure 1b for an expanded view of the boxed area)

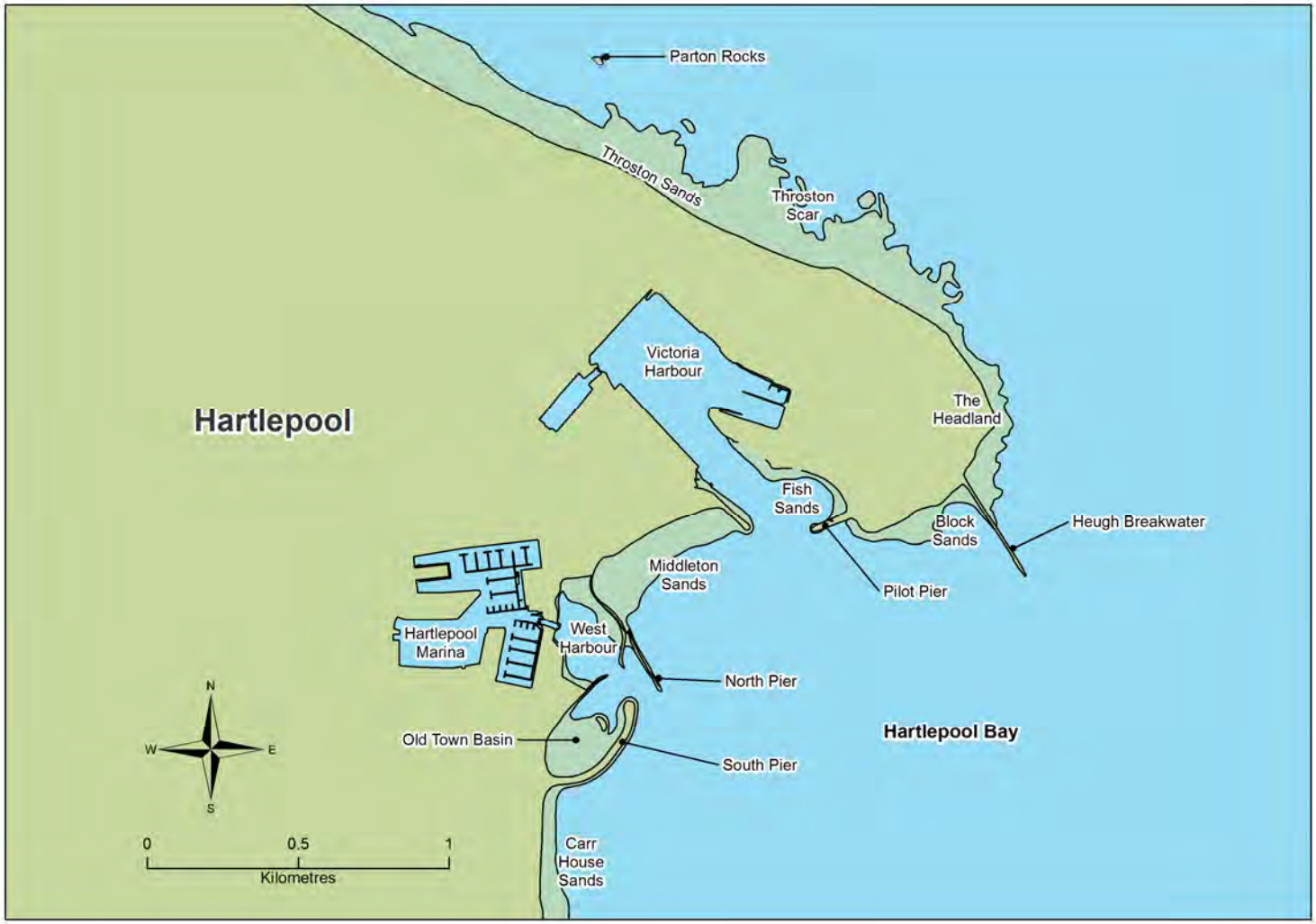


Figure 1b. Expanded view of the Hartlepool aquatic survey area adjacent to Hartlepool Town.

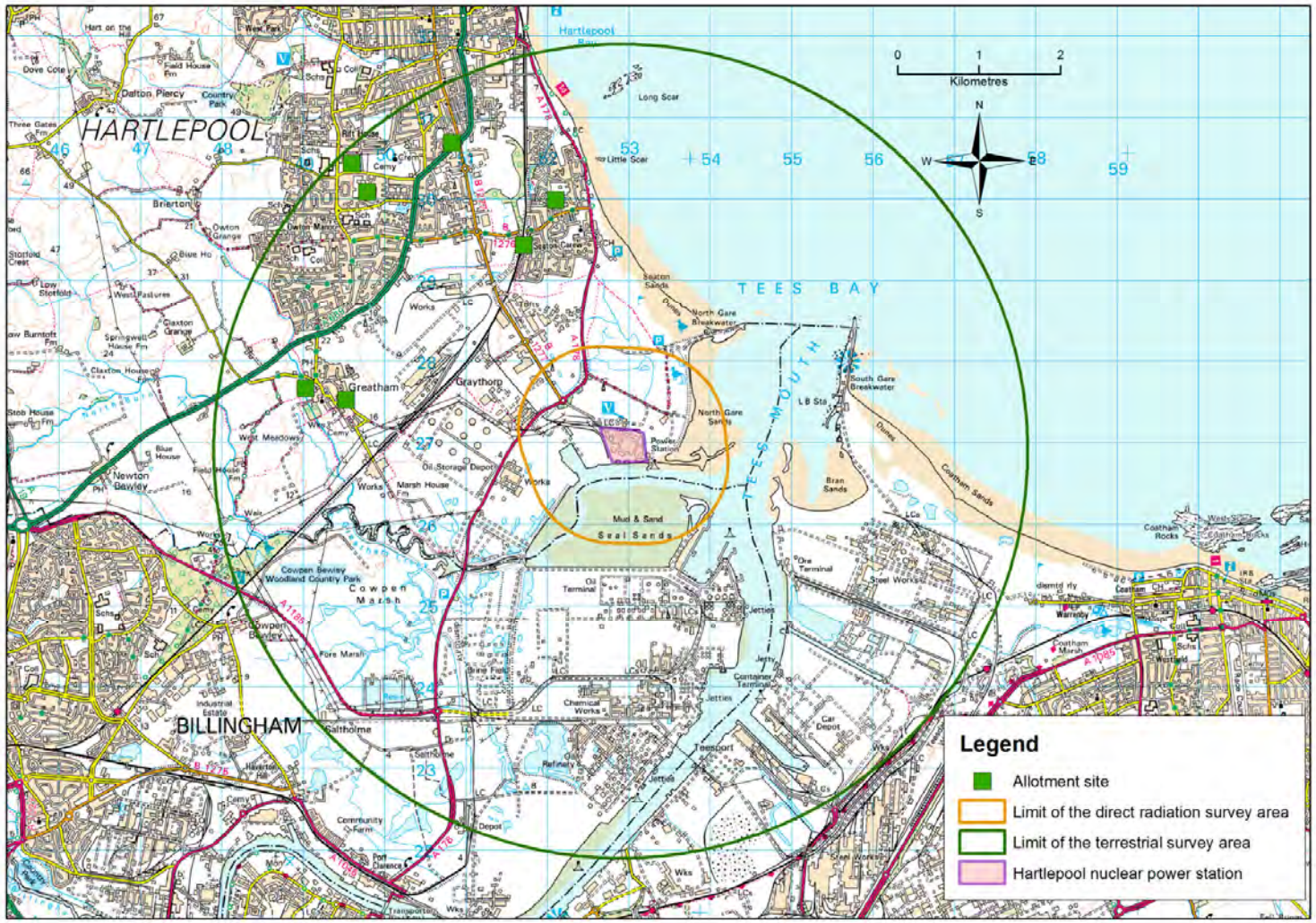


Figure 2. The Hartlepool terrestrial and direct radiation survey areas.

2.4 Conduct of the survey

As part of the pre-survey preparation, the Environment Agency, the Food Standards Agency and the Office for Nuclear Regulation were contacted to identify any additional site-specific requirements. Information relating to the activities of people in the aquatic and terrestrial survey areas was obtained from Internet searches, Ordnance Survey maps and from previous habits surveys undertaken around the Hartlepool site. People with local knowledge of the survey area were contacted for information relevant to the various exposure pathways. These included fisheries officers, representatives of the local fishing industry and representatives of Hartlepool Borough Council.

A proposed programme for fieldwork was distributed to the Environment Agency, the Food Standards Agency, and the Office for Nuclear Regulation before the fieldwork commenced, for their comment.

The fieldwork was carried out from the 10th to the 20th June 2014 by a survey team of three people, according to techniques described by Leonard *et al.* (1982). During the fieldwork a meeting was held between the members of the survey team and a representative from EDF Energy Nuclear Generation Ltd. This discussion provided details about current site activities, local information, potential exposure pathways and activities in the area, and the potential for transfer of contamination off-site by wildlife.

The following information was obtained during the meeting:

- At the time of the habits survey fieldwork both reactors were operating at nominal full load (*i.e.* normal generating capacity).
- The main liquid effluent discharges are via a pipeline into Tees Bay. There are usually about 20 discharges per month and tritiated water is discharged down the pipeline from one to three times per month. Liquid discharges are timed to occur within the period between one hour before and three hours after high water.
- Wildlife does not have access to controlled areas. Rabbits in the immediate area around the site have been culled periodically as part of general pest control measures.
- Information about potential pathways and activities in the area included: seal watching at Greatham Creek; bird watching and bait digging close to the power station; visitors to the EDF Visitors Centre; golf course and sports field nearby; cattle grazing on Seaton Snook to the north of the site; no dairy farms in the 5 km survey area.

Interviews were conducted with individuals who were identified in the pre-survey preparation and others that were identified during the fieldwork. These included, for example, commercial and hobby fishermen, anglers, people spending time on intertidal substrates, farmers, allotment holders, beekeepers and people spending time within the direct radiation survey area. Interviews were used to establish individuals' consumption, occupancy and handling rates relevant to the aquatic, terrestrial and direct radiation survey areas. Any other information of possible use to the survey was also obtained. Gamma dose rate measurements were taken over intertidal substrates in the aquatic area, and indoors

and outdoors at most properties in the direct radiation survey area where interviews were conducted. Background gamma dose rates were taken at a distance beyond 5 km from the site centre. All gamma dose rate measurements were taken using a Mini 600 Series Type 6-81 Environmental Radiation Meter with a compensated Geiger-Müller tube.

For practical and resource reasons, the survey did not involve the whole population in the vicinity of the Hartlepool site, but targeted subsets or groups, chosen in order to identify those individuals potentially most exposed to radiation pathways. However, it is possible that even within a subset or group there may have been people not interviewed during the survey. Therefore, to aid interpretation, the number of people for whom data were obtained in each group as a percentage of the estimated complete coverage for that group (where it was possible to make such an estimate) has been calculated. The results are summarised in Table 1. The 'groups' are described and quantified, and the numbers of people for whom data were obtained are given as percentages of the totals. For certain groups, such as anglers, it can be virtually impossible to calculate the total number of people who undertake the activity in the survey area because it is difficult to quantify visitors from outside the area or occasional visitors during the year. Based on UK Office of National Statistics residential data for electoral wards (www.ons.gov.uk) there were approximately 27,400 people living in the terrestrial survey area, although information was obtained for a significantly smaller number than this. The survey did not include employees or contractors at the nuclear licensed site while they were at work. This is because dose criteria applicable to these people whilst at work and the dose assessment methods are different from those for members of the public. However, data were collected for employees and contractors while outside work if these people were encountered during the survey.

People were initially questioned about their habits relating to the survey area that their first identified activity occurred in and, where possible, they were also asked about their habits relating to the other two survey areas. For example, people in the terrestrial survey were initially questioned because it was known that they grew or produced significant quantities of terrestrial foodstuffs. However, they were also asked about habits that might lead to exposure to liquid discharges or direct radiation. During interviews with representatives from organisations such as local businesses it was not possible to collect data for all pathways (for example consumption of local foods) for each person. In these cases, the data were limited to those relating to the primary reason for the interview, for example, in the case of a business within the 1 km direct radiation survey area, the occupancy rates for the employees.

3 METHODS FOR DATA ANALYSIS

3.1 Data recording and presentation

Data collected during the fieldwork were recorded in logbooks. On return to the laboratory, the data were examined and any notably high rates were double-checked, where possible, by way of a follow-up phone call. In cases where follow-up phone calls were not possible (e.g. interviewees who wished to remain anonymous), the data were accepted at face value. The raw data were entered into a habits survey database where each individual for whom information was obtained was given a unique identifier (the observation number) to assist in maintaining data quality and traceability.

The results of the individuals' consumption, occupancy and handling rates collected during the survey were grouped and presented in tables with the high-rate group members indicated in bold and with the calculated mean rates for the high-rate group and 97.5th percentile rates. The consumption rates, occupancy rates and handling rates for all groups are presented in Annex 1 for adults and Annex 2 for children and infants, with the high-rate group members indicated in bold.

Annex 3 contains estimated data for pathways where it was not possible to obtain quantifiable data from interviews. Occupancy rates for a business located in the direct radiation area, based on data collected at the same premises in 2008, are presented.

3.2 Data conversion

During the interviews, people could not always provide consumption rates in kilograms per year for food or litres per year for milk. In these circumstances, interviewees were asked to provide the information in a different format. For example, some estimated the size and number of items (e.g. eggs) consumed per year, whereas others gave the number of plants in a crop or the length and number of rows in which the crop was grown per year. The database converted these data into consumption rates (kg y^{-1} for food and l y^{-1} for milk) using a variety of conversion factors. These factors included produce weights (Hessayon, 1990 and 1997 and Good Housekeeping, 1994), edible fraction data researched by Cefas, and information supplied by the Meat and Livestock Commission.

3.3 Rounding and grouping of data

The consumption and occupancy data in the text of this report are rounded to two significant figures, except for values less than 1.0, which are rounded to one decimal place. This method of presentation reflects the authors' judgement on the accuracy of the methods used. In the tables and annexes, the consumption rate data are presented to one decimal place. Occasionally, this rounding process causes the computed values (row totals, mean rates and 97.5th percentiles), which are based on

un-rounded data, to appear slightly erroneous. Consumption rates less than 0.05 kg y^{-1} are presented to two decimal places in order to avoid the value of 0.0 kg y^{-1}. External exposure data are quoted as integer numbers of hours per year.

For the purpose of data analysis, foodstuffs were aggregated into food groups as identified in Table 2. Specific food types relevant to this survey are presented in the subsequent tables. The data are structured into groups when it is reasonable to assume that consistent concentrations or dose rates would apply within the group. For example, when considering terrestrial food consumption, all types of root vegetables are grouped together in a food group called 'root vegetables'. Similarly, for aquatic food consumption, all crustacean species are grouped as 'crustaceans'. For external exposure over intertidal sediments, occupancies over the same substrate (e.g. sand) are grouped together.

Data were structured into age groups because different dose coefficients (i.e. the factors which convert intakes of radioactivity into dose) can apply to different ages. The International Commission on Radiological Protection (ICRP) revised its recommendations for the age groupings to be used in radiological assessments and these recommendations were adopted in the 2010 habits survey reports and thereafter. Consequently, the age ranges used in the habits survey reports prior to 2010 differ from those used currently. The age ranges used in this report and the names used for the age groups, based on the recommendations in ICRP 101 (ICRP, 2007), are shown in Table A below, together with those used in reports prior to 2010, for comparison.

Table A. Names of age groups and range of ages within each age group.

Age ranges used from 2010 onwards			Age ranges used prior to 2010	
Name of age group[a]	**Age range in group**		**Name of age group**	**Age range in group**
Infant	0 to 5-year-old		3-month-old	Under 1-year-old
			1-year-old	1-year-old
			5-year-old	2-year-old to 6-year-old
Child	6-year-old to 15-year-old		10-year-old	7-year-old to 11-year-old
			15-year-old	12-year-old to 16-year-old
Adult	16-year-old and over		Adult	17-year-old and over

[a] In the 2010 reports only, the infant age group was called the 1-year-old age group and the child age group was called the 10-year-old age group.

Since there are fewer age groups for children in the current regime, there should, in general, be more observations in each group, resulting in greater robustness in the data. However, data since 2010 will not be directly comparable with data prior to 2010, since the age ranges in the age groups will be different.

For direct radiation pathways, the data were grouped into distance zones from the nuclear site boundary as a coarse indication of the potential dose rate distribution due to this source of exposure. The bands used in this report were: 0 - 0.25 km; >0.25 - 0.5 km; >0.5 - 1.0 km. These distance bands are also useful when assessing exposure to gaseous discharges.

3.4 Approaches for the identification of high rates

The habits data have been analysed to identify high rates of consumption, occupancy and handling, which are suitable for use in radiological assessments. Two approaches have been used:

Firstly, the 'cut-off' method described by Hunt *et al.* (1982) was used. With the 'cut-off' method, the appropriate high rate was calculated by taking the arithmetic mean of the values between the maximum observed rate and one third of the maximum observed rate. In this report, the term 'high-rate group' is used to represent the individuals derived by the 'cut-off' method. The mean of the high-rate group was calculated for each food group, intertidal substrate and handling pathway identified in the survey. In certain cases, using the 'cut-off' method resulted in only one person being in the high-rate group. In these cases, expert judgement was used to decide whether the high-rate group should remain as one individual or whether others should be included. If others were included, the second highest rate was divided by three and all observations above this were included in the high-rate group.

Secondly, the 97.5th percentile rate was calculated for each group by using the *Microsoft Excel* mathematical function for calculating percentiles. The use of percentiles accords with precedents used in risk assessments of the safety of food consumption. It should be noted that the interviewees in this study are often selected and, therefore, the calculated percentiles are not based on random data.

Mean and 97.5th percentile consumption rates for adults, based on national statistics, are provided as a baseline for comparison with the observed rates. The rates based on national statistics are referred to as generic rates in this report and have been taken from Byrom *et al.,* 1995.

The mean rates for the high-rate groups for children and infants for consumption, intertidal occupancy and handling pathways, have been calculated. However, in cases where few child or infant observations were identified, an alternative approach that may be used for assessments is to estimate the mean rates for the high-rate groups for children and infants by applying scaling ratios to the mean rates for the high-rate groups for adults. Ratios for this purpose for the consumption and intertidal occupancy pathways, based on generic 97.5th percentile rates, are provided in Annex 4. The age ranges within the age groups in Annex 4 do not correspond exactly with the age ranges within the age groups used throughout the rest of this report, but these ratios are the best available data for estimating child rates and infant rates from adult rates. Adult to child and adult to infant ratios are not available for handling pathways.

For use in assessments of foetal dose, consumption and occupancy rates are provided in Annex 5 for women of childbearing age. The age range used in this report for women of childbearing age is 15 – 44 years old, which is based on the classification used by the Office of National Statistics (www.ons.gov.uk).

For the direct radiation pathway, mean occupancy rates and 97.5th percentile rates have not been calculated. Such an analysis is of limited value without a detailed knowledge of the spatial extent of dose rates due to direct radiation.

3.5 Profiles of habits survey data for use in total dose assessments

The survey data have been analysed to produce profiles of consumption and occupancy rates according to the method described by Camplin *et al.* 2005. The profiles for adults are used to assess total dose integrated across all pathways of exposure in the RIFE reports (e.g. EA, FSA, NRW, NIEA, and SEPA, 2014).

Matrices of profiles for adults, children, infants and women of childbearing age are presented in Annexes 6 to 9 respectively. Within each matrix the means for the high-rate groups, as determined by the cut-off method, are presented on the diagonal. Except for the direct radiation pathway the figures across the rows are the means of the consumption and occupancy rates for the other pathways for the individuals within that profile. For the direct radiation pathway the figure denotes the proportion of the individuals within that profile who spend time within the direct radiation survey area.

3.6 Data quality

To ensure the quality of the data collected during the survey fieldwork and presented in the report, the following procedures have been employed:

- Experienced scientific staff were used for the fieldwork and data analysis. They had been trained in the techniques of interviewing and obtaining data for all pathways that were relevant to the survey being conducted. Where individuals offered information during interview that was considered unusual, they were questioned further in order to double-check the validity of their claims.
- Where possible, interviewees were contacted again to confirm the results of the initial interview if, when final consumption or occupancy rates were calculated, observations were found to be high in relation to our experience of other surveys. Local factors were taken into account in these cases.
- Data were manipulated in a purpose-built database using a consistent set of conversion factors.
- Data were stored in a database in order to minimise transcription and other errors.
- Draft reports were reviewed by the Environment Agency, the Food Standards Agency and the Office for Nuclear Regulation, and by a senior radiological consultant.
- Final reports were only issued when the Environment Agency, the Food Standards Agency and the Office for Nuclear Regulation were entirely satisfied with the format and content of the draft report.

4 AQUATIC RADIATION PATHWAYS

4.1 Aquatic survey area

The aquatic survey area (see Figures 1a and 1b) covered the intertidal areas along the north-east coast of England from Parton Rocks (Hartlepool) in the north, to Saltburn Scar (Saltburn-by-the-Sea) in the south, and the adjacent sea area up to 3 km offshore. This area encompassed approximately 25 km of seaward facing shoreline. The River Tees, from its mouth to the tidal barrage approximately 16 km upstream, was also included.

The seaward facing shoreline is predominantly a series of long sandy beaches interspersed with rocky scars. In the Tees Estuary and the sheltered bays around the entrance to Hartlepool Marina the sediments are mainly a mix of mud, sand and stones. Coal dust, which has particles of a similar size to grains of coarse sand, may be washed up on the shore throughout the survey area but the most significant deposits occur on the beaches in the north of the survey area around Hartlepool Town. Larger pieces of coal can also be found on the shore.

Parton Rocks to Fish Sands

Parton Rocks was used as a landmark to define the northern limit of the survey area but the rocks themselves were just offshore and no activities were recorded there. To the south of Parton Rocks the sandy beach at Throston was popular with walkers, dog walkers and people playing and was occasionally used by anglers and people using push nets to catch brown shrimps. The rocky area of Throston Scar extends southwards from the beach and joins the rocks of the promontory to the north of Hartlepool known as The Headland. Winkle picking and peeler crab collecting took place from these rocks, and common lobster and brown crab were caught using pots set from the shore, or by hooking them out from amongst the rocks using a pole with a hook on the end. These activities were mainly carried out during spring tides when larger expanses of rock were exposed. Anglers fished from the rocks, and rock pooling and paddling took place in the pools left by the receding tide.

The Heugh Breakwater is a pier that extends out into the sea from the south side of The Headland. The outer part of the breakwater was fenced off for safety reasons but anglers climbed over the fence to fish from the seaward end.

Further east along the south side of The Headland there are two small beaches called Block Sands (see Figure 3) and Fish Sands, separated by a rocky area and a short pier called Pilot Pier. The pier was used by anglers. At Block Sands there was a lido and concrete paddling pool on the promenade and the beach was sand and stones with rocks on the lower shore. The beach at Fish Sands was sand, with mud and rocks on the lower shore. Both these beaches were close to residential areas and easy

parking and were popular with walkers, dog walkers and families engaged in playing, rock pooling and paddling. A little bait digging also took place at Fish Sands.

Figure 3. Block Sands

Victoria Harbour and Middleton Sands

Victoria Harbour (see Figure 4) is the main commercial fishing port within the survey area and also has a cargo terminal at the western end. The fish quay has landing facilities and fish wholesale businesses are located nearby. The quay and floating pontoons provide moorings for commercial fishing vessels, non-commercial fishing boats, angling boats, charter angling boats, yachts and other small pleasure craft. An RNLI inshore lifeboat station is situated in the south-west corner of the harbour, close to the harbour mouth.

Middleton Sands, to the south-west of Victoria Harbour, fronts an industrial area. The beach was mainly sand but there were significant deposits of coal dust around the western edge of the beach, which were exploited by commercial sea coal collectors. The beach was used by walkers and dog walkers and limited amounts of angling, bait digging and push netting for brown shrimp also took place. Jet-skis and small pleasure boats were taken down an earth ramp onto the beach for launching. When the sea swell was from the south, the beach was a popular surfing venue, since it was one of the few south facing beaches along this stretch of coast.

Figure 4. Victoria Harbour

Hartlepool Marina area

To the south-west of Middleton Sands the approaches to Hartlepool Marina are protected by two large outer piers; the North Pier and the South Pier. The gate to the North Pier was not locked and anglers fished from the pier despite the 'angling prohibited' and 'unsafe structure' notices. Access to the South Pier was not restricted but there were reinforcing concrete blocks piled up around it making it difficult to fish from, and no anglers were observed there at the time of the survey. Inside the outer piers, the bays of West Harbour and Old Town Basin (see Figure 5) were separated by smaller piers, which were not used by anglers. Much of West Harbour and Old Town Basin dried out at low tide revealing a substrate of mud and sand with large stones around the perimeters. Bait digging took place in both of these bays and many old car tyres had been laid out to attract peeler crabs. An unusually deep deposit of sea coal dust had formed a narrow beach at the head of the Old Town Basin and although it was reported that people collected small quantities of coal dust from the area for their own use, none was collected commercially since there was no access to the beach for vehicles. A yacht club located on the south side of West Harbour has its own slipway for launching small craft. The club had approximately 200 members aged between six years old and 80 years old and catered for jet-skiers, water-skiers, kayakers and power boaters as well as dinghy and cruiser sailors.

Hartlepool Marina is protected by lock gates that maintain the water level at low tide and there are berths for up to 500 boats on floating pontoons. A wide variety of craft were moored there including commercial and non-commercial fishing boats, charter angling boats, private angling boats, sailing

yachts, motor cruisers, speedboats and an offshore lifeboat. A Sea Cadet Corps and a diving club had premises at the marina.

Figure 5. Old Town Basin

Carr House Sands to North Gare Breakwater

Carr House Sands stretch south from the Old Town Basin, combining with Seaton Sands (see Figure 6) to form a sandy beach five kilometres long. Two rocky areas called Long Scar and Little Scar are exposed at low water. The shore was easily accessible from Seaton Carew and Hartlepool. Carr House Sands was the main area for commercial sea coal collection and was very popular with dog walkers. Seaton Sands was used by many walkers, dog walkers and families playing on the beach. A small number of people went push-netting for brown shrimp or were digging for bait at the south end of the beach. The area was popular with surfers. Adults and children were observed swimming and paddling in the sea and lifeguards patrolled a small section of the beach in front of Seaton Carew. Anglers fished both from the beach and the rocky scars. The rocky scars were also used by people collecting winkles and peeler crabs, setting pots from the shore and hooking for brown crabs and common lobsters.

The liquid wastes from Hartlepool nuclear power station are discharged into Tees Bay from the site outfall, located just off the beach at the south end of Seaton Sands, approximately half a kilometre north of the North Gare Breakwater.

The North Gare Breakwater forms the southern limit to Seaton Sands and marks the western side of the mouth of the River Tees Estuary. The breakwater was fenced off but anglers went round the fence

in order to fish along the breakwater and also fished from the beach at a gulley called the Blue Lagoon on the south side of the breakwater.

Figure 6. Seaton Sands

West side of the Tees Estuary

Inside the estuary, a wide sandy beach called North Gare Sands, backed by sand dunes, stretches two kilometres south from the North Gare Breakwater. It is a Site of Special Scientific Interest (SSSI) and forms part of the Teesmouth National Nature Reserve. A field centre provided environmental education for school parties and other interested visitors to learn about the reserve and visits usually included spending some time on the beach. The area was also used by walkers and dog walkers. The commercial extraction of sand from North Gare Sands identified in 2008 was no longer taking place in 2014.

A long spit of mud, sand, stones and boulders separates the southern end of North Gare Sands from the Seaton-on-Tees Channel, which adjoins the western side of the main Tees Estuary. An extensive patch of samphire grew in a sheltered area near the landward end of the northern side of the spit, but no collection of samphire for consumption was identified. The Hartlepool nuclear power station is located on the northern bank of the Seaton-on-Tees Channel and there is a small jetty and slipway near the south-east corner of the station. The embankment around the jetty and westwards in front of the power station was boulders, and the shore below was a mix of stones, sand and mud, becoming increasingly muddy further down the shore. There were many pipes and old car tyres for attracting peeler crabs on the lower shore to the west and to the east of the jetty (see Figure 7). Several individuals were identified that collected peeler crabs or dug for bait in the area and one individual was identified

who collected mussels and winkles from the shore on the east side of the jetty. Small numbers of anglers fished from the embankment and shore in front of the power station.

To the west of the power station there is a wharf and dry dock. These were used by a large marine engineering company and the Seaton-on-Tees Channel was dredged to maintain access for vessels to these facilities.

The boulder embankment resumed to the west of the dry dock and extended westwards to the mouth of Greatham Creek. The shore below the embankment was a mix of mud and sand. Access to the shore in this area was by permission down a track through a business property. There were pipes and car tyres on the shore to attract peeler crabs but no other intertidal activities were identified. The intertidal substrate at Greatham Creek was mud, and although the area attracted people to watch birds and seals, they usually stayed on the banks and did not venture down to the intertidal areas.

On the south side of the Seaton-on-Tees Channel, opposite the power station, a large expanse of mud and sand called Seal Sands is exposed at low water. The Port Authority own the track to the shore and public access is prohibited. No intertidal activities were identified taking place in this area.

Figure 7. East of the power station jetty

The River Tees upstream to the tidal barrage

The River Tees is tidal from the river mouth, back to the tidal barrage approximately 16 km upstream. Above the barrage the river is fresh water. Upstream from Seal Sands and Bran Sands large stretches of both banks of the river are heavily industrialised and there are several wharfs and docks used by tankers and large cargo vessels. Further upstream towards the barrage the banks are less industrialised (see Figure 8). Public access to the riverbank was possible at the Tees barrage and via the Teesdale Way path that ran by the river for approximately 4 km downstream from the barrage. In places along this stretch of river, patches of mud and boulders were exposed along the shore at low tide, although the banks of the river were steep sided and access to the intertidal areas was difficult. No sign of any activity was observed in these intertidal areas at the time of the survey. A water sports slalom course used for kayaking and rafting was situated in a culvert around the barrage but this was entirely fresh water.

Figure 8. The River Tees below the tidal barrage

East side of the Tees Estuary

The South Gare Breakwater forms the eastern side of the mouth of the Tees Estuary. Access to the breakwater area is via a private road from Coatham, which is open to the public. The breakwater is largely made of slag from the nearby steel works, but the end section is made of concrete. Most of the concrete section was fenced off but the gate in the fence was not locked and, as at many other piers and structures in the survey area, anglers disregarded the danger signs and fished from the end of the

breakwater. A pilot station, diving club and inshore lifeboat station were based on the breakwater and there were two concrete slipways for launching small craft into the estuary.

There are three sheltered inlets called Paddy's Hole, Guy's Hole and Powder Hole situated close together on the west side of the breakwater. Paddy's Hole (see Figure 9) was the largest and over 40 small boats were moored there including commercial fishing boats, hobby fishing boats, angling boats and other pleasure craft. Approximately 15 small boats were moored at Guy's Hole and about two at Powder Hole and there was a large shore compound situated close by where other yachts and motorboats were kept. There were many huts and small chalets in this area which were used by boat owners and the general public. The embankments around the inlets were mainly boulders of slag and the inlets dried out at low water to reveal a lower shore composed of a patchy mix of mud, sand and stones. Individuals were identified undertaking boat maintenance and fixing moorings at Paddy's Hole. Winkles were collected from the shore on both sides of the South Gare Breakwater and it was reported that a small quantity of winkles had been collected from inside Paddy's Hole.

To the south of the inlets a large area of mud and sand called Bran Sands (see Figure 10) is exposed at low tide. There were patches of stones in places and mounds of boulders had been placed out on the sands for sea defence purposes and to guide the main channel of the estuary. Strings of car tyres had been laid to attract peeler crabs at several locations. Dog walking, bait digging and peeler crab collecting took place out on the sands and mussels and winkles were collected from the boulder areas.

