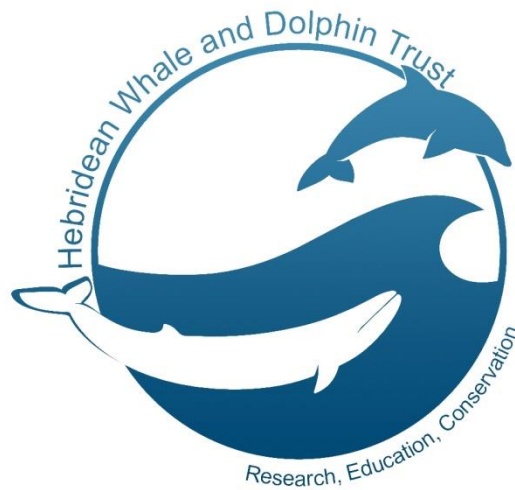


HEBRIDEAN WHALE AND DOLPHIN TRUST



Annual Report 2014



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INTRODUCTION

Founded in 1994, the Hebridean Whale and Dolphin Trust (HWDT) this year marked its 20th anniversary. In the last 20 years, the Trust has grown from a very small, locally-based charity to a larger, more sustainable organisation. HWDT currently employs three full-time, three part-time and several seasonal members of staff, and receives additional support from volunteers and interns. HWDT is backed by a Board of Trustees and a Scientific Committee to help steer the organisation. This report details the activities of HWDT in 2014.

This year was no different to any other in terms of our main objectives: to continue to collect distribution and relative abundance data on the cetaceans during *Silurian*-based surveys, to collect community sightings and strandings data and to deliver a comprehensive education and outreach programme throughout the west coast of Scotland.

In 2014, HWDT conducted 11 monitoring trips, including one specifically timed to coincide with Operation Joint Warrior (NATO's largest multi-national military exercise) and two trips just for teenagers. *Silurian* was also used to run a university field course and a private passive acoustic monitoring training course. In total, *Silurian* surveyed more than 4500 nautical miles during 760 hours of survey effort.

HWDT's surveys have enabled the collection of numerous data streams over several years, resulting in a large and complex dataset. This facilitates projects investigating specific research questions using discrete parts of the dataset, and also collaborative work where the Trust's data contribute to larger Scottish or UK-wide initiatives as part of comprehensive long-term analyses. As the dataset expands, with ongoing surveys using consistent methodology, its value can only increase in terms of its capacity to investigate trends at spatial and temporal scales that are relevant to policy-makers. For example, in 2014 HWDT's data were used by Scottish Natural Heritage (SNH) to inform the designation of Natural Conservation Marine Protected Areas (ncMPAs) in Scotland, probably the most significant use of our data to date.

The Community Sightings (and Strandings) Network (CSN) was strengthened this year with an award from Coastal Communities for our SeaChange project. This enabled the recruitment of a full-time Sightings and Strandings Officer, funded for two years. 2014 has seen the highest number of sighting reports received since the scheme began (1389 in 2014 compared with 792 in 2013). With regards to strandings, a total of 20 strandings were reported to HWDT in 2014, including a humpback whale calf in June. The CSN data are a useful indicator of the minimum species diversity and earliest arrival times of migratory species as well as informing more species- or geographic-specific studies in the future.

An integral part of the SeaChange project is public outreach. During a six-week-long roadshow, HWDT visited several disparate coastal communities and engaged 229 school pupils, 164 people at public talks and 14 tour boat operators. These activities complemented HWDT's ongoing outreach objectives, which delivered a programme of a further 23 events to a total estimated audience of 1589 people. This included a special 'Whale Week': a series of events, talks and presentations in June to celebrate 20 years of HWDT. A further 499 school pupils were engaged in learning opportunities (in addition to the SeaChange visits) via land-based visits and a week-long floating classroom education trip. September also provided an opportunity for a group of Mull youngsters to sail onboard *Silurian* to learn about HWDT's work.

The Trust's Visitor Centre and Shop were supported by the Coastal Communities-funded SeaChange project, which enabled the recruitment of a full-time Shop and Visitor Centre Manager for two years and some essential repairs and renovation work to take place. The new-look Visitor Centre will be opening in Spring 2015.

HWDT's work was recognised at the RSPB Nature of Scotland Awards for the second year running, this time in the Marine Conservation category; a great achievement to be shortlisted alongside other worthy projects. HWDT looks forward to continuing its work and developing its partnerships in 2015 to help conserve Scotland's cetaceans and marine environment.

HWDT thanks all who have supported the charity in many different ways throughout the year. Special acknowledgements are made to our funders later in this report.



RESEARCH

***Silurian* Surveys**

The Hebridean Whale and Dolphin Trust's research vessel, *Silurian*, has been a platform for conducting non-invasive cetacean monitoring surveys since 2003. The seven most commonly sighted cetacean species in Hebridean waters are:

- Minke whale
- Bottlenose dolphin
- White-beaked dolphin
- Common dolphin
- Risso's dolphin
- Killer whale
- Harbour porpoise.

