Cefas

Cefas contract report C3635

Radiological Habits Survey: Cumbrian coast beach occupancy, 2009

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Radiological Habits Survey: Cumbrian coast beach occupancy, 2009

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Contents

Annexes

1. Introduction

Members of the public may be exposed to radiation as a result of the operations of the Sellafield Ltd. nuclear site in Cumbria. Historically, radioactive particles and contaminated debris have been found on beaches in the Sellafield area following incidents in 1983 and 1992 at the Sellafield site. Monitoring work carried out after these incidents identified particles attached to beach debris such as seaweed, plastic and wood, which were predominantly recovered from the strandline. Particles were also recovered from the sand on various sections of beach. More recently, an extensive monitoring programme commenced in 2007 to detect radioactive particles on the beaches in the vicinity of the Sellafield site. This monitoring programme was subsequently extended to include beaches along the Cumbrian coast that are further afield from the Sellafield site, and the monitoring work is continuing. Radioactive particles have been detected on beaches at Allonby, Workington, St Bees, Braystones, Sellafield, Seascale and Drigg.

A beach occupancy habits survey was conducted in 2007 along the Cumbrian coast in the vicinity of the Sellafield site, in order to obtain information about activities undertaken by members of the public which may affect their exposure to radioactive particles. This information was used by the Health Protection Agency (HPA) to assess the risks to the members of the public. The HPA advice on the risks to the public, issued in 2007, considered that the chance of people coming into contact with radioactive particles was extremely low and there were no recommendations to limit access to, or use of, beaches in the Sellafield area, although further monitoring of the beaches was recommended (EA briefing note, 2009).

This report presents the results of a second beach occupancy habits survey along the Cumbrian coast which was undertaken in 2009 in order to further aid the development of a robust risk assessment for public exposure to particles and to support future targeting of monitoring effort. This survey took into account requests from the Environment Agency, the HPA and the Committee on Medical Aspects of Radiation in the Environment (COMARE), to expand the scope of the survey. The 2007 methodology was adapted in line with these requests and the main developments were:

- The survey area was extended to include an additional five localities that had not been surveyed in 2007 but where particles have been detected.
- In 2009 interviews were conducted at three of the same beaches where interviews had been conducted in 2007 as these beaches were still of particular interest.
- Four beaches where interviews were conducted in 2007 were revisited in 2009 to obtain headcounts but interviews were not conducted at these beaches in 2009.
- Approximately half of the fieldwork effort, measured in hours, was conducted at weekends.

This study has been funded by the Environment Agency in order to support their role in protecting the public from the effects of radiation.

2. The survey

2.1 Survey objectives

The specific survey objectives were:

- To conduct interviews at beaches at five new localities and to provide data to enable future targeting of beach monitoring effort at areas of high intertidal occupancy.
- To provide more habits data in order to improve confidence in the 2007 beach occupancy habits survey results to support the Health Protection Agency's work on risk assessment.
- To establish whether high beach occupancy, particularly at weekends, and during the school holidays and periods of good weather, may have been missed during the 2007 beach occupancy habits survey.

2.2 Conduct of the survey

Prior to the survey fieldwork, investigations were made to identify activities or public events occurring at the new beach locations in the survey area. The fieldwork was staggered over four months from July to October 2009 and was predominantly undertaken during the school holidays, and where possible, during periods of warm weather. The school summer holiday was from 16th July to 2nd September inclusive and the October half term holiday was from 26th October to 30th October inclusive. The fieldwork was conducted during the daytime, between the hours of 9am and 5pm, and was not conducted in the evenings. Approximately half of the fieldwork effort, measured in hours, was carried out at weekends.

Interviews and headcounts were conducted on beaches at Allonby, Workington, Parton, Whitehaven, St Bees, Braystones, Seascale and Silecroft, and headcounts were conducted on beaches at Coulderton, Nethertown, Drigg and Ravenglass. People were interviewed to ascertain the amount of time they spent undertaking activities on the beaches in the survey area. Particular attention was paid to the following pathways: handling beach materials, sediment or fishing gear; activities involving direct contact with the beach substrates, such as walking barefoot; and activities that could lead to inadvertent ingestion or inhalation of particles. Information on how people were dressed on the beach and information about where activities were taking place on the beach were also collected. Individuals previously identified by Cefas that were likely to have high occupancy or handling rates on the beaches in the survey area were contacted and interviewed. Phone interviews were conducted with representatives of certain groups, such as teachers of children on organised school trips, when it was not possible to arrange an interview in person.

3. Survey area

The survey area extended approximately 67 km along the Cumbrian coast, from Allonby in the north to Silecroft in the south. Interviews and headcounts were conducted at Allonby, Workington, Parton, Whitehaven, St Bees, Braystones, Seascale and Silecroft (Map 1). These locations correspond with the main areas that have previously been monitored and where particles have been detected. Headcounts, but not interviews, were conducted at Coulderton, Nethertown, Drigg and Ravenglass.

Three additional beaches where activities occurred were identified within the survey area. Beaches at Harrington and Maryport were identified while the survey team were en route to Workington and Allonby, and although the focus remained on the locations where particles have been detected, headcounts were conducted at Maryport and Harrington for possible use in identifying future monitoring areas. Occupancy rates at the third beach, Eskmeals beach, were obtained during interviews conducted at other beaches in the area. No monitoring has been conducted on this beach and it was not visited by the survey team. Descriptions of these additional beaches are presented in Section 3.2.1 for Maryport, Section 3.3.1 for Harrington and Section 3.12.1 for Eskmeals.

The particle find rate to date has varied over the different beaches within the survey area. Beach occupancy is also likely to vary between the beaches. Therefore, the potential to encounter particles will also vary accordingly.

The beaches at Allonby, St Bees, Seascale and Silecroft were the most popular in the area, with tourists and locals undertaking a variety of activities. Most of the beaches in the survey area had easy access by car and by foot with the exception of the area around Coulderton, Nethertown, and Braystones where access was restricted to crossings over the coastal railway track.

The upper shore at the majority of the locations in the survey area was a sand or stone beach backed either by low shale cliffs, concrete sea defences or sand dunes. At low tide many of the beaches had a large expanse of exposed substrates that were a mixture of sand, mud and rocky scars. The rocky scars were mainly composed of an aggregation of various sizes of boulders and stones and are also known as ‘boulder fields’. Over the past few years it has been noted that the topography of the beaches at some locations has changed quite dramatically due to scouring of the sand, which has exposed stones and banks of hard clay. The extensive sand ‘reefs’ created by honeycomb worms (*Sabellaria alveolata*) appear to be in decline along some of the beaches in the area.

Map 1. The Cumbrian coast beach occupancy survey area

3.1 General observations

At the start of the fieldwork the weather was predominantly wet and windy with occasional fine days. There was a high amount of rainfall in August which limited the number of observations made in this period. During September and the first part of October the weather improved and the final week of the survey was fine, sunny and dry. It is to be noted that the fieldwork effort was concentrated on days where the weather was deemed conducive to obtaining higher observation numbers. Therefore, the weather information displayed in Annex 1 is not representative of the survey period as a whole.

The relationship between how people were dressed, the activities they were undertaking and the prevailing weather conditions followed a fairly predictable pattern. Generally, the warmer the weather the less clothing people wore. On warm sunny days the members of family groups having days out on the beach undertaking activities such as playing and picnicking usually wore very little, often bathing costumes, or light summer clothing such as shorts and t-shirts. Elderly family members tended to be more covered, perhaps wearing trousers or skirts, and children were more likely to wear less. People, particularly children, were often bare footed, while others mainly wore sandals without socks, or flip-flops, which were open to the sand. A few parents encouraged their children to wear plimsoles when playing on the beach or paddling in order to protect their feet from hidden sharp objects. In these cases sand often entered the plimsoles and remained trapped next to the skin. When the weather was warm other beach users were usually dressed in light summer clothing and nearly everybody that was undertaking any sort of activity that involved walking, for example dog walking, beachcombing or litter collecting, wore some kind of footwear, either open sandals or shoes with socks. If it was dry but cool and windy people tended to wear lightweight windproof garments. Far fewer people ventured onto the beaches on wet and windy days and those that did, mainly dog-walkers and anglers, were usually well wrapped up and wearing sturdy footwear. Beach anglers tended to wear full waterproofs or chest waders unless it was very warm and even then they nearly always wore boots or shoes. Mollusc collectors usually wore wellington boots or occasionally old trainers that they did not mind getting muddy and wet. Wind surfers and kite surfers generally wore wetsuits and rubber bootees.

It was noted that individuals leaving the beaches were often still trying to brush sand off their skin and clothes, and some entered vehicles with some mud or sand still remaining on them. Dogs also often still had sand on their fur as they left the beach. Some individuals, such as beachcombers or shell collectors. deliberately removed materials from the shore and these sometimes still had sediments adhering to them.

3.2 Allonby

Allonby is the northernmost beach in the survey area.

Map 2. Allonby © Crown copyright

3.2.1 Beach description

The coast at Allonby comprised a 2 km principally sandy beach with an area of stones on the upper shore, backing onto low sand dunes. There were rocky scars with rock pools on the lower shore.

The village of Allonby is a major tourist venue on the Cumbrian Solway coast which has good access to the beach. There were three caravan parks, one of which catered exclusively for visitors and provided 90 static caravans for holiday let and areas for up to 40 touring vans and tents. The site was open from 15th March to 15th November and children were well catered for with swimming pools, games areas and playgrounds so they were not reliant on using the beach. There were also smaller, adult only, residential caravan and chalet parks.

Maryport is located approximately 6 km south of Allonby and occasional visits to obtain headcount information were made by the survey team en-route to

Allonby. The beaches near Maryport were predominantly sand with areas of stones and occasional rocky scars.

Photograph 1. Allonby beach

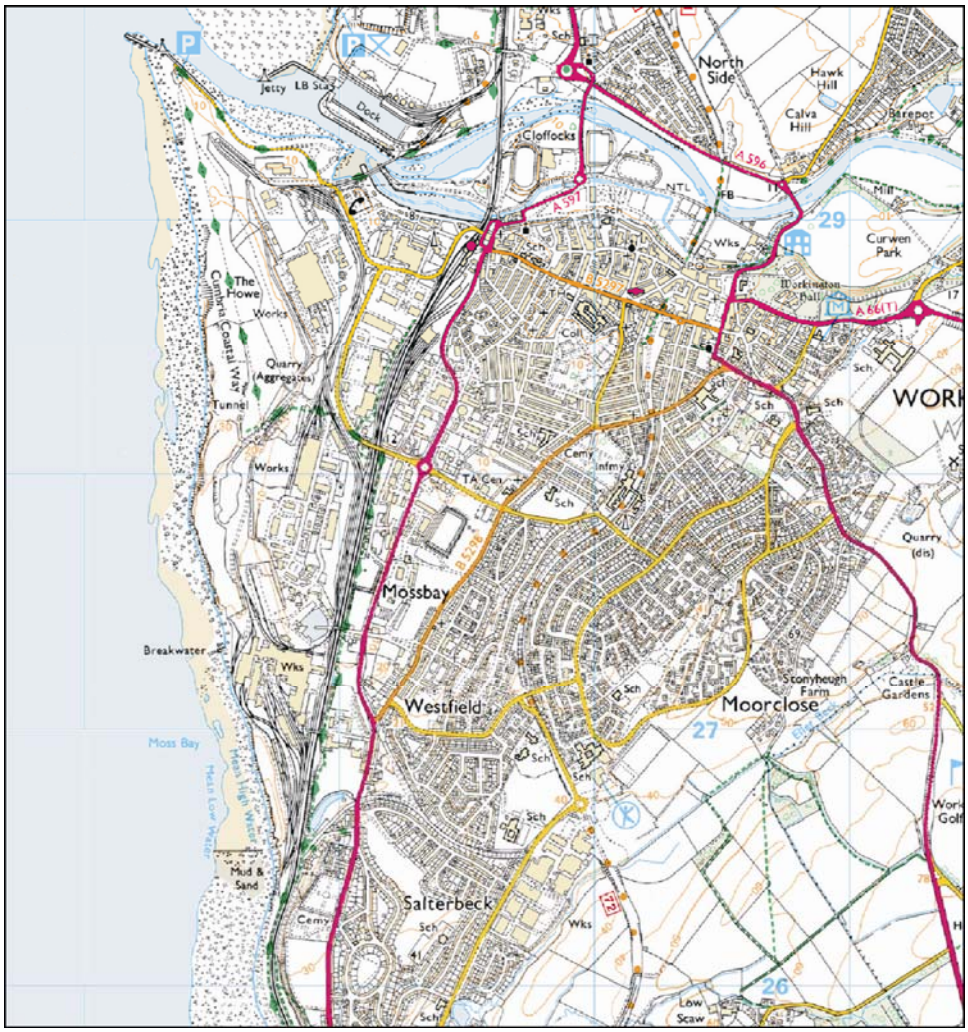
3.2.2 Activities

Activities observed on Allonby beach were dog walking, walking, kite surfing, wind surfing, kite flying, kite buggying, beach games, building sand castles, rock pooling, picnicking, collecting wood, angling and collecting stones and shells. Most beach activities were concentrated on the area of the beach close to the amenities and central car park. Dog walkers were widely distributed along the beach due to the numerous pedestrian access points and many people generally walked their dogs along the beach in one direction and returned along the path above the shore. Kite and windsurfers based themselves at the southern end of the beach.

Activities observed on the beaches near Maryport included dog walking, general beach games and windsurfing.

3.3 Workington

Workington is located approximately 16 km south-west of Allonby.



Map 3. Workington © Crown copyright

3.3.1 Beach description

The beaches in the vicinity of Workington were a mix of sand, stones and rocky areas backed with artificial sea defences, slag cliffs or low sand dunes. The area around Workington harbour has seen much improvement in recent years with the substantial landscaping of redundant industrial plant, better road access and new car parking facilities with a large surfaced car park by the southern breakwater. There were beaches to the north and to the south of the harbour with easy public access and car parking to the north.

Harrington is located approximately 4 km south of Workington and occasional visits to obtain headcount information were made by the survey team en-route to Workington. Harrington had car parks to the south and north of the harbour with easy beach access and the substrate was a mix of mud, sand, stones and rocky outcrops.

Photograph 2. Workington beach

3.3.2 Activities

Activities observed at Workington included dog walking, walking, playing, paddling, building sand castles, bait digging, limited mollusc collecting, angling from the pier ends, swimming and windsurfing. Most activities were taking place on the north side of the harbour. Bait digging occurred towards the low tide areas of sand either side of the slipway and dog walkers used the whole of the beach.

Activities observed at Harrington included dog walking, mollusc collecting and angling. A number of small angling and fishing boats operated out of the harbour.

3.4 Parton

Parton is located approximately 8 km south of Workington.

Map 4. Parton © Crown copyright

3.4.1 Beach description

Parton beach comprised two adjacent bays and was accessed by road. There was a public slipway for launching small boats, a secure compound and a number of sheds to store boats, trailers and fishing gear. A rough path of grass, coarse sand and stones ran around the top of the beach and crossed a beck over a footbridge to the northern end of the bay. The substrate was generally rocky and stony, with large flat shale ledges and areas of coarse sand in between.

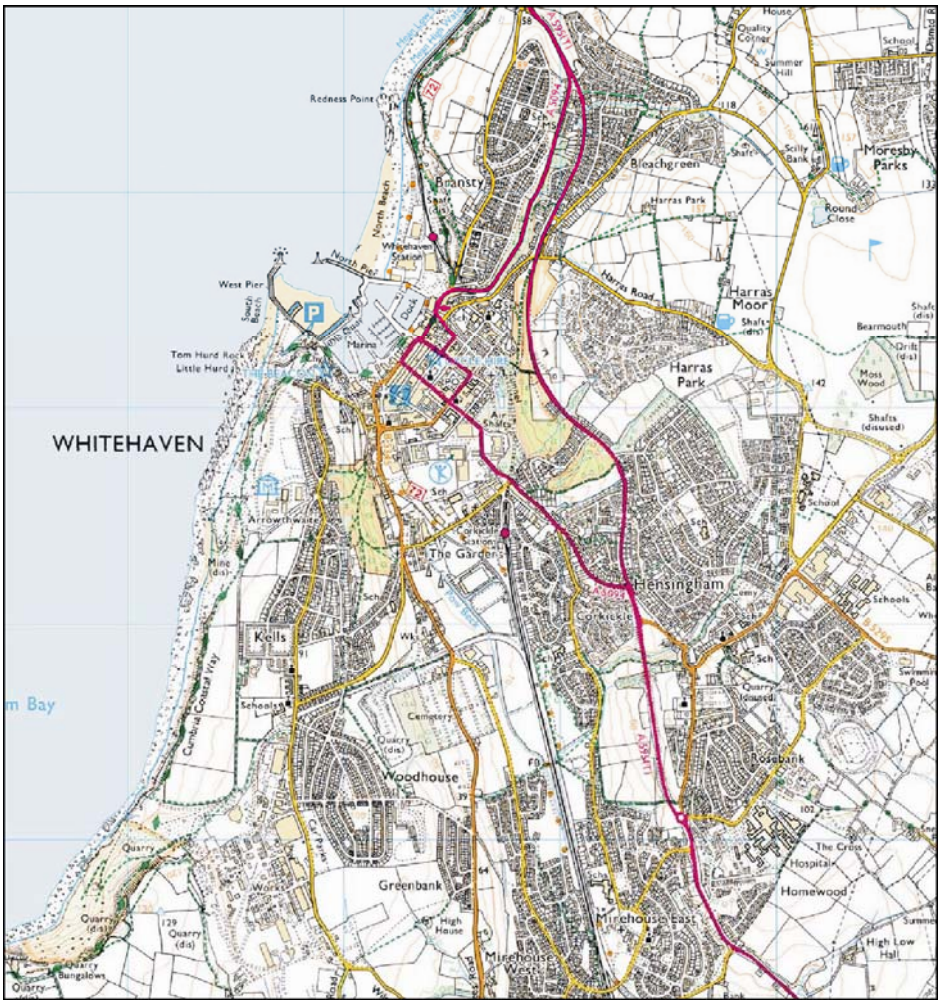
Photograph 3. Parton beach

3.4.2 Activities

Activities noted at Parton included dog walking, walking, sunbathing, angling, playing, collecting sea coal, picnicking, paddling, beachcombing, collecting wood and collecting winkles. Dog walkers used the whole of the beach, mollusc collection centred on the numerous rocky scars between the slipway and Providence Bay, particularly at low water on spring tides. Beach anglers were often seen to the north of the beck towards the high water mark.

3.5 Whitehaven

Whitehaven is located approximately 2 km south-west of Parton.



Map 5. Whitehaven © Crown copyright

3.5.1 Beach description

Whitehaven north beach was sand and stones with patches of mud, backed by massive stone block sea defences. The beach at Whitehaven outer harbour was an expanse of sand which was muddy on the lower area at low tide and fine sand on the upper area, against a sloping seawall. Whitehaven south beach was unsafe to access because of coastal erosion. Signs warned the public to keep away from the cliff edge and the access paths had been fenced off.

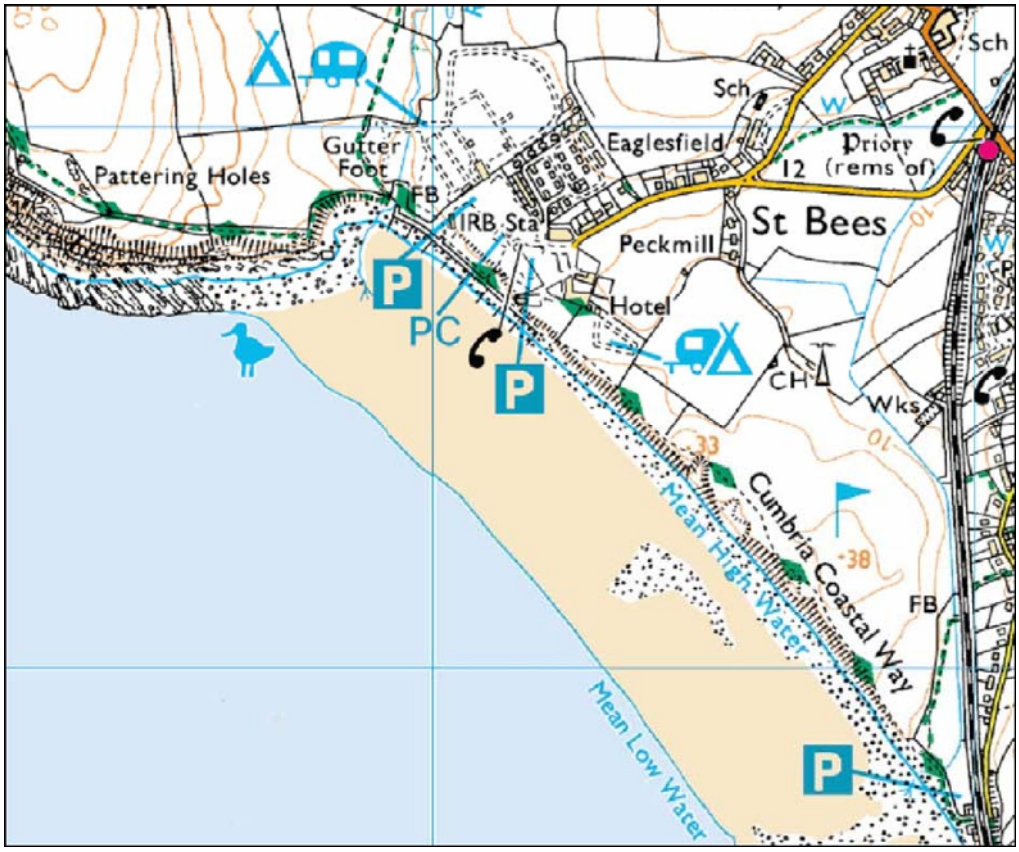
Photograph 4. Whitehaven outer harbour beach

3.5.2 Activities

The main activity noted to be taking place on Whitehaven north beach was dog walking. The upper area of the Whitehaven outer harbour beach close to the seawall was observed being regularly used by families picnicking, building sandcastles and playing ball games. Dog walkers were present at most states of the tide and used the whole of the outer harbour beach area, bait diggers frequently used the lower shore, particularly at very low spring tides, and winkles and mussels were collected from rocky scars near the mouth of the harbour and the seawalls.

3.6 St Bees

St Bees is approximately 7 km south of Whitehaven.



Map 6. St Bees © Crown copyright

3.6.1 Beach description

St Bees is a popular seaside resort with a 2 km long sandy beach, the southern end of which is locally known as Seamill. There was an access road and parking at both St Bees and Seamill. The upper shore along the high water mark was stones and was backed by soft glacial moraines. The beach was predominantly sand on the mid to lower shore and there were rock pools below the headland, midway along the beach and at the southern end. There was a concrete slipway, where the lifeboat station was based and the public used the slipway to launch boats and jet-skis.

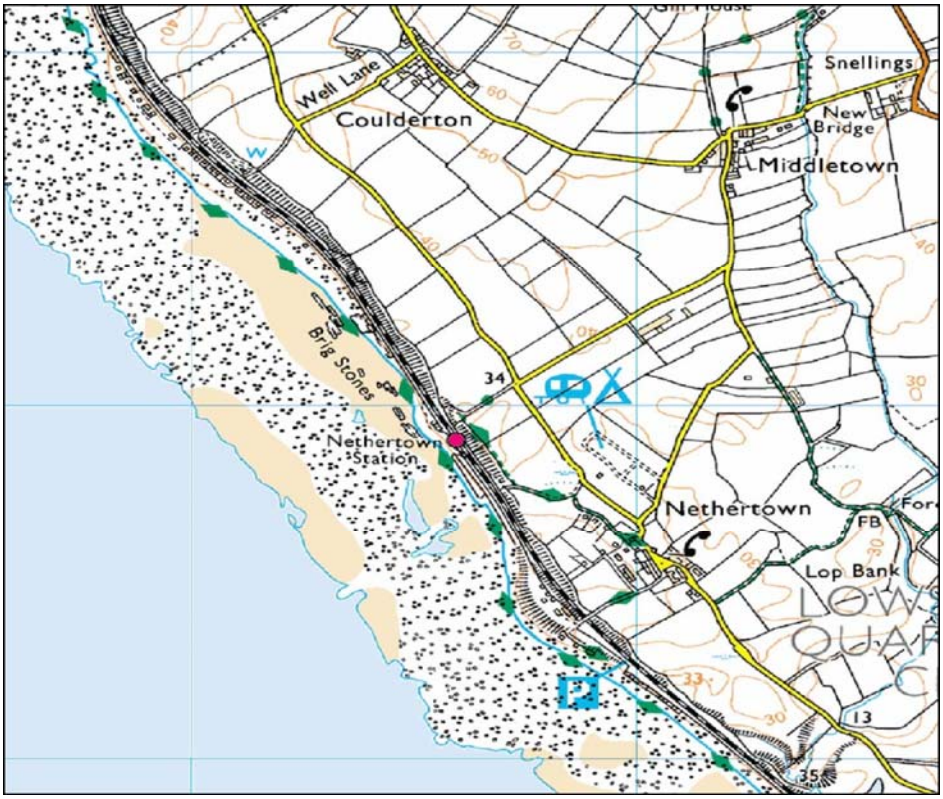
Photograph 5. St Bees beach

3.6.2 Activities

Activities reported to be undertaken regularly at St Bees throughout the year were dog walking, walking, beachcombing, angling and collecting winkles, razor shells and limpets. Activities undertaken by locals and tourists in the warmer weather were picnicking, playing ball games, building sandcastles and rock pooling. People were observed windsurfing and paddling. St Bees was very popular with holidaymakers staying at the caravan park or visiting the area and in periods of good weather there were often large numbers of people on the beach. The main area of the beach used by families playing and picnicking was in front of the main St Bees car park to the north of the beach. Dog walkers used the full length of the beach, often along the tide line. At low tide, rock pooling and winkle collecting took place near the headland and bait digging took place on the lower shore. The beach was a popular location for visiting groups of school children. Two local primary schools were identified that arranged trips to St Bees beach and activities undertaken during these trips included nature studies and rock pooling (see Section 4.5).

3.7 Coulderton and Nethertown

Coulderton is approximately 3 km south-east of St Bees and Nethertown is 1 km south-east of Coulderton.



Map 7. Coulderton and Nethertown © Crown copyright

3.7.1 Beach description

The substrate at Coulderton and Nethertown was a mixture of stones, rocks and “reefs” of honeycomb worm colonies with occasional sandy patches and lagoons. A railway track ran parallel to the shore, which prevented access to the beaches in the area except via crossings over the track at Coulderton, Nethertown rail station and Nethertown. At Coulderton there was no public parking but there was an access road leading to a row of beach chalets. At Nethertown the promenade car park was a well-used access point for beach activities. The beach chalets at Coulderton and Nethertown were a mixture of full-time residences, holiday homes to-let and second homes.

