Cefas

Cefas contract report C2848

Radiological Habits Survey: Barrow and the south-west Cumbrian coast, 2012

2013

Environment Report RL 01/13

Environment Agency

Food Standards Agency
food.gov.uk

Office for Nuclear Regulation
An agency of HSE

This page has been intentionally left blank

Environment Report RL 01/13

Final report

Radiological Habits Survey: Barrow and the south-west Cumbrian coast, 2012

C.J. Garrod, F.J. Clyne, V.E. Ly, P. Rumney and G.P. Papworth

Peer reviewed by G.J. Hunt
Approved for publication by W.C. Camplin

2013

The work described in this report was carried out under contract to the Environment Agency, the Food Standards Agency and the Health and Safety Executive.
Cefas contract C2848
FSA Project PAU 198 / Lot 7 / ERI006

This report should be cited as: Garrod, C.J., Clyne, F.J., Ly, V.E., Rumney, P. and Papworth, G.P., 2013. Radiological Habits Survey: Barrow and the south-west Cumbrian coast, 2012. RL 01/13. Cefas, Lowestoft

A copy can be obtained by downloading from the Cefas website: www.cefas.defra.gov.uk

CONTENTS

SUMMARY **7**

1 INTRODUCTION **12**

1.1 Regulatory framework 12
1.2 Radiological protection framework 13

2 THE SURVEY **15**

2.1 Site activity 15
2.2 Survey objectives 15
2.3 Survey areas 16
Figure 1. The aquatic survey area *17*
Figure 2. The Barrow terrestrial (outer ring) and direct radiation (inner ring) survey areas *18*
2.4 Conduct of the survey 19

3 METHODS FOR DATA ANALYSIS **21**

3.1 Data recording and presentation 21
3.2 Data conversion 21
3.3 Rounding and grouping of data 21
3.4 Approaches for the identification of high rates 23
3.5 Data quality 24

4 AQUATIC RADIATION PATHWAYS **25**

4.1 Aquatic survey area 25
Figure 3. Selker Bay *26*
Figure 4. Near Millom Iron Works Nature Reserve *27*
Figure 5. West side of the Duddon Estuary *28*
Figure 6. South side of the pier at Askam-in-Furness *29*
Figure 7. West Shore Park on the west coast of Walney Island *30*
Figure 8. The Walney Channel, near Jubilee Bridge *32*
Figure 9. Between Roosebeck and Rampside *33*
4.2 Commercial fisheries 34
4.3 Destination of seafood originating from the aquatic survey area 35
4.4 Hobby fishing, angling and non-commercial shellfish collecting. 35
4.5 Salthouse Wastewater Treatment Works 36
4.6 Wildfowling 37
4.7 Other pathways 37
4.8 Food consumption data 38
Table A. Summary of adults' consumption rates of foods from the aquatic survey area *38*
Table B. Summary of children's and infants' consumption rates of foods from the aquatic survey area *40*
4.9 Intertidal occupancy 40
Table C. Summary of adults' intertidal occupancy rates *41*
Table D. Summary of children's and infants' intertidal occupancy rates *42*
4.10 Gamma dose rate measurements 42
4.11 Handling of fishing gear and sediment 43
Table E. Summary of adults' handling rates of fishing gear and sediment *43*
Table F. Summary of children's handling rates of sediment *44*
4.12 Exposure to sewage, sewage sludge and sewage cake 44
4.13 Water based activities 44

5 TERRESTRIAL RADIATION PATHWAYS **46**

5.1 Terrestrial survey area 46
5.2 Destination of food originating from the terrestrial survey area 47
5.3 The potential transfer of contamination off-site by wildlife 47
5.4 Food consumption data 48
Table G. Summary of adults' consumption rates of foods from the terrestrial survey area *49*

Table H. Summary of children's and infants' consumption rates of foods from the terrestrial survey area 50

6 DIRECT RADIATION PATHWAYS 51

6.1 Direct radiation survey area 51
6.2 Residential activities 52
6.3 Leisure activities 52
6.4 Commercial activities 53
6.5 Educational activities 53
6.6 Occupancy rates 53
Table I. Summary of direct radiation occupancy rates 53
6.7 Gamma dose rate measurements 54

7 USES OF HABITS DATA FOR DOSE ASSESSMENTS 56

7.1 Combined pathways 56
7.2 Foetal dose assessment 56
7.3 Total dose assessment 56

8 COMPARISONS WITH THE PREVIOUS SURVEY 58

8.1 Aquatic survey area 58
Table K. Comparison between 1990 and 2012 intertidal occupancy rates and handling rates of fishing gear and sediment for adults 60

9 MAIN FINDINGS 61

9.1 Aquatic survey area 61
9.2 Terrestrial survey area 62
9.3 Direct radiation survey area 63

10 RECOMMENDATIONS FOR CHANGES TO THE MONITORING PROGRAMME 64

10.1 Summary of current environmental monitoring programmes 64
10.2 Recommendations 65

11 ACKNOWLEDGEMENTS 67

12 REFERENCES 68

TABLES

Table 1 Survey coverage
Table 2 Typical food groups used in habits surveys
Table 3 Adults' consumption rates of fish from the aquatic survey area (kg y^{-1})
Table 4 Adults' consumption rates of crustaceans from the aquatic survey area (kg y^{-1})
Table 5 Adults' consumption rates of molluscs from the aquatic survey area (kg y^{-1})
Table 6 Adults' consumption rates of wildfowl from the aquatic survey area (kg y^{-1})
Table 7 Adults' consumption rates of marine plants/algae from the aquatic survey area (kg y^{-1})
Table 8 Adults' consumption rates of salt marsh grazed sheep meat from the aquatic survey area (kg y^{-1})
Table 9 Children's and infants' consumption rates of fish from the aquatic survey area (kg y^{-1})
Table 10 Children's consumption rates of molluscs from the aquatic survey area (kg y^{-1})
Table 11 Children's and infants' consumption rates of wildfowl from the aquatic survey area (kg y^{-1})
Table 12 Adults' intertidal occupancy rates in the aquatic survey area (h y^{-1})
Table 13 Children's and infants' intertidal occupancy rates in the aquatic survey area (h y^{-1})
Table 14 Gamma dose rate measurements over intertidal substrates in the aquatic survey area (µGy h^{-1})
Table 15 Adults' handling rates of fishing gear and sediment in the aquatic survey area (h y^{-1})
Table 16 Children's handling rates of sediment in the aquatic survey area (h y^{-1})
Table 17 Occupancy rates in close proximity to sewage, sewage sludge and sewage cake (h y^{-1})

Table 18 Adults' occupancy rates in and on water in the aquatic survey area (h y^{-1})
Table 19 Children's and infants' occupancy rates in and on water in the aquatic survey area (h y^{-1})
Table 20 Adults' consumption rates of green vegetables from the terrestrial survey area (kg y^{-1})
Table 21 Adults' consumption rates of other vegetables from the terrestrial survey area (kg y^{-1})
Table 22 Adults' consumption rates of root vegetables from the terrestrial survey area (kg y^{-1})
Table 23 Adults' consumption rates of potato from the terrestrial survey area (kg y^{-1})
Table 24 Adults' consumption rates of domestic fruit from the terrestrial survey area (kg y^{-1})
Table 25 Adults' consumption rates of milk from the terrestrial survey area (l y^{-1})
Table 26 Adults' consumption rates of cattle meat from the terrestrial survey area (kg y^{-1})
Table 27 Adults' consumption rates of pig meat from the terrestrial survey area (kg y^{-1})
Table 28 Adults' consumption rates of sheep meat from the terrestrial survey area (kg y^{-1})
Table 29 Adults' consumption rates of poultry from the terrestrial survey area (kg y^{-1})
Table 30 Adults' consumption rates of eggs from the terrestrial survey area (kg y^{-1})
Table 31 Adults' consumption rates of wild/free foods from the terrestrial survey area (kg y^{-1})
Table 32 Adults' consumption rates of rabbits/hares from the terrestrial survey area (kg y^{-1})
Table 33 Adults' consumption rates of wild fungi from the terrestrial survey area (kg y^{-1})
Table 34 Adults' consumption rates of freshwater fish from the terrestrial survey area (kg y^{-1})
Table 35 Children's and infants' consumption rates of green vegetables from the terrestrial survey area (kg y^{-1})
Table 36 Children's and infants' consumption rates of other vegetables from the terrestrial survey area (kg y^{-1})
Table 37 Children's and infants' consumption rates of root vegetables from the terrestrial survey area (kg y^{-1})
Table 38 Children's and infants' consumption rates of potato from the terrestrial survey area (kg y^{-1})
Table 39 Children's and infants' consumption rates of domestic fruit from the terrestrial survey area (kg y^{-1})
Table 40 Children's and infants' consumption rates of milk from the terrestrial survey area (l y^{-1})
Table 41 Children's and infants' consumption rates of cattle meat from the terrestrial survey area (kg y^{-1})
Table 42 Children's consumption rates of pig meat from the terrestrial survey area (kg y^{-1})
Table 43 Children's and infants' consumption rates of sheep meat from the terrestrial survey area (kg y^{-1})
Table 44 Children's consumption rates of poultry from the terrestrial survey area (kg y^{-1})
Table 45 Children's and infants' consumption rates of eggs from the terrestrial survey area (kg y^{-1})
Table 46 Children's consumption rates of wild/free foods from the terrestrial survey area (kg y^{-1})
Table 47 Children's consumption rates of rabbits/hares from the terrestrial survey area (kg y^{-1})
Table 48 Infants' consumption rates of wild fungi from the terrestrial survey area (kg y^{-1})
Table 49 Percentage contribution each food type makes to its terrestrial food group for adults
Table 50 Direct radiation occupancy rates for adults, children and infants (h y^{-1})
Table 51 Analysis of direct radiation occupancy rates for adults, children and infants
Table 52 Gamma dose rate measurements for the direct radiation survey (µGy h^{-1})
Table 53 Combinations of adult pathways for consideration in dose assessments

ANNEXES

Annex 1 Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})
Annex 2 Children's and infants' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})
Annex 3 Qualitative and estimated data for use in dose assessments
Annex 4 Ratios for determining consumption and occupancy rates for infants and children
Annex 5 Consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1}) for women of childbearing age, for use in foetal dose assessments
Annex 6 Summary of profiles for adults
Annex 7 Summary of profiles for the child age group (6 - 15 years old)

Annex 8 Summary of profiles for the infant age group (0 - 5 years old)
Annex 9 Summary of profiles for women of childbearing age, for use in foetal dose assessments

SUMMARY

This report presents the results of a survey conducted in 2012 to determine the habits and consumption patterns of people living, working and pursuing recreational activities in the vicinity of the nuclear site at Barrow-in-Furness and along the south-west Cumbrian coast.

At Barrow-in-Furness, BAE Systems Marine Ltd builds, tests and commissions new nuclear powered submarines. The site is permitted to discharge gaseous radioactive wastes via stacks and other outlets to the atmosphere, liquid radioactive wastes to the local sewer and contains sources of direct radiation. The sewer flows to a utility company's wastewater treatment plant and after undergoing a sewage treatment process the effluent is discharged into the sea in the Walney Channel. 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 potential gaseous releases from the site.

The discharges from the Barrow nuclear site are minor compared with those from other nuclear sites located on the north-west coast of England. The coast and sea area in the vicinity of Barrow-in-Furness and south-west Cumbria may be affected by discharges of liquid radioactive waste from these sites, most notably Sellafield, and the results of this survey are also relevant to those sites.

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
- Occupancy in close proximity to sewage, sewage sludge and sewage cake
- 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 (Figure 1, page 17) covered the intertidal areas along the coast of Cumbria between Tarn Point in the north and Roosebeck in the south, and the adjacent sea area up to 10 km offshore. The Duddon Estuary, Walney Channel and the shore of Walney Island were included.

Foods from the aquatic survey area were consumed from the following food groups: fish; crustaceans; molluscs; wildfowl; marine plants/algae; salt marsh grazed sheep meat. The mean consumption rates for the adult high rate group for the separate aquatic consumption pathways for foods potentially affected by liquid discharges were:

- 27 kg y^{-1} for fish
- 12 kg y^{-1} for crustaceans
- 5.9 kg y^{-1} for molluscs
- 17 kg y^{-1} for wildfowl
- 0.7 kg y^{-1} for marine plants/algae
- 5.7 kg y^{-1} for salt marsh grazed sheep meat

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

- For fish: bass; cod; flounder; mackerel; plaice.
- For crustaceans: brown crab and common lobster
- For molluscs: cockles; mussels; whelks; winkles
- For wildfowl: greylag goose; mallard; pink-footed goose; pintail.
- For marine plants/algae: samphire
- For salt marsh grazed sheep meat: salt marsh grazed lamb

The mean consumption rate for the adult high-rate group exceeded the generic 97.5th percentile rate for crustaceans but not for fish or molluscs. Generic consumption rates have not been determined for wildfowl, marine plants/algae or salt marsh grazed sheep meat.

The activities undertaken by adults in the high-rate groups for intertidal occupancy included collecting mussels, wildfowling, angling, dog walking, oyster farming, collecting winkles, bait digging, boat maintenance, tending livestock, boat dwelling (tide out) and sitting on the beach. Gamma dose rate measurements were taken at most locations in the aquatic survey area where activities were occurring. The only activities undertaken by adults in the high-rate group for handling fishing gear were handling nets and pots. The activities undertaken by adults in the high-rate group for handling

sediment were oyster farming and wildfowling. The activities undertaken by people in and on the water included swimming, snorkelling, sub-aqua diving, windsurfing, kite-surfing, body-boarding, kayaking, jet skiing, sailing, canoeing, boat angling, gill netting, potting, trawling, dredging, charter boat skipper, working on a boat, RNLI duties, rescue boat duties, boat dwelling (tide in), fixing moorings and paddling. The use of seaweed as a fertiliser or animal feed was not identified.

The Barrow site discharges liquid waste via the sewer pipes to the Salthouse Wastewater Treatment Works where it undergoes a sewage treatment process. Occupancy rates were obtained for employees and a contractor working in close proximity to sewage, sewage sludge and sewage cake at the treatment works.

The terrestrial survey area

The terrestrial survey area (Figure 2, page 18) was defined as the land and bodies of freshwater within 5 km of the centre of the Barrow site. Fifteen farms and smallholdings were identified that farmed the land in the terrestrial survey area. They produced milk (from dairy cattle), beef cattle, lambs and geese. The farmers and their families consumed foods that were produced commercially on their land and also other foods that they produced solely for their own consumption. Seventeen allotment sites with approximately 740 plots in total were identified where a variety of fruit and vegetables were grown. Some allotment holders kept chickens for eggs on their allotment plots. Beekeeping was reported to take place within the survey area but the beekeepers could not be contacted. Freshwater fish were being consumed from waters 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; milk; cattle meat; pig meat; sheep meat; poultry; eggs; wild/free foods; rabbits/hares; wild fungi; freshwater fish. Three mean consumption rates for the adult high-rate groups were found to be greater than the generic 97.5th percentile consumption rates. These were for milk, poultry and eggs. The consumption of honey, cereals or venison was not identified.

The consumption of groundwater by humans or livestock was not identified. One household collected rainwater for their domestic supply. Livestock were consuming spring, stream and ditch water.

Control measures taken by the site operator in order to limit the possibility that contamination is transferred off-site by wildlife included ensuring that wildlife were unable to access the controlled areas and clearing debris from gutters and ground level areas to discourage seagulls from nesting.

The direct radiation survey area

The direct radiation survey area (Figure 2, page 18) was defined as the land and sea within 1 km of the Barrow nuclear licensed site boundary. Occupancy rates were obtained for residents, visitors, children attending school, and people working and undertaking recreational activities in the area.

The occupancy rates were analysed in zones according to the distance from the Barrow nuclear licensed site boundary. With the exception of the highest outdoor occupancy rate in the 0 – 0.25 km zone, which was for a worker, the highest indoor, outdoor and total occupancy rates in the 0 – 0.25 km, >0.25 – 0.5 km and >0.5 – 1.0 km zones were for residents, one of whom also attended school in the direct radiation survey 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 at distances beyond 5 km of the Barrow site centre.

Comparisons with the previous survey

Comparisons were made with the results from a previous habits survey undertaken in the aquatic survey area in 1990. No previous habits surveys for terrestrial or direct radiation pathways have been undertaken by Cefas around Barrow so no comparisons with previous results could be made for these. At the time of the 1990 survey, liquid discharges were made to a sewer that flowed directly into the Walney Channel, but since 2002, when the sewer system was upgraded, liquid discharges have been made to a sewer that flows to the Salthouse Wastewater Treatment Plant where the effluent goes through a sewage treatment process before being discharged through a pipeline at Roosecote Sands in the Walney Channel.

In the aquatic survey area in 2012, compared with 1990, there was a decrease in the mean consumption rate for the adult high-rate group for fish, from 40 kg y^{-1} to 27 kg y^{-1}, and increases in the mean consumption rates for the high-rate groups for crustaceans, from 8.0 kg y^{-1} to 12 kg y^{-1}, for molluscs, from 3.5 kg y^{-1} to 5.9 kg y^{-1}, and for wildfowl, from 7.1 kg y^{-1} to 17.2 kg y^{-1}. The consumption of marine plants/algae and salt marsh grazed sheep meat was identified in 2012 but not in 1990.

The mean intertidal occupancy rates for the adult high-rate groups increased in 2012 compared to 1990 over the following substrates: salt marsh, from 220 h y^{-1} to 290 h y^{-1}, sand, from 290 h y^{-1} to 930 h y^{-1}. The mean intertidal occupancy rate for the high rate group for mud and sand decreased from 910 h y^{-1} in 1990 to 630 h y^{-1} in 2012. In 2012 activities were recorded taking place over mud, mud and stones, sand and stones and on board a boat resting on mud and sand, but no activities were recorded over these substrates in 1990. The mean rate for the adult high-rate group for

handling fishing gear increased from 680 h y^{-1} in 1990 to 990 h y^{-1} in 2012 and the mean rate for the adult high-rate group for handling sediment decreased from 1100 h y^{-1} in 1990 to 310 h y^{-1} in 2012.

Recommendations

Recommendations for changes to the current environmental monitoring programmes are provided. These are based on the information collected during the survey and also take into account the potential radiological significance of the various pathways that were identified. It is suggested that the location of a gamma dose rate measurement that is currently taken is moved, in order to be close to a houseboat where a high occupancy rate was recorded. It is also suggested that the location of another gamma dose rate measurement and a sediment sample are moved to a position to the south of the discharge point of the effluent from the Salthouse Wastewater Treatment Works. Consideration is given to taking a one-off sample of sewage cake from the Salthouse Wastewater Treatment Works, but in view of the low and intermittent liquid discharges from the Barrow site, this is probably not warranted.

1 INTRODUCTION

The public may be exposed to radiation as a result of the operations of the Barrow 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. The discharges from the Barrow nuclear site are minor compared with those from other nuclear sites located on the north-west coast of England. The coast and sea area in the vicinity of Barrow-in-Furness and south-west Cumbria may be affected by discharges of liquid radioactive waste from these sites, most notably Sellafield. This report provides information on activities carried out by members of the public in the vicinity of the Barrow site and along the south-west coast of Cumbria and the adjacent sea area, which may influence their radiation exposure. The study has been funded by the Environment Agency, the Food Standards Agency and the Office for Nuclear Regulation 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 optimization, 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 (CEC, 1996) which embody the recommendations of the ICRP, particularly ICRP 60 (ICRP, 1991). 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), an agency of the Health and Safety Executive, 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, 2009a), 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 (CEC, 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), 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, NIEA, FSA and SEPA, 2011), 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 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 Barrow nuclear site is located within the town of Barrow-in-Furness in Cumbria. BAE Systems Marine Ltd own and operate the site, where they build, test and commission new nuclear powered submarines. At the time of the habits survey one submarine was nearing completion and was afloat in the Devonshire Dock and other submarines were in various stages of construction within the Devonshire Hall.

The site is permitted, under the Radioactive Substances Regulation of the Environmental Permitting Regulations 2010, to discharge gaseous radioactive wastes via stacks and other outlets to the atmosphere and liquid radioactive wastes to the local sewer. The sewer flows to a utility company's wastewater treatment plant and after undergoing a sewage treatment process the effluent is discharged into the sea in the Walney Channel. 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, NIEA and SEPA, 2012.

2.2 Survey objectives

The Centre for Environment, Fisheries & Aquaculture Science (Cefas) undertook the Barrow habits survey in 2012 on behalf of the Environment Agency, the Food Standards Agency, and the Office for Nuclear Regulation. The main 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 Barrow nuclear site. Additionally, habits relevant to exposure via liquid discharges from other nuclear sites located along the north-west coast of England that make discharges into the Irish Sea, most notably Sellafield, were investigated.

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
- Occupancy in close proximity to sewage, sewage sludge and sewage cake
- 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
- 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 area relating to liquid discharges, a terrestrial area relating to deposition from potential gaseous discharges, and a direct radiation area relating to ionising radiation emanating directly from the site. The aquatic survey area was extended northwards to include the coast and sea area of south-west Cumbria that may be subject to the far-field effects of Sellafield, but which is not covered in other habits surveys.

The aquatic survey area (Figure 1, page 17) covered the intertidal areas along the coast of Cumbria between Tarn Point in the north and Roosebeck in the south, and the adjacent sea area up to 10 km offshore. The Duddon Estuary, Walney Channel and the shore of Walney Island were included. This area was relevant to the far-field effects from Sellafield and encompassed the area taken to represent the predominant area of mixing of radionuclides in seawater arising from discharges from Barrow.

The terrestrial survey area (Figure 2, page 18) covered all land and bodies of freshwater within 5 km of the Barrow site centre (National Grid Reference: SD 192 689), to encompass the main areas of potential deposition from gaseous discharges.

The direct radiation survey area (Figure 2, p18) was defined as all land and water within 1 km of the Barrow 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 potential gaseous releases from the site.

The last aquatic habits survey conducted by Cefas along this stretch of coast was carried out in 1990 (Thurston *et al.*, 1993). Cefas has not previously conducted terrestrial or direct radiation habits surveys at Barrow.

Figure 1. The aquatic survey area

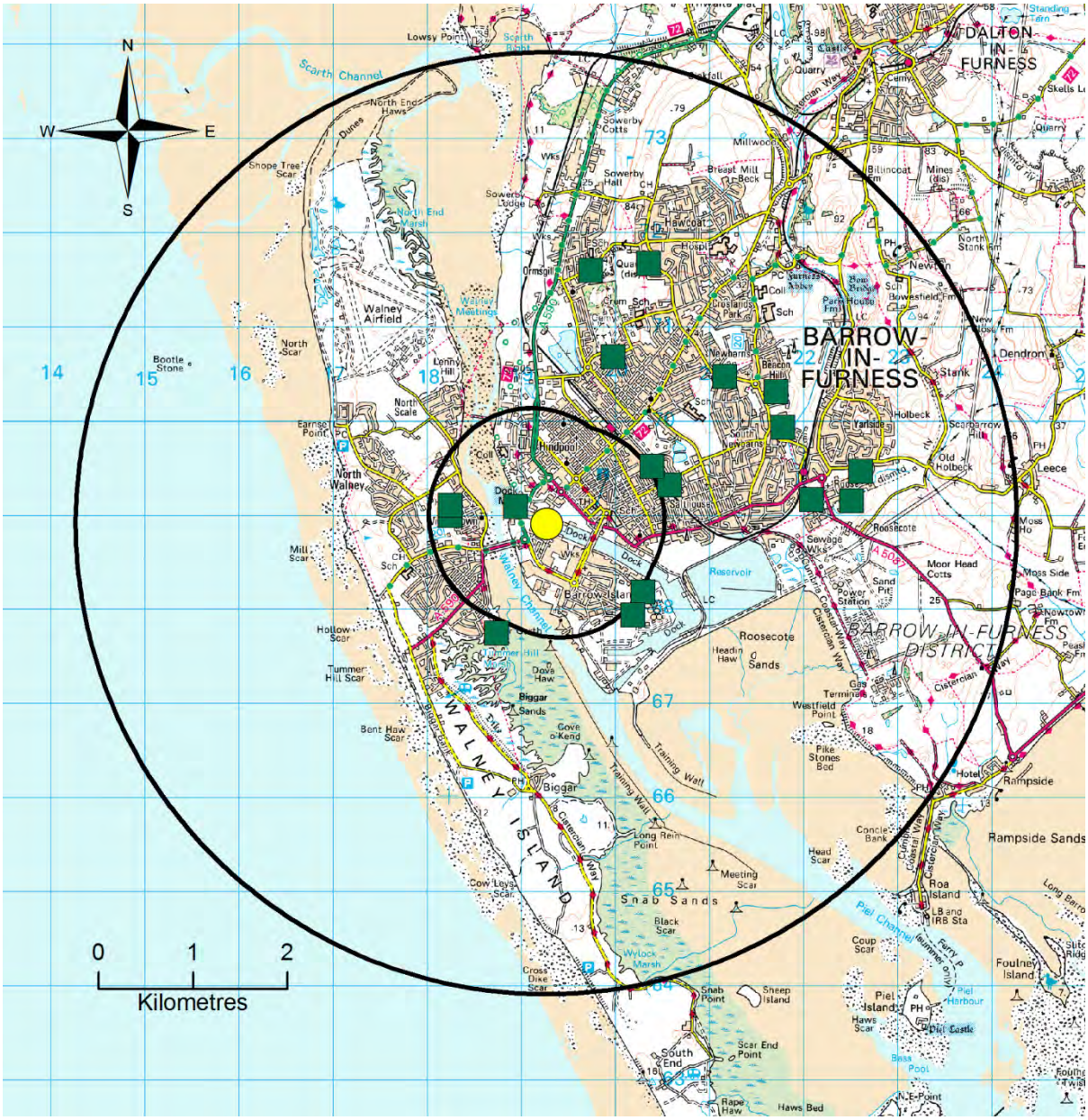

Figure 2. The Barrow terrestrial (outer ring) and direct radiation (inner ring) survey areas

Key

Site Centre

Allotment Sites

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 in the aquatic survey area. People with local knowledge of the survey area were contacted for information relevant to the various exposure pathways. These included representatives from councils, who provided information on allotment sites.

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 5th to the 15th June 2012 by a survey team of four 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 representatives from BAE Systems Marine 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, or subsequently:

- The submarine moored in the Devonshire Dock at the time of the survey was nearing completion but the reactor was not yet operational. Other submarines were in various stages of construction in the hall.
- The site only makes liquid discharges for a period of about three months every two and a half to three years. This is when the core plant is running during the commissioning of a new submarine. The liquid effluent is transferred from the submarine to an Effluent Treatment Plant on the dockside and after treatment it is discharged to the water utility company's sewer which flows to the Salthouse Wastewater Treatment Works. Up until 2002, when the sewage system was upgraded, treated liquid effluent was discharged to a sewer that flowed directly into the Walney Channel.
- The site holds permits to discharge gaseous waste but avoids making gaseous discharges during normal operations.
- The main source of direct radiation is the radiography source store, which is located within the licensed area. Radiography is carried out inside the licensed area and also in other parts of the BAE premises that are outside the licensed area.
- Wildlife does not have access to the controlled areas. A Seagull Management Programme is in operation throughout the BAE premises: debris is cleared from the gutters annually in order to discourage the birds from nesting and regular sweeps are made of ground level areas.
- Information was provided on the possible location of farms, smallholdings and beehives.

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, fishermen, anglers, sailors, people carrying out activities on intertidal areas, farmers, gardeners, and people living, working and undertaking recreational activities close to the site. 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.

For practical and resource reasons, the survey did not involve the whole population in the vicinity of the Barrow 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.statistics.gov.uk) there were approximately 59300 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 groups of people, such as the crew of a rescue boat, 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 rescue boat crew, the time spent on intertidal areas and on water.

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.

Where quantifiable data cannot be obtained from interviews but pathways are believed to exist, it is sometimes necessary to provide estimated habits data for use in dose assessments. In this series of habits survey reports, such data is usually presented in Annex 3. It was not necessary to estimate data for the Barrow survey, but Annex 3 is included in this report to maintain consistency of presentation through the series of reports.

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 listed below, together with those used in reports prior to 2010, for comparison.

Age ranges used from 2010 onwards

Name of age group[a]	Age range in group
• Infant	0 to 5-year-old
• Child	6-year-old to 15-year-old
• Adult	16-year-old and over

Age ranges used in reports prior to 2010

Name of age group	Age range in group
• 3-month-old	Under 1-year-old
• 1-year-old	1-year-old
• 5-year-old	2-year-old to 6-year-old
• 10-year-old	7-year-old to 11-year-old
• 15-year-old	12-year-old to 16-year-old
• Adult	17-year-old and over

Notes

[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 for children since 2010 will not be directly comparable with data for children 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. Three 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.

Thirdly, profiles have been produced that give a complete view of the habits of the individual that might lead to exposure to all the discharges and radiation from the site. The profiles are based on values calculated by the 'cut-off' method. The profiled data can be used to assess total dose integrated across all pathways of exposure.

Mean and 97.5th percentile consumption rates for adults based on national statistics have been derived by the Ministry of Agriculture, Fisheries and Food (MAFF) (now a part of the Department for Environment, Food and Rural Affairs, Defra) and the Food Standards Agency (Byrom *et al.,* 1995 and FSA, 2002), and these are referred to as generic rates in this report. The generic rates are used as a baseline for comparison with the observed rates.

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.statistics.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 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 (Figure 1, page 17) relating to the Barrow site and also the far-field effects of Sellafield, covered the intertidal areas along the coast of Cumbria between Tarn Point in the north and Roosebeck in the south, and the adjacent sea area up to 10 km offshore. The Duddon Estuary, Walney Channel and the shore of Walney Island were included. For the purposes of this survey the entire stretch of water between Walney Island and the mainland is referred to as the Walney Channel.

The northern part of the survey area, between Tarn Point and Haverigg Point, and the west coast of Walney Island have exposed shores of sand and stones. The Duddon Estuary and Walney Channel are more sheltered areas with extensive sand flats and mud flats that are exposed at low tide, and areas of fringing salt marsh. The small section of coast at the south end of the survey area, between the south end of the Walney Channel and Roosebeck, is within Morecambe Bay and this area also has extensive sand flats exposed at low water.

Tarn Point to Haverigg Point

Tarn Point marks the northern limit of the aquatic survey area. The shore at Tarn Point and at Selker Bay (see Figure 3), just to the south, is predominantly large stones, with patches of sand exposed at low tide on the lower shore. The area is not well used by the public since there are no roads giving access nearby and the large stones are difficult to walk over. However, a few walkers and dog walkers made their way along the shore from parking places at Tarn Bay, which was outside the survey area to the north, and one individual was identified who collected fire wood and small quantities of mussels and winkles from Selker Bay.

From Selker Bay, past Gutterby, to Silecroft, approximately 9 km further south, the shore continues to be a mix of sand and stones, becoming increasingly sandy further south. A small river enters the sea to the south of Selker Bay and low cliffs back the shore in the area around Gutterby. This entire stretch of coast can only be accessed by a few private farm tracks or by long walks on cross country footpaths or along the shore, and is little used by the public. The only activity noted at the time of the survey was angling at Gutterby.

At Silecroft there is a band of stones along the upper shore with a mix of sand and stones on the lower shore. A caravan site is located nearby and there is a large public car park close to the shore with a stone ramp down to the beach which can be used for launching small boats from road trailers. The area was popular with walkers, dog walkers, anglers and people playing on the beach. A limited

amount of bait digging took place out on the sands and horse riders were observed. Individuals were recorded swimming, body boarding and kayaking off the beach.

Figure 3. Selker Bay

South from Silecroft the shore continues as a band of stones with sand flats below, but towards the mouth of the Duddon Estuary, around Haverigg Point, the stones fade out and the sand flats become more extensive. A broad area of sand dunes backs the shore at Haverigg Point and there is no direct road access along this stretch of coast.

Haverigg Point to Millom Iron Works

Situated to the east of Haverigg Point, the village of Haverigg is a popular coastal resort with large car parks close to the beach and a caravan park and holiday chalets close by. The upper shore is predominantly sand but there are patches of stones around the mouth of a small river that cuts through the village before entering the sea. At low tide, wide sand flats are exposed that extend out into the Duddon Estuary. A few yachts and other pleasure boats, which rest on sediments at low water, are moored in the river or anchored just offshore. A tarmac ramp leads to the beach and this is used for launching a volunteer inshore rescue boat that is based nearby and also small pleasure boats brought by road trailer. The sand beach was popular for walking, dog walking, angling and playing. Horse riders were observed out on the sands and individuals were recorded paddling and kayaking in the water.

To the east of Haverigg there is a large brackish lagoon that is separated from the sea by an earth embankment reinforced with boulders and concrete slabs on its seaward face. Water skiing takes

place within the lagoon and a track runs along the top of the embankment providing access to the seaward side. Anglers cast into the sea from the concrete slabs and one individual was identified collecting small quantities of mussels from the rocks facing the embankment, for his own family's consumption.

Eastwards from the embankment, the upper shore at Hodbarrow is sand and stones backed by low rock cliffs, changing to sand backed by low sand dunes further east. The shore at Hodbarrow can be accessed from Haverigg via the track along the embankment and from another track round the landward side of the lagoon, or from the town of Millom by footpaths across the fields. The area was popular with anglers, who fished from the upper shore at high tide or made their way out across the sand flats to fish in the estuary channel at low tide. The beach was also used by dog walkers and people playing and sitting.

From the point at the north-east end of Hodbarrow beach a dilapidated quay, which is used by anglers at high tide, extends north-west towards Millom Iron Works Nature Reserve. The quay gives way to a rubble embankment in front of the nature reserve and a track down the embankment provides access to the shore from a parking area at the end of an approach road. The upper shore in this area is a mix of mud and stones. This was a very popular place for collecting peeler crabs from among the stones, for use as angling bait (see Figure 4). Several individuals also built small shelters out of house bricks or laid sections of plastic pipe and old car tyres to attract the crabs by providing hiding places for them. At low water a shallow channel flows close to the shore but many people wade across it in order to dig for lugworms for angling bait on the extensive sand flats on the other side.

Figure 4. Near Millom Iron Works Nature Reserve.

To the west of the approach road, the coast turns northwards, creating a sheltered bay where a few angling boats and other small pleasure craft are moored.