Figure 9. Paddy's Hole

Figure 10. Bran Sands

South Gare Breakwater to Saltburn Scar

The coastline from South Gare Breakwater south-eastwards to Saltburn-by-the-Sea is an unbroken 12 km stretch of sandy beach with scattered patches of stones (see Figure 11). Outcrops of rocks are exposed at low water at Coatham and Redcar. There is easy access to the shore from the villages of Coatham, Redcar, Marske-by-the-Sea and Saltburn-by-the-Sea and at many other points along this stretch of coast. Two fish wholesale businesses were located in Coatham, close to the start of the approach road to South Gare.

Angling boats, hobby fishing boats and small commercial fishing boats were launched across the beach using tractors at Redcar, Marske-by-the-Sea and Saltburn-by-the-Sea. There were over 40 boats based at Redcar, approximately 10 boats based at Marske-by-the–Sea and about 20 boats based at Saltburn-by-the-Sea. At Redcar most of the boats were kept in a compound away from the beach.

Coatham Sands, Redcar Sands, Marske Sands and Saltburn Sands were all popular beaches used for activities such as walking, dog walking, playing, angling, paddling and swimming. Surfing and kayaking took place all along this part of the coast but particularly at Saltburn Sands where there was a surf school and lifeguard station. Bait digging was identified taking place at Coatham Sands and one person was push netting for brown shrimps at Redcar Sands. Horse riders regularly used the beaches at Marske Sands and Saltburn Sands and one person was metal detecting at Marske Sands. The pier at Saltburn-by-the-Sea was a popular angling venue. It was reported that land yachting events were held occasionally on Redcar Sands.

Redcar Rocks were used by people who were angling, rock pooling and hooking for brown crabs and common lobsters. One individual was identified that went sub-aqua diving from the rocks.

Saltburn Scar marked the southern limit of the survey area. The scar was backed by high cliffs and could only be accessed along the shore from Saltburn-by-the-Sea. People were identified collecting winkles and peeler crabs, rock pooling and angling on the scar.

Figure 11. Saltburn Sands, Marske Sands and Redcar Sands

4.2 Commercial fisheries

The principal commercial fishing port was at Victoria Harbour in Hartlepool but fishing boats also operated from Hartlepool Marina, Paddy's Hole, Redcar, Marske-by-the-Sea and Saltburn-by-the-Sea. The larger boats based at Victoria Harbour fished outside the survey area, mainly trawling for *Nephrops* and whitefish. About 70 other registered fishing vessels were based within the survey area but most of these were small, less than 10 m in length, and many of them only operated part time or were not used for commercial fishing.

The main fishing activity within the survey area was potting for common lobsters and brown crabs. Velvet swimming crabs were also caught in the pots but these were not landed commercially since there was no local market for them and they were not profitable to export. Potting could be carried out all year but was predominantly undertaken during the summer. Some of the potting boats were also used for netting for mixed whitefish, and this mainly took place during the winter. Although most

commercial fishing took place in the open sea, a little potting was carried out within the lower reaches of the Tees Estuary.

Three part time commercial winkle collectors were identified who collected winkles from the South Gare Breakwater, Bran Sands and Saltburn Scar. Cockles have been known to be found in Old Town Basin in the past but at the time of the survey there was a complete ban on collecting cockles until further notice.

4.3 Destination of seafood originating from the aquatic survey area

Part of the catch of fish, brown crabs and common lobsters was sent to fish markets outside the area in Sunderland and North Shields and part was sold through local wet fish shops and supplied to local hotels and restaurants. The winkles were sold for consumption locally and in other parts of northern England.

Small quantities of fish, brown crabs and common lobsters were sold direct to the public at various places along the coast.

4.4 Hobby fishing, angling and non-commercial shellfish collecting.

Many hobby fishermen operated boats from Victoria Harbour, Hartlepool Marina, Paddy's Hole, Redcar, Marske-by-the-Sea and Saltburn-by-the-Sea. They mainly used pots to fish for brown crabs and common lobsters or set nets to catch mixed whitefish. They also caught whelks and velvet swimming crabs in the pots. The catches were consumed by the fishermen and their families and friends. Under North Eastern Inshore Fisheries Conservation Authority regulations, unlicensed fishermen are restricted to using a maximum of 10 pots or 100 metres of net and there is a retained catch limit of two common lobsters, 10 brown crabs and 30 whelks per day.

Angling was very popular in the survey area and anglers fished from most of the piers and breakwaters despite many of them being fenced off for safety reasons. Shore angling also took place from beaches and rocky areas. Boat angling was also popular, with private angling boats being kept at Victoria Harbour, Hartlepool Marina, Paddy's Hole, Guy's Hole, Redcar, Marske-by-the-Sea and Saltburn-by-the-Sea. Eleven charter angling boats operated from Victoria Harbour or Hartlepool Marina and most of them spent some of the time fishing inside the survey area and some of the time fishing outside the survey area. Anglers mainly targeted cod in the winter and bass and mackerel in the summer but a wide range of other species were also caught.

Several people were identified who set pots from the shore, or used hand held 'crabbing hooks' amongst the rocks at low tide, to catch brown crabs and common lobsters for their own families' consumption. Potting from the shore was positively identified at Throston Scar, The Headland and Little Scar, and

hooking was positively identified at Throston Scar, The Headland, Long Scar, Little Scar and Redcar Rocks, although it is likely that both these activities took place at all the rocky areas within the survey area.

Four individuals were identified using push-nets in shallow water off the beaches at Throston Sands, Middleton Sands, Seaton Sands and Redcar Sands to catch brown shrimps for their own families' consumption

Many people collected winkles for their own families' consumption from Throston Scar, The Headland, Long Scar, east of the power station jetty, South Gare Breakwater, Paddy's Hole, Bran Sands and Saltburn Scar. Two people were identified that collected mussels for their own families' consumption from east of the power station jetty and Bran Sands.

Many people collected peeler crabs for angling bait for their own use or on a semi commercial basis and pipes and old car tyres had been laid out on the shore to attract the crabs at West Harbour, Old Town Basin, to the east and west of the power station jetty, near the mouth of Greatham Creek and at Bran Sands.

4.5 Wildfowling

Two small wildfowling clubs shot on Cowpen Marsh, which is a freshwater marsh, and wildfowl were also shot over farmland in the area around Greatham. One of the wildfowling clubs had a total bag limit of 210 birds per year and the other club had a total bag limit of 200 birds per year. The wildfowling season lasted from 1st September to 31st January. The birds were not shot from tide washed areas so the shooters did not have intertidal occupancy associated with this activity. However, since the shot wildfowl would probably have spent time on nearby tide washed areas, and thereby would have potentially been exposed to aquatic discharges, the consumption data for the wildfowl have been included in the aquatic section of this report.

4.6 Other pathways

Sea coal was collected commercially from the beaches at Middleton Sands and Carr House Sands. The coal, mainly in the form of coal dust, was washed up on the shore in drifts and this was collected by shovelling it onto pick-up trucks. About eight people were engaged in the commercial collection of sea coal. It was taken to a scrap merchant in Hartlepool for cleaning before being sold on to a coal fired power station or for use as a soil conditioner.

It was reported that people collected small lumps of sea coal and coal dust for their own use as a fuel or soil conditioner.

Digging for angling bait was identified taking place at Fish Sands, Middleton Sands, West Harbour, Old Town Basin, Seaton Sands, to the east and west of the power station jetty, Bran Sands and Coatham Sands.

No use of seaweed as a fertiliser or animal feed was identified.

4.7 Food consumption data

Consumption data for aquatic foods are presented in Tables 3 to 6 for adults and in Tables 7 to 9 for children and infants. The mean consumption rates for the high-rate groups and the observed 97.5th percentile rates, calculated as described in Section 3.4, are given at the foot of each table.

Adults' consumption rates

The people consuming the greatest quantities of food from the aquatic survey area were commercial and hobby fishermen, anglers, wildfowlers, shellfish collectors, and the families and friends of these groups of people.

Table B presents a summary of the adults' consumption rates for the following food groups: fish; crustaceans; molluscs; wildfowl. No consumption of marine plants/algae was identified. The table includes the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates. For comparison, the table also includes mean consumption rates and 97.5th percentile consumption rates for fish, crustaceans and molluscs based on national data, which are referred to as 'generic' data in this report. No generic consumption rates are available for wildfowl.

Table B. Summary of adults' consumption rates of foods from the aquatic survey area

Food group	Number of observations	Number of high-rate consumers	Observed maximum for the high-rate group (kg y^{-1})	Observed minimum for the high-rate group (kg y^{-1})	Observed mean for the high-rate group (kg y^{-1})	Observed 97.5th percentile (kg y^{-1})	Generic mean* (kg y^{-1})	Generic 97.5th percentile* (kg y^{-1})
Fish	77	24	71.0	25.5	41.5	59.1	15.0	40.0
Crustaceans	54	20	45.8	15.7	26.1	42.3	3.5	10.0
Molluscs	39	3	17.8	7.3	10.8	7.8	3.5	10.0
Wildfowl	2	2	12.0	12.0	12.0	12.0	Not determined	Not determined

(*Generic rates based on data from Byrom *et al.*, 1995.)

The predominant species of fish consumed by adults were cod, ling, mackerel and whiting, with smaller quantities of bass, dab, flounder, haddock, lemon sole, plaice, pollack, pouting, red gurnard, saithe, thornback ray and turbot. The fish were caught throughout the survey area. Of the fish consumed by the 24 people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 60% cod, 15% ling, 10% whiting, 5% mackerel, and 10% a mix of bass, haddock, lemon sole, plaice, pollack, pouting, red gurnard, saithe, thornback ray and turbot. No dab or flounder were consumed by the members of the high-rate group.

The main species of crustaceans consumed by adults were brown crab and common lobster, with smaller quantities of brown shrimp and velvet swimming crab. The brown crab, common lobster and velvet swimming crab were caught over rocky patches scattered throughout the survey area. The brown shrimps were caught in shallow water at Throston Sands, Middleton Sands, Seaton Sands and Redcar Sands. Of the crustaceans consumed by the 20 people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 60% brown crab and 40% common lobster. Brown shrimp and velvet swimming crab each contributed less than 1% to the consumption of the high-rate group.

The main species of molluscs consumed by adults were whelks and winkles, with smaller quantities of mussels. The whelks were caught incidentally in crab pots fished in Tees Bay. The winkles were collected from Throston Scar, The Headland, Long Scar, east of the power station jetty, Bran Sands, Paddy's Hole, South Gare and Saltburn Scar. The mussels were collected from east of the power station jetty and Bran Sands. Of the molluscs consumed by the three people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 50% whelks and 50% winkles. No mussels were consumed by the members of the high-rate group.

The main species of wildfowl consumed by adults were Canada goose, greylag goose and mallard, with smaller quantities of teal and wigeon. The wildfowl were shot on farmland in the Greatham area. Of the wildfowl consumed by the two people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 40% mallard, 25% Canada goose, 25% greylag goose, 5% teal and 5% wigeon.

Children's consumption rates

Table C presents a summary of children's and infants' consumption rates of fish, crustaceans and molluscs from the aquatic survey area. No consumption of wildfowl or marine plants/algae was identified for the child or infant age groups. The table includes the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates. No generic rates have been determined for the child or infant age groups.

Table C. Summary of children's consumption rates of foods from the aquatic survey area

Food group	Number of observations	Number of high-rate consumers	Observed maximum for the high-rate group (kg y^{-1})	Observed minimum for the high-rate group (kg y^{-1})	Observed mean for the high-rate group (kg y^{-1})	Observed 97.5th percentile (kg y^{-1})
Child age group (6 – 15 years old)						
Fish	12	6	27.6	11.4	19.6	27.6
Crustaceans	8	2	30.3	20.0	25.1	28.5
Molluscs	5	1	7.3	7.3	7.3	6.7
Infant age group (0 – 5 years old)						
Fish	4	4	18.4	7.4	14.1	18.4
Crustaceans	2	1	8.9	8.9	8.9	8.7
Molluscs	1	1	0.9	0.9	0.9	Not applicable

The predominant species of fish consumed by the individuals in the child age group were bass, cod, ling, mackerel and whiting, with smaller quantities of dab, flounder, pollack and saithe. The predominant species of fish consumed by the individuals in the infant age group were bass, cod, ling, mackerel and whiting, with smaller quantities of lemon sole.

The main species of crustaceans consumed by the individuals in the child age group were brown crab and common lobster, with smaller quantities of brown shrimp and velvet swimming crab. The species of crustaceans consumed by the individuals in the infant age group were brown crab and common lobster.

The only species of molluscs consumed by the individuals in the child age group and the infant age group was winkles.

4.8 Intertidal occupancy

Intertidal occupancy rates for adults are presented in Table 10 and intertidal occupancy rates for children and infants are presented in Table 11. It should be noted that there are often more than one substrate at one named location and that substrates at a given location are liable to change over time. Activities were assigned to the predominant substrate over which they were taking place.

Adults' intertidal occupancy rates

Table D presents a summary of the adults' intertidal occupancy rates in the aquatic survey area. The table includes the mean occupancy rates for the high-rate groups and the observed 97.5th percentile rates.

Table D. Summary of adults' intertidal occupancy rates

Intertidal substrate	Number of observations	Number of people in the high-rate group	Maximum of the high-rate group (h y^{-1})	Mean of the high-rate group (h y^{-1})	97.5th percentile (h y^{-1})
Mud	5	2	368	368	368
Mud and sand	10	2	1098	1095	1097
Mud and stones	2	2	52	38	51
Rock	44	11	641	364	528
Sand	137	24	1022	457	585
Sand and coal	4	4	1400	1225	1400
Sand and stones	12	3	261	206	261

The activities undertaken by people in the adult high-rate groups for occupancy over each of the intertidal substrates were:

- For mud: collecting crabs to the west of the power station jetty and to the east of the power station jetty.
- For mud and sand: bait digging to the west of the power station jetty; collecting mussels, collecting winkles and bait digging to the east of the power station jetty.
- For mud and stones: boat maintenance and collecting winkles at Paddy's Hole; angling to the west of the power station jetty.
- For rock: collecting crabs at Little Scar; angling at Throston Scar, Redcar Rocks, Saltburn Scar and The Headland; setting pots on the shore at Throston Scar, The Headland and Little Scar; hooking at Throston Scar, The Headland and Little Scar; collecting winkles at Throston Scar, The Headland, Saltburn Scar and South Gare.
- For sand: bait digging at Bran Sands; angling at Middleton Sands, Seaton Sands, Redcar Sands, Saltburn Sands and Throston Sands; dog walking at Redcar Sands, Saltburn Sands, North Gare Sands, Coatham Sands, Marske Sands, Throston Sands, Carr House Sands, Seaton Sands, Fish Sands and Middleton Sands; nature warden duties at North Gare Sands.
- For sand and coal: collecting sea coal at Carr House Sands and Middleton Sands.
- For sand and stones: collecting mussels and collecting winkles at Bran Sands.

Children's and infants' intertidal occupancy rates

Table E presents a summary of the children's and infants' intertidal occupancy rates in the aquatic survey area. The table includes the mean occupancy rates for the high-rate groups and the observed 97.5th percentile rates.

Table E. Summary of children's and infants' intertidal occupancy rates

Intertidal substrate	Number of observations	Number of people in the high-rate group	Maximum of the high-rate group (h y^{-1})	Mean of the high-rate group (h y^{-1})	97.5th percentile (h y^{-1})
Child age group (6 – 15 years old)					
Mud and sand	1	1	61	61	Not applicable
Rock	12	1	177	177	139
Sand	24	7	313	207	313
Sand and stones	2	2	20	20	20
Infant age group (0 – 5 years old)					
Rock	5	5	13	10	13
Sand	11	4	156	70	145
Sand and stones	4	4	28	26	28

The activities undertaken by individuals in the child age group high-rate groups for occupancy over each of the intertidal substrates were:

- For mud and sand: bait digging at Fish Sands and east of the power station jetty.
- For rock: angling at Throston Scar and Little Scar; collecting winkles at Throston Scar, The Headland and Long Scar.
- For sand: bait digging at Middleton Sands and Seaton Sands; angling at Throston Sands, Seaton Sands, Blue Lagoon and North Gare Sands; playing at Coatham Sands, Redcar Sands, Saltburn Sands and Seaton Sands; dog walking at Seaton Sands.
- For sand and stones: playing at Block Sands.

The activities undertaken by individuals in the infant age group high-rate groups for occupancy over each of the intertidal substrates were:

- For rock: rock pooling at Saltburn Scar, Throston Scar, Redcar Rocks and Block Sands.
- For sand: playing at Fish Sands, Coatham Sands and Redcar Sands.
- For sand and stones: playing at Block Sands.

4.9 Gamma dose rate measurements

Gamma dose rate measurements were taken over six intertidal substrates. All measurements were taken at a height of 1 metre above the substrate. The results are presented in Table 12 and are summarised below.

- Two measurement taken over mud ranged from 0.063 µGy h^{-1} to 0.134 µGy h^{-1}
- One measurement taken over mud and sand was 0.057 µGy h^{-1}
- One measurement taken over mud and stones was 0.157 µGy h^{-1}
- Eleven measurements taken over sand ranged from 0.043 µGy h^{-1} to 0.051 µGy h^{-1}
- One measurement taken over sand and coal dust was 0.052 µGy h^{-1}
- Two measurements taken over sand and stones ranged from 0.050 µGy h^{-1} to 0.056 µGy h^{-1}

For comparison, natural background levels have been estimated at 0.05 µGy h^{-1} over sand, 0.07 µGy h^{-1} over mud and over salt marsh, and 0.06 µGy h^{-1} over other substrates (EA, FSA, NRW, NIEA and SEPA, 2014). The relatively high rates of 0.134 µGy h^{-1} over mud and 0.157 µGy h^{-1} over mud and stones were both taken at Paddy's Hole. The enhanced levels at this location are believed to be due to the build up of naturally occurring radionuclides in sediments owing to the degradation over time of waste slag from local iron and steel industries used in sea defences.

4.10 Handling of fishing gear and sediment

Handling fishing gear that has become entrained with fine sediment particles, or handling sediment while undertaking activities such as bait digging or mollusc collecting, can potentially give rise to skin exposure from beta radiation. Doses to the skin need consideration as part of the dose limitation system (ICRP, 1991).

Fishing gear can also be a source of gamma exposure due to occupancy in the vicinity of the gear. However, this pathway is minor compared with the exposure received during occupancy over intertidal areas and it has therefore been omitted from the report. Handling of angling equipment was not considered to be a significant pathway. Therefore, as in previous surveys, data for this pathway were not collected.

Handling rates of fishing gear and sediment for adults are presented in Table 13 and handling rates of fishing gear and sediment for children are presented in Table 14. No infants were identified handling fishing gear or sediment.

Adults' handling rates of fishing gear and sediment

Table F presents a summary of the handling rates of fishing gear and sediment for adults. The table includes the mean handling rates for the high-rate groups and the observed 97.5th percentile rates.

Table F. Summary of adults' handling rates of fishing gear and sediment

Handling activity	Number of observations	Number of people in the high-rate group	Maximum of the high-rate group (h y^{-1})	Mean of the high-rate group (h y^{-1})	97.5th percentile (h y^{-1})
Handling fishing gear	32	13	2346	1484	2346
Handling sediment	41	7	1466	1188	1460

The activities undertaken by people in the adult high-rate groups for handling included:

- For handling fishing gear: handling pots in Tees Bay and off Redcar; handling nets in Tees Bay.
- For handling sediment: bait digging to the west of the power station jetty and to the east of the power station jetty; collecting crabs to the west of the power station jetty and to the east of the power station jetty; collecting mussels to the east of the power station jetty; collecting winkles to the east of the power station jetty and at Saltburn Scar; collecting sea coal at Carr House Sands and Middleton Sands.

Children's handling rates of fishing gear and sediment

Table G presents a summary of the handling rates of fishing gear and sediment for children. The table includes the mean handling rates for the high-rate groups and the observed 97.5th percentile rates.

Table G. Summary of children's handling rates of fishing gear and sediment

Handling activity	Number of observations	Number of people in the high-rate group	Maximum of the high-rate group (h y^{-1})	Mean of the high-rate group (h y^{-1})	97.5th percentile (h y^{-1})
Handling fishing gear	1	1	16	16	Not applicable
Handling sediment	3	3	87	51	84

The activities undertaken by people in the child age group high-rate groups for handling included:

- For handling fishing gear: handling nets at Throston Sands, Middleton Sands and Seaton Sands.
- For handling sediment: bait digging at Middleton Sands and Seaton Sands; collecting winkles at Throston Scar, The Headland and Long Scar; collecting crabs at Saltburn Scar.

4.11 Water based activities

Activities taking place in or on the water can lead to ingestion of water and/or inhalation of spray. These pathways are generally considered to be of minor radiological importance in comparison with other exposure pathways such as the ingestion of foods produced in the vicinity of a nuclear site. However, relevant data have been collected for consideration in dose assessments. Mean occupancy rates for the high-rate groups and 97.5th percentile rates have not been calculated.

Activities where there is a high likelihood of the individual's face submerging under water have been classified as activities 'in water', as they are more likely to lead to ingestion of water. All other activities have been classified as activities 'on water'.

Occupancy rates for activities taking place 'in water' and 'on water' in the survey area are presented in Table 15 for adults and Table 16 for children and infants.

Activities in the water

The activities identified taking place in the water in the aquatic survey area were surfing, jet-skiing, water-skiing, kayaking, sub-aqua diving and swimming. Twenty-nine observations were recorded for adults, 14 observations were recorded for the child age group and none were recorded for the infant age group. The highest occupancy rate for adults was 310 h y^{-1} for two individuals who were surfing at Saltburn Sands. The highest occupancy rate for children was 30 h y^{-1} for 12 individuals who were kayaking in Hartlepool Marina and Hartlepool Bay.

Activities on the water

The activities taking place on the water in the aquatic survey area were canoeing, rowing, sailing, power boating, push netting, potting, gill netting, boat angling, boat maintenance, skippering charter boats, pleasure cruising and paddling. Sixty-seven observations were recorded for adults, 17 observations were recorded for the child age group and 4 observations were recorded for the infant age group. The highest occupancy rate for adults was 2300 h y^{-1} for two individuals who were potting in Tees Bay. The highest occupancy rate for the child age group was 120 h y^{-1} for 12 children who were canoeing, rowing, sailing and power boating in Hartlepool Marina, Hartlepool Bay, Tees Bay and the Tees Estuary. The highest occupancy rate for the infant age group was 20 h y^{-1} for 3 individuals who were paddling at Block Sands and Fish Sands.

5 TERRESTRIAL RADIATION PATHWAYS

5.1 Terrestrial survey area

The terrestrial survey area (see Figure 2) covered the land and freshwater watercourses within 5 km of the site centre (National Grid Reference: NZ 529 269).

The north-western part of the survey area is largely urban, encompassing the southern outskirts of the town of Hartlepool and the villages of Seaton Carew and Greatham, while the southern part of the survey area along the banks of the River Tees is heavily industrialised. The western and south-western parts of the survey area are more rural in nature and include farmland and patches of freshwater marshland.

Eight farming businesses were identified that farmed land within the survey area. Of these:

- One produced beef cattle
- One produced sheep
- Two produced beef cattle and sheep
- One produced beef cattle, sheep and arable crops
- Two produced arable crops
- One produced only hay in the survey area which was used to feed livestock kept outside the survey area.

The arable crops included wheat and oilseed rape. Hay or silage was grown on two farms for use as feed for livestock kept on the same farms.

Lamb that was produced commercially on land within the survey area was being consumed.

Seven allotment sites were identified within the survey area. Three were located in the southern suburbs of Hartlepool, two were in Seaton Carew and two were in Greatham (see Figure 2). There were approximately 260 plots at the Hartlepool sites, 110 plots at the Seaton Carew sites and 25 plots at the Greatham sites. Many varieties of fruit and vegetables were grown on the allotments and chickens were kept for egg production at two of the allotment sites.

Two beekeepers were interviewed who kept hives within the survey area. One beekeeper had four hives that each produced approximately 5 kg y^{-1} of honey and the other beekeeper had only just started beekeeping and had two hives that had each produced less than 1 kg of honey that year. Both beekeepers kept their hives at an allotment site in Hartlepool. The beekeepers consumed some of the honey and the rest was given to family and friends. Several other people were identified that kept small

numbers of bees in tubes at the allotment sites. These were kept to act as pollinators rather than for honey production.

Blackberries and mushrooms were growing wild in the area around Greatham and these were being collected and consumed.

Shooting took place on farmland in the Greatham area and over the freshwater marshes in the south-west of the survey area. Partridge, pheasant, pigeon, woodcock, rabbits and roe deer were shot and consumed. Several species of wildfowl were also shot but these have been included in the aquatic section of this report since, although they were not shot over intertidal areas, they had probably fed or roosted over the extensive intertidal areas nearby and therefore would have been potentially exposed to aquatic discharges.

One family was identified that caught and consumed brown trout from a freshwater stream passing through their land in the west of the survey area.

All the farms used mains water for both their domestic supply and for watering livestock but farm animals also had access to pond, stream or ditch water.

5.2 Destination of food originating from the terrestrial survey area

Beef cattle and lambs were mainly sold at livestock markets at Darlington, Derby and Northallerton although small quantities were sold directly to other farms outside the survey area. Wheat was sold to distilleries in Scotland and sold nationally for human consumption or animal feed, depending on quality. Oilseed rape was sent to facilities at Liverpool for processing and subsequently distributed nationally for use in foods for human consumption.

5.3 The potential transfer of contamination off-site by wildlife

A site representative reported that wildlife does not have access to controlled areas. Therefore it is unlikely that wildlife could become contaminated and transfer contamination off-site. Rabbits in the immediate area around the site have been culled periodically as part of general pest control measures.

5.4 Food consumption data

Consumption data for locally produced foodstuffs potentially affected by deposition of gaseous discharges are presented in Tables 17 to 30 for adults and Tables 31 to 38 for children and infants. The mean consumption rates for the high-rate groups and the observed 97.5th percentile rates, calculated as described in Section 3.4, are given at the foot of each table.

In order to provide information relevant to monitoring and assessments studies, the consumption rate data collected during the survey were analysed to indicate the percentage that each food type contributed to each food group. The data are summarised in Table 39.

Adults' consumption rates

Consumption of locally produced foods was identified in the following 14 food groups: green vegetables; other vegetables; root vegetables; potato; domestic fruit; sheep meat; poultry; eggs; wild/free foods; rabbits/hares; honey; wild fungi; venison; freshwater fish. No consumption of milk, cattle meat or pig meat was identified.

Table H presents a summary of the adults' consumption rates for the foods consumed from the terrestrial survey area. The table includes the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates. For comparison, the table also includes mean consumption rates and 97.5th percentile consumption rates based on national data, which are referred to as 'generic' data in this report. No generic rates have been determined for venison or freshwater fish.

Table H. Summary of adults' consumption rates of foods from the terrestrial survey area

Food group	Number of observations	Number of high-rate consumers	Observed maximum for the high-rate group (kg y^{-1})	Observed minimum for the high-rate group (kg y^{-1})	Observed mean for the high-rate group (kg y^{-1})	Observed 97.5th percentile (kg y^{-1})	Generic mean* (kg y^{-1})	Generic 97.5th percentile* (kg y^{-1})
Green vegetables	73	14	36.5	13.4	23.9	34.4	15.0	45.0
Other vegetables	73	10	35.9	12.8	22.6	26.0	20.0	50.0
Root vegetables	73	16	48.2	17.0	32.2	43.9	10.0	40.0
Potato	73	18	59.2	21.0	33.5	58.3	50.0	120.0
Domestic fruit	68	13	26.4	11.2	13.9	17.1	20.0	75.0
Sheep meat	2	2	5.7	5.7	5.7	5.7	8.0	25.0
Poultry	8	4	12.7	7.6	10.1	12.7	10.0	30.0
Eggs	10	1	34.7	34.7	34.7	29.1	8.5	25.0
Wild/free foods	7	2	2.5	2.5	2.5	2.5	7.0	25.0
Rabbits/hares	7	2	17.5	17.5	17.5	17.5	6.0	15.0
Honey	8	4	2.3	2.3	2.3	2.3	2.5	9.5
Wild fungi	4	2	7.9	2.7	5.3	7.5	3.0	10.0
Venison	2	2	3.4	3.4	3.4	3.4	Not determined	Not determined
Freshwater fish	3	3	0.5	0.5	0.5	0.5	Not determined	Not determined

(*Generic rates based on data from Byrom *et al.*, 1995.)

Two of the mean consumption rates for the high-rate groups were greater than the generic 97.5th percentile consumption rates. These were for eggs and rabbits/hares. Six of the mean consumption rates for the high-rate groups exceeded the generic mean consumption rates. These were for other vegetables, root vegetables, poultry, eggs, rabbits/hares and wild fungi. Three of the observed 97.5th percentile consumption rates exceeded the generic 97.5th percentile consumption rates. These were for root vegetables, eggs and rabbits/hares.

Children's and infants' consumption rates

Fifteen individuals in the child age group and two individuals in the infant age group were identified consuming foods from the terrestrial survey area. Table I presents a summary of children's and infants' consumption rates. The table includes the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates. No generic data have been determined for the child or infant age groups. In the child age group, no consumption of foods from the following food groups was identified: milk; cattle meat; pig meat; sheep meat; wild/free foods; honey; wild fungi; venison; freshwater fish. In the infant age group, no consumption of foods from the following food groups was identified: milk; cattle meat; pig meat; sheep meat; poultry; eggs; wild/free foods; rabbits/hares; honey; wild fungi; venison; freshwater fish.

Table I. Summary of children's and infants' consumption rates of foods from the terrestrial survey area

Food group	Number of observations	Number of high-rate consumers	Observed maximum for the high-rate group (kg y^{-1})	Observed minimum for the high-rate group (kg y^{-1})	Observed mean for the high-rate group (kg y^{-1})	Observed 97.5th percentile (kg y^{-1})
Child age group (6 - 15 years old)						
Green vegetables	13	13	11.3	5.8	8.6	10.9
Other vegetables	13	12	12.8	4.9	8.2	12.2
Root vegetables	13	13	14.0	6.1	9.8	14.0
Potato	13	13	13.7	5.7	8.4	13.7
Domestic fruit	13	9	5.0	2.4	3.5	5.0
Poultry	2	1	12.7	12.7	12.7	12.3
Eggs	2	2	5.5	3.0	4.3	5.4
Rabbits/hares	2	1	17.5	17.5	17.5	17.0
Infant age group (0 - 5 years old)						
Green vegetables	2	2	4.8	3.5	4.1	4.7
Other vegetables	2	2	5.1	4.7	4.9	5.1
Root vegetables	2	2	4.7	4.7	4.7	4.7
Potato	2	1	10.5	10.5	10.5	10.3
Domestic fruit	2	2	1.6	1.3	1.5	1.6

6 DIRECT RADIATION PATHWAYS

6.1 Direct radiation survey area

The direct radiation survey area (see Figure 2) covered the land, water and intertidal areas within 1 km of the nuclear licensed site boundary. The occupancy data collected from the direct radiation survey area is also applicable to inhalation and external exposure pathways arising from gaseous releases from the site.

The power station is located on the northern bank of the Seaton-on-Tees Channel. The direct radiation survey area to the south of the station is taken up by the water of the channel and the associated intertidal mud flats and sand flats, including Seal Sands on the southern shore of the channel. Another intertidal area, called North Gare Sands, occupies a large part of the direct radiation survey area to the east and north-east of the power station. Most of the dry land in the direct radiation survey area is situated to the north and the west of the power station and is a mix of industrial areas and countryside which is used for nature conservation, grazing livestock and leisure activities.