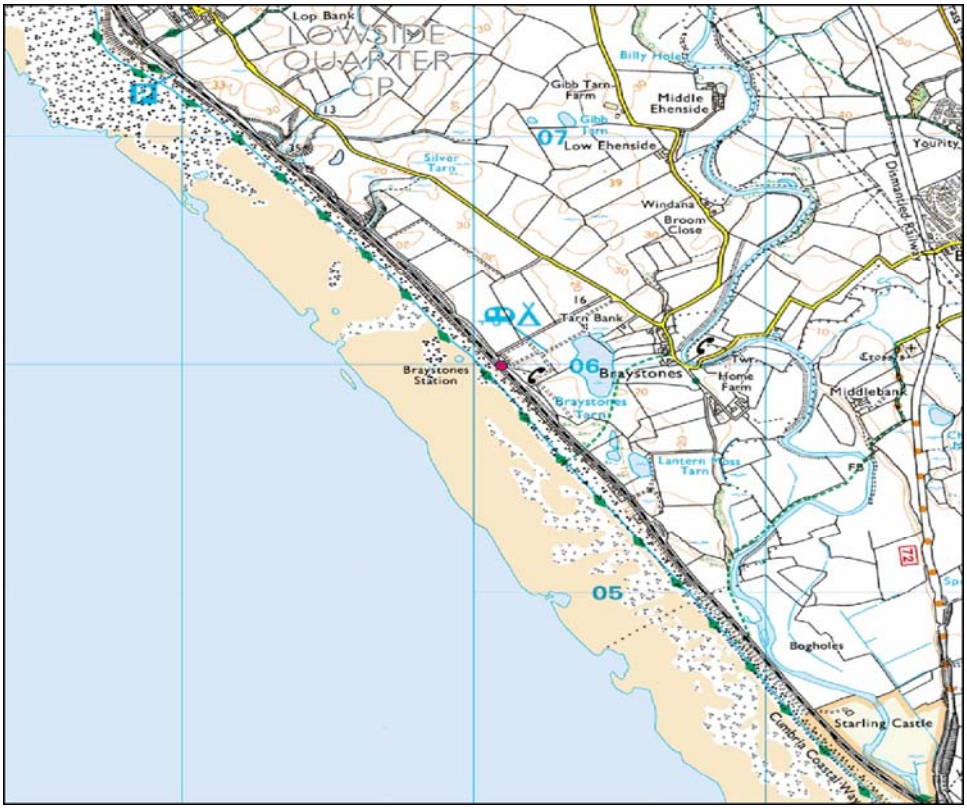
Photograph 6. Nethertown beach

3.7.2 Activities

The area was noted to be popular for collecting molluscs; mainly winkles and mussels. Other activities undertaken were angling, netting from the shore, potting offshore, collecting peeler crabs, beachcombing, beach clearing, dog walking and walking. People generally used a large area of the beach; dog walkers walked all over the beach, mollusc collectors collected winkles and mussels from the rocky areas between Coulderton and Nethertown, and anglers spread out along the tide line.

3.8 Braystones

Braystones is approximately 2 km south-east of Nethertown.



Map 8. Braystones © Crown copyright

3.8.1 Beach description

At Braystones the substrate was predominantly sand with occasional small rocky scars. The lower shore was a large expanse of mud and sand at low tide and the strip of upper shore that backed onto the railway comprised stones and boulders. There were numerous beach chalets that were a mixture of full-time residences, holiday lets and second homes. There was an access road along the top of the beach, which was in a poor state as it was frequently being washed away when storms coincided with high tides. There were two caravan parks situated just inland of the railway line.

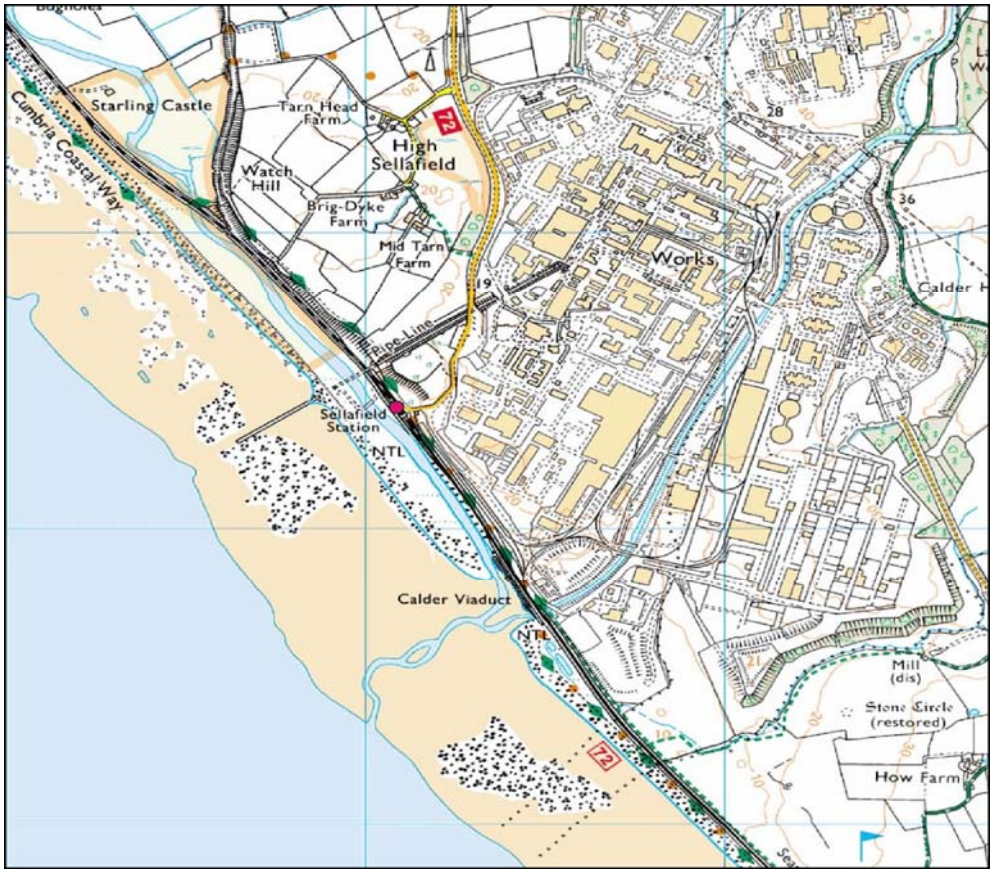
Photograph 7. Braystones beach

3.8.2 Activities

The beach was predominantly used by people living at the beach chalets and people staying at the caravan sites. Shore activities such as winkle and mussel collecting, bait digging, angling and setting nets were popular due to the large exposed areas of mud and sand at low tide. It was reported that local beach residents spent considerable amounts of time clearing the beach of storm debris, reinforcing sea defences, keeping the road clear of rubbish and filling potholes. Holidaymakers from the caravan parks undertook beach activities such as playing, building sandcastles, paddling, collecting shells, sunbathing and beachcombing. Most beach activities were observed taking place close to the chalets or caravan sites either side of Braystones rail station, although dog walkers used the whole of the beach and anglers fished from the tide line along the length of the beach. The beach to the south of Braystones rail station was used less than the beach to the north.

3.9 Sellafield

Sellafield is approximately 3 km south-east of Braystones.



Map 9. Sellafield © Crown copyright

3.9.1 Beach description

The River Ehen flows from the north-west and runs parallel with the beach, past the Sellafield nuclear site, and into the sea at the Calder Viaduct. The dunes between the River Ehen and the beach are known as the Ehen Spit. The River Calder flows through the Sellafield site and joins the River Ehen before entering the sea at the southern end of the Ehen Spit.

The beach at Sellafield was backed by sand dunes at the extreme high tide level, with a band of pebbles below this and principally sand down to the extreme low water mark. There were areas of stones, rocks and honeycomb worm reefs, with two main reefs either side of the confluence of the rivers Ehen and Calder. The Sellafield nuclear site liquid discharge pipes extend into the Irish Sea offshore of Sellafield beach. There was an access road to Sellafield rail station, but the footbridge over the railway line from the station to the beach was closed for an extended period while engineering works were being undertaken on the beach.

Photograph 8. Drigg beach, looking towards Sellafield

3.9.2 Activities

Sellafield beach was infrequently used by the public as the only way to access the beach was to walk approximately 3 km along the coast from Braystones or 2 km from Seascale. No one was observed on the beach during numerous sampling trips undertaken by the survey team. However, people interviewed at other locations reported that they did visit Sellafield beach. Several people who lived at Seascale or Braystones said that they walked their dogs, went bait digging or beachcombing on Sellafield beach and other interviewees reported that they went walking or angling there, or undertook commercial potting offshore. No children were identified spending time on Sellafield beach.

3.10 Seascale

Seascale is approximately 3 km south-east of Sellafield.

Map 10. Seascale © Crown copyright

3.10.1 Beach description

Seascale beach was popular with locals and holidaymakers due to its easy access, large car park, local amenities, secure boat compound and public slipway. The beach had a narrow stretch of stones and a small rocky scar (Whitriggs Scar) on the upper shore and a large expanse of sand on the lower shore. There was one access road from Seascale and footpath access at Carl Crag.

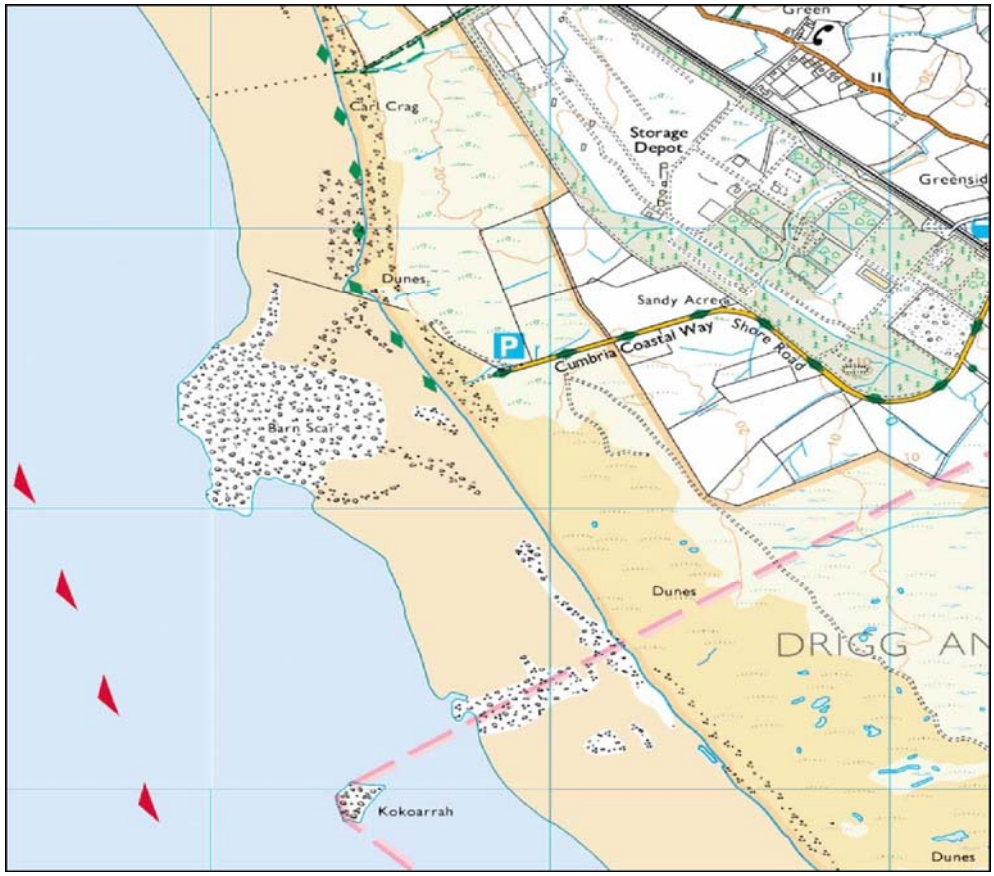
Photograph 9. Seascale beach

3.10.2 Activities

Activities identified being undertaken at Seascale were dog walking, walking, angling, playing, building sand castles, picnicking, rock pooling and beachcombing. People were observed paddling and body boarding, and commercial fishermen were identified potting offshore. The area in front of the main car park at Seascale was popular for most beach activities whereas dog walkers, walkers, beachcombers and anglers were using the whole length of the beach. Dog walkers occasionally walked towards Sellafield.

3.11 Drigg

Drigg is approximately 2 km south-east of Seascale.



Map 11. Drigg © Crown copyright

3.11.1 Beach description

Drigg beach was predominantly sand and was backed by sand dunes. Below the sand dunes there was a narrow stretch of stones and areas of mud and sand on the lower shore. There were two rocky scars, one on the lower shore that was easily accessed from the beach, and one situated beyond the mean low water mark, which could only be accessed by foot on extreme spring tides. There was one access road at Drigg and also a footpath to the north of the road.

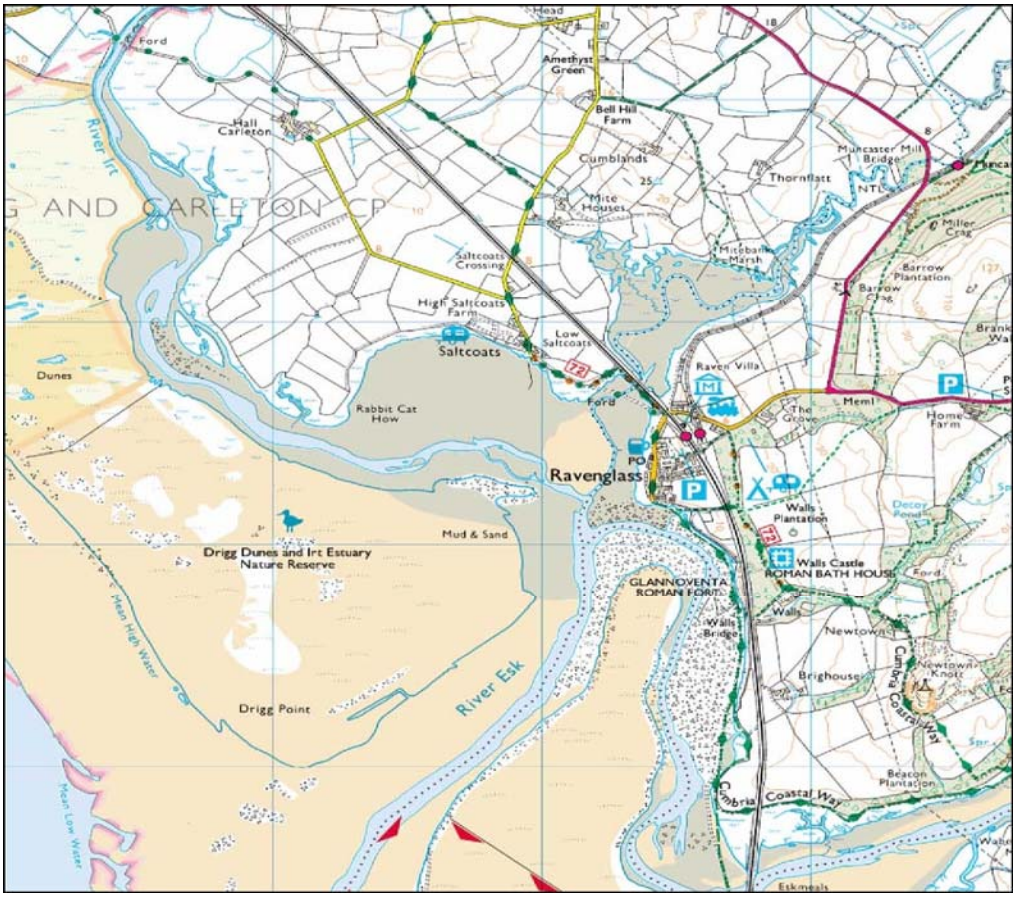
Photograph 10. Drigg beach

3.11.2 Activities

Activities identified being undertaken included dog walking, walking, angling, bait digging, playing on the beach, rock pooling, paddling, playing beach games, building sand castles, picnicking, kite buggying and groups of local volunteers collecting litter. The two rocky scars were popular areas for both mollusc and crustacean collection. The area of beach near the car park was popular with families undertaking general beach activities, whereas dog walkers, anglers and people kite buggying used the entire length and breadth of the beach.

3.12 Ravenglass

Ravenglass is approximately 5 km south-east of Drigg.



Map 12. Ravenglass © Crown copyright

3.12.1 Beach description

The shore at Ravenglass was mainly firm sand and mud with a rock and shingle area on the upper half of the beach. There was good road access and parking.

The northern limit of Eskmeals beach is located approximately 2 km south-west of Ravenglass. Although interviews and headcounts were not conducted at Eskmeals, data for activities on this beach were obtained during interviews at other beaches. Eskmeals is a 4 km long sand beach with patches of stones and a large expanse of mud, sand and rocky scars at low tide. A firing range backed the northern part of the beach and access to the beach was not permitted when firing was taking place.

Photograph 11. Ravenglass beach

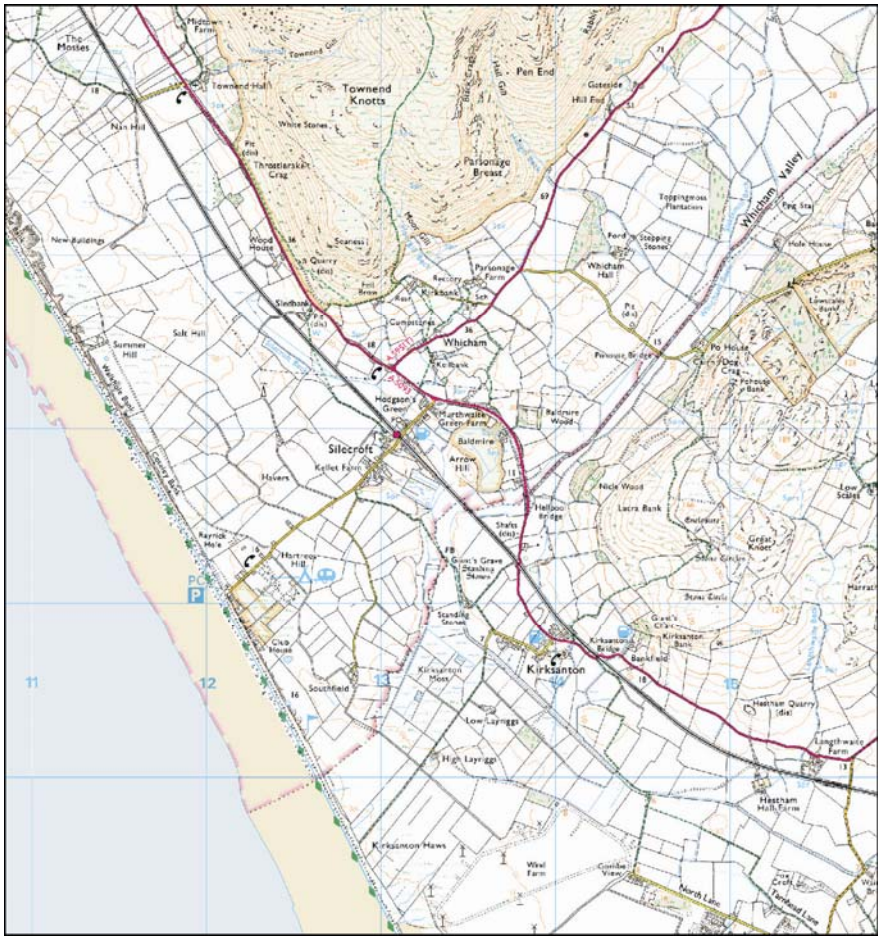
3.12.2 Activities

The majority of the beach activities at Ravenglass such as dog walking and walking occurred on the upper shore and bait digging and angling occurred on the lower shore. Several houses backed onto the beach and the beach was often used as an extension to the back gardens. There were a small number of both commercial fishing vessels and pleasure boats moored in the channel or on the beach and boat maintenance was carried out at low tide. Cockles were collected from the areas of sand and mud. Mussels and a few oysters were collected from the rocky area to the south of Ravenglass.

Eskmeals beach was a popular location for bait digging, and anglers interviewed at other locations reported that they went bait digging on the lower shore of this beach.

3.13 Silecroft

Silecroft is approximately 15 km south-east of Ravenglass and is the southernmost location in the survey area.



Map 13. Silecroft © Crown copyright

3.13.1 Beach description

The beach at Silecroft had a large car park and a ramp for launching boats. There was a holiday park that had caravans and chalets to rent, comprehensive leisure facilities and also catered for touring caravans and tents. The park had its own private access directly onto the beach and was a very popular holiday destination. The upper part of the beach was pebbled, backing onto low sand dunes or soft glacial moraines, and the lower part was extensive sand flats.

Photograph 12. Silecroft beach

3.13.2 Activities

Activities observed included angling, swimming, push netting, windsurfing, kite surfing, kite buggying, kite flying, horse riding, ball games, quad biking, dog walking, walking and collecting seaweed to use as a garden fertiliser. The majority of people participating in general beach activities were scattered along the length of the 4 km beach depending on their point of access to the beach and the state of the tide. Many people from the holiday park accessed the southern end of the beach directly on foot whilst those arriving by car tended to be concentrated on areas between the road and the concrete slipway at the north end of the beach, with the more mobile dispersing even further north. At low tide, most people went onto the flat sandy areas for picnicking, building sand castles and ball games and retreated to the stony area above on the high tide. Dog walkers typically followed the waters edge in one direction and returned by a different route, often along the strand line. Regular beach anglers had their own favourite spots and tended to fish from the top of the shore over the high water period.

4. Data recording and analysis

4.1 Headcounts

When each beach was visited, a headcount was taken of all the people observed on the beach. The headcounts are presented in full in Annex 1 with the activities undertaken and the weather conditions during the fieldwork. A summary of the headcounts obtained at each location is shown in Table 1.

Table 1. Number of people observed on the beaches during the fieldwork

	Allonby	Maryport	Workington	Harrington	Parton	Whitehaven	St Bees	Coulderton	Nethertown	Braystones	Seascale	Drigg	Ravenglass	Silecroft
School summer holidays commenced 16th July 2009														
Saturday 18th July						1	28	0	4	2	7	22	7	18
Sunday 19th July	36	12	5	3	2						23			
Tuesday 28th July					0	5								
Wednesday 29th July			5	0										
Thursday 30th July					4		5							
Friday 31st July							53			13				
Saturday 1st August	15		3		11									
Sunday 2nd August					1	15	5	6	7	2	26	27		83
Monday 3rd August							20				13	2		
Thursday 6th August			28		7	4								
Friday 7th August					18									
Saturday 8th August									4	0	6	4		40
Sunday 9th August					1					5	14	35	14	37
Wednesday 12th August	16		2											
Sunday 16th August	19	7	8	0	9									
Monday 17th August						5								
Tuesday 18th August					2	1								
Wednesday 19th August						15								
Thursday 20th August														13
Friday 21st August						10								
Tuesday 25th August						15								
Thursday 27th August														30
Friday 28th August						2								
Saturday 29th August										7	9	13	1	26
Monday 31st August	7		1		1	0								
School summer holidays ended 2nd September 2009														

	Allonby	Maryport	Workington	Harrington	Parton	Whitehaven	St Bees	Coulderton	Nethertown	Braystones	Seascale	Drigg	Ravenglass	Silecroft
Saturday 5th September						5	26		0	5	4	1	0	5
Sunday 6th September			0				0				2			17
Monday 7th September						3					7	3		
Wednesday 16th September						0								
Thursday 17th September						2								2
Saturday 19th September	16	1	3	0	2	1	0							
Tuesday 22nd September							16							
Wednesday 23rd September						5				1	3			
Thursday 24th September	0		2		2	3								
Friday 25th September						3	5			3				
Saturday 26th September											14	3	1	29
Thursday 29th September														2
Thursday 1st October	5	0	5	0	1									
Sunday 4th October							10		19	1	16	10		
Tuesday 6th October					3	2								
Wednesday 7th October						6								
Thursday 8th October						9			3					
Friday 9th October						9								
Monday 12th October	11		0		0									
Thursday 15th October						1								
Friday 16th October						4								
Monday 19th October						1								
School half term holiday commenced 26th October 2009														
Monday 26th October	25		1				3				11			
Tuesday 27th October											4			1
Wednesday 28th October	12		3				30							
Thursday 29th October											0			
Friday 30th October							20				4			14
School half term holiday ended 30th October 2009														
Saturday 31st October							11							

It was impractical to interview everyone seen on the beaches because of time limitations due to travelling, particularly if people were moving in different directions or were dispersed over a large area, and because some people left the beach while the interviews were being conducted. Therefore, headcounts do not correlate with the number of people interviewed during each beach

visit. A number of dog walkers, anglers and bait diggers were encountered more than once during the survey and these instances are recorded in Annex 1.

In addition to the people interviewed on the beaches, 24 people were interviewed in their homes and therefore these people are not included in the headcount table. The activities undertaken by these people were dog walking, commercial potting offshore, beachcombing, collecting shellfish, bait digging, angling, walking, setting nets and playing.

It should be noted that a comparison of the headcounts obtained at the same locations in the 2007 habits survey and this 2009 survey may be misleading owing to temporal and meteorological differences when the headcounts were obtained and to differences in the number of times that the beaches were visited in each year. For example at Coulderton, Nethertown, Drigg and Ravenglass, the beaches were visited more frequently in 2007 than in 2009. Although the headcounts provide a broad indication of how popular the beaches are, they would need to be conducted more frequently to provide an accurate picture of the actual number of people using the beaches.

4.2 Data for probabilistic assessments

Intertidal occupancy and handling data for use in probabilistic assessments are presented in Annex 2. For each location, data are grouped in the following categories: intertidal occupancy; handling beach materials; handling sediment; and handling fishing gear. For each interviewee, represented in the annex by an observation number, the activity undertaken, the rate for the activity in hours per year, the frequency of visit, the time of year and whether the person is local, a visitor or a tourist, have been provided.

Data were collected for people undertaking activities on the beaches at Allonby, Harrington, Maryport, Workington, Parton, Whitehaven, St Bees, Coulderton, Nethertown, Braystones, Sellafield, Seascale, Drigg, Ravenglass, Eskmeals and Silecroft. People were using the beaches at varying frequencies ranging from daily, such as local dog walkers and residents of beach chalets at Braystones and Nethertown, to just a few days per year for visiting tourists. People who owned caravans at the caravan sites at Allonby, St Bees, Braystones and Silecroft usually visited the areas for several weeks and numerous weekends in the summer. Certain activities such as dog walking, angling, bait digging, shellfish collecting and beachcombing were undertaken at a fairly constant rate throughout the year and other activities such as children playing and rock pooling were more popular in the summer months. Commercial potting was taking place offshore. It should be noted that gloves were worn by fishermen who were potting or setting nets and by shellfish collectors.

The following assumptions were made when analysing the interview data for Annex 2:

- If an interviewee gave one occupancy or handling rate for an activity that was being undertaken at a number of locations in the survey area, it was assumed that the occupancy rate was split equally between those locations.
- If an interviewee gave one occupancy rate for an activity undertaken at one location with different substrates at different states of the tide, it was assumed that the occupancy rate was split equally between the number of substrates, for example, sand and stones.
- If an interviewee provided an occupancy rate for an activity that was undertaken in the summer months, the summer has been assumed to cover a period of five months.
- School holidays were assumed to cover a period of six weeks for the summer holiday and one week for the October half term.