Data collected are unique to the west coast of Scotland with no other data available on such a large spatial and temporal scale in this area. Data on distribution and relative abundance estimation are useful for managing human activities that may impact on marine mammals. Where data were confined initially to the Argyll Islands region, in recent years the survey area has been expanded.

In 2014, HWDT conducted 11 survey trips running from May until mid-October: nine surveys departed from Tobermory, whilst two surveys departed from Kyle of Lochalsh to enable baseline surveying of the more poorly understood northerly and westerly areas of the Hebrides to take place. Surveys are led by HWDT's Marine Biodiversity Officer, who is responsible for training a team of six paying volunteers (+/- 1) in basic research techniques. Once fully trained, volunteers assist with collecting visual and acoustic data in accordance with HWDT methodology. In previous years, HWDT has run trips with support from other organisations, such as Biosphere and Earthwatch Institute, however in 2014 all trips were run directly through HWDT. HWDT ran two 'Teen Team' surveys for teenagers aged between 15 and 17 and also monitored during the NATO 'Joint Warrior' military exercise. In addition, one survey formed part of the University of St Andrews Sea Mammal Research Unit (SMRU) MRes programme. *Silurian* was chartered for one day for a passive acoustic monitoring (PAM) course run by PAMTech, and for two weeks by a team of SMRU researchers conducting research looking into localisation of harbour porpoises in three-dimensional space using passive acoustic monitoring to track individuals. This research allows one to assess what part of the water column is being used without the need for tagging, which would provide important information in environmental impact assessments of tide and wave energy devices on harbour porpoises.

Methodology

The survey methodology used in 2014 was identical on all monitoring trips (with additional data collection during HWDT's Joint Warrior survey), and has remained very similar since 2003, with some methodological and equipment adaptations and improvements made where necessary. All surveys and activities onboard *Silurian* in 2014 are summarised in Table 1.

Table 1. Surveys and activities onboard *Silurian* in 2014

Trip	Trip type	Start date	End date	Notes	Distance Travelled
Charter	Private Course	04/05/14	04/05/14	PAMTech course	N/A
HWDT 1	Research	05/05/14	13/05/14		285 mi
HWDT 2	Research	17/05/14	28/05/14		492 mi
SMRU	Research/ Education	01/06/14	09/06/14	St Andrews University students	335 mi
HWDT 3	Research	14/06/14	23/06/14		466 mi
HWDT 4	Research	24/06/14	05/07/14		494 mi
HWDT 5	Research	08/07/14	19/07/14		437 mi
HWDT 6	Research/ Education	21/07/14	27/07/14	Teen team	262 mi
HWDT 7	Research	29/07/14	09/08/14		497 mi
HWDT 8	Research/ Education	11/08/14	15/08/14	Teen Team	181 mi
Charter	Private Research	18/08/14	29/08/14	SMRU	N/A
HWDT 9	Research	01/09/14	12/09/14		518 mi
Education	Education	15/09/14	19/09/14	Mull schools & youth trip	N/A
HWDT 10	Research	22/09/14	30/09/14		243 mi
HWDT 11	Research	08/10/14	16/10/15	Concurrent with Joint Warrior military exercise	341 mi
Total					4552 mi

Trips were mostly 12 days long, the usual distance covered being between 200 – 450 nautical miles depending on weather conditions and trip duration. Surveying was generally carried out for eight to nine

hours per day, depending on conditions and levels of light available at the time of year. During these surveys HWDT undertook the following activities:

- Visual observations were conducted for all cetacean species, plus basking sharks, seals, seabirds, marine litter, creels, and other vessels during systematic line transect surveys.
- Passive acoustic surveys¹ were carried out simultaneously with the visual surveys. A towed hydrophone array was deployed in all sea conditions during daylight hours in waters >10m depth².
- Photographs of minke whales, bottlenose dolphins, common dolphins, white-beaked dolphins, killer whales, Risso's dolphins and basking sharks were collected for individual identification, at which time line transect sampling protocols were interrupted. These photographs showed the dorsal fins and any body scars or flank patterns that could be used to distinguish individual animals. A Canon EOS 10D and Canon EOS 600D with a 300mm lens were used for photo-identification.
- When white-beaked dolphins or Risso's dolphins were encountered, capturing acoustic recordings took precedent over photo-identification, and five minutes of clean (minimal boat noise) acoustic recordings were made before endeavouring to obtain photo-identification photos (this protocol began in 2012).
- Environmental conditions (sea state, swell, visibility, sun glare, and weather conditions) were recorded every 15 minutes or whenever they changed. Sea surface temperature was not recorded using an automated temperature probe in 2014 due to equipment malfunction.
- Visual data were collected and stored using the real-time data logging program LOGGER 2010 (developed by International Fund for Animal Welfare).
- Acoustic data were collected and stored using PAMGUARD Beta 1.12.05.
- During the Joint Warrior Military exercise, HWDT deployed a SoundTrap (a self-contained underwater sound recorder) to make calibrated recordings of military sonar. The SoundTrap was either deployed behind HWDT's towed hydrophone array or from a dahn buoy to collect overnight recordings.