The Hartlepool Power Station Visitors Centre, which incorporates small offices for three nature conservation bodies, is located immediately to the north of the licensed site. To the north of the Visitors Centre there is a small golf course owned by EDF and further north is an open area of grassland and marsh called Seaton Snook. To the north-east of the site there is a chemical works and beyond that an area of sand dunes, a small part of a public golf links and the sand flats of North Gare Sands. A field adjacent to the east of the site is used for grazing horses.

A small jetty extends into the Seaton-on-Tees Channel close to the south-east corner of the site and a narrow embankment extends along the south side of the site providing access to the shore. There is a wooden hut near the jetty and a bird hide towards the western end of the embankment.

A large area of land to the west of the site is occupied by a marine engineering facility and associated dry dock. Further west there is an area of land owned by a large chemical works, although the buildings of the works are located outside the survey area and the part of their land within the survey area is a nature reserve. Near the western outer limit of the survey area there is an industrial estate comprising numerous businesses of varying sizes.

To the north-west of the site there are playing fields and a nature reserve owned by EDF with an industrial landfill site beyond. The A178 road cuts through the north-west part of the survey area.

The non-industrial parts of the survey area are important wildlife conservation areas and North Gare Sands, the associated dunes, the south end of Seaton Snook and Seal Sands are all within the Teesmouth National Nature Reserve.

6.2 Residential activities

No occupied residential properties were identified within the direct radiation survey area. The single residence that was identified in the 2008 survey, which was attached to a business, was unoccupied in 2014 and both the residence and business were up for sale.

6.3 Leisure and educational activities

The direct radiation survey area was popular for leisure activities including walking, dog walking, nature studies, bird watching, seal watching and sports. The area was also used by small numbers of people for angling, bait digging and collecting shellfish.

The Hartlepool Power Station Visitors Centre, which re-opened in 2013, was open five days a week and catered for drop in visitors as well as taking organised groups on tours around the power station. A field centre based within the Visitors Centre provided educational and recreational field studies courses, including walks on North Gare Sands, for over 4000 day-visitors per year, although not all of the visitors' time was spent within the direct radiation survey area.

The nature reserve in the grounds of the chemical works to the west of the site was open to the public and attracted small numbers of visitors who mainly made their way to a hide overlooking Seal Sands from where they watched birds and seals.

The most popular area for walking and dog walking was North Gare Sands. A small number of people were identified angling, bait digging, collecting peeler crabs, collecting winkles or collecting mussels on the northern shore of the Seaton-on-Tees Channel close to the power station. Authorised groups used the hide on the embankment to the south of the site for watching birds and seals.

The small golf course near the Visitors Centre and the playing fields to the north-west of the site were primarily used by EDF employees and their guests. Only a small part of the public golf links to the north-east of the site was within the survey area so golfers only spent a relatively small amount of time inside the survey area as they played through that part of the course.

6.4 Commercial activities

The main commercial activities in the direct radiation survey area were the chemical works located to the north-east of the site, the engineering facility and dry dock adjacent to the western boundary of the site and the industrial estate in the far west of the survey area. Representatives of the chemical works and the engineering facility declined to be interviewed. There were nine working businesses within the survey area on the industrial estate and interviews were obtained at seven of these. The number of employees at the businesses ranged from one to 30.

Data was also obtained for two farm workers tending livestock on Seaton Snook and six staff and volunteers of nature conservation bodies working in the area.

The commercial extraction of sand from North Gare Sands identified in 2008 was no longer taking place in 2014.

The activities of EDF employees and contractors while at work were not considered in the direct radiation survey.

6.5 Occupancy rates

Table 40 presents indoor, outdoor and total occupancy data for adults, children and infants. An analysis of the data by distance zones and occupancy rates is shown in Table 41. A summary of occupancy rates in the direct radiation survey area is presented in Table J, below.

Table J. Summary of direct radiation occupancy rates

Zone	Number of observations	Highest indoor occupancy (h y^{-1})	Highest outdoor occupancy (h y^{-1})	Highest total occupancy (h y^{-1})
0 - 0.25 km	15	848	1466	1593
>0.25 - 0.5 km	72 (estimated)	1840 (estimated)	414 (estimated)	1840 (estimated)
>0.5 - 1.0 km	74	2500	750	3250

0 - 0.25 km from the nuclear licensed site boundary

Occupancy data were collected for 15 individuals in the 0 - 0.25 km zone. The observations were for six people who were carrying out nature warden duties; seven people who were engaged in various combinations of bait digging, collecting crabs, collecting mussels and collecting winkles; one person who was bird watching and one person who was angling. The highest indoor and total occupancy rates

were for an individual who was carrying out nature warden duties. The highest outdoor occupancy rate was for an individual who was bait digging and collecting crabs, mussels and winkles.

>0.25 - 0.5 km from the nuclear licensed site boundary

The only activity identified in this zone was working at the chemical works or engineering facility and representatives of both of these businesses declined to be interviewed. Estimates of occupancy rates for use in assessments based on the 2008 survey (see Annex 3) are provided for 72 people who worked at the chemical works. The highest indoor rate was for 46 employees, the highest outdoor rate was for three employees and the highest total occupancy rate was for all 72 employees.

>0.5 - 1.0 km from the nuclear licensed site boundary

Occupancy data were collected for 74 people in the >0.5 - 1.0 km zone. The observations were for 65 people who were working in the area, seven people who were dog walking and two farm workers who were tending livestock. The highest indoor, outdoor and total occupancy rates were for an individual who worked in the area.

6.6 Gamma dose rate measurements

Gamma dose rate measurements were taken indoors and outdoors at most properties where interviews were conducted in the Hartlepool direct radiation survey area. Outdoor measurements were taken approximately 5 to 10 metres from the nearest building, and where possible, were taken over grass. However, owing to the heavily built-up nature of the area where the buildings were situated it was often not possible to take readings over grass and most readings were taken over concrete. Gamma dose rate measurements over grass were taken at locations further than 5 km from the site centre to obtain background dose rates. All measurements were taken at a height of 1 metre above the substrate using a Mini 600 Series Type 6-81 Environmental Radiation Meter with a compensated Geiger-Müller tube. The indoor and outdoor measurements have not been adjusted for background dose rates. The results are presented in Table 42 and are summarised below.

Indoor measurements

- Seven measurements taken over concrete ranged from 0.053 µGy h^{-1} to 0.084 µGy h^{-1}

Outdoor measurements

- Three measurements taken over grass ranged from 0.062 µGy h^{-1} to 0.068 µGy h^{-1}
- One measurement taken over tarmac was 0.062 µGy h^{-1}
- Four measurements taken over concrete ranged from 0.059 µGy h^{-1} to 0.075 µGy h^{-1}

Background measurements

- Three measurements taken over grass ranged from 0.066 µGy h^{-1} to 0.073 µGy h^{-1}

Considering that gamma dose rate measurements may be influenced by the substrate over which they are taken, the nature of any nearby building materials and many other factors, the measurements taken at the properties were not notably different from the background measurements.

Estimates of the average annual doses from background radiation to the population across the UK, by county, have been made by Public Health England (previously the Radiation Protection Division of the Health Protection Agency), the most recent of these being a review conducted in 2005 (Watson *et al*, 2005). Further information on background radiation relevant to the geographic region covered in the Hartlepool habits survey can be found in the review.

7 USES OF HABITS DATA FOR DOSE ASSESSMENTS

7.1 Combined pathways

In determining habits data for the purposes of assessing radiological doses to the public, it may be necessary to consider a combination of pathways. Data are provided in Annex 1 and Annex 2 so that the full effect of combining pathways can be assessed for individual observations, given the concentrations and dose rates for a particular assessment. The rates for individuals in the high-rate groups are emboldened. In some circumstances, it will be possible to make simplifying assumptions and define the consumption and external exposure rates appropriate to a series of potential high-rate groups.

The most extensive combinations of pathways for adult dose assessment are shown in Table 43. Each of the 18 combinations shown in Table 43 represents an actual individual (or individuals) from Annex 1 who has positive data (irrespective of the magnitude), for each pathway marked with a cross. It should be noted that combination numbers in Table 43 do not correlate directly with observation numbers in Annex 1. Other individuals from Annex 1 have combinations that are not listed in Table 43 because they have fewer pathways and a dose assessment for them would be adequately covered by one of the 18 listed combinations.

7.2 Foetal dose assessment

Dose assessment of the foetus was introduced routinely for the first time in the Radioactivity in Food and the Environment report for 2005 (EA, EHS, FSA and SEPA, 2006), following the publication of recommendations by the Radiation Protection Division of the Health Protection Agency (National Radiological Protection Board, 2005). The adopted approach is to use the consumption and occupancy data for women of childbearing age in order to calculate the potential dose to the foetus. Therefore, consumption and occupancy data collected during the Hartlepool habits survey for females of childbearing age are presented in Annex 5. The Office of National Statistics classifies women to be of childbearing age if they are between 15 – 44 years old (www.ons.gov.uk); this age range has been used in Annex 5. It was not possible to collect ages for all female observations during the habits survey. However, these females with unknown ages have been included in Annex 5 as they might be women of childbearing age.

7.3 Total dose assessment

The environment agencies and the Food Standards Agency have considered ways of using habits data to calculate total dose retrospectively. The adopted approach is to use the adult consumption and occupancy data collected in each habits survey to create a matrix with a series of habits profiles for

each site. The National Dose Assessment Working Group (NDAWG) has considered this approach to assessing retrospective total doses (Camplin *et al*, 2005) and has agreed that using habits profiles is an appropriate approach. The relevant matrix for the adults' profiled habits data is shown in Annex 6. Additionally, profiles have been created for the child and infant age groups, and for women of childbearing age. These are shown in Annexes 7, 8, and 9 respectively.

8 COMPARISONS WITH THE PREVIOUS SURVEY

The results from this 2014 survey can be compared with results from the last combined habits survey undertaken at Hartlepool in 2008. The aquatic, terrestrial and direct radiation survey areas in the 2014 survey were the same as those in the 2008 survey. The comparisons below of consumption rates, intertidal occupancy rates and handling rates of fishing gear and sediment are for adults only. The comparison of occupancy rates in the direct radiation area is for all age groups combined.

8.1 Aquatic survey area

The types of activities identified in 2014 were for the most part similar to those identified in 2008.

The main species of fish consumed by the adult high-rate group in 2008 were cod, haddock, mackerel and whiting, and in 2014 the main species were similar except that haddock had been replaced by ling. The main species of crustaceans consumed by the adult high-rate group were the same in 2008 and 2014, comprising brown crab and common lobster. The main species of molluscs consumed by the adult high-rate group in both 2008 and 2014 were whelks and winkles, although in 2008 the high-rate group also consumed a small quantity of mussels, whereas no mussels were consumed by the high rate group in 2014. The wildfowl consumed by the adult high-rate group in 2008 comprised duck and goose of unknown species whereas in 2014 the main species were Canada goose, greylag goose and mallard, with smaller quantities of teal and wigeon. In 2008 the only species of marine plants/algae consumed by the adult high-rate group was samphire but in 2014 the consumption of marine plants/algae was not identified.

A comparison between the 2008 and 2014 data for the consumption of aquatic foods is presented in Table K.

Table K. Comparison between 2008 and 2014 consumption rates of aquatic food groups for adults

	2008			2014		
Food group	**Number in high-rate group**	**Maximum consumption rate (kg y^{-1})**	**Mean consumption rate for the high-rate group (kg y^{-1})**	**Number in high-rate group**	**Maximum consumption rate (kg y^{-1})**	**Mean consumption rate for the high-rate group (kg y^{-1})**
Fish	25	49.8	27.9	24	71.0	41.5
Crustaceans	14	28.6	19.3	20	45.8	26.1
Molluscs	7	7.9	5.8	3	17.8	10.8
Wildfowl	2	6.3	6.3	2	12.0	12.0
Marine plants/algae	1	0.2	0.2	Not identified		

In 2014, compared with 2008, there were increases in the mean consumption rate for the adult high-rate group for fish, from 28 kg y^{-1} to 42 kg y^{-1}, for crustaceans, from 19 kg y^{-1} to 26 kg y^{-1}, for molluscs, from 5.8 kg y^{-1} to 11 kg y^{-1}, and for wildfowl, from 6.3 kg y^{-1} to 12 kg y^{-1}. The consumption of small quantities of marine plants/algae was identified in 2008 but not in 2014.

The single samphire consumer who was identified in 2008 could not be contacted in 2014. No specific reasons were identified for the other changes in consumption rates.

For intertidal occupancy for adults in 2008, activities were recorded over the following seven substrates: mud; mud and sand; mud and stones; mud, sand and stones; rock; sand; sand and coal. In 2014, activities were recorded over similar substrates except that mud, sand and stones was replaced with sand and stones.

The following activities were undertaken by the individuals in the adult high-rate groups for intertidal substrates:

- In 2008: angling, bait digging, boat maintenance, collecting crabs, collecting mussels collecting winkles, collecting sea coal, dog walking, hooking for crabs, field centre staff duties, fixing moorings, kite flying and sand extraction.
- In 2014: angling, bait digging, boat maintenance, collecting crabs, collecting mussels collecting winkles, collecting sea coal, dog walking, hooking for crabs, nature warden duties and setting pots on the shore.

The following activities were undertaken by the individuals in the adult high-rate groups for handling fishing gear:

- In 2008: handling pots, nets and long lines.
- In 2014: handling pots and nets.

The following activities were undertaken by the individuals in the adult high-rate groups for handling sediment:

- In 2008: collecting sea coal.
- In 2014: bait digging and collecting crabs, mussels, winkles and sea coal.

A comparison between the 2008 and 2014 data for adult occupancy over intertidal substrates, handling fishing gear and handling sediment is shown in Table L.

Table L. Comparison between 2008 and 2014 intertidal occupancy rates and handling rates of fishing gear and sediment for adults						
	2008			2014		
Intertidal substrate or handling pathway	Number in high-rate group	Maximum occupancy or handling rate (h y^{-1})	Mean occupancy or handling rate for the high-rate group (h y^{-1})	Number in high-rate group	Maximum occupancy or handling rate (h y^{-1})	Mean occupancy or handling rate for the high-rate group (h y^{-1})
Mud	1	12	12	2	368	368
Mud and sand	4	104	62	2	1098	1095
Mud and stones	1	300	300	2	52	38
Mud, sand and stones	4	196	134	Not identified		
Rock	2	616	581	11	641	364
Sand	15	936	601	24	1022	457
Sand and coal	4	1529	1233	4	1400	1225
Sand and stones	Not identified			3	261	206
Handling fishing gear	10	2205	1357	13	2346	1484
Handling sediment	4	1529	1233	7	1466	1188

In 2014, compared to 2008, the mean intertidal occupancy rate for the adult high-rate group increased significantly over mud and over mud and sand; decreased significantly over mud and stones; decreased moderately over rock and over sand; and remained almost the same over sand and coal. Occupancy over mud, sand and stones was identified in 2008 but not in 2014, whereas occupancy over sand and stones was identified in 2014 but not in 2008.

The increases in the occupancy rates over mud and over mud and sand were due to two individuals being identified in 2014 who spent a high amount of time collecting peeler crabs and bait digging near the power station jetty. The decrease in the occupancy rate over mud and stones was due to a decrease in the amount of time spent undertaking boat maintenance at Paddy's Hole. Many of the other changes in the occupancy rates over the various substrates were attributed primarily to slight changes over time in the nature of the substrates at certain locations.

The mean rate for the adult high-rate group for handling fishing gear increased slightly in 2014, compared to 2008, and the mean rate for the adult high-rate group for handling sediment decreased slightly.

No use of seaweed as a fertiliser or animal feed was identified in either 2008 or 2014.

8.2 Terrestrial survey area

Activities in the terrestrial survey area in 2014 were broadly similar to those in 2008. The principal types of farm produce continued to be a mix of beef cattle, lambs and arable crops. In 2008 the arable crops included wheat, barley, oilseed rape and field beans, whereas in 2014 only wheat and oilseed rape were identified.

The growing of fruit and vegetables on allotment sites, beekeeping, shooting on farmland and the collection of wild/free foods were identified in both surveys. Angling for trout in a freshwater stream was identified in 2014 but had not been identified in 2008.

The mean consumption rates for the adult high-rate groups for terrestrial food groups from the 2008 and 2014 surveys are shown in Table M.

Table M. Comparison between 2008 and 2014 mean consumption rates for the adult high-rate groups for terrestrial food groups (kg y^{-1})

Food group	2008	2014
Green vegetables	25.9	23.9
Other vegetables	17.6	22.6
Root vegetables	21.5	32.2
Potatoes	39.4	33.5
Domestic fruit	15.0	13.9
Cattle meat	9.5	Not identified
Sheep meat	5.4	5.7
Poultry	3.7	10.1
Eggs	16.5	34.7
Wild/free foods	3.1	2.5
Rabbits/hares	10.2	17.5
Honey	10.1	2.3
Wild fungi	0.8	5.3
Venison	Not identified	3.4
Freshwater fish	Not identified	0.5

In 2014, compared to 2008, the mean consumption rates for the adult high-rate groups increased in the following seven food groups: other vegetables; root vegetables; sheep meat; poultry; eggs; rabbits/hares; wild fungi. The mean consumption rates for the adult high-rate groups decreased in 2014 in the following five food groups: green vegetables; potatoes; domestic fruit; wild/free foods; honey. The consumption of cattle meat was identified in 2008 but not in 2014, and the consumption of venison

and freshwater fish were identified in 2014 but not in 2008. No consumption of milk or pig meat was identified in either 2008 or 2014.

The most significant increases in the consumption rates were for root vegetables, poultry, eggs, rabbits/hares and wild fungi, and the most significant decrease in the consumption rates was for honey.

The cessation of the consumption of cattle meat was due to a single farming family that consumed beef in 2008 no longer doing so in 2014. The increases in the consumption rates of poultry and rabbits/hares, and the commencement of venison consumption, were due to the identification in 2014 of two very keen game shooters who were not identified in 2008. The increase in the consumption rate of eggs in 2014 was due to a single high-rate individual. The decrease in the consumption rate of honey in 2014 was attributed to one of the most experienced beekeepers having stopped beekeeping, combined with poor yields from other beekeeper's hives. No specific reasons were identified for the other changes in consumption rates.

No consumption of groundwater by humans or livestock was identified in either 2008 or 2014 although livestock had access to surface water in both years.

8.3 Direct radiation survey area

A single residence was identified in the direct radiation survey area in 2008 but this property was unoccupied in 2014 and the associated business was also closed. Other activities identified in the direct radiation survey area in 2008 and 2014 were similar and included people working, farming, carrying out nature warden duties and undertaking recreational activities.

A comparison between the 2008 and 2014 direct radiation occupancy rates for all age groups combined, by zone, is presented in Table N.

Table N. Comparison between 2008 and 2014 direct radiation occupancy rates for all age groups combined (h y^{-1})		
	2008	**2014**
0 - 0.25 km zone		
Highest indoor	1057	848
Highest outdoor	588	1466
Highest total	1645	1593
>0.25 - 0.5 km zone		
Highest indoor	1840	1840 (estimated)
Highest outdoor	1748	414 (estimated)
Highest total	2208	1840 (estimated)
>0.5 - 1.0 km zone		
Highest indoor	6982	2500
Highest outdoor	1880	750
Highest total	7416	3250

In 2008 the highest indoor, outdoor and total occupancy rates in the 0 - 0.25 km zone were for people carrying out nature warden duties (called field centre staff in the 2008 survey report), whereas in 2014, although the highest indoor and total occupancy rates were for people carrying out nature warden duties, the highest outdoor occupancy rate was for an individual who was bait digging and collecting crabs, mussels and winkles.

In 2008 in the >0.25 – 0.5 km zone, one worker had the highest outdoor and total occupancy rates and 46 employees at another company had the highest indoor occupancy rate. The 2014 data are estimated based on the 2008 data but the highest outdoor and total occupancy rates are less since the company employing the single individual with the highest rates in 2008 had closed in 2014 and data for that individual were not included in the estimates for 2014.

In 2008, the highest indoor and total occupancy rates in the >0.5 – 1.0 km zone were for two people that lived and worked in the area and the highest outdoor occupancy rate was for another person who worked in the area. In 2014 the highest indoor, outdoor and total occupancy rates in the >0.5 – 1.0 km zone were all for a person who worked in the area. The large decreases in the occupancy rates in the >0.5 – 1.0 km zone were because the single residence identified in that zone in 2008 was unoccupied in 2014 and the business associated with the residence had also closed.

In the Hartlepool direct radiation survey area, three sets of gamma dose measurements taken in 2014 can be compared with those taken at the same properties in 2008. These data are shown in Table O.

Table O. Comparison between 2008 and 2014 gamma dose rates (μGy h^{-1})				
	Indoor		Outdoor	
Location	2008	2014	2008	2014
Business 1	Not taken	0.053	0.076	0.063
Business 2	0.084	0.074	0.085	0.062
Business 3	Not taken	0.084	0.083	0.059

Notes
These measurements have not been adjusted for background dose rates.
The locations correspond to those in Table 42.

The gamma dose rates taken in 2014 were all lower than those taken at the same properties in 2008.

9 MAIN FINDINGS

The survey investigated three potential sources of public radiation exposure from the Hartlepool site, which were:

- Discharges of liquid radioactive waste into Tees Bay in the North Sea
- Discharges of gaseous radioactive waste to the atmosphere
- Emissions of direct radiation

Data were collected for 522 individuals including, for example, commercial and hobby fishermen, anglers, people spending time on intertidal substrates, farmers, allotment holders, beekeepers and people spending time within the direct radiation survey area. These people were targeted because their diet and habits may cause them to be exposed to radioactivity from the site. However, it should be noted that the most exposed people can only be defined with the outcome of a dose assessment. All consumption rates recorded are only for foods produced, collected or caught from within the aquatic and terrestrial survey areas as defined in Section 2.3.

9.1 Aquatic survey area

The mean consumption rates for the adult high-rate groups (as defined in Section 3.4) for the separate aquatic consumption pathways for foods potentially affected by liquid discharges were:

- 42 kg y^{-1} for fish
- 26 kg y^{-1} for crustaceans
- 11 kg y^{-1} for molluscs
- 12 kg y^{-1} for wildfowl

The predominant foods consumed by the people in the high-rate groups were:

- For fish: cod, ling, mackerel and whiting
- For crustaceans: brown crab and common lobster
- For molluscs: whelks and winkles
- For wildfowl: Canada goose, greylag goose and mallard

The mean occupancy rates for the adult high-rate groups over the separate intertidal substrates were:

- 370 h y^{-1} for mud
- 1100 h y^{-1} for mud and sand
- 38 h y^{-1} for mud and stones
- 360 h y^{-1} for rock
- 460 h y^{-1} for sand
- 1200 h y^{-1} for sand and coal
- 210 h y^{-1} for sand and stones

The mean rates for the adult high-rate groups for handling were:

- 1500 h y^{-1} for handling fishing gear (nets and pots)
- 1200 h y^{-1} for handling sediment

The maximum adult occupancy rates for water based activities were:

- 310 h y^{-1} for 'in water'
- 2300 h y^{-1} for 'on water'

No use of seaweed as a fertiliser or animal feed was identified.

9.2 Terrestrial survey area

The mean consumption rates for the adult high-rate groups for the separate consumption pathways for foods potentially affected by gaseous discharges were:

- 24 kg y^{-1} for green vegetables
- 23 kg y^{-1} for other vegetables
- 32 kg y^{-1} for root vegetables
- 34 kg y^{-1} for potato
- 14 kg y^{-1} for domestic fruit
- 5.7 kg y^{-1} for sheep meat
- 10 kg y^{-1} for poultry
- 35 kg y^{-1} for eggs
- 2.5 kg y^{-1} for wild/free foods
- 17 kg y^{-1} for rabbits/hares
- 2.3 kg y^{-1} for honey
- 5.3 kg y^{-1} for wild fungi
- 3.4 kg y^{-1} for venison
- 0.5 kg y^{-1} for freshwater fish

No consumption of milk, cattle meat or pig meat from the survey area was identified.

The consumption of foodstuffs by individuals in the child and infant age groups was also recorded.

No consumption of groundwater by humans or livestock was identified. All livestock were supplied with mains water for drinking but many also had access to pond, stream or ditch water.

A site representative reported that wildlife does not have access to controlled areas and therefore it is unlikely that wildlife could become contaminated and transfer contamination off-site.

9.3 Direct radiation survey area

The highest indoor and total occupancy rates in the 0 – 0.25 km zone were for an individual who was carrying out nature warden duties. The highest outdoor occupancy rate in the 0 – 0.25 km zone was for an individual who was bait digging and collecting crabs, mussels and winkles. Based on data estimated from the 2008 survey the highest indoor, outdoor and total occupancy rates in the >0.25 – 0.5 km zone were for people who worked in the area. The highest indoor, outdoor and total occupancy rates in the >0.5 – 1.0 km zone were for an individual who worked in the area.

The highest indoor, outdoor and total occupancy rates recorded for each zone were:

0 - 0.25 km zone

- 850 h y^{-1} for the indoor occupancy rate
- 1500 h y^{-1} for the outdoor occupancy rate
- 1600 h y^{-1} for the total occupancy rate

>0.25 - 0.5 km zone (estimated rates)

- 1800 h y^{-1} for the indoor occupancy rate
- 410 h y^{-1} for the outdoor occupancy rate
- 1800 h y^{-1} for the total occupancy rate

>0.5 – 1.0 km zone

- 2500 h y^{-1} for the indoor occupancy rate
- 750 h y^{-1} for the outdoor occupancy rate
- 3300 h y^{-1} for the total occupancy rate

10 RECOMMENDATIONS FOR CHANGES TO THE MONITORING PROGRAMMES

In England and Wales, the monitoring programme for radioactivity in food is undertaken by the Food Standards Agency, and the monitoring programme for radioactivity in the environment is conducted by the Environment Agency. The results of these programmes are published annually in the RIFE report (e.g. EA, FSA, NRW, NIEA and SEPA, 2014). The information collected during this habits survey can be used to make recommendations for changes to these monitoring programmes.

In 2013 the Food Standards Agency completed a public consultation to review the way that they monitor radioactivity in food. The outcome of the consultation was to implement an optimised monitoring programme on a risk basis in line with current international best practice guidance and sufficient to meet legal and international commitments (www.food.gov.uk). The revised monitoring programme was introduced in 2014. However, in order to maintain the convention adopted for habits survey reports the recommendations presented here are based on the 2013 monitoring programme as published in RIFE 19.

10.1 Summary of the monitoring programmes

The 2013 monitoring programmes relevant to the Hartlepool area included the samples and measurements listed below. The location names, foods and substrate classifications are taken directly from RIFE. Some of the samples and measurements taken for the monitoring programmes may be from outside the survey areas used for the 2014 Hartlepool habits survey.

Aquatic samples

Sample	***Location***
Plaice	Pipeline
Cod	Pipeline
Crabs	Pipeline
Winkles	South Gare
Mussels	South Gare
Mussels	Seal Sands
Seaweed	Pilot Station
Sediment	Old Town Basin
Sediment	Seaton Carew
Sediment	Paddy's Hole
Sediment	North Gare
Sediment	Greatham Creek
Sea coal	Old Town Basin
Sea coal	Carr House Sands
Seawater	North Gare

Gamma dose rate measurements over intertidal sediments

Substrate	***Location***
Sand	Fish Sands
Pebbles and sand	Fish Sands
Sand and mud	Old Town Basin
Sand and coal	Old Town Basin
Sand and coal	Carr House
Coal	Carr House
Sand	Seaton Carew
Pebbles and sand	Seaton Carew
Sand	Seaton Sands
Sand and pebbles	Seaton Sands
Sand	North Gare
Stones and mud	Paddy's Hole
Pebbles and stones	Paddy's Hole
Mud	Greatham Creek Bird Hide

Terrestrial samples

Milk
Apples
Beetroot
Blackberries
Cabbage
Honey
Potatoes
Runner beans
Wheat
Freshwater from the public supply and a borehole at Dalton Piercy

10.2 Recommendations

Recommendations for changes to the monitoring programmes based on the findings of this survey are made below.

Environment Agency monitoring

The current environmental monitoring programme adequately covers the Hartlepool area and no changes to this are suggested.

Food Standards Agency monitoring

- Within the 'mollusc' food group the sample of mussels taken from Seal Sands could be replaced by a sample of whelks caught in crab pots, since mussels are covered by the sample from South Gare and whelks are consumed in higher quantities than mussels but no sample is taken.

- The sample of runner beans taken from the 'other vegetable' food group could be replaced with a sample of peas or broad beans since these are consumed at higher rates. (Tomatoes are consumed at a higher rate than peas or broad beans but are not recommended for sampling since they are often grown under cover and/or in grow bags and therefore may be less likely to be exposed to radioactivity in the environment.)

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www.food.gov.uk

www.ons.gov.uk

Table 1. Survey coverage

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
SUMMARY OF ALL PATHWAYS					
All potential interviewees in the Hartlepool aquatic, terrestrial and direct radiation survey areas.	Number of people resident in the terrestrial survey area (excluding those resident in the direct radiation survey area) (See **(B) TERRESTRIAL PATHWAYS**)	27,400[a]	100[b]	0.4%	The survey targeted individuals who were potentially the most exposed, mostly producers of local foods such as farmers and allotment holders.
	Number of people resident in the direct radiation survey area (See **(C) DIRECT RADIATION PATHWAYS**)	0	0	-	There was only 1 residence in the direct radiation survey area and this was not occupied at the time of the srvey.
	Number of people working, visiting and undertaking recreational activities in the direct radiation survey area (See **(C) DIRECT RADIATION PATHWAYS**)	U	89[b]	U	Excluding employees and contractors at the nuclear licensed site
	Number of people effected by liquid discharges (excluding those assigned to other categories above) (See **(A) AQUATIC PATHWAYS**)	U	333[b]	U	Excluding 16 people who also had occupancy in the direct radiation survey area and have been assigned to the direct radiation category above.
	Total for aquatic, terrestrial and direct radiation survey areas	U	522[b]	U	
(A) AQUATIC PATHWAYS					
Commercial and hobby fishermen	Number of commercial and hobby fishermen fishing in the aquatic survey area	U	32	U	
People undertaking activities in or on water (*e.g.* swimmers, kayakers, boat anglers, commercial and hobby fishermen etc.)	Number of people undertaking activities in or on water in the aquatic survey area	U	110	U	
People using the shore (e.g. dog walkers, shore anglers, people playing, people collecting shellfish, etc.)	Number of people undertaking intertidal activities in the aquatic survey area	U	207	U	
Fish consumers	Number of people consuming fish from the aquatic survey area	U	93	U	
Crustacean consumers	Number of people consuming crustaceans from the aquatic survey area	U	64	U	
Mollusc consumers	Number of people consuming molluscs from the aquatic survey area	U	45	U	

Table 1. Survey coverage

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
(B) TERRESTRIAL PATHWAYS					
Farmers	Number of farmers and their family members consuming food from the terrestrial survey area	20	10	50%	
Allotment holders	Number allotment holders and and their family members consuming food from the terrestrial survey area	U	88	U	
Honey consumers	Number of people consuming honey produced in the survey area	U	8	U	
Freshwater fish consumers	Number of people consuming freshwater fish caught in the survey area	U	3	U	
(C) DIRECT RADIATION PATHWAYS					
Residents	Number of residents in the survey area	0	0	-	There was only 1 residence in the direct radiation survey area and this was not occupied at the time of the survey.
Employees	Number of people working in the survey area	U	73	U	Excluding employees and contractors at the nuclear licensed site.
Visitors (people undertaking recreational activities)	Number of people visiting the survey area	U	16	U	
BREAKDOWN OF AGE GROUPS FOR PEOPLE RESIDENT IN THE 5 km TERRESTRIAL SURVEY AREA					
Adult	16-year-old and over	22,600[a]	438	2%	
Child	6-year-old to 15-year-old	3000[a]	66	2%	
Infant	0 to 5-year-old	1800[a]	18	1%	

Notes

[a] Estimate of the number of people resident in the 5 km terrestrial survey area based on data from www.ons.gov.uk.