4.3 Collective data

An estimate of absolute occupancy for the survey area would be required in order to undertake an assessment on the total probability of encountering a particle, and although this is beyond the remit of this survey, collective data have been calculated from the survey data to assist in these assessments. The collective data are provided to give a crude indication of the relative occupancy and handling at each location in the survey area during the period of fieldwork.

Further work could be undertaken to estimate absolute occupancy, which would need to account for people that were not interviewed during the fieldwork, and people using the beaches at all other times such as evenings and other times of the year. There are many resources that could be used to assist in the estimation of absolute occupancies. The following could be considered:

- Statistics from the local tourist board and local councils on the number of visitors to the area and information about local events.
- The number of people staying in caravan parks and beach chalets in the area and the length of time that they stay for.
- Obtaining generic data from clubs or groups of regular beach users such as fishermen, anglers and watersports enthusiasts.
- Contacting regular beach users, such as dog walkers, to ask them to estimate the numbers of other people that they observe using the beach and their occupancies.
- Conducting more fieldwork to account for temporal and seasonal variability.
- Analysing meteorological data for the survey area.

4.3.1 Collective occupancy

Collective occupancy was calculated by summing all intertidal occupancy rates for people who were interviewed at each location in the survey area. Intertidal occupancy over all substrate types were combined (such as sand, mud and sand, rock and sand) for each location and no handling rates were included. It should be noted that interviewees undertaking activities at multiple locations will be counted more than once in the 'number of interviewees' column. Table 2 shows the collective occupancy (h y^{-1}) for adults and children at 17 locations in the survey area.

Table 2. Collective occupancy for all interviewees at each location

Location	Collective occupancy of interviewees (h y^{-1})	Number of interviewees
Allonby	3845	60
Maryport	1628	22
Workington	3772	32
Harrington	165	3
Parton	6995	29
Whitehaven north beach	338	8
Whitehaven outer harbour	509	11
St. Bees	6100	72
Coulderton	287	4
Nethertown	300	5
Braystones	6651	41
Sellafield	689	8
Seascale	5873	52
Drigg	5159	40
Ravenglass	647	17
Eskmeals	406	7
Silecroft	5447	79

Silecroft had the highest number of interviewees but had a lower collective occupancy rate compared with other beaches with fewer interviewees. This was because, along with the locals that regularly use the beach, there were many holidaymakers using the beach for short periods of time. Parton had the highest collective occupancy rate as there were many dog walkers who regularly used the beach. At Seascale, Braystones, St. Bees and Parton, there were fewer people using the beach than at Silecroft, however, higher collective occupancies were recorded because people visited these beaches for longer periods of time.

4.3.2 Collective handling

Collective handling was calculated by summing all rates for handling beach materials, beach sediments and fishing gear for people who were interviewed at each location. It should be noted that commercial potting was taking place offshore, and that gloves were worn by fishermen who were potting or setting nets and by shellfish collectors. Table 3 shows the collective handling (h y^{-1}) for adults and children at 16 locations in the survey area.

Table 3. Collective handling for all interviewees at each location

Location	**Collective handling (h y^{-1})**	**Number of interviewees**
Allonby	53	12
Maryport	128	4
Workington	60	2
Parton	749	8
Whitehaven north beach	115	2
Whitehaven outer harbour	501	7
St Bees	799	22
Coulderton	287	4
Nethertown	300	5
Braystones	1946	18
Sellafield	720	7
Seascale	1629	21
Drigg	1878	23
Ravenglass	693	6
Eskmeals	874	9
Silecroft	524	6

Drigg had the highest number of interviewees and the second highest collective handling rate which was mainly due to people winkle collecting, bait digging and servicing offshore lobster pots. Only Braystones had a higher collective handling rate, due in part to a high proportion of bait digging occurring there. St. Bees had a high number of interviewees but a comparatively low collective handling rates as this beach was popular with tourists, spending small amounts of time handling.

4.4 Individual exposure

High rates of Intertidal occupancy and handling for adults and children were identified using the 'cut-off' method described by Hunt *et al.,* 1982. 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. The individuals derived by the 'cut-off' method are referred to as the 'high-rate group' in this report.

With small numbers of observations, as for some occupancy data, there is the possibility of a high-rate group of one person. This is allowable provided the ICRP criteria of "reasonable" and "sustainable" apply (ICRP, 2006). In such cases judgement was used, based for example, on knowledge of the individual and his/her occupation, to ensure these criteria held good.

The results of this analysis are presented in Annexes 3 to 6 and are summarised in Tables 4 to 7 below. The raw data set for adults' and children's intertidal occupancy and handling rates are shown in Annexes 7 and 8, respectively. The same assumptions were used as when analysing the data for use in probabilistic assessments (see Section 4.2).

For individual exposure, data are structured into age groups. The age groups and their relevant age ranges are based on the recommendations in ICRP 72 (ICRP, 1996), and are listed below:

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

4.4.1 Intertidal occupancy

Activities taking place over the following nine substrates were identified: coal and sand; mud; mud and sand; mud, sand and stones; rock; rock and sand; sand; sand and stones; and stones. The activities and occupancy rates of people in the high-rate groups are summarised in Tables 4 and 5 for adults and children respectively.

Adults

Table 4. Summary of adults' intertidal occupancy rates

Substrate	Number of individuals in the high-rate group	Maximum occupancy rate for the high-rate group ($h\ y^{-1}$)	Activity of individual(s) with the maximum occupancy rate in the high-rate group	Mean occupancy rate for the high-rate group ($h\ y^{-1}$)
Coal and sand	3	81	Collecting sea coal	81
Mud	2	54	Bait digging	39
Mud and Sand	1	912	Bait digging	912
Mud, sand and stones	2	1	Dog walking	1
Rock	3	672	Winkle collecting	448
Rock and sand	5	35	Rock pooling	29
Sand	17	930	Bait digging, walking, playing, beachcombing, angling, collecting razor shells and setting nets	630
Sand and stones	13	730	Dog walking	541
Stones	18	375	Beach cleaning	232

Other activities of adults in the high-rate groups included: angling and collecting limpets over rock; kite-buggying and dog walking over sand; beachcombing over sand and stones; and angling, dog walking, playing and setting nets over stones.

Children

Table 5. Summary of children's intertidal occupancy rates

Age group	Substrate	Number of individuals in the high-rate group	Maximum occupancy rate for the high-rate group (h y^{-1})	Activity of individual(s) with the maximum occupancy rate in the high-rate group	Mean occupancy rate for the high-rate group (h y^{-1})
15	Mud and sand	2	117	Bait digging	90
	Mud, sand and stones	1	1	Dog walking	1
	Rock and sand	1	35	Rock pooling	35
	Sand	2	400	Dog walking	316
	Sand and stones	1	170	Dog walking, picnicking, playing beach games, building sand castles and paddling	170
	Stones	1	169	Angling and general beach activities	169
10	Mud and sand	2	62	Angling and general beach activities	62
	Mud, sand and stones	2	1	Dog walking	1
	Rock and sand	9	35	Rock pooling	28
	Sand	5	231	Angling and general beach activities	147
	Sand and stones	4	170	Dog walking, picnicking, playing beach games, building sand castles and paddling	162
	Stones	7	169	Angling and general beach activities	91
5	Mud and sand	1	62	Angling and beach occupancy	62
	Rock and sand	6	35	Rock pooling	21
	Sand	5	231	Angling and beach occupancy	119
	Sand and stones	4	170	Dog walking, picnicking, playing beach games, building sand castles and paddling	135
	Stones	2	169	Angling and beach occupancy	113
1	Sand	1	91	Playing, picnicking, building sand castles and paddling	91
	Sand and stones	1	170	Playing, picnicking, building sand castles and paddling	170

Other activities of children in the high-rate groups included: picnicking and playing beach games over sand; dog walking over sand and stones; and dog walking and playing over stones.

4.4.2 Handling

Handling pathways were categorised as handling beach materials (such as driftwood, shells, stones and litter), handling sediment (such as mud or sand) and handling fishing gear (such as nets or pots). The activities and handling rates for people in the high-rate groups are presented in Tables 6 and 7 for adults and children, respectively. It should be noted that commercial potting was taking place offshore, and that gloves were worn by fishermen who were potting or setting nets and by shellfish collectors.

Adults

Table 6. Summary of adults' handling rates

Handling pathway	Number of individuals in the high-rate group	Maximum handling rate for the high-rate group ($h\ y^{-1}$)	Activity of individual with the maximum handling rate in the high-rate group	Mean handling rate for the high-rate group ($h\ y^{-1}$)
Handling beach materials	4	750	Beach cleaning (litter, wood, metal)	418
Handling fishing gear	4	1170	Potting offshore	805
Handling sediment	3	939	Bait digging and collecting winkles	730

Other activities of adults in the high-rate groups included collecting driftwood, setting nets and collecting limpets and mussels.

Children

Table 7. Summary of children's handling rates

Age group	Handling pathway	Number of individuals in the high-rate group	Maximum handling rate for the high-rate group ($h\ y^{-1}$)	Activity of individual(s) with the maximum handling rate in the high-rate group	Mean handling rate for the high-rate group ($h\ y^{-1}$)
15	Handling beach materials	2	35	Rock pooling (handling stones and shells)	24
	Handling sediment	1	156	Bait digging	156
10	Handling beach materials	10	35	Rock pooling (handling stones and shells)	26
5	Handling beach materials	7	35	Rock pooling (handling stones and shells)	20

Other activities of children in the high-rate groups included; throwing stones, sticks and balls for dogs, and collecting stones and shells.

4.5 Generic occupancy data

Generic data were collected for several groups of people undertaking activities on beaches. As these data were for a large number of people with identical low occupancy rates, they have not been included in the tables in this report.

Two local primary schools conducted one trip per year to St Bees beach for groups of 25 – 30 pupils as part of their school curriculum. The ages of the pupils varied each year depending on the school curriculum. The trips were for half a day and activities included general nature studies, walking along the beach and rock pooling.

Several groups of local volunteers were identified that collected litter on beaches from Drigg to Silecroft. The supervisor of one group was interviewed and it was estimated that 30 volunteers in the group visited Drigg beach three times per year for 3-5 hours per time. Volunteers wore gloves while collecting debris such as plastic items and fishing line. The debris was collected between the dunes and the beach, mainly along the strandline, and bagged litter was collected and disposed of by the council.

4.6 Inadvertent ingestion or inhalation

Certain beach activities could lead to the inadvertent ingestion or inhalation of radioactive particles. Such activities noted during the survey included eating picnics on the beach, playing beach games, building sandcastles, sunbathing and paddling. Occupancy rates for people undertaking these activities are discussed in Sections 6 and 8 and have not been prescribed rates for inadvertent ingestion or inhalation in this report.

5. Variability and uncertainty

The results of the survey were subject to variability and uncertainty, relating to the fieldwork, data collection and assumptions made in the interpretation of the data. These are outlined below for consideration when undertaking radiological assessments.

Variability arising during the survey fieldwork includes the following:

- Meteorological variability – during the summer of 2009 there were periods of unusually high rainfall in Cumbria and many areas recorded over twice the typical rainfall during August (metoffice.gov.uk).
- Temporal variability - fieldwork was conducted during the daytime, between the hours of 9am and 5pm, and was not conducted in the evenings.
- Seasonality – the fieldwork was conducted from July to October, therefore activities taking place at other times of the year may not have been accounted for.

Uncertainty arising from the collection of data includes the following:

- Data provided by interviewees could be an underestimate or overestimate of their actual time.
- It was more realistic for some people to provide rates for activities that they had undertaken in the past rather than to provide rates for what they may do in the future, with the exception of certain people, such as dog walkers and anglers, who undertake their activities fairly routinely.
- Some interviewees could only provide rough estimates of their times spent undertaking activities, particularly due to the variable weather throughout the summer.
- One occupancy rate was often provided by interviewees for one activity undertaken at multiple locations and over multiple substrates as it was difficult for interviewees to split the occupancy rate between these locations and substrates.
- One occupancy rate was often provided for several beach activities undertaken for short periods of time during one visit to the beach, such as building sandcastles, paddling and playing ball games, as it was difficult for interviewees to specify the time undertaken for each specific activity.
- It was difficult for interviewees to specify a handling rate for certain activities, for example, the amount of time that beach combers actually spent handling beach materials rather than the time that they spent on the beach. Where possible, interviewees provided an estimate of the amount of time spent handling.

Uncertainties arising from the assumptions made in the interpretation of the data include the following:

- In some cases interviewees gave one occupancy rate which included several activities undertaken at more than one beach and over more than one substrate. When analysing these data, the occupancy rate was equally split between the number of locations, activities or substrates.
- If interviewees stated that they were undertaking activities 'in periods of good weather throughout the summer months' it was assumed that this period covered 5 months.
- It was assumed that activities reported to take place through the school summer holidays were undertaken for a period of six weeks and activities in the October half term holiday were undertaken for one week.

6. Summary and discussion

Data for 273 individuals were recorded between 18th July and 31st October 2009. Interviews were conducted and headcounts were obtained at the following eight beaches in the survey area: Allonby, Workington, Parton, Whitehaven, St Bees, Braystones, Seascale and Silecroft. Headcounts were also obtained at Maryport, Harrington, Coulderton, Nethertown, Drigg and Ravenglass. Most beaches had easy access by foot or by car so were popular with both locals and tourists. Access was more limited at Coulderton, Nethertown and Braystones, and these beaches were predominantly used by

local people that permanently resided in the beach chalets in these areas. There was no direct public access to Sellafield beach during the fieldwork and the only way to reach the beach was to walk approximately 3 km along the coast from Braystones or 2 km from Seascale.

Activities were observed occurring on all beaches visited in the survey area. The busiest beaches were Silecroft, St Bees, Seascale and Allonby, which were popular tourist locations. There were a large number of people on these beaches at weekends and many people staying at the caravan sites at Allonby, St Bees and Silecroft spent time on the beaches. Activities undertaken at weekends included families playing, picnicking and building sand castles, and although these activities were affected by the high rainfall throughout August, they were generally undertaken at low occupancy rates. Certain activities undertaken by people in the high-rate groups, such as dog walking, beachcombing, angling, setting nets, bait digging and shellfish collecting, were undertaken regularly throughout the year regardless of the weather. Of the people observed on the beaches, 19 dog walkers, five anglers and two bait diggers were encountered more than once during the survey. Handling activities undertaken by people in the high-rate group were potting offshore, bait digging, shellfish collecting and beach cleaning, and with the exception of bait digging, these were mostly undertaken wearing gloves. Other handling activities such as setting nets, beachcombing, collecting shells, rock pooling, collecting seaweed, collecting sea coal and throwing stones and sticks were undertaken at lower rates, and with the exception of setting nets, people did not wear gloves.

6.1 Comparison of the 2007 and 2009 data

The 2009 beach occupancy survey data will add clarification and improve confidence in the 2007 habits survey results. Some comparisons can be drawn between the 2007 and 2009 results at locations where interviews were conducted in both years. However, it should be noted that a comparison of the headcounts obtained at the same locations in 2007 and 2009 may be misleading owing to temporal and meteorological differences when the headcounts were obtained and to differences in the number of times that the beaches were visited in each year.

Interviews were conducted at St Bees, Braystones and Seascale in 2007 and 2009 and a comparison of the range of occupancy rates and associated activities is presented in Table 8. The activities undertaken at the same location in both years were broadly similar. The main difference was an increase in the number of people undertaking activities at the lower occupancy rates at St Bees and Seascale in 2009, which is likely to be a consequence of the introduction of weekend fieldwork in 2009. St Bees and Seascale are popular tourist beaches and interviews were conducted with numerous people undertaking activities at low occupancy rates. For example, in 2009 people spent on average 2-4 hours on the beach per visit but may have only visited the beach once or twice per week during the summer months, compared with many dog walkers that were interviewed in 2007 that walked their dog daily for 1-2 hours.

Table 8. Comparison of the range of occupancy rates (h y^{-1}) and activities at beaches where interviews were conducted in 2007 and 2009

Location	Range of occupancy rates (h y^{-1})	Number of interviewees		Activities undertaken by interviewees	
		2007	2009	2007	2009
St Bees	0 - 100	41	58	Angling, bait digging, beachcombing, building sandcastles, collecting mussels and winkles, crabbing, dog walking, eating picnics, paddling, playing, rock pooling and walking	Angling, beachcombing, building sandcastles, collecting razor shells, collecting shells, dog walking, paddling, throwing stones, and rock pooling, playing and walking
	>100 - 200	9	4	Angling, building sandcastles, collecting peeler crabs, dog walking and rock pooling	Angling, beach occupancy, collecting winkles and limpets, dog walking and walking
	>200 - 300	11	9	Angling, collecting winkles, dog walking, paddling, playing, sunbathing and walking	Angling and dog walking
	>300 - 400	7	5	Angling, dog walking, eating picnics, paddling, sunbathing and walking	Angling, dog walking and beach cleaning
	≥ 400	2	1	Dog walking	Dog walking
Braystones	0 - 100	20	21	Angling, bait digging, beachcombing, building sandcastles, collecting shells, collecting winkles, dog walking, kite flying, paddling, playing, rock pooling, setting nets, and throwing stones	Angling, bait digging, beachcombing, collecting crabs, collecting firewood, collecting razor shells, collecting shells and stones, collecting winkles, paddling, playing and setting nets
	>100 - 200	10	4	Angling, bait digging, beachcombing, building sandcastles, collecting winkles, dog walking, setting nets, and walking	Angling and bait digging
	>200 - 300	4	11	Collecting winkles, building sandcastles and playing	Angling, bait digging, collecting winkles, playing and setting nets
	>300 - 400	3	3	Angling, bait digging, beachcombing, collecting mussels and winkles, dog walking, long lining and shrimping	Angling, dog walking and setting nets
	≥ 400	8	3	Angling, bait digging, collecting mussels and winkles dog walking playing, setting nets and shrimping	Angling, beachcombing, playing, setting nets and walking

(continued overleaf)

Table 8. Comparison of the range of occupancy rates (h y^{-1}) and activities at beaches where interviews were conducted in 2007 and 2009 (continued)

Location	Range of occupancy rates (h y^{-1})	Number of interviewees		Activities undertaken by interviewees	
Seascale	0 - 100	16	30	Angling, bait digging, beachcombing, collecting winkles, dog walking, playing, rock pooling, sand yachting and walking	Angling, building sandcastles, dog walking, paddling, picnicking, playing and rock pooling
	>100 - 200	12	15	Collecting winkles, dog walking and playing	Angling, walking, rock pooling, dog walking and bait digging
	>200 - 300	4	0	Angling, collecting winkles and dog walking	None
	≥ 400	9	2	Angling, bait digging, dog walking and setting nets	Dog walking

The activities of people in the high-rate groups for occupancy rates over comparable substrates are shown in Table 9 and were broadly similar in 2007 and 2009. Some of these people were interviewed in both surveys and the data provided in 2009 was fairly consistent with that provided in 2007, particularly for people undertaking activities routinely, such as angling, dog walking, shellfish collecting and setting nets.

Table 9. Comparison of activities and mean occupancy rates for the high-rate group over substrates in 2007 and 2009

Substrate	Number of individuals in the high-rate group		Activity of individual(s) in the high-rate groups		Mean occupancy rate for the high-rate group (h y^{-1})	
	2007	2009	2007	2009	2007	2009
Mud and Sand	1	1	Angling and bait digging	Bait digging	1248	912
Rock	5	3	Angling, collecting shellfish and dog walking	Angling and collecting shellfish	442	448
Rock and sand	5	5	Collecting shellfish and rock pooling	Rock pooling	175	29
Sand	24	17	Angling, beachcombing, dog walking, jogging, setting nets, setting long-lines and walking	Angling, bait digging, beach cleaning, beachcombing, collecting shellfish, dog walking and setting nets	593	630
Stones	14	18	Angling and dog walking	Angling, beach cleaning, dog walking, playing and setting nets	378	232

The 2007 and 2009 habits survey results can be used to support the future direction of the monitoring effort, particularly at locations where high occupancy rates were identified and on beaches that were frequented by large numbers of people.

7. Acknowledgements

Gratitude is expressed to members of the public and representatives of local authorities, groups and agencies, particularly the Health Protection Agency, who offered helpful advice and information during the survey. This survey was undertaken on behalf of the Environment Agency and the project officer and other Environment Agency staff gave considerable help during the survey. Maps 2 – 13 in this report are Crown copyright.

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Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
School summer holidays commenced 16th July 2009				
Saturday 18th July 2009				
Seascale	Dry/cool NW wind	7	Dog walking	
Drigg	Dry/cool NW wind	15	Dog walking	
Silecroft	Dry/cool NW wind	18	Dog walking, families playing	
Ravenglass	Dry/cool NW wind	7	Dog walking, walking	
Drigg (2nd visit)	Dry/cool NW wind/cloudy	7	2 dog walkers, family of 5 rock pooling	
Braystones	Dry/sunny/cool W breeze	2	Dog walking	
Nethertown	Dry/sunny/cool breeze	4	Children throwing stones	
Coulderton	Dry/sunny/cool W breeze	0		
St.Bees	Dry/sunny/cool W breeze	13	5 dog walkers, family rock pooling	
St.Bees (2nd visit)	Very sunny/dry/cool W breeze	15	Dog walkers, walkers	
Whitehaven outer harbour	Hot/sunny/W breeze	1	Bait digging	
Sunday 19th July 2009				
Parton	Sunny/dry/light W wind	2	Dog walking	
Harrington	Bright/sunny/W breeze	3	Collecting pebbles, 1 dog walker	
Workington	Sunny/W breeze	2	Walking	
Workington (2nd visit)	Sunny/W breeze	0		
Workington (3rd visit)	Sunny/W breeze	3	Dog walkers and walkers	
Allonby	Very sunny/strong W breeze	36	Dog walkers, walkers and wind-surfers	
Maryport	Very sunny/strong W breeze	12	Dog walkers and general beach activities	
Seascale	Sunny/light breeze	23	Dog walkers, family paddling and playing games	
Tuesday 28th July 2009				
Parton	Light rain/windy	0		
Whitehaven outer harbour	Windy	5	2 adults and 1 child bait digging, 2 adults walking	
Wednesday 29th July 2009				
Harrington	Cloudy	0		
Workington	Cloudy	5	Dog walker, family with children playing	
Thursday 30th July 2009				
Parton	Partly cloudy/warm/windy	4	Dog walking	

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
St.Bees	Partly cloudy/warm/windy	5	Dog walkers and walkers	
Friday 31st July 2009				
Braystones	Dry/warm/overcast	13	Beach cleaning and monitoring	
St.Bees	Warm/cloudy/dry/SW wind	53	10+ dog walkers, 1 wind-surfer and general beach activities	
Saturday 1st August 2009				
Parton	Sunny/warm/windy	7	Dog walking, beach combing	
Workington	Very windy/sunny/warm	3	Dog walking	
Allonby	Sunny/windy/warm	15	1 wind-surfer, families playing and rock pooling	
Parton (2nd visit)	Warm/windy	4	1 dog walker and 1 adult and 2 children playing	
Sunday 2nd August 2009				
St.Bees	Dry/sunny/W breeze	15	Dog walking, playing, picnicking, paddling and throwing stones	
Whitehaven north beach	Fine/sunny/W breeze	5	2 dog walkers, 2 children paddling	
Coulderton	Sunny/very warm/W breeze	6	5 walkers and 1 winkle collector	
Nethertown	Warm/sunny/W breeze	7	4 people collecting pebbles, 3 dog walkers	
Braystones	Warm/sunny/W breeze	2	Walkers	
Seascale	Warm/sunny/W breeze	26	Dog walking, building sandcastles, paddling, playing beach games, beach combing	
Drigg	Warm/sunny/W breeze	27	Dog walking, walking, building sandcastles, angling	
Parton	Sunny/breezy	1	1 dog walker	
Silecroft	Warm/sunny/W breeze	83	Dog walking, canoeing, kite-surfing, kite buggying, paragliding, playing beach games and paddling	
Monday 3rd August 2009				
St.Bees	Breezy/showers	20	Kite flying and dog walking	
Seascale	Raining	13	Dog walking	
Drigg	Showers/windy/chilly	2	Walking	
Thursday 6th August 2009				
Whitehaven outer harbour	Sunny/warm/dry	4	2 dog walkers, 2 bait diggers	

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
Parton	Sunny	7	Dog walking, collecting coal	
Workington	Sunny	17	Rock climbing, swimming	
Workington (2nd visit)	Sunny	11	Dog walking	
Friday 7th August 2009				
Parton	Sunny/warm	18	Sunbathing, angling, dog walking and throwing stones	
Saturday 8th August 2009				
Silecroft	Cloudy/strong breeze/warm	40	Angling, swimming, picnicking and building sandcastles	
Drigg	Cloudy/strong breeze	4	1 woman with 2 young children sitting, 1 litter collector	
Seascale	Cloudy/cold	6	1 adult and 1 child body-boarding, 1 adult and 2 children dog walking	
Braystones	Cloudy/cold	0		
Nethertown	Cloudy/cold	4	2 adults walking, 2 children throwing stones	
Sunday 9th August 2009				
Parton	Cloudy	1	Dog walker	
Seascale	Cloudy/warm/light wind	7	Dog walkers and walkers	
Drigg	Dry/cloudy/moderate breeze	35	Litter collectors and dog walkers	
Ravenglass	Overcast/warm/light breeze	14	2 dog walkers, 6 canoeists, 2 anglers and 1 horse rider	
Silecroft	Warm/overcast/light W breeze	37	15 anglers, dog walkers and general beach activities	
Seascale	Sunny/warm/light breeze	7	4 anglers, picnickers and playing games	
Braystones	Hot/sunny/light breeze	5	3 dog walkers, 3 anglers	
Wednesday 12th August 2009				
Workington	Dry/cloudy/NW breeze	2	Dog walking	
Allonby	Cloudy/dry/strong NW breeze	16	Dog walking, families playing	
Sunday 16th August 2009				
Parton	Dry/strong SW wind	9	Dog walking	
Harrington	Dry/strong SW wind/overcast	0		