¹ Continuous acoustic monitoring was conducted, and recordings made at a sample rate of 500 kHz

² One minute recordings were made of audible sounds every 15 minutes by volunteers.

Volunteers

This year was the first field season where HWDT recruited all volunteers participating in the cetacean research surveys. This proved very successful and HWDT aims to recruit all volunteers itself in coming years. *Silurian* welcomed a total of 65 paying volunteers onboard during the 2014 field season; of these, 12 volunteers were teenagers (aged 15 – 17). Fourteen students from St. Andrew's University SMRU MRes course also joined *Silurian* and her crew during the 2014 season, for part of a survey techniques module.

Survey Routes

Silurian survey routes carried out during each monitoring survey are presented in Appendix III with the entire 2014 route shown in Figure 13. Routes were chosen to take into account weather and sea conditions and to obtain an even coverage of survey effort throughout the area. Largely due to favourable weather conditions, good coverage of all core survey areas was achieved. *Silurian* surveyed a total of over 4500 nautical miles.

Survey Coverage 2014

When surveys first began in 2003, effort was highest around the Argyll Islands. In more recent years, coverage has extended to include more northerly and westerly areas of the Hebrides. Figure 1 demonstrates the relative intensity of visual survey coverage across the area in 2014 and Figure 2 shows visual and acoustic effort in relation to survey tracks.