[b] The number of people for whom positive data was obtained for pathways (A) and (B) and (C) will usually not equal the relevant totals in the summary of all pathways. This is because in sections (A), (B) and (C) some individuals may be counted two or more times, for example someone who goes shore angling and consumes the catch.

U - Unknown

Table 2. Typical food groups used in habits surveys

Food group	Examples of foods within the group
Green vegetables	Asparagus, broccoli, Brussels sprout, cabbage, calabrese, cauliflower, chard, courgette, cucumber, gherkin, globe artichoke, herbs, kale, leaf beet, lettuce, marrow, spinach
Other vegetables	Aubergine, broad bean, chilli pepper, French bean, kohl rabi, mangetout, pea, pepper, pumpkin, runner bean, sweetcorn, tomato
Root vegetables	Beetroot, carrot, celeriac, celery, chicory, fennel, garlic, Jerusalem artichoke, leek, onion, parsnip, radish, shallot, spring onion, swede, turnip
Potato	Potato
Domestic fruit	Apple, apricot, blackberry, blackcurrant, boysenberry, cherry, damson, fig, gooseberry, grape, greengage, huckleberry, loganberry, melon, nectarine, peach, pear, plum, raspberry, redcurrant, rhubarb, rowanberry, strawberry, tayberry, whitecurrant
Milk	Cows' milk, cream, goats' milk, yoghurt
Cattle meat[a]	Beef
Pig meat[a]	Pork
Sheep meat[a]	Lamb, mutton
Poultry[b]	Chicken, duck, goose, grouse, guinea fowl, partridge, pheasant, pigeon, turkey, woodcock
Eggs	Chicken egg, duck egg, goose egg
Wild/free foods	Blackberry, chestnut, crab apple, damson, dandelion root, elderberry, nettle, rowanberry, sloe
Honey	Honey
Wild fungi	Mushrooms, other edible fungi
Rabbits/Hares	Hare, rabbit
Venison[a]	Venison
Fish (sea)	Bass, brill, cod, ling, dab, Dover sole, flounder, gurnard, haddock, hake, herring, lemon sole, mackerel, monkfish, mullet, plaice, pollack, rays, saithe, salmon, sea trout, sprat, turbot, whitebait, whiting, witch, cuttlefish[c], squid[c]
Fish (freshwater)	Brown trout, eel (river), perch, pike, rainbow trout, salmon (river)
Crustaceans	Brown crab, common lobster, crawfish, *Nephrops*, prawn, shrimp, spider crab, squat lobster, velvet swimming crab
Molluscs	Cockles, limpets, mussels, oysters, razor clam, scallops, whelks, winkles
Wildfowl[b]	Canada goose, greylag goose, mallard, pink-footed goose, pintail, shoveler, teal, wigeon

Notes

[a] Including offal

[b] Domesticated ducks and geese are classified as poultry. Wild ducks and geese are classified as wildfowl.

[c] Although squid and cuttlefish are molluscs, radiologically they are more akin to fish.

Table 3. Adults' consumption rates of fish from the Hartlepool aquatic survey area (kg y^{-1})

Observation number	Bass	Cod	Dab	Flounder	Haddock	Lemon sole	Ling	Mackerel	Plaice	Pollack	Pouting	Red gurnard	Saithe	Thornback ray	Turbot	Whiting	Total
292	**-**	**53.2**	**-**	**-**	**-**	**-**	**17.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**71.0**
337	**-**	**44.3**	**-**	**-**	**-**	**-**	**14.8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**59.1**
338	**-**	**44.3**	**-**	**-**	**-**	**-**	**14.8**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**59.1**
310	**-**	**49.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.1**	**-**	**53.1**
311	**-**	**49.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.1**	**-**	**53.1**
312	**-**	**49.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.1**	**-**	**53.1**
313	**-**	**49.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.1**	**-**	**53.1**
297	**-**	**25.8**	**-**	**-**	**-**	**-**	**-**	**12.9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**12.9**	**51.6**
437	**11.8**	**11.8**	**-**	**-**	**-**	**-**	**-**	**11.8**	**-**	**-**	**11.8**	**-**	**-**	**-**	**-**	**-**	**47.3**
8	**-**	**15.0**	**-**	**-**	**-**	**-**	**15.0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**15.0**	**44.9**
221	**-**	**11.9**	**-**	**-**	**-**	**-**	**7.9**	**-**	**11.9**	**-**	**-**	**-**	**-**	**1.6**	**-**	**7.9**	**41.3**
223	**-**	**11.9**	**-**	**-**	**-**	**-**	**7.9**	**-**	**11.9**	**-**	**-**	**-**	**-**	**1.6**	**-**	**7.9**	**41.3**
224	**-**	**14.2**	**-**	**-**	**-**	**-**	**14.2**	**-**	**-**	**0.7**	**-**	**0.7**	**0.7**	**-**	**-**	**6.4**	**36.9**
225	**3.5**	**17.7**	**-**	**-**	**-**	**-**	**3.5**	**3.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.5**	**36.9**
231	**3.5**	**17.7**	**-**	**-**	**-**	**-**	**3.5**	**3.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.5**	**36.9**
290	**-**	**26.6**	**-**	**-**	**-**	**-**	**8.9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**35.5**
293	**-**	**26.6**	**-**	**-**	**-**	**-**	**8.9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**35.5**
325	**-**	**22.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.8**	**29.5**
326	**-**	**22.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.8**	**29.5**
298	**-**	**12.9**	**-**	**-**	**-**	**-**	**-**	**6.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.4**	**25.8**
329	**-**	**7.1**	**-**	**-**	**4.3**	**2.3**	**4.3**	**3.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.3**	**25.5**
330	**-**	**7.1**	**-**	**-**	**4.3**	**2.3**	**4.3**	**3.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.3**	**25.5**
331	**-**	**7.1**	**-**	**-**	**4.3**	**2.3**	**4.3**	**3.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.3**	**25.5**
332	**-**	**7.1**	**-**	**-**	**4.3**	**2.3**	**4.3**	**3.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.3**	**25.5**
102	-	-	-	-	-	-	-	10.4	-	12.3	-	-	-	-	-	-	22.7
104	-	-	-	-	-	-	-	10.4	-	12.3	-	-	-	-	-	-	22.7
222	-	6.0	-	-	-	-	4.0	-	6.0	-	-	-	-	0.8	-	4.0	20.6
106	-	-	-	-	-	-	-	13.3	-	-	-	-	-	-	-	4.4	17.7
235	-	8.5	-	-	3.4	-	-	3.4	1.0	-	-	-	-	-	-	1.4	17.7
236	-	8.5	-	-	3.4	-	-	3.4	1.0	-	-	-	-	-	-	1.4	17.7
314	-	7.7	-	-	-	-	-	3.0	-	-	-	-	1.8	-	-	3.8	16.2
315	-	7.7	-	-	-	-	-	3.0	-	-	-	-	1.8	-	-	3.8	16.2
316	-	7.7	-	-	-	-	-	3.0	-	-	-	-	1.8	-	-	3.8	16.2
255	-	13.3	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	14.7
256	-	13.3	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	14.7
351	-	8.5	-	-	-	-	-	3.4	-	2.8	-	-	-	-	-	-	14.7
352	-	8.5	-	-	-	-	-	3.4	-	2.8	-	-	-	-	-	-	14.7
451	-	-	-	-	-	-	-	12.9	-	-	-	-	-	-	-	-	12.9
3	3.9	3.9	-	-	-	-	-	-	-	-	-	-	-	-	-	3.9	11.8
403	-	2.9	-	2.9	-	-	-	2.9	-	-	-	-	-	-	-	2.9	11.8
444	1.6	1.6	1.6	1.6	-	-	-	1.6	-	1.6	-	-	-	-	-	1.6	11.4
445	1.6	1.6	1.6	1.6	-	-	-	1.6	-	1.6	-	-	-	-	-	1.6	11.4
117	-	-	-	-	-	-	-	10.3	-	-	-	-	-	-	-	-	10.3
353	2.0	2.7	-	-	-	-	-	2.0	-	-	-	-	-	-	-	2.0	8.8

Table 3. Adults' consumption rates of fish from the Hartlepool aquatic survey area (kg y^{-1})

Observation number	Bass	Cod	Dab	Flounder	Haddock	Lemon sole	Ling	Mackerel	Plaice	Pollack	Pouting	Red gurnard	Saithe	Thornback ray	Turbot	Whiting	Total
355	2.0	2.7	-	-	-	-	-	2.0	-	-	-	-	-	-	-	2.0	8.8
318	-	3.4	0.7	-	-	-	-	2.0	-	-	-	-	-	-	-	2.3	8.4
319	-	3.4	0.7	-	-	-	-	2.0	-	-	-	-	-	-	-	2.3	8.4
214	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7	7.4
215	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	3.7	7.4
442	-	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.4
443	-	7.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.4
450	-	2.0	-	-	-	-	-	2.0	-	2.0	-	-	-	-	-	-	6.0
435	-	2.0	-	-	-	-	-	2.0	-	-	-	-	-	-	-	2.0	6.0
436	-	2.0	-	-	-	-	-	2.0	-	-	-	-	-	-	-	2.0	6.0
396	1.8	1.8	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-	5.4
143	-	2.4	0.9	0.8	-	-	-	1.1	-	-	-	-	-	-	-	-	5.2
107	-	0.5	0.9	-	-	-	-	-	-	-	-	-	-	-	-	3.0	4.5
288	-	2.8	-	-	0.6	-	0.9	-	-	-	-	-	-	-	-	-	4.3
237	-	2.0	-	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0	4.1
238	-	2.0	-	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0	4.1
239	-	2.0	-	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0	4.1
320	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1
321	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1
322	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1
9	-	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	4.1
240	-	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8
241	-	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8
242	-	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8
377	-	2.9	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	3.2
380	-	2.9	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	3.2
95	-	0.9	-	-	-	-	-	1.6	-	-	-	-	-	-	-	-	2.5
406	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3
108	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.7
109	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.7
110	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.7
111	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.7
112	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.7

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish based on the 24 high-rate adult consumers is 41.5 kg y^{-1}

The observed 97.5th percentile rate based on 77 observations is 59.1 kg y^{-1}

Table 4. Adults' consumption rates of crustaceans from the Hartlepool aquatic survey area (kg y^{-1})

Observation number	Brown shrimp	Brown crab	Common lobster	Velvet swimming crab	Total
308	**-**	**19.7**	**26.1**	**-**	**45.8**
309	**-**	**19.7**	**26.1**	**-**	**45.8**
221	**-**	**34.4**	**0.8**	**-**	**35.2**
223	**-**	**34.4**	**0.8**	**-**	**35.2**
353	**0.9**	**24.7**	**2.8**	**1.9**	**30.3**
355	**0.9**	**24.7**	**2.8**	**1.9**	**30.3**
95	**-**	**29.6**	**-**	**-**	**29.6**
259	**-**	**8.9**	**17.7**	**-**	**26.6**
260	**-**	**8.9**	**17.7**	**-**	**26.6**
329	**-**	**7.5**	**15.0**	**-**	**22.5**
330	**-**	**7.5**	**15.0**	**-**	**22.5**
331	**-**	**7.5**	**15.0**	**-**	**22.5**
332	**-**	**7.5**	**15.0**	**-**	**22.5**
222	**-**	**19.7**	**-**	**-**	**19.7**
333	**-**	**19.7**	**-**	**-**	**19.7**
264	**-**	**13.3**	**5.0**	**-**	**18.3**
255	**-**	**8.9**	**8.9**	**-**	**17.7**
256	**-**	**8.9**	**8.9**	**-**	**17.7**
258	**-**	**8.8**	**8.8**	**-**	**17.7**
143	**2.6**	**-**	**13.1**	**-**	**15.7**
334	-	13.1	1.0	-	14.1
335	-	13.1	1.0	-	14.1
336	-	13.1	1.0	-	14.1
9	-	13.2	-	-	13.2
351	-	4.9	6.5	-	11.5
352	-	4.9	6.5	-	11.5
262	-	6.6	2.5	-	9.2
263	-	6.6	2.5	-	9.2
310	-	7.1	1.7	-	8.8
311	-	7.1	1.7	-	8.8
312	-	7.1	1.7	-	8.8
313	-	7.1	1.7	-	8.8
337	-	2.3	3.0	-	5.3
442	-	-	4.9	-	4.9
443	-	-	4.9	-	4.9

Table 4. Adults' consumption rates of crustaceans from the Hartlepool aquatic survey area (kg y^{-1})

Observation number	Brown shrimp	Brown crab	Common lobster	Velvet swimming crab	Total
288	-	4.5	-	-	4.5
435	-	1.9	2.5	-	4.4
436	-	1.9	2.5	-	4.4
444	-	2.7	-	-	2.7
445	-	2.7	-	-	2.7
450	-	1.9	0.5	-	2.4
102	-	0.9	1.3	-	2.2
104	-	0.9	1.3	-	2.2
451	-	1.1	0.5	-	1.6
214	-	0.6	-	0.6	1.2
215	-	0.6	-	0.6	1.2
237	-	0.9	-	-	0.9
238	-	0.9	-	-	0.9
239	-	0.9	-	-	0.9
268	-	-	0.7	-	0.7
269	-	-	0.7	-	0.7
270	-	-	0.7	-	0.7
397	-	0.4	0.3	-	0.6
225	-	-	0.4	-	0.4

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of crustaceans based on the 20 high-rate adult consumers is 26.1 kg y^{-1}

The observed 97.5th percentile rate based on 54 observations is 42.3 kg y^{-1}

Table 5. Adults' consumption rates of molluscs from the Hartlepool aquatic survey area (kg y^{-1})

Observation number	Mussel	Whelk	Winkle	Total
449	**-**	**15.9**	**1.8**	**17.8**
353	**-**	**-**	**7.3**	**7.3**
355	**-**	**-**	**7.3**	**7.3**
438	1.6	-	2.9	4.6
439	1.6	-	2.9	4.6
397	0.7	-	2.7	3.4
450	-	1.8	0.7	2.5
265	-	-	1.7	1.7
266	-	-	1.7	1.7
303	-	-	1.0	1.0
304	-	-	1.0	1.0
166	-	-	0.8	0.8
167	-	-	0.8	0.8
168	-	-	0.8	0.8
259	-	-	0.7	0.7
260	-	-	0.7	0.7
176	-	-	0.7	0.7
177	-	-	0.7	0.7
178	-	-	0.7	0.7
179	-	-	0.7	0.7
180	-	-	0.7	0.7
181	-	-	0.7	0.7
182	-	-	0.7	0.7
183	-	-	0.7	0.7
170	-	-	0.5	0.5
171	-	-	0.5	0.5
172	-	-	0.5	0.5
173	-	-	0.5	0.5
174	-	-	0.5	0.5
175	-	-	0.5	0.5
188	-	-	0.5	0.5
189	-	-	0.5	0.5
191	-	-	0.2	0.2
192	-	-	0.2	0.2
193	-	-	0.2	0.2

Table 5. Adults' consumption rates of molluscs from the Hartlepool aquatic survey area (kg y^{-1})

Observation number	Mussel	Whelk	Winkle	Total
194	-	-	0.2	0.2
195	-	-	0.2	0.2
196	-	-	0.2	0.2
197	-	-	0.2	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of molluscs based on the 3 high-rate adult consumers is 10.8 kg y^{-1}

The observed 97.5th percentile rate based on 39 observations is 7.8 kg y^{-1}

Table 6. Adults' consumption rates of wildfowl from the Hartlepool aquatic survey area (kg y^{-1})

Observation number	Canada goose	Greylag goose	Mallard	Teal	Wigeon	Total
442	**3.0**	**3.0**	**4.9**	**0.3**	**0.7**	**12.0**
443	**3.0**	**3.0**	**4.9**	**0.3**	**0.7**	**12.0**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wildfowl based on the 2 high-rate adult consumers is 12.0 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 12.0 kg y^{-1}

Table 7. Children's and infants' consumption rates of fish from the Hartlepool aquatic survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Bass	Cod	Dab	Flounder	Lemon sole	Ling	Mackerel	Pollack	Saithe	Whiting	Total
227	**10**	**2.7**	**13.3**	**-**	**-**	**-**	**2.7**	**2.7**	**-**	**-**	**6.4**	**27.6**
228	**7**	**2.7**	**13.3**	**-**	**-**	**-**	**2.7**	**2.7**	**-**	**-**	**6.4**	**27.6**
234	**7**	**2.7**	**13.3**	**-**	**-**	**-**	**2.7**	**2.7**	**-**	**-**	**6.4**	**27.6**
317	**9**	**-**	**5.7**	**-**	**-**	**-**	**-**	**2.2**	**-**	**1.3**	**2.9**	**12.2**
446	**13**	**1.6**	**1.6**	**1.6**	**1.6**	**-**	**-**	**1.6**	**1.6**	**-**	**1.6**	**11.4**
447	**7**	**1.6**	**1.6**	**1.6**	**1.6**	**-**	**-**	**1.6**	**1.6**	**-**	**1.6**	**11.4**
354	14	2.0	2.7	-	-	-	-	2.0	-	-	2.0	8.8
119	6	-	-	-	-	-	-	7.7	-	-	-	7.7
244	13	-	3.8	-	-	-	-	-	-	-	-	3.8
378	13	-	2.9	-	-	-	-	0.3	-	-	-	3.2
379	13	-	2.9	-	-	-	-	0.3	-	-	-	3.2
243	6	-	2.8	-	-	-	-	-	-	-	-	2.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish for the child age group based upon the 6 high-rate consumers is 19.6 kg y^{-1}

The observed 97.5th percentile rate based on 12 observations is 27.6 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Bass	Cod	Dab	Flounder	Lemon sole	Ling	Mackerel	Pollack	Saithe	Whiting	Total
232	**3**	**1.8**	**8.9**	**-**	**-**	**-**	**1.8**	**1.8**	**-**	**-**	**4.3**	**18.4**
233	**4**	**1.8**	**8.9**	**-**	**-**	**-**	**1.8**	**1.8**	**-**	**-**	**4.3**	**18.4**
226	**2**	**1.2**	**5.8**	**-**	**-**	**-**	**1.2**	**1.2**	**-**	**-**	**2.8**	**12.2**
257	**5**	**-**	**6.7**	**-**	**-**	**0.7**	**-**	**-**	**-**	**-**	**-**	**7.4**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish for the infant age group based upon the 4 high-rate consumers is 14.1 kg y^{-1}

The observed 97.5th percentile rate based on 4 observations is 18.4 kg y^{-1}

Table 8. Children's and infants' consumption rates of crustaceans from the Hartlepool aquatic survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Brown crab	Brown shrimp	Common lobster	Velvet swimming crab	Total
354	**14**	**24.7**	**0.9**	**2.8**	**1.9**	**30.3**
261	**7**	**6.7**	**-**	**13.3**	**-**	**20.0**
446	13	2.7	-	-	-	2.7
447	7	2.7	-	-	-	2.7
271	7	-	-	0.5	-	0.5
272	8	-	-	0.5	-	0.5
227	10	-	-	0.3	-	0.3
228	7	-	-	0.3	-	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of crustaceans for the child age group based upon the 2 high-rate consumers is 25.1 kg y^{-1}

The observed 97.5th percentile rate based on 8 observations is 28.5 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Brown crab	Brown shrimp	Common lobster	Velvet swimming crab	Total
257	**5**	**4.4**	**-**	**4.4**	**-**	**8.9**
226	2	-	-	0.1	-	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of crustaceans for the infant age group based upon the only high-rate consumer is 8.9 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 8.7 kg y^{-1}

Table 9. Children's and infants' consumption rates of molluscs from the Hartlepool aquatic survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Winkle
354	**14**	**7.3**
305	10	1.0
169	10	0.8
261	7	0.5
190	6	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of molluscs for the child age group based upon the only high-rate consumer is 7.3 kg y^{-1}

The observed 97.5th percentile rate based on 5 observations is 6.7 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Winkle
267	**3**	**0.9**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of molluscs for the infant age group based upon the only high-rate consumer is 0.9 kg y^{-1}

The observed 97.5th percentile rate is not applicable for 1 observation

Table 10. Adults' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Rock	Sand	Sand and coal	Sand and stones
397	**West of the power station jetty**	**Collecting crabs**	**368**	-	-	-	-	-	-
	West of the power station jetty	**Bait digging**	**-**	**1098**	-	-	-	-	-
	East of the power station jetty	**Collecting mussels and collecting winkles**	**-**		-	-	-	-	-
396	**East of the power station jetty**	**Collecting crabs**	**368**	-	-	-	-	-	-
	East of the power station jetty	**Bait digging**	**-**	**1092**	-	-	-	-	-
	The Headland and Little Scar	Angling	**-**	**-**	-	72	-	-	-
	Middleton Sands, Redcar Sands and Marske Sands	Angling	**-**	**-**	-	-	215	-	-
337	West of the power station jetty	Collecting crabs	84	-	-	-	-	-	-
	Little Scar	**Collecting crabs**	-	-	-	**215**	-	-	-
	Throston Scar	**Angling**	-	-	-		-	-	-
	Seaton Sands	Angling	-	-	-	**-**	209	-	-
297	East of the power station jetty	Collecting crabs	72	-	-	-	-	-	-
	East of the power station jetty	Bait digging	-	72	-	-	-	-	-
448	Paddy's Hole	Fixing moorings	18	-	-	-	-	-	-
	Paddy's Hole	**Boat maintenance and collecting winkles**	-	-	**23**	-	-	-	**-**
	Bran Sands	**Collecting winkles**	-	-	**-**	-	-	-	**95**
444	Bran Sands	Collecting crabs	-	303	-	-	-	-	-
	Redcar Rocks and Saltburn Scar	**Angling**	-	-	-	**313**	**-**	-	-
	Bran Sands	**Bait digging**	-	-	-	**-**	**1022**	-	-
	Middleton Sands, Seaton Sands, Redcar Sands and Saltburn Sands	**Angling**	-	-	-	**-**		-	-
	Bran Sands	Collecting mussels	-	-	-	**-**	**-**	-	42
409	Bran Sands	Collecting crabs	-	108	-	-	-	-	-
325	Fish Sands and West Harbour	Bait digging	-	65	-	-	-	-	-
	Throston Scar	**Angling**	-	-	-	**390**	-	-	-
	Seaton Sands	Angling	-	-	-	**-**	209	-	-
353	Fish Sands and East of the power station jetty	Bait digging	-	61	-	-	-	-	-
	Throston Scar and Little Scar	Angling	-	-	-	177	-	-	-
	Throston Scar, The Headland and Long Scar	Collecting winkles	-	-	-		-	-	-
	Middleton Sands and Seaton Sands	Bait digging	-	-	-	-	212	-	-
	Throston Sands, Seaton Sands and Blue Lagoon	Angling	-	-	-	-		-	-
355	Fish Sands and East of the power station jetty	Bait digging	-	61	-	-	-	-	-
	Throston Scar and Little Scar	Angling	-	-	-	151	-	-	-
	Middleton Sands and Seaton Sands	Bait digging	-	-	-	-	212	-	-
	Throston Sands, Seaton Sands and Blue Lagoon	Angling	-	-	-	-		-	-
292	Old Town Basin	Bait digging	-	24	-	-	-	-	-
314	Old Town Basin	Bait digging	-	15	-	-	-	-	-
403	**West of the power station jetty**	**Angling**	-	-	**52**	-	-	-	-
	Coatham Sands and Redcar Sands	Angling	-	-	**-**	-	104	-	-
255	**Throston Scar and The Headland**	**Setting pots on the shore and hooking**	-	-	-	**641**	-	-	-
	The Headland	**Angling**	-	-	-		-	-	-
259	**Throston Scar and The Headland**	**Setting pots on the shore, hooking and collecting winkles**	-	-	-	**531**	-	-	-
184	**Saltburn Scar**	**Collecting winkles**	-	-	-	**490**	-	-	-
	Redcar Sands	**Dog walking**	-	-	-	**-**	**365**	-	-
230	**Throston Scar, Little Scar, Redcar Rocks and Saltburn Scar**	**Angling**	-	-	-	**313**	-	-	-
	Throston Sands ,Seaton Sands, Redcar Sands and Saltburn Sands	**Angling**	-	-	-	**-**	**365**	-	-
334	**Little Scar**	**Setting pots on the shore and hooking**	-	-	-	**313**	-	-	-
187	**South Gare Breakwater and Saltburn Scar**	**Collecting winkles**	-	-	-	**274**	-	-	-
225	**Throston Scar, Little Scar, Redcar Rocks and Saltburn Scar**	**Angling**	-	-	-	**261**	-	-	-
	Throston Sands ,Seaton Sands, Redcar Sands and Saltburn Sands	Angling	-	-	-	**-**	261	-	-
229	**Throston Scar, Little Scar, Redcar Rocks and Saltburn Scar**	**Angling**	-	-	-	**261**	-	-	-
	Throston Sands ,Seaton Sands, Redcar Sands and Saltburn Sands	Angling	-	-	-	**-**	261	-	-
258	The Headland	Hooking	-	-	-	209	-	-	-

Table 10. Adults' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Rock	Sand	Sand and coal	Sand and stones
333	Little Scar	Hooking	-	-	-	209	-	-	-
214	Long Scar	Angling and hooking	-	-	-	123	-	-	-
185	Saltburn Scar	Collecting winkles	-	-	-	120	-	-	-
186	Saltburn Scar	Collecting winkles	-	-	-	120	-	-	-
220	Long Scar	Angling	-	-	-	108	-	-	-
93	Redcar Rocks	Dog walking	-	-	-	91	-	-	-
	Redcar Sands	**Dog walking**	-	-	-	-	**639**	-	-
262	Throston Scar and The Headland	Hooking	-	-	-	70	-	-	-
264	Throston Scar and The Headland	Hooking	-	-	-	70	-	-	-
117	Saltburn Scar	Collecting crabs	-	-	-	65	-	-	-
	Saltburn Sands	Walking	-	-	-	-	13	-	-
341	Throston Scar	Playing and rock pooling	-	-	-	40	-	-	-
240	Redcar Rocks and Saltburn Scar	Angling	-	-	-	27	-	-	-
	Redcar Sands and Saltburn Sands	Angling	-	-	-	-	27	-	-
241	Redcar Rocks and Saltburn Scar	Angling	-	-	-	27	-	-	-
	Redcar Sands and Saltburn Sands	Angling	-	-	-	-	27	-	-
265	Throston Scar	Collecting winkles	-	-	-	26	-	-	-
303	Throston Scar and The Headland	Collecting winkles	-	-	-	26	-	-	-
124	Saltburn Scar	Rock pooling	-	-	-	13	-	-	-
	Saltburn Sands	Walking	-	-	-	-	33	-	-
125	Saltburn Scar	Rock pooling	-	-	-	13	-	-	-
	Saltburn Sands	Walking	-	-	-	-	33	-	-
347	Throston Scar	Rock pooling	-	-	-	12	-	-	-
	Throston Sands	Playing	-	-	-	-	48	-	-
348	Throston Scar	Rock pooling	-	-	-	12	-	-	-
	Throston Sands	Playing	-	-	-	-	48	-	-
166	Saltburn Scar	Collecting winkles	-	-	-	11	-	-	-
176	Saltburn Scar	Collecting winkles	-	-	-	10	-	-	-
268	Throston Scar and The Headland	Hooking	-	-	-	10	-	-	-
273	Throston Scar	Rock pooling	-	-	-	9	-	-	-
	Throston Sands	Playing	-	-	-	-	60	-	-
136	Redcar Rocks	Rock pooling	-	-	-	9	-	-	-
	Redcar Sands	Playing	-	-	-	-	21	-	-
137	Redcar Rocks	Rock pooling	-	-	-	9	-	-	-
	Redcar Sands	Playing	-	-	-	-	21	-	-
188	Saltburn Scar	Collecting winkles	-	-	-	6	-	-	-
189	Saltburn Scar	Collecting winkles	-	-	-	6	-	-	-
450	Saltburn Scar	Collecting winkles	-	-	-	6	-	-	-
284	Block Sands	Rock pooling	-	-	-	5	-	-	-
	Fish Sands	Dog walking and playing	-	-	-	-	105	-	-
	Block Sands	Playing	-	-	-	-	-	-	20
283	Block Sands	Rock pooling	-	-	-	5	-	-	-
	Fish Sands	Playing	-	-	-	-	40	-	-
	Block Sands	Playing	-	-	-	-	-	-	20
104	**Saltburn Sands**	**Dog walking**	-	-	-	-	**730**	-	-
406	**Seaton Sands**	**Angling**	-	-	-	-	**609**	-	-
	North Gare Sands	**Dog walking**	-	-	-	-		-	-
165	**Coatham Sands, Redcar Sands and Marske Sands**	**Dog walking**	-	-	-	-	**548**	-	-
253	**Throston Sands**	**Dog walking**	-	-	-	-	**548**	-	-
301	**Carr House Sands and Seaton Sands**	**Dog walking**	-	-	-	-	**548**	-	-
254	**Throston Sands and Fish Sands**	**Dog walking**	-	-	-	-	**456**	-	-
142	**Coatham Sands, Redcar Sands and Marske Sands**	**Dog walking**	-	-	-	-	**417**	-	-

Table 10. Adults' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Rock	Sand	Sand and coal	Sand and stones
428	**North Gare Sands**	**Nature warden duties**	-	-	-	-	**395**	-	-
146	**Redcar Sands**	**Dog walking**	-	-	-	-	**365**	-	-
147	**Redcar Sands**	**Dog walking**	-	-	-	-	**365**	-	-
152	**Coatham Sands, Redcar Sands and Marske Sands**	**Dog walking**	-	-	-	-	**365**	-	-
153	**Coatham Sands, Redcar Sands and Marske Sands**	**Dog walking**	-	-	-	-	**365**	-	-
207	**Middleton Sands and Seaton Sands**	**Dog walking**	-	-	-	-	**365**	-	-
402	**North Gare Sands**	**Dog walking**	-	-	-	-	**365**	-	-
413	**Coatham Sands and Redcar Sands**	**Dog walking**	-	-	-	-	**365**	-	-
414	**Coatham Sands and Redcar Sands**	**Dog walking**	-	-	-	-	**365**	-	-
210	**Throston Sands and Middleton Sands**	**Dog walking**	-	-	-	-	**351**	-	-
339	**Carr House Sands and Seaton Sands**	**Dog walking**	-	-	-	-	**351**	-	-
97	**Marske Sands**	**Dog walking**	-	-	-	-	**348**	-	-
120	**Marske Sands and Saltburn Sands**	**Dog walking**	-	-	-	-	**347**	-	-
429	North Gare Sands	Nature warden duties	-	-	-	-	316	-	-
275	Fish Sands, Middleton Sands, Seaton Sands and Coatham Sands	Walking	-	-	-	-	313	-	-
	Block Sands	Walking	-	-	-	-	-	-	10
377	North Gare Sands	Angling	-	-	-	-	313	-	-
106	Marske Sands and Saltburn Sands	Angling	-	-	-	-	293	-	-
211	Throston Sands, Middleton Sands and Carr House Sands	Dog walking	-	-	-	-	280	-	-
452	Coatham Sands	Dog walking	-	-	-	-	261	-	-
453	Coatham Sands	Dog walking	-	-	-	-	261	-	-
430	North Gare Sands	Nature warden duties	-	-	-	-	237	-	-
431	North Gare Sands	Nature warden duties	-	-	-	-	237	-	-
432	North Gare Sands	Nature warden duties	-	-	-	-	237	-	-
161	Marske Sands	Dog walking	-	-	-	-	228	-	-
162	Marske Sands	Dog walking	-	-	-	-	228	-	-
163	Marske Sands	Dog walking	-	-	-	-	228	-	-
20	Redcar Sands and Marske Sands	Dog walking	-	-	-	-	225	-	-
405	Bran Sands	Bait digging	-	-	-	-	222	-	-
	Saltburn Sands	Angling	-	-	-	-		-	-
245	Middleton Sands and Seaton Sands	Water sports preparation	-	-	-	-	196	-	-
	Carr House Sands and Seaton Sands	Dog walking	-	-	-	-		-	-
121	Redcar Sands and Marske Sands	Dog walking	-	-	-	-	189	-	-
1	Seaton Sands	Dog walking	-	-	-	-	183	-	-
2	Seaton Sands	Dog walking	-	-	-	-	183	-	-
198	Redcar Sands	Dog walking	-	-	-	-	183	-	-
302	Carr House Sands	Dog walking	-	-	-	-	183	-	-
340	Carr House Sands and Seaton Sands	Dog walking	-	-	-	-	183	-	-
96	Marske Sands	Dog walking	-	-	-	-	182	-	-
251	Throston Sands	Dog walking	-	-	-	-	175	-	-
276	Fish Sands, Middleton Sands, Seaton Sands and Coatham Sands	Walking	-	-	-	-	156	-	-
	Block Sands	Walking	-	-	-	-	-	-	5
252	Throston Sands	Dog walking	-	-	-	-	156	-	-
418	Fish Sands, Coatham Sands and Redcar Sands	Playing	-	-	-	-	156	-	-
419	Fish Sands, Coatham Sands and Redcar Sands	Playing	-	-	-	-	156	-	-
421	Coatham Sands, Redcar Sands and Saltburn Sands	Playing	-	-	-	-	156	-	-
422	Coatham Sands, Redcar Sands and Saltburn Sands	Playing	-	-	-	-	156	-	-
440	Seaton Sands	Dog walking and playing	-	-	-	-	144	-	-
128	Saltburn Sands	Lifeguard duties	-	-	-	-	141	-	-
129	Saltburn Sands	Lifeguard duties	-	-	-	-	141	-	-
130	Saltburn Sands	Lifeguard duties	-	-	-	-	141	-	-
131	Saltburn Sands	Lifeguard duties	-	-	-	-	141	-	-