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
Workington	Dry/strong SW wind/overcast	0		
Workington (2nd visit)	Dry/strong SW wind/overcast	8	2 wind-surfers and 6 dog walkers	
Maryport	Dry/some sunshine/strong SW wind	7	Dog walking	
Allonby	Sunny/SW wind	19	Dog walkers, 3 wind-surfers, walkers, 1 kite-surfer	
Monday 17th August 2009				
Whitehaven outer harbour	Dry/partially cloudy/SW wind	5	1 dog walker, family of 4 playing and picnicking	
Tuesday 18th August 2009				
Parton	Cloudy	2	2 anglers	
Whitehaven outer harbour	Light rain	1	Boat maintenance	
Wednesday 19th August 2009				
Whitehaven outer harbour	Cloudy/strong SW wind	0		
Whitehaven outer harbour	Cool/overcast/light rain	15	Family of 6 playing	
Thursday 20th August 2009				
Silecroft	Clear/strong SW wind	13	Walking, paddling and kite flying	
Friday 21st August 2009				
Whitehaven outer harbour	Dry/sunny/strong SW wind	10	Sitting, paddling, building sand castles and dog walking	
Tuesday 25th August 2009				
Whitehaven outer harbour	Sunny/SW wind	15	Picnicking, sand castling and paddling	
Thursday 27th August 2009				
Silecroft	Cloudy/cool	30	1 child kite flying, 2 families, dog walkers	
Friday 28th August 2009				
Whitehaven outer harbour	Cloudy/strong W wind	2	2 dog walkers	
Saturday 29th August 2009				
Braystones	Cloudy/strong NW wind	7	3 dog walkers and paddlers	
Seascale	Sunny/strong W wind	9	Dog walkers	5 dog walkers
Drigg	Overcast/very strong W wind	13	2 kite-buggying, 5 dog walkers, 2 bird watchers and 4 walkers	

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
Ravenglass	Dry/overcast/very strong W wind	1	Walking	
Silecroft	Overcast/dry/very strong W wind	26	5 horse riders, 1 kite surfer, 10 dog walkers, 2 families, walkers, kite fliers	
Monday 31st August 2009				
Workington	Very windy/wet	0		
Workington (2nd visit)	Very windy/wet	1	Dog walking	
Allonby	Very windy/wet	7	Dog walking	
Parton	Very windy/wet	1	Walking	
Whitehaven outer harbour	Very windy/wet	0		
School summer holidays ended 2nd September 2009				
Saturday 5th September 2009				
Whitehaven outer harbour	Overcast/dry/cool W wind	1	Dog walking	
St.Bees	Overcast/cool W wind	10	8 walkers and 2 dog walkers	
St.Bees (2nd visit)	Overcast/W wind	11	Dog walkers, beachcomber collecting driftwood	
Nethertown	Dry/overcast/W wind	0		
Braystones	Dry/overcast/SW-W wind/cold	5	Anglers	
Seascale	Overcast/light rain/strong W wind	4	Walkers	
Drigg	Overcast/light rain/W wind	1	Dog walking	
Silecroft	Overcast/light rain/strong W wind	5		3 Anglers
St.Bees (3rd visit)	Cloudy/strong W wind	5	Collecting stones	
Whitehaven outer harbour (2nd visit)	Cloudy/strong W wind	4	Children playing	
Ravenglass	Cloudy/cool/strong W wind	0		
Sunday 6th September 2009				
Silecroft	Cloudy/breezy	17	Anglers, 4 children playing	
Seascale	Raining/windy	2	Walking	
St.Bees	Heavy rain/Strong wind	0		
Workington	Heavy rain/Strong wind	0		
Monday 7th September 2009				

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
Whitehaven outer harbour	Dry/W wind	3	2 bait diggers, 1 dog walker	
Seascale	Dry/moderate breeze	7	Dog walking	
Drigg	Dry/moderate S breeze	3	Dog walking	
Wednesday 16th September 2009				
Whitehaven outer harbour		0		
Thursday 17th September 2009				
Whitehaven outer harbour		2	1 Bait digger, 1 dog walker	
Silecroft	Cloudy/warm	2	Dog walking	
Saturday 19th September 2009				
Whitehaven outer harbour		1	1 Bait digger	
Harrington	Dry/ SW wind	0		
Workington	Dry/overcast/moderate breeze	3	2 children playing	1 Dog walker
Allonby	Overcast/dry/SW wind	16	Group of 16 playing and picnicking	
Maryport	Dry/light breeze	1	Dog walking	
Parton	Dry/calm/overcast	2		2 Dog walkers
St.Bees	Dry/warm/light SW breeze	0		
Tuesday 22nd September 2009				
St.Bees	Dry/sunny/moderate SW breeze	16	16 dog walkers	
Wednesday 23rd September 2009				
Whitehaven outer harbour	Dry/cloudy/strong SW breeze	5	3 bait diggers	2 Bait diggers
Seascale	Dry/cloudy/moderate SW breeze	3	Family playing	
Braystones	Dry/cloudy/moderate SW breeze	0		
Braystones (2nd visit)	Dry/cloudy/moderate SW breeze	1	Dog walking	
Thursday 24th September 2009				
Whitehaven outer harbour		3	3 bait diggers	
Workington	Windy/cold	2	1 bait digger	
Allonby	Cloudy/windy	0		

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
Parton	Cloudy/windy/cold	2	Dog walking	
Friday 25th September 2009				
Whitehaven outer harbour		3	2 Bait diggers, 1 dog walker	
St.Bees	Dry/cloudy/light SW breeze	5		5 Dog walkers
Braystones	Dry/cloudy/light SW breeze	3	Dog walking	2 Anglers
Saturday 26th September 2009				
Seascale	Dry/some cloud	7	Dog walking	
Drigg	Dry/some cloud/light W breeze	3		3 Dog walkers
Ravenglass	Dry/some cloud/light W breeze	1	Dog walking	
Silecroft	Dry/some cloud/moderate W breeze	29	5 teenage boys swimming, dog walkers, anglers	
Seascale	Dry/some cloud/light NW breeze	7	1 angler and 2 families	
Tuesday 29th September 2009				
Silecroft	Dry/overcast/moderate NW breeze	2	1 dog walker, 1 seaweed collector	
Thursday 1st October 2009				
Parton	Sunny/calm	1	Dog walking	
Allonby	Very sunny/light NW breeze/warm	5	Walking, dog walking	
Maryport	Warm sunshine/calm	0		
Workington	Sunny/calm	5	Dog walking, walking	1 Dog walker
Harrington	Sunny/calm	0		
Sunday 4th October 2009				
Nethertown	Sunny/ W breeze	19	Dog walkers, walkers, anglers, family of 6 playing	
St.Bees	Clear/W breeze	10	Dog walkers	2 Dog walkers
Braystones	Sunny/light W breeze	1	Dog walking	
Seascale	Sunny/light W breeze	16	Family of 6 playing	
Drigg	Sunny/light W breeze/light rain	10	Dog walkers	
Tuesday 6th October 2009				

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
Whitehaven outer harbour		2	2 bait diggers	
Parton	Cloudy	3	Dog walkers	
Wednesday 7th October 2009				
Whitehaven outer harbour		6	6 dog walkers	
Thursday 8th October 2009				
Whitehaven outer harbour		9	8 bait diggers, 1 dog walker	
Nethertown	Sunny	3	Walkers	
Friday 9th October 2009				
Whitehaven outer harbour		9	3 bait diggers, 3 dog walkers, boat maintenance	
Monday 12th October 2009				
Workington	Sunny/calm	0		
Allonby	Sunny	11	Dog walkers, horse rider and walkers	
Parton	Sunny	0		
Thursday 15th October 2009				
Whitehaven outer harbour		1	1 dog walker	
Friday 16th October 2009				
Whitehaven outer harbour		4	3 bait diggers, 1 dog walker	
Monday 19th October 2009				
Whitehaven outer harbour		1	1 dog walker	
School half term holiday commenced 26th October 2009				
Monday 26th October 2009				
St.Bees	Sunny	3	2 walkers, children rock pooling	
Allonby	Sunny/calm	25	Walkers, families playing and rock pooling	
Seascale	Sunny/calm	11	Dog walking, paddling, playing	
Workington	Sunny/calm	1	Dog walkers	
Tuesday 27th October 2009				
Seascale	Sunny and cloudy	4	Walking, dog walking	
Silecroft	Cloudy	1	Angling	
Wednesday 28th October 2009				
Workington	Sunny and cloudy	3	3 dog walkers	
St.Bees	Sunny and cloudy	30	Rock pooling, playing and walking	

Annex 1. Number of people observed on the beaches during the survey fieldwork

Location	Weather	Total headcount	Activities observed	People interviewed previously during the survey
Allonby	Raining/windy	12	Kite-surfing, angling, dog walking	
Thursday 29th October 2009				
Seascale	Raining	0		
Friday 30th October 2009				
St.Bees	Windy	20	Building sandcastles, walking	
Seascale	Cloudy/windy	4	Walking	
Silecroft	Cloudy/very windy	14	Collecting wood	
School half term holiday ended 30th October 2009				
Saturday 31st October 2009				
St.Bees	Windy/light rain	11	Dog walking, playing and throwing stones	

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Allonby	Intertidal occupancy	9	M	U	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
Allonby	Intertidal occupancy	10	F	U	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
Allonby	Intertidal occupancy	11	F	3	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
Allonby	Intertidal occupancy	12	M	5	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
Allonby	Intertidal occupancy	21	M	40	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	22	F	40	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	23	M	45	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	24	F	43	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	25	F	40	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	26	M	8	Rock pooling and dog walking	65	Once per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	27	F	5	Rock pooling and dog walking	65	Once per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	28	F	7	Rock pooling and dog walking	65	Once per week all year - split between 2 locations	Local
Allonby	Intertidal occupancy	43	M	30's	Playing, building sand castles	48	6 weekends per year in summer	Staying at the Allonby caravan site
Allonby	Intertidal occupancy	44	F	30's	Playing, building sand castles	48	6 weekends per year in summer	Staying at the Allonby caravan site
Allonby	Intertidal occupancy	45	F	4	Playing, building sand castles	48	6 weekends per year in summer	Staying at the Allonby caravan site
Allonby	Intertidal occupancy	57	M	U	Dog walking	137	Daily, all year	Local
Allonby	Intertidal occupancy	58	F	U	Dog walking	137	Daily, all year	Local
Allonby	Intertidal occupancy	59	F	U	Dog walking	137	Daily, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Allonby	Intertidal occupancy	60	F	U	Dog walking	137	Daily, all year	Local
Allonby	Intertidal occupancy	61	M	10	Dog walking	137	Daily, all year	Local
Allonby	Intertidal occupancy	96	F	60's	Dog walking	548	Daily, all year	Local
Allonby	Intertidal occupancy	97	M	U	Picnicking and walking	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	98	F	U	Picnicking and walking	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	99	M	U	Picnicking and walking	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	100	F	U	Picnicking and walking	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	101	F	8	Picnicking, playing and rock pooling	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	102	F	10	Picnicking, playing and rock pooling	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	103	M	6	Picnicking, playing and rock pooling	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	104	F	9	Picnicking, playing and rock pooling	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	105	M	8	Picnicking, playing and rock pooling	30	Daily for 1 week in summer	Staying at the Allonby caravan park
Allonby	Intertidal occupancy	151	M	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	152	M	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Allonby	Intertidal occupancy	153	M	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	154	M	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	155	F	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	156	F	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	157	F	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	158	F	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	159	F	U	Playing, picnicking and collecting wood for a fire	6	Once per year in summer	Local
Allonby	Intertidal occupancy	160	F	9 months	Playing and picnicking	6	Once per year in summer	Local
Allonby	Intertidal occupancy	161	F	5	Playing and picnicking	6	Once per year in summer	Local
Allonby	Intertidal occupancy	162	F	8	Playing and picnicking	6	Once per year in summer	Local
Allonby	Intertidal occupancy	163	F	13	Playing and picnicking	6	Once per year in summer	Local
Allonby	Intertidal occupancy	164	M	4	Playing and picnicking	6	Once per year in summer	Local
Allonby	Intertidal occupancy	165	M	7	Playing and picnicking	6	Once per year in summer	Local
Allonby	Intertidal occupancy	166	M	11	Playing and picnicking	6	Once per year in summer	Local
Allonby	Intertidal occupancy	171	M	50's	Angling	160	3-4 times per week, all year - split between 5 locations	Local
Allonby	Intertidal occupancy	186	F	60's	Dog walking	548	Twice per day, all year	Local
Allonby	Intertidal occupancy	187	F	60's	Dog walking	548	Twice per day, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Allonby	Intertidal occupancy	204	M	30's	Playing	21	Daily for 1 week in school holiday	Tourist - staying in the area for 1 week
Allonby	Intertidal occupancy	205	F	30's	Playing	21	Daily for 1 week in school holiday	Tourist - staying in the area for 1 week
Allonby	Intertidal occupancy	206	M	2	Playing	21	Daily for 1 week in school holiday	Tourist - staying in the area for 1 week
Allonby	Intertidal occupancy	207	F	2	Playing	21	Daily for 1 week in school holiday	Tourist - staying in the area for 1 week
Allonby	Intertidal occupancy	208	M	30's	Angling and dog walking	16	Daily for 4 days in school holiday	Staying at Allonby caravan park
Allonby	Intertidal occupancy	209	F	30's	Angling and dog walking	16	Daily for 4 days in school holiday	Staying at Allonby caravan park
Allonby	Intertidal occupancy	210	M	10	Angling and dog walking	16	Daily for 4 days in school holiday	Staying at Allonby caravan park
Allonby	Intertidal occupancy	211	M	U	Rock pooling and playing	4	First visit	Tourist
Allonby	Intertidal occupancy	212	F	U	Rock pooling and playing	4	First visit	Tourist
Allonby	Intertidal occupancy	213	F	6	Rock pooling and playing	4	First visit	Tourist
Allonby	Intertidal occupancy	214	F	7	Rock pooling and playing	4	First visit	Tourist
Allonby	Handling beach materials	26	M	8	Rock pooling, handling stones and shells	13	Once per week all year	Local
Allonby	Handling beach materials	27	F	5	Rock pooling, handling stones and shells	13	Once per week all year	Local
Allonby	Handling beach materials	28	F	7	Rock pooling, handling stones and shells	13	Once per week all year	Local
Allonby	Handling beach materials	101	F	8	Rock pooling, handling stones and shells	2	Occasionally during 1 week in summer	Staying at the Allonby caravan park
Allonby	Handling beach materials	102	F	10	Rock pooling, handling stones and shells	2	Occasionally during 1 week in summer	Staying at the Allonby caravan park
Allonby	Handling beach materials	103	M	6	Rock pooling, handling stones and shells	2	Occasionally during 1 week in summer	Staying at the Allonby caravan park

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Allonby	Handling beach materials	104	F	9	Rock pooling, handling stones and shells	2	Occasionally during 1 week in summer	Staying at the Allonby caravan park
Allonby	Handling beach materials	105	M	8	Rock pooling, handling stones and shells	2	Occasionally during 1 week in summer	Staying at the Allonby caravan park
Allonby	Handling beach materials	211	M	U	Rock pooling - handling stones and shells	1	First visit	Tourist
Allonby	Handling beach materials	212	F	U	Rock pooling - handling stones and shells	1	First visit	Tourist
Allonby	Handling beach materials	213	F	6	Rock pooling - handling stones and shells	1	First visit	Tourist
Allonby	Handling beach materials	214	F	7	Rock pooling - handling stones and shells	1	First visit	Tourist
Braystones	Intertidal occupancy	50	M	53	Beachcombing	65	Twice per week, all year - split between 4 locations	Local
Braystones	Intertidal occupancy	86	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Braystones	Intertidal occupancy	86	M	30's	Angling	546	3 times per week, all year	Owner of a caravan at Braystones
Braystones	Intertidal occupancy	87	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Braystones	Intertidal occupancy	87	M	30's	Angling	546	3 times per week, all year	Owner of a caravan at Braystones
Braystones	Intertidal occupancy	121	F	60's	Dog walking	365	Daily, all year	Resident at Braystones caravan park
Braystones	Intertidal occupancy	137	M	40's	Angling	8	4 times per year	Local
Braystones	Intertidal occupancy	138	M	12	Angling	8	4 times per year	Local
Braystones	Intertidal occupancy	139	M	10	Angling	8	4 times per year	Local
Braystones	Intertidal occupancy	140	M	20's	Angling	210	2-3 times per fortnight, September to March	Local
Braystones	Intertidal occupancy	170	M	50's	Angling	320	3-4 times per week, all year - split between 2 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Braystones	Intertidal occupancy	171	M	50's	Angling	160	3-4 times per week, all year - split between 5 locations	Local
Braystones	Intertidal occupancy	172	M	50's	Angling	104	2 times per week, all year - split between 4 locations	Local
Braystones	Intertidal occupancy	188	M	70's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Braystones	Intertidal occupancy	189	F	70's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Braystones	Intertidal occupancy	190	M	40's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Braystones	Intertidal occupancy	191	F	40's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Braystones	Intertidal occupancy	192	F	11	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Braystones	Intertidal occupancy	193	M	7	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Braystones	Intertidal occupancy	238	M	20	Angling	210	2-3 times per fortnight, September to March	Local
Braystones	Intertidal occupancy	253	M	67	Collecting winkles	39	Twice per week, all year - split between 2 locations	Local
Braystones	Intertidal occupancy	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Braystones	Intertidal occupancy	254	M	U	Collecting winkles	9	Shellfish collecting once per month, all year - split between 2 locations	Local
Braystones	Intertidal occupancy	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Braystones	Intertidal occupancy	259	M	U	Collecting winkles	224	Daily for 9 months per year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Braystones	Intertidal occupancy	259	M	U	Setting nets	400	5 times per week January to May	Local
Braystones	Intertidal occupancy	259	M	U	Angling	72	Once per week for 9 months - split between 4 locations	Local
Braystones	Intertidal occupancy	260	F	U	Playing and angling	218	Once per week for 9 months. Angling is split between 4 locations.	Local
Braystones	Intertidal occupancy	260	F	U	Setting nets	48	12 times per year January to May	Local
Braystones	Intertidal occupancy	261	M	13	Angling and general beach activities	276	Angling once per week for 9 months - split between 4 locations. Beach activities daily in school holidays and at weekends.	Local
Braystones	Intertidal occupancy	262	M	11	Angling and general beach activities	276	Angling once per week for 9 months - split between 4 locations. Beach activities daily in school holidays and at weekends.	Local
Braystones	Intertidal occupancy	263	M	10	Angling and general beach activities	276	Angling once per week for 9 months - split between 4 locations. Beach activities daily in school holidays and at weekends.	Local
Braystones	Intertidal occupancy	264	F	6	Angling and general beach activities	276	Angling once per week for 9 months - split between 4 locations. Beach activities daily in school holidays and at weekends.	Local
Braystones	Intertidal occupancy	265	M	54	Angling	208	Twice per week, all year - split between 3 locations	Local
Braystones	Intertidal occupancy	265	M	54	Bait digging	26	Once per week, all year - split between 2 locations	Local
Braystones	Intertidal occupancy	266	M	55	Bait digging	112	Twice per week for 28 weeks	Live in a beach chalet at Braystones
Braystones	Intertidal occupancy	266	M	55	Angling, walking, beachcombing, setting nets and playing	818	Most days	Live in a beach chalet at Braystones
Braystones	Intertidal occupancy	266	M	55	Collecting razor shells and crabs	100	Collecting razor shells 18 times per year and collecting crabs once per week April to July	Live in a beach chalet at Braystones

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Braystones	Intertidal occupancy	267	F	54	Angling, setting nets, playing	244	Most days	Live in a beach chalet at Braystones
Braystones	Intertidal occupancy	268	F	7	Playing, paddling and collecting shells and stones	24	Once per week for 3 months in summer	Visiting grandparents
Braystones	Intertidal occupancy	269	F	6	Playing, paddling and collecting shells and stones	24	Once per week for 3 months in summer	Visiting grandparents
Braystones	Handling beach materials	50	M	53	Beachcombing - collecting wood	65	Twice per week, all year - split between 4 locations	Local
Braystones	Handling beach materials	266	M	55	Beachcombing - collecting firewood	12	Once per week for 3 months - split between 2 locations	Live in a beach chalet at Braystones
Braystones	Handling beach materials	268	F	7	Collecting shells and stones	12	Once per week for 3 months in summer	Visiting grandparents
Braystones	Handling beach materials	269	F	6	Collecting shells and stones	12	Once per week for 3 months in summer	Visiting grandparents
Braystones	Handling sediment	86	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Braystones	Handling sediment	87	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Braystones	Handling sediment	253	M	67	Collecting winkles	39	Twice per week, all year - split between 2 locations	Local
Braystones	Handling sediment	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Braystones	Handling sediment	254	M	U	Collecting winkles	9	Shellfish collecting once per month, all year - split between 2 locations	Local
Braystones	Handling sediment	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Braystones	Handling sediment	259	M	U	Collecting winkles	224	Daily for 9 months per year - split between 3 locations	Local
Braystones	Handling sediment	265	M	54	Bait digging	26	Once per week, all year - split between 2 locations	Local
Braystones	Handling sediment	266	M	55	Bait digging	112	Twice per week for 28 weeks	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Braystones	Handling sediment	266	M	55	Collecting razor shells and crabs	100	Collecting razor shells 18 times per year and collecting crabs once per week April to July	Local
Braystones	Handling fishing gear	259	M	U	Setting nets	400	5 times per week January to May	Local
Braystones	Handling fishing gear	260	F	U	Setting nets	48	12 times per year January to May	Local
Braystones	Handling fishing gear	266	M	55	Setting nets	480	5 times per week, December to May	Local
Braystones	Handling fishing gear	267	F	54	Setting nets	120	Twice per week, December to May	Local
Coulderton	Intertidal occupancy	46	M	30's	Collecting winkles	140	Twice per year, April to October	Local
Coulderton	Intertidal occupancy	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
Coulderton	Intertidal occupancy	254	M	U	Collecting limpets	9	Shellfish collecting once per month, all year	Local
Coulderton	Intertidal occupancy	256	M	U	Collecting winkles and limpets	117	Every 2 days, all year - split between 3 locations	Local
Coulderton	Handling beach materials	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
Coulderton	Handling sediment	46	M	30's	Collecting winkles	140	Twice per year, April to October	Local
Coulderton	Handling sediment	254	M	U	Collecting winkles	9	Shellfish collecting once per month, all year	Local
Coulderton	Handling sediment	256	M	U	Collecting winkles and limpets	117	Every 2 days, all year - split between 3 locations	Local
Drigg	Intertidal occupancy	47	M	30's	Kite-buggying and dog walking	224	Kite-buggying once per month. Dog walking 2-3 times per week - split between 2 locations.	Local
Drigg	Intertidal occupancy	48	F	30's	Dog walking	200	2-3 times per week - split between 2 locations	Local
Drigg	Intertidal occupancy	49	M	12	Dog walking	200	2-3 times per week - split between 2 locations	Local
Drigg	Intertidal occupancy	50	M	53	Beachcombing	65	Twice per week, all year - split between 4 locations	Local
Drigg	Intertidal occupancy	51	M	U	Bait digging	39	Once per week, all year	Local
Drigg	Intertidal occupancy	52	M	14	Bait digging	39	Once per week, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Drigg	Intertidal occupancy	82	M	40's	Angling	312	4 times per week, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	82	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	83	M	40's	Angling	312	4 times per week, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	83	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	84	M	40's	Bait digging	130	4 times per week, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	84	M	40's	Angling	312	Twice per month, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	85	M	40's	Angling	312	4 times per week, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	85	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	86	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Drigg	Intertidal occupancy	87	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Drigg	Intertidal occupancy	171	M	50's	Angling	160	3-4 times per week, all year - split between 5 locations	Local
Drigg	Intertidal occupancy	172	M	50's	Angling	104	2 times per week, all year - split between 4 locations	Local
Drigg	Intertidal occupancy	174	M	30's	Dog walking	312	Twice per day, 3-4 times per week - split between 2 locations	Local
Drigg	Intertidal occupancy	175	M	30's	Walking, playing, building sandcastles and picnicking	46	Twice per week for 6 months - split between 2 locations	Local
Drigg	Intertidal occupancy	176	F	30's	Walking, playing, building sandcastles and picnicking	46	Twice per week for 6 months - split between 2 locations	Local
Drigg	Intertidal occupancy	177	F	3	Walking, playing, building sandcastles and picnicking	46	Twice per week for 6 months - split between 2 locations	Local
Drigg	Intertidal occupancy	234	M	U	Litter collecting	15	3 times per year	Local
Drigg	Intertidal occupancy	235	U	U	Litter collecting	15	3 times per year	Local
Drigg	Intertidal occupancy	236	U	U	Litter collecting	15	3 times per year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Drigg	Intertidal occupancy	237	U	U	Litter collecting	15	3 times per year	Local
Drigg	Intertidal occupancy	250	F	47	Dog walking	121	Daily, all year - split between 3 locations	Local
Drigg	Intertidal occupancy	253	M	67	Beachcombing	143	Twice per week, all year - split between 2 locations	Local
Drigg	Intertidal occupancy	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Drigg	Intertidal occupancy	254	M	U	Angling	456	3 times per week in winter and 1-2 times per week in summer	Local
Drigg	Intertidal occupancy	255	M	67	Walking	19	2-3 times per week in summer - split between 2 locations	Local
Drigg	Intertidal occupancy	259	M	U	Collecting winkles	224	Daily for 9 months per year - split between 3 locations	Local
Drigg	Intertidal occupancy	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Drigg	Intertidal occupancy	259	M	U	Angling	72	Once per week for 9 months - split between 4 locations	Local
Drigg	Intertidal occupancy	260	F	U	Angling	72	Once per week for 9 months - split between 4 locations	Local
Drigg	Intertidal occupancy	261	M	13	Angling	62	Once per week for 9 months - split between 4 locations	Local
Drigg	Intertidal occupancy	262	M	11	Angling	62	Once per week for 9 months - split between 4 locations	Local
Drigg	Intertidal occupancy	263	M	10	Angling	62	Once per week for 9 months - split between 4 locations	Local
Drigg	Intertidal occupancy	264	F	6	Angling	62	Once per week for 9 months - split between 4 locations	Local
Drigg	Intertidal occupancy	265	M	54	Angling	208	Twice per week, all year - split between 3 locations	Local
Drigg	Handling beach materials	47	M	30's	Throwing stones, sticks and balls for a dog	6.5	2-3 times per week - split between 2 locations	Local
Drigg	Handling beach materials	48	F	30's	Throwing stones, sticks and balls for a dog	6.5	2-3 times per week - split between 2 locations	Local
Drigg	Handling beach materials	49	M	12	Throwing stones, sticks and balls for a dog	6.5	2-3 times per week - split between 2 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Drigg	Handling beach materials	50	M	53	Beachcombing - collecting wood	65	Twice per week, all year - split between 4 locations	Local
Drigg	Handling beach materials	174	M	30's	Throwing sticks and balls for a dog	13	Twice per day, 3-4 times per week - split between 2 locations	Local
Drigg	Handling beach materials	234	M	U	Litter collecting - mainly plastic items - wearing gloves	15	3 times per year	Local
Drigg	Handling beach materials	235	U	U	Litter collecting - mainly plastic items - wearing gloves	15	3 times per year	Local
Drigg	Handling beach materials	236	U	U	Litter collecting - mainly plastic items - wearing gloves	15	3 times per year	Local
Drigg	Handling beach materials	237	U	U	Litter collecting - mainly plastic items - wearing gloves	15	3 times per year	Local
Drigg	Handling beach materials	253	M	67	Beachcombing	143	Twice per week, all year - split between 2 locations	Local
Drigg	Handling sediment	51	M	U	Bait digging	39	Once per week, all year	Local
Drigg	Handling sediment	52	M	14	Bait digging	39	Once per week, all year	Local
Drigg	Handling sediment	82	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Drigg	Handling sediment	83	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Drigg	Handling sediment	84	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Drigg	Handling sediment	85	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Drigg	Handling sediment	86	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Drigg	Handling sediment	87	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Drigg	Handling sediment	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Drigg	Handling sediment	259	M	U	Collecting winkles	224	Daily for 9 months per year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Drigg	Handling sediment	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Drigg	Handling fishing gear	251	M	50	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Drigg	Handling fishing gear	252	M	U	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Eskmeals	Intertidal occupancy	51	M	U	Bait digging	39	Once per week, all year	Local
Eskmeals	Intertidal occupancy	52	M	14	Bait digging	39	Once per week, all year	Local
Eskmeals	Intertidal occupancy	78	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Intertidal occupancy	79	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Intertidal occupancy	80	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Intertidal occupancy	81	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Intertidal occupancy	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Eskmeals	Handling sediment	51	M	U	Bait digging	39	Once per week, all year	Local
Eskmeals	Handling sediment	52	M	14	Bait digging	39	Once per week, all year	Local
Eskmeals	Handling sediment	78	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Handling sediment	79	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Handling sediment	80	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Handling sediment	81	M	40's	Bait digging	25	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Eskmeals	Handling sediment	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Eskmeals	Handling gear	251	M	50	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Eskmeals	Handling gear	252	M	U	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Harrington	Intertidal occupancy	93	M	25	Dog walking	55	Occasionally - split between 2 locations	Local
Harrington	Intertidal occupancy	94	M	35	Dog walking	55	Occasionally - split between 2 locations	Local
Harrington	Intertidal occupancy	95	F	35	Dog walking	55	Occasionally - split between 2 locations	Local
Maryport	Intertidal occupancy	51	M	U	Bait digging	39	Once per week, all year	Local
Maryport	Intertidal occupancy	52	M	14	Bait digging	39	Once per week, all year	Local
Maryport	Intertidal occupancy	151	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	152	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	153	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	154	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	155	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	156	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	157	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Maryport	Intertidal occupancy	158	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	159	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	160	F	9 months	Playing, picnicking, building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	161	F	5	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	162	F	8	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	163	F	13	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	164	M	4	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	165	M	7	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	166	M	11	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	168	M	30's	Angling	70	Once per week, all year - split between 3 locations	Local
Maryport	Intertidal occupancy	169	M	30's	Angling	70	Once per week, all year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Maryport	Intertidal occupancy	172	M	50's	Bait digging	24	4 times per month - all year - split between 2 locations	Local
Maryport	Intertidal occupancy	265	M	54	Bait digging	26	Once per week, all year - split between 2 locations	Local
Maryport	Handling sediment	51	M	U	Bait digging	39	Once per week, all year	Local
Maryport	Handling sediment	52	M	14	Bait digging	39	Once per week, all year	Local
Maryport	Handling sediment	172	M	50's	Bait digging	24	4 times per month - all year - split between 2 locations	Local
Maryport	Handling sediment	265	M	54	Bait digging	26	Once per week, all year - split between 2 locations	Local
Nethertown	Intertidal occupancy	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
Nethertown	Intertidal occupancy	253	M	67	Collecting winkles and razor shells	78	Twice per week, all year - split between 2 locations	Local
Nethertown	Intertidal occupancy	254	M	U	Collecting winkles	9	Shellfish collecting once per month, all year - split between 2 locations	Local
Nethertown	Intertidal occupancy	256	M	U	Collecting winkles and limpets	117	Every 2 days, all year - split between 3 locations	Local
Nethertown	Intertidal occupancy	265	M	54	Collecting winkles	75	2-3 times per month, all year	Local
Nethertown	Handling beach materials	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
Nethertown	Handling sediment	253	M	67	Collecting winkles and razor shells	78	Twice per week, all year - split between 2 locations	Local
Nethertown	Handling sediment	254	M	U	Collecting winkles	9	Shellfish collecting once per month, all year - split between 2 locations	Local
Nethertown	Handling sediment	256	M	U	Collecting winkles and limpets	117	Every 2 days, all year - split between 3 locations	Local
Nethertown	Handling sediment	265	M	54	Collecting winkles	75	2-3 times per month, all year	Local
Parton	Intertidal occupancy	35	M	70	Dog walking and Beachcombing	195	Dog walking daily all year. Beachcombing once per week all year.	Local
Parton	Intertidal occupancy	36	F	60	Dog walking	65	5 days per week all year - split between 3 locations	Local
Parton	Intertidal occupancy	37	M	U	Playing	3	First visit in summer	Tourist, first visit