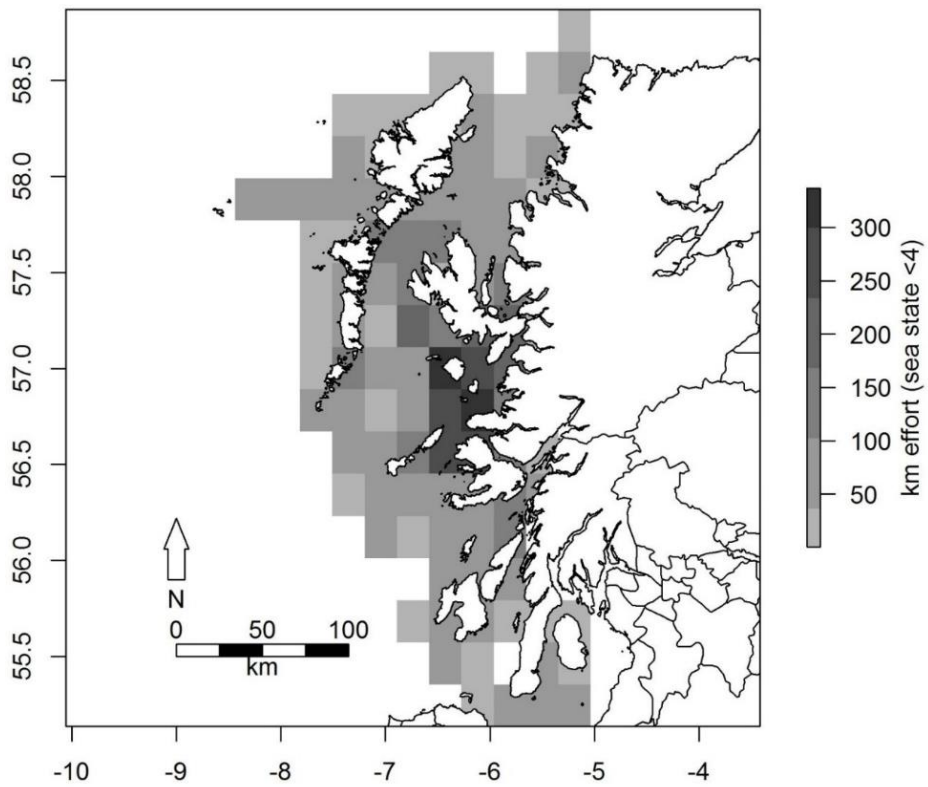


Figure 1. Visual survey effort carried out by *Silurian* during 2014

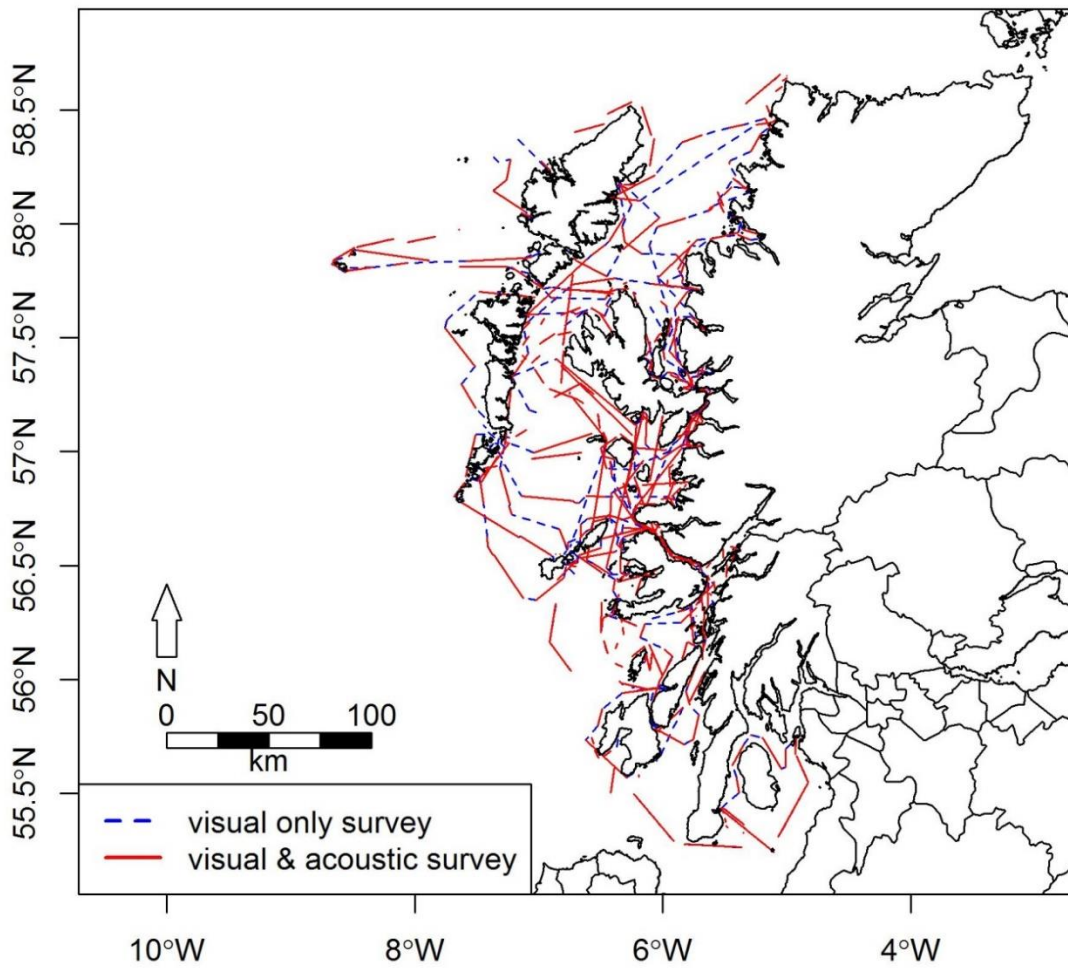


Figure 2. Route taken by *Silurian* during 2014 showing the acoustic and visual effort

Sightings

Twenty-four cetacean species have been recorded around the West Coast of Scotland, however not all species are common. Many are rarely sighted species and some have only been documented through stranding reports. In 2014, seven cetacean species were observed during *Silurian* surveys, and a summary of these sightings is presented in Table 2.

Table 2. Summary of sightings and relative abundances recorded during visual surveys from *Silurian*.

Taxon	Cetaceans							Other Mammals			Fishes	
	Bottlenose dolphin	Common dolphin	Harbour porpoise	Killer whale	Minke whale	Risso's dolphin	White-beaked dolphin	Common seal	Grey seal	Eurasian otter	Basking shark	Sunfish
Sightings	1	37	587	3	63	4	7	132	352	2	16	1
Individuals	10	649	1111	7	76	11	36	146	421	2	26	1
Group Size (mean)	10	18	2	2	1	3	5	1	1	1	2	1
Group Size (max)	10	100	25	4	4	5	15	3	25	1	6	1
Sighting rate (per 100 km)	0.01	0.51	7.84	0.04	0.86	0.05	0.10	1.79	4.78	0.03	0.22	0.01

Sighting numbers were higher than in 2013, possibly owing to favourable sighting conditions and an increase in time spent surveying. Harbour porpoise were by far the most frequently sighted cetacean with 587 encounters and 1111 individuals recorded, followed by common dolphin with 37 encounters and 649 Individuals. Common dolphin group sizes varied from 3-100 individuals with 15 white-beaked dolphins seen in amongst a group of 60 common dolphins on one occasion in July. Figure 3 illustrates the locations of small cetacean sightings from visual surveys onboard *Silurian* during 2014.

There were 63 minke whale sightings during 2014, comprising 76 individuals. Lunge feeding was observed on three occasions in 2013 and on just one occasion in 2014. Anecdotal evidence suggests that

there has been a decline in lunge feeding in recent years. Figure 4 illustrates the locations of minke and killer whale sightings from visual surveys onboard *Silurian* during 2014.

There were fewer basking shark sightings in 2014 compared to 2013, with only 16 sightings comprising 26 individuals. Basking sharks were only seen in waters between the north west of Colonsay and Barra and just north of Coll and Tiree. One sunfish sighting was recorded during the 2014 season close to the island of Muck in September. Figure 5 illustrates the locations of seals, basking sharks, sunfish, otters and unidentified cetaceans recorded during visual surveys onboard *Silurian* during 2014.