Millom Iron Works to Askam-in-Furness

From Millom northwards to where the River Duddon enters the Duddon Estuary, near Broughton-in-Furness, there are extensive areas of salt marsh along almost all of the shore (see Figure 5). Most of the marshes are only accessible via farm tracks or from a footpath on top of the earth embankment on the landward side of the marshes. Dog walkers that used the marsh near Millom mainly stayed on the embankment path, which was above the high water mark. Several local farmers grazed sheep on the salt marshes for all or part of the year and spent time on the marshes tending their livestock. The marshes were also used for shooting by the members of a wildfowling association. Farmers occasionally went out onto the sand flats in the northern part of the estuary to rescue stray sheep but, although it was possible to walk across the sand flats from one side of the estuary to the other, no other activities were identified taking place on the sand flats in this area.

Figure 5. West side of the Duddon Estuary

From Broughton-in-Furness southwards towards Askam-in-Furness on the east side of the Duddon Estuary the shore is predominantly sand with a few patches of stones and several belts of salt marsh. Wildfowling and sheep grazing took place on the salt marshes but there were few access points to the shore and no other activities were identified taking place on the intertidal zone in this area at the time of the survey.

At Askam-in-Furness there is a car park close to the shore and multiple access points to the shore from the town. A prominent pier, made from slag from a former iron works, extends out into the sands of the estuary and a few anglers fish from the pier at high water. The shore is mainly sand but to the north of the pier there is a patch of salt marsh and several angling and pleasure boats are kept pulled up on the marsh or moored in the mud gullies running through it. One individual was identified who lived on a houseboat in this area. An inshore rescue boat is kept in a hut above the shore and a few angling boats are kept in compounds close by. Vehicles are used to tow these craft down a track to the beach for launching. At low tide the boats are towed a long way across the sands to reach the deep water channel further south. The beaches at Askam-in-Furness, particularly those on the south side of the pier (see Figure 6), were popular recreational areas used by dog walkers and people playing. A limited amount of bait digging took place on the sands offshore and one person was identified pleasure riding on a quad bike. A guided adventure walk takes place across the sands of the estuary between Askam-in-Furness and Millom, approximately once per year.

Figure 6. South side of the pier at Askam-in-Furness

Askam-in-Furness to Lowsy Point

Approximately 2 km south of Askam-in-Furness there is a car park close to the shore at Roanhead, which provides access to the dunes of the Sandscale Haws National Nature Reserve to the west, as well as the beaches in the area. The shore at Roanhead and around Sandscale Haws is predominantly sand with isolated patches of mixed sand and stones. At low tide the sand flats of Duddon Sands are exposed, extending up to approximately 3 km from the shore. The area was popular with visitors, and individuals were recorded dog walking, angling, playing, kite flying and bait digging.

To the south of Sandscale Haws, Lowsy Point marks the northern limit of the Walney Channel. There are large areas of stones on the upper shore around the point and the lower shore is sand. Close to the shore there is an isolated community of about twenty former fishermen's huts which are now used as holiday homes. Many of the residents have small boats, which they launch across the shore using tractors, and are engaged in hobby fishing and boat angling. Bait digging, dog walking and shore angling were identified taking place in the area and a few people collected small quantities of cockles for their own consumption from out on the sands.

The west coast of Walney Island

A band of stones forms the upper shore along the whole length of the west coast of Walney Island and the lower shore is composed of patches of sand, patches of stones and patches of mixed sand and stones. The area is close to the population centres of Vickerstown and Barrow-in-Furness and is popular with visitors. Most activities took place close to the four car parks spread along the coast.

At West Shore Park (see Figure 7), located towards the north end of Walney Island, there is a large car park and a concrete slipway provides access to the shore. There is a holiday park and kite-surfing school close by and the area is popular with kite-surfers, windsurfers, anglers, and families having days out on the beach, playing and swimming.

Figure 7. West Shore Park on the west coast of Walney Island

Further south there are two car parks in the vicinity of Biggar Bank and this area attracted many visitors including walkers, dog walkers, anglers, bait diggers, and people collecting crabs, playing and swimming.

Towards the south end of the island there is a car park at Low Bank and although the shore here was not as busy as further north, it attracted a few visitors. Individuals were recorded dog walking, angling, quad biking and collecting small quantities of winkles for their own consumption. Wildfowling was reported to take place on the shore towards the southern end of the island. Oyster spat were reared commercially in flooded gravel pits at the south end of the island but the operation did not involve intertidal activities.

The Walney Channel (taken as the entire stretch of water between Walney Island and the mainland)

The north end of the Walney Channel dries out almost entirely at low tide, revealing wide sand flats and mud flats. There is a large area of salt marsh on the Walney Island side of the channel and a smaller area of salt marsh in Scarth Bight, on the mainland side. The central section of the Walney Channel, from Walney Meetings southwards to the entrance to Barrow Docks, is narrower and the substrate is a mix of mud, sand and stones. There is a large mussel bed at Walney Meetings and several other mussel beds scattered throughout this section. A channel, which retains water at low tide, extends southwards from just north of the Jubilee Bridge. To the south of the dock entrance there are extensive sand flats and mud flats on both sides of the channel with large areas of salt marsh on the Walney Island side and smaller areas of salt marsh at Roosecote Sands on the mainland side. At the southern end of the Walney Channel there are four islands; Sheep Island, Piel Island, Roa Island and Foulney Island. Roa Island is accessible by road along a causeway from the mainland and Foulney Island can be reached on foot from the mainland by a path along a stone causeway.

A wide variety of activities took place in the Walney Channel. It was a very popular boating area and many yachts, pleasure boats, angling boats and fishing boats were moored in the channel, mainly in the area close to the Jubilee Bridge (see Figure 8). Many of the boats rested on the sediment at low tide and individuals were identified carrying out maintenance on their boats which were resting on mud and sand. A sailing club with 80 members had its own slipway on the east side of the channel just to the north of the Jubilee Bridge and slightly further north there was a compound on the quay where fishermen stored their gear. On the opposite side of the channel there is a public slipway, which is a popular place for launching small boats and jet-skis brought by road trailers. A boat club, with its own boat compound, storage huts and slipway is located on the east side of the channel approximately 1 km to the south of the bridge. The club had 45 adult members and 30 junior members and catered for yacht sailors, boat anglers and hobby fishermen. At Roa Island, at the south end of the Walney Channel, there is a boat club and a lifeboat station with both an inshore and an offshore lifeboat. The boat club had 180 members and catered for yacht sailors, dinghy sailors,

boat anglers, and windsurfers. Many yachts and other pleasure boats were moored in the waters around Roa Island. A very small passenger ferry from Roa Island took visitors across to Piel Island.

Figure 8. The Walney Channel, near Jubilee Bridge

A limited amount of commercial and hobby fishing took place within the Walney Channel. One individual was identified that set nets from the shore in Scarth Bight. Water sports and boating activities identified taking place in the channel, mainly in the area around Piel Island and Roa Island, included boat angling, sailing, windsurfing, kite-surfing, kayaking, canoeing, jet skiing, swimming, snorkelling and recreational sub-aqua diving. Commercial sub-aqua divers worked in the channel and within the docks.

A few individuals were identified shore angling, bait digging and collecting peeler crabs for use as angling bait, mainly in the area between Walney Meetings and just south of the Jubilee Bridge. Mussels and winkles were collected both by commercial collectors and people gathering for their own consumption. Mussels were mostly collected from the area around Foulney Island but also from the central area of the channel. Winkles were collected from the north-east of the channel, from central areas, from the channel training wall on the south-east side of the channel, from around Piel Island and from around Roa Island. Several people collected cockles for their own consumption from the sand flats to the north-east and south-east of Walney Island. Other individuals hooked out lobsters from among the rocks at low tide, for their own consumption, and one individual collected small quantities of *Porphyra* commercially from stones in the channel. Several individuals collected small quantities of samphire for their own consumption from the shore between Roa Island and Rampside, Scarth Bight, the west of Barrow Island and south-east Walney Island.

Wildfowling took place in Scarth Bight and off south-east Walney Island and was reported to occur on Roosecote Sands. The shore along the west side of the causeway to Roa Island was a popular area for dog walking and occasional dog walkers were recorded on the sands in the north of the Walney Channel and off the south-east of Walney Island. A family was identified living on a houseboat moored on the east side of the causeway to Roa Island.

The port at Barrow-in-Furness was used mainly by bulk carrying cargo vessels and boats servicing the offshore wind farms. Ships transporting nuclear materials to and from Sellafield also used the port and cruise liners docked there occasionally. The port was protected by lock gates that retained the water level at low tide so the vessels did not rest on sediments. Periodic dredging took place in the port and its approaches in the south end of the Walney Channel in order to maintain the water depth for ships to pass safely.

Rampside to Roosebeck

At Rampside there is a small area of salt marsh but towards Roosebeck the upper shore is sand and stones. At low water, extensive sand flats are exposed, extending out into Morecambe Bay (see Figure 9). A road, with parking along its side, runs close to the shore between Rampside and Roosebeck, and the beaches in this area are popular for walking and dog walking. Bait digging took place on the sand flats at low tide and angling took place from the sea wall at Roosebeck at high tide. The area was used for kite-surfing, windsurfing and canoeing, and wildfowling was reported to take place. There was an oyster farm, where Pacific oysters were cultivated, approximately 4 km offshore from Roosebeck. The oysters were grown on trestles which were accessed using tractors across the sands at low tide.

Figure 9. Between Roosebeck and Rampside

4.2 Commercial fisheries

Commercial fisheries in the area were limited and only one full time commercial fisherman and a few part time fishermen were identified. It was reported that several fishermen, who had sold up and left the industry when the wind farms were built on many of the traditional fishing grounds offshore, were attempting to start fishing again.

There were no fishing ports in the area. Most fishing boats were kept moored in the Walney Channel and there was a compound used for storing fishing gear at the quay near to the Dock Museum.

Several different commercial fishing activities were identified and most were on a very small scale. These included: gill netting for grey mullet and bass; gill netting for cod; potting for whelks; otter trawling for mixed whitefish; hand gathering mussels, winkles and seaweed; oyster farming.

Gill netting for grey mullet and bass took place mainly in the Walney Channel during the summer months and involved working from the shore as well as from boats. Gill netting for cod and other whitefish was mainly carried out during the winter in the waters to the west of Walney Island and off the mouth of the Duddon Estuary. Potting for whelks was mainly carried out in the south end of the Walney Channel. Most of the trawling for mixed whitefish was carried out to the west and south of Walney Island. Catches of whitefish included cod, whiting, plaice, flounder, lemon sole and a wide variety of other species. It was reported that fishing boats based outside the survey area occasionally fished within the survey area.

Mussels were collected by hand at low tide, mainly from the area around Foulney Island but also from the Walney Channel. Both edible size mussels and seed *(i.e.* immature) mussels were collected. The mussel fishery attracted collectors from outside the survey area as well as local people, but most individuals only collected mussels for a few days each year. Small quantities of winkles were also collected by hand from around Roa Island and the north-east of the Walney Channel.

During most years there is a good settlement of seed mussel on a bank to the south-east of Foulney Island called South America, but the bank is exposed and the small mussels are in danger of being swept away in winter storms. A large shellfish merchant based in Barrow-in-Furness reported that he planned to dredge seed mussel from South America and relay them in the sheltered area around Walney Meetings in the Walney Channel, after first removing the natural mussel beds found there, which are of poor quality. The mussels would be left to grow overwinter in the channel before being sold on to growers elsewhere. This venture had not commenced at the time of the survey. The same merchant also reported that he hoped to start a fishery for razor shells off the mouth of the Duddon Estuary and that he had already carried out experimental fishing trials.

Pacific oysters spat were reared in flooded gravel pits at the south end of Walney Island and grown on at an oyster farm situated about 4 km offshore from Roosebeck. One individual collected small quantities of seaweed (*Porphyra*) from the Walney Channel on a commercial basis.

The sands off Roosebeck are part of the potential cockle fishing area of Morecambe Bay. Historically, there has been an important cockle fishery in Morecambe Bay but the cockle beds have been closed by the authorities since 2008 owing to low stocks and the small size of the cockles. It is not known when, or if, the beds will be opened again. When the fishery was last open it attracted gangs from outside the area as well as local people. The method of fishing for cockles is by hand raking at low water.

4.3 Destination of seafood originating from the aquatic survey area

Most of the fish and shellfish were sent to destinations outside the survey area.

Grey mullet, bass and other whitefish were mainly sold through Fleetwood fish market, from where they were distributed nationally. Whelks were mainly sold to a merchant in Fleetwood for export. Mussels and winkles were bought by wholesalers based in Barrow-in-Furness and at Newbiggin, which is just outside the survey area in Morecambe Bay. Edible size mussels were sold on to operations in south-west England and France for depuration and seed mussels were sold on for relaying in Wales and Europe. Winkles were mainly sent to France. Pacific oysters were sold for further growing on, mainly in Scotland, Ireland and France. Seaweed (*Porphyra*) was sold to a commercial producer of laverbread in Wales. Small quantities of fish, and shellfish were sold directly to the public by the fishermen.

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

In this report, the term ‘hobby fishing’ is used to describe recreational fishing on a small scale with gear such as nets or pots. It is usually carried out by fishermen who do not have commercial fishing licences and therefore it is illegal to offer the catch for sale. Several hobby fishermen operated in the survey area and they mainly used gill nets, lobster pots and trawl nets. One individual was identified who set nets from the shore in Scarth Bight, at the north end of the Walney Channel. At low tide, brown crabs and common lobsters were hooked out from among the stones on the west side of Walney Island and in the Walney Channel, particularly around Piel Island. It was reported that recreational divers sometimes collected lobsters while diving in the Walney Channel. Hobby fishermen mainly caught bass, grey mullet, flounder, plaice, brown crabs and common lobsters. The catches were consumed by the fishermen’s families and friends.

A charter angling boat based in the Walney Channel offered occasional angling trips to the south and west of Walney Island but also fished at offshore wrecks outside the survey area. Many private

angling boats were moored or launched from slipways in the Walney Channel and a few were kept near Millom Iron Works, at Askam-in-Furness and at Lowsy Point. Shore angling was popular at many locations including Silecroft, Haverigg, Hodbarrow, Askam-in-Furness pier, Roanhead, Lowsy Point, the west coast of Walney Island, near the Jubilee Bridge in the Walney Channel and off the seawall at Roosebeck. The main edible species caught by shore anglers were bass, cod, dab, flounder and plaice. Boat anglers caught the same species as shore anglers and also caught mackerel.

Ten individuals were identified who collected small amounts of molluscs, including cockles, mussels and winkles for their own family's consumption. The cockles were collected from the sand flats off the north-east and south-east of Walney Island and in the Duddon Estuary near Lowsy Point. The mussels were collected from the Walney Channel, Foulney Island, Hodbarrow and Selker Bay. The winkles were collected from the Walney Channel, the south-west of Walney Island and Selker Bay. One recreational diver was identified who collected whelks while diving at the south end of the Walney Channel and it was reported that other individuals caught or collected whelks from the area around Piel Island.

4.5 Salthouse Wastewater Treatment Works

Activities at the Salthouse Wastewater Treatment Works were investigated because liquid waste from the Barrow site is discharged via the sewer pipes to these works where it undergoes an activated sludge sewage treatment process. (Prior to 2002, when the sewer system was upgraded, liquid discharges were made to a sewer that flowed directly into the Walney Channel without going through a sewage treatment plant).

During the sewage treatment process, solid matter settles out to form sludge. The sludge has further treatment to remove water, which produces sewage cake. The sewage cake is taken away from the plant by contractor's lorries and spread on farmland as a fertiliser and soil conditioner, mainly in Cumbria. No farms in the terrestrial survey area were identified that had sewage cake applied to the land. The treated water is discharged into the Walney Channel via a pipeline across Roosecote Sands.

Employees and contractors at the wastewater treatment works spent time in close proximity (<10 metres) to the sewage, sewage sludge and sewage cake while carrying out their duties. The works were compact so the employees were within 10 metres of the sewage or its products for almost all of the time they were at the works. Occupancy rates for these employees and a contractor are presented in Section 4.12.

It was reported that the only activities likely to take place in the sewers between the Barrow site and the wastewater treatment works were repairs in the case of a collapse or cleaning in the case of a blockage. Both of these were considered to be rare events.

4.6 Wildfowling

Three wildfowling clubs were identified that shot within the survey area. One club had approximately 30 members, another club had approximately 50 members and the third club had approximately 55 members. The wildfowling season extended from 1st September to 20th February but the clubs imposed more restrictive dates in some areas. Wildfowling took place on salt marshes and intertidal areas on the west and east banks of the Duddon Estuary, at the north end of the Walney Channel, on Roosecote Sands on the south-east side of the Walney Channel, on the south-west side of the Walney Channel and, to a lesser extent, on the south-west side of Walney Island and off Roosebeck in Morecambe Bay. A wide variety of wildfowl were being shot including Canada goose, greylag goose, mallard, pink-footed goose, pintail, shoveler, teal and wigeon. The shot wildfowl were consumed by the wildfowlers and their families and friends.

4.7 Other pathways

The Port of Barrow-in-Furness and the approaches to the port through the south end of the Walney Channel are regularly dredged in order to maintain the water depth for ships to navigate. Dredging is usually carried out two times per year over a period of five or six weeks each time, by a vessel using a suction dredge. The dredged sediment is dumped at a spoil ground near Lightning Knoll, approximately 7 km south of Walney Island. The dredger carries approximately 13 crew but the dredging process is highly automated and they have little physical contact with the sediment.

Sheep were identified grazing on salt marsh at seven farms in the aquatic survey area, two of which were also in the terrestrial survey area. The salt marshes where grazing took place were located on the west side of the Duddon Estuary and the south-west of Walney Island. It was reported that sheep were also grazed on salt marshes on the east side of the Duddon Estuary. Some sheep grazed on salt marsh all year, while others spent only part of the year on the marsh.

Seven people were identified collecting small quantities of samphire for their own consumption and for consumption by their families and friends. The samphire was collected from Scarth Bight, near the Boat Club on the west side of Barrow Island, on south-east Walney Island and between Roa Island and Rampside.

Two houseboats were identified. One was moored on the north side of the pier at Askam-in-Furness and the other was moored on the east side of the causeway to Roa Island. Both the vessels were kept on the higher shore and they rested on mud and sand for most of the time. The boat at Askam-

in-Furness was occupied by one adult and the boat at Roa Island was occupied by two adults and a child.

The use of seaweed as a fertiliser or animal fed was not identified.

4.8 Food consumption data

Consumption data for aquatic foods are presented in Tables 3 to 8 for adults and in Tables 9 to 11 for children and infants. The tables include the mean consumption rates for the high-rate groups and the observed 97.5th percentile rates calculated as described in Section 3.4.

Adults' consumption rates

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

Table A presents a summary of the adults' consumption rates for the following food groups: fish; crustaceans; molluscs; wildfowl; marine plants/algae; salt marsh grazed sheep meat. 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 rates have been determined for wildfowl, marine plants/algae or salt marsh grazed sheep meat.

Table A. 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	86	8	47.2	19.8	27.1	27.5	15.0	40.0
Crustaceans	8	2	17.7	6.1	11.9	15.7	3.5	10.0
Molluscs	23	4	6.8	4.8	5.9	6.5	3.5	10.0
Wildfowl	16	9	28.6	10.0	17.2	27.4	Not determined	Not determined
Marine plants/algae	7	4	0.9	0.5	0.7	0.9	Not determined	Not determined
Salt marsh grazed sheep meat	6	6	5.7	5.7	5.7	5.7	Not determined	Not determined

The predominant species of fish consumed by adults were bass, cod, flounder, mackerel and plaice, with smaller quantities of dab, conger eel, eel, grey mullet, lemon sole, thornback ray and whiting. Most of the fish were caught in the waters around Walney Island and offshore to the west of Walney Island, but smaller quantities were caught in the areas around Silecroft, Haverigg, Millom and Roosebeck. Of the fish consumed by the eight people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 30% mackerel, 20% bass, 20% cod, 15% flounder, 10% plaice and 5% of a mix of dab, conger eel, eel and thornback ray.

The species of crustaceans consumed by adults were brown crab and common lobster. Both these species were caught mainly in the Walney Channel and to the west of Walney Island. Of the crustaceans consumed by the two people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 55% brown crab and 45% common lobster.

The predominant species of molluscs consumed by adults were cockles, mussels, whelks and winkles. The cockles were collected from the sand flats off the north-east and south-east of Walney Island and in the Duddon Estuary near Lowsy Point. The mussels were collected from the Walney Channel, Foulney Island, Hodbarrow and Selker Bay. The whelks were caught or collected from the south end of the Walney Channel and the winkles were collected from the Walney Channel, the south-west of Walney Island and Selker Bay. Of the molluscs consumed by the four people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 40% cockles, 30% whelks, 20% winkles and 10% mussels.

The predominant species of wildfowl consumed by adults were greylag goose, mallard, pink-footed goose and pintail, with smaller quantities of Canada goose, shoveler, teal and wigeon. These were shot on salt marshes and intertidal areas on the west side of the Duddon Estuary, Scarth Bight and the south-east and south-west of Walney Island. Of the wildfowl consumed by the nine people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 25% pink-footed goose, 25% greylag goose, 20% mallard, 10% pintail and 20% of a mix of Canada goose, shoveler, teal and wigeon.

The only species of marine plants/algae consumed by adults in this area was samphire, which was collected from the shore between Roa Island and Rampside, Scarth Bight, the west of Barrow Island and south-east Walney Island.

Adults' consumption of lamb meat from animals that had grazed on the salt marshes on the west side of the Duddon Estuary was identified.

Children's and infants' consumption rates

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

Table B. Summary of children's and infants' 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	8	5	11.5	4.1	7.4	11.4
Molluscs	4	2	0.9	0.5	0.7	0.9
Wildfowl	1	1	12.9	12.9	12.9	Not applicable
Infant age group (0 – 5 years old)						
Fish	1	1	6.5	6.5	6.5	Not applicable
Wildfowl	1	1	1.4	1.4	1.4	Not applicable

The predominant species of fish consumed by the individuals in the child age group were bass, flounder and plaice, with smaller quantities of cod and dab. The species of fish consumed by the individual in the infant age group were bass, cod, dab, flounder and plaice.

The species of mollusc consumed by the individuals in the child age group were cockles and mussels.

The species of wildfowl consumed by the individual in the child age group were Canada goose, greylag goose, mallard, pintail, teal and wigeon. The species of wildfowl consumed by the individual in the infant age group were, Canada goose, greylag goose, pintail, teal and wigeon.

4.9 Intertidal occupancy

Intertidal occupancy rates for adults are presented in Table 12 and intertidal occupancy rates for children and infants are presented in Table 13. 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 C 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 C. 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	11	7	220	138	217
Mud and sand	9	1	625	625	536
Mud and stones	12	3	420	400	420
Salt marsh	23	16	293	287	293
Sand	94	7	1460	926	1076
Sand and stones	47	17	616	368	614
Boat on mud and sand	5	3	7615	5517	7364

The activities undertaken by people in the adult high-rate groups for occupancy over the following intertidal substrates included:

- For mud: collecting mussels off Foulney Island; wildfowling in the south-east of Walney Island; angling and boat maintenance in the Walney Channel.
- For mud and sand: dog walking in the north-east of the Walney Channel; wildfowling at Scarth Bight; collecting winkles in the south of the Walney Channel.
- For mud and stones: boat maintenance in the Walney Channel.
- For salt marsh: tending livestock and wildfowling on marshes in the west Duddon Estuary.
- For sand: oyster farming offshore of Roosebeck; bait digging near Millom Iron Works; angling at Hodbarrow and Haverigg; dog walking at Hodbarrow and the south-west of Walney Island (Low Bank); sitting on the beach at Hodbarrow.
- For sand and stones: angling at Silecroft, Roanhead, west Walney Island (Biggar Bank), west Walney Island (West Shore Park) and south-west Walney Island; dog walking at Silecroft and west Walney Island (Biggar Bank); boat maintenance on the west side of Barrow Island in the Walney Channel
- For boat on mud and sand: boat dwelling (tide out) near Roa Island and at Askam-in-Furness.

Children's and infants' intertidal occupancy rates

Table D 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 D. 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)					
Sand	20	2	742	710	711
Sand and stones	4	1	200	200	189
Boat on mud and sand	1	1	3830	3830	Not applicable
Infant age group (0 – 5 years old)					
Sand	3	1	149	149	143
Sand and stones	3	3	52	52	52

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

- For sand: dog walking and angling at Hodbarrow; bait digging near Millom Iron Works
- For sand and stones: dog walking at Tarn Point and Selker Bay
- For boat on mud and sand: boat dwelling (tide out) near Roa Island

For individuals in the infant age group high-rate groups, one child was identified playing on sand at west Walney Island (West Shore Park) and three other individuals were identified playing on sand and stones at west Walney Island (Biggar Bank).

4.10 Gamma dose rate measurements

Gamma dose rate measurements were taken over seven intertidal substrates. All measurements were taken at a height of 1 metre above the substrate. The results are presented in Table 14 and are summarised below.

- Three measurements taken over mud ranged from 0.077 µGy h^{-1} to 0.081 µGy h^{-1}
- One measurement taken over mud and sand was 0.079 µGy h^{-1}
- Five measurements taken over salt marsh ranged from 0.064 µGy h^{-1} to 0.126 µGy h^{-1}
- Thirteen measurements taken over sand ranged from 0.058 µGy h^{-1} to 0.101 µGy h^{-1}
- Two measurements taken over stones ranged from 0.100 µGy h^{-1} to 0.108 µGy h^{-1}
- One measurement taken over mud and stones was 0.073 µGy h^{-1}
- One measurement taken over sand and stones was 0.087 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, NIEA and SEPA, 2012).

4.11 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 15 and handling rates of sediment for children are presented in Table 16. No children were identified handling fishing gear and no infants were identified handling fishing gear or sediment.

Adults' handling rates of fishing gear and sediment

Table E 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 E. 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	10	3	1485	990	1318
Handling sediment	72	19	546	311	350

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

- For handling fishing gear: handling nets in the Walney Channel, west of Walney Island and in the Duddon Estuary; handling pots in the Walney Channel.
- For handling sediment: oyster farming offshore of Roosebeck; wildfowling at the west Duddon Estuary marshes and south-east and south-west Walney Island.

Children's handling rates of sediment

Table F 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 group and the observed 97.5th percentile rate.

Table F. Summary of children's handling rates of 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 sediment	4	1	52	52	49

The individual in the children's high-rate group for handling sediment was bait digging near Millom Iron Works.

4.12 Exposure to sewage, sewage sludge and sewage cake

Activities at the Salthouse Wastewater Treatment Works were investigated because liquid waste from the Barrow site is discharged via the sewer pipes to this works where it undergoes an activated sludge sewage treatment process. Table 17 shows the occupancy rates in close proximity (<10 m) to sewage, sewage sludge and sewage cake for the employees at the Salthouse Wastewater Treatment Works.

Five employees had occupancy rates of 1500 h y^{-1} in close proximity (<10 m) to sewage and 500 h y^{-1} in close proximity (<10 m) to sewage sludge and sewage cake. Three of the employees were operational staff, whose duties included debris removal, cleaning filters and tanks, monitoring gauges and operating machinery. They spent approximately 10% of their time cleaning tanks by swilling them out with hoses. Two of the employees were maintenance staff whose main duty was to maintain the pumps and equipment. A contractor, who worked full time at the site operating machinery, had an occupancy rate of 1800 h y^{-1} in close proximity (<10 m) to sewage sludge and sewage cake.

A variety of other people visited the site for relatively small periods of time, including tanker drivers delivering industrial waste for treatment and lorry drivers collecting sewage cake.

4.13 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 minor 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 for adults are presented in Table 18. Occupancy rates for activities taking place 'in water' and 'on water' for children and 'in water' for infants are presented in Table 19. No infants were identified spending time 'on water'. Data for members of clubs and organisations were gained through interviews with their representatives.

Activities in the water

The activities identified taking place in the water in the aquatic survey area were swimming, snorkelling, sub-aqua diving, windsurfing, kite-surfing, body-boarding, kayaking and jet skiing. Thirty-six observations were recorded for adults, nine observations for the child age group and one observation for the infant age group. The highest occupancy rate for adults was 140 h y^{-1} for two individuals who were jet skiing and sub-aqua diving in the Walney Channel and at Piel Island. The highest occupancy rate for children was 200 h y^{-1} for an individual kayaking from Tarn Point to Silecroft. The individual in the infant age group was swimming at west Walney Island (West Shore Park) for 21 h y^{-1}.

Activities on the water

The activities taking place on the water in the aquatic survey area were sailing, canoeing, boat angling, gill netting, potting, trawling, dredging, charter boat skipper, working on a boat, RNLI duties, rescue boat duties, boat dwelling (tide in), fixing moorings and paddling. One hundred and fifteen observations were recorded for adults and six observations were recorded for individuals in the child age group. The highest occupancy rate for adults was 3100 h y^{-1} for an individual who was working on a boat off Walney Island and performing rescue boat duties in the Duddon Estuary. The highest occupancy rate for individuals in the child age group was 1000 h y^{-1} for a child who was boat dwelling (tide in) near Roa Island.

5 TERRESTRIAL RADIATION PATHWAYS

5.1 Terrestrial survey area

The terrestrial survey area (Figure 2, page 18) covered all land and bodies of freshwater within 5 km of the Barrow site centre (National Grid Reference: SD 192 689). Most of Walney Island, which lies to the west of the site on the other side of the Walney Channel, fell within the terrestrial survey area.

Much of the land in the terrestrial survey area is taken up by urban developments. The site is situated in the dock area on the southern edge of the town of Barrow-in-Furness and built up areas extend away from the site to the north and east. The small area of land to the south of the site, known as Barrow Island, is also mainly a built-up area. To the west, on the other side of the Walney Channel, the central part of Walney Island is mainly occupied by the urban area of Vickerstown and the villages of North Scale, North Walney and Tummer Hill. Most of the northern part of Walney Island is taken up by an airfield and a large nature reserve. The main area of agricultural land within the survey area lies beyond the town of Barrow-in-Furness, towards the outside of the 5 km area, to the north and east. The southern part of Walney Island is also predominantly agricultural land and there are a few fields in the central and northern parts of the island. There is a freshwater reservoir near Ormsgill on the west side of Barrow-in-Furness and a stream called Mill Beck runs north to south through the eastern outskirts of Barrow-in-Furness and feeds a pond situated to the east of the dock area.

Fifteen farms and smallholdings were identified that farmed land in the Barrow terrestrial survey area. Of these farms:

- One produced milk (from dairy cattle) and beef cattle
- One produced milk (from dairy cattle), beef cattle and lambs
- Two produced milk (from dairy cattle) and lambs
- One produced milk (from dairy cattle)
- Five produced beef cattle and lambs
- Three produced beef cattle
- One produced lambs
- One produced lambs and geese

Additionally, several individuals owned one or two fields on Walney Island which were farmed on a small scale and mainly used for growing hay or grazing livestock.

Hay was grown for animal feed but no arable crops were produced for human consumption.

Farmers, smallholders and their families were consuming milk, beef, lamb and geese produced on their own farms and smallholdings. Four farmers/smallholders kept chickens for eggs for their own families' consumption. One smallholder kept turkeys and pigs for their own family's consumption and several farmers grew fruit and vegetables for their own families' consumption.

Seventeen allotment sites with a total of approximately 740 individual plots were identified within the survey area. The location of the allotment sites are shown in Figure 2, page 18. The allotment holders grew a wide variety of fruit and vegetables and some people kept chickens for eggs on the allotment sites.

Beekeeping was reported to take place in the survey area but the apiarists could not be contacted.

Blackberries, damsons, sloes and mushrooms were growing wild in the survey area and these were collected and consumed.

Many of the farmers and smallholders allowed a small number of people to go rough shooting on their land within the survey area. A wildfowling club held the shooting rights across the land owned by several of the farms. The shooters and their families consumed the shot pheasant and rabbit.

Brown trout were consumed by two individuals from a freshwater pond in the terrestrial survey area which was potentially affected by gaseous discharges.

The consumption of groundwater by humans or livestock was not identified. One remote household collected rainwater from the roof as their sole domestic supply. Most livestock were supplied with mains water for drinking and at several farms livestock also had access to spring, stream or ditch water.

5.2 Destination of food originating from the terrestrial survey area

Beef cattle and lambs were sold through livestock auction markets in Lancashire, Kent and Cumbria. Beef cattle and lambs were also sent to abattoirs or sold to a processing factory outside the survey area. Milk was sold to a local co-operative, national distributors and supermarket chains. Geese were sold through a livestock auction in Lancashire at Christmas time. Chicken eggs were sold from the gate at one farm.

5.3 The potential transfer of contamination off-site by wildlife

Measures are taken in order to limit the possibility that contamination is transferred offsite by wildlife. Wildlife cannot gain access to the controlled areas and a Seagull Management Programme is in

operation throughout the BAE dockyard, where debris is cleared from the gutters annually in order to discourage the birds from nesting and regular sweeps are made of ground level areas.

5.4 Food consumption data

Consumption data for locally produced foodstuffs potentially affected by deposition of gaseous discharges are presented in Tables 20 to 34 for adults and Tables 35 to 48 for children and infants.

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 49.

Adults' consumption rates

Consumption of locally produced foods was identified in the following 15 food groups: green vegetables; other vegetables; root vegetables; potato; domestic fruit; milk; cattle meat; pig meat; sheep meat; poultry; eggs; wild/free foods; rabbits/hares; wild fungi; freshwater fish. No consumption of honey, cereals or venison was identified.

Table G 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 calculated as described in Section 3.4. 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 freshwater fish.