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Parton	Intertidal occupancy	38	F	U	Playing	3	First visit in summer	Tourist, first visit
Parton	Intertidal occupancy	39	M	7	Playing	3	First visit in summer	Tourist, first visit
Parton	Intertidal occupancy	40	F	9	Playing	3	First visit in summer	Tourist, first visit
Parton	Intertidal occupancy	41	F	10	Playing	3	First visit in summer	Tourist, first visit
Parton	Intertidal occupancy	42	F	50	Dog walking	365	Every day, all year	Local
Parton	Intertidal occupancy	53	F	67	Dog walking	208	4 times per week, all year	Local
Parton	Intertidal occupancy	54	M	22	Collecting sea coal, picnicking, sunbathing and dog walking	182	3-4 times per week all year (picnicking and sunbathing in summer)	Local
Parton	Intertidal occupancy	55	M	23	Collecting sea coal, picnicking, sunbathing and dog walking	182	3-4 times per week all year (picnicking and sunbathing in summer)	Local
Parton	Intertidal occupancy	56	F	22	Collecting sea coal, picnicking, sunbathing and dog walking	182	3-4 times per week all year (picnicking and sunbathing in summer)	Local
Parton	Intertidal occupancy	62	M	48	Dog walking	365	Daily, all year	Local
Parton	Intertidal occupancy	63	F	45	Dog walking	365	Daily, all year	Local
Parton	Intertidal occupancy	64	F	50	Dog walking	365	Daily, all year	Local
Parton	Intertidal occupancy	65	M	40	Angling	72	Once per month, all year	Local
Parton	Intertidal occupancy	66	M	38	Angling	72	Once per month, all year	Local
Parton	Intertidal occupancy	67	M	U	Picnicking, playing and paddling	100	Twice per week in summer	Local
Parton	Intertidal occupancy	68	F	U	Picnicking, playing and paddling	100	Twice per week in summer	Local
Parton	Intertidal occupancy	69	F	3	Picnicking, playing and paddling	100	Twice per week in summer	Local
Parton	Intertidal occupancy	70	F	5	Picnicking, playing and paddling	100	Twice per week in summer	Local
Parton	Intertidal occupancy	88	M	25	Dog walking	700	Twice per day, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Parton	Intertidal occupancy	89	F	25	Dog walking	700	Twice per day, all year	Local
Parton	Intertidal occupancy	90	F	60's	Dog walking	702	Twice per day, 4-5 times per week, all year	Local
Parton	Intertidal occupancy	91	F	60's	Dog walking	702	Twice per day, 4-5 times per week, all year	Local
Parton	Intertidal occupancy	92	M	55	Dog walking	730	Daily, all year - split between 2 locations	Local
Parton	Intertidal occupancy	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
Parton	Intertidal occupancy	167	M	U	Collecting winkles	183	Every other day, all year	Local
Parton	Intertidal occupancy	259	M	U	Collecting winkles	224	Daily for 9 months per year - split between 3 locations	Local
Parton	Handling beach materials	35	M	70	Beachcombing - collecting wood	52	Once per week all year.	Local
Parton	Handling beach materials	54	M	22	Collecting sea coal	81	3-4 times per week all year	Local
Parton	Handling beach materials	55	M	23	Collecting sea coal	81	3-4 times per week all year	Local
Parton	Handling beach materials	56	F	22	Collecting sea coal	81	3-4 times per week all year	Local
Parton	Handling beach materials	92	M	55	Throwing stones and sticks for a dog	26	Daily, all year	Local
Parton	Handling beach materials	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
Parton	Handling sediment	167	M	U	Collecting winkles	183	Every other day, all year	Local
Parton	Handling sediment	259	M	U	Collecting winkles	224	Daily for 9 months per year - split between 3 locations	Local
Ravenglass	Intertidal occupancy	125	M	40's	Dog walking	1	Once in summer	Staying at Silecroft caravan park
Ravenglass	Intertidal occupancy	126	F	40's	Dog walking	1	Once in summer	Staying at Silecroft caravan park
Ravenglass	Intertidal occupancy	127	M	12	Dog walking	1	Once in summer	Staying at Silecroft caravan park

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Ravenglass	Intertidal occupancy	128	M	10	Dog walking	1	Once in summer	Staying at Silecroft caravan park
Ravenglass	Intertidal occupancy	129	F	9	Dog walking	1	Once in summer	Staying at Silecroft caravan park
Ravenglass	Intertidal occupancy	253	M	67	Collecting mussels, cockles and oysters	78	Twice per week, all year	Local
Ravenglass	Intertidal occupancy	255	M	67	Walking	19	2-3 times per week in summer - split between 2 locations	Local
Ravenglass	Intertidal occupancy	256	M	U	Bait digging	12	6 times per year	Local
Ravenglass	Intertidal occupancy	257	M	73	Walking	6	Once per month, all year	Local
Ravenglass	Intertidal occupancy	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Intertidal occupancy	259	M	U	Collecting mussels	108	Daily for 9 months per year	Local
Ravenglass	Intertidal occupancy	259	M	U	Angling	72	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Intertidal occupancy	260	F	U	Angling	72	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Intertidal occupancy	261	M	13	Angling	62	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Intertidal occupancy	262	M	11	Angling	62	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Intertidal occupancy	263	M	10	Angling	62	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Intertidal occupancy	264	F	6	Angling	62	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Handling sediment	253	M	67	Collecting mussels	78	Twice per week, all year - split between 2 locations	Local
Ravenglass	Handling sediment	256	M	U	Bait digging	12	6 times per year	Local
Ravenglass	Handling sediment	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Ravenglass	Handling sediment	259	M	U	Collecting mussels	108	Daily for 9 months per year	Local
Ravenglass	Handling fishing gear	251	M	50	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Ravenglass	Handling fishing gear	252	M	U	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Seascale	Intertidal occupancy	6	F	60's	Playing ball games, building sandcastles and paddling	60	4 times per week in school summer holiday	Local
Seascale	Intertidal occupancy	7	F	3	Playing ball games, building sandcastles and paddling	60	4 times per week in school summer holiday	Local
Seascale	Intertidal occupancy	8	M	4	Playing ball games, building sandcastles and paddling	60	4 times per week in school summer holiday	Local
Seascale	Intertidal occupancy	47	M	30's	Dog walking	200	2-3 times per week - split between 2 locations	Local
Seascale	Intertidal occupancy	48	F	30's	Dog walking	200	2-3 times per week - split between 2 locations	Local
Seascale	Intertidal occupancy	49	M	12	Dog walking	200	2-3 times per week - split between 2 locations	Local
Seascale	Intertidal occupancy	50	M	53	Beachcombing	65	Twice per week, all year - split between 4 locations	Local
Seascale	Intertidal occupancy	82	M	40's	Angling	312	4 times per week, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	82	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	83	M	40's	Angling	312	4 times per week, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	83	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	84	M	40's	Bait digging	130	4 times per week, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	84	M	40's	Angling	312	Twice per month, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	85	M	40's	Angling	312	4 times per week, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	85	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Seascale	Intertidal occupancy	144	M	U	Angling and walking	101	Once per week, all year	Local
Seascale	Intertidal occupancy	145	F	U	Angling and walking	101	Once per week, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Seascale	Intertidal occupancy	146	F	30's	Angling and walking	101	Once per week, all year	Local
Seascale	Intertidal occupancy	147	U	12	Walking, playing and rock pooling	102	Once per week, all year	Local
Seascale	Intertidal occupancy	148	U	9	Walking, playing and rock pooling	102	Once per week, all year	Local
Seascale	Intertidal occupancy	149	U	8	Walking, playing and rock pooling	102	Once per week, all year	Local
Seascale	Intertidal occupancy	150	U	7	Walking, playing and rock pooling	102	Once per week, all year	Local
Seascale	Intertidal occupancy	173	F	60's	Dog walking	730	2 times per day, all year	Local
Seascale	Intertidal occupancy	174	M	30's	Dog walking	546	Twice per day, 3-4 times per week - split between 2 locations	Local
Seascale	Intertidal occupancy	175	M	30's	Rock pooling, walking, playing, building sandcastles and picnicking	66	Twice per week for 6 months - split between 2 locations	Local
Seascale	Intertidal occupancy	176	F	30's	Rock pooling, walking, playing, building sandcastles and picnicking	66	Twice per week for 6 months - split between 2 locations	Local
Seascale	Intertidal occupancy	177	F	3	Rock pooling, walking, playing, building sandcastles and picnicking	66	Twice per week for 6 months - split between 2 locations	Local
Seascale	Intertidal occupancy	178	M	20's	Angling	14	2 days per year	Tourist - staying at the Silecroft caravan park
Seascale	Intertidal occupancy	179	M	20's	Angling	14	2 days per year	Tourist - staying at the Silecroft caravan park
Seascale	Intertidal occupancy	180	M	20's	Angling	14	2 days per year	Tourist - staying at the Silecroft caravan park
Seascale	Intertidal occupancy	181	F	20's	Angling	14	2 days per year	Tourist - staying at the Silecroft caravan park
Seascale	Intertidal occupancy	182	F	20's	Angling	14	2 days per year	Tourist - staying at the Silecroft caravan park

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Seascale	Intertidal occupancy	183	F	20's	Angling	14	2 days per year	Tourist - staying at the Silecroft caravan park
Seascale	Intertidal occupancy	184	F	20's	Angling	14	2 days per year	Tourist - staying at the Silecroft caravan park
Seascale	Intertidal occupancy	188	M	70's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Seascale	Intertidal occupancy	189	F	70's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Seascale	Intertidal occupancy	190	M	40's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Seascale	Intertidal occupancy	191	F	40's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Seascale	Intertidal occupancy	192	F	11	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Seascale	Intertidal occupancy	193	M	7	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
Seascale	Intertidal occupancy	194	M	60's	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
Seascale	Intertidal occupancy	195	F	30's	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
Seascale	Intertidal occupancy	196	M	30's	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Seascale	Intertidal occupancy	197	M	4	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
Seascale	Intertidal occupancy	198	M	7	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
Seascale	Intertidal occupancy	199	F	10	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
Seascale	Intertidal occupancy	200	M	U	Dog walking	37	Once every 3-4 weeks, all year	Local
Seascale	Intertidal occupancy	201	F	U	Dog walking	37	Once every 3-4 weeks, all year	Local
Seascale	Intertidal occupancy	202	M	5	Dog walking, playing and building sand castles	37	Once every 3-4 weeks, all year	Local
Seascale	Intertidal occupancy	203	F	4	Dog walking, playing and building sand castles	37	Once every 3-4 weeks, all year	Local
Seascale	Intertidal occupancy	248	M	U	Beach cleaning	375	5 days per week from May to September	Local
Seascale	Intertidal occupancy	250	F	47	Dog walking	120	Daily, all year - split between 3 locations	Local
Seascale	Handling beach materials	47	M	30's	Throwing stones, sticks and balls for a dog	6.5	2-3 times per week - split between 2 locations	Local
Seascale	Handling beach materials	48	F	30's	Throwing stones, sticks and balls for a dog	6.5	2-3 times per week - split between 2 locations	Local
Seascale	Handling beach materials	49	M	12	Throwing stones, sticks and balls for a dog	6.5	2-3 times per week - split between 2 locations	Local
Seascale	Handling beach materials	50	M	53	Beachcombing - collecting wood	65	Twice per week, all year - split between 4 locations	Local
Seascale	Handling beach materials	147	U	12	Rock pooling - handling stones and shells	32	Once per week, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Seascale	Handling beach materials	148	U	9	Rock pooling - handling stones and shells	32	Once per week, all year	Local
Seascale	Handling beach materials	149	U	8	Rock pooling - handling stones and shells	32	Once per week, all year	Local
Seascale	Handling beach materials	150	U	7	Rock pooling - handling stones and shells	32	Once per week, all year	Local
Seascale	Handling beach materials	174	M	30's	Throwing sticks and balls for a dog	13	Twice per day, 3-4 times per week - split between 2 locations	Local
Seascale	Handling beach materials	175	M	30's	Rock pooling - handling stones and shells	20	1-2 times per week for 6 months	Local
Seascale	Handling beach materials	176	F	30's	Rock pooling - handling stones and shells	20	1-2 times per week for 6 months	Local
Seascale	Handling beach materials	177	F	3	Rock pooling - handling stones and shells	20	1-2 times per week for 6 months	Local
Seascale	Handling beach materials	194	M	60's	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
Seascale	Handling beach materials	195	F	30's	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
Seascale	Handling beach materials	196	M	30's	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
Seascale	Handling beach materials	197	M	4	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
Seascale	Handling beach materials	198	M	7	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
Seascale	Handling beach materials	199	F	10	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Seascale	Handling beach materials	248	M	U	Beach cleaning - litter, wood, metal - wearing full protective clothing	375	5 days per week from May to September	Local
Seascale	Handling sediment	82	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Seascale	Handling sediment	83	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Seascale	Handling sediment	84	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Seascale	Handling sediment	85	M	40's	Bait digging	130	Twice per month, all year - split between 2 locations	Local
Seascale	Handling fishing gear	251	M	50	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Seascale	Handling fishing gear	252	M	U	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Sellafield	Intertidal occupancy	50	M	53	Beachcombing	65	Twice per week, all year - split between 4 locations	Local
Sellafield	Intertidal occupancy	86	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Sellafield	Intertidal occupancy	87	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Sellafield	Intertidal occupancy	171	M	50's	Angling	160	3-4 times per week, all year - split between 5 locations	Local
Sellafield	Intertidal occupancy	172	M	50's	Angling	104	2 times per week, all year - split between 4 locations	Local
Sellafield	Intertidal occupancy	250	F	47	Dog walking	121	Daily, all year - split between 3 locations	Local
Sellafield	Intertidal occupancy	253	M	67	Beachcombing	143	Twice per week, all year - split between 2 locations	Local
Sellafield	Intertidal occupancy	266	M	55	Beachcombing and walking	64	Beachcombing once per week for 3 months and walking once per week all year	Live in a beach chalet at Braystones
Sellafield	Handling beach materials	50	M	53	Beachcombing - collecting wood	65	Twice per week, all year - split between 4 locations	Local
Sellafield	Handling beach materials	253	M	67	Beachcombing	143	Twice per week, all year - split between 2 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Sellafield	Handling beach materials	266	M	55	Beachcombing - collecting firewood	12	Once per week for 3 months - split between 2 locations	Live in a beach chalet at Braystones
Sellafield	Handling sediment	86	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Sellafield	Handling sediment	87	M	30's	Bait digging	16	Once per fortnight, all year - split between 3 locations	Owner of a caravan at Braystones
Sellafield	Handling fishing gear	251	M	50	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Sellafield	Handling fishing gear	252	M	U	Potting offshore	234	15 times per month, all year - between Bootle and Sellafield assumed between 5 locations	Local
Silecroft	Intertidal occupancy	1	M	30's	Walking	1	First visit in summer	Tourist
Silecroft	Intertidal occupancy	2	F	30's	Walking	1	First visit in summer	Tourist
Silecroft	Intertidal occupancy	3	M	6	Walking	1	First visit in summer	Tourist
Silecroft	Intertidal occupancy	4	U	20's	Dog walking	104	Every weekend all year	Local
Silecroft	Intertidal occupancy	5	U	U	Dog walking	104	Every weekend all year	Local
Silecroft	Intertidal occupancy	29	F	U	Playing and walking	4	First visit in summer	Tourist, first visit
Silecroft	Intertidal occupancy	30	M	U	Playing and walking	4	First visit in summer	Tourist, first visit
Silecroft	Intertidal occupancy	31	F	U	Playing and walking	4	First visit in summer	Tourist, first visit
Silecroft	Intertidal occupancy	32	M	U	Playing and walking	4	First visit in summer	Tourist, first visit
Silecroft	Intertidal occupancy	33	F	9	Playing and walking	4	First visit in summer	Tourist, first visit
Silecroft	Intertidal occupancy	34	F	10	Playing and walking	4	First visit in summer	Tourist, first visit
Silecroft	Intertidal occupancy	71	M	30's	Playing, building sandcastles and picnicking	60	Once per fortnight in summer	Local
Silecroft	Intertidal occupancy	72	F	30's	Playing, building sandcastles and picnicking	60	Once per fortnight in summer	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Silecroft	Intertidal occupancy	73	M	5	Playing, building sandcastles and picnicking	60	Once per fortnight in summer	Local
Silecroft	Intertidal occupancy	74	F	4	Playing, building sandcastles and picnicking	60	Once per fortnight in summer	Local
Silecroft	Intertidal occupancy	75	M	50's	Dog walking and angling	88	2-3 times per year	Tourist - have a holiday home
Silecroft	Intertidal occupancy	76	F	50's	Dog walking and angling	88	2-3 times per year	Tourist - have a holiday home
Silecroft	Intertidal occupancy	77	M	U	Angling	8	Once per year in summer	Tourist - staying at a B&B
Silecroft	Intertidal occupancy	78	M	40's	Angling	122	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Silecroft	Intertidal occupancy	79	M	40's	Angling	122	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Silecroft	Intertidal occupancy	80	M	40's	Angling	122	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Silecroft	Intertidal occupancy	81	M	40's	Angling	122	2-3 weeks per year and 10 weekends April to October	Owner of a caravan at Silecroft
Silecroft	Intertidal occupancy	110	M	35	Playing and walking	63	2 weeks and 5-6 weekends in summer	Owns a caravan at Silecroft caravan park
Silecroft	Intertidal occupancy	111	F	35	Playing and walking	63	2 weeks and 5-6 weekends in summer	Owns a caravan at Silecroft caravan park
Silecroft	Intertidal occupancy	112	M	8	Playing, walking, playing ball games, building sand castles and paddling	63	2 weeks and 5-6 weekends in summer	Owns a caravan at Silecroft caravan park
Silecroft	Intertidal occupancy	113	M	6	Playing, walking, playing ball games, building sand castles and paddling	63	2 weeks and 5-6 weekends in summer	Owns a caravan at Silecroft caravan park
Silecroft	Intertidal occupancy	114	M	30's	Paddling, picnicking, building sandcastles, playing	89	2-3 weeks per year in school holidays and 6 weekends	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	115	F	6	Paddling, picnicking, building sandcastles, playing	89	2-3 weeks per year in school holidays and 6 weekends	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	122	F	40's	Dog walking	730	Daily, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Silecroft	Intertidal occupancy	123	M	40's	Dog walking	28	14 times per year	Visitor
Silecroft	Intertidal occupancy	124	F	40's	Dog walking	28	14 times per year	Visitor
Silecroft	Intertidal occupancy	125	M	40's	Dog walking	18	1 week in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	126	F	40's	Dog walking	18	1 week in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	127	M	12	Playing	18	1 week in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	128	M	10	Playing	18	1 week in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	129	F	9	Playing	18	1 week in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	130	M	40's	Playing and kite flying	14	2 weeks in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	131	F	40's	Playing and kite flying	14	2 weeks in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	132	M	13	Playing and kite flying	14	2 weeks in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	133	F	10	Playing and kite flying	14	2 weeks in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	134	M	28	Walking	2	First visit in summer	Tourist
Silecroft	Intertidal occupancy	135	F	28	Walking	2	First visit in summer	Tourist
Silecroft	Intertidal occupancy	141	M	60's	Angling	8	1 weekend per year in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	142	M	60's	Angling	8	1 weekend per year in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	143	M	60's	Angling	8	1 weekend per year in summer	Staying at Silecroft caravan park
Silecroft	Intertidal occupancy	144	M	U	Angling	3	Once per year in summer	Local
Silecroft	Intertidal occupancy	145	F	U	Angling	3	Once per year in summer	Local
Silecroft	Intertidal occupancy	146	F	30's	Angling	3	Once per year in summer	Local
Silecroft	Intertidal occupancy	147	U	12	Rock pooling	3	Once per year in summer	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Silecroft	Intertidal occupancy	148	U	9	Rock pooling	3	Once per year in summer	Local
Silecroft	Intertidal occupancy	149	U	8	Rock pooling	3	Once per year in summer	Local
Silecroft	Intertidal occupancy	150	U	7	Rock pooling	3	Once per year in summer	Local
Silecroft	Intertidal occupancy	151	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	152	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	153	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	154	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	155	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	156	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	157	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	158	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Silecroft	Intertidal occupancy	159	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	160	F	9 months	Playing, picnicking, building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	161	F	5	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	162	F	8	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	163	F	13	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	164	M	4	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	165	M	7	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	166	M	11	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Silecroft	Intertidal occupancy	185	F	60's	Collecting seaweed	9	6 times per year, autumn and spring	Local
Silecroft	Intertidal occupancy	239	M	30's	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Silecroft	Intertidal occupancy	240	F	30's	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	241	M	30's	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	242	F	30's	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	243	M	10	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	244	M	9	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	245	M	7	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	246	F	10	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	247	M	6	Dog walking, playing, building sand castles and swimming	113	3 weeks and 3 weekends in school holidays	Staying at the Silecroft caravan park
Silecroft	Intertidal occupancy	249	M	U	Beach cleaning	375	5 days per week from May to September	Local
Silecroft	Handling beach materials	147	U	12	Rock pooling - handling stones and shells	3	Once per year in summer	Local
Silecroft	Handling beach materials	148	U	9	Rock pooling - handling stones and shells	3	Once per year in summer	Local
Silecroft	Handling beach materials	149	U	8	Rock pooling - handling stones and shells	3	Once per year in summer	Local
Silecroft	Handling beach materials	150	U	7	Rock pooling - handling stones and shells	3	Once per year in summer	Local
Silecroft	Handling beach materials	185	F	60's	Collecting seaweed	9	6 times per year, autumn and spring	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Silecroft	Handling beach materials	249	M	U	Beach cleaning - litter, wood, metal - wearing full protective clothing	375	5 days per week from May to September	Local
St Bees	Intertidal occupancy	9	M	U	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
St Bees	Intertidal occupancy	10	F	U	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
St Bees	Intertidal occupancy	11	F	3	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
St Bees	Intertidal occupancy	12	M	5	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
St Bees	Intertidal occupancy	13	M	30's	Playing, building sand castles and paddling	3	First visit in summer	Tourist, first visit
St Bees	Intertidal occupancy	14	F	30's	Playing, building sand castles and paddling	3	First visit in summer	Tourist, first visit
St Bees	Intertidal occupancy	15	M	4	Playing, building sand castles and paddling	3	First visit in summer	Tourist, first visit
St Bees	Intertidal occupancy	16	M	65	General playing, paddling and playing ball games	21	2-3 times in school holidays	Local
St Bees	Intertidal occupancy	17	F	65	General playing, paddling and playing ball games	21	2-3 times in school holidays	Local
St Bees	Intertidal occupancy	18	M	5	General playing, paddling and playing ball games	21	2-3 times in school holidays	Visitor in school holidays
St Bees	Intertidal occupancy	19	M	7	General playing, paddling and playing ball games	21	2-3 times in school holidays	Visitor in school holidays
St Bees	Intertidal occupancy	20	F	9	General playing, paddling and playing ball games	21	2-3 times in school holidays	Visitor in school holidays
St Bees	Intertidal occupancy	21	M	40	Angling and dog walking	281	Dog walking 3-4 times per week all year - split between 2 locations. Angling once per fortnight in summer and once a week in winter.	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
St Bees	Intertidal occupancy	22	F	40	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
St Bees	Intertidal occupancy	23	M	45	Angling and dog walking	281	Dog walking 3-4 times per week all year - split between 2 locations. Angling once per fortnight in summer and once a week in winter.	Local
St Bees	Intertidal occupancy	24	F	43	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
St Bees	Intertidal occupancy	25	F	40	Dog walking	91	Dog walking 3-4 times per week all year - split between 2 locations	Local
St Bees	Intertidal occupancy	26	M	8	Rock pooling and dog walking	65	Once per week all year - split between 2 locations	Local
St Bees	Intertidal occupancy	27	F	5	Rock pooling and dog walking	65	Once per week all year - split between 2 locations	Local
St Bees	Intertidal occupancy	28	F	7	Rock pooling and dog walking	65	Once per week all year - split between 2 locations	Local
St Bees	Intertidal occupancy	36	F	60	Dog walking	65	5 days per week all year - split between 3 locations	Local
St Bees	Intertidal occupancy	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
St Bees	Intertidal occupancy	168	M	30's	Angling	70	Once per week, all year - split between 3 locations	Local
St Bees	Intertidal occupancy	169	M	30's	Angling	70	Once per week, all year - split between 3 locations	Local
St Bees	Intertidal occupancy	170	M	50's	Angling	320	3-4 times per week, all year - split between 2 locations	Local
St Bees	Intertidal occupancy	172	M	50's	Angling	104	2 times per week, all year - split between 4 locations	Local
St Bees	Intertidal occupancy	188	M	70's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
St Bees	Intertidal occupancy	189	F	70's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
St Bees	Intertidal occupancy	190	M	40's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
St Bees	Intertidal occupancy	191	F	40's	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
St Bees	Intertidal occupancy	192	F	11	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
St Bees	Intertidal occupancy	193	M	7	General beach activities, occasionally throwing stones and looking for shells	24	Twice per month, all year	Local
St Bees	Intertidal occupancy	194	M	60's	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
St Bees	Intertidal occupancy	195	F	30's	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
St Bees	Intertidal occupancy	196	M	30's	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
St Bees	Intertidal occupancy	197	M	4	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
St Bees	Intertidal occupancy	198	M	7	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
St Bees	Intertidal occupancy	199	F	10	General beach activities, rock pooling, building sand castles and playing ball games	53	30 times per year, April to October - split between 2 locations	Local
St Bees	Intertidal occupancy	215	M	30's	Beach occupancy, dog walking and playing	14	2 days per year	Tourist
St Bees	Intertidal occupancy	216	F	30's	Beach occupancy, dog walking and playing	14	2 days per year	Tourist

