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Radiological Habits Survey: Springfields, 2012

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Final report

Radiological Habits Survey: Springfields, 2012

V.E. Ly, F.J. Clyne, C.J. Garrod and A. Dewar

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

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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 Springfields nuclear site. The site's main commercial activity is the manufacture of fuel elements for nuclear reactors and the production of uranium hexafluoride. Other activities include the recovery of uranium from residues and decommissioning redundant plants. The site discharges gaseous radioactive wastes via stacks to the atmosphere, liquid radioactive wastes into the River Ribble and contains sources of direct radiation. Areas likely to be most affected by the discharges and sources of radiation were defined as the aquatic survey area for liquid discharges, the terrestrial survey area for the deposition from gaseous discharges, and the direct radiation survey area for ionising radiation emanating directly from the site. The occupancy data collected from the direct radiation survey area is also applicable to the direct exposure arising from gaseous releases from the site.

The following potential exposure pathways related to the site were investigated:

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

Interviews were conducted with members of the public and data collected for 531 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) was defined as the tidal waters and intertidal area of the Ribble Estuary and its tributaries, east of a line extending from Fairhaven on the north bank to Marshside Sands on the south bank. The eastern extent of the survey area was at the A6 road bridge at Frenchwood which was the approximate tidal limit.

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

- 10 kg y^{-1} for fish
- 7.2 kg y^{-1} for crustaceans
- 0.8 kg y^{-1} for molluscs
- 14 kg y^{-1} for wildfowl
- 0.1 kg y^{-1} for marine plants/algae

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

- For fish: bass, cod, Dover sole, flounder, grey mullet and plaice
- For crustaceans: brown shrimp
- For molluscs: cockles
- For wildfowl: Canada goose, duck (unspecified species), mallard, pink-footed goose, teal and wigeon with smaller quantities of greylag goose, pintail and shoveler
- For marine plants/algae: samphire

The activities undertaken by adults in the high-rate groups for intertidal occupancy included angling; wildfowling; walking; tractor fishing; collecting marine plants, cockles, mussels and litter; bait digging; mud dipping; Royal Society for the Protection of Birds (RSPB) guide duties; dog walking; fixing moorings; boat maintenance; boat launching; tending livestock; bird watching; beachcombing; marsh warden duties; boat dwelling. Gamma dose rate measurements were taken at most locations in the aquatic survey area where activities were occurring. The only activity undertaken by adults in the high-rate group for handling fishing gear was handling nets. The activities undertaken by adults in the high-rate group for handling sediment were collecting cockles and mussels; fixing moorings; mud dipping; wildfowling; bait digging. The activities undertaken by people on the water included boat dwelling; gill netting; trawling; sailing; boat maintenance; tractor fishing; boat angling; pleasure cruising. Livestock were identified grazing on salt marsh at five farms in the aquatic survey area. The use of seaweed was not identified.

The terrestrial survey area

The terrestrial survey area (Figure 2) was defined as the land within 5 km of the centre of the Springfields site. Thirty-two farms were identified in the survey area, interviews were conducted at 23 of them. These farms produced milk (from dairy cattle), beef cattle, lambs, pigs, chickens (for eggs and meat), turkeys and arable crops. The farmers and their families consumed foods that were produced on their land. One smallholding was identified in the survey area that produced beef cattle, lambs and pigs. Four allotment sites with approximately 95 plots in total were identified where a variety of fruit and vegetables was grown. Some allotment holders kept bee hives on their plots.

Two beekeepers were identified who kept hives within the survey area. Residents were identified that kept chickens and ducks for eggs and chickens for meat.

Foods from the terrestrial survey area were consumed from the following groups: green vegetables; other vegetables; root vegetables; potato; domestic fruit; milk; cattle meat; pig meat; sheep meat; poultry; eggs; wild/free foods; honey; wild fungi. One mean consumption rate for the adult high-rate groups was found to be greater than the generic 97.5th percentile consumption rates. This was for milk. No consumption of rabbits/hares, venison or cereals was identified.

The human consumption of ground water was not identified. Livestock were consuming water from ponds, ditches and a borehole. Control measures used by the Springfields site in order to limit the possibility that contamination is transferred off-site by wildlife included using nets to prevent birds from accessing the buildings and periodically culling rabbits and pigeons.

The direct radiation survey area

The direct radiation survey area (Figure 2) was defined as the land within 1 km of the Springfields nuclear licensed site boundary. Occupancy rates were obtained for residents, visitors, employees, children attending school, an allotment holder, farmers and farm workers.

The occupancy rates were analysed in zones according to the distance from the Springfields nuclear licensed site boundary. In the 0 – 0.25 km zone, one resident had the highest indoor rate, a farmer had the highest outdoor rate and two residents shared the highest total occupancy rate. The same highest indoor and total occupancy rates in the >0.25 – 0.5 km zone were for two residents, and the highest outdoor occupancy rate was for a resident who kept a variety of animals. Two residents had the highest indoor and total occupancy rates in the >0.5 – 1.0 km zone and a farmer had the highest outdoor occupancy rate.

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 Springfields site centre.

Comparisons with the previous survey

Comparisons were made with the results from a previous habits survey undertaken around the Springfields site in 2006. Reasons for significant changes in the consumption, occupancy and handling rates were identified for certain pathways and these are provided in Section 8.

In the aquatic survey area in 2012, compared with 2006, the mean consumption rates for the adult high-rate groups decreased for fish, from 54 kg y^{-1} to 10 kg y^{-1}, for crustaceans, from 21 kg y^{-1} to

7.2 kg y^{-1}, for wildfowl, from 21 kg y^{-1} to 14 kg y^{-1}, and for marine plants/algae, from 0.7 kg y^{-1} to 0.1 kg y^{-1}. The consumption of molluscs was identified in 2012 but was not identified in 2006.

The mean intertidal occupancy rates for the adult high-rate groups decreased in 2012 compared to 2006 over the following substrates: mud, from 360 h y^{-1} to 140 h y^{-1}; sand, from 1600 h y^{-1} to 190 h y^{-1}; boat over mud, from 8300 h y^{-1} to 5900 h y^{-1}. The mean intertidal occupancy rates for the high-rate groups increased in 2012 compared with 2006 for salt marsh, from 750 h y^{-1} to 900 h y^{-1}. Activities were recorded over grass and over mud and stones in 2012 but were not recorded over these substrates in 2006. In 2006, activities were recorded over mud and sand, but were not recorded over this substrate in 2012. The mean rate for the adult high-rate group for handling fishing gear decreased in 2012 compared to 2006 from 690 h y^{-1} to 340 h y^{-1} and the mean rate for the adult high-rate group for handling sediment decreased in 2012 compared to 2006 from 390 h y^{-1} to 180 h y^{-1}.

In the terrestrial survey area in 2012, compared with 2006, there were relatively large increases in the mean consumption rates for the adult high-rate groups for sheep meat, from 15 kg^{-1} to 24 kg^{-1} and for wild fungi, from 0.5 kg y^{-1} to 1.5 kg y^{-1}. There were relatively large decreases in the mean consumption rates for the adult high-rate groups for the following food groups: green vegetables, from 29 kg y^{-1} to 17 kg y^{-1}; potato, from 48 kg y^{-1} to 31 kg y^{-1}; milk, from 440 l y^{-1} to 280 l y^{-1}; pig meat, from 25 kg y^{-1} to 11 kg y^{-1}; poultry, from 19 kg y^{-1} to 9.5 kg y^{-1}. There were small increases in the mean consumption rates for the adult high-rate groups for domestic fruit and eggs, and there were small decreases for other vegetables, root vegetables and cattle meat. The consumption of wild/free foods and honey was identified in 2012 but was not identified in 2006. The consumption of rabbits/hares was not identified in 2006 or 2012.

In the direct radiation survey area in 2012 compared with 2006, there was an increase in the highest total occupancy rate in the >0.5 – 1.0 km zone from 7700 h y^{-1} to 8600 h y^{-1}. There was a slight decrease in the highest total occupancy rates in the 0 – 0.25 km and >0.25 - 0.5 km zone in 2012 compared with 2006, from 8760 h y^{-1} to 8400 h y^{-1} and from 8400 h y^{-1} to 8300 h y^{-1} respectively. Ten sets of gamma dose rate measurements taken at the same residences and businesses in 2012 and 2006 were compared.

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. These include taking gamma dose measurements on-board a houseboat at the Freckleton Creek location, removing the sample of rabbits from the programme and adding samples of chicken eggs and honey to the programme and taking a one-off sample of lamb.

1 INTRODUCTION

The public may be exposed to radiation as a result of the operations of the Springfields nuclear licensed site either through the permitted discharges of liquid or gaseous radioactive wastes into the local environment, or from radiation emanating directly from the site. This report provides information on activities carried out locally by members of the public, 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 optimisation, other members of the public will receive acceptable doses, and overall protection to the public is provided from the effects of radiation. The term 'representative person' is equivalent to, and replaces, the term 'average member of the critical group' as recommended by ICRP (ICRP, 2006). The recommendations of the ICRP were updated in 2007 (ICRP, 2007) and, for the public, still include the principle of protecting the individuals most highly exposed to radiation, characterised by the representative person.

1.1 Regulatory framework

The Environment Agency regulates the discharges of radioactive waste under the Environmental Permitting Regulations (UK Parliament, 2010). The regulations take account of the European Union (EU) Basic Safety Standards (BSS) Directive 96/29/Euratom (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 Springfields nuclear site is located near Preston, Lancashire in north-west England, approximately 14 km east-south-east of Blackpool.

The main activities at Springfields are the production of uranium hexafluoride ("hex"); fabrication of oxide fuels for Advanced Gas-Cooled and Light Water reactors, as well as intermediate fuel products such as powders, granules and pellets; processing current and historical natural and enriched residues for recovery of uranium and return to the fuel cycle; management of cylinders containing hex; decommissioning and demolition of redundant plant and buildings. At the time of the habits survey, routine operations were being undertaken on site.

Since April 2010, responsibility for the commercial fuel manufacturing business is held by Westinghouse Electric Company Limited, and Springfields Fuels Limited manages the site on their behalf. The Nuclear Decommissioning Authority owns the assets and liabilities of the site. Under the Environmental Permitting Regulations, Springfields Fuels Limited is permitted to discharge gaseous wastes via stacks to the atmosphere and liquid radioactive wastes via an outfall into the River Ribble. 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 wastes 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 Springfields habits survey in 2012 on behalf of the Environment Agency, the Food Standards Agency, and the Office for Nuclear Regulation. The aim of the survey was to obtain comprehensive information on the habits of the public that might lead to their exposure to radiation via gaseous discharges, liquid discharges and direct radiation from the Springfields nuclear site.

Specifically, investigations were conducted into the following:

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

The Environment Agency requested that we investigate unconfirmed reports of quad bike activity along the shore of the Ribble Estuary. It was discovered that a motor cross track was located near the shore of the Ribble Estuary between Clifton Marsh and Preston Marina, however, the track did not extend to the tide washed areas so the activity was not included in this report. No additional site-specific investigations were requested by 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 gaseous discharges, and a direct radiation area relating to ionising radiation emanating directly from the site.

The aquatic survey area, shown in Figure 1, was defined as the tidal waters and intertidal area of the Ribble Estuary and its tributaries, east of a line extending from Fairhaven on the north bank to

Marshside Sands on the south bank. The eastern extent of the survey area was at the A6 road bridge at Frenchwood which was the approximate tidal limit.

The terrestrial survey area, shown in Figure 2, covered all land within 5 km of the site centre (National Grid Reference: SD 470 314), to encompass the main areas of potential deposition from gaseous discharges. Watercourses and lakes within the survey area, which potentially contained contamination from the washout of gaseous discharges, are included in the terrestrial section of this report.

The direct radiation survey area, which is also shown in Figure 2, was defined as all land within 1 km of the nuclear licensed site boundary. The occupancy data collected from the direct radiation survey area is also applicable to inhalation and external exposure pathways arising from gaseous releases from the site.

The same aquatic, terrestrial and direct radiation survey areas were used in the previous habits survey conducted by Cefas around the Springfields site, which was in 2006 (Tipple *et al*., 2007).

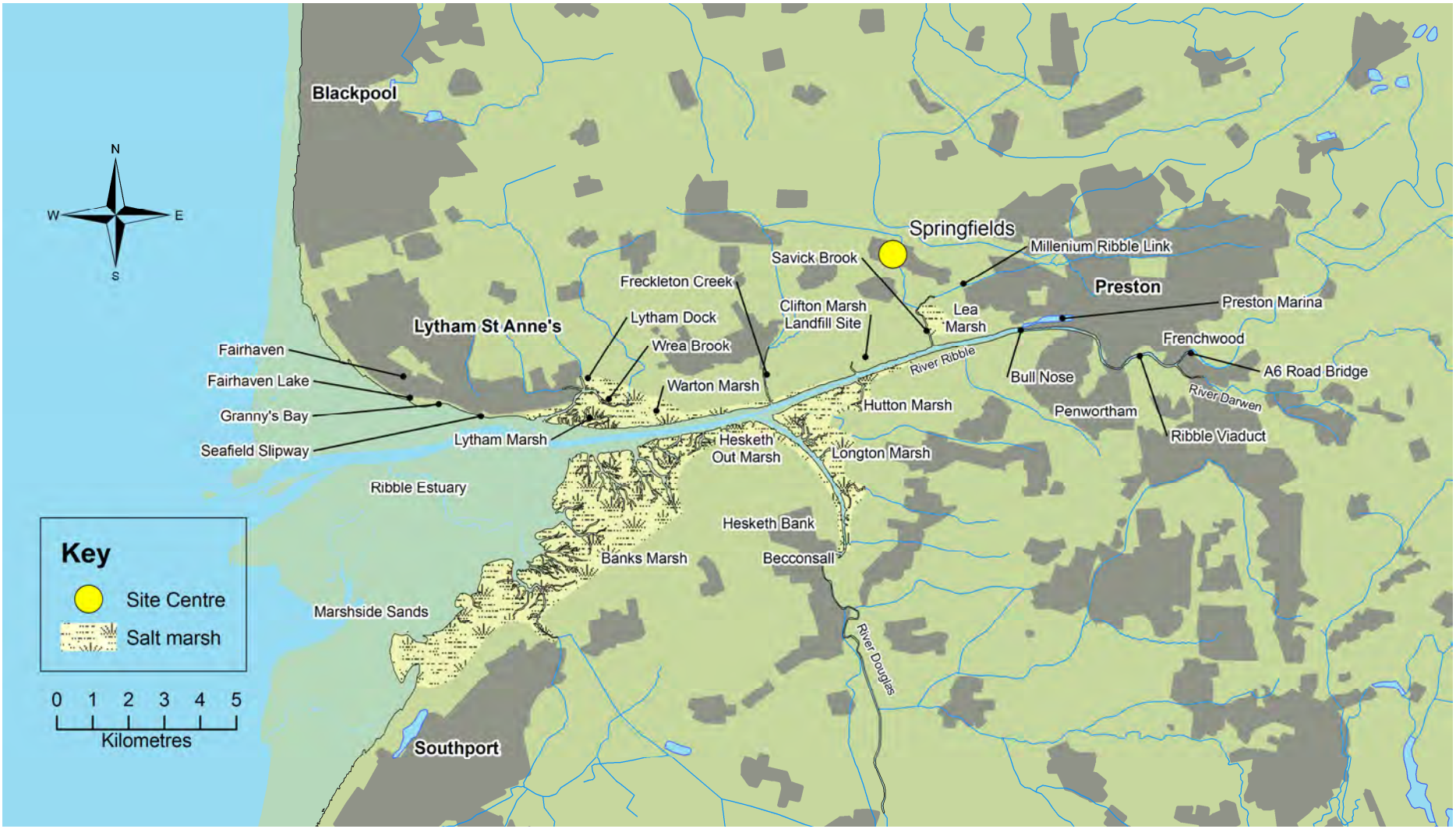

Figure 1. The Springfields aquatic survey area

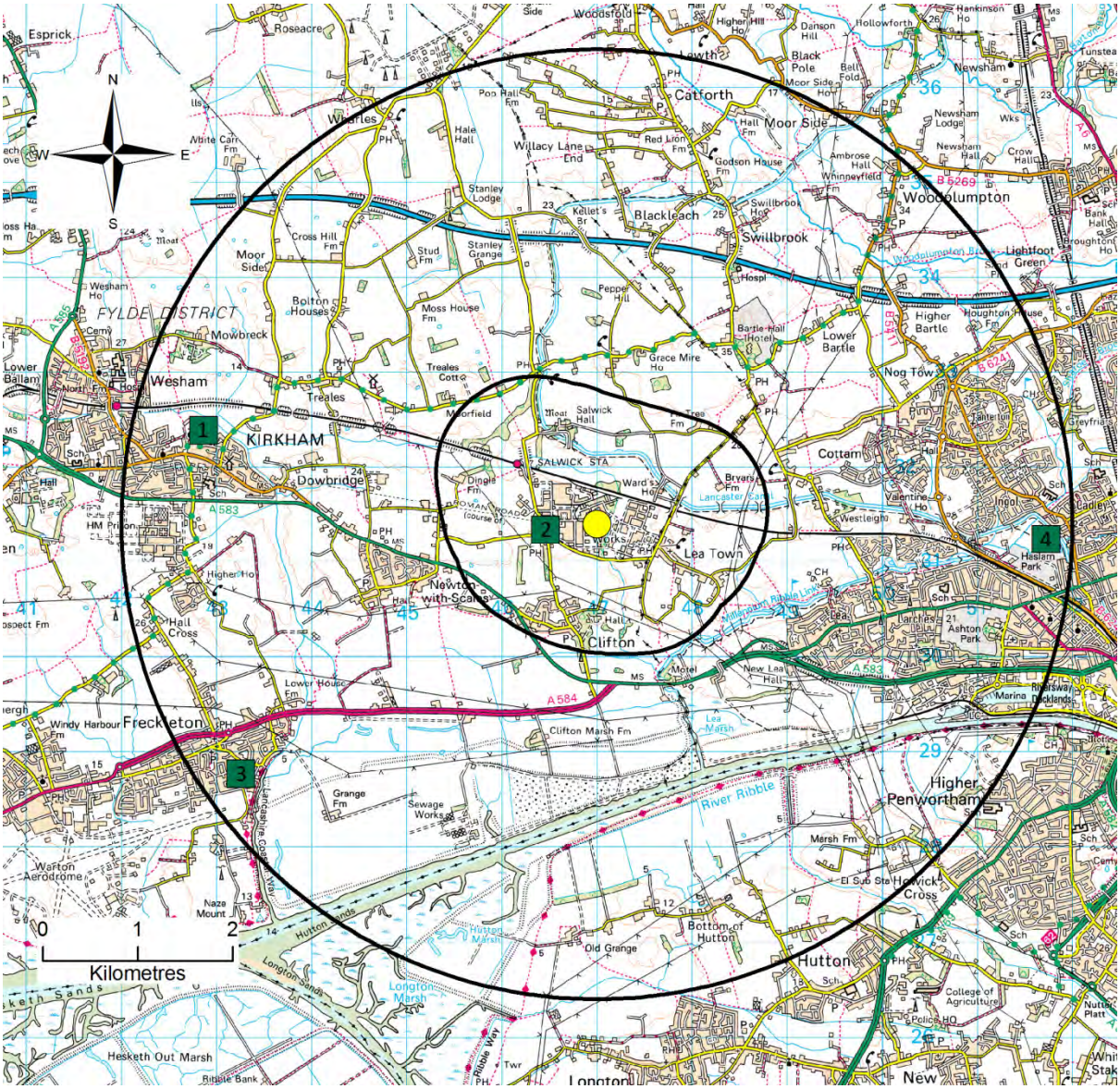

Figure 2. The Springfields terrestrial (outer ring) and direct radiation (inner ring) survey areas

Key

- Site Centre
- Allotment Sites
  1. Kirkham Allotments
  2. Springfields Allotments
  3. Freckleton Allotments
  4. Haslam Park Allotments

2.4 Conduct of the survey

As part of the pre-survey preparation, the Environment Agency, the Food Standards Agency and the Office for Nuclear Regulation were contacted to identify any additional site-specific requirements. Information relating to the activities of people in the aquatic and terrestrial survey areas was obtained from Internet searches, Ordnance Survey maps and from previous habits surveys undertaken around the Springfields site. People with local knowledge of the survey area were contacted for information relevant to the various exposure pathways. These included representatives from: the Marine Management Organisation, who provided information on commercial fishing; representatives of the local fishing industry; town and parish councils; local schools and boatyards.

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 11th to the 21st September 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 the Springfields site. 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 Springfields site was operating routinely at the time of the habits survey
- The Springfields site has a visitors' centre and a nature reserve which are visited mainly by people from schools, colleges and universities
- The maximum dose rate experienced around the site perimeter has decreased significantly since the processing of uranium ore ceased in 2006
- Beta emitting radionuclides discharged from the residue processing plant is now 95% less than in 2005
- The Deepdale Brook runs through the Springfields site via a culvert and is not subject to any site discharges
- Control measures used by the site in order to limit the possibility that contamination is transferred off-site by wildlife include using nets to prevent birds from accessing the buildings and periodically culling rabbits and pigeons
- Information about potential exposure pathways and activities in the area included: dog walking to the east, south and west of the site; samphire collecting at Granny's Bay; quad biking was reported on the intertidal areas on the north side of the River Ribble; Warton Marsh is privately owned and a popular wildfowling area; Longton Marsh is open to the public and is popular with walkers and Banks Marsh is an RSPB nature reserve

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, wildfowlers, people carrying out activities on intertidal areas, farmers, gardeners, beekeepers 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 Springfields 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 45,500 people living in the terrestrial survey area, although information was obtained for a significantly smaller number than this. It should be noted that the survey did not include employees or contractors at the Springfields nuclear 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 employees at businesses located within the direct radiation survey area, 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 businesses, the occupancy rates within the direct radiation survey area for the employees.

3 METHODS FOR DATA ANALYSIS

3.1 Data recording and presentation

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

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

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 Springfields 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. 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, shown in Figure 1, was defined as the tidal waters and intertidal area of the Ribble Estuary and its tributaries, east of a line extending from Fairhaven on the north bank to Marshside Sands on the south bank. The eastern extent of the survey area was at the A6 road bridge at Frenchwood, which was the approximate tidal limit.

Overview of the survey area

The Ribble Estuary is an important area for wildlife and forms part of the Ribble Estuary National Nature Reserve (NNR). It is designated as a Special Protection Area (SPA), Ramsar site and Site of Specific Scientific Interest (SSSI). The Ribble Estuary has many large areas of salt marsh with wide mud and sand flats exposed at low water. The upper reaches of the River Ribble are characterised by mud and grass banks and the water is predominantly freshwater. Livestock grazed on the salt marsh areas during the spring and summer months and wildfowling was very popular during the autumn and winter months. Tractor fishermen caught shrimp by towing nets through shallow water on the large areas of sand out in the estuary.

North side of the Ribble Estuary, from west to east:

Fairhaven to Wrea Brook

Fairhaven is located at the western limit of the survey area on the north side of the Ribble Estuary. The intertidal shore comprises mud and sand. A large brackish water lake separates the shore from the town. The water of the lake was 'topped up' with seawater several times per year. The lake was used for pleasure boating, canoeing and windsurfing. Angling was popular from the sea wall that separated the lake from the shore. A small amount of bait digging took place on the shore at Fairhaven and cockle collecting took place on the sand flats offshore. The RSPB had a visitors centre at Fairhaven.

At Granny's Bay, to the east of Fairhaven, there is a narrow band of sand along the upper shore, which is separated from the mud flats of the lower shore by a patch of salt marsh (see Figure 3). Dog walkers mainly stayed on the sand and RSPB guides ran nature activities on the mud and salt marsh for groups of school children and adults.

Between Granny's Bay and the Seafield slipway was a promenade which was occasionally used by anglers. The concrete slipway at Seafield was the main centre of activity for the small boats fishing in the estuary. Four commercial fishermen, a few hobby fishermen and several boat anglers kept their boats on the shore near the slipway or moored them in the channel just offshore.

The intertidal substrate was a mix of mud and stones, and tractors were used to launch boats across the shore. Individuals were identified shore angling, fixing moorings, dog walking and maintaining their boats in the vicinity of the slipway. Small quantities of mussels were collected commercially from the river training wall that directed the main water channel further offshore.

Following along the promenade east of the slipway was a Royal National Lifeboat Institution (RNLI) station and a cruising club's clubhouse, jetty and boat compound, where dinghies were kept. A wooden slipway across the salt marsh was used for launching the dinghies and the RNLI inshore rescue boat. Individuals spent a limited amount of time on the salt marsh whilst launching dinghies. Other activities identified taking place in this area included dog walking, beachcombing and collecting litter. The salt marsh in this area forms a small part of Lytham Marsh, which extends eastwards on the other side of Wrea Brook.

Figure 3. Granny's Bay

Wrea Brook to Savick Brook

Warton Marsh and Lytham Marsh together form a large salt marsh area which is drained by the Wrea Brook; the lower shoreline is mud. The Lytham Marsh to the east of Wrea Brook and most of Warton Marsh are owned and managed by a local wildfowling association, whose members shoot on the marshes. One wildfowler collected small quantities of samphire whilst out wildfowling. Warton Marsh was used for grazing livestock by a local farmer during the spring and summer months.

A marina known as Lytham Dock, which was owned by a cruising club, was located on the northern tributary of Wrea Brook and many sailing yachts and a few other craft were moored there. Most of the boats rested on mud at low water.

From the eastern end of Warton Marsh to the confluence of Freckleton Creek the shore is accessible only by rough tracks or walking along the Lancashire Coastal Way. The upper shore is a narrow belt of salt marsh and the lower shore is mud. Moorings were located on the banks of Freckleton Creek where several sailing boats were moored; individuals were identified living on three of these boats. A part-time commercial fisherman docked his boat at the mouth of Freckleton Creek and caught salmon with gill nets between June and August.

Between Freckleton Creek and the Savick Brook the substrate was predominantly mud with small areas of salt marsh, which were used for grazing livestock by two local farmers. The Clifton Marsh landfill site, which accepted disposal of very low level rubble from the decommissioning areas of the Springfields site, was located in this area. Two people shot wildfowl along the shore of Clifton Marsh. The Savick Brook (see Figure 4) is tidal up to the first lock but mainly flows through private land. No activities were identified taking place on the bank side at the time of the survey. Further upstream the Savick Brook connects with the Millennium Ribble Link thus forming a waterway between the Ribble Estuary and the Lancaster Canal.

Figure 4. Savick Brook

Savick Brook to Ribble Viaduct

East of the Savick Brook was Lea Marsh, a small area of salt marsh where a local farmer grazed livestock. From Lea Marsh to Bull Nose, the shoreline is grass, some of which is tide washed, with mud exposed at low tide. No activities were observed taking place on the tide washed areas. Bull Nose was a concrete quay at the entrance of Preston Marina and was a popular angling location due to easy access and parking (see Figure 5). Some anglers fished from the grass banks adjacent to Bull Nose. Preston Marina was mainly used by pleasure boats and canal boats. The sea scouts and a small water-skiing club were based within the marina. The local council had a boat moored at

Preston Marina which was used to spend a small amount of time maintaining the navigation posts downstream along the river. The areas along the shore from Preston Marina to the Ribble Viaduct are mainly industrial and residential with the Ribble Way footpath running parallel to the shore. At low tide large areas of mud are exposed which can be reached down steep banks from the path. No activities were observed in this area during the survey.

Figure 5. Bull Nose

Ribble Viaduct to the A6 road bridge at Frenchwood (north and south banks)

This section of the river, although tidal, is predominantly freshwater. The Ribble Way footpath continues on the north bank and another path runs along the south bank of the river through this section of the survey area. Access to the river on the north bank is difficult in places due to steep, overgrown grass banks. No activities were observed on the north bank shore during the time of the survey. On the south bank of the river, access was easier and two coarse fishing anglers were observed during the survey (see Figure 6). The River Darwen confluences on the south side of the River Ribble. Fences and steep, overgrown grass banks prevents access to the shore along the River Darwen. No activities were observed on the shore of the River Darwen during the time of the survey.

Figure 6. River Ribble near Frenchwood

South side of the Ribble Estuary, from east to west:

Ribble Viaduct to River Douglas

From the Ribble Viaduct to Penwortham there are industrial and residential areas with grass embankments down to the shore. The Ribble Way footpath runs parallel to the shore until Hutton Marsh where it goes inland towards the River Douglas. The intertidal substrate from Penwortham to Hutton Marsh changes from grass to mud, with small patches of salt marsh. With the exception of walkers and dog walkers using the Ribble Way footpath, no other activities were noted.

Hutton and Longton marshes are large areas of salt marsh to the east of the River Douglas intersected with mud gulleys that fill with water on every high tide (see Figure 7). The salt marsh floods approximately every month. The wildfowling rights of Hutton and Longton marshes belonged to a local wildfowling association who kept Hutton Marsh as a wildlife sanctuary and restricted shooting activities to Longton Marsh. Livestock were grazed on Longton Marsh. It was reported that samphire, sea beet and mushrooms grew on the marshes but only the collection of samphire, by a single wildfowler, was identified during the survey.

The River Douglas flows past the villages of Hesketh Bank and Becconsall. There was a boatyard at Becconsall, which provided moorings for several yachts and other boats. One individual was identified living permanently on one of the boats. The boat was moored over mud high up a creek and the tide came under the boat for only a few hours per day for approximately 5 days per month. The occupant was interviewed and gamma dose rate measurements were taken over a half-tidal cycle at various locations on-board the boat and over the mud beneath it.