Table G. 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} or l y^{-1})	Observed minimum for the high-rate group (kg y^{-1} or l y^{-1})	Observed mean for the high-rate group (kg y^{-1} or l y^{-1})	Observed 97.5th percentile (kg y^{-1} or l y^{-1})	Generic mean (kg y^{-1} or l y^{-1})	Generic 97.5th percentile (kg y^{-1} or l y^{-1})
Green vegetables	76	28	30.1	10.5	16.4	29.4	15.0	45.0
Other vegetables	78	25	42.8	14.4	24.4	29.8	20.0	50.0
Root vegetables	87	41	37.3	12.5	25.0	35.3	10.0	40.0
Potato	72	25	54.5	18.2	26.5	40.3	50.0	120.0
Domestic fruit	65	6	57.0	19.5	28.8	26.7	20.0	75.0
Milk	11	11	414.9	155.6	284.4	414.9	95.0	240.0
Cattle meat	25	20	65.0	23.7	33.2	54.4	15.0	45.0
Pig meat	5	4	8.5	3.4	5.3	8.1	15.0	40.0
Sheep meat	20	15	11.3	4.5	7.6	11.3	8.0	25.0
Poultry	13	1	48.0	48.0	48.0	34.3	10.0	30.0
Eggs	46	9	59.3	20.1	34.3	41.6	8.5	25.0
Wild/free foods	17	6	3.5	1.8	3.2	3.5	7.0	25.0
Rabbits/hares	2	1	9.0	9.0	9.0	8.8	6.0	15.0
Wild fungi	18	2	3.9	3.9	3.9	3.9	3.0	10.0
Freshwater fish	2	2	3.5	3.5	3.5	3.5	Not determined	Not determined

Three mean consumption rates for the high-rate groups were found to be greater than the generic 97.5th percentile consumption rates. These were for milk, poultry and eggs. Ten mean consumption rates for the high-rate groups exceeded the generic mean consumption rates. These were for green vegetables, other vegetables, root vegetables, domestic fruit, milk, cattle meat, poultry, eggs, rabbits/hares and wild fungi. Four observed 97.5th percentile consumption rates exceeded the generic 97.5th percentile consumption rates. These were for milk, cattle meat, poultry and eggs.

Children's and infants' consumption rates

Fifteen individuals in the child age group and five individuals in the infant age group were identified consuming foods from the terrestrial survey area. Table H 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: honey; wild fungi; venison; cereals; freshwater fish. In the infant age group, no consumption of foods from the following food groups was identified: honey; pig meat; poultry; wild/free foods; rabbits/hares; venison; cereals; freshwater fish.

Table H. 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} or l y^{-1})	Observed minimum for the high-rate group (kg y^{-1} or l y^{-1})	Observed mean for the high-rate group (kg y^{-1} or l y^{-1})	Observed 97.5th percentile (kg y^{-1} or l y^{-1})
Child age group (6 - 15 years old)						
Green vegetables	11	4	11.5	4.8	7.1	10.1
Other vegetables	11	7	8.0	2.8	5.9	8.0
Root vegetables	11	6	12.2	4.4	7.2	11.4
Potato	12	6	16.3	7.6	10.3	15.2
Domestic fruit	9	4	3.2	1.1	2.0	2.9
Milk	2	2	155.6	155.6	155.6	155.6
Cattle meat	1	1	16.3	16.3	16.3	Not applicable
Pig meat	1	1	2.1	2.1	2.1	Not applicable
Sheep meat	1	1	2.8	2.8	2.8	Not applicable
Poultry	2	1	1.2	1.2	1.2	1.1
Eggs	7	3	41.6	29.6	37.6	41.6
Wild/free foods	2	2	0.3	0.3	0.3	0.3
Rabbits/hares	1	1	0.5	0.5	0.5	Not applicable
Infant age group (0 - 5 years old)						
Green vegetables	2	1	3.5	3.5	3.5	3.5
Other vegetables	2	2	1.5	1.5	1.5	1.5
Root vegetables	3	2	5.9	2.1	4.0	5.7
Potato	3	1	8.5	8.5	8.5	8.1
Domestic fruit	1	1	0.4	0.4	0.4	Not applicable
Milk	1	1	86.5	86.5	86.5	Not applicable
Cattle meat	2	2	9.5	9.5	9.5	9.5
Sheep meat	3	3	2.4	1.1	1.5	2.3
Eggs	3	2	8.9	8.9	8.9	8.9
Wild fungi	1	1	0.1	0.1	0.1	Not applicable

6 DIRECT RADIATION PATHWAYS

6.1 Direct radiation survey area

The direct radiation survey area (Figure 2, page 18) covered all land and water within 1 km of the Barrow nuclear licensed site boundary. The occupancy data collected from the direct radiation area is also applicable to the direct exposure arising from potential gaseous releases from the site.

Only part of the BAE works at Barrow is a nuclear licensed site. The licensed area is situated on the northern side of the BAE premises and includes part of the Devonshire Dock. The non-licensed area of the BAE works also contains sources of direct radiation.

The BAE licensed site is situated in a heavily built-up area that includes the town centre of Barrow-in-Furness. The direct radiation survey area was a very busy area and a wide range of residential, commercial, industrial and recreational activities took place within it. The narrow waters of the Walney Channel cut north to south through the western side of the direct radiation survey area, separating Walney Island from the mainland. To the south-east of the site, Devonshire Dock and the Buccleuch Dock together form a channel of water extending to the border of the direct radiation survey area. The land to the south of the licensed site, which is almost entirely surrounded by the waters of the Walney Channel and various docks, is known as Barrow Island.

Just to the north of the site there were are three modern retail parks that together contain over 20 large retail outlets, several fast food restaurants, a cinema complex, a sports centre and large car parking areas. Between the retail parks and the eastern shore of the Walney Channel there is a small industrial estate and further north there is a college of further education, two business parks which together hold approximately 60 offices and industrial units, and several other business premises.

The area to the north-east of the site, beyond the retail parks, contains the town centre shopping district and densely populated residential neighbourhoods. There are also many public buildings, offices, several schools and a sports stadium in this area. To the east of the site there is a large supermarket on the north side of Buccleuch Dock and a road bridge crosses the docks, providing access to Barrow Island from the town centre.

To the south of the licensed site most of the land in the northern part of Barrow Island is occupied by non-licensed areas of the BAE works, which also extend along the quays on the southern side of the eastern end of Devonshire Dock and the southern side of the Buccleuch Dock. The non-licensed area of the works is dissected by public roads that provide access to the south of Barrow Island. Immediately to the south-west of the licensed site there is a small triangular area with several residential streets and to the south of the non-licensed area, in the centre of Barrow Island, there is a

larger residential district with a nursery school and a primary school. Further south, near the outskirts of the direct radiation survey area, there are a few small industrial units, allotment sites, an area of vacant land and a boat club premises that is situated next to the Walney Channel. The depots and commercial docks at the south end of Barrow Island were outside the direct radiation survey area.

Between the western boundary of the licensed site and the Walney Channel there is a narrow strip of land which is occupied by the Dock Museum, a small quay where fishing boats are moored, allotment plots, a sailing club and public gardens. A main road passes the western edge of the licensed site and leads to the Jubilee Bridge nearby, which crosses the Walney Channel and provides the only road access to Walney Island. Many yachts and boats are kept moored in the Walney Channel within the direct radiation survey area.

The western side of the direct radiation survey area extends into Vickerstown on Walney Island, which is largely a residential area and includes several schools, two allotment sites and playing fields.

Proposals have been put forward to redevelop the unoccupied land at the south end of the direct radiation survey area on Barrow Island into a business park and construct a new marina on the north side of Buccleuch Dock. At the time of writing, these proposals have been shelved and it is not known if they, or any alternative schemes, will proceed.

Owing to the busy nature of the direct radiation survey area it was not possible to conduct interviews with people undertaking all the different activities that take place within it. Therefore effort was directed at conducting interviews with residents, since they were likely to have higher occupancy times than people undertaking other activities.

6.2 Residential activities

There were a high number of residential properties covering large parts of the survey area. The closest residences to the licensed site were in the triangular housing area immediately adjacent to the south-west of the site.

Interviews were conducted at 25 residential properties, four of which were occupied by families with children. Thirteen properties were within the 0 – 0.25 km zone, seven properties were within the >0.25 – 0.5 km zone and five properties were within the >0.5 – 1.0 km zone.

6.3 Leisure activities

A very wide range of leisure activities took place within the survey area, including, for example, visiting museums, cinemas, sports centres, public houses and nightclubs; watching sports at the 7600 person capacity sports stadium; playing sports on a number of playing fields; leisure shopping and

tending to allotments. There were coastal walks along most of the west bank of the Walney Channel and parts of the east bank. Many pleasure craft were moored in the Walney Channel and people spent time maintaining their boats and pursuing water-sports activities.

6.4 Commercial activities

Many businesses were located within the direct radiation survey area including shops, offices, leisure facilities and industrial units. A few fishermen spent time working aboard boats kept in the small harbour near the Dock Museum.

The activities of the BAE site employees and contractors while at work were not considered in the direct radiation survey, as radiation workers are subject to different radiation protection criteria.

6.5 Educational activities

Approximately eight nursery schools, 12 primary and junior schools, and one college of further education were identified in the direct radiation survey area. These were mostly located in the main area of the town to the north-east of the site but five schools and a nursery were located in Vickerstown on Walney Island and one school and one nursery were located on Barrow Island to the south of the site.

6.6 Occupancy rates

Table 50 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 51. A summary of occupancy rates in the direct radiation survey area is presented in Table I.

Many residents had very high occupancy rates since most of the services that they used, such as shops, were located inside the direct radiation survey area.

Table I. 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	41	8535	1400	8750
>0.25 - 0.5 km	24	7814	1178	8386
>0.5 - 1.0 km	16	8612	3039	8734

0 - 0.25 km from the nuclear licensed site boundary

Occupancy data were collected for 41 individuals in the 0 - 0.25 km zone. The observations were for 29 residents, four of whom also worked in the area and two of whom were attending school, nine visitors and three people who were working. The highest indoor occupancy rate was for a resident, with another resident having the highest total occupancy rate. The highest outdoor occupancy rate was for an individual who worked in the area.

>0.25 - 0.5 km from the nuclear licensed site boundary

Occupancy data were collected for 24 individuals in the >0.25 - 0.5 km zone. The observations were for 15 residents, one of whom also worked in the area and one of whom was attending school, eight jet skiers and one visitor. The highest indoor occupancy rate was for a resident who was also attending school; the highest outdoor occupancy rate and the highest total occupancy rate were also for residents.

>0.5 - 1.0 km from the nuclear licensed site boundary

Occupancy data were collected for 16 people in the >0.5 - 1.0 km zone. The observations were for 12 residents, three people performing boat maintenance tasks and one person collecting crabs. The highest indoor, outdoor and total occupancy rates were for three different residents.

6.7 Gamma dose rate measurements

Gamma dose rate measurements were taken indoors and outdoors at most properties where interviews were conducted in the Barrow direct radiation survey area. Where possible, outdoor measurements were taken over grass and approximately 5 to 10 metres from the nearest building, but owing to the heavily built-up nature of the direct radiation survey area this was not usually feasible and most measurements were taken over concrete or tarmac at distances less than 5 metres from buildings. Gamma dose rate measurements over rough grass were taken at locations at distances 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. It should be noted that the indoor and outdoor measurements have not been adjusted for background dose rates. The results are presented in Table 52 and are summarised below.

Indoor measurements

- Seven measurements taken over wood ranged from 0.115 µGyh^{-1} to 0.121 µGy h^{-1}
- Fourteen measurements taken over concrete ranged from 0.102 µGy h^{-1} to 0.133 µGy h^{-1}

Outdoor measurements

- One measurements taken over grass was 0.082 µGy h^{-1}
- Six measurements taken over tarmac ranged from 0.096 µGy h^{-1} to 0.117 µGy h^{-1}
- Sixteen measurements taken over concrete ranged from 0.091 µGy h^{-1} to 0.130 µGy h^{-1}

Background measurements

- Four measurements taken over grass ranged from 0.073 µGy h^{-1} to 0.085 µGy h^{-1}

Comprehensive studies of background radiation have been carried out on a national scale by the Radiation Protection Division of the Health Protection Agency (previously the National Radiological Protection Board), the most recent of these being a review conducted in 2005 (Watson *et al*, 2005). The results from the 2005 review could be used for comparison with the data collected during this survey.

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 53. Each of the 34 combinations shown in Table 53 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 53 do not correlate directly with observation numbers in Annex 1. Other individuals from Annex 1 have combinations that are not listed in Table 53 because they have fewer pathways and a dose assessment for them would be adequately covered by one of the 34 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, 2005), 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 Barrow 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.statistics.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

Cefas has not previously conducted terrestrial or direct radiation surveys in the Barrow area so the current findings for those pathways cannot be compared with previous results. Cefas conducted an aquatic survey in the area in 1990 and the results from that survey are compared with the 2012 survey below. The methods of data analysis have changed since 1990 and the data from the 1990 survey have been re-analysed using the current methods. The comparisons are for adults only.

At the time of the 1990 survey liquid discharges from Barrow were made to a sewer that flowed directly into the Walney Channel in the vicinity of the Jubilee Bridge, without passing through a sewage treatment works. In 2002 the sewer system was upgraded and since then liquid discharges have been made to a sewer that flows to the Salthouse Wastewater Treatment Works where it undergoes an activated sludge sewage treatment process. Treated water from the works is discharged down a pipeline onto Roosecote Sands in the south-eastern part of the Walney Channel.

8.1 Aquatic survey area

In 1990 the food groups from which foods were consumed by adults were fish, crustaceans, molluscs and wildfowl. In 2012 the food groups from which foods were consumed by adults were fish, crustaceans, molluscs, wildfowl, marine plants/algae and salt marsh grazed sheep meat.

A comparison between the 1990 and 2012 data for the consumption of aquatic foods is presented in Table J.

Table J. Comparison between 1990 and 2012 consumption rates of aquatic food groups for adults

	1990			2012		
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	10	81.2	40	8	47.2	27.1
Crustaceans	2	8.2	8.0	2	17.7	11.9
Molluscs	3	5.0	3.5	4	6.8	5.9
Wildfowl	1	7.1	7.1	9	28.6	17.2
Marine plants/algae	Not identified			4	0.9	0.7
Salt marsh grazed sheep meat	Not identified			6	5.7	5.7

In 2012 compared with 1990, there was a decrease in the mean consumption rate for the adult high-rate group for fish, from 40 kg y^{-1} to 27 kg y^{-1}, and increases in the mean consumption rates for the adult high-rate groups for crustaceans, from 8.0 kg y^{-1} to 12 kg y^{-1}, for molluscs, from 3.5 kg y^{-1} to 5.9 kg y^{-1} and for wildfowl, from 7.1 kg y^{-1} to 17 kg y^{-1}. The consumption of marine plants/algae and salt marsh grazed sheep was identified in 2012 but not in 1990.

For intertidal occupancy in 1990, activities were recorded over the following three substrates: mud and sand; salt marsh; sand. In 2012, activities were recorded over the same substrates with the addition of occupancy over mud, over mud and stones, over sand and stones and occupancy on boats resting on mud and sand at low tide.

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

- In 1990: angling, bait digging, dog walking, wildfowling, turf cutting, volunteer coastguard duties, beach combing and setting nets.
- In 2012: angling, bait digging, dog walking, wildfowling, collecting mussels, collecting winkles, oyster farming, tending livestock, boat maintenance, boat dwelling (tide out) and sitting on the beach.

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

- In 1990: handling nets.
- In 2012: handling nets and pots.

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

- In 1990: bait digging.
- In 2012: oyster farming and wildfowling.

A comparison between the 1990 and 2012 data for occupancy over intertidal substrates, handling fishing gear and handling sediment is shown in Table K.

Table K. Comparison between 1990 and 2012 intertidal occupancy rates and handling rates of fishing gear and sediment for adults

	1990			2012		
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	Not identified			7	220	138
Mud and sand	4	1236	907	1	625	625
Mud and stones	Not identified			3	420	400
Salt marsh	6	303	221	16	293	287
Sand	2	331	290	7	1460	926
Sand and stones	Not identified			17	616	368
Boat on mud and sand	Not identified			3	7615	5517
Handling fishing gear	3	789	679	3	1485	990
Handling sediment	1	1122	1122	19	546	311

In 2012 activities were recorded taking place over mud, mud and stones, sand and stones and on board a boat resting on mud and sand, but no activities were recorded over these substrates in 1990. In 2012 compared to 1990, the mean intertidal occupancy rate for the high-rate group over mud and sand decreased moderately, whilst the mean rate for the high-rate group over salt marsh increased slightly and the mean rate for the high-rate group over sand increased significantly.

The mean rate for the high-rate group for handling fishing gear increased moderately in 2012 compared with 1990, whilst the mean rate for the high-rate group for handling sediment decreased significantly.

9 MAIN FINDINGS

The survey investigated the following potential sources of public radiation exposure:

- Discharges of liquid radioactive waste from the Barrow site to the local sewer (and subsequently into the sea in Walney Channel) and the far-field effects of liquid radioactive waste discharged into the Irish Sea from other nuclear sites on the north-west coast of England, most notably Sellafield
- Discharges of gaseous radioactive waste to the atmosphere from the Barrow site
- Emissions of direct radiation from the Barrow site

Data were collected for 522 individuals including, for example, commercial and hobby fishermen, anglers, people spending time on intertidal substrates, farmers, allotment holders, gardeners and people spending time within the direct radiation survey area. These people were targeted because their habits and where they live 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 rate for the adult high-rate group (as defined in Section 3.4) for the separate aquatic consumption pathways for foods potentially affected by liquid discharges were:

- 27 kg y^{-1} for fish
- 12 kg y^{-1} for crustaceans
- 5.9 kg y^{-1} for molluscs
- 17 kg y^{-1} for wildfowl
- 0.7 kg y^{-1} for marine plants/algae
- 5.7 kg y^{-1} for salt marsh grazed sheep meat

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

- For fish: bass; cod; flounder; mackerel; plaice
- For crustaceans: brown crab and common lobster
- For molluscs: cockles; mussels; whelks; winkles
- For wildfowl: greylag goose; mallard; pink-footed goose; pintail
- For marine plants/algae: samphire
- For salt marsh grazed sheep meat: salt marsh grazed lamb

The use of seaweed as a fertiliser or animal feed was not identified.

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

- 140 h y^{-1} for mud
- 630 h y^{-1} for mud and sand
- 400 h y^{-1} for mud and stones
- 290 h y^{-1} for salt marsh
- 930 h y^{-1} for sand
- 370 h y^{-1} for sand and stones
- 5500 h y^{-1} for a boat on mud and sand

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

- 990 h y^{-1} for handling fishing gear
- 310 h y^{-1} for handling sediment

The adult maximum occupancy rates for water based activities were:

- 140 h y^{-1} for 'in water'
- 3100 h y^{-1} for 'on water'

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:

- 16 kg y^{-1} for green vegetables
- 24 kg y^{-1} for other vegetables
- 25 kg y^{-1} for root vegetables
- 27 kg y^{-1} for potato
- 29 kg y^{-1} for domestic fruit
- 280 l y^{-1} for milk
- 33 kg y^{-1} for cattle meat
- 5.3 kg y^{-1} for pig meat
- 7.6 kg y^{-1} for sheep meat
- 48 kg y^{-1} for poultry
- 34 kg y^{-1} for eggs
- 3.2 kg y^{-1} for wild/free foods
- 9.0 kg y^{-1} for rabbits/hares
- 3.9 kg y^{-1} for wild fungi
- 3.5 kg y^{-1} for freshwater fish

No consumption of honey, cereals or venison 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. One remote household collected rainwater from the roof as their sole domestic supply. Most livestock were supplied with mains water for drinking and at several farms livestock also had access to spring, stream or ditch water.

Control measures taken in order to limit the possibility that contamination is transferred off the Barrow site by wildlife included ensuring that wildlife were unable to access the controlled areas and clearing debris from gutters and ground level areas to discourage seagulls from nesting.

9.3 Direct radiation survey area

With the exception of the highest outdoor occupancy rate in the 0 – 0.25 km zone, which was for an individual who was working, the highest indoor, outdoor and total occupancy rates in all three of the zones of the direct radiation survey area were for residents, one of whom also attended school in the survey area. The highest indoor, outdoor and total occupancy rates recorded for all zones were:

0 - 0.25 km zone

- 8500 h y^{-1} for the indoor occupancy rate
- 1400 h y^{-1} for the outdoor occupancy rate
- 8750 h y^{-1} for the total occupancy rate

>0.25 - 0.5 km zone

- 7800 h y^{-1} for the indoor occupancy rate
- 1200 h y^{-1} for the outdoor occupancy rate
- 8400 h y^{-1} for the total occupancy rate

>0.5 - 1 km zone

- 8600 h y^{-1} for the indoor occupancy rate
- 3000 h y^{-1} for the outdoor occupancy rate
- 8700 h y^{-1} for the total occupancy rate

.

10 RECOMMENDATIONS FOR CHANGES TO THE MONITORING PROGRAMME

The information collected during this habits survey can be used to make recommendations for changes to the current monitoring programmes operated by the Environment Agency and the Food Standards Agency, and published in the RIFE report (EA, FSA, NIEA and SEPA, 2012).

10.1 Summary of current environmental monitoring programmes

The 2011 monitoring programmes relevant to the areas covered in this report included the samples and measurements listed below. The location names, foods and substrate classifications are taken directly from RIFE. The aquatic monitoring programme for Barrow is subsumed within the far-field aquatic monitoring programme for Sellafield.

Aquatic monitoring (Reported in RIFE under far-field monitoring for Sellafield)

Aquatic samples	
Sample	**Location**
Winkles	Haverigg
Mussels	Millom
Crabs	Barrow
Lobsters	Barrow
Pacific Oysters	Roosebeck

Sediment samples
Location
Haverigg
Millom
Low Shaw
Walney Channel – N of discharge point
Walney Channel – S of discharge point

Gamma dose rate measurements	
Substrate	**Location**
Sand and pebbles	Silecroft
Pebbles	Silecroft
Mud	Haverigg
Mud	Millom
Mud and stones	Millom
Grass	Low Shaw
Mud and sand	Askam
Mud	Walney Channel, N of discharge point
Mud	Walney Channel, S of discharge point
Mud and sand	Walney Channel, S of discharge point
Salt marsh	Tummer Hill Marsh
Grass	Tummer Hill Marsh
Pebbles and stones	Roa Island

Terrestrial monitoring

The terrestrial monitoring programme at Barrow comprised grass only.

10.2 Recommendations

Recommendations for changes to the current environmental monitoring programmes are made below. They are based on the findings of this survey and also take into account the potential radiological significance of the various pathways that were identified.

It is recommended that the samples and gamma dose rate measurements currently taken, which are not listed below, remain unchanged in the monitoring programmes.

Environment Agency monitoring

- The gamma dose rate measurement currently taken over pebbles and stones at Roa Island could be moved to the mud and sand on the east side of the causeway to Roa Island (NGR: SD 233 654), close to a houseboat where high occupancy rates were recorded.
- The sediment sample and gamma dose rate measurements currently taken at the location called 'Walney Channel, S of discharge point' (which is in the central part of Walney Channel), could be moved to a location on the sand flats and mud flats to the north-west of the Roa Island causeway, which is to the south of the discharge point of the effluent from the Salthouse Wastewater Treatment Works.

- Consideration could be given to taking a one-off sample of sewage cake from the Salthouse Wastewater Treatment Works, for public reassurance purposes. However, since the liquid discharges from Barrow are low and intermittent (made over a period of approximately three months every two and a half to three years), this is probably not warranted.

Food Standards Agency monitoring

The current aquatic monitoring programme adequately covers the aquatic survey area, both for discharges from Barrow and for the far-field effects of discharges from Sellafield, and no changes to this are suggested.

Given the low discharges of gaseous waste from Barrow (Nil recorded in 2011) the sampling of grass is adequate for the terrestrial monitoring programme and no changes to this are suggested.

11 ACKNOWLEDGEMENTS

Gratitude is expressed to representatives of BAE Systems Marine Ltd, local authorities and associations, and members of the public who offered helpful advice and information during the survey. This survey was undertaken on behalf of the Environment Agency, the Food Standards Agency and the Office for Nuclear Regulation. The project officers for these organisations provided considerable help during the planning of the survey and the drafting of the report.

12 REFERENCES

Allott, R., 2005. Assessment of compliance with the public dose limit. Principles for the assessment of total retrospective public doses. National Dose Assessment Working Group. NDAWG/2/2005.

Byrom, J., Robinson, C., Simmonds, J.R., Walters, B., and Taylor, R.R., 1995. Food consumption rates for use in generalised radiological dose assessments. J. Radiol. Prot. 1995 Vol. 15 No 4 335-341.

Camplin, W.C., Grzechnik, M.P. and Smedley, C.A., 2005. Methods for assessment of total dose in the Radioactivity in Food and the Environment report. Presented to the *National Dose Assessments Working Group (NDAWG)*. Paper NDAWG/3/2005, 27th April 2005.

CEC, 1996. Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation. Off. J. Eur. Commun., 39(L159): 1-114.

EA, EHS, FSA and SEPA, 2006. Radioactivity in Food and the Environment, 2005. EA, EHS, FSA and SEPA, Warrington, Belfast, London and Stirling. RIFE (11).

EA, FSA, NIEA and SEPA, 2012. Radioactivity in Food and the Environment, 2011. EA, FSA, NIEA and SEPA, Warrington, London, Belfast and Stirling. RIFE (17).

EA, SEPA, DoENI, NRPB and FSA, 2002. Authorisation of discharges of radioactive waste to the environment. Principles for the assessment of prospective public doses. Interim Guidance. EA, SEPA, DoENI, NRPB and FSA, Lancaster.

EA, SEPA, NIEA, HPA and FSA, 2012. Principles for the Assessment of Prospective Public Doses arising from Authorised Discharges of Radioactive Waste to the Environment. EA, SEPA, NIEA, HPA and FSA, Penrith.

FSA, 2002. Assessment Methodology for the Potential Impact on Food of Radioactive Discharges to the Environment. FSA, London.

Good Housekeeping, 1994. Good Housekeeping Cook Book. Ebury Press, London.

Hessayon, D. G., 1990. The Fruit Expert, pbi Publications, Waltham Cross.

Hessayon, D. G., 1997. The New Vegetable & Herb Expert, Expert Books, London.

Hunt, G.J., Hewett, C.J. and Shepherd, J.G., 1982. The identification of critical groups and its application to fish and shellfish consumers in the coastal area of the north-east Irish Sea. Health Physics, Vol. 43, No 6, 875-889.

IAEA, 1996. International basic safety standards for protection against ionizing radiation and for the safety of radiation sources. Saf. Ser. No. 115. IAEA, Vienna.

ICRP, 1991. 1990 Recommendations of the International Commission on Radiological Protection. Annal. ICRP 21 (1-3). Pergamon Press, Oxford, (ICRP Publ. 60).

ICRP, 2006. Assessing dose of the representative person for the purpose of radiation protection of the public. Annal. ICRP 36 (3). Elsevier Science, Oxford, (ICRP Publ. 101).

ICRP, 2007. The 2007 Recommendations of the International Commission on Radiological Protection. Annal. ICRP 37 (2-4). Elsevier Science, Oxford, (ICRP Publ. 103).

Leonard, D.R.P., Hunt, G.J. and Jones, P.G.W., 1982. Investigation of individual radiation exposures from discharges to the aquatic environment: techniques used in habits surveys. Proc. 3rd Int. Symp. Soc. Radiol. Prot., Inverness, 6 to 11 June 1982. Vol 2, 512-517. Society for Radiological Protection.

NDAWG, 2005. Position paper on the collection and use of habits data for retrospective dose assessments. National Dose Assessment Working Group. NDAWG/4/2005.

NDAWG, 2009. Acquisition and use of habits data for prospective assessments. National Dose Assessment Working Group. NDAWG/2/2009.

National Radiological Protection Board, 2005. Guidance on the application of dose coefficients for the embryo and fetus from intakes of radionuclides by the mother. Docs NRPB 16(2). NRPB, Chilton, 41pp.

Smith, K.R. and Jones, A.L., 2003. Generalised habit data for radiological assessments. NRPB-W41. NRPB, Chilton.

Thurston, L.M. and Huggins, I.A., 1993. Investigation of Radiation Exposure Pathways from Liquid Effluents. Duddon and Barrow-in-Furness: Local Habits Survey 1990. MAFF Direct. Fish. Res. Tech. Note RL 2/93. Lowestoft. (Unpublished)

UK Parliament, 1965. Nuclear Installations Act, 1965 (as amended). HMSO, London.

UK Parliament, 1999. The Ionising Radiation Regulations 1999. Stat. Inst. 1999/3232. HMSO, London, 67pp.

UK Parliament, 2009a. UK Strategy for Radioactive Discharges. DECC, London.

UK Parliament, 2009b. Draft National Policy Statement for Nuclear Power Generation (EN-6). DECC, London.

UK Parliament, 2010. Environmental Permitting (England and Wales) Regulations, 2010. Statutory Instrument 2010 No 675. HMSO, London.

Watson, S.J., Jones, A.L., Oatway, W.B. and Hughes, J.S., 2005. Ionising Radiation Exposure of the UK Population: 2005 review. HPA-RPD-001, Chilton.

www.statistics.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 Barrow 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**)	50700[a]	130[c]	0.3%	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**)	8600[b]	56[c]	0.7%	
	Number of people working but not resident in the direct radiation survey area (See **(C) DIRECT RADIATION PATHWAYS**)	U	3[c]	U	Excluding employees and contractors at the nuclear licensed site.
	Number of people visiting the direct radiation survey area (See **(C) DIRECT RADIATION PATHWAYS**)	U	22[c]	U	
	Number of people effected by liquid discharges (excluding those assigned to other categories above) (See **(A) AQUATIC PATHWAYS**)	U	311[c]	U	Where an individual visited the direct radiation survey area as well as being potentially affected by liquid discharges (e.g. fishermen who worked on their boats in the direct radiation survey area) they have been allocated to a direct radiation pathway.
	Total for aquatic, terrestrial and direct radiation survey areas	U	522[c]	U	
(A) AQUATIC PATHWAYS					
Commercial and hobby fishermen	Number of commercial and hobby fishermen based in the aquatic survey area	20	11	55%	
People undertaking activities in or on water (*e.g.* swimming, boat angling, sailing and lifeboat duties)	Number of people undertaking activities in or on water in the aquatic survey area	U	159	U	
People using the shore including anglers, dog walkers and people playing etc.	Number of people undertaking intertidal activities in the aquatic survey area	U	226	U	
Wildfowlers	Number of people wildfowling in the aquatic survey area	135	19	14%	
Houseboat dwellers	Number of people living on boats in the aquatic survey area	4	4	100%	Two houseboats were identified in the survey area and interviews were conducted at both.
Fish consumers	Number of people consuming fish from the aquatic survey area	U	95	U	
Crustacean consumers	Number of people consuming crustaceans from the aquatic survey area	U	8	U	
Mollusc consumers	Number of people consuming molluscs from the aquatic survey area	U	27	U	
Wildfowl consumers	Number of people consuming wildfowl from the aquatic survey area	U	7	U	
Marine plant consumers	Number of people consuming marine plants from the aquatic survey area	U	18	U	
Salt marsh grazed sheep meat consumers	Number of people consuming salt marsh grazed sheep meat from the aquatic survey area	U	6	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	46	46	100%	Interviews were conducted at all 15 farms and sizeable smallholdings identified within the survey area.
Allotment holders	Number of allotment holders and and their family members consuming food from the terrestrial survey area	3120	97	3%	Interviews were conducted with 23 allotment holders from an estimated total of 740 allotment holders.
(C) DIRECT RADIATION PATHWAYS					
Residents	Number of residents in the survey area	8600[b]	56	0.7%	
Employees	Number of people working in the survey area	U	3	U	Excluding people living in the direct radiation survey area and employees and contractors at the nuclear licensed site.
Visitors	Number of visitors to the survey area	U	22	U	Mainly individuals who were undertaking recreational activities or visiting residential properties within the direct radiation survey area.
BREAKDOWN OF AGE GROUPS FOR PEOPLE RESIDENT IN THE 5 km TERRESTRIAL SURVEY AREA					
Adult	16-year-old and over	47000[a]	453	1.0%	
Child	6-year-old to 15-year-old	8200[a]	54	0.7%	
Infant	0 to 5-year-old	4100[a]	15	0.4%	

Notes

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

[b] Estimate of the number of people resident in the 1 km direct radiation survey area based on data from www.statistics.gov.uk.