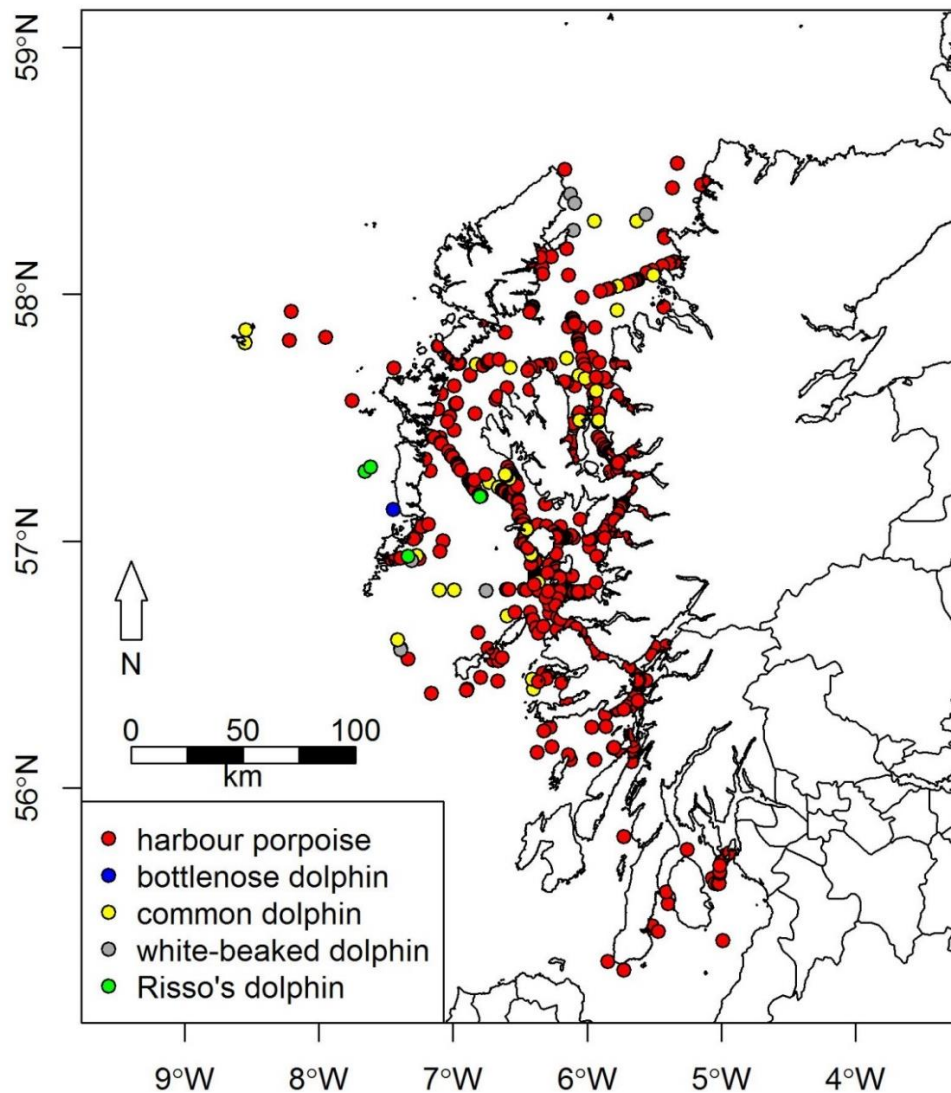


Figure 3. The locations of small cetacean sightings from visual surveys onboard *Silurian* during 2014