Figure 7. Longton Marsh

River Douglas to Marshside Sands

Hesketh Out Marsh was a large area of reclaimed land which was flooded between 2006 and 2008 as part of the managed retreat works by the Environment Agency and the RSPB to return the area to salt marsh. This area is owned by the RSPB and is now mainly used for walking and bird watching. Two RSPB wardens spend time on the salt marsh at Hesketh Out Marsh. A small wildfowling club held the rights to shoot on part of the marsh.

Banks Marsh is another large area of salt marsh that stretches west of Hesketh Out Marsh to Marshside Sands forming the largest area of marshland in the Ribble Estuary NNR (see Figure 8). As part of the NNR management of the marsh, a local farmer grazed his cattle on Banks Marsh during the summer months. Whilst tending his livestock the grazier collected and consumed small quantities of samphire. It was reported that commercial samphire collection occurred on Banks Marsh but this was not identified during the time of the survey. A wildfowling association held the rights to shoot on Banks Marsh.

Figure 8. Banks Marsh

At Marshside Sands to the west of Banks Marsh, large areas of sand flats are exposed at low tide. There was easy access to the sands via a disused track which used to serve a sand extraction company that was located here (see Figure 9). The sand extraction company had closed and the buildings had been demolished. This track was partially tide washed and was popular with walkers and dog walkers. It was also used as an access point onto Banks Marsh by the wildfowling association. This area was part of the shrimping grounds for tractor fishermen based at Southport. Four commercial tractor fishermen and two hobby tractor fishermen were identified. One individual was identified bait digging at Marshside Sands.

Figure 9. Access track to Marshside Sands

4.2 Commercial fisheries

Most of the commercial fishermen that operated within the survey area also fished further down the estuary outside the area. For the purposes of the survey all their fishing activities were taken as inside the survey area. Some fishermen were engaged in several different types of fishing and shellfish collecting, depending on the season and fishing opportunities.

Four small commercial fishing boats, all under 10m in length, operated from the Seafield slipway. They were mainly used for gill-netting for bass, and beam trawling for brown shrimp. A variety of other fish species, including grey mullet, flounder, plaice and Dover sole were caught in the gill nets.

Four salmon gill net licences, some of which were held by the fishermen based at Seafield slipway, were issued for the Ribble Estuary in 2011. The salmon fishing season lasted from June until August each year and fishing was not allowed at weekends.

Several fishermen based at Southport used tractors and amphibious vehicles to tow nets through shallow water to catch brown shrimps out on the sand flats of the estuary. The shrimp were riddled and cooked on-board the vehicles.

There is a potentially large cockle fishery out on the sand flats of the estuary that attracts both local people and gangs from outside the area. The cockles are collected by hand raking at low water and the collectors reach the beds by boat or by quad bikes and other vehicles. Following concerns about stock depletion and the safety of the collectors in previous years the fishery was heavily regulated in 2012 and was only open for about 45 days.

Two individuals were identified that collected small quantities of mussels from the training walls that directed the channels of the river.

It was reported that a few individuals fished for elvers for a few nights each year at places where fresh water streams entered the River Ribble. This involved standing on the river bank and using long handled dip nets to scoop the elvers from the water. The elvers were kept alive after capture and exported to Europe for restocking purposes.

4.3 Destination of seafood originating from the aquatic survey area

A local wet fish shop in Lytham bought the bass and other species of white fish landed from the survey area. The salmon was also sold to the wet fish shop or to private customers.

Brown shrimps were sold to local shellfish processors in Southport or to a local wet fish shop. The shrimps were used to produce potted shrimp and were processed in Southport before being distributed nationally. The cockles and mussels were sent to shellfish merchant based outside the survey area.

4.4 Hobby fishing and angling.

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 were mainly tractor fishing or gill netting from boats. Hobby fishermen mainly caught flounder, plaice, cod, bass, grey mullet, smaller quantities of other white fish species and brown shrimps. The catches were consumed by the fishermen's families and friends.

Several private angling boats were moored or launched from Seafield slipway. Shore angling for saltwater species was popular at Fairhaven, Bull Nose and off Seafield slipway. Much of the shore angling was carried out from sea walls rather than intertidal areas. The main edible species caught by the boat and shore anglers were plaice, flounder, Dover sole, grey mullet, cod, bass and the occasional sea trout. Angling for freshwater species occurred east of Bull Nose to the A6 road bridge. The fish caught were freshwater species and were not consumed.

4.5 Wildfowling

Wildfowling was very popular along the Ribble Estuary and four wildfowling clubs were identified whose members were shooting in the survey area. Three clubs had approximately 100 members each and the fourth club had approximately 10 members. The wildfowling season extended from 1st September to 20th February. One person who shot wildfowl did not belong to a club. Wildfowling took place on most of the salt marshes and associated foreshores within the survey area.

Wildfowlers were both lying and kneeling on the salt marsh and in the muddy gulleys. Most of the wildfowlers wore many layers of clothing to protect themselves from the cold weather and some wore waders and gloves. The main species being shot were mallard, teal, pintail, shoveler, wigeon, Canada goose, pink-footed goose, greylag goose and other unspecified species of duck. The shot wildfowl were consumed by the wildfowlers and their families and friends.

4.6 Other pathways

Livestock were identified grazing on salt marsh at five farms in the aquatic survey area, four of which were also in the terrestrial survey area. Two farms grazed sheep on salt marsh, one farm grazed sheep and beef cattle on salt marsh and two farms grazed beef cattle on salt marsh. Most farmers tended to restrict grazing of livestock on the Ribble Estuary salt marshes to the spring and summer months although one farmer did allow his sheep to graze for one month during the winter. Cattle and sheep were generally taken onto the salt marshes at the beginning of May and taken off during the first week of October.

Small quantities of samphire were collected from Banks, Longton and Warton marshes by a grazier and a wildfowler. The samphire was consumed by the collectors and their families. It was reported that organised groups were collecting samphire commercially from Banks Marsh but this was not identified during the survey.

4.7 Food consumption data

Consumption data for aquatic foods are presented in Tables 3 to 7 for adults and in Tables 8 to 9 for children. 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 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. 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 or marine plants/algae.

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	47	20	20.4	7.2	10.4	14.7	15.0	40.0
Crustaceans	17	3	10.0	4.8	7.2	8.7	3.5	10.0
Molluscs	1	1	0.8	0.8	0.8	NA	3.5	10.0
Wildfowl	30	10	19.5	10.6	14.2	19.5	ND	ND
Marine plants/algae	3	3	0.2	0.1	0.1	0.2	ND	ND

Notes
NA – Not applicable
ND – Not determined

The predominant species of fish consumed by adults were plaice, bass and flounder, with smaller quantities of cod, Dover sole and grey mullet. These fish were caught from the Ribble Estuary, off Fairhaven, Bull Nose and Marshside Sands. Of the fish consumed by the 20 people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 30% plaice, 25% bass, 20% flounder, 10% cod and 15% mix of Dover sole and grey mullet.

The only species of crustaceans consumed by adults were brown shrimps. The brown shrimps were caught from the Ribble Estuary and Marshside Sands.

The only species of molluscs consumed by adults were cockles. The cockles were collected from the Ribble Estuary.

The predominant species of wildfowl consumed by adults were wigeon, mallard, pink-footed goose, duck (unspecified species) and teal, with smaller quantities of Canada goose, pintail, shoveler, and greylag goose. These were shot on salt marshes and mud flats throughout the survey area. Of the wildfowl consumed by the 10 people in the high-rate group, the percentage breakdown of species, rounded to the nearest 5%, was 45% wigeon, 15% mallard, 10% pink-footed goose, 10% duck (unspecified species), 10% teal and a 10% mix of Canada goose, pintail, shoveler and greylag goose.

The only species of marine plants/algae consumed by adults was samphire, which was collected from Banks Marsh and Longton Marsh.

Children's and infants' consumption rates

Table B presents a summary of children's consumption rates of fish 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, molluscs or marine plants/algae was identified. For the infant age group, no consumption of aquatic foods was identified. No generic rates have been determined for the child or infant age groups.

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

Food group	Number of observations	Number of high-rate consumers	Observed maximum for the high-rate group (kg y^{-1})	Observed minimum for the high-rate group (kg y^{-1})	Observed mean for the high-rate group (kg y^{-1})	Observed 97.5th percentile (kg y^{-1})
Child age group (6 – 15 years old)						
Fish	1	1	14.4	14.4	14.4	Not applicable
Wildfowl	3	3	0.2	0.1	0.2	0.2

The predominant species of fish consumed by the individual in the child age group were cod and bass, with smaller quantities of grey mullet and flounder.

The only species of wildfowl consumed by the individuals in the child age group was mallard.

4.8 Intertidal occupancy

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

Adults' intertidal occupancy rates

Table 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})**
Grass	2	1	107	107	105
Mud	71	54	252	140	232
Mud and stones	7	3	435	403	432
Salt marsh	88	2	1092	896	349
Sand	14	4	270	189	268
Boat over mud	15	3	7596	5892	6701

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

- For grass: angling from the banks of the River Ribble
- For mud: angling from the banks of the River Ribble; wildfowling at Banks Marsh, Lytham Marsh, Warton Marsh, Hesketh Out Marsh and Longton Marsh; mud dipping at Granny's Bay
- For mud and stones: collecting mussels from the shore of the Ribble Estuary; dog walking, fixing moorings and boat maintenance from the Seafield slipway
- For salt marsh: tending livestock and collecting samphire at Banks Marsh; dog walking at Lytham Marsh
- For sand: tractor fishing off Marshside Sands; walking at Banks Marsh; collecting cockles from the Ribble Estuary; dog walking at Granny's Bay
- For boat over mud: boat dwelling at Becconsall and Freckleton Creek

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)					
Mud	2	2	68	68	68
Mud and stones	1	1	20	20	Not applicable
Infant age group (0 – 5 years old)					
Salt marsh	3	3	12	12	12

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

- For mud; wildfowling at Lytham and Warton marshes
- For mud and stones; boat maintenance at Seafield slipway

For individuals in the infant age group, three children were identified playing on the salt marsh at Lytham Marsh.

4.9 Assessment of occupancy in houseboats

In the Springfields aquatic survey area there are many boats that are moored in creeks that dry out at low tide, exposing the surrounding sediments for a large part of the tidal cycle. Some of these boats are used as houseboats and historically houseboat occupancy has given rise to relatively high doses.

In recent years, the estimated doses for houseboat occupancy published in the RIFE reports (for example, EA, FSA, NIEA and SEPA, 2012) have been based on occupancy rates for a single houseboat located at Becconsall and gamma dose rate measurements taken on sediments at Becconsall as part of the EA statutory monitoring programme. In order to provide detailed information to support the assessment of dose, gamma dose rate measurements have been taken on-board the houseboat in those years when a habits survey has been undertaken around the Springfields site.

During the 2006 Springfields habits survey, one set of gamma dose rate measurements was taken on-board the houseboat and on the mud underneath the houseboat, which were both high compared with previous measurements. In order to validate these high results, Cefas undertook another series of gamma dose rate measurements in 2007 (Tipple *et al*., 2007). These measurements were taken on-board and adjacent to the port and starboard sides of the hull, over part of a tidal cycle. An annual dose was estimated using these measurements and was similar to that estimated in 2006. An Environment Agency review of external radiation doses to houseboat occupants and people spending time on river banks in the Ribble Estuary was undertaken in 2008 (Punt *et al*., 2011). This included an assessment of effective dose to houseboat occupants and the results were consistent with those presented in RIFE.

During the 2012 Springfields habits survey, gamma dose rate measurements were taken on-board the houseboat and adjacent to the port side of the hull over approximately half a tidal cycle. There was no water under the boat for most of this time except for a short period over high tide. Gamma dose rate measurements were also taken on grass adjacent to the boatyard slipway over the same period; these were taken close to one of the Environment Agency statutory monitoring programme locations. The results are presented in Annex 10. The on-board gamma dose readings were all found to be below the natural background value for mud (0.07 μGy h^{-1}) and were lower than those taken in 2007. The gamma dose rate measurements taken adjacent to the hull also decreased in

2012 compared with 2007; on mud under the port side of the hull, from 0.092 µGy h^{-1} to 0.086 µGy h^{-1}, and when water provided shielding, from 0.075 µGy h^{-1} to 0.064 µGy h^{-1}. During the 2012 habits survey a large vessel was moored in the creek adjacent to the rear of the houseboat. It is not known how long the vessel had been moored in that location but it was not present at the time when the 2007 gamma dose rate measurements were taken. The vessel has reduced the area of mud exposed at the rear of the houseboat and this might have influenced the gamma dose rates recorded in 2012.

Additionally, during the 2012 survey, people were identified living on houseboats located at Freckleton. The mean rate for the high-rate group for occupancy on board a boat over mud presented in this report is 5900 h y^{-1}, which includes people living at Becconsall and at Freckleton, rather than only including people living at Becconsall as in previous reports. Since the occupancy is now based upon people living at two locations (Becconsall and Freckleton) and since the on-board measurements at Becconsall were below the natural background value for mud (0.07 µGy h^{-1}), the estimated dose has been calculated as follows.

$$D = R_{OCC} * R_{\gamma} * F,$$

where:

R_{OCC} is the representative occupancy rate with a hull shielding factor of 0.5 (Punt *et al.*, 2011) applied (5900 h y^{-1} * 0.5 = 2950 h y^{-1}),

R_{γ} is the average of a gamma dose rate for Becconsall and a gamma dose rate for Freckleton. The Becconsall gamma dose rate is the average of those taken on mud adjacent to the port side of the houseboat hull when there was no water under the hull (see Annex 10) with the natural background value for mud subtracted (0.086 - 0.07 = 0.016 µGy h^{-1}). The Freckleton gamma dose rate is the measurement nearest the houseboat taken over grass as part of the Environment Agency statutory monitoring programme with the natural background value for grass, 0.06 µGy h^{-1}, subtracted (0.098 – 0.06 = 0.038 µGy h^{-1}). (EA, unpublished result).

$R_y = 0.5 * (0.016 + 0.038) = 0.027$ µGy h^{-1}.

F is the factor for converting µGy to µSv (0.85 Sv Gy^{-1} (ICRP, 1996)).

This gives an estimated dose for houseboat occupancy of 68 µSv in 2012.

In order to support the estimation of dose due to houseboat occupancy at Becconsall in future, it is recommended that the gamma dose rate measurements are taken over the mud adjacent to the hull of the houseboat. If gamma dose rate measurements are taken at other locations in the boatyard, it would be necessary to adjust the measured dose rate to more closely reflect the dose rate over mud under the boat. Currently, no gamma dose rate measurements are taken over the mud adjacent to

the houseboat at Freckleton. It would be preferable to include such measurements in the calculation of estimated dose for houseboat occupancy at Freckleton in future and the addition of these measurements to the Environment Agency statutory monitoring programme has been suggested (see Section 10.2).

4.10 Gamma and beta dose rate measurements

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

- Two measurements taken over grass ranged from 0.073 µGy h^{-1} to 0.080 µGy h^{-1}
- Eight measurements taken over mud ranged from 0.064 µGy h^{-1} to 0.111 µGy h^{-1}
- One measurement taken over mud and stones was 0.067 µGy h^{-1}
- Six measurements taken over salt marsh ranged from 0.063 µGy h^{-1} to 0.100 µGy h^{-1}
- One measurement taken over sand was 0.065 µGy h^{-1}
- One measurement taken on a wooden houseboat over mud was 0.054 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, 2011).

Four representative beta dose rate measurements at contact with the substrates were taken over mud and salt marsh. These measurements are presented in Table 12. Three measurements taken over mud ranged from 0.080 µSv h^{-1} to 0.293 µSv h^{-1} and one measurement taken over salt marsh was 0.235 µSv h^{-1}. The highest measurement over mud was recorded on the bank of a creek at Warton Marsh.

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.

Table 13 presents the adult handling rates of fishing gear and sediment recorded during the survey and Table 14 presents the child handling rates of fishing gear and 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	12	9	500	338	497
Handling sediment	68	32	349	181	256

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

- For handling fishing gear: handling nets in the Ribble Estuary and at Marshside Sands
- For handling sediment: collecting cockles and mussels from the Ribble Estuary; bait digging off Fairhaven; fixing moorings at Seafield slipway; wildfowling at Banks, Lytham, Warton and Longton marshes

Children's handling rates of fishing gear and sediment

Table F presents a summary of the handling rates of fishing gear and sediment for children. The table includes the mean handling rate for the high-rate group.

Table F. Summary of children's handling rates of sediment (h y^{-1})

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})
Child age group (6 – 15 years old)					
Handling fishing gear	1	1	10	10	Not applicable
Handling sediment	2	2	68	68	68

The only child identified handling fishing gear in the child age group was handling nets in the Ribble Estuary.

The children identified handling sediment in the child age group were wildfowling at Lytham and Warton marshes.

4.12 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 'on water' in the survey area for adults are presented in Table 15 and occupancy rates for activities taking place 'on water' for children are presented in Table 16. Data for members of clubs and organisations were gained through interviews with their representatives.

Activities in the water

No activities were observed taking place 'in water' during the survey for adults, children or infants.

Activities on the water

The activities taking place on the water in the aquatic survey area were boat dwelling, gill netting, trawling, sailing, boat maintenance, tractor fishing, boat angling and pleasure cruising. Thirty-four observations were recorded for adults and one observation for an individual in the child age group. The highest occupancy rate for adults was 2200 h y^{-1} for one individual who was living on a houseboat in Freckleton Creek. The highest occupancy rate for the individual in the child age group was 70 h y^{-1} for a child pleasure cruising, gill netting and boat angling on the River Ribble and the Ribble Estuary. No infants were identified spending time 'on water' during the survey.

5 TERRESTRIAL RADIATION PATHWAYS

5.1 Terrestrial survey area

The terrestrial survey area (shown in Figure 2) covered all land within 5 km of the Springfields site centre (National Grid Reference: SD 470 314).

The land in the terrestrial survey area is a mix of agricultural and urban areas. The main population centres are the suburbs of the city of Preston to the east of the site and part of the town of Kirkham and Freckleton to the west. The villages of Catforth, Woodplumpton and Blackleach were located to the north, with Clifton village and Lea Town located to the south and south-east respectively and the village of Newton-with-Scales situated to the west. The River Ribble flows through the survey area and there are areas of salt marsh within the terrestrial survey area where farmers grazed their livestock. The Lancaster Canal and the Millennium Ribble Link also flow through the survey area. The Deepdale Brook joins the Savick Brook after flowing through the Springfields site via a culvert and is not subject to any site discharges.

Thirty-two working farms were identified in the Springfields terrestrial survey area; interviews were conducted at 23 of them. Of these farms:

- Two produced milk (from dairy cattle)
- One produced milk (from dairy cattle) and chickens (for egg production)
- Two produced milk (from dairy cattle) and lambs
- Two produced milk (from dairy cattle), beef cattle and lambs
- One produced milk (from dairy cattle), beef cattle, lambs and turkeys
- Five produced beef cattle
- Three produced beef cattle and lambs
- One produced beef cattle, lambs, chickens (for consumption) and arable crops
- One produced pigs
- Three produced lambs
- One produced arable crops, beef cattle and lambs
- One produced arable crops

Wheat, barley, oats and vegetables were produced for human consumption. Crops such as grass, silage, haylage, maize, wheat, barley and hay were grown for use as livestock feed and were used on the farms on which they were produced.

Farmers and their families were consuming milk, beef, lamb, chicken and turkey produced on their own farms. Three farmers kept chickens for eggs for their own families' consumption; one farmer kept

turkeys for their own family's consumption; one farmer kept pigs for their own family's consumption. A number of farmers grew fruit and vegetables for their own families' consumption.

One smallholding was identified within the survey area. The smallholder produced beef cattle, lambs, pigs and grass for animal feed which were sold to private buyers. The smallholder and their family did not consume their own produce.

Four allotment sites with a total of approximately 95 plots were identified within the survey area. The locations of the allotment sites are shown in Figure 2. Several allotment holders held more than one plot. The allotment holders grew a wide variety of fruit and vegetables which were consumed by their families and friends. Some individuals kept hives on their allotment plots.

Two beekeepers were identified who kept hives in the survey area, one of whom was interviewed. The beekeeper who was interviewed had two hives located in the suburbs of Preston. The average production of honey per hive was 18 kg y^{-1}. The honey was consumed by the beekeeper and their family. It was reported that the other beekeeper kept hives in Freckleton.

One individual was identified in the survey area who kept ducks for eggs and chickens for meat and eggs for their own family's consumption. Two other individuals were identified who kept chickens for eggs for their own families' consumption.

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

Rough shooting took place on several of the farms within the survey area. Private game shoots took place on four farms in the survey area. One farm reared ducks (unspecified species), pheasants and partridges on their land and released them for an organised game shoot. The shooters and their families consumed the shot duck (unspecified species), mallard, teal, wood pigeon, wigeon, pheasant and partridge.

The human consumption of groundwater was not identified. One farm situated to the north of the survey area supplied their livestock with borehole water for drinking. Most livestock were supplied with mains water for drinking and at several farms livestock also had access to ponds and ditches. Livestock grazing on farmland to the south of the site could potentially drink from the Deepdale Brook but this was not identified during the time of the survey.

5.2 Destination of food originating from the terrestrial survey area

Beef cattle and lambs were sold through livestock auction markets in Preston or Lancaster and to abattoirs in Preston or Yorkshire. A small amount of beef cattle and lambs were sold directly to other farms. Milk was sold to national dairies for distribution to retail and wholesale outlets. One dairy farm

had their own bottling plant which also bottled milk from other dairy farmers. Pigs were sold directly to an abattoir near Manchester or through livestock auction markets in Lancaster. Chickens were sold for meat to a national supplier or exported for egg production. Turkeys were sold direct to the public from one farm. The oats were sold to national buyers and exported for use in cereals. Barley and wheat were sold to an international distributor to be used for starch production. One beekeeper sold a small amount of honey at their place of work. Excess game from one of the organised shoots was sold to a game dealer and exported to Europe.

5.3 The transfer of contamination off-site by wildlife

Control measures were used in order to limit the possibility that contamination was transferred off-site by wildlife. These included the use of nets to prevent birds from accessing the buildings and the periodical culling of rabbits and pigeons. In the past, rabbits and pigeons have been monitored; however, this has not occurred for a number of years.

5.4 Food consumption data

Consumption data for locally produced foodstuffs potentially affected by deposition of gaseous discharges are presented in Tables 17 to 30 for adults and Tables 31 to 43 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 44 and the foods sampled as part of the 2010 Food Standards Agency monitoring programme (EA, FSA, NIEA and SEPA, 2011) are identified by emboldened italics in the table.

Adults' consumption rates

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

Table F 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 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.

Table F. 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	54	24	26.9	9.4	17.1	26.1	15.0	45.0
Other vegetables	61	18	38.1	13.5	20.9	32.2	20.0	50.0
Root vegetables	52	13	41.1	15.6	24.3	40.9	10.0	40.0
Potato	39	12	59.0	21.8	31.1	59.0	50.0	120.0
Domestic fruit	90	14	50.9	18.4	30.5	39.9	20.0	75.0
Milk	14	14	383.2	155.6	276.5	383.2	95.0	240.0
Cattle meat	19	17	47.3	18.9	27.1	47.3	15.0	45.0
Pig meat	2	2	10.7	10.7	10.7	10.7	15.0	40.0
Sheep meat	29	9	37.7	17.0	24.3	37.7	8.0	25.0
Poultry	29	16	14.0	5.5	9.5	14.0	10.0	30.0
Eggs	33	18	29.1	11.9	19.0	28.8	8.5	25.0
Wild/free foods	30	6	6.0	2.8	5.0	6.0	7.0	25.0
Honey	7	4	3.4	1.4	2.4	3.4	2.5	9.5
Wild fungi	3	3	1.5	1.5	1.5	1.5	3.0	10.0

The only mean consumption rate for the high-rate group found to be greater than the generic 97.5th percentile consumption rate was for milk. Eight 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, sheep meat and eggs. Five observed 97.5th percentile consumption rates exceeded the generic 97.5th percentile consumption rates. These were for root vegetables, milk, cattle meat, sheep meat and eggs.

Children's and infants' consumption rates

Thirty individuals in the child age group and seven individuals in the infant age group were identified consuming foods from the terrestrial survey area. Table G 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: rabbits/hares; wild fungi; venison; cereals. In the infant age group, no consumption of foods from the following food groups was identified: pig meat; eggs; rabbits/hares; wild fungi; venison; cereals.

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

Food group	Number of observations	Number of high-rate consumers	Observed maximum for the high-rate group (kg y^{-1})	Observed minimum for the high-rate group (kg y^{-1})	Observed mean for the high-rate group (kg y^{-1})	Observed 97.5th percentile (kg y^{-1})
Child age group (6 - 15 years old)						
Green vegetables	10	7	13.1	5.3	8.9	13.1
Other vegetables	13	11	14.2	5.9	8.4	14.2
Root vegetables	10	4	14.3	9.1	11.9	13.8
Potato	2	1	19.1	19.1	19.1	18.7
Domestic fruit	16	4	15.8	11.7	14.7	15.8
Milk	2	2	268.3	136.9	202.6	265.0
Cattle meat	5	5	18.9	15.8	18.3	18.9
Pig meat	3	3	10.7	8.0	9.8	10.7
Sheep meat	9	8	10.7	6.8	8.2	10.7
Poultry	1	1	5.5	5.5	5.5	NA
Eggs	9	8	21.3	7.6	16.3	21.3
Wild/free foods	8	4	1.1	0.8	0.9	1.1
Honey	1	1	3.4	3.4	3.4	NA
Infant age group (0 - 5 years old)						
Green vegetables	2	2	7.4	2.7	5.0	7.3
Other vegetables	2	2	8.0	2.9	5.5	7.9
Root vegetables	3	1	8.8	8.8	8.8	8.4
Potato	2	1	12.7	12.7	12.7	12.4
Domestic fruit	6	1	10.8	10.8	10.8	9.7
Milk	3	3	126.5	68.4	87.8	123.6
Cattle meat	2	2	7.9	7.9	7.9	7.9
Sheep meat	2	2	4.7	4.7	4.7	4.7
Poultry	2	2	5.5	5.5	5.5	5.5
Wild/free foods	3	2	0.4	0.4	0.4	0.4
Honey	1	1	1.7	1.7	1.7	NA

Notes
NA - Not applicable

6 DIRECT RADIATION PATHWAYS

6.1 Direct radiation survey area

The direct radiation survey area (shown in Figure 2) covered all land and waterways within 1 km of the Springfields nuclear licensed site boundary. The occupancy data collected from the direct radiation area is also applicable to the direct exposure arising from gaseous releases from the site.

The land within the direct radiation survey area is predominantly agricultural with small residential areas. The Preston to Blackpool railway line bisects the direct radiation survey area from east to west and runs adjacent to the northern perimeter fence of the Springfields site. An unmanned railway station and a manned signal box were located close to the north-west boundary of the site. The Lancaster Canal flows from the north-west of the survey area to the east.

The main residential areas are the villages of Lea Town to the south-east and Clifton to the south of the site. A garden centre, a church, a smallholding, a farm, a post office and a primary school were located within the residential areas. A road ran along the south, east and west of the Springfields site perimeter fence, located along this road were residential properties, a small allotment site, a farm, two public houses, a bowling green, a church, a chemical company, a plant hire company and two small private schools.

Within the direct radiation survey area were nine working farms, one of which also ran a caravan park for holidaymakers. Two other farms had fields within the direct radiation survey area.

6.2 Residential activities

The closest residences to the Springfields nuclear site were located along the road which runs alongside the western perimeter fence in the 0 – 0.25 km zone. The village of Lea Town is located to the south-east of the site and covers the 0 – 0.25 km, >0.25 – 0.5 km and >0.5 – 1.0 km zones. The village of Clifton is located to the south of the site in the >0.5 – 1.0 km zone. Residential properties were also scattered throughout the survey area.

Interviews were conducted at 32 residences, which had a combination of families with children, single occupants and retired people. Fourteen of these residences were within the 0 – 0.25 km zone, seven were within >0.25 – 0.5 km zone and 11 residences were within the >0.5 – 1.0 km zone.

6.3 Leisure activities

Walking and dog walking were noted along the paths throughout the direct radiation survey area. A small allotment site with three plots was located to the west of the site. A non-residential caravan park with approximately 40 plots was located within a working farm to the north-east of the site. Two churches, a children's play area and a bowling green were located within the survey area. The Lancaster Canal flows through the direct radiation survey area and attracts walkers and pleasure boat visitors.

6.4 Commercial activities

A few businesses were located within the direct radiation survey area, which included two public houses, a chemical company, a plant hire company, a post office and a garden centre. Nine working farms and a smallholding were scattered throughout the direct radiation survey area and interviews were conducted at the smallholding and six of the farms.

A railway signal box was located to the north-west of the Springfields site perimeter fence and was permanently manned; occupancy data was obtained for the employees. To the north of the site improvement works were being carried out by contractors on the railway bridges along the Preston to Blackpool railway line. Occupancy data was not obtained for the contractors as the work was on a short term basis.

The activities of Springfields 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

One primary school and two private schools were located within the >0.25 – 0.5 km zone. Interviews were conducted at two of the schools and generic data for staff and children were obtained. At the primary school there were 11 staff and 94 pupils whose ages ranged from 4 to 11 years old and at the private school, there were 15 staff and 16 pupils whose ages ranged from 7 to 12 years old. A representative number of staff and children have been included in the data analysis in this report.

6.6 Occupancy rates

Table 45 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 46. A summary of occupancy rates in the direct radiation survey area is presented in Table H.

Table H. 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	186	8063	3360	8428
>0.25 - 0.5 km	33	7592	2555	8322
>0.5 - 1.0 km	40	8187	3942	8604

0 - 0.25 km from the nuclear licensed site boundary

Occupancy data were collected for 186 individuals in the 0 - 0.25 km zone. The observations were for 35 residents, one of whom also worked in the area, 30 employees, eight visitors, 104 pupils, one individual tending an allotment plot and eight farmers who also lived in the area. The highest indoor rate was for an elderly resident and the highest outdoor occupancy rate was for a farmer. The highest total occupancy rate was shared by two elderly residents, both of whom lived at the same property and one of which also held the highest indoor rate in this zone.