[c] 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, common 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 aquatic survey area (kg y^{-1})

Observation number	Bass	Cod	Dab	Conger Eel	Eel	Flounder	Grey mullet	Lemon sole	Mackerel	Plaice	Thornback ray	Whiting	Total
442	**11.8**	**11.8**	**-**	**-**	**-**	**-**	**-**	**-**	**11.8**	**11.8**	**-**	**-**	**47.2**
75	**-**	**10.8**	**-**	**-**	**-**	**7.3**	**-**	**-**	**10.0**	**-**	**-**	**-**	**28.1**
76	**-**	**10.8**	**-**	**-**	**-**	**7.3**	**-**	**-**	**10.0**	**-**	**-**	**-**	**28.1**
450	**5.9**	**-**	**-**	**-**	**-**	**5.9**	**-**	**-**	**5.9**	**5.9**	**-**	**-**	**23.6**
451	**5.9**	**-**	**-**	**-**	**-**	**5.9**	**-**	**-**	**5.9**	**5.9**	**-**	**-**	**23.6**
427	**8.5**	**1.0**	**1.5**	**-**	**-**	**2.5**	**-**	**-**	**9.2**	**0.5**	**-**	**-**	**23.1**
428	**8.5**	**1.0**	**1.5**	**-**	**-**	**2.5**	**-**	**-**	**9.2**	**0.5**	**-**	**-**	**23.1**
77	**-**	**4.1**	**-**	**0.5**	**0.5**	**4.1**	**-**	**-**	**2.5**	**4.1**	**4.1**	**-**	**19.8**
256	5.4	8.2	-	-	-	1.4	-	-	-	-	-	-	15.0
257	5.4	8.2	-	-	-	1.4	-	-	-	-	-	-	15.0
258	5.4	8.2	-	-	-	1.4	-	-	-	-	-	-	15.0
259	5.4	8.2	-	-	-	1.4	-	-	-	-	-	-	15.0
278	3.6	3.6	1.6	-	-	2.3	-	-	-	3.6	-	-	14.7
279	3.6	3.6	1.6	-	-	2.3	-	-	-	3.6	-	-	14.7
410	7.1	6.6	-	-	-	-	-	-	-	-	-	-	13.7
324	4.1	3.0	0.6	-	-	-	2.1	-	-	3.0	-	-	12.7
325	4.1	3.0	0.6	-	-	-	2.1	-	-	3.0	-	-	12.7
51	3.0	2.5	-	-	-	-	-	-	-	6.0	-	-	11.5
52	3.0	2.5	-	-	-	-	-	-	-	6.0	-	-	11.5
53	3.0	2.5	-	-	-	-	-	-	-	6.0	-	-	11.5
54	3.0	2.5	-	-	-	-	-	-	-	6.0	-	-	11.5
55	3.0	2.5	-	-	-	-	-	-	-	6.0	-	-	11.5
56	3.0	2.5	-	-	-	-	-	-	-	6.0	-	-	11.5
57	3.0	2.5	-	-	-	-	-	-	-	6.0	-	-	11.5
338	10.7	-	-	-	-	-	-	-	-	-	-	-	10.7
330	5.7	-	-	-	-	-	-	-	-	4.5	-	-	10.2
331	5.7	-	-	-	-	-	-	-	-	4.5	-	-	10.2
287	2.3	2.3	-	-	-	0.9	-	-	-	1.8	-	-	7.3
274	2.3	-	-	-	-	1.4	-	-	-	2.3	-	-	5.9
275	2.3	-	-	-	-	1.4	-	-	-	2.3	-	-	5.9
276	2.3	-	-	-	-	1.4	-	-	-	2.3	-	-	5.9
32	3.4	-	-	-	-	-	-	-	-	2.4	-	-	5.8
33	3.4	-	-	-	-	-	-	-	-	2.4	-	-	5.8
321	2.7	1.4	-	-	-	0.5	-	-	-	0.7	-	0.5	5.7
322	2.7	1.4	-	-	-	0.5	-	-	-	0.7	-	0.5	5.7

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

Observation number	Bass	Cod	Dab	Conger Eel	Eel	Flounder	Grey mullet	Lemon sole	Mackerel	Plaice	Thornback ray	Whiting	Total
323	2.7	1.4	-	-	-	0.5	-	-	-	0.7	-	0.5	5.7
429	5.6	-	-	-	-	-	-	-	-	-	-	-	5.6
38	2.0	2.0	-	-	-	-	-	-	-	1.6	-	-	5.6
39	2.0	2.0	-	-	-	-	-	-	-	1.6	-	-	5.6
405	2.8	2.6	-	-	-	-	-	-	-	-	-	-	5.5
406	2.8	2.6	-	-	-	-	-	-	-	-	-	-	5.5
348	-	1.8	-	-	-	-	-	1.8	-	1.8	-	-	5.4
441	1.1	1.1	1.1	-	-	-	-	-	1.1	1.1	-	-	5.4
298	-	-	-	-	-	2.6	-	-	-	2.5	-	-	5.0
299	-	-	-	-	-	2.6	-	-	-	2.5	-	-	5.0
501	-	-	-	-	-	-	-	-	4.6	-	-	-	4.6
328	4.3	-	-	-	-	-	-	-	-	-	-	-	4.3
329	4.3	-	-	-	-	-	-	-	-	-	-	-	4.3
339	-	-	-	-	-	-	-	-	4.2	-	-	-	4.2
340	-	-	-	-	-	-	-	-	4.2	-	-	-	4.2
380	2.1	2.0	-	-	-	-	-	-	-	-	-	-	4.1
381	2.1	2.0	-	-	-	-	-	-	-	-	-	-	4.1
382	2.1	2.0	-	-	-	-	-	-	-	-	-	-	4.1
396	2.1	2.0	-	-	-	-	-	-	-	-	-	-	4.1
465	-	-	-	-	-	-	-	-	3.4	-	-	-	3.4
466	-	-	-	-	-	-	-	-	3.4	-	-	-	3.4
392	1.1	-	-	-	-	1.2	1.1	-	-	-	-	-	3.3
393	1.1	-	-	-	-	1.2	1.1	-	-	-	-	-	3.3
71	-	1.3	-	-	-	1.0	-	-	-	1.0	-	-	3.3
72	-	1.3	-	-	-	1.0	-	-	-	1.0	-	-	3.3
73	-	1.3	-	-	-	1.0	-	-	-	1.0	-	-	3.3
411	2.1	-	-	-	-	-	-	-	-	1.0	-	-	3.1
412	2.1	-	-	-	-	-	-	-	-	1.0	-	-	3.1
351	2.8	-	-	-	-	-	-	-	-	-	-	-	2.8
352	2.8	-	-	-	-	-	-	-	-	-	-	-	2.8
459	-	-	-	-	-	-	-	-	2.3	-	-	-	2.3
232	-	2.2	-	-	-	-	-	-	-	-	-	-	2.2
233	-	2.2	-	-	-	-	-	-	-	-	-	-	2.2
171	0.3	-	1.4	-	-	-	-	-	-	-	-	-	1.7
172	0.3	-	1.4	-	-	-	-	-	-	-	-	-	1.7

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

Observation number	Bass	Cod	Dab	Conger Eel	Eel	Flounder	Grey mullet	Lemon sole	Mackerel	Plaice	Thornback ray	Whiting	Total
249	-	-	-	-	-	0.8	0.5	-	-	-	-	-	1.3
250	-	-	-	-	-	0.8	0.5	-	-	-	-	-	1.3
467	-	-	-	-	-	-	-	-	1.3	-	-	-	1.3
468	-	-	-	-	-	-	-	-	1.3	-	-	-	1.3
35	0.5	-	-	-	-	-	-	-	-	0.4	-	-	0.9
36	0.5	-	-	-	-	-	-	-	-	0.4	-	-	0.9
157	0.9	-	-	-	-	-	-	-	-	-	-	-	0.9
46	0.5	-	-	-	-	-	-	-	-	0.4	-	-	0.9
47	0.5	-	-	-	-	-	-	-	-	0.4	-	-	0.9
43	0.6	-	-	-	-	-	-	-	-	-	-	-	0.6
44	0.6	-	-	-	-	-	-	-	-	-	-	-	0.6
40	0.5	-	-	-	-	-	-	-	-	-	-	-	0.5
242	0.5	-	-	-	-	-	-	-	-	-	-	-	0.5
243	0.5	-	-	-	-	-	-	-	-	-	-	-	0.5
244	0.5	-	-	-	-	-	-	-	-	-	-	-	0.5
248	0.5	-	-	-	-	-	-	-	-	-	-	-	0.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish based on the 8 high-rate adult consumers is 27.1 kg y^{-1}

The observed 97.5th percentile rate based on 86 observations is 27.5 kg y^{-1}

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

Observation number	Brown crab	Common lobster	Total
77	**7.4**	**10.3**	**17.7**
345	**5.5**	**0.6**	**6.1**
346	1.4	0.2	1.6
353	1.4	0.2	1.6
232	0.7	0.4	1.1
233	0.7	0.4	1.1
516	-	0.4	0.4
465	-	0.2	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of crustaceans based on the 2 high-rate adult consumers is 11.9 kg y^{-1}

The observed 97.5th percentile rate based on 8 observations is 15.7 kg y^{-1}

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

Observation number	Cockle	Mussel	Whelk	Winkle	Total
450	**4.3**	**1.1**	**-**	**1.4**	**6.8**
77	**1.1**	**1.2**	**2.5**	**1.3**	**6.1**
442	**-**	**-**	**4.4**	**1.3**	**5.7**
451	**4.3**	**0.5**	**-**	**-**	**4.8**
292	-	0.9	-	0.7	1.6
293	-	0.9	-	0.7	1.6
441	-	0.2	0.5	-	0.7
465	-	0.6	-	-	0.6
466	-	0.6	-	-	0.6
351	0.3	-	-	0.2	0.5
458	-	0.5	-	-	0.5
171	0.4	-	-	-	0.4
172	0.4	-	-	-	0.4
516	-	-	0.4	-	0.4
352	0.3	-	-	-	0.3
249	0.3	-	-	-	0.3
250	0.3	-	-	-	0.3
512	0.3	-	-	-	0.3
513	0.3	-	-	-	0.3
514	0.3	-	-	-	0.3
515	0.3	-	-	-	0.3
173	0.1	-	-	-	0.1
174	0.1	-	-	-	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of molluscs based on the 4 high-rate adult consumers is 5.9 kg y^{-1}

The observed 97.5th percentile rate based on 23 observations is 6.5 kg y^{-1}

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

Observation number	Canada goose	Greylag goose	Mallard	Pink-footed goose	Pintail	Shoveler	Teal	Wigeon	Total
104	**-**	**4.4**	**-**	**22.1**	**2.1**	**-**	**-**	**-**	**28.6**
345	**5.6**	**2.2**	**6.8**	**8.5**	**-**	**-**	**2.4**	**-**	**25.5**
157	**2.5**	**4.6**	**2.8**	**1.7**	**1.0**	**0.3**	**1.7**	**4.7**	**19.3**
158	**2.5**	**4.6**	**2.8**	**-**	**1.0**	**-**	**1.7**	**4.7**	**17.3**
450	**-**	**11.0**	**3.6**	**-**	**0.9**	**-**	**0.4**	**-**	**15.9**
451	**-**	**11.0**	**3.6**	**-**	**0.9**	**-**	**0.4**	**-**	**15.9**
105	**-**	**-**	**1.8**	**8.5**	**1.1**	**-**	**-**	**1.4**	**12.8**
459	**-**	**-**	**5.6**	**-**	**4.4**	**-**	**-**	**-**	**10.0**
460	**-**	**-**	**5.6**	**-**	**4.4**	**-**	**-**	**-**	**10.0**
102	-	-	1.4	3.4	-	-	0.2	1.4	6.3
106	-	-	-	5.1	-	-	-	-	5.1
132	-	-	2.1	1.1	0.9	-	0.1	0.5	4.7
133	-	-	2.1	1.1	0.9	-	0.1	0.5	4.7
134	-	-	2.1	1.1	0.9	-	0.1	0.5	4.7
103	-	-	-	3.4	-	-	-	-	3.4
101	1.4	-	0.9	-	1.1	-	-	-	3.4

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wildfowl based on the 9 high-rate adult consumers is 17.2 kg y^{-1}

The observed 97.5th percentile rate based on 16 observations is 27.4 kg y^{-1}

Table 7. Adults' consumption rates of marine plants/algae from the aquatic survey area (kg y^{-1})

Observation number	Samphire
249	**0.9**
502	**0.8**
503	**0.8**
77	**0.5**
442	0.3
441	0.2
501	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of marine plants/algae based on the 4 high-rate adult consumers is 0.7 kg y^{-1}

The observed 97.5th percentile rate based on 7 observations is 0.9 kg y^{-1}

Table 8. Adults' consumption rates of salt marsh grazed sheep meat from the aquatic survey area (kg y^{-1})

Observation number	Salt marsh grazed lamb
107	**5.7**
108	**5.7**
109	**5.7**
110	**5.7**
111	**5.7**
112	**5.7**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of salt marsh grazed sheep meat based on the 6 high-rate adult consumers is 5.7 kg y^{-1}

The observed 97.5th percentile rate based on 6 observations is 5.7 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Bass	Cod	Dab	Flounder	Plaice	Total
58	**10**	**3.0**	**2.5**	**-**	**-**	**6.0**	**11.5**
280	**7**	**2.7**	**2.7**	**1.1**	**1.8**	**2.7**	**11.1**
295	**14**	**-**	**-**	**-**	**2.6**	**2.5**	**5.0**
297	**12**	**-**	**-**	**-**	**2.6**	**2.5**	**5.0**
34	**15**	**2.3**	**-**	**-**	**-**	**1.8**	**4.1**
41	12	0.5	-	-	-	-	0.5
42	15	0.5	-	-	-	-	0.5
37	6	0.3	-	-	-	0.2	0.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish for the child age group based upon the 5 high-rate consumers is 7.4 kg y^{-1}

The observed 97.5th percentile rate based on 8 observations is 11.4 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Bass	Cod	Dab	Flounder	Plaice	Total
281	**5**	**1.8**	**1.8**	**0.9**	**1.1**	**0.8**	**6.5**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish for the infant age group based upon the only high-rate consumer is 6.5 kg y^{-1}

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

Table 10. Children's consumption rates of molluscs from the aquatic survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Cockle	Mussel	Total
294	**9**	**-**	**0.9**	**0.9**
452	**12**	**0.5**	**-**	**0.5**
175	15	0.1	-	0.1
176	11	0.1	-	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of molluscs for the child age group based upon the 2 high-rate consumers is 0.7 kg y^{-1}

The observed 97.5th percentile rate based on 4 observations is 0.9 kg y^{-1}

Table 11. Children's and infants' consumption rates of wildfowl from the aquatic survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Canada goose	Greylag goose	Mallard	Pintail	Teal	Wigeon	Total
159	**13**	**1.8**	**3.5**	**2.1**	**0.7**	**1.3**	**3.5**	**12.9**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wildfowl for the child age group based upon the only high-rate consumer is 12.9 kg y^{-1}

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

Infant age group (0 - 5 years old)

Observation number	Age	Canada goose	Greylag goose	Mallard	Pintail	Teal	Wigeon	Total
160	**5**	**0.2**	**0.5**	**-**	**0.1**	**0.2**	**0.5**	**1.4**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wildfowl for the infant age group based upon the only high-rate consumer is 1.4 kg y^{-1}

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

Table 12. Adults' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Boat on mud and sand
345	**South-east Walney Island**	**Wildfowling**	**220**	-	-	-	-	-	-
	Walney Channel	Gill netting	-	72	-	-	-	-	-
	South-west Walney Island	Wildfowling	-	-	-	-	-	8	-
428	**Walney Channel**	**Angling**	**208**	-	-	-	-	-	-
	Walney Channel	Bait digging	-	104	-	-	-	-	-
459	**South-east Walney Island**	**Wildfowling**	**200**	-	-	-	-	-	-
461	**Foulney Island**	**Collecting mussels**	**90**	-	-	-	-	-	-
462	**Foulney Island**	**Collecting mussels**	**90**	-	-	-	-	-	-
456	**Walney Channel**	**Boat maintenance**	**80**	-	-	-	-	-	720
457	**Walney Channel**	**Boat maintenance**	**80**	-	-	-	-	-	720
157	South-east Walney Island	Wildfowling	36	-	-	-	-	-	-
	South-west Walney Island	Collecting crabs		-	-	-	-	-	-
	South-east Walney Island	Walking	-	-	-	5	-	-	-
	South-west Walney Island	**Angling**	-	-	-	-	-	**240**	-
429	Walney Channel	Collecting crabs	34	-	-	-	-	-	-
	West Walney Island (Biggar Bank)	Angling	-	-	-	-	-	68	-
463	Foulney Island	Collecting mussels	27	-	-	-	-	-	-
464	Foulney Island	Collecting mussels	27	-	-	-	-	-	-
450	**North-east Walney Channel**	**Dog walking**	-	**625**	-	-	-	-	-
	Scarth Bight	**Wildfowling**	-		-	-	-	-	-
	South Walney Channel	**Collecting winkles**	-		-	-	-	-	-
	North-east and south-east Walney Island	Collecting cockles	-	-	-	-	62	-	-
	Hodbarrow	Collecting mussels	-	-	-	-		-	-
501	Between Rampside and Roa Island	Walking and collecting samphire	-	182	-	-	-	-	-
427	Walney Channel	Bait digging	-	104	-	-	-	-	-
347	Walney Channel	Gill netting	-	72	-	-	-	-	-
502	Between Rampside and Roa Island	Collecting samphire	-	6	-	-	-	-	-
503	Between Rampside and Roa Island	Collecting samphire	-	6	-	-	-	-	-
351	South-east Walney Island	Collecting cockles	-	5	-	-	-	-	-
	South-west Walney Island	Collecting winkles	-	-	-	-	-	6	-
71	**Walney Channel**	**Boat maintenance**	-	-	**420**	-	-	-	-
74	**Walney Channel**	**Boat maintenance**	-	-	**420**	-	-	-	-
75	**Walney Channel**	**Boat maintenance**	-	-	**360**	-	-	-	-
	Roanhead and Askam-in-Furness	Bait digging	-	-	-	-	54	-	-
458	Foulney Island	Collecting mussels	-	-	105	-	-	-	-
348	Walney Channel	Collecting mussels	-	-	95	-	-	-	-
	Roa Island and north-east Walney Channel	Collecting winkles	-	-		-	-	-	-
324	Walney Channel	Angling	-	-	80	-	-	-	-
	Millom Iron Works	Bait digging	-	-	-	-	50	-	-
	Silecroft	**Angling**	-	-	-	-	-	**300**	-

Table 12. Adults' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Boat on mud and sand
248	Millom Iron Works	Collecting crabs	-	-	48	-	-	-	-
	Millom Iron Works	Bait digging	-	-	-	-	45	-	-
	Gutterby, Silecroft and west Walney Island	Angling	-	-	-	-	-	40	-
349	Walney Channel	Collecting mussels	-	-	48	-	-	-	-
	Roa Island and north-east Walney Channel	Collecting winkles	-	-		-	-	-	-
350	Walney Channel	Collecting mussels	-	-	48	-	-	-	-
	Roa Island and north-east Walney Channel	Collecting winkles	-	-		-	-	-	-
273	Millom Iron Works	Collecting crabs	-	-	20	-	-	-	-
	Millom Iron Works	**Bait digging**	-	-	-	-	**625**	-	-
	Hodbarrow and Haverigg	**Angling**	-	-	-	-		-	-
	Silecroft	**Angling**	-	-	-	-	-	**250**	-
455	Walney Channel	Collecting seaweed	-	-	15	-	-	-	-
278	Millom Iron Works	Collecting crabs	-	-	12	-	-	-	-
	Millom Iron Works	Bait digging	-	-	-	-	175	-	-
	Hodbarrow and Haverigg	Angling	-	-	-	-		-	-
	Silecroft	**Angling**	-	-	-	-	-	**300**	-
92	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
93	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
94	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
95	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
96	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
97	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
98	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
99	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
100	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
101	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
102	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
103	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
104	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
105	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
106	**West Duddon Estuary marshes**	**Wildfowling**	-	-	-	**293**	-	-	-
107	**West Duddon Estuary marshes**	**Tending livestock**	-	-	-	**199**	-	-	-
113	West Duddon Estuary marshes	Tending livestock	-	-	-	52	-	-	-
114	West Duddon Estuary marshes	Tending livestock	-	-	-	52	-	-	-
77	South-east Walney Island	Collecting samphire	-	-	-	16	-	-	-
	South-east Walney Island	Collecting cockles	-	-	-	-	16	-	-
	Walney Channel	Collecting mussels	-	-	-	-		-	-
	Piel Island	Collecting winkles	-	-	-	-	-	14	-
262	South-east Walney Island	Dog walking	-	-	-	12	-	-	-
	West Walney Island (Biggar Bank)	Dog walking	-	-	-	-	-	100	-

Table 12. Adults' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Boat on mud and sand
263	South-east Walney Island	Dog walking	-	-	-	12	-	-	-
	West Walney Island (Biggar Bank)	Dog walking	-	-	-	-	-	100	-
249	Scarth Bight	Collecting samphire	-	-	-	1	-	-	-
	Scarth Bight	Setting nets	-	-	-	-	5	-	-
	Duddon Sands (near Lowsy Point)	Collecting cockles	-	-	-	-		-	-
296	**Hodbarrow**	**Dog walking**	-	-	-	-	**1460**	-	-
242	**Hodbarrow**	**Dog walking and sitting on the beach**	-	-	-	-	**1288**	-	-
243	**Hodbarrow**	**Dog walking and sitting on the beach**	-	-	-	-	**1288**	-	-
453	**Off Roosebeck**	**Oyster farming**	-	-	-	-	**637**	-	-
454	**Off Roosebeck**	**Oyster farming**	-	-	-	-	**637**	-	-
372	**South-west Walney Island (Low Bank)**	**Dog walking**	-	-	-	-	**548**	-	-
304	Hodbarrow and Haverigg	Dog walking	-	-	-	-	400	-	-
305	Hodbarrow and Haverigg	Dog walking	-	-	-	-	400	-	-
63	Askam-in-Furness	Dog walking	-	-	-	-	365	-	-
	Askam-in-Furness	**Boat dwelling (tide out)**	-	-	-	-	-	-	**7615**
375	West Walney Island (Biggar Bank)	Dog walking	-	-	-	-	365	-	-
376	West Walney Island (Biggar Bank)	Dog walking	-	-	-	-	365	-	-
390	Between Rampside and Roosebeck	Dog walking	-	-	-	-	365	-	-
391	Between Rampside and Roosebeck	Dog walking	-	-	-	-	365	-	-
378	West Walney Island (Biggar Bank)	Dog walking	-	-	-	-	335	-	-
379	West Walney Island (Biggar Bank)	Dog walking	-	-	-	-	335	-	-
215	Lowsy Point	Dog walking and bait digging	-	-	-	-	334	-	-
	Duddon Estuary	Angling	-	-	-	-		-	-
330	Millom Iron Works and Silecroft	Bait digging	-	-	-	-	300	-	-
	Hodbarrow and Haverigg	Angling	-	-	-	-		-	-
	Silecroft	**Angling**	-	-	-	-	-	**400**	-
326	Millom Iron Works	Bait digging	-	-	-	-	300	-	-
	Hodbarrow and Haverigg	Angling	-	-	-	-		-	-
	Silecroft and west Walney Island (Biggar Bank)	**Angling**	-	-	-	-	-	**362**	-
31	Roanhead	Dog walking	-	-	-	-	300	-	-
50	Askam-in-Furness	Dog walking	-	-	-	-	300	-	-
291	Haverigg	Walking	-	-	-	-	285	-	-
	Silecroft	Walking	-	-	-	-	-	65	-
287	Millom Iron Works and Silecroft	Bait digging	-	-	-	-	250	-	-
	Haverigg	Angling	-	-	-	-		-	-
	Silecroft	**Angling**	-	-	-	-	-	**600**	-
327	Millom Iron Works	Bait digging	-	-	-	-	250	-	-
	Hodbarrow and Haverigg	Angling	-	-	-	-		-	-
	Silecroft and west Walney Island (Biggar Bank)	**Angling**	-	-	-	-	-	**270**	-

Table 12. Adults' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Boat on mud and sand
277	Millom Iron Works	Bait digging	-	-	-	-	250	-	-
	Hodbarrow and Haverigg	Angling	-	-	-	-		-	-
	Silecroft	Angling	-	-	-	-	-	100	-
288	Haverigg	Walking	-	-	-	-	220	-	-
	Silecroft	Walking	-	-	-	-	-	50	-
328	Millom Iron Works	Bait digging	-	-	-	-	200	-	-
	Hodbarrow and Haverigg	Angling	-	-	-	-		-	-
	Silecroft	Angling	-	-	-	-	-	100	-
314	Haverigg	Playing	-	-	-	-	198	-	-
377	West Walney Island (Biggar Bank)	Dog walking	-	-	-	-	195	-	-
312	Haverigg	Dog walking	-	-	-	-	183	-	-
310	Haverigg	Dog walking	-	-	-	-	182	-	-
51	Roanhead and Askam-in-Furness	Bait digging	-	-	-	-	168	-	-
	Duddon Estuary off Askam-in-Furness	Boat launching	-	-	-	-		-	-
389	Between Rampside and Roosebeck	Dog walking	-	-	-	-	160	-	-
317	Haverigg	Playing	-	-	-	-	156	-	-
394	Between Rampside and Roa Island	Dog walking	-	-	-	-	156	-	-
395	Between Rampside and Roa Island	Dog walking	-	-	-	-	156	-	-
413	West Walney Island (West Shore Park)	Playing	-	-	-	-	149	-	-
414	West Walney Island (West Shore Park)	Playing	-	-	-	-	149	-	-
32	Roanhead	Angling and bait digging	-	-	-	-	142	-	-
214	Lowsy Point	Angling and bait digging	-	-	-	-	142	-	-
410	West Walney Island (Biggar Bank)	Bait digging	-	-	-	-	130	-	-
	West Walney Island (West Shore Park)	**Angling**	-	-	-	-	-	**234**	-
302	Hodbarrow and Haverigg	Dog walking	-	-	-	-	130	-	-
303	Hodbarrow and Haverigg	Dog walking	-	-	-	-	130	-	-
366	West Walney Island (Biggar Bank)	Walking	-	-	-	-	130	-	-
367	West Walney Island (Biggar Bank)	Walking	-	-	-	-	130	-	-
306	Hodbarrow and Haverigg	Playing	-	-	-	-	120	-	-
387	Between Rampside and Roosebeck	Dog walking	-	-	-	-	104	-	-
388	Between Rampside and Roosebeck	Dog walking	-	-	-	-	104	-	-
359	West Walney Island (Biggar Bank)	Playing	-	-	-	-	90	-	-
360	West Walney Island (Biggar Bank)	Playing	-	-	-	-	90	-	-
311	Haverigg	Dog walking	-	-	-	-	78	-	-
374	South-West Walney Island (Low Bank)	Quad biking	-	-	-	-	66	-	-
309	Hodbarrow and Haverigg	Playing	-	-	-	-	60	-	-
407	West Walney Island (West Shore Park)	Playing	-	-	-	-	60	-	-
282	Silecroft	Bait digging	-	-	-	-	50	-	-
	Silecroft	**Angling**	-	-	-	-	-	**300**	-

Table 12. Adults' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Boat on mud and sand
321	Millom Iron Works	Bait digging	-	-	-	-	50	-	-
	Silecroft	**Angling**	-	-	-	-	-	**300**	-
45	Roosebeck	Bait digging	-	-	-	-	45	-	-
423	West Walney Island (Biggar Bank)	Walking	-	-	-	-	39	-	-
424	West Walney Island (Biggar Bank)	Walking	-	-	-	-	39	-	-
48	Askam-in-Furness	Quad biking and playing	-	-	-	-	36	-	-
332	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
333	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
334	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
335	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
336	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
337	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
338	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
339	Askam-in-Furness	Rescue crew duties	-	-	-	-	36	-	-
46	Roosebeck	Bait digging	-	-	-	-	28	-	-
411	Walney Channel (Walney Meetings)	Bait digging	-	-	-	-	26	-	-
	West Walney Island (West Shore Park)	Angling	-	-	-	-	-	91	-
412	Walney Channel (Walney Meetings)	Bait digging	-	-	-	-	26	-	-
	West Walney Island (West Shore Park)	Angling	-	-	-	-	-	91	-
59	Roanhead	Playing and kite flying	-	-	-	-	24	-	-
300	Millom Iron Works	Bait digging	-	-	-	-	24	-	-
301	Millom Iron Works	Bait digging	-	-	-	-	24	-	-
425	West Walney Island (Biggar Bank) and Roa Island	Walking	-	-	-	-	24	-	-
426	West Walney Island (Biggar Bank)	Walking	-	-	-	-	24	-	-
35	Roanhead	Angling	-	-	-	-	23	-	-
380	West Walney Island (Biggar Bank)	Bait digging	-	-	-	-	13	-	-
	West Walney Island (Biggar Bank)	Angling	-	-	-	-	-	39	-
381	West Walney Island (Biggar Bank)	Bait digging	-	-	-	-	13	-	-
	West Walney Island (Biggar Bank)	Angling	-	-	-	-	-	39	-
382	West Walney Island (Biggar Bank)	Bait digging	-	-	-	-	13	-	-
	West Walney Island (Biggar Bank)	Angling	-	-	-	-	-	39	-
171	Duddon Sands (near Lowsy Point)	Collecting cockles	-	-	-	-	9	-	-
40	Roanhead and Askam-in-Furness	Bait digging	-	-	-	-	6	-	-
396	Roa Island	Walking	-	-	-	-	5	-	-
512	South-east Walney Island	Collecting cockles	-	-	-	-	5	-	-
513	South-east Walney Island	Collecting cockles	-	-	-	-	5	-	-
514	South-east Walney Island	Collecting cockles	-	-	-	-	5	-	-
515	South-east Walney Island	Collecting cockles	-	-	-	-	5	-	-
177	**Roanhead**	**Angling**	-	-	-	-	-	**616**	-
178	**Roanhead**	**Angling**	-	-	-	-	-	**616**	-

Table 12. Adults' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Mud	Mud and sand	Mud and stones	Salt marsh	Sand	Sand and stones	Boat on mud and sand
286	**Silecroft**	**Dog walking**	-	-	-	-	-	**520**	-
256	**West Walney Island (Biggar Bank)**	**Dog walking and angling**	-	-	-	-	-	**515**	-
439	**Walney Channel (west Barrow Island)**	**Boat maintenance**	-	-	-	-	-	**220**	-
440	**Walney Channel (west Barrow Island)**	**Boat maintenance**	-	-	-	-	-	**220**	-
28	Askam-in-Furness	Dog walking	-	-	-	-	-	150	-
29	Askam-in-Furness	Dog walking	-	-	-	-	-	144	-
30	Askam-in-Furness	Dog walking	-	-	-	-	-	144	-
285	Silecroft	Dog walking	-	-	-	-	-	104	-
292	Selker Bay	Collecting mussels, winkles and firewood	-	-	-	-	-	78	-
268	West Walney Island (Biggar Bank)	Walking	-	-	-	-	-	52	-
269	West Walney Island (Biggar Bank)	Walking	-	-	-	-	-	52	-
383	West Walney Island (Biggar Bank)	Angling	-	-	-	-	-	52	-
241	Selker Bay	Walking	-	-	-	-	-	48	-
283	Silecroft	Dog walking	-	-	-	-	-	26	-
232	West Walney Island (Biggar Bank)	Hooking crabs and lobsters	-	-	-	-	-	24	-
238	West Walney Island (Biggar Bank)	Hooking crabs and lobsters	-	-	-	-	-	24	-
442	West Barrow Island	Collecting samphire	-	-	-	-	-	3	-
441	West Barrow Island	Collecting samphire	-	-	-	-	-	2	-
447	**Near Roa Island**	**Boat dwelling (tide out)**	-	-	-	-	-	-	**5107**
448	**Near Roa Island**	**Boat dwelling (tide out)**	-	-	-	-	-	-	**3830**

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over mud based on 7 high-rate observations is 138 h y^{-1}

The observed 97.5th percentile rate based on 11 observations for mud is 217 h y^{-1}

The mean intertidal occupancy rate over mud and sand based on 1 observation is 625 h y^{-1}

The observed 97.5th percentile rate based on 9 observations for mud and sand is 536 h y^{-1}

The mean intertidal occupancy rate over mud and stones based on 3 high-rate observations is 400 h y^{-1}

The observed 97.5th percentile rate based on 12 observations for mud and stones is 420 h y^{-1}

The mean intertidal occupancy rate over salt marsh based on 16 high-rate observations is 287 h y^{-1}

The observed 97.5th percentile rate based on 23 observations for salt marsh is 293 h y^{-1}

The mean intertidal occupancy rate over sand based on 7 high-rate observations is 926 h y^{-1}

The observed 97.5th percentile rate based on 94 observations for sand is 1076 h y^{-1}

The mean intertidal occupancy rate over sand and stones based on 17 high-rate observations is 368 h y^{-1}

The observed 97.5th percentile rate based on 47 observations for sand and stones is 614 h y^{-1}

The mean intertidal occupancy rate over a boat on mud and sand based on 3 high-rate observations is 5517 h y^{-1}

The observed 97.5th percentile rate based on 5 observations for a boat on mud and sand is 7364 h y^{-1}

Table 13. Children's and infants' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	Sand	Sand and stones	Boat on mud and sand
297	**12**	**Hodbarrow**	**Dog walking**	**742**	-	-
		Millom Iron Works	**Bait digging**		-	-
295	**14**	**Hodbarrow**	**Dog walking and angling**	**677**	-	-
		Millom Iron Works	**Bait digging**		-	-
289	11	Haverigg	Walking and playing	220	-	-
		Silecroft	Walking and playing	-	50	-
290	9	Haverigg	Walking and playing	220	-	-
		Silecroft	Walking and playing	-	50	-
315	10	Haverigg	Playing	198	-	-
316	7	Haverigg	Playing	198	-	-
415	8	West Walney Island (West Shore Park)	Playing	149	-	-
369	10	West Walney Island (Biggar Bank)	Walking	130	-	-
307	10	Hodbarrow and Haverigg	Playing	120	-	-
308	8	Hodbarrow and Haverigg	Playing	120	-	-
313	8	Haverigg	Dog walking	92	-	-
373	11	South-west Walney Island (Low Bank)	Quad biking	66	-	-
408	7	West Walney Island (West Shore Park)	Playing	60	-	-
409	10	West Walney Island (West Shore Park)	Playing	60	-	-
217	9	Duddon Estuary	Angling	37	-	-
		Lowsy Point	Bait digging		-	-
60	9	Roanhead	Playing and kite flying	24	-	-
62	11	Roanhead	Playing and kite flying	24	-	-
34	15	Roanhead	Angling	20	-	-
37	6	Roanhead	Playing	10	-	-
452	12	North-east and south-east Walney Island	Collecting cockles	8	-	-
240	**15**	**Tarn Point and Selker Bay**	**Dog walking**	-	**200**	-
284	11	Silecroft	Dog walking	-	26	-
449	**11**	**Near Roa Island**	**Boat dwelling (tide out)**	-	-	**3830**

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over sand for the child age group based on 2 high-rate observations is 710 h y^{-1}

The observed 97.5th percentile rate based on 20 observations for sand is 711 h y^{-1}

The mean intertidal occupancy rate over sand and stones for the child age group based on 1 high-rate observations is 200 h y^{-1}

The observed 97.5th percentile rate based on 4 observations for sand and stones is 189 h y^{-1}

The mean intertidal occupancy rate over a boat on mud and sand for the child age group based on the only observation is 3830 h y^{-1}

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

Table 13. Children's and infants' intertidal occupancy rates in the aquatic survey area (h y^{-1})

Infant age group (0 - 5 years old)

Observation number	Age	Location	Activity	Sand	Sand and stones
416	**5**	**West Walney Island (West Shore Park)**	**Playing**	**149**	-
49	2	Askam-in-Furness	Playing	36	-
61	4	Roanhead	Playing and kite flying	24	-
270	**3**	**West Walney Island (Biggar Bank)**	**Playing**	-	**52**
271	**2**	**West Walney Island (Biggar Bank)**	**Playing**	-	**52**
272	**1**	**West Walney Island (Biggar Bank)**	**Playing**	-	**52**

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over sand for the infant age group based on 1 high-rate observations is 149 h y^{-1}

The observed 97.5th percentile rate based on 3 observations for sand is 143 h y^{-1}