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
St Bees	Intertidal occupancy	217	M	4	Rock pooling , playing and dog walking	14	2 days per year	Tourist
St Bees	Intertidal occupancy	218	F	6	Rock pooling , playing and dog walking	14	2 days per year	Tourist
St Bees	Intertidal occupancy	219	M	60's	Beach occupancy, walking	103	3-4 times per week , all year	Local
St Bees	Intertidal occupancy	220	M	8	Rock pooling	12	4 days per year	Visiting grandparents
St Bees	Intertidal occupancy	221	F	10	Rock pooling	12	4 days per year	Visiting grandparents
St Bees	Intertidal occupancy	222	F	60's	Rock pooling and playing	21	3-4 days, twice per year in school holiday	Tourist
St Bees	Intertidal occupancy	223	F	10	Rock pooling and playing	21	3-4 days, twice per year in school holiday	Tourist
St Bees	Intertidal occupancy	224	M	30's	Beach occupancy and playing	42	1 week per year in school holiday	Staying at St Bees caravan park
St Bees	Intertidal occupancy	225	F	30's	Beach occupancy and playing	42	1 week per year in school holiday	Staying at St Bees caravan park
St Bees	Intertidal occupancy	226	M	4	Rock pooling and playing	42	1 week per year in school holiday	Staying at St Bees caravan park
St Bees	Intertidal occupancy	227	F	30's	Dog walking	52	Once per week all year	Local
St Bees	Intertidal occupancy	228	M	6	Rock pooling, playing and dog walking	52	Once per week all year	Local
St Bees	Intertidal occupancy	229	M	3	Rock pooling, playing and dog walking	52	Once per week all year	Local
St Bees	Intertidal occupancy	230	M	30's	Dog walking	351	4-5 times per week, all year	Local
St Bees	Intertidal occupancy	231	F	30's	Dog walking	351	4-5 times per week, all year	Local
St Bees	Intertidal occupancy	232	F	3	Playing and building sand castles	78	Once per week, all year	Local
St Bees	Intertidal occupancy	233	F	4	Playing and building sand castles	78	Once per week, all year	Local
St Bees	Intertidal occupancy	248	M	U	Beach cleaning	375	5 days per week from May to September	Local
St Bees	Intertidal occupancy	253	M	67	Collecting razor shells	39	Twice per week, all year - split between 2 locations	Local
St Bees	Intertidal occupancy	256	M	U	Collecting winkles and limpets	117	Every 2 days, all year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
St Bees	Intertidal occupancy	257	M	73	Walking	6	Once per month, all year	Local
St Bees	Intertidal occupancy	258	F	U	Dog walking	525	Daily, all year	Local
St Bees	Intertidal occupancy	259	M	U	Angling	72	Once per week for 9 months - split between 4 locations	Local
St Bees	Intertidal occupancy	260	F	U	Angling	72	Once per week for 9 months - split between 4 locations	Local
St Bees	Intertidal occupancy	261	M	13	Angling	62	Once per week for 9 months - split between 4 locations	Local
St Bees	Intertidal occupancy	262	M	11	Angling	62	Once per week for 9 months - split between 4 locations	Local
St Bees	Intertidal occupancy	263	M	10	Angling	62	Once per week for 9 months - split between 4 locations	Local
St Bees	Intertidal occupancy	264	F	6	Angling	62	Once per week for 9 months - split between 4 locations	Local
St Bees	Intertidal occupancy	265	M	54	Angling	208	Twice per week, all year - split between 3 locations	Local
St Bees	Intertidal occupancy	270	F	60's	Dog walking	130	5 times per week, all year	Local
St Bees	Intertidal occupancy	271	F	70's	Dog walking	365	Daily, all year	Local
St Bees	Intertidal occupancy	272	F	40's	Dog walking	274	Daily, all year	Local
St Bees	Handling beach materials	26	M	8	Rock pooling, handling stones and shells	13	Once per week all year	Local
St Bees	Handling beach materials	27	F	5	Rock pooling, handling stones and shells	13	Once per week all year	Local
St Bees	Handling beach materials	28	F	7	Rock pooling, handling stones and shells	13	Once per week all year	Local
St Bees	Handling beach materials	136	M	60's	Beachcombing	21	Twice per month, all year - split between 4 locations	Local
St Bees	Handling beach materials	194	M	60's	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
St Bees	Handling beach materials	195	F	30's	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
St Bees	Handling beach materials	196	M	30's	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
St Bees	Handling beach materials	197	M	4	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
St Bees	Handling beach materials	198	M	7	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
St Bees	Handling beach materials	199	F	10	Rock pooling - handling stones and shells	18	30 times per year, April to October - split between 2 locations	Local
St Bees	Handling beach materials	217	M	4	Rock pooling - handling stones and shells	4	2 days per year	Tourist
St Bees	Handling beach materials	218	F	6	Rock pooling - handling stones and shells	4	2 days per year	Tourist
St Bees	Handling beach materials	220	M	8	Rock pooling - handling stones and shells	12	4 days per year	Visiting grandparents
St Bees	Handling beach materials	221	F	10	Rock pooling - handling stones and shells	12	4 days per year	Visiting grandparents
St Bees	Handling beach materials	222	F	60's	Rock pooling - handling stones and shells	11	3-4 days, twice per year in school holiday	Tourist
St Bees	Handling beach materials	223	F	10	Rock pooling - handling stones and shells	11	3-4 days, twice per year in school holiday	Tourist
St Bees	Handling beach materials	226	M	4	Rock pooling - handling stones and shells	12	1 week per year in school holiday	Staying at St Bees caravan park
St Bees	Handling beach materials	228	M	6	Rock pooling - handling stones and shells	17	Once per week all year	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
St Bees	Handling beach materials	229	M	3	Rock pooling - handling stones and shells	17	Once per week all year	Local
St Bees	Handling beach materials	248	M	U	Beach cleaning - litter, wood, metal - wearing full protective clothing	375	5 days per week from May to September	Local
St Bees	Handling sediment	253	M	67	Collecting razor shells	39	Twice per week, all year - split between 2 locations	Local
St Bees	Handling sediment	256	M	U	Collecting winkles and limpets	117	Every 2 days, all year - split between 3 locations	Local
Whitehaven north beach	Intertidal occupancy	35	M	70	Dog walking and beachcombing	195	Dog walking daily all year. Beachcombing once per week all year.	Local
Whitehaven north beach	Intertidal occupancy	36	F	60	Dog walking	65	5 days per week all year - split between 3 locations	Local
Whitehaven north beach	Handling beach materials	35	M	70	Beachcombing - collecting wood	52	Once per week all year.	Local
Whitehaven outer harbour	Intertidal occupancy	51	M	U	Bait digging	39	Once per week, all year	Local
Whitehaven outer harbour	Intertidal occupancy	52	M	14	Bait digging	39	Once per week, all year	Local
Whitehaven outer harbour	Intertidal occupancy	106	M	30's	Picnicking	2	First visit in summer	Staying at a camp site in Eskdale
Whitehaven outer harbour	Intertidal occupancy	107	F	30's	Picnicking	2	First visit in summer	Staying at a camp site in Eskdale
Whitehaven outer harbour	Intertidal occupancy	108	F	10	Picnicking and paddling	2	First visit in summer	Staying at a camp site in Eskdale
Whitehaven outer harbour	Intertidal occupancy	109	M	8	Picnicking and paddling	2	First visit in summer	Staying at a camp site in Eskdale
Whitehaven outer harbour	Intertidal occupancy	116	M	30's	Sunbathing	3	First visit in summer	Tourist
Whitehaven outer harbour	Intertidal occupancy	117	F	30's	Sunbathing	3	First visit in summer	Tourist
Whitehaven outer harbour	Intertidal occupancy	118	F	5	Playing ball games, paddling and building sand castles	3	First visit in summer	Tourist
Whitehaven outer harbour	Intertidal occupancy	119	F	6	Playing ball games, paddling and building sand castles	3	First visit in summer	Tourist

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y $^{-1}$)	Frequency of visits and time of year	Local/tourist
Whitehaven outer harbour	Intertidal occupancy	120	M	3	Playing ball games, paddling and building sand castles	3	First visit in summer	Tourist
Whitehaven outer harbour	Intertidal occupancy	170	M	50's	Bait digging	72	4 times per month - all year	Local
Whitehaven outer harbour	Intertidal occupancy	171	M	50's	Bait digging	72	4 times per month - all year	Local
Whitehaven outer harbour	Intertidal occupancy	172	M	50's	Bait digging	24	4 times per month - all year - split between 2 locations	Local
Whitehaven outer harbour	Intertidal occupancy	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Whitehaven outer harbour	Intertidal occupancy	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Whitehaven outer harbour	Handling sediment	51	M	U	Bait digging	39	Once per week, all year	Local
Whitehaven outer harbour	Handling sediment	52	M	14	Bait digging	39	Once per week, all year	Local
Whitehaven outer harbour	Handling sediment	170	M	50's	Bait digging	72	4 times per month - all year	Local
Whitehaven outer harbour	Handling sediment	171	M	50's	Bait digging	72	4 times per month - all year	Local
Whitehaven outer harbour	Handling sediment	172	M	50's	Bait digging	24	4 times per month - all year - split between 2 locations	Local
Whitehaven outer harbour	Handling sediment	254	M	U	Bait digging	228	Daily, all year - split between 4 locations	Local
Whitehaven outer harbour	Handling sediment	259	M	U	Bait digging	27	Once per week for 9 months - split between 4 locations	Local
Whitehaven (south of the harbour)	Intertidal occupancy	273	M	U	Collecting winkles	63	Daily, January to March	Local
Whitehaven (south of the harbour)	Handling sediment	273	M	U	Collecting winkles	63	Daily, January to March	Local
Workington	Intertidal occupancy	9	M	U	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
Workington	Intertidal occupancy	10	F	U	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
Workington	Intertidal occupancy	11	F	3	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local
Workington	Intertidal occupancy	12	M	5	Playing and building sandcastles	12	Once per week from May to October split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Workington	Intertidal occupancy	57	M	U	Dog walking	137	Daily, all year	Local
Workington	Intertidal occupancy	58	F	U	Dog walking	137	Daily, all year	Local
Workington	Intertidal occupancy	59	F	U	Dog walking	137	Daily, all year	Local
Workington	Intertidal occupancy	60	F	U	Dog walking	137	Daily, all year	Local
Workington	Intertidal occupancy	61	M	10	Dog walking	137	Daily, all year	Local
Workington	Intertidal occupancy	93	M	25	Dog walking	493	Daily, all year - split between 2 locations	Local
Workington	Intertidal occupancy	94	M	35	Dog walking	493	Daily, all year - split between 2 locations	Local
Workington	Intertidal occupancy	95	F	35	Dog walking	493	Daily, all year - split between 2 locations	Local
Workington	Intertidal occupancy	151	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	152	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	153	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	154	M	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	155	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Workington	Intertidal occupancy	156	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	157	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	158	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	159	F	U	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	160	F	9 months	Playing, picnicking, building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	161	F	5	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	162	F	8	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local

Annex 2. Data for probabilistic assessments

Location	Category	Observation number	Sex	Age	Activity	Rate (h y^{-1})	Frequency of visits and time of year	Local/tourist
Workington	Intertidal occupancy	163	F	13	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	164	M	4	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	165	M	7	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	166	M	11	Dog walking, picnicking, playing beach games building sand castles and paddling	85	Twice per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	168	M	30's	Bait digging	30	Once per week, June to October	Local
Workington	Intertidal occupancy	168	M	30's	Angling	70	Once per week, all year - split between 3 locations	Local
Workington	Intertidal occupancy	169	M	30's	Bait digging	30	Once per week, June to October	Local
Workington	Intertidal occupancy	169	M	30's	Angling	70	Once per week, all year - split between 3 locations	Local
Workington	Handling sediment	168	M	30's	Bait digging	30	Once per week, June to October	Local
Workington	Handling sediment	169	M	30's	Bait digging	30	Once per week, June to October	Local

Notes

Unknown ages are for adults only

Gloves were usually worn by individuals conducting the following activities: potting, setting nets, shellfish collecting and litter collecting/beach cleaning.

Assumptions

If an interviewee gave a total occupancy or handling rate for one activity that was being undertaken at several locations in the survey area, the total rate was split equally between those locations. Where this occurs it has been noted under frequency of visits.

If an interviewee gave a total occupancy rate for one activity that was being undertaken at one location and the location had different substrates at different states of the tide, the rate was split between the two substrates. This was applied at St. Bees, Braystones, Allonby and Silecroft.

If an interviewee gave unspecific occupancy rates in the summer months, the summer has been assumed to cover a period of five months.

School summer holidays were assumed to cover a period of six weeks.

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
54	**22**	**Parton**	**Collecting sea coal**	**81**	-	-	-	-	-	-	-	-
		Parton	Sunbathing, picnicking and dog walking	-	-	-	-	-	-	-	101	-
55	**22**	**Parton**	**Collecting sea coal**	**81**	-	-	-	-	-	-	-	-
		Parton	Sunbathing, picnicking and dog walking	-	-	-	-	-	-	-	101	-
56	**23**	**Parton**	**Collecting sea coal**	**81**	-	-	-	-	-	-	-	-
		Parton	Sunbathing, picnicking and dog walking	-	-	-	-	-	-	-	101	-
259	**U**	**Braystones and Ravenglass**	**Bait digging**	-	**54**	-	-	-	-	-	-	-
		Ravenglass and Whitehaven outer harbour	Collecting mussels, bait digging and angling	-	-	207	-	-	-	-	-	-
		Parton, Braystones and Drigg	**Collecting winkles**	-	-	-	-	**672**	-	-	-	-
		Drigg, Braystones and St Bees	**Bait digging, angling and set nets**	-	-	-	-	-	-	**571**	-	-
		St Bees, Braystones and Ravenglass	Angling	-	-	-	-	-	-	-	-	72
172	**50's**	**Maryport/**Whitehaven outer harbour	**Bait digging**	-	**24**	24	-	-	-	-	-	-
		Braystones, Sellafield, St Bees and Drigg	Angling	-	-	-	-	104	-	208	-	104
254	**U**	**Eskmeals, Whitehaven outer harbour, Braystones and Drigg**	**Bait digging**	-	-	**912**	-	-	-	-	-	-
		Nethertown, Braystones and Coulderton	Collecting winkles and limpets	-	-	-	-	27	-	-	-	-
		Drigg	**Angling**	-	-	-	-	-	-	**456**	-	-

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
51	U	Maryport, Eskmeals and Whitehaven outer harbour and Drigg	Bait digging	-	-	117	-	-	-	39	-	-
253	**67**	Ravenglass	Collecting mussels, cockles and oysters	-	-	78	-	-	-	-	-	-
		Braystones and Nethertown	Collecting winkles	-	-	-	-	78	-	-	-	-
		Sellafield, Drigg, Nethertown and St Bees	**Beachcombing and collecting razor shells**	-	-	-	-	-	-	**364**	-	-
170	**50's**	Whitehaven outer harbour	Bait digging	-	-	72	-	-	-	-	-	-
		St Bees and Braystones	**Angling**	-	-	-	-	**320**	-	-	-	**320**
171	**50's**	Whitehaven outer harbour	Bait digging	-	-	72	-	-	-	-	-	-
		Sellafield, Drigg, Allonby and Braystones	**Angling**	-	-	-	-	-	-	**480**	-	**160**
260	**U**	Ravenglass	Angling	-	-	72	-	-	-	-	-	-
		Braystones, Drigg and St Bees	**Playing, setting nets and angling**	-	-	-	-	-	-	264	-	**144**
78	40's	Eskmeals	Bait digging	-	-	25	-	-	-	-	-	-
		Silecroft	Angling	-	-	-	-	-	-	61	-	61
79	40's	Eskmeals	Bait digging	-	-	25	-	-	-	-	-	-
		Silecroft	Angling	-	-	-	-	-	-	61	-	61
80	40's	Eskmeals	Bait digging	-	-	25	-	-	-	-	-	-
		Silecroft	Angling	-	-	-	-	-	-	61	-	61
81	40's	Eskmeals	Bait digging	-	-	25	-	-	-	-	-	-
		Silecroft	Angling	-	-	-	-	-	-	61	-	61
255	67	Ravenglass and Drigg	Walking	-	-	19	-	-	-	19	-	-
86	**30's**	Braystones, Drigg and Sellafield	Bait digging	-	-	16	-	-	-	-	-	-
		Braystones	**Angling**	-	-	-	-	-	-	305	-	**273**

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
87	**30's**	Braystones, Drigg and Sellafield	Bait digging	-	-	16	-	-	-	-	-	-
		Braystones	**Angling**	-	-	-	-	-	-	305	-	**273**
256	**U**	Ravenglass	Bait digging	-	-	12	-	-	-	-	-	-
		Coulderton, St Bees and Nethertown	**Collecting winkles and limpets**	-	-	-	-	**351**	-	-	-	-
257	73	Ravenglass and St Bees	Walking	-	-	6	-	-	-	6	-	-
53	**67**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	208	-
125	40's	Ravenglass and Silecroft	Dog walking	-	-	-	**1**	-	-	18	-	-
126	40's	Ravenglass and Silecroft	Dog walking	-	-	-	**1**	-	-	18	-	-
167	U	Parton	Collecting winkles	-	-	-	-	183	-	-	-	-
46	30's	Coulderton	Collecting winkles	-	-	-	-	140	-	-	-	-
265	**54**	Nethertown	Collecting winkles	-	-	-	-	75	-	-	-	-
		Drigg, Maryport, Braystones and St Bees	**Angling and bait digging**	-	-	-	-	-	-	**676**	-	-
273	U	Whitehaven (south of the harbour)	Collecting winkles	-	-	-	-	63	-	-	-	-
194	**60's**	**St Bees and Seascale**	**Rock pooling**	-	-	-	-	-	**35**	-	-	-
			General beach activities, building sand castles and playing ball games	-	-	-	-	-	-	35	-	35
195	**30's**	**St Bees and Seascale**	**Rock pooling**	-	-	-	-	-	**35**	-	-	-
			General beach activities, building sand castles and playing ball games	-	-	-	-	-	-	35	-	35
196	**30's**	**St Bees and Seascale**	**Rock pooling**	-	-	-	-	-	**35**	-	-	-
			General beach activities, building sand castles and playing ball games	-	-	-	-	-	-	35	-	35

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
175	**30's**	**Seascale and Drigg**	**Rock pooling**	-	-	-	-	-	**20**	-	-	-
			Walking, playing, building sandcastles and picnicking	-	-	-	-	-	-	92	-	-
176	**30's**	**Seascale and Drigg**	**Rock pooling**	-	-	-	-	-	**20**	-	-	-
			Walking, playing, building sandcastles and picnicking	-	-	-	-	-	-	92	-	-
222	60's	St Bees	Rock pooling	-	-	-	-	-	11	-	-	-
			Playing	-	-	-	-	-	-	11	-	-
211	U	Allonby	Rock pooling	-	-	-	-	-	1	-	-	-
			Playing	-	-	-	-	-	-	3	-	-
212	U	Allonby	Rock pooling	-	-	-	-	-	1	-	-	-
			Playing	-	-	-	-	-	-	3	-	-
266	**55**	**Braystones**	**Bait digging, walking, playing, beachcombing, angling, collecting razor shells and setting nets**	-	-	-	-	-	-	**930**	-	-
		Sellafield	**beachcombing and walking**									
		Braystones	Collecting crabs, walking, angling and playing	-	-	-	-	-	-	-	64	101
82	**40's**	**Drigg and Seascale**	**Bait digging and angling**	-	-	-	-	-	-	**884**	-	-
83	**40's**	**Drigg and Seascale**	**Bait digging and angling**	-	-	-	-	-	-	**884**	-	-
84	**40's**	**Drigg and Seascale**	**Bait digging and angling**	-	-	-	-	-	-	**884**	-	-
85	**40's**	**Drigg and Seascale**	**Bait digging and angling**	-	-	-	-	-	-	**884**	-	-
174	**30's**	**Drigg and Seascale**	**Dog walking**	-	-	-	-	-	-	**858**	-	-
173	**60's**	**Seascale**	**Dog walking**	-	-	-	-	-	-	**730**	-	-

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
96	**60's**	**Allonby**	**Dog walking**	-	-	-	-	-	-	**548**	-	-
47	**30's**	**Drigg and Seascale**	**Kite-buggying and dog walking**	-	-	-	-	-	-	**424**	-	-
48	**30's**	**Seascale and Drigg**	**Dog walking**	-	-	-	-	-	-	**400**	-	-
248	**U**	**Seascale and St Bees**	**Beach cleaning**	-	-	-	-	-	-	**375**	-	**375**
122	**40's**	**Silecroft**	**Dog walking**	-	-	-	-	-	-	**365**	-	**365**
250	47	Sellafield, Drigg and Seascale	Dog walking	-	-	-	-	-	-	302	-	60
21	40	Allonby and St Bees	Dog walking and angling	-	-	-	-	-	-	281	-	91
23	45	Allonby and St Bees	Dog walking and angling	-	-	-	-	-	-	281	-	91
186	**60's**	**Allonby**	**Dog walking**	-	-	-	-	-	-	274	-	**274**
187	**60's**	**Allonby**	**Dog walking**	-	-	-	-	-	-	274	-	**274**
258	**U**	**St Bees**	**Dog walking**	-	-	-	-	-	-	263	-	**263**
50	53	Seascale, Sellafield, Drigg and Braystones	Beachcombing	-	-	-	-	-	-	228	-	33
267	54	Braystones	Angling, setting nets and playing	-	-	-	-	-	-	207	-	37
249	**U**	**Silecroft**	**Beach cleaning**	-	-	-	-	-	-	188	-	**188**
121	**60's**	**Braystones**	**Dog walking**	-	-	-	-	-	-	183	-	**183**
271	**70's**	**St Bees**	**Dog walking**	-	-	-	-	-	-	183	-	**183**
230	**30's**	**St Bees**	**Dog walking**	-	-	-	-	-	-	176	-	**176**
231	**30's**	**St Bees**	**Dog walking**	-	-	-	-	-	-	176	-	**176**
272	**40's**	**St Bees**	**Dog walking**	-	-	-	-	-	-	137	-	**137**
146	30's	Silecroft and Seascale	Angling and walking	-	-	-	-	-	-	104	-	-
144	U	Silecroft and Seascale	Angling and walking	-	-	-	-	-	-	104	-	-
145	U	Silecroft and Seascale	Angling and walking	-	-	-	-	-	-	104	-	-
219	60's	St Bees	Beach occupancy and walking	-	-	-	-	-	-	103	-	-
22	40	St Bees and Allonby	Dog walking	-	-	-	-	-	-	91	-	91
25	40	St Bees and Allonby	Dog walking	-	-	-	-	-	-	91	-	91
24	43	St Bees and Allonby	Dog walking	-	-	-	-	-	-	91	-	91

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
114	30's	Silecroft	Paddling, picnicking, building sandcastles, playing	-	-	-	-	-	-	89	-	-
151	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
152	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
153	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
154	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
155	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
156	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
157	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
158	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
159	U	Silecroft, Workington, Maryport and Allonby	Playing, picnicking, collecting wood for a fire, dog walking, beach games building sand castles and paddling	-	-	-	-	-	-	88	173	-
57	U	Allonby and Workington	Dog walking	-	-	-	-	-	-	69	137	69
58	U	Allonby and Workington	Dog walking	-	-	-	-	-	-	69	137	69
59	U	Allonby and Workington	Dog walking	-	-	-	-	-	-	69	137	69
60	U	Allonby and Workington	Dog walking	-	-	-	-	-	-	69	137	69
168	30's	Workington	Bait digging	-	-	-	-	-	-	65	-	-
		Maryport, Workington and St Bees	Angling	-	-	-	-	-	-	-	140	35
169	30's	Workington	Bait digging	-	-	-	-	-	-	65	-	-
		Maryport, Workington and St Bees	Angling	-	-	-	-	-	-	-	140	35
270	60's	St Bees	Dog walking	-	-	-	-	-	-	65	-	65