>0.25 - 0.5 km from the nuclear licensed site boundary

Occupancy data were collected for 33 individuals in the >0.25 - 0.5 km zone. The observations were for 31 residents, one visitor and one farmer who also lived in the area. The same highest indoor and total occupancy rates were for two elderly residents and the highest outdoor occupancy rate was for a resident who kept a variety of animals. The residents with the highest indoor, outdoor and total occupancy rates all lived at the same property.

>0.5 - 1.0 km from the nuclear licensed site boundary

Occupancy data were collected for 40 people in the >0.5 - 1.0 km zone. The observations were for 27 residents, six farmers who also lived in the area, three farm workers and four visitors. The resident with the highest indoor and the resident with the highest total occupancy rates lived at the same property. The highest outdoor occupancy rate was for a farmer.

6.7 Gamma dose rate measurements

Gamma dose rate measurements were taken indoors and outdoors at most properties where interviews were conducted in the Springfields direct radiation survey area. Where possible, outdoor measurements were taken approximately 5 to 10 metres from the nearest building. 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 47 and are summarised below.

Indoor measurements

- Seven measurements taken over wood ranged from 0.056 μGyh^{-1} to 0.116 μGy h^{-1}
- Thirty measurements taken over concrete ranged from 0.068 μGy h^{-1} to 0.109 μGy h^{-1}

Outdoor measurements

- Thirty-four measurements taken over grass ranged from 0.061 μGy h^{-1} to 0.087 μGy h^{-1}
- Two measurements taken over stones ranged from 0.061 μGy h^{-1} to 0.098 μGy h^{-1}
- Two measurements taken over concrete ranged from 0.068 μGy h^{-1} to 0.075 μGy h^{-1}
- One measurement taken over wood was 0.076 μGy h^{-1}

Background measurements

- Four measurements taken over grass ranged from 0.068 μGy h^{-1} to 0.078 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 48. Each of the 25 combinations shown in Table 48 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 48 do not correlate directly with observation numbers in Annex 1. Other individuals from Annex 1 have combinations that are not listed in Table 48 because they have fewer pathways and a dose assessment for them would be adequately covered by one of the 25 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 Springfields 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 relevant matrix for the Springfields adults' profiled habits data is shown in Annex 6. 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. Retrospective total doses around Springfields are made using these profiles and reported in the Radioactivity in Food and the Environment reports (e.g. EA, FSA, NIEA and SEPA, 2010). 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. They are not currently used in the Radioactivity in Food and the Environment reports.

8 COMPARISONS WITH THE PREVIOUS SURVEY

The results from this 2012 survey can be compared with results from the last combined habits survey undertaken in 2006. The aquatic, terrestrial and direct radiation survey areas in the 2012 survey were the same as those in the 2006 survey. All comparisons for consumption, intertidal occupancy, handling and occupancy rates in the direct radiation area are for adults only.

8.1 Aquatic survey area

The main species of fish consumed by the adult high-rate group in 2006 were bass, Dover sole and cod, and in 2012 the main species were plaice, bass, flounder and cod. In 2006 and 2012, the only species of crustaceans consumed by the adult high-rate group was brown shrimp. In 2006, no consumption of molluscs was identified; in 2012 the only mollusc species consumed by the adult high-rate group was cockles. The main species of wildfowl consumed by the adult high-rate group in 2006 were ducks (unspecified species), goose (unspecified species), mallard, pintail, teal, wigeon and common snipe and in 2012 were wigeon, mallard, pink-footed goose, duck (unspecified species) and teal. In 2006, the main species of marine plants/algae consumed by the adult high-rate group was samphire and sea beet and in 2012, the only species of marine plants/algae consumed was samphire.

A comparison between the 2006 and 2012 data for the consumption of aquatic foods is presented in Table I.

Table I. Comparison between 2006 and 2012 consumption rates of aquatic food groups for adults

	2006			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	4	72.2	53.8	20	20.4	10.4
Crustaceans	2	26.2	20.6	3	10.0	7.2
Molluscs	NC	NC	NC	1	0.8	0.8
Wildfowl	7	27.3	21.0	10	19.5	14.2
Marine plants/algae	2	1.0	0.7	3	0.2	0.1

Note
NC – Not consumed

In 2012 compared with 2006, there were decreases in all the aquatic food groups, with the exception of molluscs which were not identified in 2006. In 2012 compared with 2006, the decreases in the mean consumption rates for the adult high-rate groups were for fish, from 54 kg y^{-1} to 10 kg y^{-1}, for crustaceans, from 21 kg y^{-1} to 7.2 kg y^{-1}, for wildfowl, from 21 kg y^{-1} to 14 kg y^{-1} and for marine plants/algae, from 0.7 kg y^{-1} to 0.1 kg y^{-1}. The decrease in the mean consumption rate for the high-rate group for fish was attributed to a reduction in fishing in the winter months by the high-rate consumer identified in 2006. The decrease of the consumption rate of crustaceans was due to one of the high-rate consumers in 2006 reducing the frequency of his commercial shrimping from 10 months per year to five months per year in 2012. No specific reasons were identified for the changes in the wildfowl or marine plants/algae consumption rates.

For intertidal occupancy in 2006, activities were recorded over the following five substrates: mud; mud and sand; salt marsh; sand; houseboat. In 2012, activities were recorded over grass; mud; mud and stones; salt marsh; sand; boat over mud.

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

- In 2006; boat dwelling, sand extraction, tending livestock, set netting, seawater angling, bait digging, working, wildfowling, walking, working on the shore, freshwater angling and boat maintenance
- In 2012; angling, wildfowling, tractor fishing, walking, mud dipping, RSPB guide duties, boat maintenance, collecting mussels, collecting cockles, collecting samphire, fixing moorings, dog walking, tending livestock and boat dwelling

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

- In 2006; handling unspecified gear
- In 2012; handling nets

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

- In 2006; bait digging and wildfowling
- In 2012; collecting cockles and mussels, fixing moorings, bait digging and wildfowling

A comparison between the 2006 and 2012 data for occupancy over intertidal substrates, handling fishing gear and handling sediment is shown in Table J.

Table J. Comparison between 2006 and 2012 intertidal occupancy rates and handling rates of fishing gear and sediment for adults[a]

	2006			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})
Grass	NR	NR	NR	1	107	107
Mud	16	636	364	54	252	140
Mud and sand	1	1090	1090	NR	NR	NR
Mud and stones	NR	NR	NR	3	435	403
Salt marsh	3	1303	748	2	1092	896
Sand	3	1880	1622	4	270	189
Boat over mud	2	8421	8304	3	7596	5892
Handling fishing gear	9	1107	693	9	500	338
Handling sediment	16	830	393	32	349	181

Note
NR – Not recorded
[a] In the 2006 habits survey report the data for intertidal occupancy and handling were presented for adults and children combined. However, with the exception of mud, all the individuals in the high-rate groups were adults so the data presented here is the same as in the 2006 survey report. In 2006, the mud data included two child observations and has been re-calculated.

The most significant changes in the intertidal occupancy rates were for activities over mud, over sand, and over boat over mud, which decreased significantly in 2012 compared to 2006. Also, in 2012, activities were recorded over grass and mud and stones, but were not recorded over these substrates in 2006. In 2006, activities were recorded over mud and sand, but were not recorded over this substrate in 2012. The mean intertidal occupancy rate for the high-rate group for salt marsh in 2012 increased slightly compared to that in 2006.

The decreases in occupancy rates over mud, over mud and stones and over mud and sand were attributed partly to changes in the substrates over which activities were recorded owing to the shifting sediments in the estuary. The decline in occupancy over sand was due to the closure of the sand extraction works at Marshside Sands since 2006. The decrease in occupancy of boat over mud was due to additional houseboat dwellers identified at Freckleton Creek in 2012, the boats were moored at this location for a fewer number of hours which has decreased the mean occupancy rate for the high-rate group.

Occupancy over grass was recorded in 2012 but not in 2006 owing to angling being identified at new locations in 2012.

The handling rates for fishing gear and for sediment decreased significantly in 2012 compared with 2006. The decrease in the handling rate for fishing gear was attributed to the general decline in fishing within the estuary and the decrease in the handling rate for sediment was attributed to a keen bait digger not being interviewed in 2012.

8.2 Terrestrial survey area

Activities in the terrestrial survey area in 2012 were broadly similar to those in 2006 except that in 2012 six farmers were no longer producing chicken eggs from their farm. The principal types of farm produce continued to be a mix of milk (from dairy cattle), beef cattle and lambs. In both surveys, four allotment sites were identified and in 2012 some allotment holders kept hives for honey at their allotment plots but this was not identified in 2006.

The mean consumption rates for the adult high-rate group for terrestrial food groups from the 2006 and 2012 surveys are shown in Table K.

Table K. Comparison between 2006 and 2012 mean consumption rates for the adult high-rate groups for terrestrial food groups (kg y^{-1} or l y^{-1})

Food group	2006	2012
Green vegetables	29.2	17.1
Other vegetables	28.6	20.9
Root vegetables	28.0	24.3
Potatoes	47.8	31.1
Domestic fruit	23.9	30.5
Milk	440.7	276.5
Cattle meat	30.7	27.1
Pig meat	25.3	10.7
Sheep meat	15.5	24.3
Poultry	19.2	9.5
Eggs	12.4	19.0
Wild/free foods	NC	5.0
Honey	NC	2.4
Wild fungi	0.5	1.5

Notes

NC – Not consumed

Consumption rates increased in 2012 in the following four food groups: domestic fruit; sheep meat; eggs; wild fungi. Consumption rates decreased in 2012 in the following eight food groups: green vegetables; other vegetables; root vegetables; potato; milk; cattle meat; pig meat; poultry.

There were relatively large increases in the consumption rates for sheep meat and eggs and relatively large decreases in the consumption rates for potato, milk, pig meat and poultry. The consumption of

wild/free foods and honey was identified in 2012 but was not identified in 2006. No consumption of rabbits/hares, cereals or venison was identified in either 2006 or 2012.

The decrease in the mean consumption rate for the high-rate group for pig meat was attributed to the high-rate consumers moving out of the survey area since 2006. No specific reasons were identified for the other changes in consumption rates.

The consumption of borehole water by humans was not identified during the 2006 or 2012 surveys. Livestock were drinking from stream water in 2006 and in 2012 livestock were identified drinking from pond, ditch and borehole water.

8.3 Direct radiation survey area

Activities identified in the direct radiation survey area in 2006 and 2012 were similar and included people residing, working, farming, attending an allotment plot, attending school and visiting. Additionally in 2006, a British Nuclear Fuels Limited (BNFL) social club was located on the Springfields site and members were spending time at the club house, this club no longer exists and the site is now owned by a chemical company. Also, one individual was identified spending a small amount of time at the Lancaster Canal.

A comparison between the 2006 and 2012 direct radiation occupancy rates, by zone, is presented in Table L.

Table L. Comparison between 2006 and 2012 direct radiation occupancy rates (h y-1)

	2006	**2012**
0 - 0.25 km zone		
Highest indoor	8760	8063
Highest outdoor	3000	3360
Highest total	8760	8428
>0.25 - 0.5 km zone		
Highest indoor	7623	7592
Highest outdoor	3290	2555
Highest total	8428	8322
>0.5 - 1 km zone		
Highest indoor	6780	8187
Highest outdoor	1350	3942
Highest total	7720	8604

In 2006, the highest indoor and total occupancy rates in the 0 - 0.25 km zone were for residents, the highest outdoor rate was for a farmer. In 2006, the highest indoor, outdoor and total occupancy rates in the >0.25 – 0.5 km zone were for farmers. In 2006, the highest indoor, outdoor and total rates in the >0.5 – 1.0 km zone were for residents. In 2012, the highest indoor, outdoor and total rates were for residents with the exception of the outdoor rates in the 0 – 0.25 km and >0.5 – 1.0 km zones, which were for farmers.

In the Springfields direct radiation survey area, 10 sets of gamma dose measurements taken in 2012 can be compared with those taken at the same properties in 2006. These data are shown in Table M.

Table M. Comparison between 2006 and 2012 gamma dose rates (μGy h^{-1})

	Indoor		Outdoor	
Location	**2006**	**2012**	**2006**	**2012**
Residence 1	NM	0.095	0.089	0.068
Residence 2	NM	0.079	0.082	0.078
Residence 3	NM	NM	0.088	0.069
Residence 4	NM	NM	0.086	0.075
Residence 5	0.098	0.056	0.082	0.078
Residence 6	0.093	0.116	0.086	0.087
Residence 7	NM	0.101	0.104	0.098
Residence 8	0.088	0.091	0.082	0.070
Business 1	0.073	0.068	0.084	0.083
School 1	0.080	0.104	0.104	0.074

Notes
NM – Not measured
These measurements have not been adjusted for background dose rates
The locations correspond to those in Table 47

9 MAIN FINDINGS

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

- Discharges of liquid radioactive waste to the Ribble Estuary
- Discharges of gaseous radioactive waste to the atmosphere
- Emissions of direct radiation

Data were collected for 531 individuals including, for example, commercial and hobby fishermen, anglers, wildfowlers, boat dwellers, people spending time on intertidal substrates, farmers, allotment holders, gardeners, beekeepers 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:

- 10 kg y^{-1} for fish
- 7.2 kg y^{-1} for crustaceans
- 0.8 kg y^{-1} for molluscs
- 14 kg y^{-1} for wildfowl
- 0.1 kg y^{-1} for marine plants/algae

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

- For fish; plaice, bass, flounder and cod
- For crustaceans; brown shrimp
- For molluscs; cockles
- For wildfowl; wigeon, mallard, pink-footed goose, duck (unspecified species) and teal
- For marine plants/algae; samphire

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:

- 110 h y^{-1} for grass
- 140 h y^{-1} for mud
- 400 h y^{-1} for mud and stones
- 900 h y^{-1} for salt marsh
- 190 h y^{-1} for sand
- 5900 h y^{-1} for boat over mud

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

- 340 h y^{-1} for handling fishing gear
- 180 h y^{-1} for handling sediment

The adult maximum occupancy rates for water based activities were:

- 2200 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:

- 17 kg y^{-1} for green vegetables
- 21 kg y^{-1} for other vegetables
- 24 kg y^{-1} for root vegetables
- 31 kg y^{-1} for potato
- 30 kg y^{-1} for domestic fruit
- 280 l y^{-1} for milk
- 27 kg y^{-1} for cattle meat
- 11 kg y^{-1} for pig meat
- 24 kg y^{-1} for sheep meat
- 9.5 kg y^{-1} for poultry
- 19 kg y^{-1} for eggs
- 5.0 kg y^{-1} for wild/free foods
- 2.4 kg y^{-1} for honey
- 1.5 kg y^{-1} for wild fungi

No consumption of rabbits/hares, cereals or venison was identified from the survey area. The consumption of foodstuffs by children (child and infant age groups) was also recorded.

The human consumption of groundwater was not identified. Most livestock were supplied with mains water for drinking but at several farms livestock also had access to ponds and ditches. One farm used borehole water for their livestock.

Control measures used by the site in order to limit the possibility that contamination is transferred off-site by wildlife included using nets to prevent birds from accessing the buildings and periodically culling rabbits and pigeons.

9.3 Direct radiation survey area

With the exception of the highest outdoor occupancy rate in the 0 – 0.25 km and >0.5 – 1 km zone, which were for farmers, the highest indoor, outdoor and total occupancy rates in the zones of the direct radiation survey area were for residents. The highest indoor, outdoor and total occupancy rates recorded for all zones were:

0 - 0.25 km zone

- 8100 h y^{-1} for the indoor occupancy rate
- 3400 h y^{-1} for the outdoor occupancy rate
- 8400 h y^{-1} for the total occupancy rate

>0.25 - 0.5 km zone

- 7600 h y^{-1} for the indoor occupancy rate
- 2600 h y^{-1} for the outdoor occupancy rate
- 8300 h y^{-1} for the total occupancy rate

>0.5 - 1 km zone

- 8200 h y^{-1} for the indoor occupancy rate
- 3900 h y^{-1} for the outdoor occupancy rate
- 8600 h y^{-1} for the total occupancy rate

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10 RECOMMENDATIONS FOR CHANGES TO THE MONITORING PROGRAMME

The information collected during the 2012 Springfields habits survey can be used to make recommendations for changes to the current monitoring programmes.

10.1 Summary of current environmental monitoring programmes

The 2011 monitoring programmes for Springfields operated by the Environment Agency and the Food Standards Agency, and published in the RIFE report (EA, FSA, NIEA and SEPA, 2012), included the samples and measurements listed below. The location names, foods and substrate classifications are taken directly from that publication. Some of the samples and measurements taken for the monitoring programmes may be from outside the survey areas used for the 2012 Springfields habits survey.

Aquatic monitoring

Aquatic samples	
Sample	**Location**
Grey mullet	Ribble Estuary
Sole	Ribble Estuary
Bass	Ribble Estuary
Salmon	Ribble Estuary
Shrimps	Ribble Estuary
Cockles	Ribble Estuary
Mussels	Ribble Estuary
Wildfowl	Ribble Estuary
Samphire	Marshside Sands
Sediment	River Ribble outfall
Sediment	Savick Brook
Sediment	Lea Gate
Sediment	Lower Penwortham Park
Sediment	Penwortham rail bridge
Sediment	Penwortham rail bridge – West bank
Sediment	Penwortham position 1
Sediment	Penwortham position 2
Sediment	Lytham Yacht Club
Sediment	Becconsall
Sediment	Freckleton
Sediment	Hutton Marsh
Sediment	Longton Marsh
Grass (washed)	Hutton Marsh
Grass (unwashed)	Hutton Marsh
Soil	Hutton Marsh

Gamma dose rate measurements

Substrate	***Location***
Grass	Lytham Yacht Club
Grass and salt marsh	Warton Mud Marsh
Grass and salt marsh	Warton Mud Marsh
Grass and salt marsh	Warton Salt Marsh
Grass and mud	Freckleton
Grass	Naze Point
Grass and salt marsh	Banks Marsh
Grass	Banks Marsh
Grass and salt marsh	Banks Marsh
Grass	Banks Marsh
Grass	Hesketh Bank
Mud	Becconsall Boatyard
Salt marsh	Becconsall Boatyard
Grass and mud	Becconsall Boatyard
Asphalt	Becconsall (vicinity of houseboats)
Grass and mud	Longton Marsh
Grass and mud	Hutton Marsh
Mud	River Ribble outfall
Grass and mud	River Ribble outfall
Grass	River Ribble outfall
Grass and mud	Savick Brook, confluence with Ribble
Grass	Savick Brook, confluence with Ribble
Grass and mud	Savick Brook, tidal limit
Grass	Savick Brook, tidal limit
Grass and mud	Savick Brook, Lea Gate
Grass	Savick Brook, Lea Gate
Grass	South bank opposite outfall
Mud	Penwortham Bridge cadet hut
Grass	Lower Penwortham Park
Mud	Lower Penwortham Railway Bridge
Mud and stones	Lower Penwortham Railway Bridge
Grass	River Darwen
Mud	Riverbank Angler location 1
Mud and sand	Riverbank Angler location 1
Grass and mud	Riverbank Angler location 1
Grass and sand	Riverbank Angler location 1
Mud and sand	Riverbank Angler location 2
Grass	Ulnes Walton BNFL area survey

Beta dose rate measurements

Substrate	***Location***
Mud and sand	Lytham – Granny's Bay
Gill net	Ribble Estuary
Shrimp net	Ribble Estuary
Grass and salt marsh	Banks Marsh
Grass	Banks Marsh

Grass and salt marsh	Warton Mud Marsh
Grass and salt marsh	Warton Salt Marsh

Terrestrial monitoring

- Milk
- Apples
- Beetroot
- Blackberries
- Cabbage
- Potatoes
- Rabbit
- Runner beans
- Sediment – Deepdale Brook
- Grass
- Grass – Site fence
- Grass – Opposite site entrance
- Grass – Opposite windmill
- Grass – Deepdale Brook
- Grass – Lea Town
- Grass – N of Lea Town
- Silage
- Soil
- Soil – Site fence
- Soil – Opposite site entrance
- Soil – Opposite windmill
- Soil – Deepdale Brook
- Soil – Lea Town
- Soil – N of Lea Town
- Freshwater – Deepdale Brook

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

- In order to provide gamma dose rates for the calculation of estimated dose for houseboat occupancy, a set of gamma dose rate measurements could be taken at Freckleton Creek on mud, as close to the hull of a houseboat as practical.

Food Standards Agency monitoring

- Within the 'rabbits/hares' food group, the sample of rabbits currently collected could be removed from the programme since no consumption of rabbits or hares was identified during the survey.
- Chicken egg samples could be added to the programme since they were consumed at a high rate and no egg samples are currently taken.
- A sample of honey could be added since it was consumed at a reasonable rate and no honey samples are currently taken.
- A one-off sample of lamb could be taken since it was consumed at a high rate and no meat samples are currently taken. Alternatively, a sample of sheep faeces could be taken as a more economic option. If a sample of lamb (meat or faeces) were taken, then consideration should be given to taking it from sheep that have grazed on salt marsh within the terrestrial survey area, since this would cover the 'worst case scenario' by identifying possible contamination from both gaseous and liquid discharges.

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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 Springfields 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**)	44,700	101[b]	0.2%	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**)	900	103	11%	Interviews were conducted at 35 permanent residences out of an estimated total of 387 permanent residences.
	Number of people employed but not resident in the direct radiation survey area (See **(C) DIRECT RADIATION PATHWAYS**)	U	34[b]	U	Excluding employees and contractors of Springfields Fuels Limited.
	Number of people visiting the direct radiation survey area (See **(C) DIRECT RADIATION PATHWAYS**)	U	119[b]	U	Includes pupils attending school in the direct radiation survey area.
	Number of people effected by liquid discharges (excluding those assigned to other categories above) (See **(A) AQUATIC PATHWAYS**)	U	174[b]	U	Where an individual visited the direct radiation survey area as well as being potentially affected by liquid discharges (e.g. dog walkers) they have been allocated to the direct radiation pathway above.
	Total for aquatic, terrestrial and direct radiation survey areas	U	531	U	
(A) AQUATIC PATHWAYS					
Commercial fishermen	Number of commercial fishermen based in the aquatic survey area	9	7	78%	Includes part-time and full-time commercial fishermen.
Boat anglers and hobby fishermen	Number of boat anglers and hobby fishermen fishing in the aquatic survey area	U	6	U	
People undertaking activities in or on water (*e.g.* swimming, sailing and lifeboat duties)	Number of people undertaking activities in or on water in the aquatic survey area	U	35	U	Includes commercial fishermen, boat anglers etc.

Table 1. Survey coverage

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
People using the shore including anglers, dog walkers and people playing etc.	Number of people undertaking intertidal activities in the aquatic survey area	U	133	U	
Fish consumers	Number of people consuming fish from the aquatic survey area	U	48	U	
Crustacean consumers	Number of people consuming crustaceans from the aquatic survey area	U	17	U	
Mollusc consumers	Number of people consuming molluscs from the aquatic survey area	U	1	U	
Wildfowl consumers	Number of people consuming wildfowl from the aquatic survey area	U	33	U	
Marine plant consumers	Number of people consuming marine plants from the aquatic survey area	U	3	U	
(B) TERRESTRIAL PATHWAYS					
Farmers	Number of farmers and their family members consuming food from the terrestrial survey area	U	63	U	Interviews were conducted at 23 of the 32 farms identified within the survey area.
Allotment holders and gardeners	Number of allotment holders and gardeners and their family members consuming food from the terrestrial survey area	U	112	U	Interviews were conducted with 13 allotment holders from an estimated total of 95 allotment holders.
Beekeepers	Number of people consuming honey produced by beekeepers in the terrestrial survey area	U	8	U	1 beekeeper was interviewed.

Table 1. Survey coverage

Group	Criteria	Estimate of complete coverage	Number for whom positive data was obtained	Coverage for positive observations	Notes
(C) DIRECT RADIATION PATHWAYS					
Residents	Number of residents in the survey area	900	103	11%	Interviews were conducted at 35 permanent residences out of an estimated total of 387 permanent residences.
Employees	Number of people employed in the survey area	U	34[b]	U	Excluding employees and contractors of Springfields Fuels Limitetd
Visitors	Number of visitors to the survey area	U	119[b]	U	Includes pupils attending school in the direct radiation survey area.
BREAKDOWN OF AGE GROUPS					
Adult	16-year-old and over	36200[a]	374	1.0%	
Child	6-year-old to 15-year-old	6300[a]	123	2.0%	
Infant	0 to 5-year-old	3100[a]	34	1.1%	

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] 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
Fish	Bass, Cod, Dab, Dover sole, Flounder, Grey mullet, Plaice, Salmon, Sea trout
Crustaceans	Brown shrimp
Molluscs	Cockle
Marine plants/algae	Samphire
Wildfowl[b]	Canada goose (wildfowl), Duck (unspecified species), Greylag geese, Mallard (wildfowl), Pink-footed goose, Pintail duck, Shoveler, Teal, Wigeons
Green vegetables	Artichoke, Asparagus, Broccoli, Brussel sprout, Cabbage, Calabrese, Cauliflower, Chard, Courgette, Cucumber (Indoor), Cucumber (Outdoor), Herbs, Kale, Lettuce, Rocket, Spinach
Other vegetables	Aubergine, Broad bean, Chilli pepper, French bean (bush), French bean (climbing), Mangetout, Pea, Pepper, Pumpkin, Runner bean, Squash, Sweetcorn, Tomato (indoors), Tomato (outdoors)
Root vegetables	Beetroot, Beetroot (globe), Carrot, Celeriac, Celery, Fennel, Garlic, Kohl rabi, Leek, Onion, Parsnip, Radish, Salsify, Shallot, Spring onion, Swede, Turnip
Potato	Potato
Domestic fruit	Apple, Blackberry, Blackcurrant, Blueberry, Cherry, Damson, Gooseberry, Loganberry, Pear, Plum, Quince, Raspberry, Redcurrant, Rhubarb, Strawberry, Tayberry, Whitecurrant
Milk	Milk from cow
Cattle meat[a]	Bovine
Pig meat[a]	Pork meat
Sheep meat[a]	Lamb meat
Poultry[b]	Chicken, Mallard (poultry), Partridge, Pheasant, Pigeon, Turkey
Eggs	Chicken egg, Duck egg
Wild/free foods	Blackberry, Greengage, Hazel nut, Plums, Raspberry, Sloe
Honey	Honey
Wild fungi	Mushrooms

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 Springfields aquatic survey area (kg y^{-1})

Observation number	Bass	Cod	Dab	Dover sole	Flounder	Grey mullet	Plaice	Salmon	Sea trout	Total
531	**6.8**	**-**	**-**	**6.8**	**-**	**2.3**	**4.5**	**-**	**-**	**20.4**
392	**9.1**	**5.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**14.7**
393	**9.1**	**5.7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**14.7**
374	**5.1**	**6.0**	**-**	**-**	**1.6**	**1.7**	**-**	**-**	**-**	**14.4**
369	**3.2**	**-**	**-**	**1.4**	**3.2**	**2.3**	**1.4**	**-**	**-**	**11.3**
370	**3.2**	**-**	**-**	**1.4**	**3.2**	**2.3**	**1.4**	**-**	**-**	**11.3**
371	**3.2**	**-**	**-**	**1.4**	**3.2**	**2.3**	**1.4**	**-**	**-**	**11.3**
5	**2.4**	**3.0**	**-**	**-**	**4.2**	**-**	**-**	**-**	**-**	**9.6**
394	**-**	**-**	**-**	**2.7**	**2.7**	**-**	**3.6**	**-**	**-**	**9.1**
395	**-**	**-**	**-**	**2.7**	**2.7**	**-**	**3.6**	**-**	**-**	**9.1**
226	**-**	**-**	**-**	**-**	**-**	**-**	**9.1**	**-**	**-**	**9.1**
227	**-**	**-**	**-**	**-**	**-**	**-**	**9.1**	**-**	**-**	**9.1**
228	**-**	**-**	**-**	**-**	**-**	**-**	**9.1**	**-**	**-**	**9.1**
229	**-**	**-**	**-**	**-**	**-**	**-**	**9.1**	**-**	**-**	**9.1**
224	**-**	**-**	**-**	**-**	**4.3**	**-**	**4.2**	**-**	**-**	**8.5**
225	**-**	**-**	**-**	**-**	**4.3**	**-**	**4.2**	**-**	**-**	**8.5**
376	**3.2**	**-**	**-**	**-**	**4.1**	**-**	**-**	**-**	**-**	**7.3**
377	**3.2**	**-**	**-**	**-**	**4.1**	**-**	**-**	**-**	**-**	**7.3**
378	**3.2**	**-**	**-**	**-**	**4.1**	**-**	**-**	**-**	**-**	**7.3**
375	**2.6**	**3.0**	**-**	**-**	**0.8**	**0.9**	**-**	**-**	**-**	**7.2**
396	-	-	-	-	1.8	-	-	2.3	-	4.1
397	-	-	-	-	1.8	-	-	2.3	-	4.1
414	3.8	-	-	-	-	-	-	-	-	3.8
10	-	-	-	-	3.4	-	-	-	-	3.4
11	-	-	-	-	3.4	-	-	-	-	3.4
411	1.3	-	-	-	2.0	-	-	-	-	3.3
412	1.3	-	-	-	2.0	-	-	-	-	3.3
337	1.3	-	-	-	1.9	-	-	-	-	3.2
338	1.3	-	-	-	1.9	-	-	-	-	3.2