The mean intertidal occupancy rate over sand and stones for the infant age group based on 3 high-rate observations is 52 h y^{-1}

The observed 97.5th percentile rate based on 3 observations for sand and stones is 52 h y^{-1}

Table 14. Gamma dose rate measurements over intertidal substrates in the aquatic survey area (µGy h^{-1})

Location	National Grid Reference	Substrate	Gamma dose rate at 1 metre[a]
Tarn Point	SD 075 894	Sand	0.101
Tarn Point	SD 075 894	Stones	0.108
Selker Bay	SD 076 890	Stones	0.100
Selker Bay	SD 076 890	Sand	0.070
Silecroft	SD 120 811	Sand	0.088
Haverigg	SD 160 783	Sand	0.064
Hodbarrow	SD 192 792	Sand	0.062
Millom Iron Works	SD 188 799	Sand	0.060
Millom Iron Works	SD 188 799	Mud and stones	0.073
West Duddon Estuary (Salthouse Pool)	SD 180 806	Salt marsh	0.126
West Duddon Estuary (Arnaby Marsh)	SD 202 834	Sand	0.068
West Duddon Estuary (Arnaby Marsh)	SD 198 835	Salt marsh	0.115
Askam-in-Furness (north of pier)	SD 207 774	Salt marsh	0.064
Askam-in-Furness (south of pier)	SD 208 772	Sand	0.061
Roanhead	SD 199 757	Sand	0.058
West Walney Island (West Shore Park)	SD 170 701	Sand	0.063
South-west Walney Island (Low Bank)	SD 198 637	Sand and stones	0.087
South-west Walney Island (Low Bank)	SD 198 638	Sand	0.060
East Walney Island (just north of Jubilee Bridge)	SD 186 688	Mud	0.081
East Walney Island (south of Jubilee Bridge)	SD 187 676	Salt marsh	0.093
East Walney Island (south of Jubilee Bridge)	SD 187 676	Mud	0.077
South-east Walney Island (near Sheep Island)	SD 209 639	Mud	0.079
South-east Walney Island (near Sheep Island)	SD 209 639	Salt marsh	0.086
East of Roa Island	SD 234 654	Mud and sand	0.079
Between Rampside and Roosebeck	SD 249 670	Sand	0.067
Roosebeck	SD 254 673	Sand	0.072

Notes

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

Table 15. Adults' handling rates of fishing gear and sediment in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Fishing gear	Sediment
348	**Walney Channel, west of Walney Island and Duddon Estuary**	**Handling nets**	**1485**	-
	Walney Channel	**Handling pots**		-
	Walney Channel	Collecting mussels	-	95
	Roa Island and north-east Walney Channel	Collecting winkles	-	
349	**Walney Channel, west of Walney Island and Duddon Estuary**	**Handling nets**	**743**	-
	Walney Channel	**Handling pots**		-
	Walney Channel	Collecting mussels	-	48
	Roa Island and north-east Walney Channel	Collecting winkles	-	
350	**Walney Channel, west of Walney Island and Duddon Estuary**	**Handling nets**	**743**	-
	Walney Channel	**Handling pots**		
	Walney Channel	Collecting mussels	-	48
	Roa Island and north-east Walney Channel	Collecting winkles	-	
345	Walney Channel	Handling nets	126	-
	South-east and south-west Walney Island	**Wildfowling**	-	**228**
347	Walney Channel	Handling nets	126	-
435	Off Walney Island	Handling nets	20	-
436	Off Walney Island	Handling nets	20	-
437	Off Walney Island	Handling nets	20	-
438	Off Walney Island	Handling nets	20	-
249	Scarth Bight	Handling nets	3	-
	Duddon Sands (near Lowsy Point)	Collecting cockles	-	2
453	**Off Roosebeck**	**Oyster farming**	-	**546**
454	**Off Roosebeck**	**Oyster farming**	-	**546**
92	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
93	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
94	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
95	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
96	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
97	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
98	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
99	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
100	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
101	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
102	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
103	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
104	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**

Table 15. Adults' handling rates of fishing gear and sediment in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Fishing gear	Sediment
105	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
106	**West Duddon Estuary marshes**	**Wildfowling**	-	**293**
459	**South-east Walney Island**	**Wildfowling**	-	**200**
273	Millom Iron Works	Bait digging and collecting crabs	-	145
450	Scarth Bight	Wildfowling	-	139
	North-east and south-east Walney Island	Collecting cockles	-	
	Hodbarrow	Collecting mussels	-	
	South Walney Channel	Collecting winkles	-	
51	Roanhead and Askam-in-Furness	Bait digging	-	132
410	West Walney Island (Biggar Bank)	Bait digging	-	130
458	Foulney Island	Collecting mussels	-	105
427	Walney Channel	Bait digging	-	104
428	Walney Channel	Bait digging	-	104
287	Millom Iron Works and Silecroft	Bait digging	-	100
326	Millom Iron Works	Bait digging	-	100
327	Millom Iron Works	Bait digging	-	100
330	Millom Iron Works and Silecroft	Bait digging	-	100
248	Millom Iron Works	Bait digging and collecting crabs	-	93
77	Piel Island	Fixing moorings from a boat and collecting winkles	-	90
	South-east Walney Island	Collecting cockles	-	
	Walney Channel	Collecting mussels	-	
461	Foulney Island	Collecting mussels	-	90
462	Foulney Island	Collecting mussels	-	90
278	Millom Iron Works	Bait digging and collecting crabs	-	87
214	Lowsy Point	Bait digging	-	76
215	Lowsy Point	Bait digging	-	76
75	Roanhead and Askam-in-Furness	Bait digging	-	54
32	Roanhead	Bait digging	-	52
277	Millom Iron Works	Bait digging	-	50
282	Silecroft	Bait digging	-	50
321	Millom Iron Works	Bait digging	-	50
324	Millom Iron Works	Bait digging	-	50
328	Millom Iron Works	Bait digging	-	50
45	Roosebeck	Bait digging	-	45
157	South-east Walney Island	Wildfowling	-	36
	South-west Walney Island	Collecting crabs	-	

Table 15. Adults' handling rates of fishing gear and sediment in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	Fishing gear	Sediment
429	Walney Channel	Collecting crabs	-	34
46	Roosebeck	Bait digging	-	28
463	Foulney Island	Collecting mussels	-	27
464	Foulney Island	Collecting mussels	-	27
292	Selker Bay	Collecting mussels and winkles	-	26
411	Walney Channel (Walney Meetings)	Bait digging	-	26
412	Walney Channel (Walney Meetings)	Bait digging	-	26
232	West Walney Island (Biggar Bank)	Hooking crabs and lobsters	-	24
238	West Walney Island (Biggar Bank)	Hooking crabs and lobsters	-	24
300	Millom Iron Works	Bait digging	-	24
301	Millom Iron Works	Bait digging	-	24
455	Walney Channel	Collecting seaweed	-	15
380	West Walney Island (Biggar Bank)	Bait digging	-	13
381	West Walney Island (Biggar Bank)	Bait digging	-	13
382	West Walney Island (Biggar Bank)	Bait digging	-	13
351	South-east Walney Island	Collecting cockles	-	11
	South-west Walney Island	Collecting winkles	-	
171	Duddon Sands (near Lowsy Point)	Collecting cockles	-	9
40	Roanhead and Askam-in-Furness	Bait digging	-	6
512	South-east Walney Island	Collecting cockles	-	5
513	South-east Walney Island	Collecting cockles	-	5
514	South-east Walney Island	Collecting cockles	-	5
515	South-east Walney Island	Collecting cockles	-	5

Notes

Emboldened observations are the high-rate individuals

The mean fishing gear handling rate based on 3 high-rate observations is 990 h y^{-1}

The observed 97.5th percentile rate based on 10 observations for fishing gear is 1318 h y^{-1}

The mean sediment handling rate based on 19 high-rate observations is 311 h y^{-1}

The observed 97.5th percentile rate based on 72 observations for sediment is 350 h y^{-1}

Table 16. Children's handling rates of sediment in the aquatic survey area (h y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	Sediment
295	**14**	**Millom Iron Works**	**Bait digging**	**52**
297	12	Millom Iron Works	Bait digging	12
452	12	North-east and south-east Walney Island	Collecting cockles	8
217	9	Lowsy Point	Bait digging	4

Notes

Emboldened observations are the high-rate individuals

The mean sediment handling rate for the child age group based on 1 high-rate observations is 52 h y^{-1}

The observed 97.5th percentile rate based on 4 observations for sediment handling is 49 h y^{-1}

Table 17. Occupancy rates in close proximity to sewage, sewage sludge and sewage cake (h y^{-1})

Observation number	Activity	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake
517	Debris removal, cleaning filters and tanks, monitoring gauges and operating machinery	1512	504
518	Debris removal, cleaning filters and tanks, monitoring gauges and operating machinery	1512	504
519	Debris removal, cleaning filters and tanks, monitoring gauges and operating machinery	1512	504
520	Maintaining pumps and equipment	1512	504
521	Maintaining pumps and equipment	1512	504
522	Operating machinery	-	1776

Table 18. Adult's occupancy rates in and on water in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
77	Walney Channel and Piel Island	Jet skiing and sub-aqua diving	144	-
	Walney Channel and west of Walney Island	Boat angling and charter boat skipper	-	262
	Piel Island	Fixing moorings	-	
78	Walney Channel and Piel Island	Jet skiing and sub-aqua diving	144	-
288	Silecroft and Haverigg	Swimming and body-boarding	110	-
467	Walney Channel and Roa Island	Kayaking	73	-
	Piel Island	Snorkelling		-
	Walney Channel and Piel Island	Sailing	-	646
	Walney Channel and Roa Island	Canoeing	-	
468	Walney Channel and Roa Island	Kayaking	73	-
	Piel Island	Snorkelling		-
	Walney Channel and Piel Island	Sailing	-	646
	Walney Channel and Roa Island	Canoeing	-	
469	Walney Channel and Roa Island	Kayaking	73	-
	Piel Island	Snorkelling		-
	Walney Channel and Piel Island	Sailing	-	310
	Walney Channel and Roa Island	Canoeing	-	
470	Walney Channel and Roa Island	Kayaking	70	-
	Walney Channel and Roa Island	Canoeing	-	70
384	West Walney Island (West Shore Park) and Rampside	Windsurfing	60	-
385	West Walney Island (West Shore Park) and Rampside	Windsurfing	60	-
386	West Walney Island (West Shore Park) and Rampside	Windsurfing	60	-
318	Off Silecroft and Haverigg	Kayaking	56	-
319	Off Silecroft and Haverigg	Kayaking	56	-
400	Off Walney Island	Jet skiing	55	-
401	Off Walney Island	Jet skiing	55	-
402	Off Walney Island	Jet skiing	55	-
397	Walney Channel and Piel Island	Jet skiing	44	-
465	Roa Island and Rampside	Kite-surfing and windsurfing	40	-
	Roa Island and Rampside	Canoeing	-	20
466	Roa Island and Rampside	Kite-surfing and windsurfing	40	-
	Roa Island and Rampside	Canoeing	-	20
398	Walney Channel and Piel Island	Jet skiing	33	-
399	Walney Channel and Piel Island	Jet skiing	33	-
291	Silecroft and Haverigg	Swimming and body-boarding	30	-

Table 18. Adult's occupancy rates in and on water in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
413	West Walney Island (West Shore Park)	Swimming	21	-
414	West Walney Island (West Shore Park)	Swimming	21	-
496	Roa Island and Rampside	Windsurfing	18	-
497	Roa Island and Rampside	Windsurfing	18	-
498	Roa Island and Rampside	Windsurfing	18	-
499	Roa Island and Rampside	Windsurfing	18	-
500	Roa Island and Rampside	Windsurfing	18	-
443	Walney Channel	Sub-aqua diving	15	-
444	Walney Channel	Sub-aqua diving	15	-
445	Walney Channel	Sub-aqua diving	15	-
446	Walney Channel	Sub-aqua diving	15	-
359	West Walney Island (Biggar Bank)	Swimming	9	-
360	West Walney Island (Biggar Bank)	Swimming	9	-
407	West Walney Island (West Shore Park)	Swimming	9	-
501	Piel Island	Swimming	5	-
	Walney Channel and south of Walney Island	Sailing	-	72
339	Off Walney Island	Working on a boat	-	3072
	Duddon Estuary	Rescue boat duties	-	
341	Off Walney Island	Working on a boat	-	3000
342	Off Walney Island	Working on a boat	-	3000
343	Off Walney Island	Working on a boat	-	3000
344	Off Walney Island	Working on a boat	-	3000
348	Walney Channel, west of Walney Island and Duddon Estuary	Gill netting	-	2190
	Walney Channel	Potting	-	
447	Near Roa Island	Boat dwelling (tide in)	-	1344
349	Walney Channel, west of Walney Island and Duddon Estuary	Gill netting	-	1095
	Walney Channel	Potting	-	
350	Walney Channel, west of Walney Island and Duddon Estuary	Gill netting	-	1095
	Walney Channel	Potting	-	
448	Near Roa Island	Boat dwelling (tide in)	-	1008
63	Askam-in-Furness	Boat dwelling (tide in)	-	672
256	Walney Channel	Boat angling	-	400
71	Walney Channel	Sailing and boat angling	-	384
79	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
80	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264

Table 18. Adult's occupancy rates in and on water in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
81	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
82	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
83	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
84	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
85	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
86	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
87	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
88	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
89	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
90	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
91	South Walney Channel and Port of Barrow-in-Furness	Dredging	-	264
428	Off Walney Island	Boat angling	-	260
430	Off Walney Island	Boat angling	-	234
431	Off Walney Island	Boat angling	-	234
432	Off Walney Island	Boat angling	-	234
433	Off Walney Island	Boat angling	-	234
434	Off Walney Island	Boat angling	-	234
471	Walney Channel and west of Walney Island	RNLI duties	-	176
472	Walney Channel and west of Walney Island	RNLI duties	-	176
473	Walney Channel and west of Walney Island	RNLI duties	-	176
474	Walney Channel and west of Walney Island	RNLI duties	-	176
475	Walney Channel and west of Walney Island	RNLI duties	-	176
476	Walney Channel and west of Walney Island	RNLI duties	-	176
477	Walney Channel and west of Walney Island	RNLI duties	-	176
478	Walney Channel and west of Walney Island	RNLI duties	-	176
479	Walney Channel and west of Walney Island	RNLI duties	-	176
480	Walney Channel and west of Walney Island	RNLI duties	-	176
405	West of Walney Island	Boat angling	-	143
406	West of Walney Island	Boat angling	-	143
232	South Walney and West Walney	Boat angling	-	120
238	South Walney and West Walney	Boat angling	-	120
51	Walney Channel	Boat angling	-	108
345	Walney Channel	Gill netting	-	108
347	Walney Channel	Gill netting	-	108
459	Walney Channel and off Walney Island	Sailing	-	100

Table 18. Adult's occupancy rates in and on water in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
504	Walney Channel and south of Walney Island	Sailing	-	100
505	Walney Channel and south of Walney Island	Sailing	-	100
506	Walney Channel and south of Walney Island	Sailing	-	100
507	Walney Channel and south of Walney Island	Sailing	-	100
508	Walney Channel and south of Walney Island	Sailing	-	100
509	Walney Channel and south of Walney Island	Sailing	-	100
510	Walney Channel and south of Walney Island	Sailing	-	100
511	Walney Channel and south of Walney Island	Sailing	-	100
512	Walney Channel and south of Walney Island	Sailing	-	100
513	Walney Channel and south of Walney Island	Sailing	-	100
514	Walney Channel and south of Walney Island	Sailing	-	100
515	Walney Channel and south of Walney Island	Sailing	-	100
516	Walney Channel and south of Walney Island	Sailing	-	100
491	Walney Channel and west of Walney Island	Boat angling	-	96
492	Walney Channel and west of Walney Island	Boat angling	-	96
493	Walney Channel and west of Walney Island	Boat angling	-	96
494	Walney Channel and west of Walney Island	Boat angling	-	96
495	Walney Channel and west of Walney Island	Boat angling	-	96
392	Piel Island	Boat angling	-	78
393	Piel Island	Boat angling	-	78
332	Duddon Estuary	Rescue boat duties	-	72
333	Duddon Estuary	Rescue boat duties	-	72
334	Duddon Estuary	Rescue boat duties	-	72
335	Duddon Estuary	Rescue boat duties	-	72
336	Duddon Estuary	Rescue boat duties	-	72
337	Duddon Estuary	Rescue boat duties	-	72
338	Duddon Estuary	Rescue boat duties	-	72
481	Walney Channel and south of Walney Island	Sailing	-	72
482	Walney Channel and south of Walney Island	Sailing	-	72
483	Walney Channel and south of Walney Island	Sailing	-	72
484	Walney Channel and south of Walney Island	Sailing	-	72
485	Walney Channel and south of Walney Island	Sailing	-	72
486	Walney Channel and south of Walney Island	Sailing	-	72
487	Walney Channel and south of Walney Island	Sailing	-	72
488	Walney Channel and south of Walney Island	Sailing	-	72

Table 18. Adult's occupancy rates in and on water in the aquatic survey area (h y^{-1})

Observation number	Location	Activity	In water	On water
489	Walney Channel and south of Walney Island	Sailing	-	72
490	Walney Channel and south of Walney Island	Sailing	-	72
435	Off Walney Island	Trawling	-	60
436	Off Walney Island	Trawling	-	60
437	Off Walney Island	Trawling	-	60
438	Off Walney Island	Trawling	-	60
75	Walney Channel	Boat angling	-	54
74	Walney Channel	Sailing	-	50
442	Off Walney Island	Boat angling	-	48
244	Duddon Estuary	Boat angling	-	42
245	Duddon Estuary	Boat angling	-	42
246	Duddon Estuary	Boat angling	-	42
247	Duddon Estuary	Boat angling	-	42
396	Piel Island	Boat angling	-	40
314	Haverigg	Paddling	-	33
249	Duddon Estuary	Boat angling	-	32
427	Off Walney Island	Boat angling	-	30
214	South of Walney Island	Boat angling	-	28
215	South of Walney Island	Boat angling	-	28
143	Off Walney Island	Sailing	-	16
144	Off Walney Island	Sailing	-	16
441	Off Walney Island	Boat angling	-	15

Table 19. Children's and infants' occupancy rates in and on water in the aquatic survey area (h y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	In water	On water
240	15	Tarn Point to Silecroft	Kayaking	196	-
289	11	Silecroft and Haverigg	Swimming and bodyboarding	110	-
290	9	Silecroft and Haverigg	Swimming and bodyboarding	110	-
320	12	Off Silecroft and Haverigg	Kayaking	56	-
403	11	Off Walney Island	Jet skiing	55	-
404	9	Off Walney Island	Jet skiing	55	-
415	8	West Walney Island (West Shore Park)	Swimming	21	-
408	7	West Walney Island (West Shore Park)	Swimming	9	-
409	10	West Walney Island (West Shore Park)	Swimming	9	-
449	11	Near Roa Island	Boat dwelling (tide in)	-	1008
315	10	Haverigg	Paddling	-	33
316	7	Haverigg	Paddling	-	33
145	12	Off Walney Island	Sailing	-	16
146	13	Off Walney Island	Sailing	-	16
217	9	South of Walney Island	Boat angling	-	14

Infant age group (0 - 5 years old)

Observation number	Age	Location	Activity	In water	On water
416	5	West Walney Island (West Shore Park)	Swimming	21	-

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

Observation number	Broccoli	Brussels sprout	Cabbage	Callaloo	Cauliflower	Chard	Courgette	Cucumber	Gherkin	Kale	Lettuce	Marrow	Spinach	Total
136	**-**	**16.4**	**13.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**30.1**
137	**-**	**16.4**	**13.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**30.1**
138	**5.7**	**-**	**9.2**	**0.4**	**10.9**	**-**	**-**	**-**	**-**	**3.1**	**-**	**-**	**-**	**29.3**
139	**5.7**	**-**	**9.2**	**0.4**	**10.9**	**-**	**-**	**-**	**-**	**3.1**	**-**	**-**	**-**	**29.3**
232	**1.6**	**1.7**	**11.0**	**-**	**-**	**-**	**2.2**	**-**	**-**	**-**	**2.3**	**-**	**-**	**18.8**
233	**1.6**	**1.7**	**11.0**	**-**	**-**	**-**	**2.2**	**-**	**-**	**-**	**2.3**	**-**	**-**	**18.8**
135	**-**	**-**	**-**	**-**	**18.4**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18.4**
191	**-**	**-**	**5.5**	**-**	**-**	**-**	**4.6**	**4.3**	**0.9**	**-**	**0.7**	**-**	**-**	**15.9**
192	**-**	**-**	**5.5**	**-**	**-**	**-**	**4.6**	**4.3**	**0.9**	**-**	**0.7**	**-**	**-**	**15.9**
193	**-**	**-**	**5.5**	**-**	**-**	**-**	**4.6**	**4.3**	**0.9**	**-**	**0.7**	**-**	**-**	**15.9**
194	**-**	**-**	**5.5**	**-**	**-**	**-**	**4.6**	**4.3**	**0.9**	**-**	**0.7**	**-**	**-**	**15.9**
189	**-**	**1.6**	**8.2**	**-**	**5.1**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**-**	**15.7**
190	**-**	**1.6**	**8.2**	**-**	**5.1**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**-**	**15.7**
214	**1.0**	**-**	**5.0**	**-**	**-**	**0.3**	**1.4**	**4.3**	**-**	**2.7**	**0.6**	**-**	**-**	**15.3**
215	**1.0**	**-**	**5.0**	**-**	**-**	**0.3**	**1.4**	**4.3**	**-**	**2.7**	**0.6**	**-**	**-**	**15.3**
216	**1.0**	**-**	**5.0**	**-**	**-**	**0.3**	**1.4**	**4.3**	**-**	**2.7**	**0.6**	**-**	**-**	**15.3**
423	**-**	**2.7**	**-**	**-**	**-**	**-**	**-**	**10.2**	**-**	**-**	**-**	**-**	**1.0**	**14.0**
424	**-**	**2.7**	**-**	**-**	**-**	**-**	**-**	**10.2**	**-**	**-**	**-**	**-**	**1.0**	**14.0**
147	**-**	**-**	**4.6**	**-**	**2.8**	**-**	**-**	**4.3**	**-**	**-**	**1.2**	**-**	**-**	**12.8**
148	**-**	**-**	**4.6**	**-**	**2.8**	**-**	**-**	**4.3**	**-**	**-**	**1.2**	**-**	**-**	**12.8**
203	**2.6**	**-**	**0.4**	**-**	**-**	**-**	**9.2**	**-**	**-**	**-**	**0.1**	**-**	**-**	**12.3**
204	**2.6**	**-**	**0.4**	**-**	**-**	**-**	**9.2**	**-**	**-**	**-**	**0.1**	**-**	**-**	**12.3**
167	**2.8**	**2.3**	**2.3**	**-**	**2.8**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**10.9**
168	**2.8**	**2.3**	**2.3**	**-**	**2.8**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**10.9**
169	**2.8**	**2.3**	**2.3**	**-**	**2.8**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**10.9**
170	**2.8**	**2.3**	**2.3**	**-**	**2.8**	**-**	**-**	**-**	**-**	**-**	**0.8**	**-**	**-**	**10.9**
209	**-**	**2.3**	**4.8**	**-**	**2.0**	**-**	**-**	**-**	**-**	**-**	**1.5**	**-**	**-**	**10.5**
210	**-**	**2.3**	**4.8**	**-**	**2.0**	**-**	**-**	**-**	**-**	**-**	**1.5**	**-**	**-**	**10.5**
195	-	-	9.1	-	-	-	-	-	-	-	-	-	-	9.1
196	-	-	9.1	-	-	-	-	-	-	-	-	-	-	9.1
165	-	-	5.0	-	-	-	-	3.2	-	-	-	-	-	8.2
166	-	-	5.0	-	-	-	-	3.2	-	-	-	-	-	8.2
179	-	-	2.7	-	-	-	5.0	-	-	-	-	-	-	7.7
180	-	-	2.7	-	-	-	5.0	-	-	-	-	-	-	7.7
211	-	1.5	3.2	-	1.3	-	-	-	-	-	1.0	-	-	7.0
212	-	1.5	3.2	-	1.3	-	-	-	-	-	1.0	-	-	7.0
171	-	2.7	3.2	-	-	-	-	1.1	-	-	-	-	-	7.0
172	-	2.7	3.2	-	-	-	-	1.1	-	-	-	-	-	7.0
205	1.3	-	0.2	-	-	-	4.6	-	-	-	0.1	-	-	6.1
206	1.3	-	0.2	-	-	-	4.6	-	-	-	0.1	-	-	6.1
207	1.3	-	0.2	-	-	-	4.6	-	-	-	0.1	-	-	6.1
161	0.7	-	-	-	0.7	-	2.8	-	-	-	-	1.8	-	5.9
163	0.7	-	-	-	0.7	-	2.8	-	-	-	-	1.8	-	5.9

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

Observation number	Broccoli	Brussels sprout	Cabbage	Callaloo	Cauliflower	Chard	Courgette	Cucumber	Gherkin	Kale	Lettuce	Marrow	Spinach	Total
164	0.7	-	-	-	0.7	-	2.8	-	-	-	-	1.8	-	5.9
153	0.8	-	2.8	-	-	-	-	-	-	-	1.2	-	-	4.8
154	0.8	-	2.8	-	-	-	-	-	-	-	1.2	-	-	4.8
140	1.0	-	1.5	-	1.8	-	-	-	-	0.5	-	-	-	4.8
141	1.0	-	1.5	-	1.8	-	-	-	-	0.5	-	-	-	4.8
155	0.5	-	1.9	-	-	-	-	-	-	-	0.8	-	-	3.2
156	0.5	-	1.9	-	-	-	-	-	-	-	0.8	-	-	3.2
149	-	-	1.1	-	0.7	-	-	1.1	-	-	0.3	-	-	3.2
150	-	-	1.1	-	0.7	-	-	1.1	-	-	0.3	-	-	3.2
115	-	-	1.9	-	1.2	-	-	-	-	-	-	-	-	3.1
116	-	-	1.9	-	1.2	-	-	-	-	-	-	-	-	3.1
117	-	-	1.9	-	1.2	-	-	-	-	-	-	-	-	3.1
118	-	-	1.9	-	1.2	-	-	-	-	-	-	-	-	3.1
119	-	-	1.9	-	1.2	-	-	-	-	-	-	-	-	3.1
120	-	-	1.9	-	1.2	-	-	-	-	-	-	-	-	3.1
218	-	-	1.3	-	-	-	-	-	-	-	1.0	-	-	2.3
219	-	-	1.3	-	-	-	-	-	-	-	1.0	-	-	2.3
220	-	-	1.3	-	-	-	-	-	-	-	1.0	-	-	2.3
234	0.2	0.2	1.2	-	-	-	0.2	-	-	-	0.3	-	-	2.1
235	0.2	0.2	1.2	-	-	-	0.2	-	-	-	0.3	-	-	2.1
197	-	-	-	-	-	-	-	-	-	-	1.9	-	-	1.9
198	-	-	-	-	-	-	-	-	-	-	1.9	-	-	1.9
221	-	-	1.0	-	-	-	-	-	-	-	0.8	-	-	1.7
222	-	-	1.0	-	-	-	-	-	-	-	0.8	-	-	1.7
173	-	0.5	0.6	-	-	-	-	0.2	-	-	-	-	-	1.4
174	-	0.5	0.6	-	-	-	-	0.2	-	-	-	-	-	1.4
186	-	-	1.3	-	-	-	-	-	-	-	-	-	-	1.3
187	-	-	1.3	-	-	-	-	-	-	-	-	-	-	1.3
181	-	-	0.3	-	-	-	0.6	-	-	-	-	-	-	0.9
199	-	-	-	-	-	-	-	-	-	-	0.4	-	-	0.4
200	-	-	-	-	-	-	-	-	-	-	0.4	-	-	0.4
201	-	-	-	-	-	-	-	-	-	-	0.4	-	-	0.4
202	-	-	-	-	-	-	-	-	-	-	0.4	-	-	0.4

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables based on the 28 high-rate adult consumers is 16.4 kg y^{-1}

The observed 97.5th percentile rate based on 76 observations is 29.4 kg y^{-1}

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

Observation number	Broad bean	Chilli pepper	French bean	Pea	Pepper	Runner bean	Squash	Sweetcorn	Tomato	Total
135	**-**	**4.4**	**-**	**13.4**	**8.8**	**-**	**-**	**-**	**16.2**	**42.8**
197	**-**	**-**	**-**	**2.8**	**-**	**-**	**-**	**-**	**27.0**	**29.8**
198	**-**	**-**	**-**	**2.8**	**-**	**-**	**-**	**-**	**27.0**	**29.8**
147	**-**	**-**	**-**	**-**	**0.5**	**-**	**-**	**-**	**29.3**	**29.7**
148	**-**	**-**	**-**	**-**	**0.5**	**-**	**-**	**-**	**29.3**	**29.7**
191	**2.0**	**-**	**2.4**	**2.0**	**3.9**	**2.6**	**0.1**	**0.3**	**15.8**	**29.2**
192	**2.0**	**-**	**2.4**	**2.0**	**3.9**	**2.6**	**0.1**	**0.3**	**15.8**	**29.2**
193	**2.0**	**-**	**2.4**	**2.0**	**3.9**	**2.6**	**0.1**	**0.3**	**15.8**	**29.2**
194	**2.0**	**-**	**2.4**	**2.0**	**3.9**	**2.6**	**0.1**	**0.3**	**15.8**	**29.2**
185	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**27.0**	**27.0**
179	**1.5**	**-**	**2.4**	**1.5**	**1.8**	**-**	**-**	**-**	**19.4**	**26.7**
180	**1.5**	**-**	**2.4**	**1.5**	**1.8**	**-**	**-**	**-**	**19.4**	**26.7**
225	**5.6**	**-**	**-**	**2.3**	**-**	**3.6**	**-**	**-**	**10.8**	**22.2**
226	**5.6**	**-**	**-**	**2.3**	**-**	**3.6**	**-**	**-**	**10.8**	**22.2**
232	**1.0**	**-**	**-**	**0.3**	**1.8**	**1.8**	**-**	**-**	**16.2**	**21.1**
233	**1.0**	**-**	**-**	**0.3**	**1.8**	**1.8**	**-**	**-**	**16.2**	**21.1**
167	**-**	**-**	**-**	**1.4**	**-**	**2.6**	**-**	**-**	**16.2**	**20.1**
168	**-**	**-**	**-**	**1.4**	**-**	**2.6**	**-**	**-**	**16.2**	**20.1**
169	**-**	**-**	**-**	**1.4**	**-**	**2.6**	**-**	**-**	**16.2**	**20.1**
170	**-**	**-**	**-**	**1.4**	**-**	**2.6**	**-**	**-**	**16.2**	**20.1**
153	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18.9**	**18.9**
154	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**18.9**	**18.9**
203	**0.7**	**-**	**0.8**	**-**	**-**	**1.5**	**-**	**1.0**	**11.7**	**15.7**
204	**0.7**	**-**	**0.8**	**-**	**-**	**1.5**	**-**	**1.0**	**11.7**	**15.7**
239	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**14.4**	**14.4**
184	-	-	-	-	-	-	-	-	13.5	13.5
230	3.4	-	-	1.4	-	2.1	-	-	6.5	13.3
231	3.4	-	-	1.4	-	2.1	-	-	6.5	13.3
189	3.3	-	2.2	3.2	-	-	-	4.1	-	12.8
190	3.3	-	2.2	3.2	-	-	-	4.1	-	12.8
155	-	-	-	-	-	-	-	-	12.6	12.6
156	-	-	-	-	-	-	-	-	12.6	12.6
199	-	-	-	0.6	-	-	-	-	10.8	11.4
200	-	-	-	0.6	-	-	-	-	10.8	11.4
201	-	-	-	0.6	-	-	-	-	10.8	11.4
202	-	-	-	0.6	-	-	-	-	10.8	11.4
138	-	-	0.9	5.8	-	-	-	2.8	-	9.4
139	-	-	0.9	5.8	-	-	-	2.8	-	9.4
165	-	-	-	2.5	0.2	-	-	-	6.3	9.0
166	-	-	-	2.5	0.2	-	-	-	6.3	9.0
423	0.8	-	-	0.1	-	-	-	-	7.2	8.1
424	0.8	-	-	0.1	-	-	-	-	7.2	8.1
161	0.2	-	0.2	0.1	-	2.0	-	-	5.4	8.0
163	0.2	-	0.2	0.1	-	2.0	-	-	5.4	8.0

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

Observation number	Broad bean	Chilli pepper	French bean	Pea	Pepper	Runner bean	Squash	Sweetcorn	Tomato	Total
164	0.2	-	0.2	0.1	-	2.0	-	-	5.4	8.0
205	0.4	-	0.4	-	-	0.8	-	0.5	5.9	7.9
206	0.4	-	0.4	-	-	0.8	-	0.5	5.9	7.9
207	0.4	-	0.4	-	-	0.8	-	0.5	5.9	7.9
171	-	-	0.4	-	-	-	-	0.6	6.8	7.7
172	-	-	0.4	-	-	-	-	0.6	6.8	7.7
188	4.6	-	0.7	2.3	-	-	-	-	-	7.5
149	-	-	-	-	0.1	-	-	-	7.3	7.4
150	-	-	-	-	0.1	-	-	-	7.3	7.4
195	-	-	2.7	-	-	-	-	4.1	-	6.8
196	-	-	2.7	-	-	-	-	4.1	-	6.8
209	2.3	-	-	2.4	-	1.3	-	-	-	6.0
210	2.3	-	-	2.4	-	1.3	-	-	-	6.0
214	0.4	-	-	2.0	0.5	-	-	0.7	1.8	5.4
215	0.4	-	-	2.0	0.5	-	-	0.7	1.8	5.4
216	0.4	-	-	2.0	0.5	-	-	0.7	1.8	5.4
218	4.5	-	-	0.4	-	-	-	-	-	4.9
219	4.5	-	-	0.4	-	-	-	-	-	4.9
220	4.5	-	-	0.4	-	-	-	-	-	4.9
211	1.5	-	-	1.6	-	0.9	-	-	-	4.0
212	1.5	-	-	1.6	-	0.9	-	-	-	4.0
221	3.4	-	-	0.3	-	-	-	-	-	3.7
222	3.4	-	-	0.3	-	-	-	-	-	3.7
181	0.2	-	0.3	0.2	0.2	-	-	-	2.2	3.0
227	0.7	-	-	0.3	-	0.5	-	-	1.4	3.0
228	0.7	-	-	0.3	-	0.5	-	-	1.4	3.0
234	0.1	-	-	-	0.2	0.2	-	-	1.8	2.3
235	0.1	-	-	-	0.2	0.2	-	-	1.8	2.3
140	-	-	0.3	1.0	-	-	-	0.5	-	1.7
141	-	-	0.3	1.0	-	-	-	0.5	-	1.7
173	-	-	0.1	-	-	-	-	0.1	1.4	1.5
174	-	-	0.1	-	-	-	-	0.1	1.4	1.5
186	0.6	-	-	0.5	-	-	-	-	-	1.0
187	0.6	-	-	0.5	-	-	-	-	-	1.0