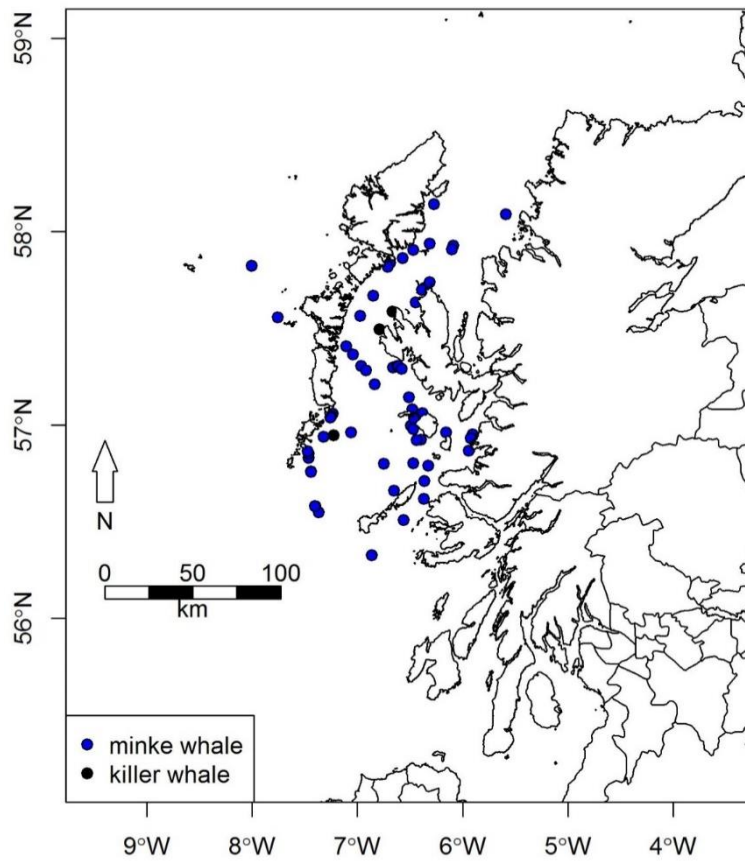


Figure 4. The locations of minke whale and killer whale sightings from visual surveys onboard *Silurian* during 2014

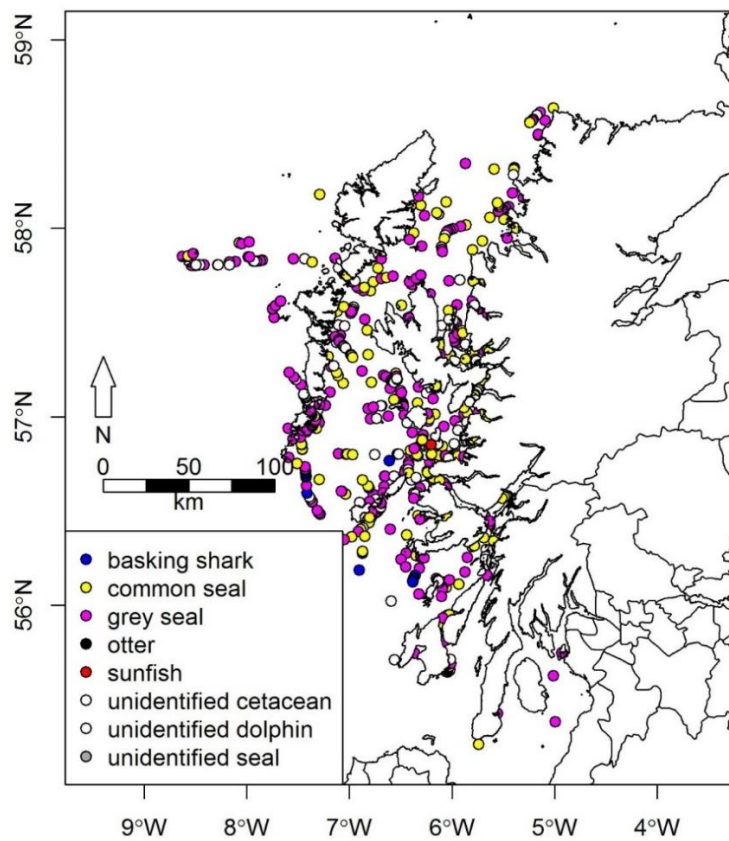


Figure 5. The locations seals, basking sharks, sunfish, otters and unidentified cetaceans recorded during visual surveys onboard *Silurian* during 2014

Acoustic Monitoring

Sighting rates for inconspicuous species such as harbour porpoise drop very rapidly with sea state, falling substantially between sea state 1 and 2. Passive Acoustic Monitoring (PAM) therefore plays a key role in HWDT's data collection, especially for harbour porpoise, as animals can be detected acoustically in environmental conditions which are not conducive to visual surveys (weather, sea state or light levels). Figure 6 presents the acoustic survey effort for *Silurian* surveys during 2014. 2014 acoustic data are being analysed and results will be available early 2015.