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

Observation number	Bass	Cod	Dab	Dover sole	Flounder	Grey mullet	Plaice	Salmon	Sea trout	Total
7	-	-	-	-	3.0	-	-	-	-	3.0
8	-	-	-	-	3.0	-	-	-	-	3.0
6	-	-	-	-	2.0	-	-	-	0.9	3.0
339	2.8	-	-	-	-	-	-	-	-	2.8
340	2.8	-	-	-	-	-	-	-	-	2.8
345	0.6	-	-	-	2.0	-	-	-	-	2.7
409	-	-	1.1	-	1.5	-	-	-	-	2.7
410	-	-	1.1	-	1.5	-	-	-	-	2.7
348	-	-	-	-	2.4	-	-	-	-	2.4
343	1.0	-	-	-	1.0	-	-	-	-	2.0
344	1.0	-	-	-	1.0	-	-	-	-	2.0
230	-	-	-	-	-	-	1.8	-	-	1.8
231	-	-	-	-	-	-	1.8	-	-	1.8
398	-	-	-	-	0.9	-	-	0.9	-	1.8
399	-	-	-	-	0.9	-	-	0.9	-	1.8
346	0.6	-	-	-	1.0	-	-	-	-	1.7
347	0.6	-	-	-	1.0	-	-	-	-	1.7
413	1.1	-	-	-	-	-	-	-	-	1.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish based on the 20 high-rate adult consumers is 10.4 kg y^{-1}

The observed 97.5th percentile rate based on 47 observations is 14.7 kg y^{-1}

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

Observation number	Brown shrimp
394	**10.0**
395	**6.8**
234	**4.8**
224	2.4
225	2.4
369	1.7
370	1.7
371	1.7
226	0.9
227	0.9
228	0.9
229	0.9
339	0.9
340	0.9
246	0.7
247	0.7
231	0.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of crustaceans based on the 3 high-rate adult consumers is 7.2 kg y^{-1}

The observed 97.5th percentile rate based on 17 observations is 8.7 kg y^{-1}

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

Observation number	Cockle
394	0.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of molluscs based on the only adult consumer is 0.8 kg y^{-1}

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

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

Observation number	Canada goose	Duck (unspecified species)	Greylag goose	Mallard	Pink-footed goose	Pintail	Shoveler	Teal	Wigeon	Total
334	**-**	**-**	**-**	**3.0**	**1.7**	**0.5**	**0.5**	**2.1**	**11.7**	**19.5**
335	**-**	**-**	**-**	**3.0**	**1.7**	**0.5**	**0.5**	**2.1**	**11.7**	**19.5**
336	**-**	**-**	**-**	**3.0**	**1.7**	**0.5**	**0.5**	**2.1**	**11.7**	**19.5**
230	**4.2**	**-**	**-**	**0.6**	**5.1**	**-**	**-**	**0.2**	**4.4**	**14.4**
231	**4.2**	**-**	**-**	**0.6**	**5.1**	**-**	**-**	**0.2**	**4.4**	**14.4**
337	**-**	**-**	**0.9**	**1.1**	**2.0**	**0.4**	**-**	**-**	**7.7**	**12.1**
519	**-**	**3.4**	**-**	**3.4**	**-**	**-**	**-**	**1.2**	**2.6**	**10.6**
520	**-**	**3.4**	**-**	**3.4**	**-**	**-**	**-**	**1.2**	**2.6**	**10.6**
521	**-**	**3.4**	**-**	**3.4**	**-**	**-**	**-**	**1.2**	**2.6**	**10.6**
522	**-**	**3.4**	**-**	**3.4**	**-**	**-**	**-**	**1.2**	**2.6**	**10.6**
523	-	-	-	-	-	-	-	4.8	-	4.8
339	-	-	-	-	-	-	-	1.4	3.2	4.6
340	-	-	-	-	-	-	-	1.4	3.2	4.6
232	-	-	-	-	-	-	-	-	4.4	4.4
233	-	-	-	-	-	-	-	-	4.4	4.4
63	-	-	-	1.1	1.7	-	-	-	0.9	3.7
64	-	-	-	1.1	1.7	-	-	-	0.9	3.7
341	-	-	-	-	-	-	-	0.5	1.1	1.5
342	-	-	-	-	-	-	-	0.5	1.1	1.5
65	-	-	-	0.6	-	-	-	0.2	0.5	1.3
66	-	-	-	0.6	-	-	-	0.2	0.5	1.3
281	-	-	-	0.8	-	-	-	0.5	-	1.3
282	-	-	-	0.8	-	-	-	0.5	-	1.3
283	-	-	-	0.8	-	-	-	0.5	-	1.3
181	-	-	-	0.3	-	-	-	-	-	0.3
182	-	-	-	0.3	-	-	-	-	-	0.3
183	-	-	-	0.3	-	-	-	-	-	0.3
184	-	-	-	0.3	-	-	-	-	-	0.3
312	-	-	-	0.2	-	-	-	-	-	0.2
313	-	-	-	0.2	-	-	-	-	-	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wildfowl based on the 10 high-rate adult consumers is 14.2 kg y^{-1}

The observed 97.5th percentile rate based on 30 observations is 19.5 kg y^{-1}

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

Observation number	Samphire
403	**0.2**
337	**0.1**
338	**0.1**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of marine plants/algae based on the 3 high-rate adult consumers is 0.1 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 0.2 kg y^{-1}

Table 8. Children's consumption rates of fish from the Springfields aquatic survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Bass	Cod	Flounder	Grey mullet	Total
373	**14**	**5.1**	**6.0**	**1.6**	**1.7**	**14.4**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of fish for the child age group based upon the only high-rate consumer is 14.4 kg y^{-1}

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

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

Child age group (6 - 15 years old)

Observation number	Age	Mallard
314	**14**	**0.2**
315	**13**	**0.2**
316	**6**	**0.1**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wildfowl for the child age group based upon the 3 high-rate consumers is 0.2 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 0.2 kg y^{-1}

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

Observation number	Location	Activity	Grass	Mud	Mud and stones	Salt marsh	Sand	Boat over mud
501	**Banks of River Ribble**	**Angling**	**107**	**143**	-	-	-	-
502	**Banks of River Ribble**	Angling	20	10	-	-	-	-
230	**Banks Marsh**	**Wildfowling**	-	**252**	-	-	-	-
		Walking	-	**-**	-	52	-	-
	Marshside Sands and Banks Marsh	**Tractor fishing and walking**	-	**-**	-	-	**132**	-
45	**Lytham and Warton marshes**	**Wildfowling**	-	**232**	-	-	-	-
		Walking	-	**-**	-	32	-	-
46	**Lytham and Warton marshes**	**Wildfowling**	-	**232**	-	-	-	-
		Walking	-	**-**	-	32	-	-
324	**Longton Marsh**	**Wildfowling**	-	**210**	-	-	-	-
		Walking	-	**-**	-	120	-	-
325	**Longton Marsh**	**Wildfowling**	-	**210**	-	-	-	-
		Walking	-	**-**	-	120	-	-
326	**Longton Marsh**	**Wildfowling**	-	**210**	-	-	-	-
		Walking	-	**-**	-	120	-	-
327	**Longton Marsh**	**Wildfowling**	-	**210**	-	-	-	-
		Walking	-	**-**	-	120	-	-
328	**Longton Marsh**	**Wildfowling**	-	**210**	-	-	-	-
		Walking	-	**-**	-	120	-	-
337	**Longton Marsh and Warton marshes**	**Wildfowling**	-	**175**	-	-	-	-
		Collecting samphire and walking	-	**-**	-	65	-	-
	Off Fairhaven	Bait digging	-	**-**	-	-	24	-
236	**Banks Marsh**	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
237	**Banks Marsh**	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
238	**Banks Marsh**	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
239	**Banks Marsh**	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
240	**Banks Marsh**	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
241	**Banks Marsh**	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
242	**Banks Marsh**	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-

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

Observation number	Location	Activity	Grass	Mud	Mud and stones	Salt marsh	Sand	Boat over mud
243	Banks Marsh	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
244	Banks Marsh	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
245	Banks Marsh	**Wildfowling**	-	**168**	-	-	-	-
		Walking	-	**-**	-	24	-	-
334	Longton Marsh	**Wildfowling**	-	**160**	-	-	-	-
		Walking	-	**-**	-	80	-	-
35	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
36	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
37	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
38	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
39	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
40	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
41	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
42	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
43	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
44	Lytham and Warton marshes	**Wildfowling**	-	**136**	-	-	-	-
		Walking	-	**-**	-	32	-	-
329	Longton Marsh	**Wildfowling**	-	**105**	-	-	-	-
		Walking	-	**-**	-	60	-	-
330	Longton Marsh	**Wildfowling**	-	**105**	-	-	-	-
		Walking	-	**-**	-	60	-	-
331	Longton Marsh	**Wildfowling**	-	**105**	-	-	-	-
		Walking	-	**-**	-	60	-	-
332	Longton Marsh	**Wildfowling**	-	**105**	-	-	-	-
		Walking	-	**-**	-	60	-	-

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

Observation number	Location	Activity	Grass	Mud	Mud and stones	Salt marsh	Sand	Boat over mud
333	Longton Marsh	**Wildfowling**	-	**105**	-	-	-	-
		Walking	-	**-**	-	60	-	-
55	Hesketh Out Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
56	Hesketh Out Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
57	Hesketh Out Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
193	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
194	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
195	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
196	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
197	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
198	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
199	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
200	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
201	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
202	Banks Marsh	**Wildfowling**	-	**100**	-	-	-	-
		Walking	-	**-**	-	20	-	-
349	Granny's Bay	**Mud dipping**	-	**86**	-	-	-	-
		RSPB Guide	-	**-**	-	57	-	-
350	Granny's Bay	**Mud dipping**	-	**86**	-	-	-	-
		RSPB Guide	-	**-**	-	57	-	-
351	Granny's Bay	**Mud dipping**	-	**86**	-	-	-	-
		RSPB Guide	-	**-**	-	57	-	-
352	Granny's Bay	**Mud dipping**	-	**86**	-	-	-	-
		RSPB Guide	-	**-**	-	57	-	-

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

Observation number	Location	Activity	Grass	Mud	Mud and stones	Salt marsh	Sand	Boat over mud
65	**Lytham and Warton marshes**	**Wildfowling**	-	**85**	-	-	-	-
		Dog walking	-	**-**	-	183	-	-
14	River Ribble - east of the viaduct	Angling	-	60	-	-	-	-
15	River Ribble - east of the viaduct	Angling	-	60	-	-	-	-
58	Hesketh Out Marsh	Wildfowling	-	50	-	-	-	-
		Walking	-	-	-	10	-	-
59	Hesketh Out Marsh	Wildfowling	-	50	-	-	-	-
		Walking	-	-	-	10	-	-
60	Hesketh Out Marsh	Wildfowling	-	50	-	-	-	-
		Walking	-	-	-	10	-	-
61	Hesketh Out Marsh	Wildfowling	-	50	-	-	-	-
		Walking	-	-	-	10	-	-
62	Hesketh Out Marsh	Wildfowling	-	50	-	-	-	-
		Walking	-	-	-	10	-	-
63	Hesketh Out Marsh	Wildfowling	-	50	-	-	-	-
		Walking	-	-	-	10	-	-
9	West of Bull Nose	Angling	-	30	-	-	-	-
353	Granny's Bay	Mud dipping	-	15	-	-	-	-
		RSPB Guide	-	-	-	10	-	-
354	Granny's Bay	Mud dipping	-	15	-	-	-	-
		RSPB Guide	-	-	-	10	-	-
531	Seafield slipway	Fixing moorings	-	4	-	-	-	-
	Seafield slipway	**Boat maintenance**	-	-	**435**	-	-	-
	Ribble Estuary	**Collecting mussels**						
		Collecting cockles	-	-	-	-	**270**	-
387	Lytham Marsh	Boat launching	-	2	-	-	-	-
388	Lytham Marsh	Boat launching	-	2	-	-	-	-
389	Lytham Marsh	Boat launching	-	2	-	-	-	-
390	Lytham Marsh	Boat launching	-	2	-	-	-	-
392	**Seafield slipway**	**Dog walking, fixing moorings and boat maintenance**	-	-	**413**	-	-	-
394	**Ribble Estuary**	**Boat maintenance**	-	-	**360**	-	-	-
		Collecting cockles	-	-	**-**	-	**264**	-
376	Seafield slipway	Angling	-	-	60	-	-	-
372	Seafield slipway	Boat maintenance	-	-	39	-	-	-
371	Seafield slipway	Angling	-	-	30	-	-	-
414	Seafield slipway	Angling	-	-	24	-	-	-
403	**Banks Marsh**	**Tending livestock and collecting samphire**	-	-	-	**1092**	-	-
415	**Lytham Marsh**	**Dog walking**	-	-	-	**700**	-	-

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

Observation number	Location	Activity	Grass	Mud	Mud and stones	Salt marsh	Sand	Boat over mud
369	Lytham Marsh	Dog walking, bird watching, collecting litter and walking	-	-	-	355	-	-
416	Lytham Marsh	Dog walking and beachcombing	-	-	-	320	-	-
421	Lytham Marsh	Dog walking	-	-	-	270	-	-
	Granny's Bay	**Dog walking**	-	-	-	-	**90**	-
524	Freckleton	Tending livestock	-	-	-	122	-	-
525	Freckleton	Tending livestock	-	-	-	122	-	-
365	Lytham Marsh	Collecting litter	-	-	-	100	-	-
366	Lytham Marsh	Collecting litter	-	-	-	100	-	-
367	Lytham Marsh	Collecting litter	-	-	-	100	-	-
368	Lytham Marsh	Collecting litter	-	-	-	100	-	-
401	Marshside Sands and Hesketh Out Marsh	Marsh warden	-	-	-	96	-	-
402	Marshside Sands and Hesketh Out Marsh	Marsh warden	-	-	-	96	-	-
357	Lytham Marsh	Collecting litter	-	-	-	70	-	-
358	Lytham Marsh	Collecting litter	-	-	-	70	-	-
359	Lytham Marsh	Collecting litter	-	-	-	70	-	-
360	Lytham Marsh	Collecting litter	-	-	-	70	-	-
361	Lytham Marsh	Collecting litter	-	-	-	70	-	-
362	Lytham Marsh	Collecting litter	-	-	-	70	-	-
363	Lytham Marsh	Collecting litter	-	-	-	70	-	-
364	Lytham Marsh	Collecting litter	-	-	-	70	-	-
467	South bank of River Ribble	Dog walking	-	-	-	65	-	-
417	Lytham Marsh	Dog walking	-	-	-	50	-	-
339	Warton Marsh	Walking and wildfowling	-	-	-	48	-	-
519	Clifton Marsh	Wildfowling	-	-	-	24	-	-
523	Clifton Marsh	Wildfowling	-	-	-	24	-	-
234	Marshside Sands	Bait digging and tractor fishing	-	-	-	-	86	-
5	Off Fairhaven	Angling	-	-	-	-	60	-
224	Marshside Sands	Tractor fishing	-	-	-	-	56	-
226	Marshside Sands	Tractor fishing	-	-	-	-	38	-
235	Marshside Sands	Tractor fishing	-	-	-	-	33	-
227	Marshside Sands	Tractor fishing	-	-	-	-	23	-
355	Granny's Bay	Dog walking	-	-	-	-	6	-
356	Granny's Bay	Dog walking	-	-	-	-	6	-
246	Marshside Sands	Tractor fishing	-	-	-	-	3	-
400	**Becconsall**	**Boat dwelling**	-	-	-	-	-	**7596**

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

Observation number	Location	Activity	Grass	Mud	Mud and stones	Salt marsh	Sand	Boat over mud
408	**Freckleton creek**	**Boat dwelling**	-	-	-	-	-	**5040**
		Dog walking	-	-	-	12	-	**-**
407	**Freckleton creek**	**Boat dwelling**	-	-	-	-	-	**5040**
404	Freckleton creek	Boat dwelling	-	-	-	-	-	2190
405	Freckleton creek	Boat dwelling	-	-	-	-	-	812
379	Lytham Dock	Boat maintenance	-	-	-	-	-	420
380	Lytham Dock	Boat maintenance	-	-	-	-	-	420
381	Lytham Dock	Boat maintenance	-	-	-	-	-	420
382	Lytham Dock	Boat maintenance	-	-	-	-	-	420
391	Lytham Dock	Boat maintenance	-	-	-	-	-	336
406	Freckleton creek	Boat dwelling	-	-	-	-	-	325
383	Lytham Dock	Boat maintenance	-	-	-	-	-	84
384	Lytham Dock	Boat maintenance	-	-	-	-	-	84
385	Lytham Dock	Boat maintenance	-	-	-	-	-	84
386	Lytham Dock	Boat maintenance	-	-	-	-	-	84

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over grass based on 1 observation is 107 h y^{-1}

The observed 97.5th percentile rate based on 2 observations for grass is 105 h y^{-1}

The mean intertidal occupancy rate over mud based on 54 high-rate observations is 140 h y^{-1}

The observed 97.5th percentile rate based on 71 observations for mud is 232 h y^{-1}

The mean intertidal occupancy rate over mud and stones based on 3 high-rate observations is 403 h y^{-1}

The observed 97.5th percentile rate based on 7 observations for mud and stones is 432 h y^{-1}

The mean intertidal occupancy rate over salt marsh based on 2 high-rate observations is 896 h y^{-1}

The observed 97.5th percentile rate based on 88 observations for salt marsh is 349 h y^{-1}

The mean intertidal occupancy rate over sand based on 4 high-rate observations is 189 h y^{-1}

The observed 97.5th percentile rate based on 14 observations for sand is 268 h y^{-1}

The mean intertidal occupancy rate over boat over mud based on 3 high-rate observations is 5892 h y^{-1}

The observed 97.5th percentile rate based on 15 observations for boat over mud is 6701 h y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	Mud	Mud and stones	Salt marsh
47	12	Lytham and Warton marshes	Wildfowling	68	-	-
48	15	Lytham and Warton marshes	Wildfowling	68	-	-
373	14	Seafield slipway	Boat maintenance	-	20	-

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over mud based on 2 high-rate observations is 68 h y^{-1}

The observed 97.5th percentile rate based on 2 observations for mud is 68 h y^{-1}

The mean intertidal occupancy rate over mud and stones based on 1 high-rate observation is 20 h y^{-1}

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

Infant age group (0 - 5 years old)

Observation number	Age	Location	Activity	Mud	Mud and stones	Salt marsh
418	5	Lytham Marsh	Playing	-	-	12
419	4	Lytham Marsh	Playing	-	-	12
420	2	Lytham Marsh	Playing	-	-	12

Notes

Emboldened observations are the high-rate individuals

The mean intertidal occupancy rate over salt marsh based on 3 high-rate observations is 12 h y^{-1}

The observed 97.5th percentile rate based on 3 observations for salt marsh is 12 h y^{-1}

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

Location	NGR	Substrate	Gamma dose rate at 1 metre[a]	Beta dose rate at contact
Banks Marsh	SD 390 228	Salt marsh	0.081	-
Confluence of Savick Brook and River Ribble	SD 481 288	Mud	0.069	0.080
Granny's Bay	SD 344 271	Mud	0.066	-
Granny's Bay	SD 344 272	Salt marsh	0.063	-
Longton Marsh	SD 455 253	Salt marsh	0.100	-
Longton Marsh	SD 455 257	Salt marsh	-	0.235
Lytham Marsh	SD 359 268	Salt marsh	0.067	-
Marshside Sands	SD 341 206	Salt marsh	0.073	-
Off Seafield slipway	SD 356 267	Mud	0.064	-
Off Seafield slipway	SD 355 267	Mud and stones	0.067	-
Freckleton creek	SD 434 284	Wooden houseboat on mud	0.054	-
Ribble Viaduct	SD 535 283	Grass	0.073	-
Ribble Viaduct	SD 535 283	Sand	0.065	-
Savick Brook	SD 479 295	Mud	0.086	-
South bank of River Ribble	SD 494 289	Mud	0.090	-
South bank of River Ribble	SD 494 289	Salt marsh	0.078	-
Warton Marsh	SD 406 268	Mud	0.111	0.293
Warton Marsh	SD 406 266	Mud	0.081	0.185
West of Bull Nose	SD 504 293	Mud	0.079	-
West of Bull Nose	SD 504 293	Grass	0.080	-

Notes

NR - Not recorded

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

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

Observation number	Location	Activity	Fishing gear	Sediment
531	**Ribble Estuary**	**Handling nets**	**500**	**-**
	Ribble Estuary and Seafield slipway	**Collecting cockles and mussels, fixing moorings**	-	**349**
396	**Ribble Estuary**	**Handling nets**	**488**	-
226	**Marshside Sands**	**Handling nets**	**450**	-
235	**Marshside Sands**	**Handling nets**	**392**	-
394	**Ribble Estuary**	**Handling nets**	**280**	-
	Ribble Estuary	**Collecting cockles**	-	**264**
227	**Marshside Sands**	**Handling nets**	**270**	-
392	**Ribble Estuary**	**Handling nets**	**250**	-
	Seafield slipway	Fixing moorings	-	3
230	**Marshside Sands**	**Handling nets**	**240**	-
	Banks Marsh	**Wildfowling**	-	**252**
234	**Marshside Sands**	**Handling nets**	**168**	-
	Marshside Sands	Bait digging	-	72
224	Marshside Sands	Handling nets	112	-
246	Marshside Sands	Handling nets	36	-
372	Ribble Estuary	Handling nets	30	-
45	**Lytham and Warton marshes**	**Wildfowling**	-	**232**
46	**Lytham and Warton marshes**	**Wildfowling**	-	**232**
324	**Longton Marsh**	**Wildfowling**	-	**210**
325	**Longton Marsh**	**Wildfowling**	-	**210**
326	**Longton Marsh**	**Wildfowling**	-	**210**
327	**Longton Marsh**	**Wildfowling**	-	**210**
328	**Longton Marsh**	**Wildfowling**	-	**210**
337	**Longton and Warton marshes and off Fairhaven**	**Wildfowling and bait digging**	-	**199**
236	**Banks Marsh**	**Wildfowling**	-	**168**
237	**Banks Marsh**	**Wildfowling**	-	**168**
238	**Banks Marsh**	**Wildfowling**	-	**168**
239	**Banks Marsh**	**Wildfowling**	-	**168**
240	**Banks Marsh**	**Wildfowling**	-	**168**
241	**Banks Marsh**	**Wildfowling**	-	**168**
242	**Banks Marsh**	**Wildfowling**	-	**168**
243	**Banks Marsh**	**Wildfowling**	-	**168**
244	**Banks Marsh**	**Wildfowling**	-	**168**
245	**Banks Marsh**	**Wildfowling**	-	**168**
334	**Longton Marsh**	**Wildfowling**	-	**160**
35	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
36	**Lytham and Warton marshes**	**Wildfowling**	-	**136**

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

Observation number	Location	Activity	Fishing gear	Sediment
37	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
38	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
39	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
40	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
41	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
42	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
43	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
44	**Lytham and Warton marshes**	**Wildfowling**	-	**136**
329	Longton Marsh	Wildfowling	-	105
330	Longton Marsh	Wildfowling	-	105
331	Longton Marsh	Wildfowling	-	105
332	Longton Marsh	Wildfowling	-	105
333	Longton Marsh	Wildfowling	-	105
55	Hesketh Out Marsh	Wildfowling	-	100
56	Hesketh Out Marsh	Wildfowling	-	100
57	Hesketh Out Marsh	Wildfowling	-	100
193	Banks Marsh	Wildfowling	-	100
194	Banks Marsh	Wildfowling	-	100
195	Banks Marsh	Wildfowling	-	100
196	Banks Marsh	Wildfowling	-	100
197	Banks Marsh	Wildfowling	-	100
198	Banks Marsh	Wildfowling	-	100
199	Banks Marsh	Wildfowling	-	100
200	Banks Marsh	Wildfowling	-	100
201	Banks Marsh	Wildfowling	-	100
202	Banks Marsh	Wildfowling	-	100
349	Granny's Bay	Mud dipping	-	86
350	Granny's Bay	Mud dipping	-	86
351	Granny's Bay	Mud dipping	-	86
352	Granny's Bay	Mud dipping	-	86
65	Lytham and Warton marshes	Wildfowling	-	85
58	Hesketh Out Marsh	Wildfowling	-	50
59	Hesketh Out Marsh	Wildfowling	-	50
60	Hesketh Out Marsh	Wildfowling	-	50
61	Hesketh Out Marsh	Wildfowling	-	50
62	Hesketh Out Marsh	Wildfowling	-	50
63	Hesketh Out Marsh	Wildfowling	-	50
339	Warton Marsh	Wildfowling	-	40

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

Observation number	Location	Activity	Fishing gear	Sediment
519	Clifton Marsh	Wildfowling	-	24
523	Clifton Marsh	Wildfowling	-	24
353	Granny's Bay	Bait digging	-	15
354	Granny's Bay	Bait digging	-	15

Notes

Emboldened observations are the high-rate individuals

The mean fishing gear handling rate based on 9 high-rate observations is 338 h y^{-1}

The observed 97.5th percentile rate based on 12 observations for fishing gear is 497 h y^{-1}

The mean sediment handling rate based on 32 high-rate observations is 181 h y^{-1}

The observed 97.5th percentile rate based on 68 observations for sediment is 256 h y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	Fishing gear	Sediment
373	14	Ribble Estuary	Handling nets	10	-
47	12	Lytham and Warton marshes	Wildfowling	-	68
48	15	Lytham and Warton marshes	Wildfowling	-	68

Notes

Emboldened observations are the high-rate individuals

The mean fishing gear handling rate based on 1 high-rate observation is 10 h y^{-1}

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

The mean sediment handling rate based on 2 high-rate observations is 68 h y^{-1}

The observed 97.5th percentile rate based on 2 observations for sediment is 68 h y^{-1}

Table 15. Adult's occupancy rates on water in the Springfields aquatic survey area (h y^{-1})

Observation number	Location	Activity	On water
404	Freckleton creek	Boat dwelling	2190
531	Ribble Estuary	Gill netting	1200
405	Freckleton creek	Boat dwelling	1138
394	Ribble Estuary	Gill netting and trawling	1092
407	Freckleton creek	Boat dwelling	1008
408	Freckleton creek	Boat dwelling	1008
379	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	700
380	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	700
381	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	700
382	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	700
391	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	560
396	Ribble Estuary	Gill netting	488
406	Freckleton creek	Boat dwelling	455
392	Ribble Estuary	Gill netting	450
226	Marshside Sands	Tractor fishing	450
235	Marshside Sands	Tractor fishing	392
400	Becconsall	Boat dwelling	380
230	Marshside Sands	Tractor fishing	336
227	Marshside Sands	Tractor fishing	270
224	Marshside Sands	Tractor fishing	168
234	Marshside Sands	Tractor fishing	168
383	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	140
384	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	140
385	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	140
386	Ribble Estuary and Lytham Dock	Sailing and boat maintenance	140
372	Ribble Estuary and River Ribble	Boat angling, gill netting and pleasure cruising	106
387	Ribble Estuary	Sailing	56
388	Ribble Estuary	Sailing	56
389	Ribble Estuary	Sailing	56
390	Ribble Estuary	Sailing	56
246	Marshside Sands	Tractor fishing	36
337	Ribble Estuary	Boat angling	30
12	River Ribble	Sailing	17
13	River Ribble	Sailing	17

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

Child age group (6 - 15 years old)

Observation number	Age	Location	Activity	On water
373	14	River Ribble and Ribble Estuary	Pleasure cruising, gill netting and boat angling	70