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables based on the 25 high-rate adult consumers is 24.4 kg y^{-1}

The observed 97.5th percentile rate based on 78 observations is 29.8 kg y^{-1}

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

Observation number	Beetroot	Carrot	Celeriac	Garlic	Kohl rabi	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
232	**-**	**2.7**	**-**	**-**	**-**	**2.7**	**8.1**	**4.3**	**-**	**2.4**	**0.8**	**16.3**	**-**	**37.3**
233	**-**	**2.7**	**-**	**-**	**-**	**2.7**	**8.1**	**4.3**	**-**	**2.4**	**0.8**	**16.3**	**-**	**37.3**
135	**5.4**	**2.3**	**-**	**-**	**-**	**5.4**	**5.9**	**-**	**-**	**-**	**-**	**11.5**	**4.9**	**35.4**
189	**8.9**	**-**	**-**	**-**	**4.1**	**-**	**16.8**	**-**	**-**	**-**	**-**	**4.9**	**-**	**34.7**
190	**8.9**	**-**	**-**	**-**	**4.1**	**-**	**16.8**	**-**	**-**	**-**	**-**	**4.9**	**-**	**34.7**
138	**5.8**	**-**	**-**	**-**	**-**	**4.3**	**13.8**	**-**	**-**	**4.1**	**-**	**-**	**5.2**	**33.2**
139	**5.8**	**-**	**-**	**-**	**-**	**4.3**	**13.8**	**-**	**-**	**4.1**	**-**	**-**	**5.2**	**33.2**
184	**3.4**	**-**	**-**	**-**	**-**	**5.4**	**11.9**	**-**	**-**	**-**	**-**	**12.3**	**-**	**32.9**
185	**3.4**	**-**	**-**	**-**	**-**	**5.4**	**11.9**	**-**	**-**	**-**	**-**	**12.3**	**-**	**32.9**
218	**12.3**	**-**	**-**	**-**	**-**	**3.0**	**14.4**	**-**	**-**	**-**	**-**	**-**	**1.4**	**31.1**
219	**12.3**	**-**	**-**	**-**	**-**	**3.0**	**14.4**	**-**	**-**	**-**	**-**	**-**	**1.4**	**31.1**
220	**12.3**	**-**	**-**	**-**	**-**	**3.0**	**14.4**	**-**	**-**	**-**	**-**	**-**	**1.4**	**31.1**
225	**5.1**	**-**	**-**	**-**	**-**	**-**	**22.3**	**-**	**-**	**-**	**-**	**3.4**	**-**	**30.8**
226	**5.1**	**-**	**-**	**-**	**-**	**-**	**22.3**	**-**	**-**	**-**	**-**	**3.4**	**-**	**30.8**
167	**9.2**	**-**	**-**	**-**	**-**	**10.1**	**6.8**	**-**	**-**	**4.0**	**0.3**	**-**	**-**	**30.4**
168	**9.2**	**-**	**-**	**-**	**-**	**10.1**	**6.8**	**-**	**-**	**4.0**	**0.3**	**-**	**-**	**30.4**
169	**9.2**	**-**	**-**	**-**	**-**	**10.1**	**6.8**	**-**	**-**	**4.0**	**0.3**	**-**	**-**	**30.4**
170	**9.2**	**-**	**-**	**-**	**-**	**10.1**	**6.8**	**-**	**-**	**4.0**	**0.3**	**-**	**-**	**30.4**
153	**4.4**	**-**	**-**	**-**	**-**	**5.9**	**13.2**	**2.2**	**-**	**-**	**-**	**-**	**-**	**25.7**
154	**4.4**	**-**	**-**	**-**	**-**	**5.9**	**13.2**	**2.2**	**-**	**-**	**-**	**-**	**-**	**25.7**
165	**5.0**	**6.8**	**-**	**-**	**-**	**2.0**	**7.9**	**2.9**	**-**	**-**	**-**	**-**	**-**	**24.6**
166	**5.0**	**6.8**	**-**	**-**	**-**	**2.0**	**7.9**	**2.9**	**-**	**-**	**-**	**-**	**-**	**24.6**
221	**9.2**	**-**	**-**	**-**	**-**	**2.3**	**10.8**	**-**	**-**	**-**	**-**	**-**	**1.0**	**23.3**
222	**9.2**	**-**	**-**	**-**	**-**	**2.3**	**10.8**	**-**	**-**	**-**	**-**	**-**	**1.0**	**23.3**
209	**4.1**	**-**	**-**	**0.3**	**-**	**2.2**	**7.1**	**-**	**-**	**3.5**	**1.6**	**-**	**4.3**	**23.1**
210	**4.1**	**-**	**-**	**0.3**	**-**	**2.2**	**7.1**	**-**	**-**	**3.5**	**1.6**	**-**	**4.3**	**23.1**
197	**4.5**	**-**	**-**	**-**	**-**	**14.1**	**4.5**	**-**	**-**	**-**	**-**	**-**	**-**	**23.1**
198	**4.5**	**-**	**-**	**-**	**-**	**14.1**	**4.5**	**-**	**-**	**-**	**-**	**-**	**-**	**23.1**
230	**3.1**	**-**	**-**	**-**	**-**	**-**	**13.4**	**-**	**-**	**-**	**-**	**2.0**	**-**	**18.5**
231	**3.1**	**-**	**-**	**-**	**-**	**-**	**13.4**	**-**	**-**	**-**	**-**	**2.0**	**-**	**18.5**
155	**2.9**	**-**	**-**	**-**	**-**	**3.9**	**8.8**	**1.4**	**-**	**-**	**-**	**-**	**-**	**17.1**
156	**2.9**	**-**	**-**	**-**	**-**	**3.9**	**8.8**	**1.4**	**-**	**-**	**-**	**-**	**-**	**17.1**
195	**-**	**-**	**-**	**-**	**-**	**10.1**	**5.4**	**-**	**-**	**-**	**-**	**-**	**-**	**15.5**
196	**-**	**-**	**-**	**-**	**-**	**10.1**	**5.4**	**-**	**-**	**-**	**-**	**-**	**-**	**15.5**
136	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**14.6**	**14.6**
137	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**14.6**	**14.6**
188	**9.0**	**-**	**-**	**-**	**-**	**-**	**5.5**	**-**	**-**	**-**	**-**	**-**	**-**	**14.5**
171	**1.1**	**-**	**-**	**-**	**-**	**-**	**4.1**	**0.7**	**-**	**0.2**	**-**	**6.8**	**-**	**13.0**
172	**1.1**	**-**	**-**	**-**	**-**	**-**	**4.1**	**0.7**	**-**	**0.2**	**-**	**6.8**	**-**	**13.0**
211	**2.7**	**-**	**-**	**0.2**	**-**	**1.5**	**4.8**	**-**	**-**	**2.3**	**1.1**	**-**	**-**	**12.5**
212	**2.7**	**-**	**-**	**0.2**	**-**	**1.5**	**4.8**	**-**	**-**	**2.3**	**1.1**	**-**	**-**	**12.5**
203	2.7	-	-	-	0.8	-	8.8	-	-	-	-	-	-	12.3
204	2.7	-	-	-	0.8	-	8.8	-	-	-	-	-	-	12.3
182	-	-	-	-	-	-	11.9	-	-	-	-	-	-	11.9
179	5.5	-	-	-	-	-	3.2	-	-	-	-	-	-	8.8
180	5.5	-	-	-	-	-	3.2	-	-	-	-	-	-	8.8
214	0.4	0.6	-	-	-	-	4.8	-	-	0.2	-	-	1.7	7.6
215	0.4	0.6	-	-	-	-	4.8	-	-	0.2	-	-	1.7	7.6

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

Observation number	Beetroot	Carrot	Celeriac	Garlic	Kohl rabi	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
216	0.4	0.6	-	-	-	-	4.8	-	-	0.2	-	-	1.7	7.6
205	1.3	-	-	-	0.4	-	4.4	-	-	-	-	-	-	6.2
206	1.3	-	-	-	0.4	-	4.4	-	-	-	-	-	-	6.2
207	1.3	-	-	-	0.4	-	4.4	-	-	-	-	-	-	6.2
199	2.3	-	-	-	-	2.8	0.9	-	-	-	-	-	-	6.0
200	2.3	-	-	-	-	2.8	0.9	-	-	-	-	-	-	6.0
201	2.3	-	-	-	-	2.8	0.9	-	-	-	-	-	-	6.0
202	2.3	-	-	-	-	2.8	0.9	-	-	-	-	-	-	6.0
140	1.0	-	-	-	-	0.7	2.3	-	-	0.7	-	-	0.9	5.5
141	1.0	-	-	-	-	0.7	2.3	-	-	0.7	-	-	0.9	5.5
423	-	3.6	-	-	-	-	1.3	-	-	-	-	-	-	4.9
424	-	3.6	-	-	-	-	1.3	-	-	-	-	-	-	4.9
191	1.8	0.9	-	-	-	-	1.6	-	-	-	-	-	-	4.4
192	1.8	0.9	-	-	-	-	1.6	-	-	-	-	-	-	4.4
193	1.8	0.9	-	-	-	-	1.6	-	-	-	-	-	-	4.4
194	1.8	0.9	-	-	-	-	1.6	-	-	-	-	-	-	4.4
234	-	0.3	0.2	-	-	0.3	0.9	0.5	-	0.3	0.1	1.8	-	4.4
235	-	0.3	0.2	-	-	0.3	0.9	0.5	-	0.3	0.1	1.8	-	4.4
227	0.7	-	-	-	-	-	3.0	-	-	-	-	0.5	-	4.1
228	0.7	-	-	-	-	-	3.0	-	-	-	-	0.5	-	4.1
147	-	-	-	-	-	4.0	-	-	-	-	-	-	-	4.0
148	-	-	-	-	-	4.0	-	-	-	-	-	-	-	4.0
183	-	-	-	-	-	-	4.0	-	-	-	-	-	-	4.0
186	2.1	-	-	-	-	-	-	-	-	-	-	1.7	-	3.8
187	2.1	-	-	-	-	-	-	-	-	-	-	1.7	-	3.8
173	0.2	-	-	-	-	-	0.8	0.1	-	-	-	1.4	-	2.6
174	0.2	-	-	-	-	-	0.8	0.1	-	-	-	1.4	-	2.6
161	-	-	-	0.5	-	-	1.7	-	0.1	-	-	-	-	2.2
163	-	-	-	0.5	-	-	1.7	-	0.1	-	-	-	-	2.2
164	-	-	-	0.5	-	-	1.7	-	0.1	-	-	-	-	2.2
181	1.2	-	-	-	-	-	0.4	-	-	-	-	-	-	1.6
149	-	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0
150	-	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0
115	-	-	-	-	-	0.9	-	-	-	-	-	-	-	0.9
116	-	-	-	-	-	0.9	-	-	-	-	-	-	-	0.9
117	-	-	-	-	-	0.9	-	-	-	-	-	-	-	0.9
118	-	-	-	-	-	0.9	-	-	-	-	-	-	-	0.9
119	-	-	-	-	-	0.9	-	-	-	-	-	-	-	0.9
120	-	-	-	-	-	0.9	-	-	-	-	-	-	-	0.9

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables based on the 41 high-rate adult consumers is 25.0 kg y^{-1}

The observed 97.5th percentile rate based on 87 observations is 35.3 kg y^{-1}

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

Observation number	Potato
182	**54.5**
232	**40.3**
233	**40.3**
147	**32.6**
148	**32.6**
239	**32.5**
188	**27.2**
209	**25.5**
210	**25.5**
167	**24.5**
168	**24.5**
169	**24.5**
170	**24.5**
165	**23.2**
166	**23.2**
197	**22.8**
198	**22.8**
218	**21.8**
219	**21.8**
220	**21.8**
189	**20.5**
190	**20.5**
203	**18.2**
204	**18.2**
183	**18.2**
211	17.0
212	17.0
136	16.4
137	16.4
221	16.3
222	16.3
179	10.2
180	10.2
214	10.1
215	10.1
216	10.1
205	9.1
206	9.1
207	9.1
184	8.2
185	8.2
149	8.2
150	8.2
423	6.1
424	6.1
186	5.6
187	5.6
171	5.1
172	5.1
199	4.6
200	4.6
201	4.6
202	4.6
234	3.4
235	3.4

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

Observation number	Potato
225	3.3
226	3.3
230	2.0
231	2.0
115	1.8
116	1.8
117	1.8
118	1.8
119	1.8
120	1.8
5	1.3
6	1.3
181	1.1
173	1.0
174	1.0
227	0.4
228	0.4

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of potato based on the 25 high-rate adult consumers is 26.5 kg y^{-1}

The observed 97.5th percentile rate based on 72 observations is 40.3 kg y^{-1}

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

Observation number	Apple	Blackberry	Blackcurrant	Cherry	Damson	Gooseberry	Grape	Melon	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Whitecurrant	Total
346	**35.0**	**-**	**-**	**-**	**-**	**7.0**	**-**	**-**	**15.0**	**-**	**-**	**-**	**-**	**-**	**-**	**57.0**
147	**19.8**	**-**	**-**	**-**	**-**	**3.1**	**0.3**	**-**	**-**	**-**	**-**	**-**	**3.5**	**-**	**-**	**26.7**
148	**19.8**	**-**	**-**	**-**	**-**	**3.1**	**0.3**	**-**	**-**	**-**	**-**	**-**	**3.5**	**-**	**-**	**26.7**
135	**-**	**-**	**6.0**	**-**	**-**	**-**	**-**	**9.3**	**-**	**-**	**-**	**-**	**8.2**	**-**	**-**	**23.5**
153	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.0**	**0.6**	**-**	**-**	**3.5**	**13.5**	**-**	**19.5**
154	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.0**	**0.6**	**-**	**-**	**3.5**	**13.5**	**-**	**19.5**
155	-	-	-	-	-	-	-	-	-	-	-	-	2.3	13.6	-	15.9
156	-	-	-	-	-	-	-	-	-	-	-	-	2.3	13.6	-	15.9
179	-	1.1	5.4	-	-	-	-	-	-	-	-	-	4.1	-	-	10.7
180	-	1.1	5.4	-	-	-	-	-	-	-	-	-	4.1	-	-	10.7
167	-	-	-	-	-	8.2	-	-	-	-	-	-	2.3	-	-	10.5
168	-	-	-	-	-	8.2	-	-	-	-	-	-	2.3	-	-	10.5
169	-	-	-	-	-	8.2	-	-	-	-	-	-	2.3	-	-	10.5
170	-	-	-	-	-	8.2	-	-	-	-	-	-	2.3	-	-	10.5
203	0.8	-	-	-	0.5	1.9	-	-	-	-	-	3.0	1.5	1.8	0.8	10.2
204	0.8	-	-	-	0.5	1.9	-	-	-	-	-	3.0	1.5	1.8	0.8	10.2
205	0.8	-	-	-	-	1.9	-	-	-	-	-	3.0	1.5	0.9	0.8	8.8
181	-	3.6	3.4	-	-	-	-	-	-	-	-	-	0.5	-	-	7.5
206	0.8	-	-	-	-	-	-	-	-	-	-	3.0	1.5	0.9	0.8	6.9
138	-	-	-	-	-	-	-	-	-	-	-	-	-	6.8	-	6.8
139	-	-	-	-	-	-	-	-	-	-	-	-	-	6.8	-	6.8
191	0.5	-	-	0.2	1.1	2.3	-	-	-	-	-	-	-	2.3	-	6.4
192	0.5	-	-	0.2	1.1	2.3	-	-	-	-	-	-	-	2.3	-	6.4
225	-	-	-	-	-	5.1	-	-	-	-	-	-	1.2	-	-	6.3
226	-	-	-	-	-	5.1	-	-	-	-	-	-	1.2	-	-	6.3
197	-	-	-	-	-	-	-	-	-	-	-	-	5.8	-	-	5.8
198	-	-	-	-	-	-	-	-	-	-	-	-	5.8	-	-	5.8
193	-	-	-	-	1.1	2.3	-	-	-	-	-	-	-	2.3	-	5.7
194	-	-	-	-	1.1	2.3	-	-	-	-	-	-	-	2.3	-	5.7
423	-	-	-	-	-	-	-	-	-	-	1.0	-	-	3.4	-	4.4
424	-	-	-	-	-	-	-	-	-	-	1.0	-	-	3.4	-	4.4
184	-	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	4.1
185	-	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	4.1
230	-	-	-	-	-	3.1	-	-	-	-	-	-	0.7	-	-	3.8
231	-	-	-	-	-	3.1	-	-	-	-	-	-	0.7	-	-	3.8
207	0.8	-	-	-	-	-	-	-	-	-	-	-	1.5	0.9	-	3.2
5	0.6	-	-	-	0.3	-	-	-	-	-	-	-	-	0.9	-	1.8
6	0.6	-	-	-	0.3	-	-	-	-	-	-	-	-	0.9	-	1.8
209	0.9	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	1.2
210	0.9	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	1.2
199	-	-	-	-	-	-	-	-	-	-	-	-	1.2	-	-	1.2
200	-	-	-	-	-	-	-	-	-	-	-	-	1.2	-	-	1.2
201	-	-	-	-	-	-	-	-	-	-	-	-	1.2	-	-	1.2
202	-	-	-	-	-	-	-	-	-	-	-	-	1.2	-	-	1.2
140	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	-	1.1
141	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	-	1.1
218	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9

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

Observation number	Apple	Blackberry	Blackcurrant	Cherry	Damson	Gooseberry	Grape	Melon	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Whitecurrant	Total
149	-	-	-	-	-	-	-	-	-	-	-	-	0.9	-	-	0.9
150	-	-	-	-	-	-	-	-	-	-	-	-	0.9	-	-	0.9
214	0.3	-	-	-	-	-	-	-	0.3	-	-	0.2	-	-	-	0.8
215	0.3	-	-	-	-	-	-	-	0.3	-	-	0.2	-	-	-	0.8
227	-	-	-	-	-	0.7	-	-	-	-	-	-	0.2	-	-	0.8
228	-	-	-	-	-	0.7	-	-	-	-	-	-	0.2	-	-	0.8
171	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-	0.6
172	-	-	-	-	-	-	-	-	-	-	-	-	0.6	-	-	0.6
1	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	0.5
2	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	0.5
3	-	-	-	-	-	-	-	-	-	-	-	0.5	-	-	-	0.5
182	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
188	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
161	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	0.2
163	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	0.2
164	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	0.2
173	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	0.1
174	-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit based on the 6 high-rate adult consumers is 28.8 kg y^{-1}

The observed 97.5th percentile rate based on 65 observations is 26.7 kg y^{-1}

Table 25. Adults' consumption rates of milk from the terrestrial survey area (l y^{-1})

Observation number	Cows' milk
17	414.9
122	414.9
123	414.9
115	262.1
116	262.1
117	262.1
118	262.1
119	262.1
120	262.1
5	155.6
6	155.6

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of milk based on the 11 high-rate adult consumers is 284.4 l y^{-1}

The observed 97.5th percentile rate based on 11 observations is 414.9 l y^{-1}

Table 26. Adults' consumption rates of cattle meat from the terrestrial survey area (kg y^{-1})

Observation number	Beef
353	**65.0**
345	**47.3**
346	**47.3**
355	**39.0**
9	**37.8**
10	**37.8**
13	**35.5**
14	**35.5**
15	**35.5**
16	**35.5**
357	**32.5**
354	**26.0**
124	**23.7**
125	**23.7**
126	**23.7**
127	**23.7**
128	**23.7**
129	**23.7**
130	**23.7**
131	**23.7**
356	16.3
1	11.8
2	11.8
3	11.8
4	11.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of cattle meat based on the 20 high-rate adult consumers is 33.2 kg y^{-1}

The observed 97.5th percentile rate based on 25 observations is 54.4 kg y^{-1}

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

Observation number	Pork
353	**8.5**
355	**5.1**
357	**4.3**
354	**3.4**
356	2.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of pig meat based on the 4 high-rate adult consumers is 5.3 kg y^{-1}

The observed 97.5th percentile rate based on 5 observations is 8.1 kg y^{-1}

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

Observation number	Lamb
132	**11.3**
133	**11.3**
134	**11.3**
353	**11.3**
115	**7.1**
116	**7.1**
117	**7.1**
118	**7.1**
119	**7.1**
120	**7.1**
355	**6.8**
357	**5.7**
9	**4.5**
10	**4.5**
354	**4.5**
356	2.8
1	1.4
2	1.4
3	1.4
4	1.4

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of sheep meat based on the 15 high-rate adult consumers is 7.6 kg y^{-1}

The observed 97.5th percentile rate based on 20 observations is 11.3 kg y^{-1}

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

Observation number	Chicken	Goose	Pheasant	Turkey	Total
135	**39.0**	**-**	**9.0**	**-**	**48.0**
353	-	-	-	2.3	2.3
354	-	-	-	2.3	2.3
355	-	-	-	2.3	2.3
171	-	-	1.4	-	1.4
172	-	-	1.4	-	1.4
356	-	-	-	1.2	1.2
357	-	-	-	1.2	1.2
132	-	0.7	-	-	0.7
133	-	0.7	-	-	0.7
134	-	0.7	-	-	0.7
173	-	-	0.4	-	0.4
174	-	-	0.4	-	0.4

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of poultry based on the only high-rate adult consumer is 48.0 kg y^{-1}

The observed 97.5th percentile rate based on 13 observations is 34.3 kg y^{-1}

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

Observation number	Chicken egg
161	**59.3**
5	**41.6**
6	**41.6**
134	**41.6**
353	**35.9**
180	**25.1**
357	**23.1**
17	**20.8**
179	**20.1**
132	17.8
133	17.8
147	17.8
148	17.8
167	17.8
168	17.8
220	17.8
264	17.8
181	15.0
209	15.0
210	15.0
239	14.0
188	13.3
203	11.0
204	11.0
9	8.9
10	8.9
169	8.9
170	8.9
218	8.9
219	8.9
221	8.9
222	8.9
354	5.9
355	5.9
205	5.5
206	5.5
207	5.5
356	5.0
268	4.4
269	4.4
149	3.5
150	3.5
211	1.7
212	1.7
262	0.7
263	0.7

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of eggs based on the 9 high-rate adult consumers is 34.3 kg y^{-1}

The observed 97.5th percentile rate based on 46 observations is 41.6 kg y^{-1}

Table 31. Adults' consumption rates of wild/free foods from the terrestrial survey area (kg y^{-1})

Observation number	Blackberry	Damson	Sloe	Total
353	**3.0**	**-**	**0.5**	**3.5**
354	**3.0**	**-**	**0.5**	**3.5**
355	**3.0**	**-**	**0.5**	**3.5**
450	**3.4**	**-**	**-**	**3.4**
451	**3.4**	**-**	**-**	**3.4**
182	**-**	**1.8**	**-**	**1.8**
179	-	1.1	-	1.1
180	-	1.1	-	1.1
17	0.9	-	-	0.9
171	0.8	-	-	0.8
172	0.8	-	-	0.8
1	0.5	-	-	0.5
2	0.5	-	-	0.5
3	0.5	-	-	0.5
181	-	0.5	-	0.5
5	0.3	-	-	0.3
6	0.3	-	-	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild/free foods based on the 6 high-rate adult consumers is 3.2 kg y^{-1}

The observed 97.5th percentile rate based on 17 observations is 3.5 kg y^{-1}

Table 32. Adults' consumption rates of rabbits/hares from the terrestrial survey area (kg y^{-1})

Observation number	Rabbit
135	**9.0**
353	2.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of rabbits/hares based on the only high-rate adult consumer is 9.0 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 8.8 kg y^{-1}

Table 33. Adults' consumption rates of wild fungi from the terrestrial survey area (kg y^{-1})

Observation number	Mushrooms
450	**3.9**
451	**3.9**
17	0.9
1	0.5
2	0.5
3	0.5
232	0.5
233	0.5
353	0.3
354	0.3
355	0.3
188	0.2
115	0.2
116	0.2
117	0.2
118	0.2
119	0.2
120	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild fungi based on the 2 high-rate adult consumers is 3.9 kg y^{-1}

The observed 97.5th percentile rate based on 18 observations is 3.9 kg y^{-1}

Table 34. Adults' consumption rates of freshwater fish from the terrestrial survey area (kg y^{-1})

Observation number	Brown trout
450	**3.5**
451	**3.5**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of freshwater fish based on the 2 high-rate adult consumers is 3.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 3.5 kg y^{-1}

Table 35. Children's and infants' consumption rates of green vegetables from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Broccoli	Brussels sprout	Cabbage	Cauliflower	Chard	Courgette	Cucumber	Kale	Lettuce	Marrow	Total
217	**9**	**0.8**	**-**	**3.7**	**-**	**0.2**	**1.0**	**3.2**	**2.0**	**0.5**	**-**	**11.5**
208	**11**	**1.3**	**-**	**0.2**	**-**	**-**	**4.6**	**-**	**-**	**0.1**	**-**	**6.1**
162	**10**	**0.7**	**-**	**-**	**0.7**	**-**	**2.8**	**-**	**-**	**-**	**1.8**	**5.9**
142	**12**	**1.0**	**-**	**1.5**	**1.8**	**-**	**-**	**-**	**0.5**	**-**	**-**	**4.8**
151	13	-	-	1.1	0.7	-	-	1.1	-	0.3	-	3.2
152	10	-	-	1.1	0.7	-	-	1.1	-	0.3	-	3.2
236	14	0.2	0.2	1.2	-	-	0.2	-	-	0.3	-	2.1
223	10	-	-	1.0	-	-	-	-	-	0.8	-	1.7
175	15	-	0.5	0.6	-	-	-	0.2	-	-	-	1.4
176	11	-	0.5	0.6	-	-	-	0.2	-	-	-	1.4
224	7	-	-	0.7	-	-	-	-	-	0.6	-	1.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables for the child age group based upon the 4 high-rate consumers is 7.1 kg y^{-1}

The observed 97.5th percentile rate based on 11 observations is 10.1 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Broccoli	Brussels sprout	Cabbage	Cauliflower	Chard	Courgette	Cucumber	Kale	Lettuce	Marrow	Total
213	**3**	**-**	**0.8**	**1.6**	**0.7**	**-**	**-**	**-**	**-**	**0.5**	**-**	**3.5**
121	2	-	-	0.6	0.4	-	-	-	-	-	-	1.0

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables for the infant age group based upon the only high-rate consumer is 3.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 3.5 kg y^{-1}

Table 36. Children's and infants' consumption rates of other vegetables from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Broad bean	French bean	Pea	Pepper	Runner bean	Sweetcorn	Tomato	Total
162	**10**	**0.2**	**0.2**	**0.1**	**-**	**2.0**	**-**	**5.4**	**8.0**
208	**11**	**0.4**	**0.4**	**-**	**-**	**0.8**	**0.5**	**5.9**	**7.9**
151	**13**	**-**	**-**	**-**	**0.1**	**-**	**-**	**7.3**	**7.4**
152	**10**	**-**	**-**	**-**	**0.1**	**-**	**-**	**7.3**	**7.4**
217	**9**	**0.3**	**-**	**1.5**	**0.4**	**-**	**0.5**	**1.4**	**4.0**
223	**10**	**3.4**	**-**	**0.3**	**-**	**-**	**-**	**-**	**3.7**
224	**7**	**2.6**	**-**	**0.2**	**-**	**-**	**-**	**-**	**2.8**
236	14	0.1	-	-	0.2	0.2	-	1.8	2.3
142	12	-	0.3	1.0	-	-	0.5	-	1.7
175	15	-	0.1	-	-	-	0.1	1.4	1.5
176	11	-	0.1	-	-	-	0.1	1.4	1.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables for the child age group based upon the 7 high-rate consumers is 5.9 kg y^{-1}

The observed 97.5th percentile rate based on 11 observations is 8.0 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Broad bean	French bean	Pea	Pepper	Runner bean	Sweetcorn	Tomato	Total
213	**3**	**0.8**	**-**	**0.8**	**-**	**-**	**-**	**-**	**1.5**
229	**5**	**0.4**	**-**	**0.2**	**-**	**0.2**	**-**	**0.7**	**1.5**

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 1.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 1.5 kg y^{-1}

Table 37. Children's and infants' consumption rates of root vegetables from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Beetroot	Carrot	Celeriac	Garlic	Kohl rabi	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
223	**10**	**4.6**	**-**	**-**	**-**	**-**	**2.3**	**4.3**	**-**	**-**	**-**	**-**	**-**	**1.0**	**12.2**
224	**7**	**3.5**	**-**	**-**	**-**	**-**	**1.7**	**3.2**	**-**	**-**	**-**	**-**	**-**	**0.8**	**9.1**
208	**11**	**1.3**	**-**	**-**	**-**	**0.4**	**-**	**4.4**	**-**	**-**	**-**	**-**	**-**	**-**	**6.2**
217	**9**	**0.3**	**0.4**	**-**	**-**	**-**	**-**	**3.6**	**-**	**-**	**0.5**	**-**	**-**	**1.3**	**6.1**
142	**12**	**1.0**	**-**	**-**	**-**	**-**	**0.7**	**2.3**	**-**	**-**	**0.7**	**-**	**-**	**0.9**	**5.5**
236	**14**	**-**	**0.3**	**0.2**	**-**	**-**	**0.3**	**0.9**	**0.5**	**-**	**0.3**	**0.1**	**1.8**	**-**	**4.4**
175	11	0.2	-	-	-	-	-	0.8	0.1	-	-	-	1.4	-	2.6
176	15	0.2	-	-	-	-	-	0.8	0.1	-	-	-	1.4	-	2.6
162	10	-	-	-	0.5	-	-	1.7	-	0.1	-	-	-	-	2.2
151	13	-	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0
152	10	-	-	-	-	-	1.0	-	-	-	-	-	-	-	1.0

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables for the child age group based upon the 6 high-rate consumers is 7.2 kg y^{-1}

The observed 97.5th percentile rate based on 11 observations is 11.4 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Beetroot	Carrot	Celeriac	Garlic	Kohl rabi	Leek	Onion	Parsnip	Radish	Shallot	Spring onion	Swede	Turnip	Total
213	**3**	**1.4**	**-**	**-**	**-**	**-**	**0.7**	**1.2**	**-**	**-**	**1.2**	**0.5**	**-**	**1.0**	**5.9**
229	**5**	**0.3**	**-**	**-**	**-**	**-**	**-**	**1.5**	**-**	**-**	**-**	**-**	**0.2**	**-**	**2.1**
121	2	-	-	-	-	-	0.3	-	-	-	-	-	-	-	0.3

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 4.0 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 5.7 kg y^{-1}

Table 38. Children's and infants' consumption rates of potato from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Potato
223	**10**	**16.3**
224	**7**	**12.2**
208	**11**	**9.1**
151	**13**	**8.2**
152	**10**	**8.2**
217	**9**	**7.6**
236	14	3.4
237	10	1.7
7	13	1.3
8	10	1.3
175	15	1.0
176	11	1.0

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of potato for the child age group based upon the 6 high-rate consumers is 10.3 kg y^{-1}

The observed 97.5th percentile rate based on 12 observations is 15.2 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Potato
213	**3**	**8.5**
121	2	0.6
229	5	0.2

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 8.5 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 8.1 kg y^{-1}

Table 39. Children's and infants' consumption rates of domestic fruit from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Apple	Damson	Gooseberry	Rhubarb	Strawberry	Total
208	**11**	**0.8**	**-**	**-**	**1.5**	**0.9**	**3.2**
7	**10**	**0.6**	**0.3**	**-**	**-**	**0.9**	**1.8**
8	**13**	**0.6**	**0.3**	**-**	**-**	**0.9**	**1.8**
142	**12**	**-**	**-**	**-**	**-**	**1.1**	**1.1**
151	13	-	-	-	0.9	-	0.9
152	10	-	-	-	0.9	-	0.9
162	10	-	-	-	-	0.2	0.2
175	15	-	-	-	0.1	-	0.1
176	11	-	-	-	0.1	-	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit for the child age group based upon the 4 high-rate consumers is 2.0 kg y^{-1}

The observed 97.5th percentile rate based on 9 observations is 2.9 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Apple	Damson	Gooseberry	Rhubarb	Strawberry	Total
229	**5**	**-**	**-**	**0.3**	**0.1**	**-**	**0.4**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit for the infant age group based upon the only high-rate consumer is 0.4 kg y^{-1}

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

Table 40. Children's and infants' consumption rates of milk from the terrestrial survey area (l y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Cows' milk
7	**13**	**155.6**
8	**10**	**155.6**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of milk for the child age group based upon the 2 high-rate consumers is 155.6 l y^{-1}

The observed 97.5th percentile rate based on 2 observations is 155.6 l y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Cows' milk
121	**2**	**86.5**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of milk for the infant age group based upon the only high-rate consumer is 86.5 l y^{-1}

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

Table 41. Children's and infants' consumption rates of cattle meat from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Beef
358	7	16.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of cattle meat for the child age group based upon the only high-rate consumer is 16.3 kg y^{-1}

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

Infant age group (0 - 5 years old)

Observation number	Age	Beef
11	3	9.5
12	3	9.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of cattle meat for the infant age group based upon the 2 high-rate consumers is 9.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 9.5 kg y^{-1}

Table 42. Children's consumption rates of pig meat from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Pork
358	**7**	**2.1**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of pig meat for the child age group based upon the only high-rate consumer is 2.1 kg y^{-1}

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

Table 43. Children's and infants' consumption rates of sheep meat from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Lamb
358	**7**	**2.8**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of sheep meat for the child age group based upon the only high-rate consumer is 2.8 kg y^{-1}

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

Infant age group (0 - 5 years old)

Observation number	Age	Lamb
121	**2**	**2.4**
11	**3**	**1.1**
12	**3**	**1.1**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of sheep meat for the infant age group based upon the 3 high-rate consumers is 1.5 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 2.3 kg y^{-1}

Table 44. Children's consumption rates of poultry from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Pheasant	Turkey	Total
358	**7**	**-**	**1.2**	**1.2**
175	15	0.4	-	0.4

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 1.2 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 1.1 kg y^{-1}

Table 45. Children's and infants' consumption rates of eggs from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Chicken egg
7	**13**	**41.6**
8	**10**	**41.6**
162	**10**	**29.6**
208	11	5.5
358	7	5.0
151	13	3.5
152	10	3.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of eggs for the child age group based upon the 3 high-rate consumers is 37.6 kg y^{-1}

The observed 97.5th percentile rate based on 7 observations is 41.6 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Chicken egg
11	**3**	**8.9**
12	**3**	**8.9**
213	3	0.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of eggs for the infant group based upon the 2 high-rate consumers is 8.9 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 8.9 kg y^{-1}

Table 46. Children's consumption rates of wild/free foods from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Blackberry
7	13	0.3
8	10	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild/free foods for the child age group based upon the 2 high-rate consumers is 0.3 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 0.3 kg y^{-1}

Table 47. Children's consumption rates of rabbits/hares from the terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Rabbit
358	7	0.5

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 0.5 kg y^{-1}

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

Table 48. Infants' consumption rates of wild fungi from the survey area (kg y^{-1})

Infant age group (0 - 5 years old)

Observation number	Age	Mushrooms
121	2	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild fungi for the infant age group based upon the only high-rate consumer is 0.1 kg y^{-1}

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

Table 49. Percentage contribution each food type makes to its terrestrial food group for adults

Green vegetables	
Cabbage	36.3 %
Cauliflower	13.5 %
Courgette	12.1 %
Cucumber	10.7 %
Brussels sprout	10.5 %
Broccoli	6.9 %
Lettuce	5.3 %
Kale	2.6 %
Marrow	0.8 %
Gherkin	0.6 %
Spinach	0.3 %
Chard	0.1 %
Callaloo	0.1 %

Other vegetables	
Tomato	66.7 %
Pea	9.3 %
Broad bean	8.1 %
Runner bean	5.4 %
Pepper	3.6 %
French bean	3.3 %
Sweetcorn	3.2 %
Chilli pepper	0.5 %
Squash	0.0 %

Root vegetables	
Onion	39.3 %
Beetroot	20.6 %
Leek	15.5 %
Swede	9.2 %
Turnip	5.3 %
Shallot	3.5 %
Carrot	2.8 %
Parsnip	2.0 %
Kohl rabi	0.9 %
Spring onion	0.6 %
Garlic	0.2 %
Celeriac	0.0 %
Radish	0.0 %

Potato	
Potato	100.0 %

Domestic fruit	
Strawberry	22.3 %
Rhubarb	19.7 %
Apple	19.6 %
Gooseberry	18.4 %
Blackcurrant	4.8 %
Pear	4.7 %
Redcurrant	3.3 %
Melon	2.2 %
Blackberry	1.8 %
Damson	1.4 %
Whitecurrant	0.7 %
Raspberry	0.5 %
Plum	0.3 %
Grape	0.2 %
Cherry	0.1 %

Milk	
Cows' milk	100.0 %

Cattle meat	
Beef	100.0 %

Pig meat	
Pork	100.0 %

Sheep meat	
Lamb	100.0 %

Poultry	
Chicken	61.8 %
Pheasant	20.0 %
Turkey	14.8 %
Goose	3.5 %

Eggs	
Chicken egg	100.0 %

Wild/free foods	
Blackberry	77.5 %
Damson	17.3 %
Sloe	5.2 %

Rabbits/hares	
Rabbit	100.0 %

Wild fungi	
Mushroom	100.0 %

Freshwater fish	
Brown trout	100.0 %

Notes

None of the food types listed in this table were monitored by FSA in 2011 (EA, FSA, NIEA and SEPA, 2012), but grass was sampled

Percentages are based on the consumption of all adults in the survey consuming that particular food group.