Table 10. Adults' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Rock	Sand	Sand and coal	Sand and stones
23	Coatham Sands and Marske Sands	Dog walking	-	-	-	-	137	-	-
24	Coatham Sands and Marske Sands	Dog walking	-	-	-	-	137	-	-
437	Bran Sands	Bait digging	-	-	-	-	130	-	-
	Bran Sands	Collecting mussels	-	-	-	-	-	-	26
208	Middleton Sands	Dog walking	-	-	-	-	130	-	-
209	Middleton Sands	Dog walking	-	-	-	-	130	-	-
410	Bran Sands	Bait digging	-	-	-	-	130	-	-
411	Bran Sands and Coatham Sands	Dog walking	-	-	-	-	130	-	-
412	Bran Sands and Coatham Sands	Dog walking	-	-	-	-	130	-	-
277	Fish Sands	Playing	-	-	-	-	128	-	-
	Block Sands	Playing	-	-	-	-	-	-	32
278	Fish Sands	Playing	-	-	-	-	128	-	-
	Block Sands	Playing	-	-	-	-	-	-	32
144	Redcar Sands and Marske Sands	Dog walking	-	-	-	-	104	-	-
145	Redcar Sands and Marske Sands	Dog walking	-	-	-	-	104	-	-
164	Marske Sands	Dog walking	-	-	-	-	104	-	-
344	Throston Sands	Dog walking	-	-	-	-	104	-	-
398	North Gare Sands	Dog walking	-	-	-	-	104	-	-
404	North Gare Sands	Dog walking	-	-	-	-	104	-	-
204	Marske Sands	Metal detecting and walking	-	-	-	-	93	-	-
98	Marske Sands	Dog walking	-	-	-	-	80	-	-
399	North Gare Sands, Redcar Sands and Saltburn Sands	Dog walking	-	-	-	-	78	-	-
400	North Gare Sands, Redcar Sands and Saltburn Sands	Dog walking	-	-	-	-	78	-	-
401	North Gare Sands, Redcar Sands and Saltburn Sands	Dog walking	-	-	-	-	78	-	-
407	Bran Sands	Bait digging	-	-	-	-	78	-	-
408	Bran Sands	Bait digging	-	-	-	-	78	-	-
132	Saltburn Sands	Lifeguard duties	-	-	-	-	71	-	-
133	Saltburn Sands	Lifeguard duties	-	-	-	-	71	-	-
134	Saltburn Sands	Lifeguard duties	-	-	-	-	71	-	-
135	Saltburn Sands	Lifeguard duties	-	-	-	-	71	-	-
282	Fish Sands	Playing	-	-	-	-	64	-	-
	Block Sands	Playing	-	-	-	-	-	-	16
122	Redcar Sands and Marske Sands	Dog walking	-	-	-	-	52	-	-
143	Redcar Sands and Marske Sands	Angling	-	-	-	-	52	-	-
415	Coatham Sands	Bait digging	-	-	-	-	50	-	-
416	Coatham Sands	Bait digging	-	-	-	-	50	-	-
417	Coatham Sands	Bait digging	-	-	-	-	50	-	-
25	Coatham Sands and Redcar Sands	Playing	-	-	-	-	44	-	-
26	Coatham Sands and Redcar Sands	Playing	-	-	-	-	44	-	-
99	Redcar Sands	Playing	-	-	-	-	44	-	-
100	Redcar Sands	Playing	-	-	-	-	44	-	-
113	Marske Sands and Saltburn Sands	Horse riding	-	-	-	-	39	-	-
114	Marske Sands and Saltburn Sands	Horse riding	-	-	-	-	39	-	-
28	Coatham Sands and Redcar Sands	Playing	-	-	-	-	33	-	-
148	Coatham Sands and Redcar Sands	Dog walking	-	-	-	-	33	-	-
149	Coatham Sands and Redcar Sands	Dog walking	-	-	-	-	33	-	-
21	Marske Sands and Saltburn Sands	Water sports preparation	-	-	-	-	26	-	-
22	Marske Sands and Saltburn Sands	Water sports preparation	-	-	-	-	26	-	-
381	North Gare Sands	Dog walking	-	-	-	-	26	-	-
237	Redcar Rocks	Hooking	-	-	-	-	21	-	-
376	North Gare Sands	Nature warden duties	-	-	-	-	20	-	-
154	Coatham Sands	Playing	-	-	-	-	16	-	-

Table 10. Adults' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Rock	Sand	Sand and coal	Sand and stones
155	Coatham Sands	Playing	-	-	-	-	16	-	-
246	Middleton Sands and Seaton Sands	Water sports preparation	-	-	-	-	13	-	-
247	Middleton Sands and Seaton Sands	Water sports preparation	-	-	-	-	13	-	-
248	Middleton Sands and Seaton Sands	Water sports preparation	-	-	-	-	13	-	-
249	Middleton Sands and Seaton Sands	Water sports preparation	-	-	-	-	13	-	-
250	Middleton Sands and Seaton Sands	Water sports preparation	-	-	-	-	13	-	-
435	Bran Sands	Bait digging	-	-	-	-	13	-	-
436	Bran Sands	Bait digging	-	-	-	-	13	-	-
115	Saltburn Sands	Water sports preparation	-	-	-	-	9	-	-
116	Saltburn Sands	Water sports preparation	-	-	-	-	9	-	-
205	**Carr House Sands**	**Collecting sea coal**	-	-	-	-	-	**1400**	-
206	**Carr House Sands**	**Collecting sea coal**	-	-	-	-	-	**1400**	-
212	**Middleton Sands and Carr House Sands**	**Collecting sea coal**	-	-	-	-	-	**1050**	-
213	**Middleton Sands and Carr House Sands**	**Collecting sea coal**	-	-	-	-	-	**1050**	-
438	**Bran Sands**	**Collecting mussels and collecting winkles**	-	-	-	-	-	-	**261**
439	**Bran Sands**	**Collecting mussels and collecting winkles**	-	-	-	-	-	-	**261**

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over mud based on 2 high-rate observations is 368 h y^{-1}

The observed 97.5th percentile rate based on 5 observations for mud is 368 h y^{-1}

The mean intertidal occupancy rate over mud and sand based on 2 high-rate observations is 1095 h y^{-1}

The observed 97.5th percentile rate based on 10 observations for mud and sand is 1097 h y^{-1}

The mean intertidal occupancy rate over mud and stones based on 2 high-rate observations is 38 h y^{-1}

The observed 97.5th percentile rate based on 2 observations for mud and stones is 51 h y^{-1}

The mean intertidal occupancy rate over rock based on 11 high-rate observations is 364 h y^{-1}

The observed 97.5th percentile rate based on 44 observations for rock is 528 h y^{-1}

The mean intertidal occupancy rate over sand based on 24 high-rate observations is 457 h y^{-1}

The observed 97.5th percentile rate based on 137 observations for sand is 585 h y^{-1}

The mean intertidal occupancy rate over sand and coal based on 4 high-rate observations is 1225 h y^{-1}

The observed 97.5th percentile rate based on 4 observations for sand and coal is 1400 h y^{-1}

The mean intertidal occupancy rate over sand and stones based on 3 high-rate observations is 206 h y^{-1}

The observed 97.5th percentile rate based on 12 observations for sand and stones is 261 h y^{-1}

Table 11. Children's and infants' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	Mud and sand	Rock	Sand	Sand and stones
354	**14**	**Fish Sands and East of the power station jetty**	**Bait digging**	**61**	-	-	-
		Throston Scar and Little Scar	**Angling**	**-**	**177**	**-**	-
		Throston Scar, The Headland and Long Scar	**Collecting winkles**	**-**		**-**	-
		Middleton Sands and Seaton Sands	**Bait digging**	**-**	**-**	**212**	-
		Throston Sands, Seaton Sands and Blue Lagoon	**Angling**	**-**	**-**		-
342	10	Throston Scar	Playing and rock pooling	-	40	-	-
343	10	Throston Scar	Playing and rock pooling	-	40	-	-
118	9	Saltburn Scar	Collecting crabs	-	33	-	-
		Saltburn Sands	Walking	-	-	7	-
119	6	Saltburn Scar	Collecting crabs	-	33	-	-
		Saltburn Sands	Walking	-	-	7	-
349	12	Throston Scar	Rock pooling	-	12	-	-
		Throston Sands	Playing	-	-	48	-
350	6	Throston Scar	Rock pooling	-	12	-	-
		Throston Sands	Playing	-	-	48	-
138	12	Redcar Rocks	Rock pooling	-	9	-	-
		Redcar Sands	Playing	-	-	21	-
139	10	Redcar Rocks	Rock pooling	-	9	-	-
		Redcar Sands	Playing	-	-	21	-
140	8	Redcar Rocks	Rock pooling	-	9	-	-
		Redcar Sands	Playing	-	-	21	-
285	**9**	Block Sands	Rock pooling	-	5	-	-
		Fish Sands	Playing	-	-	40	**-**
		Block Sands	**Playing**	-	-	-	**20**
286	**6**	Block Sands	Rock pooling	-	5	-	-
		Fish Sands	Playing	-	-	40	**-**
		Block Sands	**Playing**	-	-	-	**20**
378	**13**	**North Gare Sands**	**Angling**	**-**	**-**	**313**	**-**
379	**13**	**North Gare Sands**	**Angling**	**-**	**-**	**313**	**-**
423	**12**	**Coatham Sands, Redcar Sands and Saltburn Sands**	**Playing**	**-**	**-**	**156**	**-**
424	**10**	**Coatham Sands, Redcar Sands and Saltburn Sands**	**Playing**	**-**	**-**	**156**	**-**
425	**7**	**Coatham Sands, Redcar Sands and Saltburn Sands**	**Playing**	**-**	**-**	**156**	**-**
441	**9**	**Seaton Sands**	**Dog walking and playing**	**-**	**-**	**144**	**-**
345	7	Throston Sands	Dog walking	-	-	104	-
346	12	Throston Sands	Dog walking	-	-	104	-
27	14	Coatham Sands and Redcar Sands	Playing	-	-	33	-
29	12	Coatham Sands and Redcar Sands	Playing	-	-	33	-

Table 11. Children's and infants' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	Mud and sand	Rock	Sand	Sand and stones
150	14	Coatham Sands and Redcar Sands	Dog walking	-	-	33	-
151	14	Coatham Sands and Redcar Sands	Dog walking	-	-	33	-
156	6	Coatham Sands	Playing	-	-	16	-
157	9	Coatham Sands	Playing	-	-	16	-

Notes

Emboldened observations are the high-rate individuals

The intertidal occupancy rate over mud and sand for the child age group based on the only observation is 61 h y^{-1}

The observed 97.5th percentile rate is not applicable for 1 observation

The mean intertidal occupancy rate over rock for the child age group based on 1 high-rate observations is 177 h y^{-1}

The observed 97.5th percentile rate based on 12 observations for rock is 139 h y^{-1}

The mean intertidal occupancy rate over sand for the child age group based on 7 high-rate observations is 207 h y^{-1}

The observed 97.5th percentile rate based on 24 observations for sand is 313 h y^{-1}

The mean intertidal occupancy rate over sand and stones for the child age group based on 2 high-rate observations is 20 h y^{-1}

The observed 97.5th percentile rate based on 2 observations for sand and stones is 20 h y^{-1}

Table 11. Children's and infants' intertidal occupancy rates in the Hartlepool aquatic survey area (h y^{-1})

Infant age group (0 - 5 years old)

Observation number	Age	Location	Activity	Mud and sand	Rock	Sand	Sand and stones
126	**5**	**Saltburn Scar**	**Rock pooling**	-	**13**	-	-
		Saltburn Sands	Walking	-	**-**	33	-
127	**3**	**Saltburn Scar**	**Rock pooling**	-	**13**	-	-
		Saltburn Sands	Walking	-	**-**	33	-
274	**4**	**Throston Scar**	**Rock pooling**	-	**9**	-	-
		Throston Sands	Playing	-	**-**	60	-
141	**5**	**Redcar Rocks**	**Rock pooling**	-	**9**	-	-
		Redcar Sands	Playing	-	**-**	21	-
287	**4**	**Block Sands**	**Rock pooling**	-	**5**	-	-
		Fish Sands	Playing	-	**-**	40	**-**
		Block Sands	**Playing**	-	**-**	-	**20**
420	**5**	**Fish Sands, Coatham Sands and Redcar Sands**	**Playing**	-	-	**156**	-
279	**3**	**Fish Sands**	**Playing**	-	-	**112**	-
		Block Sands	**Playing**	-	-	**-**	**28**
280	**4**	**Fish Sands**	**Playing**	-	-	**112**	-
		Block Sands	**Playing**	-	-	**-**	**28**
281	**5**	**Fish Sands**	**Playing**	-	-	**112**	-
		Block Sands	**Playing**	-	-	**-**	**28**
123	4	Redcar Sands and Marske Sands	Dog walking	-	-	52	-
101	3	Redcar Sands	Playing	-	-	44	-

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over rock for the infant age group based on 5 high-rate observations is 10 h y^{-1}

The observed 97.5th percentile rate based on 5 observations for rock is 13 h y^{-1}

The mean intertidal occupancy rate over sand for the infant age group based on 4 high-rate observations is 70 h y^{-1}

The observed 97.5th percentile rate based on 11 observations for sand is 145 h y^{-1}

The mean intertidal occupancy rate over sand and stones for the infant age group based on 4 high-rate observations is 26 h y^{-1}

The observed 97.5th percentile rate based on 4 observations for sand and stones is 28 h y^{-1}

Table 12. Gamma dose rate measurements over intertidal substrates in the Hartlepool aquatic survey area (µGy h^{-1})

Location	National Grid Reference	Substrate	Gamma dose rate at 1 metre[a]
Throston Sands	NZ 519 347	Sand	0.045
Block Sands	NZ 528 334	Sand and stones	0.050
Fish Sands	NZ 527 335	Sand	0.046
Middleton Sands	NZ 521 333	Sand	0.051
Old Town Basin	NZ 518 327	Mud and sand	0.057
Carr House Sands	NZ 517 322	Sand and coal dust	0.052
Seaton Carew	NZ 528 296	Sand	0.047
East of the power station jetty	NZ 534 267	Mud	0.063
Bran Sands	NZ 553 267	Sand	0.043
Paddy's Hole	NZ 555 273	Mud and stones	0.157
Paddy's Hole	NZ 555 273	Mud	0.134
Coatham Sands	NZ 558 276	Sand	0.049
Coatham Sands	NZ 587 255	Sand	0.046
Redcar Sands	NZ 600 256	Sand	0.048
Between Redcar Sands and Marske Sands	NZ 624 238	Sand	0.049
Marske Sands	NZ 637 230	Sand	0.044
Marske Sands	NZ 636 229	Sand and stones	0.056
Saltburn Sands	NZ 667 217	Sand	0.049

Notes

[a] These measurements have not been adjusted for background dose rates.

Table 13. Adults' handling rates of fishing gear and sediment in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	Fishing gear	Sediment
299	**Tees Bay**	**Handling pots**	**2346**	-
300	**Tees Bay**	**Handling pots**	**2346**	-
327	**Tees Bay**	**Handling nets and pots**	**2000**	-
328	**Tees Bay**	**Handling nets and pots**	**2000**	-
306	**Tees Bay**	**Handling nets and pots**	**1748**	-
307	**Tees Bay**	**Handling nets and pots**	**1748**	-
448	**Tees Bay**	**Handling pots**	**1183**	-
	Bran Sands and Paddy's Hole	Collecting winkles	**-**	122
	Paddy's Hole	Fixing moorings	**-**	
185	**Off Redcar**	**Handling pots**	**1173**	-
	Saltburn Scar	Collecting winkles	**-**	120
186	**Off Redcar**	**Handling pots**	**1173**	-
	Saltburn Scar	Collecting winkles	-	120
289	**Tees Bay**	**Handling nets and pots**	**912**	-
290	**Tees Bay**	**Handling nets and pots**	**912**	-
291	**Tees Bay**	**Handling nets and pots**	**912**	-
351	**Tees Bay**	**Handling nets and pots**	**834**	-
329	Tees Bay	Handling nets and pots	550	-
94	Off Redcar	Handling pots	363	-
198	Off Redcar	Handling pots	210	-
310	Tees Bay	Handling pots	209	-
311	Tees Bay	Handling pots	209	-
255	Throston Scar and The Headland	Handling pots	196	-
259	Throston Scar and The Headland	Handling pots	130	-
	Throston Scar and The Headland	Collecting winkles	-	10
334	Little Scar	Handling pots	104	-
95	Off Redcar	Handling pots	50	-
102	Off Saltburn-by-the-Sea	Handling pots	45	-
103	Off Saltburn-by-the-Sea	Handling pots	45	-
143	Redcar Sands	Handling nets	26	-
353	Throston Sands, Middleton Sands and Seaton Sands	Handling nets	16	-
	Middleton Sands and Seaton Sands	Bait digging	-	87
	Throston Scar, The Headland and Long Scar	Collecting winkles	-	
355	Throston Sands, Middleton Sands and Seaton Sands	Handling nets	16	-
	Middleton Sands and Seaton Sands	Bait digging	-	87
	Throston Scar, The Headland and Long Scar	Collecting winkles	-	
435	Tees Estuary	Handling pots	9	-
	Bran Sands	Bait digging	-	13
436	Tees Estuary	Handling pots	9	-
	Bran Sands	Bait digging	-	13
9	Tees Bay	Handling pots	7	-
297	Tees Bay	Handling pots	6	-
	East of the power station jetty	Bait digging and collecting crabs	-	144
298	Tees Bay	Handling pots	6	-

Table 13. Adults' handling rates of fishing gear and sediment in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	Fishing gear	Sediment
397	**West of the power station jetty**	**Bait digging and collecting crabs**	**-**	**1466**
	East of the power station jetty	**Collecting mussels and collecting winkles**	-	
396	**East of the power station jetty**	**Bait digging and collecting crabs**	**-**	**1460**
205	**Carr House Sands**	**Collecting sea coal**	**-**	**1400**
206	**Carr House Sands**	**Collecting sea coal**	**-**	**1400**
212	**Middleton Sands and Carr House Sands**	**Collecting sea coal**	**-**	**1050**
213	**Middleton Sands and Carr House Sands**	**Collecting sea coal**	**-**	**1050**
184	**Saltburn Scar**	**Collecting winkles**	**-**	**490**
444	Bran Sands	Bait digging, collecting crabs and collecting mussels	-	428
187	South Gare Breakwater and Saltburn Scar	Collecting winkles	-	274
438	Bran Sands	Collecting mussels and collecting winkles	-	261
439	Bran Sands	Collecting mussels and collecting winkles	-	261
437	Bran Sands	Bait digging and collecting mussels	-	156
410	Bran Sands	Bait digging	-	130
409	Bran Sands	Collecting crabs	-	108
337	Little Scar and West of the power station jetty	Collecting crabs	-	90
407	Bran Sands	Bait digging	-	78
408	Bran Sands	Bait digging	-	78
117	Saltburn Scar	Collecting crabs	-	65
325	Fish Sands and West Harbour	Bait digging	-	65
415	Coatham Sands	Bait digging	-	50
416	Coatham Sands	Bait digging	-	50
417	Coatham Sands	Bait digging	-	50
265	Throston Scar	Collecting winkles	-	26
303	Throston Scar and The Headland	Collecting winkles	-	26
405	Bran Sands	Bait digging	-	26
292	Old Town Basin	Bait digging	-	24
314	Old Town Basin	Bait digging	-	15
166	Saltburn Scar	Collecting winkles	-	11
176	Saltburn Scar	Collecting winkles	-	10
450	Saltburn Scar	Collecting winkles	-	6
188	Saltburn Scar	Collecting winkles	-	6
189	Saltburn Scar	Collecting winkles	-	6

Notes

Emboldened observations are the high-rate individuals

The mean fishing gear handling rate based on 13 high-rate observations is 1484 h y^{-1}

The observed 97.5th percentile rate based on 32 observations for fishing gear is 2346 h y^{-1}

The mean sediment handling rate based on 7 high-rate observations is 1188 h y^{-1}

The observed 97.5th percentile rate based on 41 observations for sediment is 1460 h y^{-1}

Table 14. Children's handling rates of fishing gear and sediment in the Hartlepool aquatic survey area (h y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	Fishing gear	Sediment
354	14	Throston Sands, Middleton Sands and Seaton Sands	Handling nets	16	-
		Middleton Sands and Seaton Sands	Bait digging	-	87
		Throston Scar, The Headland and Long Scar	Collecting winkles	-	
118	9	Saltburn Scar	Collecting crabs	-	33
119	6	Saltburn Scar	Collecting crabs	-	33

Notes

Emboldened observations are the high-rate individuals

The fishing gear handling rate for the child age group based on the only observation is 16 h y^{-1}

The observed 97.5th percentile rate is not applicable for 1 observation

The mean sediment handling rate for the child age group based on 3 high-rate observations is 51 h y^{-1}

The observed 97.5th percentile rate based on 3 observations for sediment is 84 h y^{-1}

Table 15. Adults' occupancy rates in and on water in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
128	Saltburn Sands	Surfing	313	-
129	Saltburn Sands	Surfing	313	-
21	Marske Sands and Saltburn Sands	Surfing	209	-
22	Marske Sands and Saltburn Sands	Surfing	209	-
115	Saltburn Sands	Surfing	208	-
116	Saltburn Sands	Surfing	208	-
387	Hartlepool Bay and Tees Bay	Jet-skiing	164	-
388	Hartlepool Bay and Tees Bay	Jet-skiing	164	-
389	Hartlepool Bay and Tees Bay	Water-skiing	164	-
390	Hartlepool Bay and Tees Bay	Water-skiing	164	-
245	Middleton Sands and Seaton Sands	Surfing	78	-
246	Middleton Sands and Seaton Sands	Surfing	78	-
247	Middleton Sands and Seaton Sands	Surfing	78	-
248	Middleton Sands and Seaton Sands	Surfing	78	-
249	Middleton Sands and Seaton Sands	Surfing	78	-
250	Middleton Sands and Seaton Sands	Surfing	78	-
105	Saltburn Sands	Surfing	35	-
362	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
363	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
364	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
371	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
372	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
373	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
374	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
375	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
	Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
143	Redcar Rocks	Sub-aqua diving	26	-
	Redcar Sands	Push netting	-	26
391	Hartlepool Bay and Tees Bay	Kayaking	20	-
392	Hartlepool Bay and Tees Bay	Kayaking	20	-

Table 15. Adults' occupancy rates in and on water in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
28	Coatham Sands and Redcar Sands	Swimming and surfing	11	-
299	Tees Bay	Potting	-	2346
300	Tees Bay	Potting	-	2346
327	Tees Bay	Potting and gill netting	-	2000
328	Tees Bay	Potting and gill netting	-	2000
306	Tees Bay	Potting and gill netting	-	1748
307	Tees Bay	Potting and gill netting	-	1748
289	Tees Bay	Boat angling, potting and gill netting	-	1716
	Victoria Harbour	Boat maintenance	-	
290	Tees Bay	Boat angling, potting and gill netting	-	1716
	Victoria Harbour	Boat maintenance	-	
291	Tees Bay	Boat angling, potting and gill netting	-	1716
	Victoria Harbour	Boat maintenance	-	
448	Tees Bay	Potting	-	1577
185	Off Redcar	Potting	-	1408
186	Off Redcar	Potting	-	1408
337	Tees Bay	Charter boat skipper	-	1040
297	Tees Bay	Boat angling and potting	-	898
	Victoria Harbour	Boat maintenance	-	
310	Tees Bay	Potting	-	834
311	Tees Bay	Potting	-	834
324	Tees Bay	Charter boat skipper	-	834
351	Tees Bay	Potting and gill netting	-	834
298	Tees Bay	Boat angling and potting	-	794
224	Tees Bay	Boat angling	-	715
437	Tees Bay	Boat angling	-	624
288	Tees Bay	Boat angling	-	575
	Victoria Harbour	Boat maintenance	-	
8	Tees Bay	Boat angling	-	560
329	Tees Bay	Potting and gill netting	-	550
395	Hartlepool Bay and Tees Bay	Pleasure cruising	-	530
94	Off Redcar	Potting	-	424
323	Tees Bay	Charter boat skipper	-	416
296	Tees Bay	Boat angling	-	352
294	Tees Bay	Boat angling	-	352
295	Tees Bay	Boat angling	-	352
325	Tees Bay	Boat angling	-	288

Table 15. Adults' occupancy rates in and on water in the Hartlepool aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
198	Off Redcar	Potting	-	210
235	Tees Bay	Boat angling	-	209
221	Tees Bay	Boat angling	-	172
	Victoria Harbour	Boat maintenance	-	
9	Tees Bay	Boat angling and potting	-	166
450	Tees Bay	Boat angling	-	131
451	Tees Bay	Boat angling	-	131
95	Off Redcar	Boat angling and potting	-	130
435	Tees Bay and Tees Estuary	Boat angling and potting	-	113
436	Tees Bay and Tees Estuary	Boat angling and potting	-	113
383	Hartlepool Bay and Tees Bay	Sailing	-	105
384	Hartlepool Bay and Tees Bay	Sailing	-	105
385	Hartlepool Bay and Tees Bay	Sailing	-	105
386	Hartlepool Bay and Tees Bay	Sailing	-	105
102	Off Saltburn-by-the-Sea	Boat angling and potting	-	90
103	Off Saltburn-by-the-Sea	Boat angling and potting	-	90
222	Tees Bay	Boat angling	-	72
107	Tees Bay	Boat angling	-	30
341	Throston Scar	Paddling	-	20
353	Throston Sands, Middleton Sands and Seaton Sands	Push netting	-	16
355	Throston Sands, Middleton Sands and Seaton Sands	Push netting	-	16
393	Hartlepool Bay and Tees Bay	Pleasure cruising	-	16
394	Hartlepool Bay and Tees Bay	Pleasure cruising	-	16
382	Hartlepool Bay and Tees Bay	Sailing	-	8
154	Coatham Sands	Paddling	-	7
155	Coatham Sands	Paddling	-	7
99	Redcar Sands	Paddling	-	6
100	Redcar Sands	Paddling	-	6

Table 16. Children's and infants' occupancy rates in and on water in the Hartlepool aquatic survey area (h y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	In water	On water
356	10	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
357	11	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
358	12	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
359	13	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
360	14	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
361	15	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
365	10	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
366	11	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
367	12	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
368	13	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
369	14	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
370	15	Hartlepool Marina and Hartlepool Bay	Kayaking	30	-
		Hartlepool Marina, Hartlepool Bay, Tees Bay and Tees Estuary	Canoeing, rowing, sailing and power boating	-	120
29	12	Coatham Sands and Redcar Sands	Swimming and surfing	11	-
27	14	Coatham Sands and Redcar Sands	Swimming and surfing	11	-
342	10	Throston Scar	Paddling	-	20
343	10	Throston Scar	Paddling	-	20
354	14	Throston Sands, Middleton Sands and Seaton Sands	Push netting	-	16
156	6	Coatham Sands	Paddling	-	7
157	9	Coatham Sands	Paddling	-	7

Infant age group (0 - 5 years old)

Observation number	Age	Location	Activity	In water	On water
279	3	Block Sands and Fish Sands	Paddling	-	20
280	4	Block Sands and Fish Sands	Paddling	-	20
281	5	Block Sands and Fish Sands	Paddling	-	20
101	3	Redcar Sands	Paddling	-	6

Table 17. Adults' consumption rates of green vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Asparagus	Broccoli	Brussel sprout	Cabbage	Cauliflower	Courgette	Cucumber	Herbs	Kale	Lettuce	Rocket	Spinach	Total
40	**2.5**	**-**	**8.9**	**13.0**	**4.0**	**6.2**	**0.8**	**0.1**	**-**	**1.0**	**-**	**-**	**36.5**
41	**2.5**	**-**	**8.9**	**13.0**	**4.0**	**6.2**	**0.8**	**0.1**	**-**	**1.0**	**-**	**-**	**36.5**
45	**-**	**2.5**	**3.0**	**16.0**	**1.2**	**-**	**3.4**	**-**	**-**	**7.9**	**-**	**-**	**33.9**
46	**-**	**2.5**	**3.0**	**16.0**	**1.2**	**-**	**3.4**	**-**	**-**	**7.9**	**-**	**-**	**33.9**
38	**1.4**	**-**	**4.4**	**3.0**	**4.9**	**7.2**	**5.5**	**0.1**	**3.1**	**1.0**	**-**	**-**	**30.5**
39	**1.4**	**-**	**4.4**	**3.0**	**4.9**	**7.2**	**5.5**	**0.1**	**3.1**	**1.0**	**-**	**-**	**30.5**
214	**-**	**0.5**	**1.6**	**5.3**	**-**	**-**	**17.9**	**-**	**-**	**0.8**	**-**	**-**	**26.1**
215	**-**	**0.5**	**1.6**	**5.3**	**-**	**-**	**17.9**	**-**	**-**	**0.8**	**-**	**-**	**26.1**
10	**-**	**-**	**3.6**	**9.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.4**
11	**-**	**-**	**3.6**	**9.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.4**
12	**-**	**-**	**3.6**	**9.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.4**
13	**-**	**-**	**3.6**	**9.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.4**
14	**-**	**-**	**3.6**	**9.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.4**
15	**-**	**-**	**3.6**	**9.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.4**
34	0.5	-	2.7	4.8	-	1.4	-	-	1.0	1.5	-	-	11.9
35	0.5	-	2.7	4.8	-	1.4	-	-	1.0	1.5	-	-	11.9
36	0.5	-	2.7	4.8	-	1.4	-	-	1.0	1.5	-	-	11.9
37	0.5	-	2.7	4.8	-	1.4	-	-	1.0	1.5	-	-	11.9
199	-	1.3	0.8	4.1	0.6	-	2.9	0.2	-	0.5	0.3	0.6	11.3
200	-	1.3	0.8	4.1	0.6	-	2.9	0.2	-	0.5	0.3	0.6	11.3
201	-	1.3	0.8	4.1	0.6	-	2.9	0.2	-	0.5	0.3	0.6	11.3
202	-	1.3	0.8	4.1	0.6	-	2.9	0.2	-	0.5	0.3	0.6	11.3
63	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
64	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
65	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
66	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
67	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
68	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
69	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
70	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
71	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
72	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
73	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
75	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
76	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
78	0.3	1.4	1.7	2.3	1.4	-	2.1	-	-	0.6	-	0.3	10.1
30	0.5	-	-	4.6	2.0	1.0	0.5	-	-	1.5	-	-	10.1
31	0.5	-	-	4.6	2.0	1.0	0.5	-	-	1.5	-	-	10.1
32	0.5	-	-	4.6	2.0	1.0	0.5	-	-	1.5	-	-	10.1
33	0.5	-	-	4.6	2.0	1.0	0.5	-	-	1.5	-	-	10.1
83	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	-	9.6