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

Observation number	Asparagus	Broccoli	Brussel sprouts	Cabbage	Calabrese	Cauliflower	Chard	Courgette	Cucumber	Herbs	Kale	Lettuce	Rocket	Spinach	Total
517	**5.7**	**3.4**	**2.0**	**5.5**	**-**	**1.7**	**-**	**4.6**	**-**	**0.05**	**-**	**4.1**	**-**	**-**	**26.9**
518	**5.7**	**3.4**	**2.0**	**5.5**	**-**	**1.7**	**-**	**4.6**	**-**	**0.05**	**-**	**4.1**	**-**	**-**	**26.9**
438	**-**	**-**	**1.2**	**2.2**	**-**	**5.3**	**0.4**	**3.2**	**5.9**	**0.1**	**4.7**	**0.6**	**0.9**	**-**	**24.4**
439	**-**	**-**	**1.2**	**2.2**	**-**	**5.3**	**0.4**	**3.2**	**5.9**	**0.1**	**4.7**	**0.6**	**0.9**	**-**	**24.4**
210	**-**	**3.3**	**-**	**1.4**	**3.3**	**-**	**0.8**	**7.4**	**-**	**-**	**4.4**	**3.6**	**0.1**	**-**	**24.1**
211	**-**	**3.3**	**-**	**1.4**	**3.3**	**-**	**0.8**	**7.4**	**-**	**-**	**4.4**	**3.6**	**0.1**	**-**	**24.1**
503	**-**	**2.6**	**1.0**	**15.9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.1**	**-**	**-**	**20.6**
504	**-**	**2.6**	**1.0**	**15.9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1.1**	**-**	**-**	**20.6**
492	**0.6**	**-**	**-**	**1.5**	**-**	**-**	**-**	**10.1**	**6.4**	**-**	**-**	**-**	**-**	**-**	**18.6**
493	**0.6**	**-**	**-**	**1.5**	**-**	**-**	**-**	**10.1**	**6.4**	**-**	**-**	**-**	**-**	**-**	**18.6**
499	**-**	**2.0**	**-**	**2.6**	**-**	**-**	**-**	**11.0**	**-**	**-**	**-**	**1.1**	**-**	**-**	**16.8**
500	**-**	**2.0**	**-**	**2.6**	**-**	**-**	**-**	**11.0**	**-**	**-**	**-**	**1.1**	**-**	**-**	**16.8**
181	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.1**	**-**	**-**	**-**	**2.4**	**-**	**2.7**	**13.2**
182	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.1**	**-**	**-**	**-**	**2.4**	**-**	**2.7**	**13.2**
183	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.1**	**-**	**-**	**-**	**2.4**	**-**	**2.7**	**13.2**
184	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.1**	**-**	**-**	**-**	**2.4**	**-**	**2.7**	**13.2**
494	**-**	**-**	**1.9**	**2.7**	**-**	**-**	**-**	**3.1**	**3.6**	**-**	**1.1**	**0.6**	**-**	**-**	**13.1**
495	**-**	**-**	**1.9**	**2.7**	**-**	**-**	**-**	**3.1**	**3.6**	**-**	**1.1**	**0.6**	**-**	**-**	**13.1**
478	**-**	**-**	**-**	**4.3**	**-**	**3.4**	**-**	**-**	**4.3**	**-**	**-**	**0.7**	**-**	**-**	**12.6**
479	**-**	**-**	**-**	**4.3**	**-**	**3.4**	**-**	**-**	**4.3**	**-**	**-**	**0.7**	**-**	**-**	**12.6**
480	**-**	**-**	**-**	**4.3**	**-**	**3.4**	**-**	**-**	**4.3**	**-**	**-**	**0.7**	**-**	**-**	**12.6**
481	**-**	**-**	**-**	**4.3**	**-**	**3.4**	**-**	**-**	**4.3**	**-**	**-**	**0.7**	**-**	**-**	**12.6**
436	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7.4**	**-**	**-**	**-**	**2.0**	**-**	**-**	**9.4**
437	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7.4**	**-**	**-**	**-**	**2.0**	**-**	**-**	**9.4**
484	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
485	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
486	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
487	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
488	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
489	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
490	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
491	-	0.5	1.1	1.5	-	0.9	-	-	2.6	-	-	0.4	-	-	7.0
505	-	0.9	0.3	5.3	-	-	-	-	-	-	-	0.4	-	-	6.9
506	-	0.9	0.3	5.3	-	-	-	-	-	-	-	0.4	-	-	6.9
468	-	-	-	1.6	-	-	-	-	3.7	-	-	-	-	-	5.3
469	-	-	-	1.6	-	-	-	-	3.7	-	-	-	-	-	5.3
470	-	-	-	1.6	-	-	-	-	3.7	-	-	-	-	-	5.3
471	-	-	-	1.6	-	-	-	-	3.7	-	-	-	-	-	5.3
16	-	4.7	-	-	-	-	-	-	-	-	-	-	-	-	4.7
17	-	4.7	-	-	-	-	-	-	-	-	-	-	-	-	4.7
519	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	2.0

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

Observation number	Asparagus	Broccoli	Brussel sprouts	Cabbage	Calabrese	Cauliflower	Chard	Courgette	Cucumber	Herbs	Kale	Lettuce	Rocket	Spinach	Total
520	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	2.0
521	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	2.0
522	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	2.0
70	-	-	-	-	-	-	-	1.1	-	-	-	-	-	-	1.1
71	-	-	-	-	-	-	-	1.1	-	-	-	-	-	-	1.1
322	-	-	-	-	-	-	-	-	1.1	-	-	-	-	-	1.1
323	-	-	-	-	-	-	-	-	1.1	-	-	-	-	-	1.1
422	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-	0.8
423	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-	0.8
424	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-	0.8
425	-	-	-	-	-	-	-	-	-	-	-	0.8	-	-	0.8
29	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3
30	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables based on the 24 high-rate adult consumers is 17.1 kg y^{-1}

The observed 97.5th percentile rate based on 54 observations is 26.1 kg y^{-1}

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

Observation number	Aubergine	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Pumpkin	Runner bean	Squash	Sweetcorn	Tomato	Total
517	**-**	**4.1**	**-**	**3.2**	**4.1**	**4.1**	**4.9**	**-**	**6.1**	**0.3**	**0.6**	**10.8**	**38.1**
518	**-**	**4.1**	**-**	**3.2**	**4.1**	**4.1**	**4.9**	**-**	**6.1**	**0.3**	**0.6**	**10.8**	**38.1**
181	**-**	**3.6**	**-**	**-**	**-**	**3.6**	**-**	**-**	**10.9**	**8.1**	**-**	**-**	**26.2**
182	**-**	**3.6**	**-**	**-**	**-**	**3.6**	**-**	**-**	**10.9**	**8.1**	**-**	**-**	**26.2**
183	**-**	**3.6**	**-**	**-**	**-**	**3.6**	**-**	**-**	**10.9**	**8.1**	**-**	**-**	**26.2**
184	**-**	**3.6**	**-**	**-**	**-**	**3.6**	**-**	**-**	**10.9**	**8.1**	**-**	**-**	**26.2**
492	**-**	**2.3**	**-**	**-**	**-**	**1.1**	**1.0**	**-**	**0.8**	**10.1**	**0.7**	**7.2**	**23.2**
493	**-**	**2.3**	**-**	**-**	**-**	**1.1**	**1.0**	**-**	**0.8**	**10.1**	**0.7**	**7.2**	**23.2**
16	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.5**	**-**	**-**	**7.9**	**16.4**
17	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8.5**	**-**	**-**	**7.9**	**16.4**
438	**1.8**	**-**	**-**	**0.6**	**-**	**-**	**2.5**	**-**	**1.8**	**0.4**	**1.2**	**7.8**	**16.0**
439	**1.8**	**-**	**-**	**0.6**	**-**	**-**	**2.5**	**-**	**1.8**	**0.4**	**1.2**	**7.8**	**16.0**
494	**-**	**0.8**	**2.9**	**0.4**	**-**	**0.1**	**-**	**-**	**2.1**	**-**	**0.2**	**7.6**	**14.2**
495	**-**	**0.8**	**2.9**	**0.4**	**-**	**0.1**	**-**	**-**	**2.1**	**-**	**0.2**	**7.6**	**14.2**
29	**-**	**-**	**-**	**-**	**-**	**2.7**	**-**	**1.0**	**3.1**	**-**	**-**	**7.2**	**13.9**
30	**-**	**-**	**-**	**-**	**-**	**2.7**	**-**	**1.0**	**3.1**	**-**	**-**	**7.2**	**13.9**
436	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.5**	**13.5**
437	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**13.5**	**13.5**
484	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
485	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
486	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
487	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
488	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
489	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
490	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
491	-	2.3	-	1.4	-	3.4	-	-	3.4	0.1	0.2	1.4	12.0
499	-	0.3	-	-	-	-	-	-	-	-	0.5	9.9	10.6
500	-	0.3	-	-	-	-	-	-	-	-	0.5	9.9	10.6
203	-	-	-	-	-	-	-	-	7.7	-	-	-	7.7
204	-	-	-	-	-	-	-	-	7.7	-	-	-	7.7
442	-	-	-	-	-	-	-	-	-	-	-	6.0	6.0
443	-	-	-	-	-	-	-	-	-	-	-	6.0	6.0
444	-	-	-	-	-	-	-	-	-	-	-	6.0	6.0
445	-	-	-	-	-	-	-	-	-	-	-	6.0	6.0
446	-	-	-	-	-	-	-	-	-	-	-	6.0	6.0
447	-	-	-	-	-	-	-	-	-	-	-	6.0	6.0
210	-	-	-	0.6	-	5.4	-	-	-	-	-	-	6.0
211	-	-	-	0.6	-	5.4	-	-	-	-	-	-	6.0
468	-	-	-	-	-	1.2	0.3	-	-	-	-	4.4	5.9
469	-	-	-	-	-	1.2	0.3	-	-	-	-	4.4	5.9
470	-	-	-	-	-	1.2	0.3	-	-	-	-	4.4	5.9
471	-	-	-	-	-	1.2	0.3	-	-	-	-	4.4	5.9

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

Observation number	Aubergine	Broad bean	Chilli pepper	French bean	Mangetout	Pea	Pepper	Pumpkin	Runner bean	Squash	Sweetcorn	Tomato	Total
478	-	1.0	-	-	-	1.0	-	-	-	-	0.6	2.7	5.3
479	-	1.0	-	-	-	1.0	-	-	-	-	0.6	2.7	5.3
480	-	1.0	-	-	-	1.0	-	-	-	-	0.6	2.7	5.3
481	-	1.0	-	-	-	1.0	-	-	-	-	0.6	2.7	5.3
422	-	-	-	0.9	-	-	-	-	-	-	-	3.2	4.1
423	-	-	-	0.9	-	-	-	-	-	-	-	3.2	4.1
424	-	-	-	0.9	-	-	-	-	-	-	-	3.2	4.1
425	-	-	-	0.9	-	-	-	-	-	-	-	3.2	4.1
483	-	-	-	0.5	-	-	-	-	-	-	3.5	-	4.0
70	-	-	-	-	-	-	-	-	2.3	-	-	-	2.3
71	-	-	-	-	-	-	-	-	2.3	-	-	-	2.3
503	-	-	-	-	-	0.1	-	-	1.5	-	-	-	1.7
504	-	-	-	-	-	0.1	-	-	1.5	-	-	-	1.7
515	-	0.6	-	-	-	0.1	-	-	-	-	-	-	0.6
516	-	0.6	-	-	-	0.1	-	-	-	-	-	-	0.6
505	-	-	-	-	-	0.05	-	-	0.5	-	-	-	0.6
506	-	-	-	-	-	0.05	-	-	0.5	-	-	-	0.6
322	-	-	-	-	-	-	-	-	0.5	-	-	-	0.5
323	-	-	-	-	-	-	-	-	0.5	-	-	-	0.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables based on the 18 high-rate adult consumers is 20.9 kg y^{-1}

The observed 97.5th percentile rate based on 61 observations is 32.2 kg y^{-1}

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

Observation number	Beetroot	Carrot	Celeriac	Celery	Fennel	Garlic	Jerusalem artichoke	Kohl rabi	Leek	Onion	Parsnip	Radish	Salsify	Shallot	Spring onion	Swede	Turnip	Total
438	**11.5**	**-**	**-**	**-**	**-**	**-**	**7.8**	**-**	**3.4**	**11.8**	**1.2**	**-**	**-**	**-**	**-**	**3.8**	**1.5**	**41.1**
439	**11.5**	**-**	**-**	**-**	**-**	**-**	**7.8**	**-**	**3.4**	**11.8**	**1.2**	**-**	**-**	**-**	**-**	**3.8**	**1.5**	**41.1**
517	**4.1**	**4.1**	**1.2**	**-**	**-**	**0.6**	**-**	**-**	**4.1**	**6.6**	**4.9**	**0.6**	**-**	**4.5**	**0.7**	**5.5**	**3.9**	**40.6**
518	**-**	**4.1**	**1.2**	**-**	**-**	**0.6**	**-**	**-**	**4.1**	**6.6**	**-**	**0.6**	**-**	**4.5**	**0.7**	**5.5**	**3.9**	**31.7**
483	**6.2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**5.4**	**5.4**	**-**	**-**	**4.8**	**-**	**-**	**-**	**21.8**
181	**6.6**	**3.6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.9**	**-**	**-**	**-**	**-**	**5.4**	**-**	**18.5**
182	**6.6**	**3.6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.9**	**-**	**-**	**-**	**-**	**5.4**	**-**	**18.5**
183	**6.6**	**3.6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.9**	**-**	**-**	**-**	**-**	**5.4**	**-**	**18.5**
184	**6.6**	**3.6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2.9**	**-**	**-**	**-**	**-**	**5.4**	**-**	**18.5**
492	**2.1**	**2.3**	**-**	**1.4**	**-**	**-**	**-**	**-**	**2.3**	**1.8**	**1.8**	**-**	**-**	**1.6**	**1.0**	**3.4**	**-**	**17.5**
493	**2.1**	**2.3**	**-**	**1.4**	**-**	**-**	**-**	**-**	**2.3**	**1.8**	**1.8**	**-**	**-**	**1.6**	**1.0**	**3.4**	**-**	**17.5**
210	**3.6**	**3.2**	**-**	**-**	**-**	**-**	**-**	**-**	**3.2**	**4.4**	**-**	**-**	**-**	**1.2**	**-**	**-**	**-**	**15.6**
211	**3.6**	**3.2**	**-**	**-**	**-**	**-**	**-**	**-**	**3.2**	**4.4**	**-**	**-**	**-**	**1.2**	**-**	**-**	**-**	**15.6**
494	1.7	0.9	-	-	-	-	-	0.9	1.0	4.6	1.8	0.4	0.4	-	0.4	-	-	12.2
495	1.7	0.9	-	-	-	-	-	0.9	1.0	4.6	1.8	0.4	0.4	-	0.4	-	-	12.2
203	-	-	-	-	-	-	-	-	-	11.0	-	-	-	-	-	-	-	11.0
204	-	-	-	-	-	-	-	-	-	11.0	-	-	-	-	-	-	-	11.0
16	5.1	-	-	-	-	-	-	-	2.8	2.3	-	-	-	-	-	-	-	10.2
17	5.1	-	-	-	-	-	-	-	2.8	2.3	-	-	-	-	-	-	-	10.2
478	1.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	0.5	3.1	1.2	7.4
479	1.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	0.5	3.1	1.2	7.4
480	1.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	0.5	3.1	1.2	7.4
481	1.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	0.5	3.1	1.2	7.4
499	-	-	0.5	-	-	-	5.4	-	-	-	0.5	0.1	-	-	-	-	-	6.5
500	-	-	0.5	-	-	-	5.4	-	-	-	0.5	0.1	-	-	-	-	-	6.5
422	2.1	-	-	-	-	-	-	-	1.1	0.9	-	-	-	-	-	-	-	4.1
423	2.1	-	-	-	-	-	-	-	1.1	0.9	-	-	-	-	-	-	-	4.1
424	2.1	-	-	-	-	-	-	-	1.1	0.9	-	-	-	-	-	-	-	4.1
425	2.1	-	-	-	-	-	-	-	1.1	0.9	-	-	-	-	-	-	-	4.1
484	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
485	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
486	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
487	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
488	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
489	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
490	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
491	-	1.1	-	-	-	-	-	-	1.1	-	0.9	-	-	-	0.3	-	-	3.4
503	-	0.3	-	-	-	0.3	-	-	-	1.7	-	-	-	-	-	-	-	2.3
504	-	0.3	-	-	-	0.3	-	-	-	1.7	-	-	-	-	-	-	-	2.3
468	-	1.2	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	2.1
469	-	1.2	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	2.1
470	-	1.2	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	2.1

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

Observation number	Beetroot	Carrot	Celeriac	Celery	Fennel	Garlic	Jerusalem artichoke	Kohl rabi	Leek	Onion	Parsnip	Radish	Salsify	Shallot	Spring onion	Swede	Turnip	Total
471	-	1.2	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	2.1
322	-	0.7	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	0.9
323	-	0.7	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	0.9
507	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
508	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
509	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
510	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8
505	-	0.1	-	-	-	0.1	-	-	-	0.6	-	-	-	-	-	-	-	0.8
506	-	0.1	-	-	-	0.1	-	-	-	0.6	-	-	-	-	-	-	-	0.8
24	-	-	-	-	0.2	-	-	-	-	-	-	-	-	-	-	-	-	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables based on the 13 high-rate adult consumers is 24.3 kg y^{-1}

The observed 97.5th percentile rate based on 52 observations is 40.9 kg y^{-1}

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

Observation number	Potato
517	**59.0**
518	**59.0**
503	**30.3**
504	**30.3**
438	**25.5**
439	**25.5**
519	**25.0**
520	**25.0**
521	**25.0**
522	**25.0**
29	**21.8**
30	**21.8**
210	16.4
211	16.4
483	13.7
478	10.1
479	10.1
480	10.1
481	10.1
505	10.1
506	10.1
181	7.3
182	7.3
183	7.3
184	7.3
16	5.7
17	5.7
422	4.6
423	4.6
424	4.6
425	4.6
499	3.0
500	3.0
507	2.0
508	2.0
509	2.0
510	2.0
322	1.8
323	1.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of potato based on the 12 high-rate adult consumers is 31.1 kg y^{-1}

The observed 97.5th percentile rate based on 39 observations is 59.0 kg y^{-1}

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

Observation number	Apple	Blackberry	Blackcurrant	Blueberry	Cherry	Damson	Gooseberry	Loganberry	Pear	Plum	Quince	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Whitecurrant	Total
210	**4.0**	**-**	**4.5**	**-**	**-**	**-**	**3.3**	**-**	**4.0**	**4.0**	**2.0**	**4.1**	**1.8**	**18.4**	**4.8**	**-**	**-**	**50.9**
211	**4.0**	**-**	**4.5**	**-**	**-**	**-**	**3.3**	**-**	**4.0**	**4.0**	**2.0**	**4.1**	**1.8**	**18.4**	**4.8**	**-**	**-**	**50.9**
422	**34.2**	**-**	**0.2**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**0.1**	**5.1**	**-**	**-**	**39.9**
423	**34.2**	**-**	**0.2**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**0.1**	**5.1**	**-**	**-**	**39.9**
424	**34.2**	**-**	**0.2**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**0.1**	**5.1**	**-**	**-**	**39.9**
425	**34.2**	**-**	**0.2**	**-**	**-**	**-**	**0.2**	**-**	**-**	**-**	**-**	**-**	**-**	**0.1**	**5.1**	**-**	**-**	**39.9**
517	**-**	**-**	**1.6**	**0.4**	**0.8**	**-**	**-**	**0.4**	**0.8**	**0.8**	**-**	**-**	**1.6**	**9.2**	**6.9**	**-**	**0.4**	**22.9**
518	**-**	**-**	**1.6**	**0.4**	**0.8**	**-**	**-**	**0.4**	**0.8**	**0.8**	**-**	**-**	**1.6**	**9.2**	**6.9**	**-**	**0.4**	**22.9**
438	**6.5**	**0.9**	**3.7**	**-**	**0.4**	**-**	**0.9**	**-**	**-**	**0.4**	**-**	**1.5**	**2.0**	**1.5**	**2.9**	**-**	**1.0**	**21.5**
439	**6.5**	**0.9**	**3.7**	**-**	**0.4**	**-**	**0.9**	**-**	**-**	**0.4**	**-**	**1.5**	**2.0**	**1.5**	**2.9**	**-**	**1.0**	**21.5**
51	**11.3**	**-**	**1.8**	**-**	**-**	**-**	**-**	**-**	**3.4**	**-**	**-**	**-**	**-**	**3.4**	**-**	**-**	**-**	**20.0**
52	**11.3**	**-**	**1.8**	**-**	**-**	**-**	**-**	**-**	**3.4**	**-**	**-**	**-**	**-**	**3.4**	**-**	**-**	**-**	**20.0**
70	**10.2**	**-**	**1.8**	**-**	**-**	**-**	**-**	**-**	**-**	**2.3**	**-**	**-**	**1.8**	**1.1**	**1.1**	**-**	**-**	**18.4**
71	**10.2**	**-**	**1.8**	**-**	**-**	**-**	**-**	**-**	**-**	**2.3**	**-**	**-**	**1.8**	**1.1**	**1.1**	**-**	**-**	**18.4**
29	0.5	15.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.4
30	0.5	15.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16.4
494	4.2	0.4	-	-	-	4.8	0.9	-	1.1	-	-	1.4	-	-	2.9	-	-	15.6
495	4.2	0.4	-	-	-	4.8	0.9	-	1.1	-	-	1.4	-	-	2.9	-	-	15.6
436	9.0	-	-	-	-	1.5	-	-	-	-	-	-	-	4.6	-	-	-	15.1
437	9.0	-	-	-	-	1.5	-	-	-	-	-	-	-	4.6	-	-	-	15.1
519	10.0	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-	12.3
520	10.0	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-	12.3
521	10.0	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-	12.3
522	10.0	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-	12.3
53	11.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3
16	-	-	2.8	-	-	-	-	-	-	-	-	4.2	-	-	3.0	-	-	10.1
17	-	-	2.8	-	-	-	-	-	-	-	-	4.2	-	-	3.0	-	-	10.1
74	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.0
75	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.0
483	-	-	-	-	-	-	-	-	-	-	-	5.1	-	-	3.6	-	-	8.7
492	5.0	0.5	-	-	-	0.8	-	-	-	-	-	-	-	-	2.4	-	-	8.6
493	5.0	0.5	-	-	-	0.8	-	-	-	-	-	-	-	-	2.4	-	-	8.6

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

Observation number	Apple	Blackberry	Blackcurrant	Blueberry	Cherry	Damson	Gooseberry	Loganberry	Pear	Plum	Quince	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Whitecurrant	Total
452	1.6	-	-	-	-	-	-	-	-	-	-	4.5	-	-	-	-	-	6.1
453	1.6	-	-	-	-	-	-	-	-	-	-	4.5	-	-	-	-	-	6.1
281	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.0
282	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.0
283	6.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.0
484	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
485	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
486	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
487	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
488	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
489	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
490	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
491	-	-	-	-	-	-	1.0	-	-	-	-	-	-	1.7	1.2	2.0	-	5.9
253	0.5	-	-	-	-	-	-	-	3.3	1.7	-	-	-	-	-	-	-	5.5
254	0.5	-	-	-	-	-	-	-	3.3	1.7	-	-	-	-	-	-	-	5.5
255	0.5	-	-	-	-	-	-	-	3.3	1.7	-	-	-	-	-	-	-	5.5
256	0.5	-	-	-	-	-	-	-	3.3	1.7	-	-	-	-	-	-	-	5.5
257	0.5	-	-	-	-	-	-	-	3.3	1.7	-	-	-	-	-	-	-	5.5
258	0.5	-	-	-	-	-	-	-	3.3	1.7	-	-	-	-	-	-	-	5.5
215	3.0	-	-	-	-	2.3	-	-	-	-	-	-	-	-	-	-	-	5.3
216	3.0	-	-	-	-	2.3	-	-	-	-	-	-	-	-	-	-	-	5.3
478	-	-	-	-	-	-	-	-	-	1.5	-	1.5	-	1.7	-	-	-	4.8
479	-	-	-	-	-	-	-	-	-	1.5	-	1.5	-	1.7	-	-	-	4.8
480	-	-	-	-	-	-	-	-	-	1.5	-	1.5	-	1.7	-	-	-	4.8
481	-	-	-	-	-	-	-	-	-	1.5	-	1.5	-	1.7	-	-	-	4.8
468	2.5	-	-	-	-	-	-	-	1.3	0.4	-	-	-	-	-	-	-	4.1
469	2.5	-	-	-	-	-	-	-	1.3	0.4	-	-	-	-	-	-	-	4.1
470	2.5	-	-	-	-	-	-	-	1.3	0.4	-	-	-	-	-	-	-	4.1
471	2.5	-	-	-	-	-	-	-	1.3	0.4	-	-	-	-	-	-	-	4.1
527	2.5	-	-	-	-	1.0	-	-	0.5	-	-	-	-	-	-	-	-	4.0
528	2.5	-	-	-	-	1.0	-	-	0.5	-	-	-	-	-	-	-	-	4.0
529	2.5	-	-	-	-	1.0	-	-	0.5	-	-	-	-	-	-	-	-	4.0

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

Observation number	Apple	Blackberry	Blackcurrant	Blueberry	Cherry	Damson	Gooseberry	Loganberry	Pear	Plum	Quince	Raspberry	Redcurrant	Rhubarb	Strawberry	Tayberry	Whitecurrant	Total
530	2.5	-	-	-	-	1.0	-	-	0.5	-	-	-	-	-	-	-	-	4.0
24	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	-	-	-	2.3
312	-	-	-	-	-	-	-	-	-	2.1	-	-	-	-	-	-	-	2.1
313	-	-	-	-	-	-	-	-	-	2.1	-	-	-	-	-	-	-	2.1
515	-	-	0.7	-	-	-	-	-	-	-	-	0.7	-	-	0.7	-	-	2.0
516	-	-	0.7	-	-	-	-	-	-	-	-	0.7	-	-	0.7	-	-	2.0
524	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0
525	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0
526	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.0
454	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
455	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
456	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
457	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
458	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
459	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
267	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
268	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
269	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
270	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
271	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7
67	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	0.7
68	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	0.7
322	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	0.5
323	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	0.5
279	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	0.5
280	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	0.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of domestic fruit based on the 14 high-rate adult consumers is 30.5 kg y^{-1}

The observed 97.5th percentile rate based on 90 observations is 39.9 kg y^{-1}

Table 22. Adults' consumption rates of milk from the Springfields terrestrial survey area (l y^{-1})

Observation number	Cow's milk
507	383.2
508	383.2
509	383.2
513	365.0
514	365.0
212	273.8
213	273.8
214	273.8
215	273.8
216	273.8
248	155.6
249	155.6
250	155.6
251	155.6

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of milk based on the 14 high-rate adult consumers is 276.5 l y^{-1}

The observed 97.5th percentile rate based on 14 observations is 383.2 l y^{-1}

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

Observation number	Beef
513	**47.3**
514	**47.3**
215	**31.5**
216	**31.5**
281	**31.5**
282	**31.5**
283	**31.5**
519	**23.7**
520	**23.7**
521	**23.7**
522	**23.7**
442	**18.9**
443	**18.9**
444	**18.9**
445	**18.9**
446	**18.9**
447	**18.9**
16	12.2
17	12.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of cattle meat based on the 17 high-rate adult consumers is 27.1 kg y^{-1}

The observed 97.5th percentile rate based on 19 observations is 47.3 kg y^{-1}

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

Observation number	Pork
312	**10.7**
313	**10.7**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of pig meat based on the 2 high-rate adult consumers is 10.7 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 10.7 kg y^{-1}

Table 25. Adults' consumption rates of sheep meat from the Springfields terrestrial survey area (kg y^{-1})

Observation number	Lamb
281	**37.7**
282	**37.7**
283	**37.7**
215	**18.8**
216	**18.8**
519	**17.0**
520	**17.0**
521	**17.0**
522	**17.0**
312	10.7
313	10.7
212	7.5
213	7.5
214	7.5
442	6.8
443	6.8
444	6.8
445	6.8
446	6.8
447	6.8
181	2.8
182	2.8
183	2.8
184	2.8
463	2.8
464	2.8
465	2.8
67	2.5
68	2.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of sheep meat based on the 9 high-rate adult consumers is 24.3 kg y^{-1}

The observed 97.5th percentile rate based on 29 observations is 37.7 kg y^{-1}

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

Observation number	Chicken	Partridge	Pheasant	Pigeon	Turkey	Total
16	**-**	**-**	**-**	**-**	**14.0**	**14.0**
17	**-**	**-**	**-**	**-**	**14.0**	**14.0**
452	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
453	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
454	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
455	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
456	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
457	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
458	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
459	**-**	**1.6**	**9.5**	**-**	**-**	**11.1**
248	**-**	**-**	**-**	**-**	**7.0**	**7.0**
249	**-**	**-**	**-**	**-**	**7.0**	**7.0**
519	**3.8**	**-**	**-**	**1.7**	**-**	**5.5**
520	**3.8**	**-**	**-**	**1.7**	**-**	**5.5**
521	**3.8**	**-**	**-**	**1.7**	**-**	**5.5**
522	**3.8**	**-**	**-**	**1.7**	**-**	**5.5**
253	3.1	-	-	-	-	3.1
254	3.1	-	-	-	-	3.1
255	3.1	-	-	-	-	3.1
256	3.1	-	-	-	-	3.1
257	3.1	-	-	-	-	3.1
258	3.1	-	-	-	-	3.1
281	-	-	1.5	-	-	1.5
282	-	-	1.5	-	-	1.5
283	-	-	1.5	-	-	1.5
181	-	-	0.3	-	-	0.3
182	-	-	0.3	-	-	0.3
183	-	-	0.3	-	-	0.3
184	-	-	0.3	-	-	0.3

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of poultry based on the 16 high-rate adult consumers is 9.5 kg y^{-1}

The observed 97.5th percentile rate based on 29 observations is 14.0 kg y^{-1}

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

Observation number	Chicken egg	Duck egg	Total
312	**29.1**	**-**	**29.1**
29	**28.7**	**-**	**28.7**
30	**28.7**	**-**	**28.7**
274	**21.3**	**-**	**21.3**
275	**21.3**	**-**	**21.3**
276	**21.3**	**-**	**21.3**
313	**20.2**	**-**	**20.2**
27	**17.8**	**-**	**17.8**
28	**17.8**	**-**	**17.8**
452	**17.8**	**-**	**17.8**
453	**17.8**	**-**	**17.8**
300	**17.1**	**-**	**17.1**
301	**17.1**	**-**	**17.1**
302	**17.1**	**-**	**17.1**
254	**8.0**	**5.3**	**13.3**
212	**11.9**	**-**	**11.9**
213	**11.9**	**-**	**11.9**
214	**11.9**	**-**	**11.9**
51	9.2	-	9.2
52	9.2	-	9.2
24	8.9	-	8.9
49	8.1	-	8.1
50	8.1	-	8.1
253	8.0	-	8.0
255	8.0	-	8.0
256	8.0	-	8.0
267	7.6	-	7.6
268	7.6	-	7.6
269	7.6	-	7.6
270	7.6	-	7.6
271	7.6	-	7.6
32	5.6	-	5.6
33	5.6	-	5.6

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of eggs based on the 18 high-rate adult consumers is 19.0 kg y^{-1}

The observed 97.5th percentile rate based on 33 observations is 28.8 kg y^{-1}

Table 28. Adults' consumption rates of wild/free foods from the Springfields terrestrial survey area (kg y^{-1})