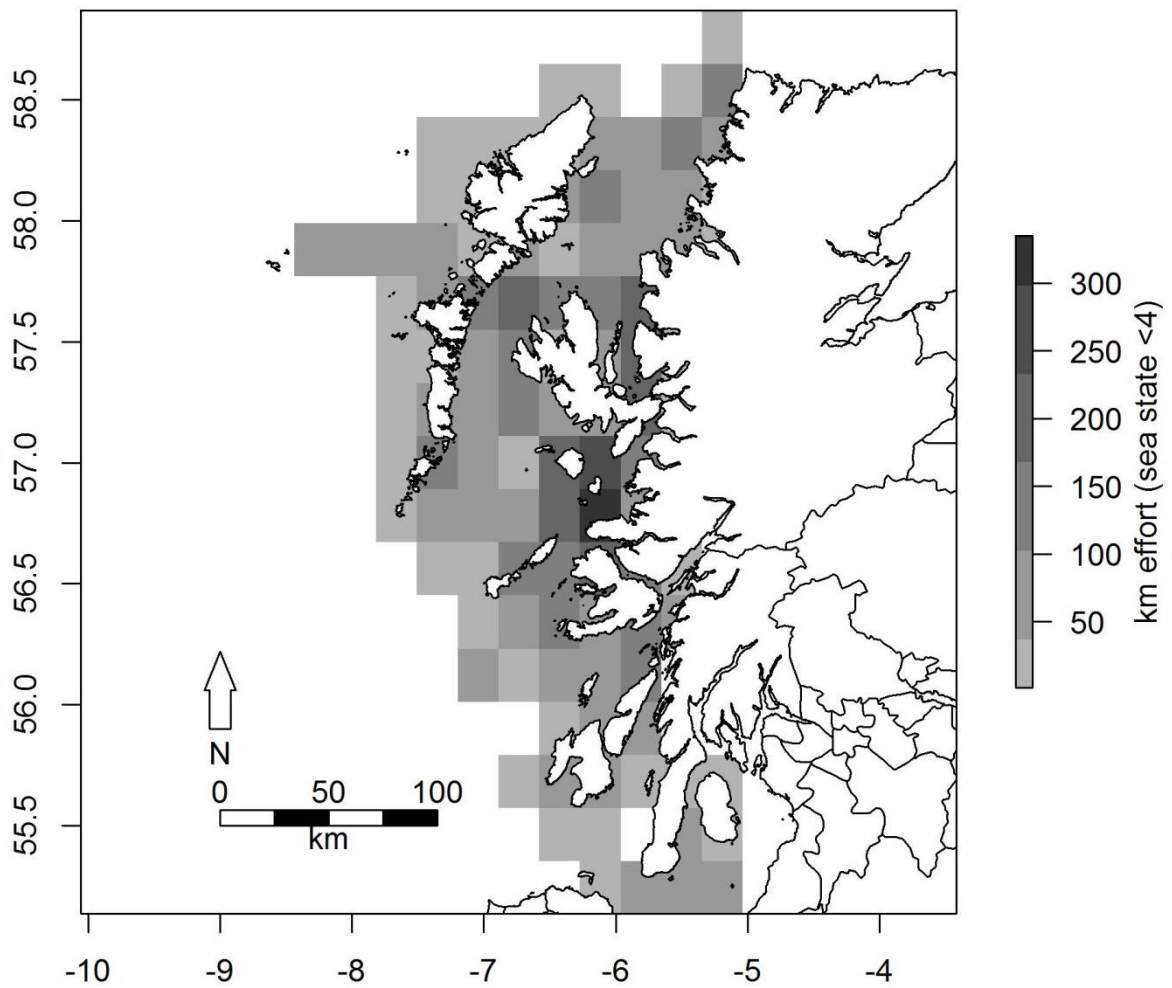


Figure 6. Acoustic survey effort carried out from *Silurian* during 2014

Photographic Identification

Photo identification is a non-invasive technique which has been used by HWDT to study the whales and dolphins off the west coast of Scotland for many years. HWDT has established catalogues for the area's minke whales, killer whales and bottlenose dolphins. Using this technique, we can monitor the movements of whales and dolphins, learn about their social structure and estimate the number of animals in a population.

HWDT has recently begun using the software DISCOVERY which is a photo identification data-management system for individually recognisable animals. This software will be used in the analysis and cataloguing of all photo identification images.

Species

Bottlenose Dolphin

Research continues to take place on the photo-ID of bottlenose dolphins found off the west coast of Scotland. Images taken in 2014 are being added to the already-established catalogue. The catalogue currently consists of 35 individuals that make up the Inner Hebridean group and 16 individuals from the Outer Hebridean population. This year we began using DISCOVERY software to aid in the analysis and cataloguing of bottlenose dolphin photo-ID images. Of the bottlenose dolphins encountered and photographically identified by HWDT based on photos submitted by the public in 2014, new individuals appear to have been identified. It is unclear at this stage, however, whether these represent new individuals not in the existing HWDT catalogue, or whether they are known individuals unrecognisable due to mark loss in intervening years. It is likely that these are new individuals to the HWDT catalogue and research in 2015 will attempt to match these individuals to catalogues from other parts of the UK and possibly further afield.

A group of ten bottlenose dolphins was observed by volunteers onboard *Silurian* on 24 July in the Sound of Barra. Photo-ID images were obtained and compared with the existing catalogue for the Outer Hebrides bottlenose dolphin group. Seven individuals were matched to that group, with one new calf documented. The other two animals were not matched to the catalogue. Two individuals from the catalogue were not observed during the 24 July encounter.

Killer Whale

Dr Andy Foote and HWDT continue to work together on the west coast killer whale community photo-ID catalogue; however the management of the catalogue is now HWDT's responsibility. Killer whales were encountered on three occasions during the 2014 season. Individuals 001 (John Coe), 006 (Lulu), 007 (Money Penny), 008 (Aquarius) and 005 (Comet) of the West Coast Community of killer whales were positively identified from these encounters. One solitary killer whale was observed on 11 July however photo-ID images were not obtained as the individual was only seen briefly for one surfacing.

During the encounter with individual 001 (John Coe) on 13 July, photographs taken show evidence of a bite mark on the killer whale's fluke (Figure 7), which is likely to be from a shark.



Figure 7. Photograph showing a likely shark bite in the fluke of killer whale 001 (John Coe), of the west coast community of killer whales.