Table 17. Adults' consumption rates of green vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Asparagus	Broccoli	Brussel sprout	Cabbage	Cauliflower	Courgette	Cucumber	Herbs	Kale	Lettuce	Rocket	Spinach	Total
84	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	-	9.6
85	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	-	9.6
86	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	-	9.6
87	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	-	9.6
216	-	0.5	1.6	5.3	-	-	-	-	-	0.8	-	-	8.2
217	-	0.5	1.6	5.3	-	-	-	-	-	0.8	-	-	8.2
218	-	0.5	1.6	5.3	-	-	-	-	-	0.8	-	-	8.2
219	-	0.5	1.6	5.3	-	-	-	-	-	0.8	-	-	8.2
50	-	0.6	0.7	3.7	0.3	-	0.8	-	-	1.8	-	-	7.8
52	-	0.6	0.7	3.7	0.3	-	0.8	-	-	1.8	-	-	7.8
47	-	0.6	0.7	3.7	0.3	-	0.8	-	-	1.8	-	-	7.8
48	-	0.6	0.7	3.7	0.3	-	0.8	-	-	1.8	-	-	7.8
49	-	0.6	0.7	3.7	0.3	-	0.8	-	-	1.8	-	-	7.8
51	-	0.6	0.7	3.7	0.3	-	0.8	-	-	1.8	-	-	7.8
158	-	-	-	4.3	0.9	-	2.0	-	-	-	-	-	7.1
159	-	-	-	4.3	0.9	-	2.0	-	-	-	-	-	7.1
42	0.5	-	1.7	2.5	0.8	1.2	0.1	0.0	-	0.2	-	-	7.0
56	-	1.2	0.7	1.9	0.6	-	2.6	-	-	-	-	-	6.9
57	-	1.2	0.7	1.9	0.6	-	2.6	-	-	-	-	-	6.9
58	-	1.2	0.7	1.9	0.6	-	2.6	-	-	-	-	-	6.9
59	-	1.2	0.7	1.9	0.6	-	2.6	-	-	-	-	-	6.9
60	-	1.2	0.7	1.9	0.6	-	2.6	-	-	-	-	-	6.9
61	-	1.2	0.7	1.9	0.6	-	2.6	-	-	-	-	-	6.9
3	-	1.3	-	-	0.6	2.5	-	-	-	1.0	-	-	5.4
4	-	1.3	-	-	0.6	2.5	-	-	-	1.0	-	-	5.4
5	-	1.3	-	-	0.6	2.5	-	-	-	1.0	-	-	5.4
6	-	1.3	-	-	0.6	2.5	-	-	-	1.0	-	-	5.4
7	-	1.3	-	-	0.6	2.5	-	-	-	1.0	-	-	5.4
81	-	-	-	2.9	-	-	-	-	-	1.4	0.3	-	4.6
82	-	-	-	2.9	-	-	-	-	-	1.4	0.3	-	4.6
79	-	-	-	2.6	1.6	-	-	-	-	-	-	-	4.2
80	-	-	-	2.6	1.6	-	-	-	-	-	-	-	4.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables based on the 14 high-rate adult consumers is 23.9 kg y^{-1}

The observed 97.5th percentile rate based on 73 observations is 34.4 kg y^{-1}

Table 18. Adults' consumption rates of other vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Aubergine	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Pumpkin	Runner bean	Squash	Sweetcorn	Tomato	Total
40	**-**	**2.4**	**0.3**	**4.3**	**-**	**4.8**	**1.0**	**6.7**	**-**	**-**	**1.3**	**15.1**	**35.9**
41	**-**	**2.4**	**0.3**	**4.3**	**-**	**4.8**	**1.0**	**6.7**	**-**	**-**	**1.3**	**15.1**	**35.9**
38	**-**	**-**	**-**	**0.6**	**-**	**5.9**	**-**	**-**	**-**	**2.4**	**0.7**	**14.0**	**23.6**
39	**-**	**-**	**-**	**0.6**	**-**	**5.9**	**-**	**-**	**-**	**2.4**	**0.7**	**14.0**	**23.6**
45	**0.4**	**1.5**	**-**	**7.1**	**-**	**5.9**	**-**	**-**	**-**	**-**	**0.9**	**5.8**	**21.6**
46	**0.4**	**1.5**	**-**	**7.1**	**-**	**5.9**	**-**	**-**	**-**	**-**	**0.9**	**5.8**	**21.6**
79	**-**	**-**	**-**	**2.3**	**-**	**3.8**	**2.2**	**-**	**-**	**-**	**-**	**12.6**	**20.9**
80	**-**	**-**	**-**	**2.3**	**-**	**-**	**2.2**	**-**	**-**	**-**	**-**	**12.6**	**17.1**
158	**-**	**1.1**	**-**	**-**	**-**	**1.1**	**2.3**	**-**	**-**	**-**	**-**	**8.4**	**12.8**
159	**-**	**1.1**	**-**	**-**	**-**	**1.1**	**2.3**	**-**	**-**	**-**	**-**	**8.4**	**12.8**
199	-	-	-	-	-	0.8	0.3	-	-	-	-	9.8	10.9
200	-	-	-	-	-	0.8	0.3	-	-	-	-	9.8	10.9
201	-	-	-	-	-	0.8	0.3	-	-	-	-	9.8	10.9
202	-	-	-	-	-	0.8	0.3	-	-	-	-	9.8	10.9
30	-	1.4	0.1	-	1.4	-	1.8	-	-	-	0.7	5.4	10.8
31	-	1.4	0.1	-	1.4	-	1.8	-	-	-	0.7	5.4	10.8
32	-	1.4	0.1	-	1.4	-	1.8	-	-	-	0.7	5.4	10.8
33	-	1.4	0.1	-	1.4	-	1.8	-	-	-	0.7	5.4	10.8
34	-	-	-	-	-	0.1	-	-	-	-	0.4	10.1	10.7
35	-	-	-	-	-	0.1	-	-	-	-	0.4	10.1	10.7
36	-	-	-	-	-	0.1	-	-	-	-	0.4	10.1	10.7
37	-	-	-	-	-	0.1	-	-	-	-	0.4	10.1	10.7
56	-	-	-	-	-	1.4	-	-	-	-	-	8.9	10.2
57	-	-	-	-	-	1.4	-	-	-	-	-	8.9	10.2
58	-	-	-	-	-	1.4	-	-	-	-	-	8.9	10.2
59	-	-	-	-	-	1.4	-	-	-	-	-	8.9	10.2
60	-	-	-	-	-	1.4	-	-	-	-	-	8.9	10.2
61	-	-	-	-	-	1.4	-	-	-	-	-	8.9	10.2
83	-	1.1	-	0.7	-	1.1	0.3	-	-	-	-	6.1	9.4
84	-	1.1	-	0.7	-	1.1	0.3	-	-	-	-	6.1	9.4
85	-	1.1	-	0.7	-	1.1	0.3	-	-	-	-	6.1	9.4
86	-	1.1	-	0.7	-	1.1	0.3	-	-	-	-	6.1	9.4
87	-	1.1	-	0.7	-	1.1	0.3	-	-	-	-	6.1	9.4
63	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
64	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
65	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
66	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
67	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
68	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
69	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
70	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0

Table 18. Adults' consumption rates of other vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Aubergine	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Pumpkin	Runner bean	Squash	Sweetcorn	Tomato	Total
71	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
72	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
73	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
75	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
76	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
78	-	1.7	-	1.0	-	0.8	0.9	-	-	-	0.7	1.8	7.0
42	-	0.5	0.0	0.8	-	0.9	0.2	1.3	-	-	0.2	2.9	6.8
3	-	-	-	0.9	-	2.3	-	-	2.3	-	0.5	-	6.0
4	-	-	-	0.9	-	2.3	-	-	2.3	-	0.5	-	6.0
5	-	-	-	0.9	-	2.3	-	-	2.3	-	0.5	-	6.0
6	-	-	-	0.9	-	2.3	-	-	2.3	-	0.5	-	6.0
7	-	-	-	0.9	-	2.3	-	-	2.3	-	0.5	-	6.0
47	0.1	0.3	-	1.6	-	1.3	-	-	-	-	0.2	1.3	4.9
48	0.1	0.3	-	1.6	-	1.3	-	-	-	-	0.2	1.3	4.9
49	0.1	0.3	-	1.6	-	1.3	-	-	-	-	0.2	1.3	4.9
50	0.1	0.3	-	1.6	-	1.3	-	-	-	-	0.2	1.3	4.9
51	0.1	0.3	-	1.6	-	1.3	-	-	-	-	0.2	1.3	4.9
52	0.1	0.3	-	1.6	-	1.3	-	-	-	-	0.2	1.3	4.9
214	-	0.5	-	-	-	0.5	-	-	1.6	-	-	-	2.6
215	-	0.5	-	-	-	0.5	-	-	1.6	-	-	-	2.6
216	-	0.5	-	-	-	0.5	-	-	1.6	-	-	-	2.6
217	-	0.5	-	-	-	0.5	-	-	1.6	-	-	-	2.6
218	-	0.5	-	-	-	0.5	-	-	1.6	-	-	-	2.6
219	-	0.5	-	-	-	0.5	-	-	1.6	-	-	-	2.6
10	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8
11	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8
12	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8
13	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8
14	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8
15	-	1.8	-	-	-	-	-	-	-	-	-	-	1.8
81	-	-	-	-	-	0.1	-	-	-	-	1.1	-	1.2
82	-	-	-	-	-	0.1	-	-	-	-	1.1	-	1.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables based on the 10 high-rate adult consumers is 22.6 kg y^{-1}

The observed 97.5th percentile rate based on 73 observations is 26.0 kg y^{-1}

Table 19. Adults' consumption rates of root vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Beetroot	Carrot	Celery	Chicory root	Garlic	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
40	**8.7**	**4.8**	**4.2**	**-**	**-**	**-**	**11.5**	**3.8**	**-**	**-**	**0.6**	**14.5**	**-**	**48.2**
41	**8.7**	**4.8**	**4.2**	**-**	**-**	**-**	**11.5**	**3.8**	**-**	**-**	**0.6**	**14.5**	**-**	**48.2**
45	**16.1**	**-**	**-**	**-**	**-**	**-**	**14.2**	**-**	**-**	**-**	**-**	**8.9**	**3.5**	**42.8**
46	**16.1**	**-**	**-**	**-**	**-**	**-**	**14.2**	**-**	**-**	**-**	**-**	**8.9**	**3.5**	**42.8**
79	**20.9**	**-**	**-**	**-**	**-**	**5.7**	**12.2**	**1.5**	**-**	**1.4**	**-**	**-**	**-**	**41.8**
80	**20.9**	**-**	**-**	**-**	**-**	**5.7**	**12.2**	**1.5**	**-**	**1.4**	**-**	**-**	**-**	**41.8**
38	**5.3**	**2.9**	**-**	**-**	**0.8**	**2.9**	**14.0**	**2.3**	**-**	**-**	**-**	**8.8**	**-**	**37.2**
39	**5.3**	**2.9**	**-**	**-**	**0.8**	**2.9**	**14.0**	**2.3**	**-**	**-**	**-**	**8.8**	**-**	**37.2**
81	**-**	**2.1**	**-**	**-**	**-**	**12.8**	**13.7**	**6.8**	**-**	**-**	**1.4**	**-**	**-**	**36.9**
82	**-**	**2.1**	**-**	**-**	**-**	**12.8**	**13.7**	**6.8**	**-**	**-**	**1.4**	**-**	**-**	**36.9**
214	**2.9**	**1.1**	**-**	**-**	**-**	**1.9**	**3.0**	**0.5**	**-**	**-**	**0.6**	**7.1**	**-**	**17.0**
215	**2.9**	**1.1**	**-**	**-**	**-**	**1.9**	**3.0**	**0.5**	**-**	**-**	**0.6**	**7.1**	**-**	**17.0**
216	**2.9**	**1.1**	**-**	**-**	**-**	**1.9**	**3.0**	**0.5**	**-**	**-**	**0.6**	**7.1**	**-**	**17.0**
217	**2.9**	**1.1**	**-**	**-**	**-**	**1.9**	**3.0**	**0.5**	**-**	**-**	**0.6**	**7.1**	**-**	**17.0**
218	**2.9**	**1.1**	**-**	**-**	**-**	**1.9**	**3.0**	**0.5**	**-**	**-**	**0.6**	**7.1**	**-**	**17.0**
219	**2.9**	**1.1**	**-**	**-**	**-**	**1.9**	**3.0**	**0.5**	**-**	**-**	**0.6**	**7.1**	**-**	**17.0**
34	0.5	1.6	0.5	-	0.4	-	4.1	0.3	-	-	-	6.8	-	14.1
35	0.5	1.6	0.5	-	0.4	-	4.1	0.3	-	-	-	6.8	-	14.1
36	0.5	1.6	0.5	-	0.4	-	4.1	0.3	-	-	-	6.8	-	14.1
37	0.5	1.6	0.5	-	0.4	-	4.1	0.3	-	-	-	6.8	-	14.1
63	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
64	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
65	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
66	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
67	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
68	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
69	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
70	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
71	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
72	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
73	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
75	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
76	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
78	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
158	3.8	1.1	-	-	-	2.1	3.4	-	-	-	-	-	-	10.3
159	3.8	1.1	-	-	-	2.1	3.4	-	-	-	-	-	-	10.3
47	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8
48	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8
49	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8
50	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8
51	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8

Table 19. Adults' consumption rates of root vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Beetroot	Carrot	Celery	Chicory root	Garlic	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
52	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8
83	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
84	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
85	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
86	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
87	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
56	-	1.4	-	-	-	-	3.9	-	-	-	-	4.2	-	9.4
57	-	1.4	-	-	-	-	3.9	-	-	-	-	4.2	-	9.4
58	-	1.4	-	-	-	-	3.9	-	-	-	-	4.2	-	9.4
59	-	1.4	-	-	-	-	3.9	-	-	-	-	4.2	-	9.4
60	-	1.4	-	-	-	-	3.9	-	-	-	-	4.2	-	9.4
61	-	1.4	-	-	-	-	3.9	-	-	-	-	4.2	-	9.4
42	1.7	0.9	0.8	-	-	-	2.2	0.7	-	-	0.1	2.8	-	9.2
10	4.4	-	-	-	-	-	1.7	-	-	-	-	-	2.9	8.9
11	4.4	-	-	-	-	-	1.7	-	-	-	-	-	2.9	8.9
12	4.4	-	-	-	-	-	1.7	-	-	-	-	-	2.9	8.9
13	4.4	-	-	-	-	-	1.7	-	-	-	-	-	2.9	8.9
14	4.4	-	-	-	-	-	1.7	-	-	-	-	-	2.9	8.9
15	4.4	-	-	-	-	-	1.7	-	-	-	-	-	2.9	8.9
30	0.2	-	-	-	0.1	2.9	1.3	-	-	0.5	-	2.3	0.4	7.6
31	0.2	-	-	-	0.1	2.9	1.3	-	-	0.5	-	2.3	0.4	7.6
32	0.2	-	-	-	0.1	2.9	1.3	-	-	0.5	-	2.3	0.4	7.6
33	0.2	-	-	-	0.1	2.9	1.3	-	-	0.5	-	2.3	0.4	7.6
3	-	-	-	-	-	-	4.9	0.6	-	-	-	-	0.9	6.4
4	-	-	-	-	-	-	4.9	0.6	-	-	-	-	0.9	6.4
5	-	-	-	-	-	-	4.9	0.6	-	-	-	-	0.9	6.4
6	-	-	-	-	-	-	4.9	0.6	-	-	-	-	0.9	6.4
7	-	-	-	-	-	-	4.9	0.6	-	-	-	-	0.9	6.4
199	1.4	0.8	-	-	-	1.5	2.4	-	-	-	-	-	-	6.1
200	1.4	0.8	-	-	-	1.5	2.4	-	-	-	-	-	-	6.1
201	1.4	0.8	-	-	-	1.5	2.4	-	-	-	-	-	-	6.1
202	1.4	0.8	-	-	-	1.5	2.4	-	-	-	-	-	-	6.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables based on the 16 high-rate adult consumers is 32.2 kg y^{-1}

The observed 97.5th percentile rate based on 73 observations is 43.9 kg y^{-1}

Table 20. Adults' consumption rates of potato from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Potato
38	**59.2**
39	**59.2**
40	**58.1**
41	**58.1**
45	**35.8**
46	**35.8**
79	**30.9**
80	**30.9**
34	**27.3**
35	**27.3**
36	**27.3**
37	**27.3**
56	**21.0**
57	**21.0**
58	**21.0**
59	**21.0**
60	**21.0**
61	**21.0**
214	17.5
215	17.5
216	17.5
217	17.5
218	17.5
219	17.5
63	13.7
64	13.7
65	13.7
66	13.7
67	13.7
68	13.7
69	13.7
70	13.7
71	13.7
72	13.7
73	13.7
75	13.7
76	13.7
78	13.7
42	11.1
3	10.8
4	10.8

Table 20. Adults' consumption rates of potato from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Potato
5	10.8
6	10.8
7	10.8
81	10.8
82	10.8
10	9.7
11	9.7
12	9.7
13	9.7
14	9.7
15	9.7
158	8.5
159	8.5
47	8.2
48	8.2
49	8.2
50	8.2
51	8.2
52	8.2
199	6.2
200	6.2
201	6.2
202	6.2
30	6.1
31	6.1
32	6.1
33	6.1
83	5.7
84	5.7
85	5.7
86	5.7
87	5.7

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of potato based on the 18 high-rate adult consumers is 33.5 kg y^{-1}

The observed 97.5th percentile rate based on 73 observations is 58.3 kg y^{-1}

Table 21. Adults' consumption rates of domestic fruit from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Apple	Blackberry	Blackcurrant	Blueberry	Fig	Gooseberry	Grape	Melon	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Whitecurrant	Total
40	**8.3**	**-**	**5.1**	**0.4**	**-**	**1.3**	**-**	**-**	**2.5**	**5.1**	**-**	**2.5**	**1.3**	**-**	**-**	**-**	**26.4**
41	**8.3**	**-**	**5.1**	**0.4**	**-**	**1.3**	**-**	**-**	**2.5**	**5.1**	**-**	**2.5**	**1.3**	**-**	**-**	**-**	**26.4**
79	**1.0**	**-**	**2.3**	**-**	**-**	**2.3**	**-**	**-**	**-**	**-**	**0.3**	**2.3**	**2.3**	**-**	**-**	**2.3**	**12.6**
80	**1.0**	**-**	**2.3**	**-**	**-**	**2.3**	**-**	**-**	**-**	**-**	**0.3**	**2.3**	**2.3**	**-**	**-**	**2.3**	**12.6**
3	**-**	**-**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**4.7**	**5.8**	**0.9**	**-**	**11.6**
4	**-**	**-**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**4.7**	**5.8**	**0.9**	**-**	**11.6**
5	**-**	**-**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**4.7**	**5.8**	**0.9**	**-**	**11.6**
6	**-**	**-**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**4.7**	**5.8**	**0.9**	**-**	**11.6**
7	**-**	**-**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**4.7**	**5.8**	**0.9**	**-**	**11.6**
34	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.6**	**-**	**-**	**1.9**	**-**	**1.3**	**6.4**	**-**	**-**	**11.2**
35	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.6**	**-**	**-**	**1.9**	**-**	**1.3**	**6.4**	**-**	**-**	**11.2**
36	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.6**	**-**	**-**	**1.9**	**-**	**1.3**	**6.4**	**-**	**-**	**11.2**
37	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.6**	**-**	**-**	**1.9**	**-**	**1.3**	**6.4**	**-**	**-**	**11.2**
81	1.0	-	0.5	-	-	0.3	-	-	-	-	-	-	5.0	1.0	-	-	7.8
82	1.0	-	0.5	-	-	0.3	-	-	-	-	-	-	5.0	1.0	-	-	7.8
38	1.6	-	-	-	-	-	-	2.2	-	-	1.8	-	-	1.8	-	-	7.6
39	1.6	-	-	-	-	-	-	2.2	-	-	1.8	-	-	1.8	-	-	7.6
42	1.6	-	1.0	0.1	-	0.2	-	-	0.5	1.0	-	0.5	0.2	-	-	-	5.0
63	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
64	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
65	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
66	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
67	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
68	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
69	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
70	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
71	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
72	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
73	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
75	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
76	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
78	1.0	-	-	-	-	0.9	-	-	-	-	-	-	1.6	-	-	-	3.4
83	-	-	-	-	-	-	-	-	-	-	0.8	-	-	2.4	-	-	3.2
84	-	-	-	-	-	-	-	-	-	-	0.8	-	-	2.4	-	-	3.2
85	-	-	-	-	-	-	-	-	-	-	0.8	-	-	2.4	-	-	3.2
86	-	-	-	-	-	-	-	-	-	-	0.8	-	-	2.4	-	-	3.2
87	-	-	-	-	-	-	-	-	-	-	0.8	-	-	2.4	-	-	3.2
56	1.4	0.6	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	-	2.7
57	1.4	0.6	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	-	2.7
58	1.4	0.6	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	-	2.7
59	1.4	0.6	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	-	2.7
60	1.4	0.6	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	-	2.7
61	1.4	0.6	-	-	-	-	-	-	-	-	-	-	-	0.1	0.6	-	2.7
158	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	-	2.4
159	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	-	2.4

Table 21. Adults' consumption rates of domestic fruit from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Apple	Blackberry	Blackcurrant	Blueberry	Fig	Gooseberry	Grape	Melon	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Whitecurrant	Total
30	-	1.6	-	-	-	-	-	-	-	-	0.1	-	0.2	-	-	-	2.0
31	-	1.6	-	-	-	-	-	-	-	-	0.1	-	0.2	-	-	-	2.0
32	-	1.6	-	-	-	-	-	-	-	-	0.1	-	0.2	-	-	-	2.0
33	-	1.6	-	-	-	-	-	-	-	-	0.1	-	0.2	-	-	-	2.0
214	0.2	-	-	-	0.4	-	0.3	-	0.2	0.2	-	-	0.2	-	-	-	1.7
215	0.2	-	-	-	0.4	-	0.3	-	0.2	0.2	-	-	0.2	-	-	-	1.7
199	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.2	-	-	1.5
200	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.2	-	-	1.5
201	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.2	-	-	1.5
202	-	-	-	-	-	-	-	-	-	-	-	-	0.4	1.2	-	-	1.5
216	0.2	-	-	-	0.4	-	-	-	0.2	0.2	-	-	0.2	-	-	-	1.3
217	0.2	-	-	-	0.4	-	-	-	0.2	0.2	-	-	0.2	-	-	-	1.3
45	-	-	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	0.9
46	-	-	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	0.9
218	0.2	-	-	-	-	-	-	-	0.2	0.2	-	-	0.2	-	-	-	0.9
219	0.2	-	-	-	-	-	-	-	0.2	0.2	-	-	0.2	-	-	-	0.9
397	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
47	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	0.2
48	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	0.2
49	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	0.2
50	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	0.2
51	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	0.2
52	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit based on the 13 high-rate adult consumers is 13.9 kg y^{-1}

The observed 97.5th percentile rate based on 68 observations is 17.1 kg y^{-1}

Table 22. Adults' consumption rates of sheep meat from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Lamb
521	**5.7**
522	**5.7**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of sheep meat based on the 2 high-rate adult consumers is 5.7 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 5.7 kg y^{-1}

Table 23. Adults' consumption rates of poultry from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Partridge	Pheasant	Pigeon	Woodcock	Total
353	**-**	**5.4**	**7.3**	**-**	**12.7**
355	**-**	**5.4**	**7.3**	**-**	**12.7**
442	**0.6**	**5.8**	**-**	**1.1**	**7.6**
443	**0.6**	**5.8**	**-**	**1.1**	**7.6**
16	-	2.6	-	-	2.6
17	-	2.6	-	-	2.6
426	-	-	0.1	-	0.1
427	-	-	0.1	-	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of poultry based on the 4 high-rate adult consumers is 10.1 kg y^{-1}

The observed 97.5th percentile rate based on 8 observations is 12.7 kg y^{-1}

Table 24. Adults' consumption rates of eggs from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Chicken egg
37	**34.7**
35	9.9
38	8.7
39	8.7
158	5.5
159	5.5
199	3.0
200	3.0
201	3.0
202	3.0

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of eggs based on the only high-rate adult consumer is 34.7 kg y^{-1}

The observed 97.5th percentile rate based on 10 observations is 29.1 kg y^{-1}

Table 25. Adults' consumption rates of wild/free foods from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Blackberry
426	**2.5**
427	**2.5**
442	0.5
443	0.5
16	0.3
17	0.3
19	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild/free foods based on the 2 high-rate adult consumers is 2.5 kg y^{-1}

The observed 97.5th percentile rate based on 7 observations is 2.5 kg y^{-1}

Table 26. Adults' consumption rates of rabbits/hares from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Rabbit
353	**17.5**
355	**17.5**
16	2.6
17	2.6
442	1.3
443	1.3
397	1.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of rabbits/hares based on the 2 high-rate adult consumers is 17.5 kg y^{-1}

The observed 97.5th percentile rate based on 7 observations is 17.5 kg y^{-1}

Table 27. Adults' consumption rates of honey from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Honey
34	**2.3**
35	**2.3**
36	**2.3**
37	**2.3**
38	0.6
39	0.6
433	0.3
434	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of honey based on the 4 high-rate adult consumers is 2.3 kg y^{-1}

The observed 97.5th percentile rate based on 8 observations is 2.3 kg y^{-1}

Table 28. Adults' consumption rates of wild fungi from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Mushrooms
16	**7.9**
397	**2.7**
442	0.1
443	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild fungi based on the 2 high-rate adult consumers is 5.3 kg y^{-1}

The observed 97.5th percentile rate based on 4 observations is 7.5 kg y^{-1}

Table 29. Adults' consumption rates of venison from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Venison
442	**3.4**
443	**3.4**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of venison based on the 2 high-rate adult consumers is 3.4 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 3.4 kg y^{-1}

Table 30. Adults' consumption rates of freshwater fish from the Hartlepool terrestrial survey area (kg y^{-1})

Observation number	Brown trout
16	**0.5**
17	**0.5**
19	**0.5**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish (freshwater) based on the 3 high-rate adult consumers is 0.5 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 0.5 kg y^{-1}

Table 31. Children's and infants' consumption rates of green vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Asparagus	Broccoli	Brussel sprout	Cabbage	Cauliflower	Courgette	Cucumber	Herbs	Lettuce	Rocket	Spinach	Total
203	15	-	1.3	0.8	4.1	0.6	-	2.9	0.2	0.5	0.3	0.6	11.3
74	15	0.3	1.4	1.7	2.3	1.4	-	2.1	-	0.6	-	0.3	10.1
77	15	0.3	1.4	1.7	2.3	1.4	-	2.1	-	0.6	-	0.3	10.1
89	13	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	9.6
90	13	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	9.6
91	14	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	9.6
92	15	-	1.9	1.1	4.6	0.5	-	1.4	-	-	-	-	9.6
53	15	-	0.6	0.7	3.7	0.3	-	0.8	-	1.8	-	-	7.8
54	13	-	0.6	0.7	3.7	0.3	-	0.8	-	1.8	-	-	7.8
160	15	-	-	-	4.3	0.9	-	2.0	-	-	-	-	7.1
43	14	0.5	-	1.7	2.5	0.8	1.2	0.1	0.02	0.2	-	-	7.0
44	12	0.5	-	1.7	2.5	0.8	1.2	0.1	0.02	0.2	-	-	7.0
55	9	-	0.4	0.5	2.7	0.2	-	0.6	-	1.3	-	-	5.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables for the child age group based upon the 13 high-rate consumers is 8.6 kg y^{-1}

The observed 97.5th percentile rate based on 13 observations is 10.9 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Asparagus	Broccoli	Brussel sprout	Cabbage	Cauliflower	Courgette	Cucumber	Herbs	Lettuce	Rocket	Spinach	Total
88	5	-	0.9	0.6	2.3	0.2	-	0.7	-	-	-	-	4.8
62	4	-	0.6	0.4	0.9	0.3	-	1.3	-	-	-	-	3.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables for the infant age group based upon the 2 high-rate consumers is 4.1 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 4.7 kg y^{-1}

Table 32. Children's and infants' consumption rates of other vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Aubergine	Broad bean	Chilli pepper	French bean	Pea	Pepper	Pumpkin	Sweetcorn	Tomato	Total
160	**15**	**-**	**1.1**	**-**	**-**	**1.1**	**2.3**	**-**	**-**	**8.4**	**12.8**
203	**15**	**-**	**-**	**-**	**-**	**0.8**	**0.3**	**-**	**-**	**9.8**	**10.9**
89	**13**	**-**	**1.1**	**-**	**0.7**	**1.1**	**0.3**	**-**	**-**	**6.1**	**9.4**
90	**13**	**-**	**1.1**	**-**	**0.7**	**1.1**	**0.3**	**-**	**-**	**6.1**	**9.4**
91	**14**	**-**	**1.1**	**-**	**0.7**	**1.1**	**0.3**	**-**	**-**	**6.1**	**9.4**
92	**15**	**-**	**1.1**	**-**	**0.7**	**1.1**	**0.3**	**-**	**-**	**6.1**	**9.4**
74	**15**	**-**	**1.7**	**-**	**1.0**	**0.8**	**0.9**	**-**	**0.7**	**1.8**	**7.0**
77	**15**	**-**	**1.7**	**-**	**1.0**	**0.8**	**0.9**	**-**	**0.7**	**1.8**	**7.0**
43	**14**	**-**	**0.5**	**0.05**	**0.8**	**0.9**	**0.2**	**1.3**	**0.2**	**2.9**	**6.8**
44	**12**	**-**	**0.5**	**0.05**	**0.8**	**0.9**	**0.2**	**1.3**	**0.2**	**2.9**	**6.8**
53	**15**	**0.1**	**0.3**	**-**	**1.6**	**1.3**	**-**	**-**	**0.2**	**1.3**	**4.9**
54	**13**	**0.1**	**0.3**	**-**	**1.6**	**1.3**	**-**	**-**	**0.2**	**1.3**	**4.9**
55	9	0.1	0.3	-	1.2	1.0	-	-	0.2	1.0	3.7

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables for the child age group based upon the 12 high-rate consumers is 8.2 kg y^{-1}

The observed 97.5th percentile rate based on 13 observations is 12.2 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Aubergine	Broad bean	Chilli pepper	French bean	Pea	Pepper	Pumpkin	Sweetcorn	Tomato	Total
62	**4**	**-**	**-**	**-**	**-**	**0.7**	**-**	**-**	**-**	**4.4**	**5.1**
88	**5**	**-**	**0.6**	**-**	**0.3**	**0.6**	**0.2**	**-**	**-**	**3.0**	**4.7**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables for the infant age group based upon the 2 high-rate consumers is 4.9 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 5.1 kg y^{-1}