Observation number	Blackberry	Greengage	Hazelnut	Sloe	Total
215	**1.5**	**-**	**-**	**4.5**	**6.0**
216	**1.5**	**-**	**-**	**4.5**	**6.0**
51	**6.0**	**-**	**-**	**-**	**6.0**
52	**6.0**	**-**	**-**	**-**	**6.0**
16	**2.8**	**-**	**-**	**-**	**2.8**
17	**2.8**	**-**	**-**	**-**	**2.8**
312	-	-	-	1.1	1.1
313	-	-	-	1.1	1.1
436	1.0	-	-	-	1.0
437	1.0	-	-	-	1.0
527	-	0.5	-	0.5	1.0
528	-	0.5	-	0.5	1.0
529	-	0.5	-	0.5	1.0
530	-	0.5	-	0.5	1.0
507	0.3	-	-	0.6	0.8
508	0.3	-	-	0.6	0.8
509	0.3	-	-	0.6	0.8
510	0.3	-	-	0.6	0.8
67	0.7	-	-	-	0.7
68	0.7	-	-	-	0.7
519	-	-	-	0.6	0.6
520	-	-	-	0.6	0.6
521	-	-	-	0.6	0.6
522	-	-	-	0.6	0.6
281	0.5	-	-	-	0.5
282	0.5	-	-	-	0.5
283	0.5	-	-	-	0.5
499	0.5	-	-	-	0.5
500	0.5	-	-	-	0.5
24	0.2	-	0.1	-	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 5.0 kg y^{-1}

The observed 97.5th percentile rate based on 30 observations is 6.0 kg y^{-1}

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

Observation number	Honey
438	**3.4**
439	**3.4**
517	**1.4**
518	**1.4**
483	0.9
492	0.7
493	0.7

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of honey based on the 4 high-rate adult consumers is 2.4 kg y^{-1}

The observed 97.5th percentile rate based on 7 observations is 3.4 kg y^{-1}

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

Observation number	Mushrooms
281	**1.5**
282	**1.5**
283	**1.5**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild fungi based on the 3 high-rate adult consumers is 1.5 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 1.5 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Brussel sprouts	Cabbage	Cauliflower	Chard	Courgette	Cucumber	Herbs	Kale	Lettuce	Rocket	Total
496	**13**	**1.9**	**2.7**	**-**	**-**	**3.1**	**3.6**	**-**	**1.1**	**0.6**	**-**	**13.1**
497	**11**	**1.9**	**2.7**	**-**	**-**	**3.1**	**3.6**	**-**	**1.1**	**0.6**	**-**	**13.1**
440	**7**	**0.9**	**1.6**	**1.6**	**0.3**	**1.6**	**1.8**	**0.04**	**1.4**	**0.5**	**0.6**	**10.3**
498	**9**	**1.4**	**2.0**	**-**	**-**	**2.3**	**2.7**	**-**	**0.9**	**0.5**	**-**	**9.8**
472	**13**	**-**	**1.6**	**-**	**-**	**-**	**3.7**	**-**	**-**	**-**	**-**	**5.3**
473	**15**	**-**	**1.6**	**-**	**-**	**-**	**3.7**	**-**	**-**	**-**	**-**	**5.3**
474	**12**	**-**	**1.6**	**-**	**-**	**-**	**3.7**	**-**	**-**	**-**	**-**	**5.3**
475	9	-	1.2	-	-	-	2.8	-	-	-	-	4.0
476	6	-	1.2	-	-	-	2.8	-	-	-	-	4.0
482	8	-	-	-	-	-	0.7	-	-	-	-	0.7

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables for the child age group based upon the 7 high-rate consumers is 8.9 kg y^{-1}

The observed 97.5th percentile rate based on 10 observations is 13.1 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Brussel sprout	Cabbage	Cauliflower	Chard	Courgette	Cucumber	Herbs	Kale	Lettuce	Rocket	Total
441	**5**	**0.6**	**1.1**	**1.3**	**0.2**	**0.8**	**1.5**	**0.03**	**1.2**	**0.3**	**0.4**	**7.4**
477	**4**	**-**	**0.8**	**-**	**-**	**-**	**1.9**	**-**	**-**	**-**	**-**	**2.7**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of green vegetables for the infant age group based upon the 2 high-rate consumers is 5.0 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 7.3 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Aubergine	Broad bean	Chilli pepper	French bean	Pea	Pepper	Runner bean	Squash	Sweetcorn	Tomato	Total
496	**13**	**-**	**0.8**	**2.9**	**0.4**	**0.1**	**-**	**2.1**	**-**	**0.2**	**7.6**	**14.2**
497	**11**	**-**	**0.8**	**2.9**	**0.4**	**0.1**	**-**	**2.1**	**-**	**0.2**	**7.6**	**14.2**
440	**7**	**1.3**	**-**	**-**	**0.5**	**-**	**1.9**	**1.3**	**0.3**	**0.9**	**5.8**	**12.0**
498	**9**	**-**	**0.6**	**2.2**	**0.3**	**0.1**	**-**	**1.6**	**-**	**0.1**	**5.7**	**10.6**
448	**14**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.0**	**6.0**
449	**14**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.0**	**6.0**
450	**11**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.0**	**6.0**
451	**10**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6.0**	**6.0**
472	**13**	**-**	**-**	**-**	**-**	**1.2**	**0.3**	**-**	**-**	**-**	**4.4**	**5.9**
473	**15**	**-**	**-**	**-**	**-**	**1.2**	**0.3**	**-**	**-**	**-**	**4.4**	**5.9**
474	**12**	**-**	**-**	**-**	**-**	**1.2**	**0.3**	**-**	**-**	**-**	**4.4**	**5.9**
475	9	-	-	-	-	0.9	0.2	-	-	-	3.3	4.4
476	6	-	-	-	-	0.9	0.2	-	-	-	3.3	4.4

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of other vegetables for the child age group based upon the 11 high-rate consumers is 8.4 kg y^{-1}

The observed 97.5th percentile rate based on 13 observations is 14.2 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Aubergine	Broad bean	Chilli pepper	French bean	Pea	Pepper	Runner bean	Squash	Sweetcorn	Tomato	Total
441	**5**	**0.9**	**-**	**-**	**0.3**	**-**	**1.3**	**0.9**	**0.2**	**0.6**	**3.9**	**8.0**
477	**4**	**-**	**-**	**-**	**-**	**0.6**	**0.1**	**-**	**-**	**-**	**2.2**	**2.9**

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 5.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 7.9 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Beetroot	Carrot	Jerusalem artichoke	Kohl rabi	Leek	Onion	Parsnip	Radish	Salsify	Spring onion	Swede	Turnip	Total
440	**7**	**1.9**	**-**	**2.3**	**-**	**2.6**	**3.6**	**0.9**	**-**	**-**	**-**	**1.9**	**1.1**	**14.3**
496	**13**	**1.7**	**0.9**	**-**	**0.9**	**1.0**	**4.6**	**1.8**	**0.4**	**0.4**	**0.4**	**-**	**-**	**12.2**
497	**11**	**1.7**	**0.9**	**-**	**0.9**	**1.0**	**4.6**	**1.8**	**0.4**	**0.4**	**0.4**	**-**	**-**	**12.2**
498	**9**	**1.3**	**0.6**	**-**	**0.7**	**0.8**	**3.5**	**1.4**	**0.3**	**0.3**	**0.3**	**-**	**-**	**9.1**
472	13	-	1.2	-	-	-	0.9	-	-	-	-	-	-	2.1
473	15	-	1.2	-	-	-	0.9	-	-	-	-	-	-	2.1
474	12	-	1.2	-	-	-	0.9	-	-	-	-	-	-	2.1
475	9	-	0.9	-	-	-	0.7	-	-	-	-	-	-	1.6
476	6	-	0.9	-	-	-	0.7	-	-	-	-	-	-	1.6
511	14	-	0.8	-	-	-	-	-	-	-	-	-	-	0.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of root vegetables for the child age group based upon the 4 high-rate consumers is 11.9 kg y^{-1}

The observed 97.5th percentile rate based on 10 observations is 13.8 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Beetroot	Carrot	Jerusalem artichoke	Kohl rabi	Leek	Onion	Parsnip	Radish	Salsify	Spring onion	Swede	Turnip	Total
441	**5**	**1.6**	**-**	**1.9**	**-**	**-**	**3.0**	**0.6**	**-**	**-**	**-**	**1.0**	**0.8**	**8.8**
477	4	-	0.6	-	-	-	0.5	-	-	-	-	-	-	1.1
512	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 only high-rate consumer is 8.8 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 8.4 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Potato
440	**7**	**19.1**
511	14	2.0

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of potato for the child age group based upon the only high-rate consumer is 19.1 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 18.7 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Potato
441	**5**	**12.7**
512	2	0.7

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 12.7 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 12.4 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Apple	Blackberry	Blackcurrant	Cherry	Damson	Gooseberry	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Whitecurrant	Total
440	**7**	**4.8**	**0.6**	**2.8**	**0.3**	**-**	**0.7**	**-**	**-**	**1.1**	**1.5**	**1.1**	**2.2**	**0.7**	**15.8**
496	**13**	**4.2**	**0.4**	**-**	**-**	**4.8**	**0.9**	**1.1**	**-**	**1.4**	**-**	**-**	**2.9**	**-**	**15.6**
497	**11**	**4.2**	**0.4**	**-**	**-**	**4.8**	**0.9**	**1.1**	**-**	**1.4**	**-**	**-**	**2.9**	**-**	**15.6**
498	**9**	**3.2**	**0.3**	**-**	**-**	**3.6**	**0.6**	**0.8**	**-**	**1.1**	**-**	**-**	**2.1**	**-**	**11.7**
472	13	2.5	-	-	-	-	-	1.3	0.4	-	-	-	-	-	4.1
473	15	2.5	-	-	-	-	-	1.3	0.4	-	-	-	-	-	4.1
474	12	2.5	-	-	-	-	-	1.3	0.4	-	-	-	-	-	4.1
475	9	1.9	-	-	-	-	-	0.9	0.3	-	-	-	-	-	3.1
476	6	1.9	-	-	-	-	-	0.9	0.3	-	-	-	-	-	3.1
217	6	1.5	-	-	-	1.1	-	-	-	-	-	-	-	-	2.6
314	14	-	-	-	-	-	-	-	2.1	-	-	-	-	-	2.1
315	13	-	-	-	-	-	-	-	2.1	-	-	-	-	-	2.1
316	6	-	-	-	-	-	-	-	1.6	-	-	-	-	-	1.6
460	7	0.8	-	-	-	-	-	-	-	0.1	-	-	-	-	0.9
272	13	0.7	-	-	-	-	-	-	-	-	-	-	-	-	0.7
273	15	0.7	-	-	-	-	-	-	-	-	-	-	-	-	0.7

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 14.7 kg y^{-1}

The observed 97.5th percentile rate based on 16 observations is 15.8 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Apple	Blackberry	Blackcurrant	Cherry	Damson	Gooseberry	Pear	Plum	Raspberry	Redcurrant	Rhubarb	Strawberry	Whitecurrant	Total
441	**5**	**3.2**	**0.4**	**1.8**	**0.2**	**-**	**0.4**	**-**	**0.2**	**0.7**	**1.0**	**0.7**	**1.5**	**0.5**	**10.8**
477	4	1.3	-	-	-	-	-	0.6	0.2	-	-	-	-	-	2.1
218	4	0.8	-	-	-	0.6	-	-	-	-	-	-	-	-	1.3
219	2	0.8	-	-	-	0.6	-	-	-	-	-	-	-	-	1.3
461	5	0.8	-	-	-	-	-	-	-	0.1	-	-	-	-	0.9
462	2	0.8	-	-	-	-	-	-	-	0.1	-	-	-	-	0.9

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 10.8 kg y^{-1}

The observed 97.5th percentile rate based on 6 observations is 9.7 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Cow's milk
511	**14**	**268.3**
217	**6**	**136.9**

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 202.6 l y^{-1}

The observed 97.5th percentile rate based on 2 observations is 265.0 l y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Cow's milk
512	**2**	**126.5**
218	**4**	**68.4**
219	**2**	**68.4**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of milk for the infant age group based upon the 3 high-rate consumers is 87.8 l y^{-1}

The observed 97.5th percentile rate based on 3 observations is 123.6 l y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Beef
448	14	18.9
449	14	18.9
450	11	18.9
451	10	18.9
217	6	15.8

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of cattle meat for the child age group based upon the 5 high-rate consumers is 18.3 kg y^{-1}

The observed 97.5th percentile rate based on 5 observations is 18.9 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Beef
218	4	7.9
219	2	7.9

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 7.9 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 7.9 kg y^{-1}

Table 38. Children's consumption rates of pig meat from the Springfields terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Pork
314	**14**	**10.7**
315	**13**	**10.7**
316	**6**	**8.0**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of pig meat for the child age group based upon the 3 high-rate consumers is 9.8 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 10.7 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Lamb
314	**14**	**10.7**
315	**13**	**10.7**
217	**6**	**9.4**
316	**6**	**8.0**
448	**14**	**6.8**
449	**14**	**6.8**
450	**11**	**6.8**
451	**10**	**6.8**
466	14	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 8 high-rate consumers is 8.2 kg y^{-1}

The observed 97.5th percentile rate based on 9 observations is 10.7 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Lamb
218	**4**	**4.7**
219	**2**	**4.7**

Notes

Emboldened observations are the high-rate consumers

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

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

Table 40. Children's and infants' consumption rates of poultry from the Springfields terrestrial survey area (kg y^{-1}

Child age group (6 - 15 years old)

Observation number	Age	Partridge	Pheasant	Total
460	7	0.8	4.7	5.5

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 5.5 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	Partridge	Pheasant	Total
461	5	0.8	4.7	5.5
462	2	0.8	4.7	5.5

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of poultry for the infant age group based upon the 2 high-rate consumers is 5.5 kg y^{-1}

The observed 97.5th percentile rate based on 2 observations is 5.5 kg y^{-1}

Table 41. Children's consumption rates of eggs from the Springfields terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Chicken egg
277	**14**	**21.3**
278	**10**	**21.3**
314	**14**	**20.2**
315	**13**	**20.2**
303	**14**	**17.1**
316	**6**	**15.1**
272	**13**	**7.6**
273	**15**	**7.6**
34	6	5.6

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of eggs for the child age group based upon the 8 high-rate consumers is 16.3 kg y^{-1}

The observed 97.5th percentile rate based on 9 observations is 21.3 kg y^{-1}

Table 42. Children's and infants' consumption rates of wild/free foods from the Springfields terrestrial survey area (kg y^{-1})

Child age group (6 - 15 years old)

Observation number	Age	Blackberry	Hazelnut	Plum	Sloe	Total
314	**14**	**-**	**-**	**-**	**1.1**	**1.1**
315	**13**	**-**	**-**	**-**	**1.1**	**1.1**
316	**6**	**-**	**-**	**-**	**0.8**	**0.8**
217	**6**	**0.8**	**-**	**-**	**-**	**0.8**
440	7	-	-	0.3	-	0.3
511	14	0.3	-	-	-	0.3
25	7	0.1	0.1	-	-	0.2
26	6	0.1	0.1	-	-	0.2

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild/free foods for the child age group based upon the 4 high-rate consumers is 0.9 kg y^{-1}

The observed 97.5th percentile rate based on 8 observations is 1.1 kg y^{-1}

Infant age group (0 - 5 years old)

Observation number	Age	Blackberry	Hazelnut	Plum	Sloe	Total
218	**4**	**0.4**	**-**	**-**	**-**	**0.4**
219	**2**	**0.4**	**-**	**-**	**-**	**0.4**
512	2	0.1	-	-	-	0.1

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of wild/free foods for the infant age group based upon the 2 high-rate consumers is 0.4 kg y^{-1}

The observed 97.5th percentile rate based on 3 observations is 0.4 kg y^{-1}

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

Child age group (6 - 15 years old)

Observation number	Age	Honey
440	**7**	**3.4**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of honey for the child age group based upon the only high-rate consumer is 3.4 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	Honey
441	**5**	**1.7**

Notes

Emboldened observations are the high-rate consumers

The mean consumption rate of honey for the infant age group based upon the only high-rate consumer is 1.7 kg y^{-1}

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

Table 44. Percentage contribution each food type makes to its terrestrial food group for adults

Green vegetables	
Courgette	24.3 %
Cabbage	20.8 %
Cucumber	16.3 %
Broccoli	8.7 %
Lettuce	8.6 %
Cauliflower	6.6 %
Brussel sprout	4.2 %
Kale	3.9 %
Asparagus	2.4 %
Spinach	2.2 %
Calabrese	1.2 %
Chard	0.4 %
Rocket	0.4 %
Herbs	0.04 %

Other vegetables	
Tomato	36.7 %
Runner bean	22.2 %
Pea	12.2 %
Squash	8.7 %
Broad bean	8.4 %
French bean	3.9 %
Pepper	2.8 %
Sweetcorn	2.1 %
Mangetout	1.3 %
Chilli pepper	0.9 %
Aubergine	0.6 %
Pumpkin	0.3 %

Root vegetables	
Onion	20.9 %
Beetroot	20.4 %
Swede	12.1 %
Carrot	11.8 %
Leek	9.6 %
Parsnip	8.1 %
Artichoke	5.4 %
Shallot	4.0 %
Turnip	3.2 %
Spring onion	1.7 %
Celeriac	0.7 %
Celery	0.6 %
Radish	0.5 %
Garlic	0.4 %
Kohl rabi	0.4 %
Salsify	0.2 %
Fennel	0.04 %

Potato	
Potato	100.0 %

Domestic fruit	
Apple	44.4 %
Rhubarb	11.7 %
Strawberry	9.7 %
Plum	5.6 %
Pear	5.3 %
Raspberry	5.2 %
Blackberry	4.1 %
Blackcurrant	4.1 %
Damson	2.8 %
Gooseberry	2.2 %
Tayberry	1.9 %
Redcurrant	1.7 %
Quince	0.5 %
Whitecurrant	0.3 %
Cherry	0.3 %
Loganberry	0.1 %
Blueberry	0.1 %

Milk	
Cows' milk	100.0 %

Cattle meat	
Beef	100.0 %

Pig meat	
Pork	100.0 %

Sheep meat	
Lamb	100.0 %

Poultry	
Pheasant	46.1 %
Turkey	23.8 %
Chicken	19.1 %
Partridge	7.1 %
Pigeon	3.9 %

Eggs	
Chicken egg	98.8 %
Duck egg	1.2 %

Wild/free foods	
Blackberry	58.4 %
Sloe	37.1 %
Greengage	4.2 %
Hazel nut	0.2 %

Honey	
Honey	100.0 %

Wild fungi	
Mushrooms	100.0 %

Notes

Food types in emboldened italics were monitored by FSA in 2011 (EA, FSA, NIEA and SEPA, 2012).
Rabbit was also monitored.
Percentages are based on the consumption of all adults in the survey consuming that particular food group.

Table 45. Direct radiation occupancy rates for adults, children and infants in the Springfields area (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
0 to 0.25 km zone						
259	M	85	Residing	6603	1825	8428
260	F	86	Residing	8063	365	8428
263	F	56	Residing	7738	550	8288
316	M	6	Residing	7737	510	8247
253	F	57	Residing	7360	725	8085
436	M	54	Residing	7515	360	7875
262	M	62	Residing	7322	550	7872
209	M	80	Residing	7488	200	7688
312	F	41	Residing and farming	6972	714	7686
313	M	46	Residing and farming	4830	2856	7686
281	F	56	Residing and farming	6561	1120	7681
282	M	57	Residing and farming	4224	3360	7584
18	F	63	Residing	6939	525	7464
222	F	10	Residing	6523	725	7248
223	F	8	Residing	6523	725	7248
426	M	37	Residing and working	6647	289	6936
254	M	57	Residing	5502	1407	6909
29	M	62	Residing	5941	849	6790
255	M	19	Residing	6584	100	6684
261	F	58	Residing	5152	1460	6612
27	M	59	Residing	5110	1460	6570
256	M	21	Residing	6428	100	6528
265	F	62	Residing	6122	370	6492
314	M	14	Residing	5917	510	6427
315	F	13	Residing	5917	510	6427
264	F	21	Residing	5690	550	6240
437	F	57	Residing	5763	360	6123
266	M	63	Residing	6024	96	6120
221	M	45	Residing	5227	725	5952
24	F	61	Residing	5288	658	5946
220	F	34	Residing	5131	725	5856
30	F	58	Residing	5504	146	5650
28	F	55	Residing	4526	730	5256
22	F	49	Residing	3879	141	4020
23	F	20	Residing	3949	71	4020
427	M	33	Working	2070	230	2300
428	M	27	Working	2070	230	2300
283	M	30	Farming	550	1600	2150
205	M	U	Working	1920	96	2016
206	M	U	Working	1920	96	2016
207	M	U	Working	1920	96	2016
208	M	U	Working	1920	96	2016
422	M	57	Residing	1520	240	1760
423	F	57	Residing	1520	240	1760
294	M	U	Working	1267	293	1560
295	M	U	Working	1267	293	1560
296	F	U	Working	1267	293	1560
297	F	U	Working	1267	293	1560
299	M	U	Working	780	780	1560
429	M	19	Working	1374	96	1470
284	M	7	Attending school	1130	235	1365
285	M	11	Attending school	1130	235	1365
286	M	11	Attending school	1130	235	1365
287	M	8	Attending school	1130	235	1365
288	M	10	Attending school	1130	235	1365
289	M	10	Attending school	1130	235	1365
290	M	9	Attending school	1130	235	1365
291	M	9	Attending school	1130	235	1365
292	M	9	Attending school	1130	235	1365
293	M	9	Attending school	1130	235	1365
76	M	U	Working	1140	190	1330
77	F	U	Working	1140	190	1330

Table 45. Direct radiation occupancy rates for adults, children and infants in the Springfields area (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
78	F	U	Working	1140	190	1330
79	F	U	Working	1140	190	1330
80	F	U	Working	1140	190	1330
87	M	4	Attending school	912	323	1235
88	M	4	Attending school	912	323	1235
89	M	4	Attending school	912	323	1235
90	M	4	Attending school	912	323	1235
91	F	4	Attending school	912	323	1235
92	F	4	Attending school	912	323	1235
93	F	4	Attending school	912	323	1235
94	F	4	Attending school	912	323	1235
95	M	5	Attending school	912	323	1235
96	M	5	Attending school	912	323	1235
97	M	5	Attending school	912	323	1235
98	F	5	Attending school	912	323	1235
99	F	5	Attending school	912	323	1235
100	F	5	Attending school	912	323	1235
101	F	5	Attending school	912	323	1235
102	M	5	Attending school	912	323	1235
103	M	5	Attending school	912	323	1235
104	M	5	Attending school	912	323	1235
105	F	5	Attending school	912	323	1235
106	F	5	Attending school	912	323	1235
107	M	6	Attending school	912	323	1235
108	M	6	Attending school	912	323	1235
109	M	6	Attending school	912	323	1235
110	F	6	Attending school	912	323	1235
111	F	6	Attending school	912	323	1235
112	M	6	Attending school	912	323	1235
113	M	6	Attending school	912	323	1235
114	M	6	Attending school	912	323	1235
115	F	6	Attending school	912	323	1235
116	F	6	Attending school	912	323	1235
117	F	6	Attending school	912	323	1235
118	M	7	Attending school	912	323	1235
119	M	7	Attending school	912	323	1235
120	M	7	Attending school	912	323	1235
121	F	7	Attending school	912	323	1235
122	F	7	Attending school	912	323	1235
123	F	7	Attending school	912	323	1235
124	M	7	Attending school	912	323	1235
125	M	7	Attending school	912	323	1235
126	M	7	Attending school	912	323	1235
127	M	7	Attending school	912	323	1235
128	F	7	Attending school	912	323	1235
129	F	7	Attending school	912	323	1235
130	F	7	Attending school	912	323	1235
131	F	7	Attending school	912	323	1235
132	M	8	Attending school	912	323	1235
133	M	8	Attending school	912	323	1235
134	M	8	Attending school	912	323	1235
135	M	8	Attending school	912	323	1235
136	F	8	Attending school	912	323	1235
137	F	8	Attending school	912	323	1235
138	F	8	Attending school	912	323	1235
139	M	8	Attending school	912	323	1235
140	M	8	Attending school	912	323	1235
141	M	8	Attending school	912	323	1235
142	F	8	Attending school	912	323	1235
143	F	8	Attending school	912	323	1235
144	F	8	Attending school	912	323	1235
145	M	9	Attending school	912	323	1235
146	M	9	Attending school	912	323	1235

Table 45. Direct radiation occupancy rates for adults, children and infants in the Springfields area (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
147	M	9	Attending school	912	323	1235
148	M	9	Attending school	912	323	1235
149	F	9	Attending school	912	323	1235
150	F	9	Attending school	912	323	1235
151	F	9	Attending school	912	323	1235
152	F	9	Attending school	912	323	1235
153	M	9	Attending school	912	323	1235
154	M	9	Attending school	912	323	1235
155	M	9	Attending school	912	323	1235
156	F	9	Attending school	912	323	1235
157	F	9	Attending school	912	323	1235
158	F	9	Attending school	912	323	1235
159	M	10	Attending school	912	323	1235
160	M	10	Attending school	912	323	1235
161	M	10	Attending school	912	323	1235
162	M	10	Attending school	912	323	1235
163	F	10	Attending school	912	323	1235
164	F	10	Attending school	912	323	1235
165	F	10	Attending school	912	323	1235
166	F	10	Attending school	912	323	1235
167	M	10	Attending school	912	323	1235
168	M	10	Attending school	912	323	1235
169	M	10	Attending school	912	323	1235
170	F	10	Attending school	912	323	1235
171	F	10	Attending school	912	323	1235
172	F	10	Attending school	912	323	1235
173	M	11	Attending school	912	323	1235
174	M	11	Attending school	912	323	1235
175	M	11	Attending school	912	323	1235
176	M	11	Attending school	912	323	1235
177	F	11	Attending school	912	323	1235
178	F	11	Attending school	912	323	1235
179	F	11	Attending school	912	323	1235
180	F	11	Attending school	912	323	1235
430	M	18	Working	1129	96	1225
298	M	U	Working	877	293	1170
424	F	22	Residing	950	150	1100
425	F	22	Residing	950	150	1100
258	F	U	Visiting	1020	20	1040
431	M	17	Working	884	96	980
432	F	22	Working	884	96	980
433	F	22	Working	884	96	980
434	F	20	Working	884	96	980
435	F	16	Working	884	96	980
31	F	1	Visiting	720	240	960
257	F	U	Visiting	926	10	936
85	F	U	Working	690	230	920
86	M	U	Working	690	230	920
81	F	U	Working	570	190	760
82	F	U	Working	570	190	760
83	F	U	Working	570	190	760
84	F	U	Working	570	190	760
25	M	7	Visiting	440	88	528
26	M	6	Visiting	440	88	528
19	M	4	Visiting	200	50	250
20	M	4	Visiting	200	50	250
21	F	11	Visiting	200	50	250
203	M	79	Attending allotment plot	-	104	104
212	M	U	Farming	-	46	46
213	F	U	Farming	-	46	46
214	M	U	Farming	-	46	46
>0.25 to 0.5 km zone						
269	M	81	Residing	7592	730	8322

Table 45. Direct radiation occupancy rates for adults, children and infants in the Springfields area (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
270	F	74	Residing	7592	730	8322
2	F	U	Residing	5867	2373	8240
3	F	19	Residing	5867	2373	8240
4	M	10	Residing	5867	2373	8240
267	F	57	Residing	5329	2555	7884
268	M	62	Residing	7154	730	7884
317	F	45	Residing	6581	1040	7621
278	M	10	Residing	6484	936	7420
53	F	77	Residing	7309	94	7403
51	M	66	Residing	5492	1698	7190
52	F	60	Residing	5492	1698	7190
272	M	13	Residing	6274	730	7004
273	F	15	Residing	6274	730	7004
302	F	16	Residing	6260	700	6960
321	M	15	Residing	6834	50	6884
34	F	6	Residing	6503	319	6822
320	F	16	Residing	6659	50	6709
271	M	35	Residing	6187	365	6552
300	F	51	Residing	5753	700	6453
277	F	14	Residing	5235	936	6171
303	F	14	Residing	5343	700	6043
32	F	44	Residing	5394	589	5983
301	M	47	Residing	5276	700	5976
274	F	40	Residing	5736	208	5944
276	M	16	Residing	4985	936	5921
318	M	45	Residing	5320	500	5820
33	M	41	Residing	5252	515	5767
1	M	U	Residing	4197	1460	5657
275	M	39	Residing	4152	208	4360
319	F	20	Residing	3382	50	3432
54	F	U	Visiting	999	35	1034
215	M	U	Farming	-	26	26
>0.5 to 1 km zone						
310	M	64	Residing	6238	2366	8604
311	F	63	Residing	8187	365	8552
185	F	43	Residing and farming	7049	875	7924
186	M	45	Residing and farming	7049	875	7924
248	M	U	Residing and farming	3942	3942	7884
279	F	58	Residing	7117	730	7847
280	M	66	Residing	7117	730	7847
68	F	68	Residing	6516	1189	7705
183	F	56	Residing and farming	6968	530	7498
67	M	68	Residing	6206	1189	7395
49	M	67	Residing	6433	879	7312
50	F	65	Residing	6433	879	7312
182	M	29	Residing and farming	5904	1372	7276
71	F	71	Residing	6268	934	7202
70	M	67	Residing	6171	934	7105
192	F	78	Residing	6589	455	7044
181	M	59	Residing and farming	5220	1460	6680
323	F	80	Residing	5888	403	6291
322	M	82	Residing	6128	163	6291
74	M	59	Residing	5422	788	6210
75	F	60	Residing	5422	788	6210
306	F	17	Residing	5945	223	6168
307	M	15	Residing	5945	223	6168
249	F	U	Residing	5519	613	6132
191	M	20	Residing	5562	78	5640
304	F	38	Residing	5405	223	5628
305	M	43	Residing	5385	223	5608
188	M	48	Residing	4997	515	5512
189	F	54	Residing	4997	515	5512
187	M	18	Residing	4961	275	5236