Table 50. Direct radiation occupancy rates for adults, children and infants (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
0 to 0.25 km zone						
264	F	67	Residing	7970	780	8750
24	M	56	Residing	7624	1040	8664
25	F	10	Residing and attending school	8216	448	8664
67	M	43	Residing	8535	129	8664
269	F	24	Residing	7926	730	8656
270	F	3	Residing	7926	730	8656
271	F	2	Residing	7926	730	8656
272	F	1	Residing	7926	730	8656
68	M	67	Residing	8366	208	8574
69	F	64	Residing	8366	208	8574
363	F	85	Residing	8422	26	8448
267	F	79	Residing	7878	546	8424
251	M	49	Residing	7772	572	8344
252	F	42	Residing	7772	572	8344
19	F	33	Residing and working	8132	148	8280
21	M	11	Residing and attending school	7842	438	8280
421	M	45	Residing	7875	365	8240
422	F	42	Residing	7875	365	8240
370	M	31	Residing and working	7896	312	8208
371	F	28	Residing and working	7896	312	8208
253	F	42	Residing and working	7564	468	8032
268	M	30	Residing	6470	730	7200
27	F	18	Residing	6628	416	7044
20	F	15	Residing	6153	372	6525
417	F	66	Residing	5840	602	6442
359	M	64	Residing	5640	50	5690
360	F	58	Residing	4862	50	4912
18	M	36	Residing	3780	312	4092
26	M	15	Residing	3081	528	3609
348	M	51	Working	1000	1400	2400
349	M	U	Working	500	700	1200
350	M	U	Working	500	700	1200
361	F	7	Visiting	825	25	850
364	F	63	Visiting	496	52	548
365	F	60	Visiting	496	52	548
418	F	65	Visiting	280	28	308
419	M	U	Visiting	280	28	308
420	F	U	Visiting	280	28	308
362	M	38	Visiting	225	25	250
265	M	8	Visiting	130	26	156
266	M	5	Visiting	130	26	156

Table 50. Direct radiation occupancy rates for adults, children and infants (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
>0.25 to 0.5 km zone						
70	F	71	Residing	7314	1072	8386
369	M	10	Residing and attending school	7814	234	8048
368	M	18	Residing	7708	260	7968
424	F	33	Residing	7741	143	7884
366	F	40	Residing	7684	156	7840
367	M	35	Residing	7736	104	7840
425	M	57	Residing	6648	644	7292
426	F	57	Residing	6648	644	7292
154	M	57	Residing	5830	1178	7008
64	M	43	Residing and working	6457	331	6788
153	M	59	Residing	6339	403	6742
22	F	80	Residing	6188	294	6482
65	F	42	Residing	5809	283	6092
423	M	32	Residing	5901	143	6044
23	M	U	Residing	1882	50	1932
66	M	2	Visiting	1040	208	1248
400	M	25	Jet skiing	-	41	41
401	M	34	Jet skiing	-	41	41
402	M	36	Jet skiing	-	41	41
403	M	11	Jet skiing	-	41	41
404	M	9	Jet skiing	-	41	41
397	M	40	Jet skiing	-	33	33
398	M	25	Jet skiing	-	25	25
399	F	25	Jet skiing	-	25	25
>0.5 to 1 km zone						
259	F	19	Residing	8369	365	8734
254	F	70	Residing	8612	100	8712
255	M	72	Residing	8264	400	8664
257	F	50	Residing	8291	365	8656
261	F	58	Residing	8049	350	8399
260	M	59	Residing	7674	700	8374
165	M	66	Residing	4816	3039	7855
262	M	68	Residing	7449	375	7824
263	F	64	Residing	7449	375	7824
256	M	46	Residing	7446	274	7720
166	F	56	Residing	5418	2156	7574
258	M	17	Residing	6028	912	6940
75	M	70	Boat maintenance	-	360	360
439	M	U	Boat maintenance	-	220	220
440	M	U	Boat maintenance	-	220	220
429	M	52	Collecting crabs	-	34	34

Notes
U = Unknown

Table 51. Analysis of direct radiation occupancy rates for adults, children and infants

Number of hours	Number of observations
0 to 0.25 km zone	
>8000 to 8760	21
>7000 to 8000	2
>6000 to 7000	2
>5000 to 6000	1
>4000 to 5000	2
>3000 to 4000	1
>2000 to 3000	1
>1000 to 2000	2
0 to 1000	9
0 to 8760	**41**
>0.25 to 0.5 km zone	
>8000 to 8760	2
>7000 to 8000	7
>6000 to 7000	5
>5000 to 6000	0
>4000 to 5000	0
>3000 to 4000	0
>2000 to 3000	0
>1000 to 2000	2
0 to 1000	8
0 to 8760	**24**
>0.5 to 1 km zone	
>8000 to 8760	6
>7000 to 8000	5
>6000 to 7000	1
>5000 to 6000	0
>4000 to 5000	0
>3000 to 4000	0
>2000 to 3000	0
>1000 to 2000	0
0 to 1000	4
0 to 8760	**16**

Table 52. Gamma dose rate measurements for the direct radiation survey (µGy h^{-1})

Residences				
Location	Indoor substrate	Indoor gamma dose rate at 1 metre[a]	Outdoor substrate	Outdoor gamma dose rate at 1 metre[a]
Residence 1	Wood	0.116	Concrete	0.091
Residence 2	Wood	0.121	Concrete	0.112
Residence 3	Concrete	0.103	Tarmac	0.103
Residence 4	Concrete	0.107	Tarmac	0.117
Residence 5	Wood	0.115	Tarmac	0.104
Residence 6	-	-	Concrete	0.120
Residence 7	Concrete	0.105	Concrete	0.114
Residence 8	Concrete	0.109	Concrete	0.121
Residence 9	Concrete	0.105	Concrete	0.130
Residence 10	Concrete	0.106	Concrete	0.099
Residence 11	Concrete	0.109	Concrete	0.130
Residence 12	Concrete	0.124	Concrete	0.123
Residence 13	Concrete	0.105	Concrete	0.127
Residence 14	Concrete	0.102	Concrete	0.113
Residence 15	Concrete	0.117	Concrete	0.111
Residence 16	Concrete	0.105	Concrete	0.111
Residence 17	Concrete	0.106	Grass	0.082
Residence 18	Wood	0.120	Concrete	0.108
Residence 19	-	-	Concrete	0.120
Residence 20	Concrete	0.133	Concrete	0.119
Residence 21	Wood	0.116	Tarmac	0.107
Residence 22	Wood	0.115	Tarmac	0.104
Residence 23	Wood	0.115	Tarmac	0.096

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	Askam	SD 213 769	Grass	0.073
Background 2	South-east of Gleaston Village	SD 262 702	Grass	0.083
Background 3	Near High Farm	SD 245 734	Grass	0.075
Background 4	South end of Walney Island	SD 210 632	Grass	0.085

Table 53. Combinations of adult pathways for consideration in dose assessments

Combination number	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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																
2										X	X	X					X	X																		
3		X											X	X	X	X	X	X	X	X																
4												X					X	X		X																
5							X	X	X	X	X														X										X		X
6	X	X	X		X																				X		X		X	X			X	X		
7	X																							X		X				X				X		X
8																										X								X		
9	X			X																					X		X			X						
10						X																			X											
11							X		X	X		X			X					X																
12				X											X	X	X																			
13							X	X	X		X					X			X																	
14							X	X	X	X	X						X	X																		
15	X		X				X	X	X	X	X					X		X								X				X						
16								X	X	X	X						X			X																
17							X	X	X	X	X															X				X				X		
18	X	X					X	X	X	X										X							X			X				X		
19	X																							X		X	X			X						
20	X																										X							X	X	X
21																	X								X		X								X	X
22		X		X									X									X	X				X		X	X				X		
23		X									X		X																							
24	X																							X					X	X				X	X	X
25	X		X																				X				X			X						
26																										X							X		X	X
27	X																					X	X							X				X		
28	X																					X					X			X						X
29	X		X	X														X		X	X		X			X				X						
30																						X							X							
31			X																					X						X						
32	X			X																		X								X				X		
33	X				X																		X										X	X		
34																															X		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: domestic fruit, cattle meat, sheep meat, wild/free foods and wild fungi.

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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	56	-	-	-	-	-	-	-	-	-	-	0.5	-	11.8	-	1.4	-	-	0.5	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	F	61	-	-	-	-	-	-	-	-	-	-	0.5	-	11.8	-	1.4	-	-	0.5	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	M	93	-	-	-	-	-	-	-	-	-	-	0.5	-	11.8	-	1.4	-	-	0.5	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	F	25	-	-	-	-	-	-	-	-	-	-	-	-	11.8	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	F	41	-	-	-	-	-	-	-	-	-	1.3	1.8	**155.6**	-	-	-	-	**41.6**	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	M	44	-	-	-	-	-	-	-	-	-	1.3	1.8	**155.6**	-	-	-	-	**41.6**	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	M	35	-	-	-	-	-	-	-	-	-	-	-	-	**37.8**	-	**4.5**	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	F	33	-	-	-	-	-	-	-	-	-	-	-	-	**37.8**	-	**4.5**	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	F	44	-	-	-	-	-	-	-	-	-	-	-	-	**35.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	M	46	-	-	-	-	-	-	-	-	-	-	-	-	**35.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	M	19	-	-	-	-	-	-	-	-	-	-	-	-	**35.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	F	17	-	-	-	-	-	-	-	-	-	-	-	-	**35.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	M	56	-	-	-	-	-	-	-	-	-	-	-	**414.9**	-	-	-	-	**20.8**	0.9	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	M	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3780	312
19	F	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8132	148
22	F	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6188	294
23	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1882	50
24	M	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7624	1040
27	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6628	416
28	M	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150	-	-	-	-	-	-	-	-	-
29	M	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	-	-	-	-	-	-	-	-	-
30	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	-	-	-	-	-	-	-	-	-
31	M	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-
32	M	45	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	142	-	-	-	52	-	-	-	-	-	-
33	F	43	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	M	41	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-
36	F	39	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
38	M	57	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39	M	31	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	M	U	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	6	-	-	-	-	-	-
43	M	64	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	F	U	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	M	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	-	-	-	45	-	-	-	-	-	-
46	M	51	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	-	-	-	28	-	-	-	-	-	-
47	M	77	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	-	-	-
50	M	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-
51	M	U	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	168	-	-	-	132	-	-	-	108	-	-
52	M	U	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	M	U	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	M	U	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	M	U	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
56	M	U	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
57	M	U	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
59	M	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-
63	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365	-	**7615**	-	-	-	-	-	672	-	-
64	M	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6457	331
65	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5809	283
67	M	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8535	129
68	M	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8366	208
69	F	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8366	208
70	F	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7314	1072
71	M	70	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**420**	-	-	-	-	-	-	-	-	384	-	-
72	F	U	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
73	M	U	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**420**	-	-	-	-	-	-	-	-	50	-	-
75	M	70	**28.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**360**	-	54	-	-	-	54	-	-	54	-	360
76	F	64	**28.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77	M	U	**19.8**	**17.7**	**6.1**	-	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	16	14	-	-	90	-	-	144	262	-	-
78	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	-	-	-
79	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
80	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
81	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
82	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
83	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
84	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
85	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
86	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
87	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
88	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
89	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
90	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
91	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	264	-	-
92	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
93	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
94	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
95	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
96	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
97	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
98	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
99	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
100	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
101	M	U	-	-	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
102	M	U	-	-	-	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
103	M	U	-	-	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
104	M	U	-	-	-	**28.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
105	M	U	-	-	-	**12.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-
106	M	U	-	-	-	5.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**293**	-	-	-	-	**293**	**-**	**-**	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
107	M	U	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**199**	-	-	-	-	-	-	-	-	-	-
108	F	U	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	F	U	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	F	U	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	F	U	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	F	U	-	-	-	-	-	**5.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
113	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-
114	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-	-	-
115	F	55	-	-	-	-	-	-	3.1	-	0.9	1.8	-	**262.1**	-	-	**7.1**	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
116	M	59	-	-	-	-	-	-	3.1	-	0.9	1.8	-	**262.1**	-	-	**7.1**	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	F	29	-	-	-	-	-	-	3.1	-	0.9	1.8	-	**262.1**	-	-	**7.1**	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
118	F	26	-	-	-	-	-	-	3.1	-	0.9	1.8	-	**262.1**	-	-	**7.1**	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
119	M	22	-	-	-	-	-	-	3.1	-	0.9	1.8	-	**262.1**	-	-	**7.1**	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120	M	24	-	-	-	-	-	-	3.1	-	0.9	1.8	-	**262.1**	-	-	**7.1**	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
122	M	64	-	-	-	-	-	-	-	-	-	-	-	**414.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
123	M	53	-	-	-	-	-	-	-	-	-	-	-	**414.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
124	M	51	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
125	M	57	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
126	F	48	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
127	F	17	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
128	F	17	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
129	F	26	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130	F	24	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
131	F	22	-	-	-	-	-	-	-	-	-	-	-	-	**23.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
132	M	65	-	-	-	4.7	-	-	-	-	-	-	-	-	-	-	**11.3**	0.7	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
133	F	54	-	-	-	4.7	-	-	-	-	-	-	-	-	-	-	**11.3**	0.7	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
134	F	25	-	-	-	4.7	-	-	-	-	-	-	-	-	-	-	**11.3**	0.7	**41.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
135	M	60	-	-	-	-	-	-	**18.4**	**42.8**	**35.4**	-	**23.5**	-	-	-	-	**48.0**	-	-	**9.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
136	M	72	-	-	-	-	-	-	**30.1**	-	**14.6**	16.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
137	F	68	-	-	-	-	-	-	**30.1**	-	**14.6**	16.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
138	M	75	-	-	-	-	-	-	**29.3**	9.4	**33.2**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
139	F	73	-	-	-	-	-	-	**29.3**	9.4	**33.2**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
140	M	40	-	-	-	-	-	-	4.8	1.7	5.5	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
141	M	40	-	-	-	-	-	-	4.8	1.7	5.5	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
143	M	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
144	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
147	M	64	-	-	-	-	-	-	**12.8**	**29.7**	4.0	**32.6**	**26.7**	-	-	-	-	-	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
148	F	60	-	-	-	-	-	-	**12.8**	**29.7**	4.0	**32.6**	**26.7**	-	-	-	-	-	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
149	M	30	-	-	-	-	-	-	3.2	7.4	1.0	8.2	0.9	-	-	-	-	-	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150	F	25	-	-	-	-	-	-	3.2	7.4	1.0	8.2	0.9	-	-	-	-	-	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
153	M	59	-	-	-	-	-	-	4.8	**18.9**	**25.7**	-	**19.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6339	403
154	M	57	-	-	-	-	-	-	4.8	**18.9**	**25.7**	-	**19.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5830	1178
155	F	29	-	-	-	-	-	-	3.2	12.6	**17.1**	-	15.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
156	M	26	-	-	-	-	-	-	3.2	12.6	**17.1**	-	15.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
157	M	34	0.9	-	-	**19.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	5	-	**240**	-	-	36	-	-	-	-	-	-
158	M	32	-	-	-	**17.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
161	F	39	-	-	-	-	-	-	5.9	8.0	2.2	-	0.2	-	-	-	-	-	**59.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
163	M	53	-	-	-	-	-	-	5.9	8.0	2.2	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
164	M	49	-	-	-	-	-	-	5.9	8.0	2.2	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
165	M	66	-	-	-	-	-	-	8.2	9.0	**24.6**	**23.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4816	3039
166	F	56	-	-	-	-	-	-	8.2	9.0	**24.6**	**23.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5418	2156
167	M	49	-	-	-	-	-	-	**10.9**	**20.1**	**30.4**	**24.5**	10.5	-	-	-	-	-	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
168	F	49	-	-	-	-	-	-	**10.9**	**20.1**	**30.4**	**24.5**	10.5	-	-	-	-	-	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
169	M	66	-	-	-	-	-	-	**10.9**	**20.1**	**30.4**	**24.5**	10.5	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
170	F	75	-	-	-	-	-	-	**10.9**	**20.1**	**30.4**	**24.5**	10.5	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
171	M	58	1.7	-	0.4	-	-	-	7.0	7.7	**13.0**	5.1	0.6	-	-	-	-	1.4	-	0.8	-	-	-	-	-	-	-	9	-	-	9	-	-	-	-	-	-	-
172	F	59	1.7	-	0.4	-	-	-	7.0	7.7	**13.0**	5.1	0.6	-	-	-	-	1.4	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
173	F	37	-	-	0.1	-	-	-	1.4	1.5	2.6	1.0	0.1	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
174	M	40	-	-	0.1	-	-	-	1.4	1.5	2.6	1.0	0.1	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
177	M	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**616**	-	-	-	-	-	-	-	-	-
178	M	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**616**	-	-	-	-	-	-	-	-	-
179	F	56	-	-	-	-	-	-	7.7	**26.7**	8.8	10.2	10.7	-	-	-	-	-	**20.1**	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180	M	24	-	-	-	-	-	-	7.7	**26.7**	8.8	10.2	10.7	-	-	-	-	-	**25.1**	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
181	M	63	-	-	-	-	-	-	0.9	3.0	1.6	1.1	7.5	-	-	-	-	-	15.0	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
182	M	64	-	-	-	-	-	-	-	-	11.9	**54.5**	0.5	-	-	-	-	-	-	**1.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
183	M	64	-	-	-	-	-	-	-	-	4.0	**18.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
184	M	78	-	-	-	-	-	-	-	13.5	**32.9**	8.2	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
185	F	70	-	-	-	-	-	-	-	**27.0**	**32.9**	8.2	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
186	M	66	-	-	-	-	-	-	1.3	1.0	3.8	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
187	F	60	-	-	-	-	-	-	1.3	1.0	3.8	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
188	M	62	-	-	-	-	-	-	-	7.5	**14.5**	**27.2**	0.5	-	-	-	-	-	13.3	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
189	M	62	-	-	-	-	-	-	**15.7**	12.8	**34.7**	**20.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190	F	59	-	-	-	-	-	-	**15.7**	12.8	**34.7**	**20.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
191	M	62	-	-	-	-	-	-	**15.9**	**29.2**	4.4	-	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
192	F	62	-	-	-	-	-	-	**15.9**	**29.2**	4.4	-	6.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
193	F	35	-	-	-	-	-	-	**15.9**	**29.2**	4.4	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
194	M	40	-	-	-	-	-	-	**15.9**	**29.2**	4.4	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195	M	65	-	-	-	-	-	-	9.1	6.8	**15.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
196	F	65	-	-	-	-	-	-	9.1	6.8	**15.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
197	M	74	-	-	-	-	-	-	1.9	**29.8**	**23.1**	**22.8**	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
198	F	70	-	-	-	-	-	-	1.9	**29.8**	**23.1**	**22.8**	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
199	M	45	-	-	-	-	-	-	0.4	11.4	6.0	4.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200	F	45	-	-	-	-	-	-	0.4	11.4	6.0	4.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
201	M	18	-	-	-	-	-	-	0.4	11.4	6.0	4.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
202	M	20	-	-	-	-	-	-	0.4	11.4	6.0	4.6	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
203	M	68	-	-	-	-	-	-	**12.3**	**15.7**	12.3	**18.2**	10.2	-	-	-	-	-	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
204	F	65	-	-	-	-	-	-	**12.3**	**15.7**	12.3	**18.2**	10.2	-	-	-	-	-	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	M	40	-	-	-	-	-	-	6.1	7.9	6.2	9.1	8.8	-	-	-	-	-	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
206	F	40	-	-	-	-	-	-	6.1	7.9	6.2	9.1	6.9	-	-	-	-	-	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
207	M	17	-	-	-	-	-	-	6.1	7.9	6.2	9.1	3.2	-	-	-	-	-	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
209	M	66	-	-	-	-	-	-	**10.5**	6.0	**23.1**	**25.5**	1.2	-	-	-	-	-	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210	F	54	-	-	-	-	-	-	**10.5**	6.0	**23.1**	**25.5**	1.2	-	-	-	-	-	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
211	M	43	-	-	-	-	-	-	7.0	4.0	**12.5**	17.0	-	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
212	F	42	-	-	-	-	-	-	7.0	4.0	**12.5**	17.0	-	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
214	M	63	-	-	-	-	-	-	**15.3**	5.4	7.6	10.1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	142	-	-	-	76	-	-	-	28	-	-
215	F	61	-	-	-	-	-	-	**15.3**	5.4	7.6	10.1	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	334	-	-	-	76	-	-	-	28	-	-
216	F	42	-	-	-	-	-	-	**15.3**	5.4	7.6	10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
218	M	41	-	-	-	-	-	-	2.3	4.9	**31.1**	**21.8**	0.9	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
219	F	42	-	-	-	-	-	-	2.3	4.9	**31.1**	**21.8**	-	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
220	M	70	-	-	-	-	-	-	2.3	4.9	**31.1**	**21.8**	-	-	-	-	-	-	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
221	M	39	-	-	-	-	-	-	1.7	3.7	**23.3**	16.3	-	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
222	F	37	-	-	-	-	-	-	1.7	3.7	**23.3**	16.3	-	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
225	M	57	-	-	-	-	-	-	-	**22.2**	**30.8**	3.3	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
226	F	50	-	-	-	-	-	-	-	**22.2**	**30.8**	3.3	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
227	M	30	-	-	-	-	-	-	-	3.0	4.1	0.4	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
228	F	28	-	-	-	-	-	-	-	3.0	4.1	0.4	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230	M	74	-	-	-	-	-	-	-	13.3	**18.5**	2.0	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
231	F	70	-	-	-	-	-	-	-	13.3	**18.5**	2.0	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
232	M	57	2.2	1.1	-	-	-	-	**18.8**	**21.1**	**37.3**	**40.3**	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	24	-	-	24	-	-	-	120	-	-
233	F	57	2.2	1.1	-	-	-	-	**18.8**	**21.1**	**37.3**	**40.3**	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
234	F	35	-	-	-	-	-	-	2.1	2.3	4.4	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
235	M	40	-	-	-	-	-	-	2.1	2.3	4.4	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
238	M	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	24	-	-	-	120	-	-
239	M	63	-	-	-	-	-	-	-	**14.4**	-	**32.5**	-	-	-	-	-	-	14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
241	M	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	-	-	-	-	-	-	-	-
242	F	63	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1288**	-	-	-	-	-	-	-	-	-	-
243	F	42	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1288**	-	-	-	-	-	-	-	-	-	-
244	M	40	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	-
245	M	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	-
246	M	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	-
247	M	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	-
248	M	19	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	45	40	-	-	93	-	-	-	-	-	-
249	M	68	1.3	-	0.3	-	**0.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	-	-	3	2	-	-	-	32	-	-
250	F	65	1.3	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
251	M	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7772	572
252	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7772	572
253	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7564	468
254	F	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8612	100
255	M	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8264	400
256	M	46	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**515**	-	-	-	-	-	-	400	7446	274
257	F	50	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8291	365
258	M	17	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6028	912

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
259	F	19	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8369	365
260	M	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7674	700
261	F	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8049	350
262	M	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	12	-	100	-	-	-	-	-	-	7449	375
263	F	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	12	-	100	-	-	-	-	-	-	7449	375
264	F	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7970	780
267	F	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7878	546
268	M	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.4	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	6470	730
269	F	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.4	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	7926	730
273	F	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	**625**	**250**	-	-	145	-	-	-	-	-	-
274	M	79	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
275	F	80	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
276	F	82	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
277	M	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250	100	-	-	50	-	-	-	-	-	-
278	M	31	14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	175	**300**	-	-	87	-	-	-	-	-	-
279	F	30	14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
282	M	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	**300**	-	-	50	-	-	-	-	-	-
283	F	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-	-	-	-
285	F	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-	-
286	M	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**520**	-	-	-	-	-	-	-	-	-
287	M	49	7.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250	**600**	-	-	100	-	-	-	-	-	-
288	M	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	50	-	-	-	-	-	110	-	-	-
291	F	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	285	65	-	-	-	-	-	30	-	-	-
292	M	36	-	-	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	26	-	-	-	-	-	-
293	F	34	-	-	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
296	F	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1460**	-	-	-	-	-	-	-	-	-	-
298	M	44	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
299	F	40	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
300	M	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	24	-	-	-	-	-	-
301	M	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	24	-	-	-	-	-	-
302	M	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-	-	-
303	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-	-	-
304	F	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	-	-	-	-	-	-	-	-	-	-
305	F	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	-	-	-	-	-	-	-	-	-	-
306	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-	-	-	-
309	M	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-
310	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	-	-	-	-	-
311	F	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	-	-	-
312	F	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	-	-	-	-	-	-	-	-	-
314	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	198	-	-	-	-	-	-	-	33	-	-
317	M	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-	-	-
318	M	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	-	-
319	M	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	-	-
321	M	22	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	**300**	-	-	50	-	-	-	-	-	-

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
322	M	45	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
323	F	44	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
324	M	23	12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	-	50	**300**	-	-	50	-	-	-	-	-	-
325	M	50	12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
326	M	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	**362**	-	-	100	-	-	-	-	-	-
327	M	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250	**270**	-	-	100	-	-	-	-	-	-
328	M	48	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	100	-	-	50	-	-	-	-	-	-
329	F	48	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	M	30	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300	**400**	-	-	100	-	-	-	-	-	-
331	F	28	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
332	M	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	72	-	-
333	M	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	72	-	-
334	M	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	72	-	-
335	M	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	72	-	-
336	M	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	72	-	-
337	F	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	72	-	-
338	M	24	10.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	72	-	-
339	M	50	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-	3072	-	-
340	F	55	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
341	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000	-	-
342	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000	-	-
343	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000	-	-
344	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3000	-	-
345	M	65	-	**6.1**	-	**25.5**	-	-	-	-	-	-	-	-	**47.3**	-	-	-	-	-	-	-	-	**220**	72	-	-	-	8	-	126	**228**	**-**	**-**	-	108	-	-
346	F	64	-	1.6	-	-	-	-	-	-	-	-	**57.0**	-	**47.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
347	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-	-	-	-	126	-	-	-	-	108	-	-
348	M	51	5.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95	-	-	-	-	**1485**	95	-	-	-	2190	1000	1400
349	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	-	-	-	**743**	48	-	-	-	1095	500	700
350	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	-	-	-	**743**	48	-	-	-	1095	500	700
351	M	U	2.8	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	6	-	-	11	-	-	-	-	-	-
352	F	U	2.8	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
353	M	63	-	1.6	-	-	-	-	-	-	-	-	-	-	**65.0**	**8.5**	**11.3**	2.3	**35.9**	**3.5**	2.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
354	F	53	-	-	-	-	-	-	-	-	-	-	-	-	**26.0**	**3.4**	**4.5**	2.3	5.9	**3.5**	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
355	M	20	-	-	-	-	-	-	-	-	-	-	-	-	**39.0**	**5.1**	**6.8**	2.3	5.9	**3.5**	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
356	F	28	-	-	-	-	-	-	-	-	-	-	-	-	16.3	2.1	2.8	1.2	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
357	M	33	-	-	-	-	-	-	-	-	-	-	-	-	**32.5**	**4.3**	**5.7**	1.2	**23.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
359	M	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	-	-	-	-	-	-	9	-	5640	50
360	F	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	-	-	-	-	-	-	9	-	4862	50
362	M	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	225	25
363	F	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8422	26
364	F	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	496	52
365	F	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	496	52
366	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-	7684	156
367	M	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-	-	7736	104

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
368	M	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7708	260
370	M	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7896	312
371	F	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7896	312
372	M	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**548**	-	-	-	-	-	-	-	-	-
374	M	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-	-	-	-	-	-	-	-	-
375	M	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365	-	-	-	-	-	-	-	-	-
376	F	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365	-	-	-	-	-	-	-	-	-
377	M	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	195	-	-	-	-	-	-	-	-	-
378	M	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	335	-	-	-	-	-	-	-	-	-
379	F	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	335	-	-	-	-	-	-	-	-	-
380	M	25	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	39	-	-	13	-	-	-	-	-
381	M	25	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	39	-	-	13	-	-	-	-	-
382	M	27	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	39	-	-	13	-	-	-	-	-
383	M	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52	-	-	-	-	-	-	-	-
384	M	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-
385	M	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-
386	M	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-
387	F	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-	-
388	M	74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	-	-	-
389	M	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	160	-	-	-	-	-	-	-	-	-
390	M	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365	-	-	-	-	-	-	-	-	-
391	F	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	365	-	-	-	-	-	-	-	-	-
392	M	66	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-
393	M	60	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-
394	M	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-	-
395	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-	-	-
396	M	38	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	40	-	-
397	M	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	-	-	33
398	M	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	25
399	F	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	25
400	M	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	-	-	41
401	M	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	-	-	41
402	M	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	-	-	41
405	M	57	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	143	-	-
406	M	58	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	143	-	-
407	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	9	-	-	-
410	M	44	13.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	**234**	-	-	130	-	-	-	-	-
411	M	17	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	91	-	-	26	-	-	-	-	-
412	M	17	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	91	-	-	26	-	-	-	-	-
413	M	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	149	-	-	-	-	-	21	-	-	-
414	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	149	-	-	-	-	-	21	-	-	-
417	F	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5840	602
418	F	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280	28
419	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280	28