Table 33. Children's and infants' consumption rates of root vegetables from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Beetroot	Carrot	Celery	Chicory root	Garlic	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
74	15	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
77	15	1.5	0.8	0.3	0.3	0.04	0.6	3.8	0.7	0.01	0.6	0.2	5.1	-	14.0
160	15	3.8	1.1	-	-	-	2.1	3.4	-	-	-	-	-	-	10.3
53	15	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8
54	13	3.7	-	-	-	-	-	3.2	-	-	-	-	2.0	0.8	9.8
89	13	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
90	13	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
91	14	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
92	15	3.1	2.3	1.4	-	-	-	2.7	-	-	-	-	-	-	9.5
43	14	1.7	0.9	0.8	-	-	-	2.2	0.7	-	-	0.1	2.8	-	9.2
44	12	1.7	0.9	0.8	-	-	-	2.2	0.7	-	-	0.1	2.8	-	9.2
55	9	2.8	-	-	-	-	-	2.4	-	-	-	-	1.5	0.6	7.3
203	15	1.4	0.8	-	-	-	1.5	2.4	-	-	-	-	-	-	6.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables for the child age group based upon the 13 high-rate consumers is 9.8 kg y^{-1}

The observed 97.5th percentile rate based on 13 observations is 14.0 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Beetroot	Carrot	Celery	Chicory root	Garlic	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
88	5	1.6	1.1	0.7	-	-	-	1.4	-	-	-	-	-	-	4.7
62	4	-	0.7	-	-	-	-	1.9	-	-	-	-	2.1	-	4.7

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables for the infant age group based upon the 2 high-rate consumers is 4.7 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 4.7 kg y^{-1}

Table 34. Children's and infants' consumption rates of potato from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Potato
74	**15**	**13.7**
77	**15**	**13.7**
43	**14**	**11.1**
44	**12**	**11.1**
160	**15**	**8.5**
53	**15**	**8.2**
54	**13**	**8.2**
203	**15**	**6.2**
55	**9**	**6.1**
89	**13**	**5.7**
90	**13**	**5.7**
91	**14**	**5.7**
92	**15**	**5.7**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of potato for the child age group based upon the 13 high-rate consumers is 8.4 kg y^{-1}

The observed 97.5th percentile rate based on 13 observations is 13.7 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Potato
62	**4**	**10.5**
88	5	2.9

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of potato for the infant age group based upon the only high-rate consumer is 10.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 10.3 kg y^{-1}

Table 35. Chidren's and infants' consumption rates of domestic fruit from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Apple	Blackberry	Blackcurrant	Blueberry	Gooseberry	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Total
43	**14**	**1.6**	**-**	**1.0**	**0.1**	**0.2**	**0.5**	**1.0**	**-**	**0.5**	**0.2**	**-**	**-**	**5.0**
44	**12**	**1.6**	**-**	**1.0**	**0.1**	**0.2**	**0.5**	**1.0**	**-**	**0.5**	**0.2**	**-**	**-**	**5.0**
74	**15**	**1.0**	**-**	**-**	**-**	**0.9**	**-**	**-**	**-**	**-**	**1.6**	**-**	**-**	**3.4**
77	**15**	**1.0**	**-**	**-**	**-**	**0.9**	**-**	**-**	**-**	**-**	**1.6**	**-**	**-**	**3.4**
89	**13**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**2.4**	**-**	**3.2**
90	**13**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**2.4**	**-**	**3.2**
91	**14**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**2.4**	**-**	**3.2**
92	**15**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**2.4**	**-**	**3.2**
160	**15**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.4**	**-**	**2.4**
203	15	-	-	-	-	-	-	-	-	-	0.4	1.2	-	1.5
53	15	-	-	-	-	-	-	0.2	-	-	-	-	-	0.2
54	13	-	-	-	-	-	-	0.2	-	-	-	-	-	0.2
55	9	-	-	-	-	-	-	0.2	-	-	-	-	-	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit for the child age group based upon the 9 high-rate consumers is 3.5 kg y^{-1}

The observed 97.5th percentile rate based on 13 observations is 5.0 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Apple	Blackberry	Blackcurrant	Blueberry	Gooseberry	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Total
88	**5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.4**	**-**	**-**	**1.2**	**-**	**1.6**
62	**4**	**0.7**	**0.3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.1**	**0.3**	**1.3**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit for the infant age group based upon the 2 high-rate consumers is 1.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 1.6 kg y^{-1}

Table 36. Children's consumption rates of poultry from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Pheasant	Pigeon	Total
354	**14**	**5.4**	**7.3**	**12.7**
18	12	0.3	-	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of poultry for the child age group based upon the only high-rate consumer is 12.7 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 12.3 kg y^{-1}

Table 37. Children's consumption rates of eggs from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Chicken egg
160	**15**	**5.5**
203	**15**	**3.0**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of eggs for the child age group based upon the 2 high-rate consumers is 4.3 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 5.4 kg y^{-1}

Table 38. Children's consumption rates of rabbits/hares from the Hartlepool terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Rabbit
354	**14**	**17.5**
18	12	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of rabbits/hares for the child age group based upon the only high-rate consumer is 17.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 17.0 kg y^{-1}

Table 39. Percentage contribution each food type makes to its terrestrial food group for adults

Green vegetables	
Cabbage	37.7 %
Cucumber	15.4 %
Brussel sprout	13.9 %
Cauliflower	7.9 %
Lettuce	7.8 %
Broccoli	6.9 %
Courgette	5.9 %
Asparagus	2.0 %
Kale	1.2 %
Spinach	0.8 %
Rocket	0.2 %
Herbs	0.2 %

Other vegetables	
Tomato	50.6 %
Pea	14.0 %
Broad bean	9.4 %
French bean	9.3 %
Pepper	5.2 %
Sweetcorn	4.0 %
Runner bean	3.2 %
Pumpkin	2.2 %
Mangetout	0.9 %
Squash	0.7 %
Aubergine	0.2 %
Chilli pepper	0.2 %

Root vegetables	
Onion	30.4 %
Swede	23.2 %
Beetroot	20.2 %
Leek	7.7 %
Carrot	6.4 %
Parsnip	4.2 %
Turnip	3.2 %
Celery	2.0 %
Shallot	1.2 %
Spring onion	0.9 %
Garlic	0.4 %
Chicory root	0.3 %
Radish	0.0 %

Potato	
Potato	100.0 %

Domestic fruit	
Strawberry	25.3 %
Rhubarb	21.9 %
Apple	15.2 %
Gooseberry	6.3 %
Blackcurrant	5.1 %
Raspberry	5.0 %
Plum	4.8 %
Melon	3.4 %
Redcurrant	3.1 %
Blackberry	3.0 %
Tayberry	2.4 %
Pear	2.1 %
Whitecurrant	1.4 %
Fig	0.5 %
Blueberry	0.3 %
Grapes	0.2 %

Sheep meat	
Lamb	100.0 %

Poultry	
Pheasant	60.3 %
Pigeon	32.2 %
Woodcock	4.9 %
Partridge	2.6 %

Eggs	
Chicken egg	100.0 %

Wild/free foods	
Blackberry	100.0 %

Rabbits/hares	
Rabbit	100.0 %

Honey	
Honey	100.0 %

Wild fungi	
Mushrooms	100.0 %

Venison	
Venison	100.0 %

Freshwater fish	
Brown trout	100.0 %

Notes

Food types in emboldened italics were monitored by FSA in 2013 (EA, FSA, NIEA and SEPA, 2014).
Milk and wheat were also monitored.
Percentages are based on the consumption of all adults in the survey consuming that particular food group.

Table 40. Direct radiation occupancy rates for adults, children and infants in the Hartlepool area (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
0 to 0.25 km zone						
428	F	60	Nature warden duties	848	745	1593
397	M	70	Bait digging and collecting crabs, mussels and winkles	-	1466	1466
396	M	58	Bait digging and collecting crabs	-	1460	1460
376	M	U	Nature warden duties	805	460	1265
429	F	46	Nature warden duties	318	528	846
430	U	U	Nature warden duties	82	354	436
431	U	U	Nature warden duties	82	354	436
432	U	U	Nature warden duties	82	354	436
381	M	49	Bird watching	-	182	182
297	M	61	Bait digging and collecting crabs	-	144	144
337	M	43	Collecting crabs	-	84	84
403	M	35	Angling	-	52	52
353	M	37	Bait digging	-	30	30
354	M	14	Bait digging	-	30	30
355	M	52	Bait digging	-	30	30
>0.25 to 0.5 km zone						
See Annex 3 for estimated data						
>0.5 to 1 km zone						
504	M	U	Working	2500	750	3250
519	M	U	Working	2050	700	2750
507	M	U	Working	1674	698	2372
508	M	U	Working	1674	698	2372
509	M	U	Working	1674	698	2372
510	M	U	Working	1674	698	2372
511	M	U	Working	1674	698	2372
512	M	U	Working	1674	698	2372
513	M	U	Working	1674	698	2372
514	M	U	Working	1674	698	2372
515	M	U	Working	1674	698	2372
516	M	U	Working	1674	698	2372
517	M	U	Working	1674	698	2372
518	M	U	Working	1674	698	2372
480	M	U	Working	2185	47	2232
481	M	U	Working	2185	47	2232
482	M	U	Working	2185	47	2232
483	M	U	Working	2185	47	2232
484	M	U	Working	2185	47	2232
485	M	U	Working	2185	47	2232
486	M	U	Working	2185	47	2232
487	M	U	Working	2185	47	2232
488	M	U	Working	2185	47	2232
489	M	U	Working	2185	47	2232
490	M	U	Working	2185	47	2232
491	M	U	Working	2185	47	2232
492	M	U	Working	2165	67	2232
493	M	U	Working	2165	67	2232
494	M	U	Working	2165	67	2232
495	M	U	Working	1720	512	2232
496	M	U	Working	1720	512	2232
501	M	U	Working	2160	48	2208
502	M	U	Working	1488	720	2208
503	M	U	Working	1488	720	2208
497	M	34	Working	1750	250	2000
467	M	U	Working	1767	47	1814
468	M	U	Working	1767	47	1814
469	M	U	Working	1767	47	1814
470	M	U	Working	1767	47	1814
471	M	U	Working	1767	47	1814
472	M	U	Working	1767	47	1814
473	M	U	Working	1767	47	1814
474	M	U	Working	1767	47	1814
475	F	U	Working	1767	47	1814
476	F	U	Working	1767	47	1814
477	F	U	Working	1767	47	1814
478	F	U	Working	1767	47	1814
479	F	U	Working	1767	47	1814
505	F	U	Working	1767	47	1814
520	M	U	Working	1200	480	1680
456	F	U	Working	1348	47	1395

Table 40. Direct radiation occupancy rates for adults, children and infants in the Hartlepool area (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
498	M	U	Working	744	186	930
499	M	U	Working	744	186	930
457	M	U	Working	697	47	744
500	F	U	Working	672	48	720
506	F	U	Working	651	47	698
406	M	75	Dog walking	-	504	504
402	M	67	Dog walking	-	365	365
454	M	U	Tending livestock	-	365	365
458	M	U	Working	186	47	233
459	M	U	Working	186	47	233
460	M	U	Working	186	47	233
461	M	U	Working	186	47	233
462	M	U	Working	186	47	233
463	M	U	Working	186	47	233
464	M	U	Working	186	47	233
465	M	U	Working	186	47	233
466	M	U	Working	186	47	233
398	M	62	Dog walking	-	104	104
404	M	62	Dog walking	-	104	104
455	F	42	Tending livestock	-	91	91
399	M	51	Dog walking	-	26	26
400	F	20	Dog walking	-	26	26
401	F	18	Dog walking	-	26	26

Notes

U = Unknown

No data for the >0.25 to 0.5 km zone

Table 41. Analysis of direct radiation occupancy rates for adults, children and infants in the Hartlepool area

0 to 0.25 km zone	
Number of hours	**Number of observations**
8000 to 8760	0
7000 to 8000	0
6000 to 7000	0
5000 to 6000	0
4000 to 5000	0
3000 to 4000	0
2000 to 3000	0
1000 to 2000	4
0 to 1000	11
0 to 8760	**15**

>0.25 to 0.5 km zone	
Number of hours	**Number of observations**
See Annex 3 for estimated data	

>0.5 to 1 km zone	
Number of hours	**Number of observations**
8000 to 8760	0
7000 to 8000	0
6000 to 7000	0
5000 to 6000	0
4000 to 5000	0
3000 to 4000	1
2000 to 3000	34
1000 to 2000	16
0 to 1000	23
0 to 8760	**74**

Table 42. Gamma dose rate measurements for the Hartlepool direct radiation survey (µGy h^{-1})

Businesses

Location	Indoor substrate	Indoor gamma dose rate at 1 metre[a]	Outdoor substrate	Outdoor gamma dose rate at 1 metre[a]
Business 1	Concrete	0.053	Grass	0.063
Business 2	Concrete	0.074	Tarmac	0.062
Business 3	Concrete	0.084	Concrete	0.059
Business 4	Concrete	0.065	Concrete	0.068
Business 5	Concrete	0.082	Concrete	0.075
Business 6	-	Not measured	Concrete	0.082
Business 7	Concrete	0.065	Grass	0.068
Business 8	Concrete	0.071	Grass	0.062

Notes

[a] These measurements have not been adjusted for background dose rates.

Backgrounds

	Location	National Grid Reference	Substrate	Background gamma dose rate at 1 metre
Background 1	Newton Bewley	NZ 463 266	Grass	0.066
Background 2	South of Yearby	NZ 601 204	Grass	0.073
Background 3	West of Hart Village	NZ 459 353	Grass	0.066

Table 43. Combinations of adult pathways for consideration in dose assessments in the Hartlepool area

Combination number	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
1	X	X																					X			X		X	X		
2	X	X			X	X	X	X	X													X									
3											X		X	X		X		X													
4					X	X	X	X	X			X			X																
5	X	X	X								X			X						X		X	X			X	X		X		X
6																								X			X				
7	X	X																	X			X	X				X		X		X
8	X	X																		X		X	X		X		X				
9	X																		X	X						X	X		X		X
10																							X							X	X
11	X																		X	X		X	X				X				X
12		X	X						X					X		X			X	X							X				X
13	X																				X		X								X
14	X																						X		X		X		X		
15			X																						X		X				
16	X	X		X							X		X	X		X	X														
17																			X		X				X	X	X		X		
18										X																					

Notes

The food groups and external exposure pathways marked with a cross are combined for the corresponding combination number. For example, combination number 1 represents an individual (or individuals) from Annex 1 who had positive data for the following pathways: fish, crustaceans, intertidal occupancy over sand, handling fishing gear, occupancy in water and occupancy on water.

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
1	M	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	-	-	-	-	-	-	-
2	F	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	-	-	-	-	-	-	-
3	M	75	11.8	-	-	-	5.4	6.0	6.4	10.8	**11.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	M	56	-	-	-	-	5.4	6.0	6.4	10.8	**11.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	F	56	-	-	-	-	5.4	6.0	6.4	10.8	**11.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	M	20	-	-	-	-	5.4	6.0	6.4	10.8	**11.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	F	20	-	-	-	-	5.4	6.0	6.4	10.8	**11.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	M	72	**44.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	560	-	-
9	M	U	4.1	13.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-	-	166	-	-
10	M	71	-	-	-	-	**13.4**	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	M	46	-	-	-	-	**13.4**	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	M	48	-	-	-	-	**13.4**	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	F	32	-	-	-	-	**13.4**	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	F	38	-	-	-	-	**13.4**	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	F	28	-	-	-	-	**13.4**	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	M	59	-	-	-	-	-	-	-	-	-	-	2.6	-	0.3	2.6	-	**7.9**	-	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-
17	M	20	-	-	-	-	-	-	-	-	-	-	2.6	-	0.3	2.6	-	-	-	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-
19	F	22	-	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-
20	M	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	225	-	-	-	-	-	-	-	-
21	M	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	209	-	-	-
22	M	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	209	-	-	-
23	M	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	137	-	-	-	-	-	-	-	-
24	F	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	137	-	-	-	-	-	-	-	-
25	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	-	-	-	-	-	-
26	M	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	-	-	-	-	-	-
28	M	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	11	-	-	-
30	M	57	-	-	-	-	10.1	10.8	7.6	6.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31	F	54	-	-	-	-	10.1	10.8	7.6	6.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	F	37	-	-	-	-	10.1	10.8	7.6	6.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	F	28	-	-	-	-	10.1	10.8	7.6	6.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	M	65	-	-	-	-	11.9	10.7	14.1	**27.3**	**11.2**	-	-	-	-	-	**2.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	F	65	-	-	-	-	11.9	10.7	14.1	**27.3**	**11.2**	-	-	**9.9**	-	-	**2.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
36	M	45	-	-	-	-	11.9	10.7	14.1	**27.3**	**11.2**	-	-	-	-	-	**2.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	F	40	-	-	-	-	11.9	10.7	14.1	**27.3**	**11.2**	-	-	**34.7**	-	-	**2.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
38	M	64	-	-	-	-	**30.5**	**23.6**	**37.2**	**59.2**	7.6	-	-	**8.7**	-	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	F	62	-	-	-	-	**30.5**	**23.6**	**37.2**	**59.2**	7.6	-	-	**8.7**	-	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	M	75	-	-	-	-	**36.5**	**35.9**	**48.2**	**58.1**	**26.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	F	70	-	-	-	-	**36.5**	**35.9**	**48.2**	**58.1**	**26.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	M	48	-	-	-	-	7.0	6.8	9.2	11.1	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	M	76	-	-	-	-	**33.9**	**21.6**	**42.8**	**35.8**	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	F	76	-	-	-	-	**33.9**	**21.6**	**42.8**	**35.8**	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	M	51	-	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	M	47	-	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49	F	46	-	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	F	44	-	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	M	21	-	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	M	19	-	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	M	63	-	-	-	-	6.9	10.2	9.4	**21.0**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57	F	57	-	-	-	-	6.9	10.2	9.4	**21.0**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58	F	37	-	-	-	-	6.9	10.2	9.4	**21.0**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	F	33	-	-	-	-	6.9	10.2	9.4	**21.0**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	M	22	-	-	-	-	6.9	10.2	9.4	**21.0**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	F	18	-	-	-	-	6.9	10.2	9.4	**21.0**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	M	67	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64	M	60	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	F	69	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66	M	49	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	M	32	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	M	27	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69	F	45	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	F	32	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
71	F	27	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
72	F	21	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
73	F	18	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75	M	17	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
76	M	18	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
78	M	20	-	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
79	M	75	-	-	-	-	4.2	**20.9**	**41.8**	**30.9**	**12.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
80	F	79	-	-	-	-	4.2	**17.1**	**41.8**	**30.9**	**12.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81	M	57	-	-	-	-	4.6	1.2	**36.9**	10.8	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
82	F	57	-	-	-	-	4.6	1.2	**36.9**	10.8	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	U	66	-	-	-	-	9.6	9.4	9.5	5.7	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
84	F	64	-	-	-	-	9.6	9.4	9.5	5.7	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85	F	42	-	-	-	-	9.6	9.4	9.5	5.7	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
86	F	44	-	-	-	-	9.6	9.4	9.5	5.7	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
87	M	43	-	-	-	-	9.6	9.4	9.5	5.7	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
93	M	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91	**639**	-	-	-	-	-	-	-	-
94	M	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	363	-	-	424	-	-
95	U	68	2.5	**29.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	130	-	-
96	M	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	-	-	-
97	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**348**	-	-	-	-	-	-	-	-
98	F	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	-	-	-	-	-	-	-
99	M	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	-	-	-	6	-	-
100	F	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	-	-	-	6	-	-
102	M	48	22.7	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	90	-	-
103	M	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	90	-	-
104	F	48	22.7	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**730**	-	-	-	-	-	-	-	-
105	M	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35	-	-	-
106	M	64	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	293	-	-	-	-	-	-	-	-
107	M	64	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-
108	M	48	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	M	44	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	F	63	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	F	45	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	F	48	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	-	-	-
114	F	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	-	-	-
115	M	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	208	-	-	-
116	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	-	-	-	208	-	-	-
117	M	41	10.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	13	-	-	-	65	-	-	-	-
120	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**347**	-	-	-	-	-	-	-	-
121	M	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	189	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
122	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-
124	M	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	33	-	-	-	-	-	-	-	-
125	F	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	33	-	-	-	-	-	-	-	-
128	M	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	141	-	-	-	-	313	-	-	-
129	M	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	141	-	-	-	-	313	-	-	-
130	M	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	141	-	-	-	-	-	-	-	-
131	M	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	141	-	-	-	-	-	-	-	-
132	M	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	-	-	-	-	-	-	-	-
133	M	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	-	-	-	-	-	-	-	-
134	M	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	-	-	-	-	-	-	-	-
135	M	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71	-	-	-	-	-	-	-	-
136	M	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	21	-	-	-	-	-	-	-	-
137	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	21	-	-	-	-	-	-	-	-
142	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**417**	-	-	-	-	-	-	-	-
143	M	42	5.2	**15.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	26	-	26	26	-	-
144	M	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-
145	F	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-
146	M	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	-
147	F	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	-
148	M	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-
149	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	-	-
152	M	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	-
153	F	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	-
154	M	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	7	-	-
155	F	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	-	7	-	-
158	F	44	-	-	-	-	7.1	**12.8**	10.3	8.5	2.4	-	-	**5.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
159	M	47	-	-	-	-	7.1	**12.8**	10.3	8.5	2.4	-	-	**5.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
161	F	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	228	-	-	-	-	-	-	-	-
162	M	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	228	-	-	-	-	-	-	-	-
163	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	228	-	-	-	-	-	-	-	-
164	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-
165	M	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**548**	-	-	-	-	-	-	-	-
166	M	43	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-	11	-	-	-	-
167	F	64	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
168	F	27	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
170	M	U	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
171	M	U	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
172	M	U	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
173	M	U	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
174	M	U	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
175	M	U	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
176	M	48	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	10	-	-	-	-
177	F	47	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
178	F	20	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
179	M	18	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180	M	48	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
181	M	41	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
182	M	41	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
183	M	40	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
184	M	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**490**	**365**	-	-	-	**490**	-	-	-	-
185	M	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	-	-	**1173**	120	-	1408	-	-
186	M	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	-	-	**1173**	120	-	1408	-	-
187	M	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**274**	-	-	-	-	274	-	-	-	-
188	M	50	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	6	-	-	-	-
189	F	49	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	6	-	-	-	-
191	F	27	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
192	M	68	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
193	M	60	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
194	M	63	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195	F	63	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
196	F	60	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
197	F	61	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
198	M	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	-	210	-	-	210	-	-
199	M	49	-	-	-	-	11.3	10.9	6.1	6.2	1.5	-	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200	F	47	-	-	-	-	11.3	10.9	6.1	6.2	1.5	-	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201	M	19	-	-	-	-	11.3	10.9	6.1	6.2	1.5	-	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	F	19	-	-	-	-	11.3	10.9	6.1	6.2	1.5	-	-	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	M	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
205	M	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1400**	-	-	**1400**	-	-	-	-
206	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1400**	-	-	**1400**	-	-	-	-
207	M	77	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	-
208	F	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-
209	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-
210	M	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**351**	-	-	-	-	-	-	-	-
211	M	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280	-	-	-	-	-	-	-	-
212	M	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1050**	-	-	**1050**	-	-	-	-
213	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1050**	-	-	**1050**	-	-	-	-
214	M	68	7.4	1.2	-	-	**26.1**	2.6	**17.0**	17.5	1.7	-	-	-	-	-	-	-	-	-	-	-	-	123	-	-	-	-	-	-	-	-	-
215	F	67	7.4	1.2	-	-	**26.1**	2.6	**17.0**	17.5	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
216	M	50	-	-	-	-	8.2	2.6	**17.0**	17.5	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
217	F	45	-	-	-	-	8.2	2.6	**17.0**	17.5	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
218	M	18	-	-	-	-	8.2	2.6	**17.0**	17.5	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
219	M	17	-	-	-	-	8.2	2.6	**17.0**	17.5	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220	M	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108	-	-	-	-	-	-	-	-	-
221	M	69	**41.3**	**35.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	172	-	-
222	M	45	20.6	**19.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
223	F	70	**41.3**	**35.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
224	M	66	**36.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	715	-	-
225	M	35	**36.9**	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**261**	261	-	-	-	-	-	-	-	-
229	M	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**261**	261	-	-	-	-	-	-	-	-
230	M	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**313**	**365**	-	-	-	-	-	-	-	-
231	F	41	**36.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235	M	62	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-
236	F	58	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
237	M	62	4.1	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-	-	-	-	-
238	F	62	4.1	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
239	M	24	4.1	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240	M	40	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	27	-	-	-	-	-	-	-	-
241	M	43	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	27	-	-	-	-	-	-	-	-
242	F	43	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
245	M	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	196	-	-	-	-	78	-	-	-
246	M	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	78	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
247	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	78	-	-	-
248	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	78	-	-	-
249	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	78	-	-	-
250	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-	78	-	-	-
251	F	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	175	-	-	-	-	-	-	-	-
252	M	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-
253	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**548**	-	-	-	-	-	-	-	-
254	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**456**	-	-	-	-	-	-	-	-
255	M	38	14.7	**17.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**641**	-	-	-	196	-	-	-	-	-
256	F	35	14.7	**17.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
258	M	73	-	**17.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	-	-	-	-	-	-	-
259	M	34	-	**26.6**	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**531**	-	-	-	130	10	-	-	-	-
260	F	35	-	**26.6**	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
262	M	53	-	9.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-	-	-
263	F	47	-	9.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
264	M	43	-	**18.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-	-	-
265	M	31	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	26	-	-	-	-
266	F	27	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
268	M	38	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-
269	F	41	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
270	F	80	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
273	F	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	60	-	-	-	-	-	-	-	-
275	F	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	313	-	10	-	-	-	-	-	-
276	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	5	-	-	-	-	-	-
277	M	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	128	-	32	-	-	-	-	-	-
278	F	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	128	-	32	-	-	-	-	-	-
282	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64	-	16	-	-	-	-	-	-
283	M	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	40	-	20	-	-	-	-	-	-
284	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	105	-	20	-	-	-	-	-	-
288	M	62	4.3	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	575	-	-
289	M	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**912**	-	-	1716	-	-
290	M	62	**35.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**912**	-	-	1716	-	-
291	M	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**912**	-	-	1716	-	-
292	M	48	**71.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	24	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
293	F	47	**35.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
294	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	352	-	-
295	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	352	-	-
296	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	352	-	-
297	M	61	**51.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	72	-	-	-	-	-	6	144	-	898	-	144
298	M	U	**25.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	794	-	-
299	M	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2346**	-	-	2346	-	-
300	M	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2346**	-	-	2346	-	-
301	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**548**	-	-	-	-	-	-	-	-
302	M	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	-	-	-	-	-	-	-
303	M	39	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	26	-	-	-	-
304	F	38	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
306	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1748**	-	-	1748	-	-
307	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1748**	-	-	1748	-	-
308	M	57	-	**45.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
309	F	56	-	**45.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
310	M	54	**53.1**	8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	834	-	-
311	M	50	**53.1**	8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	834	-	-
312	F	55	**53.1**	8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
313	F	50	**53.1**	8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
314	M	44	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	15	-	-	-	-
315	F	44	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
316	F	18	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
318	M	27	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
319	F	26	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	M	55	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
321	F	53	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
322	F	20	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
323	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	416	-	-
324	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	834	-	-
325	M	55	**29.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	-	**390**	209	-	-	-	65	-	288	-	-
326	F	56	**29.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
327	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2000**	-	-	2000	-	-
328	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**2000**	-	-	2000	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
329	M	64	**25.5**	**22.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	550	-	-	550	-	-
330	F	61	**25.5**	**22.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
331	M	36	**25.5**	**22.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
332	F	33	**25.5**	**22.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
333	M	83	-	**19.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	209	-	-	-	-	-	-	-	-	-
334	M	19	-	14.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**313**	-	-	-	104	-	-	-	-	-
335	M	48	-	14.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
336	F	48	-	14.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
337	M	43	**59.1**	5.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	-	-	**215**	209	-	-	-	90	-	1040	-	84
338	F	26	**59.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
339	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**351**	-	-	-	-	-	-	-	-
340	M	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	-	-	-	-	-	-	-
341	F	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	-	20	-	-
344	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-
347	M	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	48	-	-	-	-	-	-	-	-
348	F	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	48	-	-	-	-	-	-	-	-
351	M	U	14.7	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**834**	-	-	834	-	-
352	F	U	14.7	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
353	M	37	8.8	**30.3**	**7.3**	-	-	-	-	-	-	-	**12.7**	-	-	**17.5**	-	-	-	-	-	61	-	177	212	-	-	16	87	-	16	-	30
355	M	52	8.8	**30.3**	**7.3**	-	-	-	-	-	-	-	**12.7**	-	-	**17.5**	-	-	-	-	-	61	-	151	212	-	-	16	61	-	16	-	30
362	M	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
363	M	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
364	M	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
371	F	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
372	F	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
373	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
374	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
375	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
376	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	805	460
377	M	44	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	313	-	-	-	-	-	-	-	-
380	F	U	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
381	M	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-	182
382	F	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-
383	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
384	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-
385	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-
386	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-
387	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	-	-	-
388	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	-	-	-
389	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	-	-	-
390	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	-	-	-
391	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-
392	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-
393	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
394	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
395	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	530	-	-
396	M	58	5.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**368**	**1092**	-	72	215	-	-	-	**1460**	-	-	-	1460
397	M	70	-	0.6	3.4	-	-	-	-	-	0.5	-	-	-	-	1.1	-	**2.7**	-	-	**368**	**1098**	-	-	-	-	-	-	**1466**	-	-	-	1466
398	M	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	104
399	M	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	26
400	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	26
401	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	26
402	M	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	365
403	M	35	11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**52**	-	104	-	-	-	-	-	-	-	52
404	M	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	104
405	M	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	222	-	-	-	26	-	-	-	-
406	M	75	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**609**	-	-	-	-	-	-	-	504
407	M	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	78	-	-	-	-
408	M	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	78	-	-	-	-
409	M	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	108	-	-	-	-	-	-	108	-	-	-	-
410	M	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	130	-	-	-	-
411	M	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-
412	F	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-
413	M	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	-
414	F	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**365**	-	-	-	-	-	-	-	-
415	M	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	50	-	-	-	-
416	M	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	50	-	-	-	-
417	M	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	50	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
418	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-
419	M	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-
421	M	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-
422	F	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-
426	M	47	-	-	-	-	-	-	-	-	-	-	0.1	-	**2.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
427	F	50	-	-	-	-	-	-	-	-	-	-	0.1	-	**2.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
428	F	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**395**	-	-	-	-	-	-	848	745
429	F	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	316	-	-	-	-	-	-	318	528
430	U	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	237	-	-	-	-	-	-	82	354
431	U	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	237	-	-	-	-	-	-	82	354
432	U	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	237	-	-	-	-	-	-	82	354
433	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
434	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
435	M	60	6.0	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	9	13	-	113	-	-
436	M	60	6.0	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	9	13	-	113	-	-
437	M	U	**47.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	26	-	156	-	624	-	-
438	M	30	-	-	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**261**	-	261	-	-	-	-
439	M	53	-	-	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**261**	-	261	-	-	-	-
440	M	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	-	-	-	-	-	-	-	-
442	M	59	7.4	4.9	-	**12.0**	-	-	-	-	-	-	**7.6**	-	0.5	1.3	-	0.1	**3.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
443	M	19	7.4	4.9	-	**12.0**	-	-	-	-	-	-	**7.6**	-	0.5	1.3	-	0.1	**3.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
444	M	52	11.4	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	303	-	**313**	**1022**	-	42	-	428	-	-	-	-
445	F	39	11.4	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
448	M	34	-	-	**17.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	**23**	-	-	-	**95**	**1183**	122	-	1577	-	-
449	M	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
450	M	64	6.0	2.4	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	6	-	131	-	-
451	M	66	12.9	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	131	-	-
452	M	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261	-	-	-	-	-	-	-	-
453	F	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261	-	-	-	-	-	-	-	-
454	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365
455	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91
456	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1348	47
457	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	697	47
458	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
459	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
460	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
461	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
462	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
463	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
464	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
465	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
466	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	47
467	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
468	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
469	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
470	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
471	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
472	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
473	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
474	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
475	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
476	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
477	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
478	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
479	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
480	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
481	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
482	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
483	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
484	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
485	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
486	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
487	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
488	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
489	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
490	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
491	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2185	47
492	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2165	67