Table 45. Direct radiation occupancy rates for adults, children and infants in the Springfields area (h y^{-1})

Observation Number	Sex	Age (years)	Main activity	Indoor occupancy	Outdoor occupancy	Total occupancy
308	M	68	Residing	4408	252	4660
309	F	69	Residing	4408	252	4660
190	M	24	Residing	4288	104	4392
72	M	13	Visiting	2772	88	2860
250	M	U	Farm workers	240	2160	2400
251	M	U	Farm workers	-	2280	2280
252	M	U	Farm workers	-	2280	2280
73	M	U	Visiting	2112	44	2156
184	F	27	Visiting	1680	48	1728
69	F	3	Visiting	703	73	776

Notes

U = Unknown

Table 46. Analysis of direct radiation occupancy rates for adults, children and infants in the Springfields area

Number of hours	Number of observations
0 to 0.25 km zone	
>8000 to 8760	5
>7000 to 8000	10
>6000 to 7000	13
>5000 to 6000	5
>4000 to 5000	2
>3000 to 4000	0
>2000 to 3000	7
>1000 to 2000	122
0 to 1000	22
0 to 8760	**186**
>0.25 to 0.5 km zone	
>8000 to 8760	5
>7000 to 8000	9
>6000 to 7000	8
>5000 to 6000	7
>4000 to 5000	1
>3000 to 4000	1
>2000 to 3000	0
>1000 to 2000	1
0 to 1000	1
0 to 8760	**33**
>0.5 to 1 km zone	
>8000 to 8760	2
>7000 to 8000	14
>6000 to 7000	8
>5000 to 6000	6
>4000 to 5000	3
>3000 to 4000	0
>2000 to 3000	5
>1000 to 2000	1
0 to 1000	1
0 to 8760	**40**

Table 47. Gamma dose rate measurements for the Springfields direct radiation survey (μGy h^{-1})

Residences and businesses				
Location	Indoor substrate	Indoor gamma dose rate at 1 metre[a]	Outdoor substrate	Outdoor gamma dose rate at 1 metre[a]
Residence 1	Concrete	0.095	Grass	0.068
Residence 2	Concrete	0.079	Grass	0.078
Residence 3	NM	NM	Grass	0.069
Residence 4	NM	NM	Grass	0.075
Residence 5	Wood	0.056	Grass	0.078
Residence 6	Wood	0.116	Grass	0.087
Residence 7	Concrete	0.101	Stones	0.098
Residence 8	Concrete	0.091	Grass	0.070
Residence 9	Concrete	0.088	Grass	0.073
Residence 10	Concrete	0.081	Grass	0.074
Residence 11	Concrete	0.070	Grass	0.061
Residence 12	Concrete	0.068	Grass	0.070
Residence 13	Concrete	0.075	Grass	0.072
Residence 14	Wood	0.100	Grass	0.074
Residence 15	Concrete	0.084	Grass	0.064
Residence 16	Concrete	0.088	Grass	0.071
Residence 17	Concrete	0.089	Grass	0.078
Residence 18	Concrete	0.090	Grass	0.080
Residence 19	Concrete	0.109	Grass	0.066
Residence 20	Concrete	0.085	Concrete	0.075
Residence 21	Concrete	0.085	Grass	0.081
Residence 22	Concrete	0.093	Grass	0.073
Residence 23	Concrete	0.102	Grass	0.070
Residence 24	Concrete	0.096	Grass	0.081
Residence 25	Concrete	0.079	Grass	0.080
Residence 26	Concrete	0.094	Grass	0.076
Residence 27	Concrete	0.088	Grass	0.078
Residence 28	Concrete	0.087	Grass	0.071

Table 47. Gamma dose rate measurements for the Springfields direct radiation survey (μGy h^{-1})

Residences and businesses				
Residence 29	Concrete	0.080	Grass	0.076
Residence 30	Concrete	0.099	Stones	0.061
Residence 31	Concrete	0.080	Concrete	0.068
Residence 32	Concrete	0.088	Grass	0.074
Residence 33	Concrete	0.097	Grass	0.068
Residence 34	Wood	0.107	Grass	0.085
Residence 35	Concrete	0.096	Grass	0.085
Business 1	Wood	0.068	Grass	0.083
Business 2	Wood	0.097	Grass	0.074
Schools				
School 1	Wood	0.104	Grass	0.074
School 2	Concrete	0.105	Wood	0.076

Notes

NM - Not measured

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

Backgrounds				
	Location	**NGR**	**Substrate**	**Background gamma dose rate at 1 metre**
Background 1	Wesham	SD 422 334	Grass	0.071
Background 2	Broughton	SD 517 346	Grass	0.068
Background 3	Penwortham	SD 510 281	Grass	0.068
Background 4	Hesketh Out Marsh	SD 419 249	Grass	0.078

Table 48. Combinations of adult pathways for consideration in dose assessments in the Springfields area

Combination number	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over houseboat	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over sand	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
1								X		X						X	X												X	X
2	X	X	X																			X		X		X		X		
3	X				X																		X	X	X	X	X	X		
4						X	X	X	X	X		X			X		X													
5						X	X		X	X						X													X	X
6					X					X		X		X	X		X		X										X	X
7					X	X	X	X	X					X	X														X	X
8											X			X		X														X
9										X	X	X		X			X													X
10	X	X			X																				X		X			
11		X																						X		X	X	X		
12											X				X														X	X
13										X					X	X													X	X
14					X					X			X	X		X	X												X	X
15						X	X	X	X	X																			X	X
16	X			X	X																		X	X	X		X	X		
17	X																					X	X	X		X	X	X		
18																					X				X			X		
19						X	X			X							X												X	X
20						X	X	X	X	X								X												
21							X					X		X																
22										X					X	X	X													
23																				X			X							
24								X	X		X						X													
25					X	X			X	X		X		X	X		X								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: root vegetables, domestic fruit, eggs, wild/free foods and indoor and outdoor occupancy.

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	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	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4197	1460
2	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5867	2373
3	F	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5867	2373
5	M	54	**9.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-
6	M	67	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	M	60	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	M	62	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	M	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-	-
10	M	41	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	M	42	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-
13	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-
14	M	36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-
15	M	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-
16	M	58	-	-	-	-	-	4.7	**16.4**	10.2	5.7	10.1	-	12.2	-	-	**14.0**	-	**2.8**	-	-	-	-	-	-	-	-	-	-	-	-	-
17	F	58	-	-	-	-	-	4.7	**16.4**	10.2	5.7	10.1	-	12.2	-	-	**14.0**	-	**2.8**	-	-	-	-	-	-	-	-	-	-	-	-	-
18	F	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6939	525
22	F	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3879	141
23	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3949	71
24	F	61	-	-	-	-	-	-	-	0.2	-	2.3	-	-	-	-	-	8.9	0.3	-	-	-	-	-	-	-	-	-	-	-	5288	658
27	M	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**17.8**	-	-	-	-	-	-	-	-	-	-	-	-	5110	1460
28	F	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**17.8**	-	-	-	-	-	-	-	-	-	-	-	-	4526	730
29	M	62	-	-	-	-	-	0.3	**13.9**	-	**21.8**	16.4	-	-	-	-	-	**28.7**	-	-	-	-	-	-	-	-	-	-	-	-	5941	849
30	F	58	-	-	-	-	-	0.3	**13.9**	-	**21.8**	16.4	-	-	-	-	-	**28.7**	-	-	-	-	-	-	-	-	-	-	-	-	5504	146
32	F	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.6	-	-	-	-	-	-	-	-	-	-	-	-	5394	589
33	M	41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.6	-	-	-	-	-	-	-	-	-	-	-	-	5252	515
35	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
36	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
37	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
38	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
39	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
40	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
41	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
42	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
43	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
44	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**136**	-	32	-	-	-	**136**	-	-	-
45	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**232**	-	32	-	-	-	**232**	-	-	-
46	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**232**	-	32	-	-	-	**232**	-	-	-
49	M	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	-	-	-	-	-	-	-	-	-	-	-	-	6433	879
50	F	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.1	-	-	-	-	-	-	-	-	-	-	-	-	6433	879
51	M	66	-	-	-	-	-	-	-	-	-	**20.0**	-	-	-	-	-	9.2	**6.0**	-	-	-	-	-	-	-	-	-	-	-	5492	1698
52	F	60	-	-	-	-	-	-	-	-	-	**20.0**	-	-	-	-	-	9.2	**6.0**	-	-	-	-	-	-	-	-	-	-	-	5492	1698
53	F	77	-	-	-	-	-	-	-	-	-	11.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7309	94
54	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	999	35
55	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
56	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
57	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
58	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	10	-	-	-	50	-	-	-
59	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	10	-	-	-	50	-	-	-
60	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	10	-	-	-	50	-	-	-
61	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	10	-	-	-	50	-	-	-
62	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	10	-	-	-	50	-	-	-
63	M	U	-	-	-	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	10	-	-	-	50	-	-	-
64	F	U	-	-	-	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	M	U	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**85**	-	183	-	-	-	85	-	-	-
66	F	U	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	M	68	-	-	-	-	-	-	-	-	-	0.7	-	-	-	2.5	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	6206	1189
68	F	68	-	-	-	-	-	-	-	-	-	0.7	-	-	-	2.5	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	6516	1189
70	M	67	-	-	-	-	-	1.1	2.3	-	-	**18.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6171	934
71	F	71	-	-	-	-	-	1.1	2.3	-	-	**18.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6268	934
73	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2112	44
74	M	59	-	-	-	-	-	-	-	-	-	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5422	788
75	F	60	-	-	-	-	-	-	-	-	-	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5422	788
76	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
77	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
78	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
79	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
80	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
81	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
82	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
83	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
84	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
85	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	690	230
86	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	690	230
181	M	59	-	-	-	-	0.3	**13.2**	**26.2**	**18.5**	7.3	-	-	-	-	2.8	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	5220	1460
182	M	29	-	-	-	-	0.3	**13.2**	**26.2**	**18.5**	7.3	-	-	-	-	2.8	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	5904	1372
183	F	56	-	-	-	-	0.3	**13.2**	**26.2**	**18.5**	7.3	-	-	-	-	2.8	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	6968	530
184	F	27	-	-	-	-	0.3	**13.2**	**26.2**	**18.5**	7.3	-	-	-	-	2.8	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	1680	48
185	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7049	875
186	M	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7049	875
187	M	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4961	275
188	M	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4997	515
189	F	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4997	515
190	M	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4288	104
191	M	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5562	78
192	F	78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6589	455
193	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
194	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
195	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
196	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
197	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
198	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
199	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
200	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
201	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-
202	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**100**	-	20	-	-	-	100	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
203	M	79	-	-	-	-	-	-	7.7	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	104
204	F	U	-	-	-	-	-	-	7.7	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1920	96
206	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1920	96
207	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1920	96
208	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1920	96
209	M	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7488	200
210	M	U	-	-	-	-	-	**24.1**	6.0	**15.6**	16.4	**50.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
211	F	U	-	-	-	-	-	**24.1**	6.0	**15.6**	16.4	**50.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
212	M	U	-	-	-	-	-	-	-	-	-	-	**273.8**	-	-	7.5	-	**11.9**	-	-	-	-	-	-	-	-	-	-	-	-	46
213	F	U	-	-	-	-	-	-	-	-	-	-	**273.8**	-	-	7.5	-	**11.9**	-	-	-	-	-	-	-	-	-	-	-	-	46
214	M	U	-	-	-	-	-	-	-	-	-	-	**273.8**	-	-	7.5	-	**11.9**	-	-	-	-	-	-	-	-	-	-	-	-	46
215	M	U	-	-	-	-	-	-	-	-	-	5.3	**273.8**	**31.5**	-	**18.8**	-	-	**6.0**	-	-	-	-	-	-	-	-	-	-	-	26
216	F	U	-	-	-	-	-	-	-	-	-	5.3	**273.8**	**31.5**	-	**18.8**	-	-	**6.0**	-	-	-	-	-	-	-	-	-	-	-	-
220	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5131	725
221	M	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5227	725
224	M	84	**8.5**	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56	-	112	-	168	-	-
225	F	82	**8.5**	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
226	M	U	**9.1**	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	-	**450**	-	450	-	-
227	M	U	**9.1**	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	-	**270**	-	270	-	-
228	F	U	**9.1**	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
229	F	U	**9.1**	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
230	M	80	1.8	-	-	-	**14.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**252**	-	52	**132**	-	**240**	**252**	336	-	-
231	F	U	1.8	0.5	-	-	**14.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
232	M	U	-	-	-	-	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
233	M	U	-	-	-	-	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
234	M	70	-	**4.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	86	-	168	72	168	-	-
235	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33	-	**392**	-	392	-	-
236	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
237	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
238	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
239	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
240	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
241	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
242	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
243	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
244	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
245	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**168**	-	24	-	-	-	**168**	-	-	-
246	M	U	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	36	-	36	-	-
247	F	U	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
248	M	U	-	-	-	-	-	-	-	-	-	-	**155.6**	-	-	-	**7.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	3942	3942
249	F	U	-	-	-	-	-	-	-	-	-	-	**155.6**	-	-	-	**7.0**	-	-	-	-	-	-	-	-	-	-	-	-	-	5519	613
250	M	U	-	-	-	-	-	-	-	-	-	-	**155.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	240	2160
251	M	U	-	-	-	-	-	-	-	-	-	-	**155.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2280
252	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2280
253	F	57	-	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	8.0	-	-	-	-	-	-	-	-	-	-	-	-	7360	725
254	M	57	-	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	**13.3**	-	-	-	-	-	-	-	-	-	-	-	-	5502	1407
255	M	19	-	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	8.0	-	-	-	-	-	-	-	-	-	-	-	-	6584	100
256	M	21	-	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	8.0	-	-	-	-	-	-	-	-	-	-	-	-	6428	100
257	F	U	-	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	926	10
258	F	U	-	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	1020	20
259	M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6603	1825
260	F	86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8063	365
261	F	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5152	1460
262	M	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7322	550
263	F	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7738	550
264	F	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5690	550
265	F	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6122	370
266	M	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6024	96
267	F	57	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	5329	2555
268	M	62	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	7154	730
269	M	81	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	7592	730
270	F	74	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	7592	730
271	M	35	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	7.6	-	-	-	-	-	-	-	-	-	-	-	-	6187	365

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
274	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**21.3**	-	-	-	-	-	-	-	-	-	-	-	-	5736	208
275	M	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**21.3**	-	-	-	-	-	-	-	-	-	-	-	-	4152	208
276	M	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**21.3**	-	-	-	-	-	-	-	-	-	-	-	-	4985	936
279	F	58	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7117	730
280	M	66	-	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7117	730
281	F	56	-	-	-	-	1.3	-	-	-	-	6.0	-	**31.5**	-	**37.7**	1.5	-	0.5	-	**1.5**	-	-	-	-	-	-	-	-	-	6561	1120
282	M	57	-	-	-	-	1.3	-	-	-	-	6.0	-	**31.5**	-	**37.7**	1.5	-	0.5	-	**1.5**	-	-	-	-	-	-	-	-	-	4224	3360
283	M	30	-	-	-	-	1.3	-	-	-	-	6.0	-	**31.5**	-	**37.7**	1.5	-	0.5	-	**1.5**	-	-	-	-	-	-	-	-	-	550	1600
294	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1267	293
295	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1267	293
296	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1267	293
297	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1267	293
298	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	877	293
299	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	780	780
300	F	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**17.1**	-	-	-	-	-	-	-	-	-	-	-	-	5753	700
301	M	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**17.1**	-	-	-	-	-	-	-	-	-	-	-	-	5276	700
302	F	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**17.1**	-	-	-	-	-	-	-	-	-	-	-	-	6260	700
304	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5405	223
305	M	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5385	223
306	F	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5945	223
308	M	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4408	252
309	F	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4408	252
310	M	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6238	2366
311	F	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8187	365
312	F	41	-	-	-	-	0.2	-	-	-	-	2.1	-	-	**10.7**	10.7	-	**29.1**	1.1	-	-	-	-	-	-	-	-	-	-	-	6972	714
313	M	46	-	-	-	-	0.2	-	-	-	-	2.1	-	-	**10.7**	10.7	-	**20.2**	1.1	-	-	-	-	-	-	-	-	-	-	-	4830	2856
317	F	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6581	1040
318	M	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5320	500
319	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3382	50
320	F	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6659	50
322	M	82	-	-	-	-	-	1.1	0.5	0.9	1.8	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6128	163
323	F	80	-	-	-	-	-	1.1	0.5	0.9	1.8	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5888	403

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
324	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**210**	-	120	-	-	-	**210**	-	-	-
325	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**210**	-	120	-	-	-	**210**	-	-	-
326	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**210**	-	120	-	-	-	**210**	-	-	-
327	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**210**	-	120	-	-	-	**210**	-	-	-
328	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**210**	-	120	-	-	-	**210**	-	-	-
329	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**105**	-	60	-	-	-	105	-	-	-
330	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**105**	-	60	-	-	-	105	-	-	-
331	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**105**	-	60	-	-	-	105	-	-	-
332	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**105**	-	60	-	-	-	105	-	-	-
333	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**105**	-	60	-	-	-	105	-	-	-
334	M	U	-	-	-	-	**19.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**160**	-	80	-	-	-	**160**	-	-	-
335	F	U	-	-	-	-	**19.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
336	M	17	-	-	-	-	**19.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
337	M	U	3.2	-	-	**0.1**	**12.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**175**	-	65	24	-	-	**199**	30	-	-
338	F	U	3.2	-	-	**0.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
339	M	55	2.8	0.9	-	-	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	-	-	-	40	-	-	-
340	F	55	2.8	0.9	-	-	4.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
341	M	25	-	-	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
342	F	25	-	-	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
343	M	72	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
344	F	71	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	M	76	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
346	M	76	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
347	F	74	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
348	M	78	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
349	F	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**86**	-	57	-	-	-	86	-	-	-
350	F	65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**86**	-	57	-	-	-	86	-	-	-
351	M	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**86**	-	57	-	-	-	86	-	-	-
352	M	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**86**	-	57	-	-	-	86	-	-	-
353	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	10	-	-	-	15	-	-	-
354	F	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	10	-	-	-	15	-	-	-
355	M	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
356	F	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-	-
357	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
358	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
359	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
360	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
361	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
362	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
363	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
364	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
365	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-
366	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-
367	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-
368	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-
369	F	61	**11.3**	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	355	-	-	-	-	-	-	-
370	M	61	**11.3**	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
371	M	38	**11.3**	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	-
372	M	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	30	-	106	-	-
374	F	55	**14.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
375	F	80	**7.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
376	M	20	**7.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-
377	M	45	**7.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
378	F	44	**7.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
379	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420	-	-	700	-	-
380	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420	-	-	700	-	-
381	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420	-	-	700	-	-
382	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	420	-	-	700	-	-
383	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	-	-	140	-	-
384	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	-	-	140	-	-
385	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	-	-	140	-	-
386	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	-	-	140	-	-
387	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	56	-	-
388	M	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	56	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
389	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	56	-	-
390	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	56	-	-
391	M	72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	336	-	-	560	-	-
392	M	51	**14.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**413**	-	-	-	**250**	3	450	-	-
393	F	79	**14.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
394	M	52	**9.1**	**10.0**	**0.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**360**	-	**264**	-	**280**	**264**	1092	-	-
395	F	51	**9.1**	**6.8**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
396	M	71	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**488**	-	488	-	-
397	F	70	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
398	M	U	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
399	F	U	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400	M	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7596**	-	-	380	-	-
401	M	56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-	-	-	-	-	-
402	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-	-	-	-	-	-
403	M	U	-	-	-	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**1092**	-	-	-	-	-	-	-
404	M	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2190	-	-	2190	-	-
405	M	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	812	-	-	1138	-	-
406	F	47	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	325	-	-	455	-	-
407	M	93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5040**	-	-	1008	-	-
408	F	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	**5040**	-	-	1008	-	-
409	M	50	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
410	F	50	2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
411	M	56	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
412	F	55	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
413	M	60	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
414	M	61	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	-	-	-	-	-
415	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**700**	-	-	-	-	-	-	-
416	M	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	320	-	-	-	-	-	-	-
417	F	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-
421	F	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	270	**90**	-	-	-	-	-	-
422	M	57	-	-	-	-	-	0.8	4.1	4.1	4.6	**39.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1520	240
423	F	57	-	-	-	-	-	0.8	4.1	4.1	4.6	**39.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1520	240

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
424	F	22	-	-	-	-	-	0.8	4.1	4.1	4.6	**39.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	950	150
425	F	22	-	-	-	-	-	0.8	4.1	4.1	4.6	**39.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	950	150
426	M	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6647	289
427	M	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2070	230
428	M	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2070	230
429	M	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1374	96
430	M	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1129	96
431	M	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
432	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
433	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
434	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
435	F	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
436	M	54	-	-	-	-	-	**9.4**	**13.5**	-	-	15.1	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	7515	360
437	F	57	-	-	-	-	-	**9.4**	**13.5**	-	-	15.1	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	5763	360
438	M	47	-	-	-	-	-	**24.4**	**16.0**	**41.1**	**25.5**	**21.5**	-	-	-	-	-	-	-	**3.4**	-	-	-	-	-	-	-	-	-	-	-
439	F	32	-	-	-	-	-	**24.4**	**16.0**	**41.1**	**25.5**	**21.5**	-	-	-	-	-	-	-	**3.4**	-	-	-	-	-	-	-	-	-	-	-
442	M	U	-	-	-	-	-	-	6.0	-	-	-	-	**18.9**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
443	M	U	-	-	-	-	-	-	6.0	-	-	-	-	**18.9**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
444	M	U	-	-	-	-	-	-	6.0	-	-	-	-	**18.9**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
445	M	U	-	-	-	-	-	-	6.0	-	-	-	-	**18.9**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
446	F	U	-	-	-	-	-	-	6.0	-	-	-	-	**18.9**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
447	F	U	-	-	-	-	-	-	6.0	-	-	-	-	**18.9**	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
452	M	61	-	-	-	-	-	-	-	-	-	6.1	-	-	-	-	**11.1**	**17.8**	**-**	-	-	-	-	-	-	-	-	-	-	-	-
453	F	61	-	-	-	-	-	-	-	-	-	6.1	-	-	-	-	**11.1**	**17.8**	**-**	-	-	-	-	-	-	-	-	-	-	-	-
454	M	35	-	-	-	-	-	-	-	-	-	1.6	-	-	-	-	**11.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
455	F	35	-	-	-	-	-	-	-	-	-	1.6	-	-	-	-	**11.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
456	M	37	-	-	-	-	-	-	-	-	-	1.6	-	-	-	-	**11.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
457	F	37	-	-	-	-	-	-	-	-	-	1.6	-	-	-	-	**11.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
458	M	40	-	-	-	-	-	-	-	-	-	1.6	-	-	-	-	**11.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
459	F	40	-	-	-	-	-	-	-	-	-	1.6	-	-	-	-	**11.1**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
463	M	55	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
464	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
465	M	17	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
467	F	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65	-	-	-	-	-	-	-
468	M	65	-	-	-	-	-	5.3	5.9	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
469	M	U	-	-	-	-	-	5.3	5.9	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
470	F	U	-	-	-	-	-	5.3	5.9	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
471	F	U	-	-	-	-	-	5.3	5.9	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
478	M	67	-	-	-	-	-	**12.6**	5.3	7.4	10.1	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
479	F	65	-	-	-	-	-	**12.6**	5.3	7.4	10.1	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
480	F	89	-	-	-	-	-	**12.6**	5.3	7.4	10.1	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
481	M	66	-	-	-	-	-	**12.6**	5.3	7.4	10.1	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
483	M	U	-	-	-	-	-	-	4.0	**21.8**	13.7	8.7	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-
484	F	75	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
485	M	U	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
486	F	46	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
487	M	47	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
488	M	21	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
489	F	19	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
490	F	19	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
491	M	21	-	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
492	M	U	-	-	-	-	-	**18.6**	**23.2**	**17.5**	-	8.6	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-
493	F	U	-	-	-	-	-	**18.6**	**23.2**	**17.5**	-	8.6	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-
494	F	44	-	-	-	-	-	**13.1**	**14.2**	12.2	-	15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
495	M	39	-	-	-	-	-	**13.1**	**14.2**	12.2	-	15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
499	M	42	-	-	-	-	-	**16.8**	10.6	6.5	3.0	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
500	F	49	-	-	-	-	-	**16.8**	10.6	6.5	3.0	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
501	M	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**107**	**143**	-	-	-	-	-	-	-	-	-
502	M	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**20**	10	-	-	-	-	-	-	-	-	-
503	M	65	-	-	-	-	-	**20.6**	1.7	2.3	**30.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
504	F	61	-	-	-	-	-	**20.6**	1.7	2.3	**30.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
505	M	35	-	-	-	-	-	6.9	0.6	0.8	10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
506	M	37	-	-	-	-	-	6.9	0.6	0.8	10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
507	M	55	-	-	-	-	-	-	-	0.8	2.0	-	**383.2**	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Molluscs	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Wild fungi	Intertidal occupancy over grass	Intertidal occupancy over mud	Intertidal occupancy over mud and stones	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
508	F	51	-	-	-	-	-	-	-	0.8	2.0	-	**383.2**	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
509	M	32	-	-	-	-	-	-	-	0.8	2.0	-	**383.2**	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
510	F	40	-	-	-	-	-	-	-	0.8	2.0	-	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-
513	M	U	-	-	-	-	-	-	-	-	-	-	**365.0**	**47.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
514	M	U	-	-	-	-	-	-	-	-	-	-	**365.0**	**47.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
515	M	U	-	-	-	-	-	-	0.6	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
516	F	U	-	-	-	-	-	-	0.6	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
517	M	59	-	-	-	-	-	**26.9**	**38.1**	**40.6**	**59.0**	**22.9**	-	-	-	-	-	-	-	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-
518	F	65	-	-	-	-	-	**26.9**	**38.1**	**31.7**	**59.0**	**22.9**	-	-	-	-	-	-	-	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-
519	M	48	-	-	-	-	**10.6**	2.0	-	-	**25.0**	12.3	-	**23.7**	-	**17.0**	**5.5**	-	0.6	-	-	-	-	-	24	-	-	-	24	-	-	-
520	F	50	-	-	-	-	**10.6**	2.0	-	-	**25.0**	12.3	-	**23.7**	-	**17.0**	**5.5**	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-
521	F	16	-	-	-	-	**10.6**	2.0	-	-	**25.0**	12.3	-	**23.7**	-	**17.0**	**5.5**	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-
522	M	78	-	-	-	-	**10.6**	2.0	-	-	**25.0**	12.3	-	**23.7**	-	**17.0**	**5.5**	-	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-
523	M	U	-	-	-	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-	-	24	-	-	-
524	M	66	-	-	-	-	-	-	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	122	-	-	-	-	-	-	-
525	M	34	-	-	-	-	-	-	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	122	-	-	-	-	-	-	-
526	F	U	-	-	-	-	-	-	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
527	M	U	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
528	F	U	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
529	F	U	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
530	F	U	-	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-
531	M	58	**20.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	**435**	-	**270**	-	**500**	**349**	1200	-	-

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}) in the Springfields area

Observation number	Sex	Age (years)	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	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)																									
4	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5867	2373
21	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	50
25	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	440	88
26	M	6	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-	440	88
34	F	6	-	-	-	-	-	-	-	-	-	-	-	-	5.6	-	-	-	-	-	-	-	-	6503	319
47	M	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**68**	-	-	**68**	-	-	-
48	M	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**68**	-	-	**68**	-	-	-
72	M	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2772	88
107	M	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
108	M	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
109	M	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
110	F	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
111	F	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
112	M	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
113	M	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
114	M	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
115	F	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
116	F	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
117	F	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
118	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
119	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
120	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
121	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
122	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323

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

Observation number	Sex	Age (years)	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
123	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
124	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
125	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
126	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
127	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
128	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
129	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
130	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
131	F	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
132	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
133	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
134	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
135	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
136	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
137	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
138	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
139	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
140	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
141	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
142	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
143	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
144	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
145	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
146	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
147	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323

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

Observation number	Sex	Age (years)	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
148	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
149	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
150	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
151	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
152	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
153	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
154	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
155	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
156	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
157	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
158	F	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
159	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
160	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
161	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
162	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
163	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
164	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
165	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
166	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
167	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
168	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
169	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
170	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
171	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
172	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323

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

Observation number	Sex	Age (years)	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
173	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
174	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
175	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
176	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
177	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
178	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
179	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
180	F	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
217	M	6	-	-	-	-	-	-	2.6	**136.9**	**15.8**	-	**9.4**	-	-	**0.8**	-	-	-	-	-	-	-	-	-
222	F	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6523	725
223	F	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6523	725
272	M	13	-	-	-	-	-	-	0.7	-	-	-	-	-	**7.6**	-	-	-	-	-	-	-	-	6274	730
273	F	15	-	-	-	-	-	-	0.7	-	-	-	-	-	**7.6**	-	-	-	-	-	-	-	-	6274	730
277	F	14	-	-	-	-	-	-	-	-	-	-	-	-	**21.3**	-	-	-	-	-	-	-	-	5235	936
278	M	10	-	-	-	-	-	-	-	-	-	-	-	-	**21.3**	-	-	-	-	-	-	-	-	6484	936
284	M	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
285	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
286	M	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
287	M	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
288	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
289	M	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
290	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
291	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
292	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235
293	M	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1130	235