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
110	35	Silecroft	Walking and playing	-	-	-	-	-	-	63	-	-
111	35	Silecroft	Walking and playing	-	-	-	-	-	-	63	-	-
71	30's	Silecroft	Playing, building sandcastles and picnicking	-	-	-	-	-	-	60	-	-
72	30's	Silecroft	Playing, building sandcastles and picnicking	-	-	-	-	-	-	60	-	-
6	60's	Seascale	Playing ball games, building sandcastles and paddling	-	-	-	-	-	-	60	-	-
239	30's	Silecroft	Dog walking, playing, building sand castles and swimming	-	-	-	-	-	-	57	-	57
240	30's	Silecroft	Dog walking, playing, building sand castles and swimming	-	-	-	-	-	-	57	-	57
241	30's	Silecroft	Dog walking, playing, building sand castles and swimming	-	-	-	-	-	-	57	-	57
242	30's	Silecroft	Dog walking, playing, building sand castles and swimming	-	-	-	-	-	-	57	-	57
4	20's	Silecroft	Dog walking	-	-	-	-	-	-	52	-	52
5	U	Silecroft	Dog walking	-	-	-	-	-	-	52	-	52
190	40's	Seascale, St Bees and Braystones	General beach activities, occasionally throwing stones and looking for shells	-	-	-	-	-	-	48	-	24
191	40's	Seascale, St Bees and Braystones	General beach activities, occasionally throwing stones and looking for shells	-	-	-	-	-	-	48	-	24

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
188	70's	Seascale, St Bees and Braystones	General beach activities, occasionally throwing stones and looking for shells	-	-	-	-	-	-	48	-	24
189	70's	St Bees, Seascale and Braystones	General beach activities, occasionally throwing stones and looking for shells	-	-	-	-	-	-	48	-	24
43	30's	Allonby	Playing, building sand castles	-	-	-	-	-	-	48	-	-
44	30's	Allonby	Playing, building sand castles	-	-	-	-	-	-	48	-	-
75	50's	Silecroft	Angling and dog walking	-	-	-	-	-	-	44	-	44
76	50's	Silecroft	Angling and dog walking	-	-	-	-	-	-	44	-	44
224	30's	St Bees	Beach occupancy, playing	-	-	-	-	-	-	42	-	-
225	30's	St Bees	Beach occupancy, playing	-	-	-	-	-	-	42	-	-
200	U	Seascale	Dog walking	-	-	-	-	-	-	37	-	-
201	U	Seascale	Dog walking	-	-	-	-	-	-	37	-	-
9	U	St Bees, Allonby and Workington	Playing and building sandcastles	-	-	-	-	-	-	36	-	-
10	U	St Bees, Allonby and Workington	Playing and building sandcastles	-	-	-	-	-	-	36	-	-
36	60	St Bees, Whitehaven north beach and Parton	Dog walking	-	-	-	-	-	-	33	130	33
97	U	Allonby	Picnicking and walking	-	-	-	-	-	-	30	-	-
98	U	Allonby	Picnicking and walking	-	-	-	-	-	-	30	-	-
99	U	Allonby	Picnicking and walking	-	-	-	-	-	-	30	-	-
100	U	Allonby	Picnicking and walking	-	-	-	-	-	-	30	-	-
227	30's	St Bees	Dog walking	-	-	-	-	-	-	26	-	26
204	30's	Allonby	Playing	-	-	-	-	-	-	21	-	-
205	30's	Allonby	Playing	-	-	-	-	-	-	21	-	-

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
16	65	St Bees	General playing, playing ball games and paddling	-	-	-	-	-	-	21	-	-
17	65	St Bees	General playing, playing ball games and paddling	-	-	-	-	-	-	21	-	-
208	30's	Allonby	Dog walking and angling	-	-	-	-	-	-	16	-	-
209	30's	Allonby	Dog walking and angling	-	-	-	-	-	-	16	-	-
234	U	Drigg	Litter collecting	-	-	-	-	-	-	15	-	-
235	U	Drigg	Litter collecting	-	-	-	-	-	-	15	-	-
236	U	Drigg	Litter collecting	-	-	-	-	-	-	15	-	-
237	U	Drigg	Litter collecting	-	-	-	-	-	-	15	-	-
123	40's	Silecroft	Dog walking	-	-	-	-	-	-	14	-	14
124	40's	Silecroft	Dog walking	-	-	-	-	-	-	14	-	14
178	20's	Seascale	Angling	-	-	-	-	-	-	14	-	-
179	20's	Seascale	Angling	-	-	-	-	-	-	14	-	-
180	20's	Seascale	Angling	-	-	-	-	-	-	14	-	-
181	20's	Seascale	Angling	-	-	-	-	-	-	14	-	-
182	20's	Seascale	Angling	-	-	-	-	-	-	14	-	-
183	20's	Seascale	Angling	-	-	-	-	-	-	14	-	-
184	20's	Seascale	Angling	-	-	-	-	-	-	14	-	-
215	30's	St Bees	Playing, dog walking and beach occupancy	-	-	-	-	-	-	14	-	-
216	30's	St Bees	Playing, dog walking and beach occupancy	-	-	-	-	-	-	14	-	-
130	40's	Silecroft	Playing and kite flying	-	-	-	-	-	-	14	-	-
131	40's	Silecroft	Playing and kite flying	-	-	-	-	-	-	14	-	-
77	U	Silecroft	Angling	-	-	-	-	-	-	8	-	-
185	60's	Silecroft	Collecting seaweed	-	-	-	-	-	-	5	-	5
141	60's	Silecroft	Angling	-	-	-	-	-	-	4	-	4
142	60's	Silecroft	Angling	-	-	-	-	-	-	4	-	4
143	60's	Silecroft	Angling	-	-	-	-	-	-	4	-	4
13	30's	St Bees	Playing, building sand castles and paddling	-	-	-	-	-	-	3	-	-
14	30's	St Bees	Playing, building sand castles and paddling	-	-	-	-	-	-	3	-	-

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
116	30's	Whitehaven outer harbour	Sunbathing	-	-	-	-	-	-	3	-	-
117	30's	Whitehaven outer harbour	Sunbathing	-	-	-	-	-	-	3	-	-
134	28	Silecroft	Walking	-	-	-	-	-	-	2	-	-
135	28	Silecroft	Walking	-	-	-	-	-	-	2	-	-
106	30's	Whitehaven outer harbour	Picnicking	-	-	-	-	-	-	2	-	-
107	30's	Whitehaven outer harbour	Picnicking	-	-	-	-	-	-	2	-	-
1	30's	Silecroft	Walking	-	-	-	-	-	-	1	-	-
2	30's	Silecroft	Walking	-	-	-	-	-	-	1	-	-
92	**55**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**730**	-
90	**60's**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**702**	-
91	**60's**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**702**	-
88	**25**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**700**	-
89	**25**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**700**	-
93	**25**	**Workington and Harrington**	**Dog walking**	-	-	-	-	-	-	-	**548**	-
94	**35**	**Workington and Harrington**	**Dog walking**	-	-	-	-	-	-	-	**548**	-
95	**35**	**Workington and Harrington**	**Dog walking**	-	-	-	-	-	-	-	**548**	-
35	**70**	**Parton and Whitehaven north beach**	**Beachcombing and dog walking**	-	-	-	-	-	-	-	**390**	-
63	**45**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**365**	-
62	**48**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**365**	-
42	**50**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**365**	-
64	**50**	**Parton**	**Dog walking**	-	-	-	-	-	-	-	**365**	-
67	U	Parton	Picnicking, playing and paddling	-	-	-	-	-	-	-	100	-
68	U	Parton	Picnicking, playing and paddling	-	-	-	-	-	-	-	100	-

Annex 3. Adults' intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Coal and sand	Mud	Mud and sand	Mud, sand and stones	Rock	Rock and sand	Sand	Sand and stones	Stones
66	38	Parton	Angling	-	-	-	-	-	-	-	72	-
65	40	Parton	Angling	-	-	-	-	-	-	-	72	-
37	U	Parton	Playing	-	-	-	-	-	-	-	3	-
38	U	Parton	Playing	-	-	-	-	-	-	-	3	-
140	**20's**	**Braystones**	**Angling**	-	-	-	-	-	-	-	-	**210**
238	**20**	**Braystones**	**Angling**	-	-	-	-	-	-	-	-	**210**
136	60's	Nethertown, Parton, St Bees and Coulderton	Beachcombing	-	-	-	-	-	-	-	-	84
137	40's	Braystones	Angling	-	-	-	-	-	-	-	-	8
29	U	Silecroft	Playing and walking	-	-	-	-	-	-	-	-	4
30	U	Silecroft	Playing and walking	-	-	-	-	-	-	-	-	4
31	U	Silecroft	Playing and walking	-	-	-	-	-	-	-	-	4
32	U	Silecroft	Playing and walking	-	-	-	-	-	-	-	-	4

Notes

Emboldened observations are the high-rate group

The mean intertidal occupancy rate over coal and sand based on 3 high-rate observations is 81 h y^{-1}

The mean intertidal occupancy rate over mud based on 2 high-rate observations is 39 h y^{-1}

The intertidal occupancy rate over mud and sand for the only high-rate observation is 912 h y^{-1}

The mean intertidal occupancy rate over mud, sand and stones for two high-rate observations is 1 h y^{-1}

The mean intertidal occupancy rate over rock based on 3 high-rate observations is 448 h y^{-1}

The mean intertidal occupancy rate over rock and sand based on 5 high-rate observations is 29 h y^{-1}

The mean intertidal occupancy rate over sand based on 17 high-rate observations is 630 h y^{-1}

The mean intertidal occupancy rate over sand and stones based on 13 high-rate observations is 541 h y^{-1}

The mean intertidal occupancy rate over stones based on 18 high-rate observations is 232 h y^{-1}

Winkle collecting predominantly occurred over rock, therefore all observations have been entered as such. However, it is known to also occur over a mixture of substrates, such as sand, stones and worm colonies.

Assumptions

If an interviewee gave a total occupancy for one activity that was being undertaken at several locations in the survey area, the total rate was split equally between those locations.

If an interviewee gave unspecific occupancy rates in the summer months, the summer has been assumed to cover a period of five months.

Annex 4. Children's intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Mud and sand	Mud, sand and stones	Rock and sand	Sand	Sand and stones	Stones
15-year-old age group									
52	**14**	**Whitehaven outer harbour, Maryport, Eskmeals and** Drigg	**Bait digging**	**117**	-	-	39	-	-
261	**13**	**Ravenglass, Drigg, St Bees and Braystones**	**Angling and general beach activities**	**62**	-	-	**231**	-	**169**
127	**12**	**Ravenglass**	**Dog walking**	-	**1**	-	-	-	-
		Silecroft	Playing	-	-	-	18	-	-
147	**12**	**Silecroft and Seascale**	**Rock pooling**	-	-	**35**	-	-	-
		Seascale	Playing and walking	-	-	-	70	-	-
49	**12**	**Seascale and Drigg**	**Dog walking**	-	-	-	**400**	-	-
163	**13**	**Silecroft Allonby, Maryport and Workington**	**Dog walking, picnicking, playing beach games building sand castles and paddling**	-	-	-	91	**170**	-
132	13	Silecroft	Playing and kite flying	-	-	-	14	-	-
138	12	Braystones	Angling	-	-	-	-	-	8
10-year-old age group									
263	**10**	**Ravenglass, Drigg, St Bees and Braystones**	**Angling and general beach activities**	**62**	-	-	**231**	-	**169**
262	**11**	**Ravenglass, Drigg, St Bees and Braystones**	**Angling and general beach activities**	**62**	-	-	**231**	-	**169**
129	**9**	**Ravenglass**	**Dog walking**	-	**1**	-	-	-	-
		Silecroft	Playing	-	-	-	18	-	-
128	**10**	**Ravenglass**	**Dog walking**	-	**1**	-	-	-	-
		Silecroft	Playing	-	-	-	18	-	-
150	**7**	**Silecroft and Seascale**	**Rock pooling**	-	-	**35**	-	-	-
		Seascale	Playing and walking	-	-	-	70	-	-
149	**8**	**Silecroft and Seascale**	**Rock pooling**	-	-	**35**	-	-	-
		Seascale	Playing and walking	-	-	-	70	-	-
148	**9**	**Silecroft and Seascale**	**Rock pooling**	-	-	**35**	-	-	-
		Seascale	Playing and walking	-	-	-	70	-	-

Annex 4. Children's intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Mud and sand	Mud, sand and stones	Rock and sand	Sand	Sand and stones	Stones
198	**7**	**St Bees and Seascale**	**Rock pooling**	-	-	**35**	-	-	-
			General beach activities, building sand castles and playing ball games	-	-	-	35	-	35
199	**10**	**St Bees and Seascale**	**Rock pooling**	-	-	**35**	-	-	-
			General beach activities, building sand castles and playing ball games	-	-	-	35	-	35
28	**7**	**St Bees and Allonby**	**Rock pooling**	-	-	**26**	-	-	-
			Dog walking	-	-	-	52	-	52
26	**8**	**St Bees and Allonby**	**Rock pooling**	-	-	**26**	-	-	-
			Dog walking	-	-	-	52	-	52
220	**8**	**St Bees**	**Rock pooling**	-	-	**12**	-	-	-
221	**10**	**St Bees**	**Rock pooling**	-	-	**12**	-	-	-
223	10	St Bees	Rock pooling	-	-	11	-	-	-
			Playing	-	-	-	11	-	-
101	8	Allonby	Rock pooling	-	-	2	-	-	-
			Picnicking and playing	-	-	-	28	-	-
105	8	Allonby	Rock pooling	-	-	2	-	-	-
			Picnicking and playing	-	-	-	28	-	-
104	9	Allonby	Rock pooling	-	-	2	-	-	-
			Picnicking and playing	-	-	-	28	-	-
102	10	Allonby	Rock pooling	-	-	2	-	-	-
			Picnicking and playing	-	-	-	28	-	-
214	7	Allonby	Rock pooling	-	-	1	-	-	-
			Playing	-	-	-	3	-	-
165	**7**	**Silecroft Allonby, Maryport and Workington**	**Dog walking, picnicking, playing beach games building sand castles and paddling**	-	-	-	**91**	**170**	-

Annex 4. Children's intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Mud and sand	Mud, sand and stones	Rock and sand	Sand	Sand and stones	Stones
162	**8**	**Silecroft Allonby, Maryport and Workington**	**Dog walking, picnicking, playing beach games building sand castles and paddling**	-	-	-	**91**	**170**	-
166	**11**	**Silecroft Allonby, Maryport and Workington**	**Dog walking, picnicking, playing beach games building sand castles and paddling**	-	-	-	**91**	**170**	-
61	**10**	**Allonby and Workington**	**Dog walking**	-	-	-	69	**137**	**69**
112	8	Silecroft	Playing, walking, playing ball games, building sand castles and paddling	-	-	-	63	-	-
245	**7**	**Silecroft**	**Dog walking, playing, building sand castles and swimming**	-	-	-	57	-	**57**
244	**9**	**Silecroft**	**Dog walking, playing, building sand castles and swimming**	-	-	-	57	-	**57**
243	**10**	**Silecroft**	**Dog walking, playing, building sand castles and swimming**	-	-	-	57	-	**57**
246	**10**	**Silecroft**	**Dog walking, playing, building sand castles and swimming**	-	-	-	57	-	**57**
193	7	St Bees, Seascale and Braystones	General beach activities, occasionally throwing stones and looking for shells	-	-	-	48	-	24
192	11	St Bees, Seascale and Braystones	General beach activities, occasionally throwing stones and looking for shells	-	-	-	48	-	24
19	7	St Bees	General playing, playing ball games and paddling	-	-	-	21	-	-

Annex 4. Children's intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Mud and sand	Mud, sand and stones	Rock and sand	Sand	Sand and stones	Stones
20	9	St Bees	General playing, playing ball games and paddling	-	-	-	21	-	-
210	10	Allonby	Angling and dog walking	-	-	-	16	-	-
133	10	Silecroft	Playing and kite flying	-	-	-	14	-	-
268	7	Braystones	Playing, paddling and collecting shells and stones	-	-	-	12	-	12
109	8	Whitehaven outer harbour	Picnicking and paddling	-	-	-	2	-	-
108	10	Whitehaven outer harbour	Picnicking and paddling	-	-	-	2	-	-
39	7	Parton	Playing	-	-	-	-	3	-
40	9	Parton	Playing	-	-	-	-	3	-
41	10	Parton	Playing	-	-	-	-	3	-
139	10	Braystones	Angling	-	-	-	-	-	8
33	9	Silecroft	Playing and walking	-	-	-	-	-	4
34	10	Silecroft	Playing and walking	-	-	-	-	-	4
5-year-old age group									
264	**6**	**Ravenglass, Drigg, St Bees and Braystones**	**Angling and beach occupancy**	**62**	-	-	**231**	-	**169**
197	**4**	**St Bees and Seascale**	**Rock pooling**	-	-	**35**	-	-	-
			General beach activities, building sand castles and playing ball games	-	-	-	35	-	35
27	**5**	**St Bees and Allonby**	**Rock pooling**	-	-	**26**	-	-	-
		St Bees and Allonby	Dog walking	-	-	-	52	-	52
177	**3**	**Seascale**	**Rock pooling**	-	-	**20**	-	-	-
		Seascale and Drigg	**Walking, playing, building sandcastles and picnicking**	-	-	-	**92**	-	-
229	**3**	**St Bees**	**Rock pooling**	-	-	**17**	-	-	-
		St Bees	Playing and dog walking	-	-	-	17	-	17
228	**6**	**St Bees**	**Rock pooling**	-	-	**17**	-	-	-
		St Bees	Playing and dog walking	-	-	-	17	-	17
226	**4**	**St Bees**	**Rock pooling**	-	-	**12**	-	-	-
			Playing	-	-	-	30	-	-
217	4	St Bees	Rock pooling	-	-	4	-	-	-
			Dog walking and playing	-	-	-	10	-	-

Annex 4. Children's intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Mud and sand	Mud, sand and stones	Rock and sand	Sand	Sand and stones	Stones
218	6	St Bees	Rock pooling	-	-	4	-	-	-
			Dog walking and playing	-	-	-	10	-	-
103	6	Allonby	Rock pooling	-	-	2	-	-	-
			Playing and picnicking	-	-	-	28	-	-
213	6	Allonby	Rock pooling	-	-	1	-	-	-
			Playing	-	-	-	3	-	-
164	**4**	**Silecroft Allonby, Maryport and Workington**	**Dog walking, picnicking, playing beach games building sand castles and paddling**	-	-	-	**91**	**170**	-
161	**5**	**Silecroft Allonby, Maryport and Workington**	**Dog walking, picnicking, playing beach games building sand castles and paddling**	-	-	-	**91**	**170**	-
115	**6**	**Silecroft**	**Paddling, picnicking, building sandcastles, playing**	-	-	-	**89**	-	-
113	6	Silecroft	Playing, walking, playing ball games, building sand castles and paddling	-	-	-	63	-	-
7	3	Seascale	Playing ball games, building sandcastles and paddling	-	-	-	60	-	-
8	4	Seascale	Playing ball games, building sandcastles and paddling	-	-	-	60	-	-
74	4	Silecroft	Playing, building sandcastles and picnicking	-	-	-	60	-	-
73	5	Silecroft	Playing, building sandcastles and picnicking	-	-	-	60	-	-
247	**6**	**Silecroft**	**Dog walking, playing, building sand castles and swimming**	-	-	-	57	-	**57**

Annex 4. Children's intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Mud and sand	Mud, sand and stones	Rock and sand	Sand	Sand and stones	Stones
45	4	Allonby	Playing, building sand castles	-	-	-	48	-	-
232	3	St Bees	Playing	-	-	-	39	-	39
233	4	St Bees	Playing	-	-	-	39	-	39
203	4	Seascale	Dog walking, playing and building sand castles	-	-	-	37	-	-
202	5	Seascale	Dog walking, playing and building sand castles	-	-	-	37	-	-
11	3	St Bees, Workington and Allonby	Playing and building sandcastles	-	-	-	36	-	-
12	5	St Bees, Workington and Allonby	Playing and building sandcastles	-	-	-	36	-	-
206	2	Allonby	Playing	-	-	-	21	-	-
207	2	Allonby	Playing	-	-	-	21	-	-
18	5	St Bees	General playing, playing ball games and paddling	-	-	-	21	-	-
269	6	Braystones	Playing, paddling and collecting shells and stones	-	-	-	12	-	12
120	3	Whitehaven outer harbour	Playing ball games, paddling and building sand castles	-	-	-	3	-	-
15	4	St Bees	Playing, building sand castles and paddling	-	-	-	3	-	-
118	5	Whitehaven outer harbour	Playing ball games, paddling and building sand castles	-	-	-	3	-	-
119	6	Whitehaven outer harbour	Playing ball games, paddling and building sand castles	-	-	-	3	-	-
3	6	Silecroft	Walking	-	-	-	1	-	-
69	**3**	**Parton**	**Picnicking, playing and paddling**	**-**	**-**	**-**	**-**	**100**	-
70	**5**	**Parton**	**Picnicking, playing and paddling**	**-**	**-**	**-**	**-**	**100**	-

Annex 4. Children's intertidal occupancy rates (h y^{-1})

Observation number	Age	Location	Activity	Mud and sand	Mud, sand and stones	Rock and sand	Sand	Sand and stones	Stones
3-month-old age group									
160	**9 months**	**Silecroft Allonby, Maryport and Workington**	**Playing, picnicking, building sand castles and paddling**	**-**	**-**	**-**	**91**	**170**	**-**

Notes

Emboldened observations are the high-rate group

15-year-old age group

The mean intertidal occupancy rate over mud and sand based on 2 high rate observations is 90 h y^{-1}

The intertidal occupancy rate over mud, sand and stones based on the only observation is 1 h y^{-1}

The intertidal occupancy rate over rock and sand based on the only observation is 35 h y^{-1}

The mean intertidal occupancy rate over sand based on 2 high rate observations is 316 h y^{-1}

The intertidal occupancy rate over sand and stones based on the only observation is 170 h y^{-1}

The mean intertidal occupancy rate over stones based on 1 high-rate observation is 169 h y^{-1}

10-year-old age group

The mean intertidal occupancy rate over mud and sand based on 2 high-rate observations is 62 h y^{-1}

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

The mean intertidal occupancy rate over rock and sand based on 9 high-rate observations is 28 h y^{-1}

The mean intertidal occupancy rate over sand based on 5 high-rate observations is 147 h y^{-1}

The mean intertidal occupancy rate over sand and stones based on 4 high-rate observations is 162 h y^{-1}

The mean intertidal occupancy rate over stones based on 7 high-rate observations is 91 h y^{-1}

5-year-old age group

The intertidal occupancy rate over mud and sand for the only observation is 62 h y^{-1}

The mean intertidal occupancy rate over rock and sand based on 6 high-rate observations is 21 h y^{-1}

The mean intertidal occupancy rate over sand based on 5 high-rate observations is 119 h y^{-1}

The mean intertidal occupancy rate over sand and stones based on 4 high-rate observations is 135 h y^{-1}

The mean intertidal occupancy rate over stones based on 2 high-rate observations is 113 h y^{-1}

3-month-old age group

The intertidal occupancy rate over sand for the only observation is 91 h y^{-1}

The intertidal occupancy rate over sand and stones for the only observation is 170 h y^{-1}

Assumptions

If an interviewee gave a total occupancy for one activity that was being undertaken at several locations in the survey area, the total rate was split equally between those locations.

If an interviewee gave unspecific occupancy rates in the summer months, the summer has been assumed to cover a period of five months.

School summer holidays were assumed to cover a period of six weeks.

Annex 5. Adults' handling rates (h y^{-1})

Observation number	Age	Location	Activity	Handling beach materials	Handling fishing gear	Handling sediment
248	**U**	**Seascale and St Bees**	**Beach cleaning - litter, wood, metal - wearing full protective clothing**	**750**	-	-
249	**U**	**Silecroft**	**Beach cleaning - litter, wood, metal - wearing full protective clothing**	**375**	-	-
253	**67**	**Drigg and Sellafield**	**Beachcombing - collecting driftwood**	**286**	-	-
		Braystones, Nethertown, Ravenglass and St Bees	Collecting winkles, razor shells and mussels	**-**	-	234
50	**53**	**Braystones, Sellafield, Seascale and Drigg**	**Beachcombing - collecting wood**	**260**	-	-
35	70	Parton and Whitehaven north beach	Beachcombing - collecting wood	104	-	-
136	60's	St Bees, Coulderton, Nethertown and Parton	Beachcombing - collecting driftwood	84	-	-
194	60's	St Bees and Seascale	Rock pooling - handling stones and shells	35	-	-
195	30's	St Bees and Seascale	Rock pooling - handling stones and shells	35	-	-
196	30's	St Bees and Seascale	Rock pooling - handling stones and shells	35	-	-
92	55	Parton	Throwing stones and sticks for a dog	26	-	-
174	30's	Drigg and Seascale	Throwing sticks and balls for a dog	26	-	-
175	30's	Seascale	Rock pooling - handling stones and shells	20	-	-
176	30's	Seascale	Rock pooling - handling stones and shells	20	-	-
234	U	Drigg	Litter collecting - mainly plastic items - wearing gloves	15	-	-
235	U	Drigg	Litter collecting - mainly plastic items - wearing gloves	15	-	-
236	U	Drigg	Litter collecting - mainly plastic items - wearing gloves	15	-	-
237	U	Drigg	Litter collecting - mainly plastic items - wearing gloves	15	-	-
47	30's	Drigg and Seascale	Throwing stones, sticks and balls for a dog	13	-	-
48	30's	Drigg and Seascale	Throwing stones, sticks and balls for a dog	13	-	-
222	60's	St Bees	Rock pooling - handling stones and shells	11	-	-
211	U	Allonby	Rock pooling - handling stones and shells	1	-	-
212	U	Allonby	Rock pooling - handling stones and shells	1	-	-

Annex 5. Adults' handling rates (h y^{-1})

Observation number	Age	Location	Activity	Handling beach materials	Handling fishing gear	Handling sediment
251	**50**	**Eskmeals, Drigg, Ravenglass, Seascale and Sellafield**	**Potting offshore**	-	**1170**	-
252	**U**	**Eskmeals, Drigg, Ravenglass, Seascale and Sellafield**	**Potting offshore**	-	**1170**	-
266	**55**	**Braystones and Sellafield**	**Beachcombing - collecting firewood**	24		
		Braystones	**Setting nets**	-	**480**	-
			Bait digging, collecting crabs and razor shells	-	-	212
259	**U**	**Braystones**	**Setting nets**	-	**400**	-
		Braystones, Drigg, Parton, Ravenglass and Whitehaven outer harbour	**Bait digging and collecting winkles and mussels**	-	-	**888**
267	54	Braystones	Setting nets	-	120	-
260	U	Braystones	Setting nets	-	48	-
254	**U**	**Braystones, Coulderton, Drigg, Eskmeals, Nethertown and Whitehaven outer harbour**	**Bait digging and collecting winkles**	-	-	**939**
256	**U**	**Coulderton, Nethertown, Ravenglass and St Bees**	**Bait digging and collecting winkles and limpets**	-	-	**363**
82	40's	Drigg and Seascale	Bait digging	-	-	260
83	40's	Drigg and Seascale	Bait digging	-	-	260
84	40's	Drigg and Seascale	Bait digging	-	-	260
85	40's	Drigg and Seascale	Bait digging	-	-	260
167	U	Parton	Collecting winkles	-	-	183
51	U	Eskmeals, Drigg, Maryport and Whitehaven outer harbour	Bait digging	-	-	156
46	30's	Coulderton	Collecting winkles	-	-	140
265	54	Braystones, Maryport and Nethertown	Bait digging and collecting winkles	-	-	127
54	22	Parton	Collecting sea coal	-	-	81
55	23	Parton	Collecting sea coal	-	-	81
56	22	Parton	Collecting sea coal	-	-	81
170	50's	Whitehaven outer harbour	Bait digging	-	-	72

Annex 5. Adults' handling rates (h y^{-1})

Observation number	Age	Location	Activity	Handling beach materials	Handling fishing gear	Handling sediment
171	50's	Whitehaven outer harbour	Bait digging	-	-	72
273	U	Whitehaven (south of the harbour)	Collecting winkles	-	-	63
86	30's	Braystones, Drigg and Sellafield	Bait digging	-	-	48
87	30's	Braystones, Drigg and Sellafield	Bait digging	-	-	48
172	50's	Maryport and Whitehaven outer harbour	Bait digging	-	-	48
168	30's	Workington	Bait digging	-	-	30
169	30's	Workington	Bait digging	-	-	30
78	40's	Eskmeals	Bait digging	-	-	25
79	40's	Eskmeals	Bait digging	-	-	25
80	40's	Eskmeals	Bait digging	-	-	25
81	40's	Eskmeals	Bait digging	-	-	25
185	60's	Silecroft	Collecting seaweed	-	-	9

Notes

Emboldened observations are the high-rate individuals

The mean rate for handling beach materials based on 4 high-rate observations is 418 h y^{-1}

The mean rate for handling fishing gear based on 4 high-rate observations is 805 h y^{-1}

The mean rate for handling sediment based on 3 high-rate observations is 730 h y^{-1}

Gloves were usually worn by individuals conducting the following activities: potting, setting nets, shellfish collecting and litter collecting/beach cleaning.