Annex 1. Adults' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Honey	Wild fungi	Venison	Fish (freshwater)	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and coal	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
493	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2165	67
494	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2165	67
495	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1720	512
496	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1720	512
497	M	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1750	250
498	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	744	186
499	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	744	186
500	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	672	48
501	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2160	48
502	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1488	720
503	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1488	720
504	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2500	750
505	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
506	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	651	47
507	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
508	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
509	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
510	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
511	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
512	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
513	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
514	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
515	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
516	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
517	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
518	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1674	698
519	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2050	700
520	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1200	480
521	M	U	-	-	-	-	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
522	F	U	-	-	-	-	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes

U=Unknown

Emboldened observations are the high-rate individuals

Annex 2. Children's and infants' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Poultry	Eggs	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Outdoor occupancy within 1 km of the licensed site boundary
Child age group (6 - 15 years old)																						
18	M	12	-	-	-	-	-	-	-	-	0.3	-	0.3	-	-	-	-	-	-	-	-	-
27	M	14	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	11	-	-
29	F	12	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	11	-	-
43	F	14	-	-	-	**7.0**	**6.8**	**9.2**	**11.1**	**5.0**	-	-	-	-	-	-	-	-	-	-	-	-
44	F	12	-	-	-	**7.0**	**6.8**	**9.2**	**11.1**	**5.0**	-	-	-	-	-	-	-	-	-	-	-	-
53	F	15	-	-	-	**7.8**	**4.9**	**9.8**	**8.2**	0.2	-	-	-	-	-	-	-	-	-	-	-	-
54	F	13	-	-	-	**7.8**	**4.9**	**9.8**	**8.2**	0.2	-	-	-	-	-	-	-	-	-	-	-	-
55	M	9	-	-	-	**5.8**	3.7	**7.3**	**6.1**	0.2	-	-	-	-	-	-	-	-	-	-	-	-
74	F	15	-	-	-	**10.1**	**7.0**	**14.0**	**13.7**	**3.4**	-	-	-	-	-	-	-	-	-	-	-	-
77	M	15	-	-	-	**10.1**	**7.0**	**14.0**	**13.7**	**3.4**	-	-	-	-	-	-	-	-	-	-	-	-
89	F	13	-	-	-	**9.6**	**9.4**	**9.5**	**5.7**	**3.2**	-	-	-	-	-	-	-	-	-	-	-	-
90	F	13	-	-	-	**9.6**	**9.4**	**9.5**	**5.7**	**3.2**	-	-	-	-	-	-	-	-	-	-	-	-
91	F	14	-	-	-	**9.6**	**9.4**	**9.5**	**5.7**	**3.2**	-	-	-	-	-	-	-	-	-	-	-	-
92	M	15	-	-	-	**9.6**	**9.4**	**9.5**	**5.7**	**3.2**	-	-	-	-	-	-	-	-	-	-	-	-
118	M	9	-	-	-	-	-	-	-	-	-	-	-	-	33	7	-	-	**33**	-	-	-
119	M	6	7.7	-	-	-	-	-	-	-	-	-	-	-	33	7	-	-	**33**	-	-	-
138	M	12	-	-	-	-	-	-	-	-	-	-	-	-	9	21	-	-	-	-	-	-
139	F	10	-	-	-	-	-	-	-	-	-	-	-	-	9	21	-	-	-	-	-	-
140	F	8	-	-	-	-	-	-	-	-	-	-	-	-	9	21	-	-	-	-	-	-
150	M	14	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-
151	F	14	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-
156	F	6	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	7	-
157	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-	7	-

Annex 2. Children's and infants' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Poultry	Eggs	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Outdoor occupancy within 1 km of the licensed site boundary
160	F	15	-	-	-	**7.1**	**12.8**	**10.3**	**8.5**	**2.4**	-	**5.5**	-	-	-	-	-	-	-	-	-	-
169	F	10	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190	M	6	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	F	15	-	-	-	**11.3**	**10.9**	**6.1**	**6.2**	1.5	-	**3.0**	-	-	-	-	-	-	-	-	-	-
227	F	10	**27.6**	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
228	F	7	**27.6**	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
234	F	7	**27.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
243	F	6	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
244	F	13	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
261	M	7	-	**20.0**	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
271	F	7	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
272	M	8	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
285	M	9	-	-	-	-	-	-	-	-	-	-	-	-	5	40	**20**	-	-	-	-	-
286	F	6	-	-	-	-	-	-	-	-	-	-	-	-	5	40	**20**	-	-	-	-	-
305	M	10	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
317	M	9	**12.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
342	F	10	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	20	-
343	F	10	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	-	-	20	-
345	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-
346	F	12	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-
349	M	12	-	-	-	-	-	-	-	-	-	-	-	-	12	48	-	-	-	-	-	-
350	F	6	-	-	-	-	-	-	-	-	-	-	-	-	12	48	-	-	-	-	-	-
354	M	14	8.8	**30.3**	**7.3**	-	-	-	-	-	**12.7**	-	**17.5**	**61**	**177**	**212**	-	**16**	**87**	-	16	30
356	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-

Annex 2. Children's and infants' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Poultry	Eggs	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Outdoor occupancy within 1 km of the licensed site boundary
357	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
358	M	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
359	M	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
360	M	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
361	M	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
365	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
366	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
367	F	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
368	F	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
369	F	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
370	F	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-
378	M	13	3.2	-	-	-	-	-	-	-	-	-	-	-	-	**313**	-	-	-	-	-	-
379	M	13	3.2	-	-	-	-	-	-	-	-	-	-	-	-	**313**	-	-	-	-	-	-
423	M	12	-	-	-	-	-	-	-	-	-	-	-	-	-	**156**	-	-	-	-	-	-
424	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	**156**	-	-	-	-	-	-
425	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	**156**	-	-	-	-	-	-
441	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	**144**	-	-	-	-	-	-
446	F	13	**11.4**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
447	F	7	**11.4**	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Infant age group (0 - 5 years old)																						
62	F	4	-	-	-	**3.5**	**5.1**	**4.7**	**10.5**	**1.3**	-	-	-	-	-	-	-	-	-	-	-	-
88	F	5	-	-	-	**4.8**	**4.7**	**4.7**	2.9	**1.6**	-	-	-	-	-	-	-	-	-	-	-	-
101	M	3	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	-	-	6	-
123	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-

Annex 2. Children's and infants' consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) in the Hartlepool area

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Poultry	Eggs	Rabbits/hares	Intertidal occupancy over mud and sand	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Handling fishing gear	Handling sediment	Occupancy in water	Occupancy on water	Outdoor occupancy within 1 km of the licensed site boundary
126	M	5	-	-	-	-	-	-	-	-	-	-	-	-	**13**	33	-	-	-	-	-	-
127	F	3	-	-	-	-	-	-	-	-	-	-	-	-	**13**	33	-	-	-	-	-	-
141	M	5	-	-	-	-	-	-	-	-	-	-	-	-	**9**	21	-	-	-	-	-	-
226	M	2	**12.2**	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
232	M	3	**18.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
233	M	4	**18.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
257	F	5	**7.4**	**8.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
267	F	3	-	-	**0.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
274	F	4	-	-	-	-	-	-	-	-	-	-	-	-	**9**	60	-	-	-	-	-	-
279	F	3	-	-	-	-	-	-	-	-	-	-	-	-	-	**112**	**28**	-	-	-	20	-
280	F	4	-	-	-	-	-	-	-	-	-	-	-	-	-	**112**	**28**	-	-	-	20	-
281	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	**112**	**28**	-	-	-	20	-
287	M	4	-	-	-	-	-	-	-	-	-	-	-	-	**5**	40	**20**	-	-	-	-	-
420	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	**156**	-	-	-	-	-	-

Notes

Emboldened observations are the high-rate individuals

Annex 3. Qualitative and estimated data for use in dose assessments

Direct radiation occupancy rates in the >0.25 to 0.5 km zone based on data from the 2008 survey (h y^{-1})

2008 Survey Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
592	M	U	Working	1426	414	1840
593	M	U	Working	1426	414	1840
594	M	U	Working	1426	414	1840
595	M	U	Working	1656	184	1840
596	M	U	Working	1656	184	1840
597	M	U	Working	1656	184	1840
598	M	U	Working	1656	184	1840
599	M	U	Working	1656	184	1840
600	M	U	Working	1656	184	1840
601	M	U	Working	1656	184	1840
602	M	U	Working	1656	184	1840
603	M	U	Working	1656	184	1840
604	M	U	Working	1656	184	1840
605	M	U	Working	1656	184	1840
606	M	U	Working	1656	184	1840
607	M	U	Working	1656	184	1840
608	M	U	Working	1656	184	1840
609	M	U	Working	1656	184	1840
610	M	U	Working	1656	184	1840
611	M	U	Working	1656	184	1840
612	M	U	Working	1656	184	1840
613	M	U	Working	1656	184	1840
614	M	U	Working	1656	184	1840
615	M	U	Working	1656	184	1840
616	M	U	Working	1656	184	1840
617	M	U	Working	1656	184	1840
580	F	U	Working	1840	-	1840
581	F	U	Working	1840	-	1840
582	F	U	Working	1840	-	1840
583	F	U	Working	1840	-	1840
584	F	U	Working	1840	-	1840
585	F	U	Working	1840	-	1840
586	F	U	Working	1840	-	1840
587	F	U	Working	1840	-	1840
588	F	U	Working	1840	-	1840
589	F	U	Working	1840	-	1840
590	F	U	Working	1840	-	1840
591	F	U	Working	1840	-	1840
618	M	U	Working	1840	-	1840
619	M	U	Working	1840	-	1840
620	M	U	Working	1840	-	1840
621	M	U	Working	1840	-	1840
622	M	U	Working	1840	-	1840
623	M	U	Working	1840	-	1840
624	M	U	Working	1840	-	1840
625	M	U	Working	1840	-	1840
626	M	U	Working	1840	-	1840
627	M	U	Working	1840	-	1840
628	M	U	Working	1840	-	1840
629	M	U	Working	1840	-	1840
630	M	U	Working	1840	-	1840
631	M	U	Working	1840	-	1840
632	M	U	Working	1840	-	1840
633	M	U	Working	1840	-	1840
634	M	U	Working	1840	-	1840
635	M	U	Working	1840	-	1840

Annex 3. Qualitative and estimated data for use in dose assessments

Direct radiation occupancy rates in the >0.25 to 0.5 km zone based on data from the 2008 survey (h y^{-1})

2008 Survey Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
636	M	U	Working	1840	-	1840
637	M	U	Working	1840	-	1840
638	M	U	Working	1840	-	1840
639	M	U	Working	1840	-	1840
640	M	U	Working	1840	-	1840
641	M	U	Working	1840	-	1840
642	M	U	Working	1840	-	1840
643	M	U	Working	1840	-	1840
644	M	U	Working	1840	-	1840
645	M	U	Working	1840	-	1840
646	M	U	Working	1840	-	1840
647	M	U	Working	1840	-	1840
648	M	U	Working	1840	-	1840
649	M	U	Working	1840	-	1840
650	F	U	Working	1840	-	1840
651	F	U	Working	1840	-	1840

Annex 4. Ratios for determining consumption and occupancy rates for children and infants

Group	Ratio[a]	
	Child[e]/adult	Infant[e]/adult
Fish[b]	0.200	0.050
Crustaceans[b]	0.250	0.050
Molluscs[b]	0.250	0.050
Green vegetables	0.444	0.222
Other vegetables	0.500	0.200
Root vegetables	0.500	0.375
Potatoes	0.708	0.292
Domestic fruit	0.667	0.467
Milk	1.000	1.333
Cattle meat	0.667	0.222
Pig meat	0.625	0.138
Sheep meat	0.400	0.120
Poultry	0.500	0.183
Eggs	0.800	0.600
Wild/free foods[c]	0.490	0.110
Game[d]	0.500	0.140
Honey	0.789	0.789
Wild fungi	0.450	0.150
Freshwater fish[b]	0.250	0.050
External exposure over intertidal substrates	0.500	0.030

Notes

[a]Excepting notes b and c, consumption ratios were derived from Byrom et al., (1995) which presented data for infants aged 6 to 12 months and children aged 10 to 11 years.

[b]Ratios were derived from Smith and Jones, (2003) which presented data for infants and children of unspecified ages.

[c]Ratios were derived from FSA data for wild fruit and nuts for infants and 10-year-old children.

[d]Game includes rabbits/hares and venison.

[e]Note that the age ranges within the age groups in this table do not correspond exactly with the age ranges within the age groups used throughout the rest of this report.

Annex 5. Consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) for women of childbearing age[a] in the Hartlepool area, for use in foetal dose assessments

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Eggs	Wild/free foods	Honey	Fish (freshwater)	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
7	F	20	-	-	-	5.4	6.0	6.4	10.8	11.6	-	-	-	-	-	-	-	-	-	-	-	-
13	F	32	-	-	-	13.4	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-
14	F	38	-	-	-	13.4	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-
15	F	28	-	-	-	13.4	1.8	8.9	9.7	-	-	-	-	-	-	-	-	-	-	-	-	-
19	F	22	-	-	-	-	-	-	-	-	-	-	0.3	-	0.5	-	-	-	-	-	-	-
25	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	-	-	-
32	F	37	-	-	-	10.1	10.8	7.6	6.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-
33	F	28	-	-	-	10.1	10.8	7.6	6.1	2.0	-	-	-	-	-	-	-	-	-	-	-	-
37	F	40	-	-	-	11.9	10.7	14.1	27.3	11.2	-	34.7	-	2.3	-	-	-	-	-	-	-	-
50	F	44	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-
53	F	15	-	-	-	7.8	4.9	9.8	8.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-
58	F	37	-	-	-	6.9	10.2	9.4	21.0	2.7	-	-	-	-	-	-	-	-	-	-	-	-
59	F	33	-	-	-	6.9	10.2	9.4	21.0	2.7	-	-	-	-	-	-	-	-	-	-	-	-
61	F	18	-	-	-	6.9	10.2	9.4	21.0	2.7	-	-	-	-	-	-	-	-	-	-	-	-
70	F	32	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-
71	F	27	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-
72	F	21	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-
73	F	18	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-
74	F	15	-	-	-	10.1	7.0	14.0	13.7	3.4	-	-	-	-	-	-	-	-	-	-	-	-
85	F	42	-	-	-	9.6	9.4	9.5	5.7	3.2	-	-	-	-	-	-	-	-	-	-	-	-
86	F	44	-	-	-	9.6	9.4	9.5	5.7	3.2	-	-	-	-	-	-	-	-	-	-	-	-
100	F	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	6	-	-
113	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-
114	F	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-
116	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9	-	208	-	-	-
120	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	347	-	-	-	-	-
122	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-

Annex 5. Consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) for women of childbearing age[a] in the Hartlepool area, for use in foetal dose assessments

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Eggs	Wild/free foods	Honey	Fish (freshwater)	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
125	F	28	-	-	-	-	-	-	-	-	-	-	-	-	-	13	33	-	-	-	-	-
137	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	9	21	-	-	-	-	-
149	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	-	-	-
155	F	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	7	-	-
158	F	44	-	-	-	7.1	12.8	10.3	8.5	2.4	-	5.5	-	-	-	-	-	-	-	-	-	-
160	F	15	-	-	-	7.1	12.8	10.3	8.5	2.4	-	5.5	-	-	-	-	-	-	-	-	-	-
161	F	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	228	-	-	-	-	-
163	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	228	-	-	-	-	-
164	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-
168	F	27	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
178	F	20	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
191	F	27	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	F	19	-	-	-	11.3	10.9	6.1	6.2	1.5	-	3.0	-	-	-	-	-	-	-	-	-	-
203	F	15	-	-	-	11.3	10.9	6.1	6.2	1.5	-	3.0	-	-	-	-	-	-	-	-	-	-
231	F	41	36.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
242	F	43	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
254	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	456	-	-	-	-	-
256	F	35	14.7	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
260	F	35	-	26.6	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
266	F	27	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
269	F	41	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
273	F	32	-	-	-	-	-	-	-	-	-	-	-	-	-	9	60	-	-	-	-	-
275	F	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	313	10	-	-	-	-
276	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	5	-	-	-	-
282	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64	16	-	-	-	-
284	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	5	105	20	-	-	-	-
301	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	548	-	-	-	-	-

Annex 5. Consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) for women of childbearing age[a] in the Hartlepool area, for use in foetal dose assessments

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Eggs	Wild/free foods	Honey	Fish (freshwater)	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
304	F	38	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	F	44	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
316	F	18	16.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
319	F	26	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
322	F	20	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
332	F	33	25.5	22.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
338	F	26	59.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
339	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	351	-	-	-	-	-
341	F	33	-	-	-	-	-	-	-	-	-	-	-	-	-	40	-	-	-	20	-	-
344	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-
352	F	U	14.7	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
370	F	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
371	F	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
372	F	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
373	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
375	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	120	-	-
380	F	U	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-
386	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-
388	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	-	-	-
390	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	164	-	-	-
392	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-
394	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
400	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	26
401	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	26
412	F	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-
418	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-

Annex 5. Consumption rates (kg y^{-1}) and occupancy rates (h y^{-1}) for women of childbearing age[a] in the Hartlepool area, for use in foetal dose assessments

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Sheep meat	Eggs	Wild/free foods	Honey	Fish (freshwater)	Intertidal occupancy over rock	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Occupancy in water	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
422	F	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-
434	F	U	-	-	-	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-
445	F	39	11.4	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
455	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91
456	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1348	47
475	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
476	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
477	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
478	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
479	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
500	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	672	48
505	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1767	47
506	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	651	47
522	F	U	-	-	-	-	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-

Notes

U = Unknown

[a] Based on National Statistics guidelines women were deemed to be of childbearing age if they were between 15 and 44 years old. Women of unknown age were included as they were potentially women of childbearing age.

Annex 6. Summary of profiles for adults in the Hartlepool area

Profile Name	Number of individuals	Pathway Name: Crustacea	Direct[a]	Eggs	Fish - Freshwater	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext - Sand/Sea Coal[b]	Gamma ext - Sediments[c]	Honey	Meat - Game[d]	Meat - Poultry	Meat - Sheep	Meat - Wildfowl	Mollusca	Mushrooms	Occupancy IN water	Occupancy ON water	Plume (IN; 0-0.25km)[e]	Plume (MID; 0.25-0.5km)[e]	Plume (OUT; 0.5-1km)[e]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		kg	-	kg	kg	kg	kg	kg	h	h	kg	kg	kg	kg	kg	kg	kg	h	h	h	h	h	kg	kg	kg	kg
Crustacean consumers	**20**	26.1	0.10	-	-	13.0	-	-	-	30	-	1.7	1.3	-	-	0.80	-	1	49	3	-	-	-	-	-	-
Occupants for direct radiation	**160**	0.42	1.00	-	-	0.92	<0.01	-	-	45	-	0.23	0.16	-	-	0.11	0.02	-	12	53	830	730	-	-	-	-
Egg consumers	**1**	-	-	34.7	-	-	11.2	-	-	-	2.3	-	-	-	-	-	-	-	-	-	-	-	11.9	10.7	27.3	14.1
Freshwater fish consumers	**3**	-	-	-	0.47	-	-	0.30	-	-	-	1.7	1.7	-	-	-	2.6	-	-	-	-	-	-	-	-	-
Sea fish consumers	**24**	8.4	0.08	-	-	41.5	-	-	-	48	-	-	-	-	-	-	-	-	380	10	-	-	-	-	-	-
Domestic fruit consumers	**13**	-	-	3.4	-	0.91	13.9	-	-	-	0.70	-	-	-	-	-	-	-	-	-	-	-	12.0	14.0	26.3	20.6
Wild fruit and nut consumers	**2**	-	-	-	-	-	-	2.5	-	-	-	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-
Occupants over sand/sea coal	**4**	-	-	-	-	-	-	-	1230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occupants over sediment	**6**	0.92	0.50	-	-	7.0	0.08	-	-	1080	-	0.19	-	-	-	0.57	0.45	-	-	490	-	84	-	-	-	-
Honey consumers	**4**	-	-	11.1	-	-	11.2	-	-	-	2.3	-	-	-	-	-	-	-	-	-	-	-	11.9	10.7	27.3	14.1
Game meat consumers	**2**	30.3	1.00	-	-	8.8	-	-	-	270	-	17.5	12.7	-	-	7.3	-	-	16	30	-	-	-	-	-	-
Poultry meat consumers	**4**	17.6	0.50	-	-	8.1	-	0.23	-	140	-	11.1	10.1	-	6.0	3.6	0.06	-	8	15	-	-	-	-	-	-
Sheep meat consumers	**2**	-	-	-	-	-	-	-	-	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-
Wildfowl consumers	**2**	4.9	-	-	-	7.4	-	0.45	-	-	-	4.8	7.6	-	12.0	-	0.11	-	-	-	-	-	-	-	-	-
Mollusc consumers	**3**	20.2	0.67	-	-	5.9	-	-	-	180	-	11.6	8.4	-	-	10.8	-	-	11	20	-	-	-	-	-	-
Mushroom consumers	**2**	0.31	0.50	-	0.24	-	0.23	0.15	-	730	-	1.8	1.3	-	-	1.7	5.3	-	-	730	-	-	-	-	-	-
Occupants IN water	**10**	-	-	-	-	-	-	-	-	35	-	-	-	-	-	-	-	210	-	-	-	-	-	-	-	-
Occupants ON water	**19**	1.8	0.11	-	-	15.4	-	-	-	30	-	-	-	-	-	-	-	-	1460	12	-	-	-	-	-	-
Occupants for plume pathways (0 - 0.25 km)	**5**	0.13	1.00	-	-	1.1	0.09	-	-	770	-	0.23	-	-	-	0.68	0.55	-	-	1330	-	-	-	-	-	-
Occupants for plume pathways (>0.25 - 0.5 km)	**72**	-	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1840	-	-	-	-	-
Occupants for plume pathways (>0.5 - 1.0 km)	**51**	-	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2150	-	-	-	-
Green vegetable consumers	**14**	0.17	-	1.2	-	1.1	5.2	-	-	-	0.08	-	-	-	-	-	-	-	-	-	-	-	23.9	12.7	28.5	24.6
Other domestic vegetable consumers	**10**	-	-	2.8	-	-	10.0	-	-	-	0.11	-	-	-	-	-	-	-	-	-	-	-	22.4	22.6	38.5	36.1
Potato consumers	**18**	-	-	3.4	-	-	8.7	-	-	-	0.57	-	-	-	-	-	-	-	-	-	-	-	16.6	16.9	33.5	25.2
Root vegetable consumers	**16**	0.15	-	1.1	-	0.92	7.4	-	-	-	0.07	-	-	-	-	-	-	-	-	-	-	-	19.0	13.6	30.9	32.2

Notes:

[a]Expressed as the proportion of the profile members who are exposed to direct radiation.

[b]Gamma ext - sand/sea coal only includes occupancy over sand and sea coal

[c]Gamma ext - sediments represents occupancy over mud; mud and sand; mud and stones; sand; sand and stones.

[d]Game meat includes venison and rabbits/hares.

[e]Plume times are the sums of individuals' indoor and outdoor times. Occupancy rates in the MID zone are estimated based on 2008 survey data.

The means of the high-rate groups are determined by the 'cut-off' method and are highlighted on the diagonal.

Annex 7. Summary of profiles for the child age group (6 - 15 years old) in the Hartlepool area

Profile Name	Number of individuals	Pathway Name															
		Crustacea	Direct[a]	Eggs	Fish - Sea	Fruit - Domestic	Gamma ext - Sediments[b]	Meat - Game[c]	Meat - Poultry	Mollusca	Occupancy IN water	Occupancy ON water	Plume (IN; 0-0.25km)[d]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		kg	-	kg	kg	kg	h	kg	kg	kg	h	h	h	kg	kg	kg	kg
Crustacean consumers	**2**	25.1	0.50	-	4.4	-	140	8.7	6.3	3.9	-	8	15	-	-	-	-
Occupants for direct radiation	**1**	30.3	1.00	-	8.8	-	270	17.5	12.7	7.3	-	16	30	-	-	-	-
Egg consumers	**2**	-	-	4.3	-	2.0	-	-	-	-	-	-	-	9.2	11.8	7.3	8.2
Sea fish consumers	**6**	0.98	-	-	19.6	-	-	-	-	-	-	-	-	-	-	-	-
Domestic fruit consumers	**9**	-	-	0.61	-	3.5	-	-	-	-	-	-	-	8.8	8.7	9.0	10.5
Occupants over sediment	**9**	3.4	0.11	-	1.7	-	190	1.9	1.4	0.81	-	2	3	-	-	-	-
Game meat consumers	**1**	30.3	1.00	-	8.8	-	270	17.5	12.7	7.3	-	16	30	-	-	-	-
Poultry meat consumers	**1**	30.3	1.00	-	8.8	-	270	17.5	12.7	7.3	-	16	30	-	-	-	-
Mollusc consumers	**1**	30.3	1.00	-	8.8	-	270	17.5	12.7	7.3	-	16	30	-	-	-	-
Occupants IN water	**14**	-	-	-	-	-	5	-	-	-	27	100	-	-	-	-	-
Occupants ON water	**12**	-	-	-	-	-	-	-	-	-	30	120	-	-	-	-	-
Occupants for plume pathways (0 - 0.25 km)	**1**	30.3	1.00	-	8.8	-	270	17.5	12.7	7.3	-	16	30	-	-	-	-
Green vegetable consumers	**13**	-	-	0.66	-	2.6	-	-	-	-	-	-	-	8.6	7.9	8.4	9.8
Other domestic vegetable consumers	**12**	-	-	0.71	-	2.8	-	-	-	-	-	-	-	8.9	8.2	8.6	10.0
Potato consumers	**13**	-	-	0.66	-	2.6	-	-	-	-	-	-	-	8.6	7.9	8.4	9.8
Root vegetable consumers	**13**	-	-	0.66	-	2.6	-	-	-	-	-	-	-	8.6	7.9	8.4	9.8

Notes:

[a]Expressed as the proportion of the profile members who are exposed to direct radiation.

[b]Gamma ext - sediments represents occupancy over mud and sand; sand; sand and stones.

[c]Game meat includes rabbits/hares.

[d]Plume times are the sums of individuals' indoor and outdoor times.

The means of the high-rate groups are determined by the 'cut-off' method and are highlighted on the diagonal.

Annex 8. Summary of profiles for the infant age group (0 - 5 years old) in the Hartlepool area

		Pathway Name									
Profile Name	**Number of individuals**	**Crustacea**	**Fish - Sea**	**Fruit - Domestic**	**Gamma ext - Sediments[a]**	**Mollusca**	**Occupancy ON water**	**Vegetables - Green**	**Vegetables - Other Domestic**	**Vegetables - Potatoes**	**Vegetables - Root**
		kg	**kg**	**kg**	**h**	**kg**	**h**	**kg**	**kg**	**kg**	**kg**
Crustacean consumers	**1**	8.9	7.4	-	-	-	-	-	-	-	-
Sea fish consumers	**4**	2.2	14.1	-	-	-	-	-	-	-	-
Domestic fruit consumers	**2**	-	-	1.5	-	-	-	4.1	4.9	6.7	4.7
Occupants over sediment	**7**	-	-	-	110	-	9	-	-	-	-
Mollusc consumers	**1**	-	-	-	-	0.87	-	-	-	-	-
Occupants ON water	**3**	-	-	-	140	-	20	-	-	-	-
Green vegetable consumers	**2**	-	-	1.5	-	-	-	4.1	4.9	6.7	4.7
Other domestic vegetable consum	**2**	-	-	1.5	-	-	-	4.1	4.9	6.7	4.7
Potato consumers	**1**	-	-	1.3	-	-	-	3.5	5.1	10.5	4.7
Root vegetable consumers	**2**	-	-	1.5	-	-	-	4.1	4.9	6.7	4.7

Notes:

[a]Gamma ext - sediments represents occupancy over sand; sand and stones.

The means of the high-rate groups are determined by the 'cut-off' method and are highlighted on the diagonal.

Annex 9. Summary of profiles for women of childbearing age in the Hartlepool area, for use in foetal dose assessments

Profile Name	Number of individuals	Pathway Name																		
		Crustacea	Direct[a]	Eggs	Fish - Freshwater	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext - Sediments[b]	Honey	Meat - Sheep	Mollusca	Occupancy IN water	Occupancy ON water	Plume (MID; 0.25-0.5km)[c]	Plume (OUT; 0.5-1km)[c]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		kg	-	kg	kg	kg	kg	kg	h	kg	kg	kg	h	h	h	h	kg	kg	kg	kg
Crustacean consumers	**4**	19.6	-	-	-	13.7	-	-	-	-	-	0.18	-	-	-	-	-	-	-	-
Occupants for direct radiation	**26**	-	1.00	-	-	-	-	-	6	-	-	-	-	-	990	530	-	-	-	-
Egg consumers	**1**	-	-	34.7	-	-	11.2	-	-	2.3	-	-	-	-	-	-	11.9	10.7	27.3	14.1
Freshwater fish consumers	**1**	-	-	-	0.47	-	-	0.30	-	-	-	-	-	-	-	-	-	-	-	-
Sea fish consumers	**3**	7.5	-	-	-	40.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Domestic fruit consumers	**2**	-	-	17.3	-	-	11.4	-	-	1.1	-	-	-	-	-	-	8.6	8.3	19.1	10.3
Wild fruit and nut consumers	**1**	-	-	-	0.47	-	-	0.30	-	-	-	-	-	-	-	-	-	-	-	-
Occupants over sediment	**7**	-	-	-	-	-	-	-	350	-	-	-	-	-	-	-	-	-	-	-
Honey consumers	**1**	-	-	34.7	-	-	11.2	-	-	2.3	-	-	-	-	-	-	11.9	10.7	27.3	14.1
Sheep meat consumers	**1**	-	-	-	-	-	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-
Mollusc consumers	**5**	5.3	-	-	-	-	-	-	-	-	-	0.97	-	-	-	-	-	-	-	-
Occupants IN water	**3**	-	-	-	-	-	-	-	3	-	-	-	180	-	-	-	-	-	-	-
Occupants ON water	**7**	-	-	-	-	-	-	-	-	-	-	-	21	120	-	-	-	-	-	-
Occupants for plume pathways (>0.25 - 0.5 km)	**14**	-	1.00	-	-	-	-	-	-	-	-	-	-	-	1840	-	-	-	-	-
Occupants for plume pathways (>0.5 - 1.0 km)	**9**	-	1.00	-	-	-	-	-	-	-	-	-	-	-	-	1520	-	-	-	-
Green Vegetable Consumers	**23**	-	-	2.2	-	-	2.9	-	-	0.10	-	-	-	-	-	-	9.6	8.1	11.6	10.1
Other Domestic Vegetable Consumers	**20**	-	-	2.6	-	-	3.3	-	-	0.11	-	-	-	-	-	-	9.0	9.0	11.9	10.3
Potato Consumers	**13**	-	-	2.7	-	-	3.7	-	-	0.17	-	-	-	-	-	-	9.9	6.8	15.3	11.2
Root Vegetable Consumers	**23**	-	-	2.2	-	-	2.9	-	-	0.10	-	-	-	-	-	-	9.6	8.1	11.6	10.1

Notes:

[a]Expressed as the proportion of the profile members who are exposed to direct radiation.

[b]Gamma ext - sediments represents occupancy over sand; sand and stones.

[c]Plume times are the sums of individuals' indoor and outdoor times. Occupancy rates in the MID zone are estimated based on 2008 survey data.

The means of the high-rate groups are determined by the 'cut-off' method and are highlighted on the diagonal.

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