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

Observation number	Sex	Age (years)	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
303	F	14	-	-	-	-	-	-	-	-	-	-	-	-	**17.1**	-	-	-	-	-	-	-	-	5343	700
307	M	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5945	223
314	M	14	-	**0.2**	-	-	-	-	2.1	-	-	**10.7**	**10.7**	-	**20.2**	**1.1**	-	-	-	-	-	-	-	5917	510
315	F	13	-	**0.2**	-	-	-	-	2.1	-	-	**10.7**	**10.7**	-	**20.2**	**1.1**	-	-	-	-	-	-	-	5917	510
316	M	6	-	**0.1**	-	-	-	-	1.6	-	-	**8.0**	**8.0**	-	**15.1**	**0.8**	-	-	-	-	-	-	-	7737	510
321	M	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6834	50
373	M	14	**14.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**20**	-	-	**10**	-	70	-	-
440	F	7	-	-	**10.3**	**12.0**	**14.3**	**19.1**	**15.8**	-	-	-	-	-	-	0.3	**3.4**	-	-	-	-	-	-	-	-
448	M	14	-	-	-	**6.0**	-	-	-	-	**18.9**	-	**6.8**	-	-	-	-	-	-	-	-	-	-	-	-
449	M	14	-	-	-	**6.0**	-	-	-	-	**18.9**	-	**6.8**	-	-	-	-	-	-	-	-	-	-	-	-
450	F	11	-	-	-	**6.0**	-	-	-	-	**18.9**	-	**6.8**	-	-	-	-	-	-	-	-	-	-	-	-
451	F	10	-	-	-	**6.0**	-	-	-	-	**18.9**	-	**6.8**	-	-	-	-	-	-	-	-	-	-	-	-
460	F	7	-	-	-	-	-	-	0.9	-	-	-	-	**5.5**	-	-	-	-	-	-	-	-	-	-	-
466	F	14	-	-	-	-	-	-	-	-	-	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-
472	M	13	-	-	**5.3**	**5.9**	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
473	F	15	-	-	**5.3**	**5.9**	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
474	F	12	-	-	**5.3**	**5.9**	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
475	F	9	-	-	4.0	4.4	1.6	-	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
476	F	6	-	-	4.0	4.4	1.6	-	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
482	F	8	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
496	F	13	-	-	**13.1**	**14.2**	**12.2**	-	**15.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
497	M	11	-	-	**13.1**	**14.2**	**12.2**	-	**15.6**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
498	F	9	-	-	**9.8**	**10.6**	**9.1**	-	**11.7**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
511	U	14	-	-	-	-	0.8	2.0	-	**268.3**	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
Infant age group (0 - 5 years old)																									
19	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	50
20	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	50
31	F	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	720	240
69	F	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	703	73
87	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
88	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
89	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
90	M	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
91	F	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
92	F	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
93	F	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
94	F	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
95	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
96	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
97	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
98	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
99	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
100	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
101	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
102	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
103	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
104	M	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
105	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323
106	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	912	323

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

Observation number	Sex	Age (years)	Fish	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud and stones	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Handling fishing gear	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
218	M	4	-	-	-	-	-	-	1.3	**68.4**	**7.9**	-	**4.7**	-	-	**0.4**	-	-	-	-	-	-	-	-	-
219	F	2	-	-	-	-	-	-	1.3	**68.4**	**7.9**	-	**4.7**	-	-	**0.4**	-	-	-	-	-	-	-	-	-
418	F	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12**	-	-	-	-	-
419	F	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12**	-	-	-	-	-
420	M	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12**	-	-	-	-	-
441	F	5	-	-	**7.4**	**8.0**	**8.8**	**12.7**	**10.8**	-	-	-	-	-	-	-	**1.7**	-	-	-	-	-	-	-	-
461	M	5	-	-	-	-	-	-	0.9	-	-	-	-	**5.5**	-	-	-	-	-	-	-	-	-	-	-
462	F	2	-	-	-	-	-	-	0.9	-	-	-	-	**5.5**	-	-	-	-	-	-	-	-	-	-	-
477	F	4	-	-	**2.7**	**2.9**	1.1	-	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
512	U	2	-	-	-	-	0.3	0.7	-	**126.5**	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-

Notes

Emboldened observations are the high-rate individuals

U = Unknown

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

Details of activity	Exposure pathways involved	Estimated occupancy 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] in the Springfields area, for use in foetal dose assessments

Observation number	Sex	Age (years)	Fish	Crustaceans	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
2	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5867	2373
3	F	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5867	2373
23	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3949	71
32	F	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.6	-	-	-	-	-	-	-	-	5394	589
54	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	999	35
64	F	U	-	-	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66	F	U	-	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
77	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
78	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
79	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
80	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1140	190
81	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
82	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
83	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
84	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	570	190
85	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	690	230
184	F	27	-	-	-	0.3	13.2	26.2	18.5	7.3	-	-	-	-	2.8	0.3	-	-	-	-	-	-	-	-	-	1680	48
185	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7049	875
204	F	U	-	-	-	-	-	7.7	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
211	F	U	-	-	-	-	24.1	6.0	15.6	16.4	50.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
213	F	U	-	-	-	-	-	-	-	-	-	273.8	-	-	7.5	-	11.9	-	-	-	-	-	-	-	-	-	46
216	F	U	-	-	-	-	-	-	-	-	5.3	273.8	31.5	-	18.8	-	-	6.0	-	-	-	-	-	-	-	-	-
220	F	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5131	725
228	F	U	9.1	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
229	F	U	9.1	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
231	F	U	1.8	0.5	-	14.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
247	F	U	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
249	F	U	-	-	-	-	-	-	-	-	-	155.6	-	-	-	7.0	-	-	-	-	-	-	-	-	-	5519	613
257	F	U	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-	926	10
258	F	U	-	-	-	-	-	-	-	-	5.5	-	-	-	-	3.1	-	-	-	-	-	-	-	-	-	1020	20
264	F	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5690	550
273	F	15	-			-	-	-	-	-	0.7	-	-	-	-	-	7.6	-	-	-	-			-	-	6274	730
274	F	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.3	-	-	-	-	-	-	-	-	5736	208
296	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1267	293
297	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1267	293
302	F	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.1	-	-	-	-	-	-	-	-	6260	700
304	F	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5405	223
306	F	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5945	223
312	F	41	-	-	-	0.2	-	-	-	-	2.1	-	-	10.7	10.7	-	29.1	1.1	-	-	-	-	-	-	-	6972	714
319	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3382	50
320	F	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6659	50
335	F	U	-	-	-	19.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
338	F	U	3.2	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
342	F	25	-	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
353	F	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	10	-	-	15	-	-	-
356	F	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	-
361	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-
362	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-
363	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-
364	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
367	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-
368	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-
378	F	44	7.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
385	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	-	140	-	-
386	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	84	-	140	-	-
389	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	56	-	-
390	F	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	56	-	-
399	F	U	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
402	F	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	96	-	-	-	-	-	-
415	F	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	700	-	-	-	-	-	-
421	F	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	270	90	-	-	-	-	-
424	F	22	-	-	-	-	0.8	4.1	4.1	4.6	39.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	950	150
425	F	22	-	-	-	-	0.8	4.1	4.1	4.6	39.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	950	150
432	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
433	F	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
434	F	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
435	F	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	884	96
439	F	32	-	-	-	-	24.4	16.0	41.1	25.5	21.5	-	-	-	-	-	-	-	3.4	-	-	-	-	-	-	-	-
446	F	U	-	-	-	-	-	6.0	-	-	-	-	18.9	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-
447	F	U	-	-	-	-	-	6.0	-	-	-	-	18.9	-	6.8	-	-	-	-	-	-	-	-	-	-	-	-
455	F	35	-	-	-	-	-	-	-	-	1.6	-	-	-	-	11.1	-	-	-	-	-	-	-	-	-	-	-
457	F	37	-	-	-	-	-	-	-	-	1.6	-	-	-	-	11.1	-	-	-	-	-	-	-	-	-	-	-
459	F	40	-	-	-	-	-	-	-	-	1.6	-	-	-	-	11.1	-	-	-	-	-	-	-	-	-	-	-
464	F	U	-	-	-	-	-	-	-	-	-	-	-	-	2.8	-	-	-	-	-	-	-	-	-	-	-	-
470	F	U	-	-	-	-	5.3	5.9	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Observation number	Sex	Age (years)	Fish	Crustaceans	Marine plants/algae	Wildfowl	Green vegetables	Other vegetables	Root vegetables	Potato	Domestic fruit	Milk	Cattle meat	Pig meat	Sheep meat	Poultry	Eggs	Wild/free foods	Honey	Intertidal occupancy over mud	Intertidal occupancy over salt marsh	Intertidal occupancy over sand	Intertidal occupancy boat over mud	Handling sediment	Occupancy on water	Indoor occupancy within 1 km of the licensed site boundary	Outdoor occupancy within 1 km of the licensed site boundary
471	F	U	-	-	-	-	5.3	5.9	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
473	F	15	-			-	5.3	5.9	2.1	-	4.1	-	-	-	-	-	-	-	-	-	-			-	-	-	-
489	F	19	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
490	F	19	-	-	-	-	7.0	12.0	3.4	-	5.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
493	F	U	-	-	-	-	18.6	23.2	17.5	-	8.6	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-
494	F	44	-	-	-	-	13.1	14.2	12.2	-	15.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
510	F	40	-	-	-	-	-	-	0.8	2.0	-	-	-	-	-	-	-	0.8	-	-	-	-	-	-	-	-	-
516	F	U	-	-	-	-	-	0.6	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
521	F	17	-	-	-	10.6	2.0	-	-	25.0	12.3	-	23.7	-	17.0	5.5	-	0.6	-	-	-	-	-	-	-	-	-
526	F	U	-	-	-	-	-	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
528	F	U	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-
529	F	U	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-
530	F	U	-	-	-	-	-	-	-	-	4.0	-	-	-	-	-	-	1.0	-	-	-	-	-	-	-	-	-

Notes

U = Unknown

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

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

Profile Name	Number of individuals	Pathway Name: Crustacea	Direct[a]	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Houseboat occupants[b]	Gamma ext - Salt marsh[c]	Gamma ext - Sediment[d]	Honey	Marine plants/algae	Meat - Cow	Meat - Pig	Meat - Poultry	Meat - Sheep	Wildfowl	Milk	Molluscs	Mushrooms	Occupancy ON water	Plume (IN; 0-0.25km)[e]	Plume (MID; >0.25-0.5km)[e]	Plume (OUT; >0.5-1.1km)[e]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		kg	-	kg	kg	kg	kg	h	h	h	kg	kg	kg	kg	kg	kg	kg	kg	l	kg	kg	h	h	h	h	kg	kg	kg	kg
Crustacean consumers	3	7.2	-	-	6.0	-	-	-	-	240	-	-	-	-	-	-	-	-	-	0.26	-	420	-	-	-	-	-	-	-	-
Occupants for direct radiation	133	-	1.00	3.2	-	3.0	0.19	-	-	-	-	-	0.95	0.16	0.29	1.4	0.04	12.9	-	0.03	-	1910	1160	1690	0.60	1.4	0.71	0.78
Egg consumers	18	-	0.89	19.0	-	3.0	0.12	-	-	-	-	-	-	1.2	1.4	2.4	0.02	45.6	-	-	-	2590	1980	-	0.03	1.5	2.4	-
Sea fish consumers	20	1.5	-	-	10.4	-	-	-	18	100	-	-	-	-	-	-	-	-	0.04	-	180	-	-	-	-	-	-	-
Domestic fruit consumers	14	-	0.57	1.3	-	30.5	0.86	-	-	-	0.68	-	-	-	-	-	-	-	-	-	-	410	1030	1020	11.1	10.1	15.7	14.4
Wild fruit and nut consumers	6	-	0.50	3.1	-	11.8	5.0	-	-	-	-	-	14.6	-	4.7	6.3	-	91.3	-	-	-	-	2400	-	1.6	5.5	1.9	3.4
Houseboat occupants	3	-	-	-	-	-	-	5890	4	-	-	-	-	-	-	-	-	-	-	-	800	-	-	-	-	-	-	-
Occupants for exposure - Salt marsh	2	-	-	-	-	-	-	-	900	-	-	0.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occupants for exposure - Sediment	5	2.0	-	-	9.2	-	-	-	10	480	-	-	-	-	-	-	2.9	-	0.16	-	620	-	-	-	-	-	-	-
Honey consumers	4	-	-	-	-	22.2	-	-	-	-	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	25.6	27.1	42.2	38.6
Marine plants/algae consumers	3	-	-	-	2.1	-	-	-	390	66	-	0.13	-	-	-	-	4.0	-	-	-	10	-	-	-	-	-	-	-
Cattle meat consumers	17	-	0.24	-	-	4.6	0.92	-	1	-	-	-	27.1	-	1.6	15.2	2.7	75.1	-	0.27	-	1020	2	-	0.48	2.1	5.9	-
Pork meat consumers	2	-	1.00	24.6	-	2.1	1.1	-	-	-	-	-	-	10.7	-	10.7	0.19	-	-	-	-	7690	-	-	-	-	-	-
Poultry meat consumers	16	-	0.13	2.2	-	5.7	0.50	-	2	-	-	-	7.4	-	9.5	4.2	2.6	19.4	-	-	-	-	-	880	1.1	2.1	7.0	1.3
Sheep meat consumers	9	-	0.44	-	-	8.6	1.7	-	3	-	-	-	28.0	-	2.9	24.3	5.1	60.8	-	0.50	-	1940	3	-	0.91	-	11.1	-
Wildfowl consumers	10	0.05	-	-	0.68	4.9	0.23	-	22	74	-	0.01	9.5	-	2.2	6.8	14.2	-	-	-	37	-	-	-	0.82	-	10.0	-
Milk consumers	14	-	0.57	2.5	-	0.76	1.0	-	-	-	-	-	11.3	-	1.0	4.3	-	276.5	-	-	-	10	2	1340	-	-	0.44	0.18
Mollusc consumers	1	10.0	-	-	9.1	-	-	-	-	620	-	-	-	-	-	-	-	-	0.79	-	1090	-	-	-	-	-	-	-
Mushroom consumers	3	-	1.00	-	-	6.0	0.45	-	-	-	-	-	31.5	-	1.5	37.7	1.3	-	-	1.5	-	5810	-	-	-	-	-	-
Occupancy ON water	6	1.7	-	-	4.9	-	-	2180	2	220	-	-	-	-	-	-	-	-	0.13	-	1270	-	-	-	-	-	-	-
Occupants for plume pathways (inner area)	30	-	1.00	6.3	-	3.5	0.18	-	-	-	-	-	2.1	0.71	0.52	3.2	0.10	-	-	0.10	-	6780	-	-	0.64	1.8	1.5	<0.01
Occupants for plume pathways (mid area)	23	-	1.00	8.0	-	2.4	0.52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6690	-	-	-	-	-
Occupants for plume pathways (outer area)	32	-	1.00	0.51	-	1.9	0.04	-	-	-	-	-	-	-	0.46	0.42	0.03	9.7	-	-	-	-	-	6660	1.4	2.6	0.80	1.8
Green vegetable consumers	24	-	0.25	-	-	12.0	0.12	-	-	-	0.46	-	-	-	0.05	0.47	0.05	-	-	-	-	580	-	970	17.1	15.5	14.1	15.3
Other domestic vegetable consumers	18	-	0.44	3.2	-	12.2	0.43	-	-	-	0.61	-	1.4	-	1.6	0.63	0.06	-	-	-	-	1470	-	1290	13.7	20.9	14.1	17.1
Potato consumers	12	-	0.17	4.8	-	14.2	0.19	-	2	-	0.80	-	7.9	-	1.8	5.7	3.5	-	-	-	-	1040	-	-	12.7	11.6	31.1	13.2
Root vegetable consumers	13	-	0.31	-	-	16.6	-	-	-	-	0.91	-	-	-	0.09	0.87	0.09	-	-	-	-	-	-	1780	18.5	21.2	18.8	24.3

Notes

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

[b]Gamma ext - houseboat represents occupancy of boat over mud.

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

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

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

Profile Name	Number of individuals	Pathway Name: Direct[a]	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext - Sediment[b]	Honey	Meat - Cow	Meat - Pig	Meat - Poultry	Meat - Sheep	Wildfowl	Milk	Occupancy ON water	Plume (IN; 0-0.25km)[c]	Plume (MID; >0.25-0.5km)[c]	Plume (OUT; >0.5-1km)[c]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		-	kg	kg	kg	kg	h	kg	kg	kg	kg	kg	kg	h	h	h	h	h	kg	kg	kg	kg
Occupants for direct radiation	**102**	1.00	1.3	-	0.07	0.03	-	-	-	0.29	-	0.29	<0.01	-	-	1390	540	89	-	-	-	-
Egg consumers	**8**	1.00	16.3	-	0.90	0.36	-	-	-	3.7	-	3.7	0.07	-	-	2640	4210	-	-	-	-	-
Sea fish consumers	**1**	-	-	14.4	-	-	20	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
Domestic fruit consumers	**4**	-	-	-	14.7	0.08	-	0.85	-	-	-	-	-	-	-	-	-	-	11.6	12.7	4.8	11.9
Wild fruit and nut consumers	**4**	0.75	13.9	-	2.1	0.91	-	-	3.9	7.3	-	9.7	0.13	34.2	-	5280	-	-	-	-	-	-
Occupants for exposure - sediment	**2**	-	-	-	-	-	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honey consumers	**1**	-	-	-	15.8	0.32	-	3.4	-	-	-	-	-	-	-	-	-	-	10.3	12.0	19.1	14.3
Cattle meat consumers	**5**	-	-	-	0.53	0.15	-	-	18.3	-	-	7.3	-	27.4	-	-	-	-	-	4.8	-	-
Pork meat consumers	**3**	1.00	18.5	-	1.9	0.96	-	-	-	9.8	-	9.8	0.17	-	-	7030	-	-	-	-	-	-
Poultry meat consumers	**1**	-	-	-	0.90	-	-	-	-	-	5.5	-	-	-	-	-	-	-	-	-	-	-
Sheep meat consumers	**8**	0.38	6.9	-	1.1	0.46	-	-	11.4	3.7	-	8.2	0.07	17.1	-	2640	-	-	-	3.0	-	-
Wildfowl consumers	**3**	1.00	18.5	-	1.9	0.96	-	-	-	9.8	-	9.8	0.17	-	-	7030	-	-	-	-	-	-
Milk consumers	**2**	-	-	-	1.3	0.51	-	-	7.9	-	-	4.7	-	202.6	-	-	-	-	-	-	1.0	0.42
Occupancy ON water	**1**	-	-	14.4	-	-	20	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-
Occupants for plume pathways (inner area)	**5**	1.00	11.1	-	1.2	0.58	-	-	-	5.9	-	5.9	0.10	-	-	7120	-	-	-	-	-	-
Occupants for plume pathways (mid area)	**8**	1.00	10.1	-	0.18	-	-	-	-	-	-	-	-	-	-	-	6950	-	-	-	-	-
Occupants for plume pathways (outer area)	**2**	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4510	-	-	-	-
Green vegetable consumers	**7**	-	-	-	10.2	0.05	-	0.49	-	-	-	-	-	-	-	-	-	-	8.9	9.8	2.7	7.7
Other domestic vegetable consumers	**11**	-	-	-	6.5	0.03	-	0.31	6.9	-	-	2.5	-	-	-	-	-	-	5.7	8.4	1.7	4.9
Potato consumers	**1**	-	-	-	15.8	0.32	-	3.4	-	-	-	-	-	-	-	-	-	-	10.3	12.0	19.1	14.3
Root vegetable consumers	**4**	-	-	-	14.7	0.08	-	0.85	-	-	-	-	-	-	-	-	-	-	11.6	12.7	4.8	11.9

Notes

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

[b]Gamma ext - sediment includes occupancy over mud; over mud 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 8. Summary of profiles for the infant age group (0 - 5 years old) in the Springfields area

Profile Name	Number of individuals	Pathway Name														
		Direct[a]	Fruit - Domestic	Fruit and nuts - Wild	Gamma ext - Salt marsh[b]	Honey	Meat - Cow	Meat - Poultry	Meat - Sheep	Milk	Plume (IN; 0-0.25km)[c]	Plume (OUT; >0.5-1km)[c]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		-	kg	kg	kg	kg	kg	kg	kg	l	h	h	kg	kg	kg	kg
Occupants for direct radiation	**24**	1.00	-	-	-	-	-	-	-	-	1090	32	-	-	-	-
Domestic fruit consumers	**1**	-	10.8	-	-	1.7	-	-	-	-	-	-	7.4	8.0	12.7	8.8
Wild fruit and nut consumers	**2**	-	1.3	0.38	-	-	7.9	-	4.7	68.4	-	-	-	-	-	-
Occupants for exposure - Salt marsh	**3**	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-
Honey consumers	**1**	-	10.8	-	-	1.7	-	-	-	-	-	-	7.4	8.0	12.7	8.8
Cattle meat consumers	**2**	-	1.3	0.38	-	-	7.9	-	4.7	68.4	-	-	-	-	-	-
Poultry meat consumers	**2**	-	0.90	-	-	-	-	5.5	-	-	-	-	-	-	-	-
Sheep meat consumers	**2**	-	1.3	0.38	-	-	7.9	-	4.7	68.4	-	-	-	-	-	-
Milk consumers	**3**	-	0.88	0.28	-	-	5.3	-	3.1	87.8	-	-	-	-	0.23	0.09
Occupants for plume pathways (inner area)	**21**	1.00	-	-	-	-	-	-	-	-	1220	-	-	-	-	-
Occupants for plume pathways (outer area)	**1**	1.00	-	-	-	-	-	-	-	-	-	780	-	-	-	-
Green vegetable consumers	**2**	-	6.4	-	-	0.85	-	-	-	-	-	-	5.0	5.5	6.4	4.9
Other domestic vegetable consumers	**2**	-	6.4	-	-	0.85	-	-	-	-	-	-	5.0	5.5	6.4	4.9
Potato consumers	**1**	-	10.8	-	-	1.7	-	-	-	-	-	-	7.4	8.0	12.7	8.8
Root vegetable consumers	**1**	-	10.8	-	-	1.7	-	-	-	-	-	-	7.4	8.0	12.7	8.8

Notes

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

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

[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 in the Springfields area, for use in foetal dose assessments

Profile Name	Number of individuals	Pathway Name: Crustacea	Direct[a]	Eggs	Fish - Sea	Fruit - Domestic	Fruit and nuts - Wild	Houseboat occupants[b]	Gamma ext - Salt marsh[c]	Gamma ext - Sediment[d]	Honey	Marine plants/algae	Meat - Cow	Meat - Pig	Meat - Poultry	Meat - Sheep	Wildfowl	Milk	Occupancy ON water	Plume (IN; 0-0.25km)[e]	Plume (MID; >0.25-0.5km)[e]	Plume (OUT; >0.5-1.1km)[e]	Vegetables - Green	Vegetables - Other Domestic	Vegetables - Potatoes	Vegetables - Root
		kg	-	kg	kg	kg	kg	h	h	h	kg	kg	kg	kg	kg	kg	kg	l	h	h	h	h	kg	kg	kg	kg
Crustacean consumers	4	0.74	-	-	5.0	-	-	-	-	-	-	-	-	-	-	-	3.6	-	-	-	-	-	-	-	-	-
Occupants for direct radiation	38	-	1.00	2.4	-	2.5	0.03	-	-	-	-	-	-	0.28	0.36	0.55	0.01	11.3	-	1170	1410	730	0.39	0.90	0.43	0.70
Egg consumers	4	-	1.00	19.8	-	0.53	0.26	-	-	-	-	-	-	2.7	-	4.6	0.05	68.4	-	1930	3230	-	-	-	-	-
Sea fish consumers	4	0.45	-	-	7.2	-	-	-	-	-	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Domestic fruit consumers	4	-	0.50	-	-	38.0	-	-	-	-	0.85	-	-	-	-	-	-	-	-	550	-	-	12.5	7.5	12.7	16.2
Wild fruit and nut consumers	1	-	-	-	-	5.3	6.0	-	-	-	-	-	31.5	-	-	18.8	-	273.8	-	-	-	-	-	-	-	-
Houseboat occupants	2	-	-	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	140	-	-	-	-	-	-	-
Occupants for exposure - Salt marsh	2	-	-	-	-	-	-	-	490	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Occupants for exposure - Sediment	1	-	-	-	-	-	-	-	270	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Honey consumers	1	-	-	-	-	21.5	-	-	-	-	3.4	-	-	-	-	-	-	-	-	-	-	-	24.4	16.0	25.5	41.1
Marine plant/algae consumers	1	-	-	-	3.2	-	-	-	-	-	-	0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cattle meat consumers	4	-	-	-	-	4.4	1.7	-	-	-	-	-	23.3	-	1.4	12.3	2.6	68.4	-	-	-	-	0.51	3.0	6.3	-
Pork meat consumers	1	-	1.00	29.1	-	2.1	1.1	-	-	-	-	-	-	10.7	-	10.7	0.19	-	-	7690	-	-	-	-	-	-
Poultry meat consumers	5	-	0.20	-	-	3.4	0.11	-	-	-	-	-	4.7	-	9.1	3.4	2.1	31.1	-	-	-	1230	0.41	-	5.0	-
Sheep meat consumers	6	-	0.33	6.8	-	3.3	1.3	-	-	-	-	-	15.5	1.8	0.91	11.3	1.8	91.3	-	1290	-	-	0.34	2.0	4.2	-
Wildfowl consumers	3	0.15	-	-	0.60	4.1	0.19	-	-	-	-	-	7.9	-	1.8	5.7	14.8	-	-	-	-	-	0.68	-	8.3	-
Milk consumers	3	-	0.67	4.0	-	1.8	2.0	-	-	-	-	-	10.5	-	2.3	8.8	-	234.4	-	15	-	2040	-	-	-	-
Occupancy ON water	4	-	-	-	-	-	-	42	-	1	-	-	-	-	-	-	-	-	98	-	-	-	-	-	-	-
Occupants for plume pathways (inner area)	4	-	1.00	7.3	-	0.53	0.26	-	-	-	-	-	-	2.7	-	2.7	0.05	-	-	5950	-	-	-	-	-	-
Occupants for plume pathways (mid area)	8	-	1.00	6.5	-	0.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6560	-	-	-	-	-
Occupants for plume pathways (outer area)	4	-	1.00	-	-	-	-	-	-	-	-	-	-	-	1.8	-	-	38.9	-	-	-	6460	-	-	-	-
Green vegetable consumers	5	-	0.20	-	-	19.3	-	-	-	-	0.82	-	-	-	0.06	0.57	0.06	-	-	-	-	350	18.7	17.1	9.8	21.0
Other domestic vegetable consumers	6	-	0.17	-	-	9.6	-	-	-	-	0.68	-	-	-	0.05	0.47	0.05	-	-	-	-	290	13.9	17.3	5.5	16.0
Potato consumers	3	-	-	-	-	28.2	0.19	-	-	-	1.1	-	7.9	-	1.8	5.7	3.5	-	-	-	-	-	16.8	7.3	22.3	18.9
Root vegetable consumers	4	-	0.25	-	-	20.3	-	-	-	-	1.0	-	-	-	0.07	0.71	0.07	-	-	-	-	430	20.1	17.8	12.3	23.2

Notes

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

[b]Gamma ext - houseboat represents occupancy of boat over mud.

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

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

[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 10. Gamma dose rate measurements taken on-board and in the vicinity of a houseboat at Becconsall (μGy h^{-1})

Measurements taken during the period of the tidal cycle when the boat had no water under the hull					
Time	**On-board the boat**	**Time**	**Adjacent to the port side of the boat's hull (over mud)**	**Time**	**Adjacent to the slipway (over grass)**
11:15	0.064	11:15	0.086	11:15	0.074
11:30	0.054	11:30	0.087	11:30	0.070
See below for the period from 11.45 to 14.15 when water provided shielding under the hull.					
14:30	0.061	14:30	0.087	14:30	0.070
14:45	0.063	14:45	0.084	14:45	0.079
15:00	0.064	15:00	0.087	15:00	0.077
-	-	15:15	0.085	-	-
15:30	0.064	15:30	0.083	15:30	0.076
-	-	15:45	0.088	15:45	0.095
16:00	0.068	16:00	0.088	16:00	0.074
-	-	16:15	0.085	16:15	0.076
16:30	0.065	16:30	0.084	16:30	0.076
-	-	16:45	0.084	16:45	0.091
17:00	0.066	17:00	0.085	17:00	0.082
-	-	17:15	0.088	17:15	0.068
17:30	0.061	17:30	0.085	17:30	0.072
-	-	17:45	0.089	17:45	0.102
18:00	0.059	18:00	0.089	18:15	0.088
18:30	0.065	18:30	0.085	-	-
19:00	0.062	19:00	0.094	-	-
Mean	**0.063**	**Mean**	**0.086**	**Mean**	**0.080**
Measurements taken during the period of the tidal cycle when water provided shielding under the hull (the water depth varied over this period)					
Time	**On-board the boat**	**Time**	**Adjacent to the port side of the boat's hull (over water)**	**Time**	**Adjacent to the slipway (over grass)**
11:45	0.047	-	-	11:45	0.067
12:00	0.043	-	-	12:00	0.057
12:15	0.042	12:15	0.065	12:15	0.055
12:30	0.042	12:30	0.054	12:30	0.054
12:45	0.042	12:45	0.052	12:45	0.072
13:00	0.041	13:00	0.056	13:00	0.071
13:15	0.041	13:15	0.050	13:15	0.066
13:30	0.038	13:30	0.061	13:30	0.067
13:45	0.044	13:45	0.071	13:45	0.067
14:00	0.046	14:00	0.079	14:00	0.067
14:15	0.058	14:15	0.084	14:15	0.078
Mean	**0.044**	**Mean**	**0.064**	**Mean**	**0.066**

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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

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