Assumptions

If an interviewee gave a total handling rate for one activity that was being undertaken at several locations in the survey area, the total rate was split equally between those locations.

If an interviewee gave unspecific occupancy rates in the summer months, the summer has been assumed to cover a period of five months.

Annex 6. Children's handling rates (h y^{-1})

Observation number	Sex	Age	Location	Activity	Handling beach materials	Handling sediment
15-year-old age group						
147	**U**	**12**	**Silecroft and Seascale**	**Rock pooling - handling stones and shells**	**35**	**-**
49	**M**	**12**	**Drigg and Seascale**	**Throwing stones, sticks and balls for a dog**	**13**	**-**
52	**M**	**14**	**Eskmeals, Drigg, Maryport, Whitehaven outer harbour**	**Bait digging**	-	**156**
10-year-old age group						
148	**U**	**9**	**Silecroft and Seascale**	**Rock pooling - handling stones and shells**	**35**	-
149	**U**	**8**	**Silecroft and Seascale**	**Rock pooling - handling stones and shells**	**35**	-
150	**U**	**7**	**Silecroft and Seascale**	**Rock pooling - handling stones and shells**	**35**	-
198	**M**	**7**	**St Bees and Seascale**	**Rock pooling - handling stones and shells**	**35**	-
199	**F**	**10**	**St Bees and Seascale**	**Rock pooling - handling stones and shells**	**35**	-
26	**M**	**8**	**Allonby and St Bees**	**Rock pooling - handling stones and shells**	**26**	-
28	**F**	**7**	**Allonby and St Bees**	**Rock pooling - handling stones and shells**	**26**	-
220	**M**	**8**	**St Bees**	**Rock pooling - handling stones and shells**	**12**	-
221	**F**	**10**	**St Bees**	**Rock pooling - handling stones and shells**	**12**	-
268	**F**	**7**	**Braystones**	**Collecting shells and stones**	**12**	-
223	F	10	St Bees	Rock pooling - handling stones and shells	11	-

Annex 6. Children's handling rates (h y^{-1})

Observation number	Sex	Age	Location	Activity	Handling beach materials	Handling sediment
101	F	8	Allonby	Rock pooling - handling stones and shells	2	-
102	F	10	Allonby	Rock pooling - handling stones and shells	2	-
104	F	9	Allonby	Rock pooling - handling stones and shells	2	-
105	M	8	Allonby	Rock pooling - handling stones and shells	2	-
214	F	7	Allonby	Rock pooling - handling stones and shells	1	-
5-year-old age group						
197	**M**	**4**	**St Bees and Seascale**	**Rock pooling - handling stones and shells**	**35**	-
27	**F**	**5**	**Allonby and St Bees**	**Rock pooling - handling stones and shells**	**26**	-
177	**F**	**3**	**Seascale**	**Rock pooling - handling stones and shells**	**20**	-
228	**M**	**6**	**St Bees**	**Rock pooling - handling stones and shells**	**17**	-
229	**M**	**3**	**St Bees**	**Rock pooling - handling stones and shells**	**17**	-
226	**M**	**4**	**St Bees**	**Rock pooling - handling stones and shells**	**12**	-
269	**F**	**6**	**Braystones**	**Collecting shells and stones**	**12**	-
217	M	4	St Bees	Rock pooling - handling stones and shells	4	-
218	F	6	St Bees	Rock pooling - handling stones and shells	4	-

Annex 6. Children's handling rates (h y^{-1})

Observation number	Sex	Age	Location	Activity	Handling beach materials	Handling sediment
103	M	6	Allonby	Rock pooling - handling stones and shells	2	-
213	F	6	Allonby	Rock pooling - handling stones and shells	1	-

Notes

Emboldened observations are the high-rate individuals

15-year-old age group

The mean rate for handling beach materials based on 2 high rate observations is 24 h y^{-1}

The rate for handling sediment based on the only observation is 156 h y^{-1}

10-year-old age group

The mean rate for handling beach materials based on 10 high rate observations is 26 h y^{-1}

5-year-old age group

The mean rate for handling beach materials based on 7 high rate observations is 20 h y^{-1}

Assumptions

If an interviewee gave a total handling rate for one activity that was being undertaken at several locations in the survey area, the total rate was split equally between those locations.

If an interviewee gave unspecific occupancy rates in the summer months, the summer has been assumed to cover a period of five months.

School summer holidays were assumed to cover a period of six weeks.

Annex 7. Adults' intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over coal and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over mud	Intertidal occupancy over rock	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling fishing gear	Handling sediment
1	M	30's	-	-	-	-	-	-	1	-	-	-	-	-
2	F	30's	-	-	-	-	-	-	1	-	-	-	-	-
4	U	20's	-	-	-	-	-	-	52	-	52	-	-	-
5	U	U	-	-	-	-	-	-	52	-	52	-	-	-
6	F	60's	-	-	-	-	-	-	60	-	-	-	-	-
9	M	U	-	-	-	-	-	-	36	-	-	-	-	-
10	F	U	-	-	-	-	-	-	36	-	-	-	-	-
13	M	30's	-	-	-	-	-	-	3	-	-	-	-	-
14	F	30's	-	-	-	-	-	-	3	-	-	-	-	-
16	M	65	-	-	-	-	-	-	21	-	-	-	-	-
17	F	65	-	-	-	-	-	-	21	-	-	-	-	-
21	M	40	-	-	-	-	-	-	281	-	91	-	-	-
22	F	40	-	-	-	-	-	-	91	-	91	-	-	-
23	M	45	-	-	-	-	-	-	281	-	91	-	-	-
24	F	43	-	-	-	-	-	-	91	-	91	-	-	-
25	F	40	-	-	-	-	-	-	91	-	91	-	-	-
29	F	U	-	-	-	-	-	-	-	-	4	-	-	-
30	M	U	-	-	-	-	-	-	-	-	4	-	-	-
31	F	U	-	-	-	-	-	-	-	-	4	-	-	-
32	M	U	-	-	-	-	-	-	-	-	4	-	-	-
35	M	70	-	-	-	-	-	-	-	390	-	104	-	-
36	F	60	-	-	-	-	-	-	33	130	33	-	-	-
37	M	U	-	-	-	-	-	-	-	3	-	-	-	-
38	F	U	-	-	-	-	-	-	-	3	-	-	-	-
42	F	50	-	-	-	-	-	-	-	365	-	-	-	-
43	M	30's	-	-	-	-	-	-	48	-	-	-	-	-
44	F	30's	-	-	-	-	-	-	48	-	-	-	-	-
46	M	30's	-	-	-	-	140	-	-	-	-	-	-	140
47	M	30's	-	-	-	-	-	-	424	-	-	13	-	-
48	F	30's	-	-	-	-	-	-	400	-	-	13	-	-
50	M	53	-	-	-	-	-	-	228	-	33	260	-	-
51	M	U	-	117	-	-	-	-	39	-	-	-	-	156
53	F	67	-	-	-	-	-	-	-	208	-	-	-	-
54	M	22	81	-	-	-	-	-	-	101	-	-	-	81
55	M	23	81	-	-	-	-	-	-	101	-	-	-	81

Annex 7. Adults' intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over coal and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over mud	Intertidal occupancy over rock	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling fishing gear	Handling sediment
56	F	22	81	-	-	-	-	-	-	101	-	-	-	81
57	M	U	-	-	-	-	-	-	69	137	69	-	-	-
58	F	U	-	-	-	-	-	-	69	137	69	-	-	-
59	F	U	-	-	-	-	-	-	69	137	69	-	-	-
60	F	U	-	-	-	-	-	-	69	137	69	-	-	-
62	M	48	-	-	-	-	-	-	-	365	-	-	-	-
63	F	45	-	-	-	-	-	-	-	365	-	-	-	-
64	F	50	-	-	-	-	-	-	-	365	-	-	-	-
65	M	40	-	-	-	-	-	-	-	72	-	-	-	-
66	M	38	-	-	-	-	-	-	-	72	-	-	-	-
67	M	U	-	-	-	-	-	-	-	100	-	-	-	-
68	F	U	-	-	-	-	-	-	-	100	-	-	-	-
71	M	30's	-	-	-	-	-	-	60	-	-	-	-	-
72	F	30's	-	-	-	-	-	-	60	-	-	-	-	-
75	M	50's	-	-	-	-	-	-	44	-	44	-	-	-
76	F	50's	-	-	-	-	-	-	44	-	44	-	-	-
77	M	U	-	-	-	-	-	-	8	-	-	-	-	-
78	M	40's	-	25	-	-	-	-	61	-	61	-	-	25
79	M	40's	-	25	-	-	-	-	61	-	61	-	-	25
80	M	40's	-	25	-	-	-	-	61	-	61	-	-	25
81	M	40's	-	25	-	-	-	-	61	-	61	-	-	25
82	M	40's	-	-	-	-	-	-	884	-	-	-	-	260
83	M	40's	-	-	-	-	-	-	884	-	-	-	-	260
84	M	40's	-	-	-	-	-	-	884	-	-	-	-	260
85	M	40's	-	-	-	-	-	-	884	-	-	-	-	260
86	M	30's	-	16	-	-	-	-	305	-	273	-	-	48
87	M	30's	-	16	-	-	-	-	305	-	273	-	-	48
88	M	25	-	-	-	-	-	-	-	700	-	-	-	-
89	F	25	-	-	-	-	-	-	-	700	-	-	-	-
90	F	60's	-	-	-	-	-	-	-	702	-	-	-	-
91	F	60's	-	-	-	-	-	-	-	702	-	-	-	-
92	M	55	-	-	-	-	-	-	-	730	-	26	-	-
93	M	25	-	-	-	-	-	-	-	548	-	-	-	-
94	M	35	-	-	-	-	-	-	-	548	-	-	-	-
95	F	35	-	-	-	-	-	-	-	548	-	-	-	-

Annex 7. Adults' intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over coal and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over mud	Intertidal occupancy over rock	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling fishing gear	Handling sediment
96	F	60's	-	-	-	-	-	-	548	-	-	-	-	-
97	M	U	-	-	-	-	-	-	30	-	-	-	-	-
98	F	U	-	-	-	-	-	-	30	-	-	-	-	-
99	M	U	-	-	-	-	-	-	30	-	-	-	-	-
100	F	U	-	-	-	-	-	-	30	-	-	-	-	-
106	M	30's	-	-	-	-	-	-	2	-	-	-	-	-
107	F	30's	-	-	-	-	-	-	2	-	-	-	-	-
110	M	35	-	-	-	-	-	-	63	-	-	-	-	-
111	F	35	-	-	-	-	-	-	63	-	-	-	-	-
114	M	30's	-	-	-	-	-	-	89	-	-	-	-	-
116	M	30's	-	-	-	-	-	-	3	-	-	-	-	-
117	F	30's	-	-	-	-	-	-	3	-	-	-	-	-
121	F	60's	-	-	-	-	-	-	183	-	183	-	-	-
122	F	40's	-	-	-	-	-	-	365	-	365	-	-	-
123	M	40's	-	-	-	-	-	-	14	-	14	-	-	-
124	F	40's	-	-	-	-	-	-	14	-	14	-	-	-
125	M	40's	-	-	1	-	-	-	18	-	-	-	-	-
126	F	40's	-	-	1	-	-	-	18	-	-	-	-	-
130	M	40's	-	-	-	-	-	-	14	-	-	-	-	-
131	F	40's	-	-	-	-	-	-	14	-	-	-	-	-
134	M	28	-	-	-	-	-	-	2	-	-	-	-	-
135	F	28	-	-	-	-	-	-	2	-	-	-	-	-
136	M	60's	-	-	-	-	-	-	-	-	84	84	-	-
137	M	40's	-	-	-	-	-	-	-	-	8	-	-	-
140	M	20's	-	-	-	-	-	-	-	-	210	-	-	-
141	M	60's	-	-	-	-	-	-	4	-	4	-	-	-
142	M	60's	-	-	-	-	-	-	4	-	4	-	-	-
143	M	60's	-	-	-	-	-	-	4	-	4	-	-	-
144	M	U	-	-	-	-	-	-	104	-	-	-	-	-
145	F	U	-	-	-	-	-	-	104	-	-	-	-	-
146	F	30's	-	-	-	-	-	-	104	-	-	-	-	-
151	M	U	-	-	-	-	-	-	88	173	-	-	-	-
152	M	U	-	-	-	-	-	-	88	173	-	-	-	-
153	M	U	-	-	-	-	-	-	88	173	-	-	-	-
154	M	U	-	-	-	-	-	-	88	173	-	-	-	-

Annex 7. Adults' intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over coal and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over mud	Intertidal occupancy over rock	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling fishing gear	Handling sediment
155	F	U	-	-	-	-	-	-	88	173	-	-	-	-
156	F	U	-	-	-	-	-	-	88	173	-	-	-	-
157	F	U	-	-	-	-	-	-	88	173	-	-	-	-
158	F	U	-	-	-	-	-	-	88	173	-	-	-	-
159	F	U	-	-	-	-	-	-	88	173	-	-	-	-
167	M	U	-	-	-	-	183	-	-	-	-	-	-	183
168	M	30's	-	-	-	-	-	-	65	140	35	-	-	30
169	M	30's	-	-	-	-	-	-	65	140	35	-	-	30
170	M	50's	-	72	-	-	320	-	-	-	320	-	-	72
171	M	50's	-	72	-	-	-	-	480	-	160	-	-	72
172	M	50's	-	24	-	24	104	-	208	-	104	-	-	48
173	F	60's	-	-	-	-	-	-	730	-	-	-	-	-
174	M	30's	-	-	-	-	-	-	858	-	-	26	-	-
175	M	30's	-	-	-	-	-	20	92	-	-	20	-	-
176	F	30's	-	-	-	-	-	20	92	-	-	20	-	-
178	M	20's	-	-	-	-	-	-	14	-	-	-	-	-
179	M	20's	-	-	-	-	-	-	14	-	-	-	-	-
180	M	20's	-	-	-	-	-	-	14	-	-	-	-	-
181	F	20's	-	-	-	-	-	-	14	-	-	-	-	-
182	F	20's	-	-	-	-	-	-	14	-	-	-	-	-
183	F	20's	-	-	-	-	-	-	14	-	-	-	-	-
184	F	20's	-	-	-	-	-	-	14	-	-	-	-	-
185	F	60's	-	-	-	-	-	-	5	-	5	-	-	9
186	F	60's	-	-	-	-	-	-	274	-	274	-	-	-
187	F	60's	-	-	-	-	-	-	274	-	274	-	-	-
188	M	70's	-	-	-	-	-	-	48	-	24	-	-	-
189	F	70's	-	-	-	-	-	-	48	-	24	-	-	-
190	M	40's	-	-	-	-	-	-	48	-	24	-	-	-
191	F	40's	-	-	-	-	-	-	48	-	24	-	-	-
194	M	60's	-	-	-	-	-	35	35	-	35	35	-	-
195	F	30's	-	-	-	-	-	35	35	-	35	35	-	-
196	M	30's	-	-	-	-	-	35	35	-	35	35	-	-
200	M	U	-	-	-	-	-	-	37	-	-	-	-	-
201	F	U	-	-	-	-	-	-	37	-	-	-	-	-
204	M	30's	-	-	-	-	-	-	21	-	-	-	-	-

Annex 7. Adults' intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over coal and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over mud	Intertidal occupancy over rock	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling fishing gear	Handling sediment
205	F	30's	-	-	-	-	-	-	21	-	-	-	-	-
208	M	30's	-	-	-	-	-	-	16	-	-	-	-	-
209	F	30's	-	-	-	-	-	-	16	-	-	-	-	-
211	M	U	-	-	-	-	-	1	3	-	-	1	-	-
212	F	U	-	-	-	-	-	1	3	-	-	1	-	-
215	M	30's	-	-	-	-	-	-	14	-	-	-	-	-
216	F	30's	-	-	-	-	-	-	14	-	-	-	-	-
219	M	60's	-	-	-	-	-	-	103	-	-	-	-	-
222	F	60's	-	-	-	-	-	11	11	-	-	11	-	-
224	M	30's	-	-	-	-	-	-	42	-	-	-	-	-
225	F	30's	-	-	-	-	-	-	42	-	-	-	-	-
227	F	30's	-	-	-	-	-	-	26	-	26	-	-	-
230	M	30's	-	-	-	-	-	-	176	-	176	-	-	-
231	F	30's	-	-	-	-	-	-	176	-	176	-	-	-
234	M	U	-	-	-	-	-	-	15	-	-	15	-	-
235	U	U	-	-	-	-	-	-	15	-	-	15	-	-
236	U	U	-	-	-	-	-	-	15	-	-	15	-	-
237	U	U	-	-	-	-	-	-	15	-	-	15	-	-
238	M	20	-	-	-	-	-	-	-	-	210	-	-	-
239	M	30's	-	-	-	-	-	-	57	-	57	-	-	-
240	F	30's	-	-	-	-	-	-	57	-	57	-	-	-
241	M	30's	-	-	-	-	-	-	57	-	57	-	-	-
242	F	30's	-	-	-	-	-	-	57	-	57	-	-	-
248	M	U	-	-	-	-	-	-	375	-	375	750	-	-
249	M	U	-	-	-	-	-	-	188	-	188	375	-	-
250	F	47	-	-	-	-	-	-	302	-	60	-	-	-
251	M	50	-	-	-	-	-	-	-	-	-	-	1170	-
252	M	U	-	-	-	-	-	-	-	-	-	-	1170	-
253	M	67	-	78	-	-	78	-	364	-	-	286	-	234
254	M	U	-	912	-	-	27	-	456	-	-	-	-	939
255	M	67	-	19	-	-	-	-	19	-	-	-	-	-
256	M	U	-	12	-	-	351	-	-	-	-	-	-	363
257	M	73	-	6	-	-	-	-	6	-	-	-	-	-
258	F	U	-	-	-	-	-	-	263	-	263	-	-	-
259	M	U	-	207	-	54	672	-	571	-	72	-	400	888

Annex 7. Adults' intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over coal and sand	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over mud	Intertidal occupancy over rock	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling fishing gear	Handling sediment
260	F	U	-	72	-	-	-	-	264	-	144	-	48	-
265	M	54	-	-	-	-	75	-	676	-	-	-	-	127
266	M	55	-	-	-	-	-	-	930	64	101	-	480	212
267	F	54	-	-	-	-	-	-	207	-	37	-	120	-
270	F	60's	-	-	-	-	-	-	65	-	65	-	-	-
271	F	70's	-	-	-	-	-	-	183	-	183	-	-	-
272	F	40's	-	-	-	-	-	-	137	-	137	-	-	-
273	M	U	-	-	-	-	63	-	-	-	-	-	-	63

Notes
U = Unknown

Annex 8. Children's intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling sediment
15-year-old age group										
49	M	12	-	-	-	400	-	-	13	-
52	M	14	117	-	-	39	-	-	-	156
127	M	12	-	1	-	18	-	-	-	-
132	M	13	-	-	-	14	-	-	-	-
138	M	12	-	-	-	-	-	8	-	-
147	U	12	-	-	35	70	-	-	35	-
163	F	13	-	-	-	91	170	-	-	-
261	M	13	62	-	-	231	-	169	-	-
10-year-old age group										
19	M	7	-	-	-	21	-	-	-	-
20	F	9	-	-	-	21	-	-	-	-
26	M	8	-	-	26	52	-	52	26	-
28	F	7	-	-	26	52	-	52	26	-
33	F	9	-	-	-	-	-	4	-	-
34	F	10	-	-	-	-	-	4	-	-
39	M	7	-	-	-	-	3	-	-	-
40	F	9	-	-	-	-	3	-	-	-
41	F	10	-	-	-	-	3	-	-	-
61	M	10	-	-	-	69	137	69	-	-
101	F	8	-	-	2	28	-	-	2	-
102	F	10	-	-	2	28	-	-	2	-
104	F	9	-	-	2	28	-	-	2	-
105	M	8	-	-	2	28	-	-	2	-
108	F	10	-	-	-	2	-	-	-	-
109	M	8	-	-	-	2	-	-	-	-
112	M	8	-	-	-	63	-	-	-	-
128	M	10	-	1	-	18	-	-	-	-
129	F	9	-	1	-	18	-	-	-	-
133	F	10	-	-	-	14	-	-	-	-
139	M	10	-	-	-	-	-	8	-	-
148	U	9	-	-	35	70	-	-	35	-
149	U	8	-	-	35	70	-	-	35	-
150	U	7	-	-	35	70	-	-	35	-
162	F	8	-	-	-	91	170	-	-	-

Annex 8. Children's intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling sediment
165	M	7	-	-	-	91	170	-	-	-
166	M	11	-	-	-	91	170	-	-	-
192	F	11	-	-	-	48	-	24	-	-
193	M	7	-	-	-	48	-	24	-	-
198	M	7	-	-	35	35	-	35	35	-
199	F	10	-	-	35	35	-	35	35	-
210	M	10	-	-	-	16	-	-	-	-
214	F	7	-	-	1	3	-	-	1	-
220	M	8	-	-	12	-	-	-	12	-
221	F	10	-	-	12	-	-	-	12	-
223	F	10	-	-	11	11	-	-	11	-
243	M	10	-	-	-	57	-	57	-	-
244	M	9	-	-	-	57	-	57	-	-
245	M	7	-	-	-	57	-	57	-	-
246	F	10	-	-	-	57	-	57	-	-
262	M	11	62	-	-	231	-	169	-	-
263	M	10	62	-	-	231	-	169	-	-
268	F	7	-	-	-	12	-	12	12	-
5-year-old age group										
3	M	6	-	-	-	1	-	-	-	-
7	F	3	-	-	-	60	-	-	-	-
8	M	4	-	-	-	60	-	-	-	-
11	F	3	-	-	-	36	-	-	-	-
12	M	5	-	-	-	36	-	-	-	-
15	M	4	-	-	-	3	-	-	-	-
18	M	5	-	-	-	21	-	-	-	-
27	F	5	-	-	26	52	-	52	26	-
45	F	4	-	-	-	48	-	-	-	-
69	F	3	-	-	-	-	100	-	-	-
70	F	5	-	-	-	-	100	-	-	-
73	M	5	-	-	-	60	-	-	-	-
74	F	4	-	-	-	60	-	-	-	-
103	M	6	-	-	2	28	-	-	2	-
113	M	6	-	-	-	63	-	-	-	-
115	F	6	-	-	-	89	-	-	-	-

Annex 8. Children's intertidal occupancy rates (h y^{-1}) and handling rates (h y^{-1})

Observation number	Sex	Age	Intertidal occupancy over mud and sand	Intertidal occupancy over mud, sand and stones	Intertidal occupancy over rock and sand	Intertidal occupancy over sand	Intertidal occupancy over sand and stones	Intertidal occupancy over stone	Handling beach materials	Handling sediment
118	F	5	-	-	-	3	-	-	-	-
119	F	6	-	-	-	3	-	-	-	-
120	M	3	-	-	-	3	-	-	-	-
161	F	5	-	-	-	91	170	-	-	-
164	M	4	-	-	-	91	170	-	-	-
177	F	3	-	-	20	92	-	-	20	-
197	M	4	-	-	35	35	-	35	35	-
202	M	5	-	-	-	37	-	-	-	-
203	F	4	-	-	-	37	-	-	-	-
206	M	2	-	-	-	21	-	-	-	-
207	F	2	-	-	-	21	-	-	-	-
213	F	6	-	-	1	3	-	-	1	-
217	M	4	-	-	4	10	-	-	4	-
218	F	6	-	-	4	10	-	-	4	-
226	M	4	-	-	12	30	-	-	12	-
228	M	6	-	-	17	17	-	17	17	-
229	M	3	-	-	17	17	-	17	17	-
232	F	3	-	-	-	39	-	39	-	-
233	F	4	-	-	-	39	-	39	-	-
247	M	6	-	-	-	57	-	57	-	-
264	F	6	62	-	-	231	-	169	-	-
269	F	6	-	-	-	12	-	12	12	-
3-month-old age group										
160	F	9 months	-	-	-	91	170	-	-	-

Notes
U=Unknown

About us

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

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

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

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

CTL systems and services are developed by teams that are experienced in fisheries, environmental management and aquaculture, and in working closely with clients to ensure that their needs are fully met.
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With our unique facilities and our breadth of expertise in environmental and fisheries management, we can rapidly put together a multi-disciplinary team of experienced specialists, fully supported by our comprehensive in-house resources.

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

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

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

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