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
420	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280	28
421	M	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7875	365
422	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7875	365
423	M	32	-	-	-	-	-	-	**14.0**	8.1	4.9	6.1	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	-	-	5901	143
424	F	33	-	-	-	-	-	-	**14.0**	8.1	4.9	6.1	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	-	-	7741	143
425	M	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	6648	644
426	F	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	6648	644
427	M	50	**23.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104	-	-	-	-	-	-	104	-	-	-	30	-	-
428	M	28	**23.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**208**	104	-	-	-	-	-	-	104	-	-	-	260	-	-
429	M	52	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	34	-	-	-	-	68	-	-	34	-	-	-	-	-	34
430	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	234	-	-
431	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	234	-	-
432	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	234	-	-
433	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	234	-	-
434	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	234	-	-
435	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	60	-	-
436	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	60	-	-
437	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	60	-	-
438	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	60	-	-
439	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	220
440	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**220**	-	-	-	-	-	-	-	-	220
441	M	U	5.4	-	0.7	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	15	-	-
442	M	U	**47.2**	-	**5.7**	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	48	-	-
443	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-
444	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-
445	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-
446	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-
447	M	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5107**	-	-	-	-	-	1344	-	-
448	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3830**	-	-	-	-	-	1008	-	-
450	M	71	**23.6**	-	**6.8**	**15.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.4**	-	**3.9**	**3.5**	-	**625**	-	-	62	-	-	-	139	-	-	-	-	-	-
451	F	70	**23.6**	-	**4.8**	**15.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.4**	-	**3.9**	**3.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
453	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**637**	-	-	-	**546**	**-**	**-**	-	-	-	-
454	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**637**	-	-	-	**546**	**-**	**-**	-	-	-	-
455	M	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-	-	15	-	-	-	-	-	-
456	M	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**80**	-	-	-	-	-	720	-	-	-	-	-	-	-	-
457	M	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**80**	-	-	-	-	-	720	-	-	-	-	-	-	-	-
458	M	U	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	105	-	-	-	-	-	105	-	-	-	-	-	-
459	M	36	2.3	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**200**	-	-	-	-	-	-	-	**200**	**-**	**-**	-	100	-	-
460	F	U	-	-	-	**10.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
461	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**90**	-	-	-	-	-	-	-	90	-	-	-	-	-	-
462	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**90**	-	-	-	-	-	-	-	90	-	-	-	-	-	-
463	M	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	-	-	-	-	-	-	-	27	-	-	-	-	-	-
464	M	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27	-	-	-	-	-	-	-	27	-	-	-	-	-	-
465	M	U	3.4	0.2	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	20	-	-

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
466	F	U	3.4	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	20	-	-
467	M	49	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	646	-	-
468	F	49	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	646	-	-
469	M	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	73	310	-	-
470	M	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	70	-	-
471	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
472	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
473	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
474	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
475	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
476	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
477	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
478	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
479	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
480	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	176	-	-
481	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
482	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
483	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
484	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
485	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
486	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
487	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
488	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
489	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
490	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
491	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-
492	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-
493	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-
494	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-
495	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-
496	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
497	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
498	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
499	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
500	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
501	F	U	4.6	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	-	-	-	-	5	72	-	-
502	F	U	-	-	-	-	**0.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
503	F	U	-	-	-	-	**0.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-
504	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
505	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
506	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
507	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
508	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
509	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-

Annex 1. Adults' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits	Wild fungi	Freshwater fish	Intertidal occupancy over mud	Intertidal occupancy over mud and sand	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	Handling fishing gear	Handling sediment	Occupancy in close proximity (<10m) to sewage	Occupancy in close proximity (<10m) to sewage sludge or sewage cake	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
510	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
511	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
512	M	29	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	5	-	-	-	100	-	-
513	F	U	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	5	-	-	-	100	-	-
514	F	U	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	5	-	-	-	100	-	-
515	M	U	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	5	-	-	-	100	-	-
516	M	61	-	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
517	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1512	504	-	-	-	-
518	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1512	504	-	-	-	-
519	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1512	504	-	-	-	-
520	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1512	504	-	-	-	-
521	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1512	504	-	-	-	-
522	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1776	-	-	-	-

Notes

Emboldened observations are the high-rate individuals

U = Unknown

Annex 2. Children's and infants' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Wild fungi	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	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
Child age group (6 - 15 years old)																											
7	F	13	-	-	-	-	-	-	1.3	**1.8**	**155.6**	-	-	-	-	**41.6**	**0.3**	-	-	-	-	-	-	-	-	-	-
8	M	10	-	-	-	-	-	-	1.3	**1.8**	**155.6**	-	-	-	-	**41.6**	**0.3**	-	-	-	-	-	-	-	-	-	-
20	F	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6153	372
21	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7842	438
25	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8216	448
26	M	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3081	528
34	F	15	**4.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-
37	M	6	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-
41	M	12	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	M	15	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58	M	10	**11.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-
62	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-
142	M	12	-	-	-	**4.8**	1.7	**5.5**	-	**1.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
145	M	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
146	F	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
151	M	10	-	-	-	3.2	**7.4**	1.0	**8.2**	0.9	-	-	-	-	-	3.5	-	-	-	-	-	-	-	-	-	-	-
152	F	13	-	-	-	3.2	**7.4**	1.0	**8.2**	0.9	-	-	-	-	-	3.5	-	-	-	-	-	-	-	-	-	-	-
159	M	13	-	-	**12.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
162	M	10	-	-	-	**5.9**	**8.0**	2.2	-	0.2	-	-	-	-	-	**29.6**	-	-	-	-	-	-	-	-	-	-	-
175	F	15	-	0.1	-	1.4	1.5	2.6	1.0	0.1	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-
176	F	11	-	0.1	-	1.4	1.5	2.6	1.0	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
208	M	11	-	-	-	**6.1**	**7.9**	**6.2**	**9.1**	**3.2**	-	-	-	-	-	5.5	-	-	-	-	-	-	-	-	-	-	-
217	M	9	-	-	-	**11.5**	**4.0**	**6.1**	**7.6**	-	-	-	-	-	-	-	-	-	-	37	-	-	4	-	14	-	-

Annex 2. Children's and infants' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Wild fungi	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	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
223	F	10	-	-	-	1.7	**3.7**	**12.2**	**16.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
224	M	7	-	-	-	1.3	**2.8**	**9.1**	**12.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
236	M	14	-	-	-	2.1	2.3	**4.4**	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
237	M	10	-	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
240	M	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**200**	-	-	196	-	-	-
265	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	26
280	M	7	**11.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
284	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	-	-	-	-	-	-
289	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	50	-	-	110	-	-	-
290	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	220	50	-	-	110	-	-	-
294	F	9	-	**0.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
295	M	14	**5.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**677**	-	-	**52**	-	-	-	-
297	M	12	**5.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**742**	-	-	12	-	-	-	-
307	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-
308	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-
313	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92	-	-	-	-	-	-	-
315	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	198	-	-	-	-	33	-	-
316	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	198	-	-	-	-	33	-	-
320	M	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	-	-
358	M	7	-	-	-	-	-	-	-	-	-	**16.3**	**2.1**	**2.8**	**1.2**	5.0	-	**0.5**	-	-	-	-	-	-	-	-	-
361	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	825	25
369	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	7814	234
373	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66	-	-	-	-	-	-	-
403	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	-	-	41
404	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55	-	-	41

Annex 2. Children's and infants' consumption rates (kg y^{-1} or l y^{-1}) and occupancy rates (h y^{-1})

Observation number	Sex	Age (years)	Fish	Molluscs	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Rabbits/hares	Wild fungi	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	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
408	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	9	-	-	-
409	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	9	-	-	-
415	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	149	-	-	-	21	-	-	-
449	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3830**	-	-	1008	-	-
452	M	12	-	**0.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	8	-	-	-	-
Infant age group (0 - 5 years old)																											
11	F	3	-	-	-	-	-	-	-	-	-	**9.5**	-	**1.1**	-	**8.9**	-	-	-	-	-	-	-	-	-	-	-
12	F	3	-	-	-	-	-	-	-	-	-	**9.5**	-	**1.1**	-	**8.9**	-	-	-	-	-	-	-	-	-	-	-
49	M	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-
61	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-
66	M	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1040	208
121	M	2	-	-	-	1.0	-	0.3	0.6	-	**86.5**	-	-	**2.4**	-	-	-	-	**0.1**	-	-	-	-	-	-	-	-
160	F	5	-	-	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
213	F	3	-	-	-	**3.5**	**1.5**	**5.9**	**8.5**	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-
229	M	5	-	-	-	-	**1.5**	**2.1**	0.2	**0.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
266	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	26
270	F	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**52**	-	-	-	-	7926	730
271	F	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**52**	-	-	-	-	7926	730
272	F	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**52**	-	-	-	-	7926	730
281	F	5	**6.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
416	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**149**	-	-	-	21	-	-	-

Notes

U=Unknown

Emboldened observations are the high-rate individuals

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

Details of activity	Exposure pathways involved	Estimated rate
None identified	None identified	Not applicable

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

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

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} or l y^{-1}) and occupancy rates (h y^{-1}) for women of childbearing age[a], for use in foetal dose assessments

Observation number	Sex	Age (years)	Fish	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Wild fungi	Intertidal occupancy over mud and sand	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	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
4	F	25	-	-	-	-	-	-	-	-	-	-	-	11.8	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	F	41	-	-	-	-	-	-	-	-	1.3	1.8	155.6	-	-	-	-	41.6	0.3	-	-	-	-	-	-	-	-	-	-	-
10	F	33	-	-	-	-	-	-	-	-	-	-	-	37.8	-	4.5	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-
13	F	44	-	-	-	-	-	-	-	-	-	-	-	35.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	F	17	-	-	-	-	-	-	-	-	-	-	-	35.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	F	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8132	148
20	F	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6153	372
27	F	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6628	416
30	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	144	-	-	-	-	-	-
33	F	43	5.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	F	15	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-	-	-	-
36	F	39	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	F	U	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	-	-	-
65	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5809	283
72	F	U	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	F	U	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	F	U	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110	F	U	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
111	F	U	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
112	F	U	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
117	F	29	-	-	-	-	-	3.1	-	0.9	1.8	-	262.1	-	-	7.1	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-
118	F	26	-	-	-	-	-	3.1	-	0.9	1.8	-	262.1	-	-	7.1	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-
127	F	17	-	-	-	-	-	-	-	-	-	-	-	23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
128	F	17	-	-	-	-	-	-	-	-	-	-	-	23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
129	F	26	-	-	-	-	-	-	-	-	-	-	-	23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130	F	24	-	-	-	-	-	-	-	-	-	-	-	23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
131	F	22	-	-	-	-	-	-	-	-	-	-	-	23.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
134	F	25	-	-	4.7	-	-	-	-	-	-	-	-	-	-	11.3	0.7	41.6	-	-	-	-	-	-	-	-	-	-	-	-
144	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-
150	F	25	-	-	-	-	-	3.2	7.4	1.0	8.2	0.9	-	-	-	-	-	3.5	-	-	-	-	-	-	-	-	-	-	-	-
155	F	29	-	-	-	-	-	3.2	12.6	17.1	-	15.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
161	F	39	-	-	-	-	-	5.9	8.0	2.2	-	0.2	-	-	-	-	-	59.3	-	-	-	-	-	-	-	-	-	-	-	-
173	F	37	-	0.1	-	-	-	1.4	1.5	2.6	1.0	0.1	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-
175	F	15	-	0.1	-	-	-	1.4	1.5	2.6	1.0	0.1	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Wild fungi	Intertidal occupancy over mud and sand	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	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
193	F	35	-	-	-	-	-	15.9	29.2	4.4	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
206	F	40	-	-	-	-	-	6.1	7.9	6.2	9.1	6.9	-	-	-	-	-	5.5	-	-	-	-	-	-	-	-	-	-	-	-
212	F	42	-	-	-	-	-	7.0	4.0	12.5	17.0	-	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-
216	F	42	-	-	-	-	-	15.3	5.4	7.6	10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
219	F	42	-	-	-	-	-	2.3	4.9	31.1	21.8	-	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-
222	F	37	-	-	-	-	-	1.7	3.7	23.3	16.3	-	-	-	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-
228	F	28	-	-	-	-	-	-	3.0	4.1	0.4	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
234	F	35	-	-	-	-	-	2.1	2.3	4.4	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
243	F	42	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1288	-	-	-	-	-	-	-
252	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7772	572
253	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7564	468
259	F	19	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8369	365
269	F	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.4	-	-	-	-	-	52	-	-	-	-	7926	730
279	F	30	14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
291	F	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	285	65	-	-	30	-	-	-
293	F	34	-	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
299	F	40	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
303	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	-	-
304	F	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	-	-	-	-	-	-	-
306	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120	-	-	-	-	-	-	-
310	F	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	-	-
311	F	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-
312	F	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	183	-	-	-	-	-	-	-
314	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	198	-	-	-	-	33	-	-
323	F	44	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
331	F	28	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
337	F	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	-	-	-	72	-	-
352	F	U	2.8	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
356	F	28	-	-	-	-	-	-	-	-	-	-	-	16.3	2.1	2.8	1.2	5.0	-	-	-	-	-	-	-	-	-	-	-	-
366	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	130	-	-	-	-	-	7684	156
371	F	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7896	312
395	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	-	-	-	-	-	-	-
399	F	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	25
407	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	9	-	-	-
414	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	149	-	-	-	21	-	-	-

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

Observation number	Sex	Age (years)	Fish	Molluscs	Wildfowl	Marine plants/algae	Saltmarsh grazed sheep	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Wild fungi	Intertidal occupancy over mud and sand	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over boat on mud and sand	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
420	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280	28
422	F	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7875	365
424	F	33	-	-	-	-	-	14.0	8.1	4.9	6.1	4.4	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-	-	7741	143
448	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3830	-	-	1008	-	-
460	F	U	-	-	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
466	F	U	3.4	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40	20	-	-
486	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
487	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
488	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
489	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
490	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72	-	-
499	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
500	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-
501	F	U	4.6	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	182	-	-	-	-	-	5	72	-	-
502	F	U	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-
503	F	U	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-	-	-	-
508	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
509	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
510	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
511	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-
513	F	U	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	5	-	100	-	-
514	F	U	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	5	-	100	-	-

Notes

Emboldened observations are the high-rate individuals

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

Profile Name	Number of individuals	Pathway Name: Crustacea	Direct[a]	Eggs	Fish - Freshwater	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Houseboat occupants[b]	Gamma ext - Salt marsh[c]	Gamma ext - Sediment[d]	Marine plants/algae	Meat - Cow	Meat - Game[e]	Meat - Pig	Meat - Poultry	Meat - salt marsh grazed sheep	Meat - Sheep	Wildfowl	Milk	Molluscs	Mushrooms	Occupancy in close proximity to sewage	Occupancy in close proximity to sewage sludge or sewage cake	Occupancy IN water	Occupancy ON water	Plume (IN; 0-0.25km)[f]	Plume (MID; >0.25-0.5km)[f]	Plume (OUT; >0.5-1.1km)[f]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		kg	-	kg	kg	kg	kg	kg	h	h	h	kg	kg	kg	kg	kg	kg	kg	kg	l	kg	kg	h	h	h	h	h	h	kg	kg	kg	kg
Crustacean consumers	2	11.9	-	-	-	9.9	-	-	-	8	170	0.23	23.7	-	-	-	-	-	12.7	-	3.1	-	-	-	72	190	-	-	-	-	-	-	-
Occupants for direct radiation	67	-	1.00	0.42	-	1.5	0.71	-	-	<1	38	-	-	-	-	-	-	-	-	-	-	-	-	-	4	72	2640	1430	1460	0.81	1.1	0.87	1.6
Egg consumers	9	0.18	-	34.3	-	-	2.8	0.81	-	-	-	-	10.8	0.25	1.4	0.47	-	3.1	0.53	80.7	-	0.13	-	-	-	-	-	-	-	2.4	6.8	2.6	2.2
Freshwater fish consumers	2	-	-	-	3.5	23.6	-	3.4	-	-	340	-	-	-	-	-	-	-	15.9	-	5.8	3.9	-	-	-	-	-	-	-	-	-	-	-
Sea fish consumers	8	2.2	0.13	-	0.88	27.1	-	0.85	-	2	190	0.09	-	-	-	-	-	-	4.0	-	2.9	0.96	-	-	18	82	-	-	45	-	-	-	-
Domestic fruit consumers	6	0.26	0.33	5.9	-	-	28.8	-	-	-	-	-	7.9	1.5	-	8.0	-	-	-	-	-	-	-	-	-	-	-	2290	-	8.9	23.3	10.9	15.8
Wild fruit and nut consumers	6	0.26	-	8.0	1.2	7.9	0.08	3.2	-	-	110	-	21.7	0.38	2.8	1.2	-	3.8	5.3	-	1.9	1.4	-	-	-	-	-	-	-	-	-	9.1	2.0
Houseboat occupants	3	-	-	-	-	-	-	-	5520	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1010	-	-	-	-	-	-	-
Occupants for exposure - Salt marsh	16	-	-	-	-	-	-	-	-	290	-	-	-	-	-	-	0.35	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occupants for exposure - Sediment	17	-	0.06	-	0.21	4.2	-	0.20	-	-	760	-	-	-	-	-	-	-	0.93	-	0.40	0.23	-	-	-	24	-	-	450	-	-	-	-
Marine plants/algae consumers	4	4.4	-	-	-	5.3	-	-	-	4	12	0.72	-	-	-	-	-	-	-	-	1.6	-	-	-	36	74	-	-	-	-	-	-	-
Cattle meat consumers	20	0.47	-	4.4	-	-	2.9	0.52	-	-	15	-	33.2	0.11	1.1	0.41	-	1.9	1.3	-	-	0.05	-	-	-	5	-	-	-	-	-	-	-
Game meat consumers	1	-	-	-	-	-	23.5	-	-	-	-	-	-	9.0	-	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	18.4	42.8	-	35.4
Pork meat consumers	4	0.40	-	17.7	-	-	-	2.6	-	-	-	-	40.6	0.56	5.3	2.0	-	7.1	-	-	-	0.23	-	-	-	-	-	-	-	-	-	-	-
Poultry meat consumers	1	-	-	-	-	-	23.5	-	-	-	-	-	-	9.0	-	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	18.4	42.8	-	35.4
Salt marsh grazed sheep meat consumers	6	-	-	-	-	-	-	-	-	33	-	-	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sheep meat consumers	15	0.11	-	11.1	-	-	-	0.70	-	-	-	-	15.9	0.15	1.4	0.69	-	7.6	0.95	104.9	-	0.12	-	-	-	-	-	-	-	1.2	-	0.72	0.38
Wildfowl consumers	9	0.68	-	-	0.79	5.6	-	0.76	-	66	160	-	5.3	-	-	-	-	-	17.2	-	1.3	0.86	-	-	-	23	-	-	-	-	-	-	-
Milk consumers	11	-	-	9.5	-	-	0.32	0.14	-	-	-	-	-	-	-	-	-	3.9	-	284.4	-	0.17	-	-	-	-	-	-	-	1.7	-	1.2	0.52
Mollusc consumers	4	4.4	-	-	1.8	28.5	-	1.7	-	4	180	0.18	-	-	-	-	-	-	7.9	-	5.9	1.9	-	-	36	78	-	-	-	-	-	-	-
Mushroom consumers	2	-	-	-	3.5	23.6	-	3.4	-	-	340	-	-	-	-	-	-	-	15.9	-	5.8	3.9	-	-	-	-	-	-	-	-	-	-	-
Occupancy in proximity to sewage	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1510	500	-	-	-	-	-	-	-	-	-
Occupancy in proximity to sewage sludge or cake	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1780	-	-	-	-	-	-	-	-	-
Occupancy IN water	15	1.2	0.20	-	-	1.5	-	-	-	1	20	0.03	-	-	-	-	-	-	-	-	0.41	-	-	-	76	130	-	8	-	-	-	-	-
Occupancy ON water	9	-	0.33	-	-	1.1	-	-	570	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2310	530	-	-	-	-	-	-
Occupants for plume pathways (inner area)	22	-	1.00	1.2	-	-	-	-	-	-	13	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	7730	-	-	-	-	-	-
Occupants for plume pathways (mid area)	13	-	1.00	-	-	-	3.7	-	-	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7200	-	2.9	4.2	0.93	4.7
Occupants for plume pathways (outer area)	12	-	1.00	0.11	-	5.0	-	-	-	2	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	-	8110	1.4	1.5	3.9	4.1
Green vegetable consumers	28	0.08	0.07	5.0	-	0.16	6.8	-	-	-	21	-	-	0.32	-	1.7	-	-	-	-	-	0.03	-	-	-	6	-	500	-	16.4	16.5	16.0	18.8
Other domestic vegetable consumers	25	0.09	0.08	6.8	-	0.18	10.1	0.09	-	-	<1	-	-	0.36	-	1.9	-	-	-	-	-	0.04	-	-	-	5	-	550	-	9.7	24.4	15.7	19.6
Potato consumers	25	0.09	0.08	8.2	-	0.18	5.3	0.07	-	-	<1	-	-	-	-	-	-	-	-	-	-	0.05	-	-	-	5	-	-	620	8.4	14.6	26.5	22.5
Root vegetable consumers	41	0.05	0.10	3.7	-	0.19	4.7	0.04	-	-	<1	-	-	0.22	-	1.2	-	-	-	-	0.02	0.03	-	-	-	3	-	340	380	8.9	13.2	14.4	25.0

Notes

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

[b]Gamma ext - houseboat represents occupancy of boat on mud and sand.

[c]Gamma ext - salt marsh represents occupancy over salt marsh.

[d]Gamma ext - sediment includes occupancy over mud; mud and sand; mud and stones; sand and stones; sand.

[e]Game meat includes rabbits

[f]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 7. Summary of profiles for the child age group (6 - 15 years old)

		Pathway Name																						
Profile Name	Number of individuals	Direct[a]	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Houseboat occupants[b]	Gamma ext - Sediment[c]	Meat - Cow	Meat - Game[d]	Meat - Pig	Meat - Poultry	Meat - Sheep	Wildfowl	Milk	Molluscs	Occupancy IN water	Occupancy ON water	Plume (IN; 0-0.25km)[e]	Plume (MID; >0.25-0.5km)[e]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		-	kg	kg	kg	kg	h	h	kg	kg	kg	kg	kg	kg	l	kg	h	h	h	h	kg	kg	kg	kg
Occupants for direct radiation	9	1.00	-	-	-	-	-	14	-	-	-	-	-	-	-	-	12	-	3120	900	-	-	-	-
Egg consumers	3	-	37.6	-	1.2	0.23	-	-	-	-	-	-	-	-	103.7	-	-	-	-	-	2.0	2.7	0.84	0.75
Sea fish consumers	5	-	-	7.4	-	-	-	290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Domestic fruit consumers	4	-	22.2	-	2.0	0.17	-	-	-	-	-	-	-	-	77.8	-	-	-	-	-	2.7	2.4	2.9	2.9
Wild fruit and nut consumers	2	-	41.6	-	1.8	0.34	-	-	-	-	-	-	-	-	155.6	-	-	-	-	-	-	-	1.3	-
Houseboat occupants	1	-	-	-	-	-	3830	-	-	-	-	-	-	-	-	-	-	1010	-	-	-	-	-	-
Occupants for exposure - Sediment	4	-	-	2.5	-	-	-	490	-	-	-	-	-	-	-	-	55	-	-	-	-	-	-	-
Cattle meat consumers	1	-	5.0	-	-	-	-	-	16.3	0.45	2.1	1.2	2.8	-	-	-	-	-	-	-	-	-	-	-
Game meat consumers	1	-	5.0	-	-	-	-	-	16.3	0.45	2.1	1.2	2.8	-	-	-	-	-	-	-	-	-	-	-
Pork meat consumers	1	-	5.0	-	-	-	-	-	16.3	0.45	2.1	1.2	2.8	-	-	-	-	-	-	-	-	-	-	-
Poultry meat consumers	1	-	5.0	-	-	-	-	-	16.3	0.45	2.1	1.2	2.8	-	-	-	-	-	-	-	-	-	-	-
Sheep meat consumers	1	-	5.0	-	-	-	-	-	16.3	0.45	2.1	1.2	2.8	-	-	-	-	-	-	-	-	-	-	-
Wildfowl consumers	1	-	-	-	-	-	-	-	-	-	-	-	-	12.9	-	-	-	-	-	-	-	-	-	-
Milk consumers	2	-	41.6	-	1.8	0.34	-	-	-	-	-	-	-	-	155.6	-	-	-	-	-	-	-	1.3	-
Mollusc consumers	2	-	-	-	-	-	-	4	-	-	-	-	-	-	-	0.73	-	-	-	-	-	-	-	-
Occupancy IN water	3	-	-	-	-	-	-	250	-	-	-	-	-	-	-	-	140	-	-	-	-	-	-	-
Occupancy ON water	1	-	-	-	-	-	3830	-	-	-	-	-	-	-	-	-	-	1010	-	-	-	-	-	-
Occupants for plume pathways (inner area)	4	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6770	-	-	-	-	-
Occupants for plume pathways (mid area)	1	1.00	-	-	-	-	-	130	-	-	-	-	-	-	-	-	-	-	-	8050	-	-	-	-
Green vegetable consumers	4	-	8.8	-	1.1	-	-	9	-	-	-	-	-	-	-	-	-	4	-	-	7.1	5.4	4.2	5.0
Other domestic vegetable consumers	7	-	6.0	-	0.73	-	-	5	-	-	-	-	-	-	-	-	-	2	-	-	4.7	5.9	8.8	5.4
Potato consumers	6	-	2.1	-	0.82	-	-	6	-	-	-	-	-	-	-	-	-	2	-	-	4.5	5.5	10.3	5.9
Root vegetable consumers	6	-	0.91	-	0.72	-	-	6	-	-	-	-	-	-	-	-	-	2	-	-	4.6	3.7	8.1	7.2

Notes

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

[b]Gamma ext - houseboat represents occupancy of boat on mud and sand.

[c]Gamma ext - sediment includes occupancy over sand; sand and stones.

[d]Game meat includes rabbits

[e]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)

		Pathway Name																	
Profile Name	Number of individuals	Direct[a]	Eggs	Fish - Sea	Fruit - Domestic	Gamma ext - Sediment[b]	Meat - Cow	Meat - Sheep	Wildfowl	Milk	Mushrooms	Occupancy IN water	Plume (IN; 0-0.25km)[c]	Plume (MID; >0.25-0.5km)[c]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		-	kg	kg	kg	h	kg	kg	kg	l	kg	h	h	h	kg	kg	kg	kg
Occupants for direct radiation	5	1.00	-	-	-	31	-	-	-	-	-	-	5220	250	-	-	-	-
Egg consumers	2	-	8.9	-	-	-	9.5	1.1	-	-	-	-	-	-	-	-	-	-
Sea fish consumers	1	-	-	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Domestic fruit consumers	1	-	-	-	0.42	-	-	-	-	-	-	-	-	-	-	1.5	0.22	2.1
Occupants for exposure - Sediment	4	0.75	-	-	-	76	-	-	-	-	-	5	6490	-	-	-	-	-
Cattle meat consumers	2	-	8.9	-	-	-	9.5	1.1	-	-	-	-	-	-	-	-	-	-
Sheep meat consumers	3	-	5.9	-	-	-	6.3	1.5	-	28.8	0.02	-	-	-	0.34	-	0.20	0.10
Wildfowl consumers	1	-	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-
Milk consumers	1	-	-	-	-	-	-	2.4	-	86.5	0.05	-	-	-	1.0	-	0.59	0.31
Mushroom consumers	1	-	-	-	-	-	-	2.4	-	86.5	0.05	-	-	-	1.0	-	0.59	0.31
Occupancy IN water	1	-	-	-	-	150	-	-	-	-	-	21	-	-	-	-	-	-
Occupants for plume pathways (inner area)	3	1.00	-	-	-	52	-	-	-	-	-	-	8660	-	-	-	-	-
Occupants for plume pathways (mid area)	1	1.00	-	-	-	-	-	-	-	-	-	-	-	1250	-	-	-	-
Green vegetable consumers	1	-	0.83	-	-	-	-	-	-	-	-	-	-	-	3.5	1.5	8.5	5.9
Other domestic vegetable consumers	2	-	0.41	-	0.21	-	-	-	-	-	-	-	-	-	1.8	1.5	4.4	4.0
Potato consumers	1	-	0.83	-	-	-	-	-	-	-	-	-	-	-	3.5	1.5	8.5	5.9
Root vegetable consumers	2	-	0.41	-	0.21	-	-	-	-	-	-	-	-	-	1.8	1.5	4.4	4.0

Notes

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

[b]Gamma ext - sediment includes occupancy over sand; sand and stones.

[c]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 9. Summary of profiles for women of childbearing age, for use in foetal dose assessments

Profile Name	Number of individuals	Pathway Name: Direct[a]	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Houseboat occupants[b]	Gamma ext - Sediment[c]	Marine plants/algae	Meat - Cow	Meat - Pig	Meat - Poultry	Meat - salt marsh grazed sheep	Meat - Sheep	Wildfowl	Milk	Molluscs	Mushrooms	Occupancy IN water	Occupancy ON water	Plume (IN; 0-0.25km)[d]	Plume (MID; >0.25-0.5km)[d]	Plume (OUT; >0.5-1.1km)[d]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		-	kg	kg	kg	kg	h	h	kg	kg	kg	kg	kg	kg	kg	l	kg	kg	h	h	h	h	h	kg	kg	kg	kg
Occupants for direct radiation	**14**	1.00	0.32	1.1	0.32	-	-	16	-	-	-	-	-	-	-	-	-	-	2	-	4550	1560	620	1.0	0.58	0.43	0.35
Egg consumers	**3**	-	47.5	-	0.64	0.11	-	-	-	-	-	0.24	-	3.8	1.6	51.9	-	-	-	-	-	-	-	2.0	2.7	0.42	0.75
Sea fish consumers	**6**	0.17	-	9.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1460	-	-	-	-
Domestic fruit consumers	**3**	-	1.8	-	9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.4	16.5	3.0	9.2
Wild fruit and nut consumers	**1**	-	41.6	-	1.8	0.34	-	-	-	-	-	-	-	-	-	155.6	-	-	-	-	-	-	-	-	-	1.3	-
Houseboat occupants	**1**	-	-	-	-	-	3830	-	-	-	-	-	-	-	-	-	-	-	-	1010	-	-	-	-	-	-	-
Occupants for exposure - Sediment	**1**	-	-	0.48	-	-	-	1290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marine plants/algae consumers	**2**	-	-	-	-	-	-	6	0.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cattle meat consumers	**9**	-	1.5	-	-	-	-	-	-	27.0	0.24	0.13	-	0.82	-	-	-	-	-	-	-	-	-	-	-	-	-
Pork meat consumers	**1**	-	5.0	-	-	-	-	-	-	16.3	2.1	1.2	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Poultry meat consumers	**2**	-	23.3	-	-	-	-	-	-	8.1	1.1	0.95	-	7.1	2.4	-	-	-	-	-	-	-	-	-	-	-	-
Salt marsh grazed sheep meat consumers	**5**	-	-	-	-	-	-	-	-	-	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sheep meat consumers	**4**	-	12.6	-	-	-	-	-	-	9.5	-	0.18	-	7.5	1.2	131.1	-	0.08	-	-	-	-	-	1.6	-	0.90	0.47
Wildfowl consumers	**2**	-	20.8	-	-	-	-	-	-	-	-	0.37	-	5.7	7.4	-	-	-	-	-	-	-	-	-	-	-	-
Milk consumers	**3**	-	13.9	-	0.59	0.11	-	-	-	-	-	-	-	4.8	-	226.6	-	0.11	-	-	-	-	-	2.1	-	1.6	0.63
Mollusc consumers	**2**	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	1.1	-	20	10	-	-	-	-	-	-	-
Mushroom consumers	**2**	-	-	-	-	-	-	-	-	-	-	-	-	7.1	-	262.1	-	0.16	-	-	-	-	-	3.1	-	1.8	0.95
Occupancy IN water	**6**	0.17	-	0.57	-	-	-	83	-	-	-	-	-	-	-	-	0.10	-	27	3	-	4	-	-	-	-	-
Occupancy ON water	**1**	-	-	-	-	-	3830	-	-	-	-	-	-	-	-	-	-	-	-	1010	-	-	-	-	-	-	-
Occupants for plume pathways (inner area)	**8**	1.00	0.56	-	-	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	7920	-	-	-	-	-	-
Occupants for plume pathways (mid area)	**3**	1.00	-	-	1.5	-	-	56	-	-	-	-	-	-	-	-	-	-	-	-	-	7270	-	4.7	2.7	2.0	1.6
Occupants for plume pathways (outer area)	**1**	1.00	-	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8730	-	-	-	-
Green vegetable consumers	**6**	0.17	11.1	-	2.9	-	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	1310	-	10.7	10.4	7.0	6.3
Other domestic vegetable consumers	**2**	-	-	-	10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.6	20.9	-	10.7
Potato consumers	**6**	-	4.7	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.9	5.5	13.7	13.6
Root vegetable consumers	**4**	-	4.9	-	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6	6.3	13.8	21.0

Notes

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

[b]Gamma ext - houseboat represents occupancy of boat on mud and sand.

[c]Gamma ext - sediment includes occupancy over mud and sand; sand; sand and stones.

[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.

This page has been intentionally left blank

This page has been intentionally left blank

About us

Cefas is a multi-disciplinary scientific research and consultancy centre providing a comprehensive range of services in fisheries management, environmental monitoring and assessment, and aquaculture to a large number of clients worldwide.

We have more than 500 staff based in 2 laboratories, our own ocean-going research vessel, and over 100 years of fisheries experience.

We have a long and successful track record in delivering high-quality services to clients in a confidential and impartial manner.
(www.cefas.defra.gov.uk)

Cefas Technology Limited (CTL) is a wholly owned subsidiary of Cefas specialising in the application of Cefas technology to specific customer needs in a cost-effective and focussed manner.

CTL systems and services are developed by teams that are experienced in fisheries, environmental management and aquaculture, and in working closely with clients to ensure that their needs are fully met.
(www.cefastechnology.co.uk)

Customer focus

With our unique facilities and our breadth of expertise in environmental and fisheries management, we can rapidly put together a multi-disciplinary team of experienced specialists, fully supported by our comprehensive in-house resources.

Our existing customers are drawn from a broad spectrum with wide ranging interests. Clients include:

- international and UK government departments
- the European Commission
- the World Bank
- Food and Agriculture Organisation of the United Nations (FAO)
- oil, water, chemical, pharmaceutical, agro-chemical, aggregate and marine industries
- non-governmental and environmental organisations
- regulators and enforcement agencies
- local authorities and other public bodies

We also work successfully in partnership with other organisations, operate in international consortia and have several joint ventures commercialising our intellectual property.

Head office
Centre for Environment,
Fisheries & Aquaculture Science
Pakefield Road, Lowestoft,
Suffolk NR33 0HT UK

Tel +44 (0) 1502 56 2244
Fax +44 (0) 1502 51 3865
Web www.cefas.defra.gov.uk

printed on paper made from a minimum 75% de-inked post-consumer waste