Minke Whale

There were 37 minke whale photo-ID encounters this season, compared to 17 in 2013. Photographs have been added to the long-term minke whale photo-ID database and preliminary analysis indicates that there may be new individuals identified from the 2014 season. HWDT will release an updated catalogue in 2015. Photographic analysis highlighted one minke whale with plastic strapping around its rostrum this season, as can be seen in Figure 8.



Figure 8. Minke whale with plastic strapping entangled around its rostrum.

Risso's Dolphin

Risso's dolphin photo-ID images were obtained this year (including those from the HWDT Community Sightings Network). Photos from these encounters will be shared with the Whale and Dolphin Conservation (WDC) and the Manx Whale and Dolphin Watch (MWDW). By exchanging data with multiple organisations HWDT hopes to build a broader-scale picture of Risso's dolphin distribution and movement patterns.

Other Species

In addition to the Trust's photo-ID catalogues for bottlenose and Risso's dolphins, minke and killer whales, photographs of common and white-beaked dolphins have also been taken this season. Photographs of basking shark dorsal fins are also to be submitted to The Shark Trust.

Anthropogenic Impacts

Aquaculture and Acoustic Deterrent Devices

Areas within the Inner Hebrides are recognised as important areas for harbour porpoises, a protected species under the EU Habitats Directive, Annex II and IV. The European Commission has recently highlighted to the UK government the lack of designation of Special Areas of Conservation (SACs) for harbour porpoises, an issue which could lead to the UK being referred to the European Court of Justice.

The lack of implemented legislation towards the protection of harbour porpoises and their habitats leaves Scottish waters open to threats from developments that could potentially impact them, such as aquaculture, through displacement and the use of Acoustic Deterrent Devices (ADDs). HWDT objects to unregulated use of acoustic deterrents in developments which could potentially impact this species. In 2014 HWDT raised concerns over the lack of proper impact assessment for harbour porpoises (and other marine mammals) in the EIAs submitted by two fish farm development applicants. One of HWDT's submissions led to the stipulation that no ADDs shall be used at a particular site, as part of the planning permission.

Offshore Renewables

Several sites within HWDT's research area are potential locations for offshore renewable developments. Whilst offshore renewables have value in the generation of non-carbon-based energy, their construction has implications for the area's cetacean populations. Simply by carrying out regular surveys, the Trust is collecting a valuable dataset to increase the baseline data available for these areas. These data can then be used by renewable energy companies for an Environmental Impact Assessment (EIA) and by the Scottish Government for future Marine Spatial Planning.

Marine Litter and Ghost Fishing Gear

In 2014, HWDT was approached by World Animal Protection for potential collaboration on their 'Global Ghost Gear Initiative'. WAP commissioned HWDT to carry out a desk-based analysis on the issue of ghost gear in the waters to the west of Scotland. Because the issues of ghost fishing gear, entanglement and marine litter are often inseparable, an analysis on all of these issues was carried out with regards to the problem of cetacean entanglements. Data from the following sources were analysed: Scottish Marine Animal Strandings Scheme, Community Sightings Network and *Silurian* (photo-ID images, creel, litter and ghost gear sightings). The report is currently being finalised and will be submitted to WAP on 31 January. Preliminary results indicate that chronic entanglement in litter is an important welfare issue and fatal entanglement in creels remains both a conservation and welfare issue for minke whales, but less so for other cetacean species in this area.

Community Sightings Network (CSN)

HWDT has maintained a database of incidental sightings of cetaceans, basking sharks, sunfish and turtles since 2001. These sightings are reported by members of the public and since 2007, the Trust has solicited sighting reports via its website. There are currently 5920 sighting records in the database. A total of 1389 sightings was received in 2014, of which 1346 were determined to species level (Table 3). A total of 12 species was recorded this year, the same number as in 2013. There were no beaked whale sightings and no sightings of Atlantic white-sided dolphins recorded this year.

2014 saw the most sightings reports since the scheme began (Figure 9). This was probably due to a combination of very settled weather during the summer, and promotion of the scheme during the SeaChange road-show throughout the Inner Hebrides. The CSN data are a useful indicator of the minimum species diversity and earliest arrival times of migratory species. The scheme is also very useful in informing more species- or geographic-specific studies in the future.

Table 3. Summary of sighting reports received by HWDT through the online Community Sightings Network reporting form during 2014

Taxon	Cetaceans											Fishes		
Species	Bottlenose dolphin	Common dolphin	Fin whale	Harbour porpoise	Humpback whale	Killer whale	Minke whale	Pilot whale	Risso's dolphin	Striped dolphin	Sperm whale	White-beaked dolphin	Basking shark	Sunfish
Sightings	122	129	1	714	19	34	243	2	22	1	3	6	48	2
Individuals	1142	4735	1	2376	20	126	349	8	139	1	4	38	142	2
Group Size (mean)	9	37	1	3	1	4	1	4	6	1	1	6	3	1
Group Size (max)	30	500	1	30	2	12	9	7	20	1	2	15	25	1

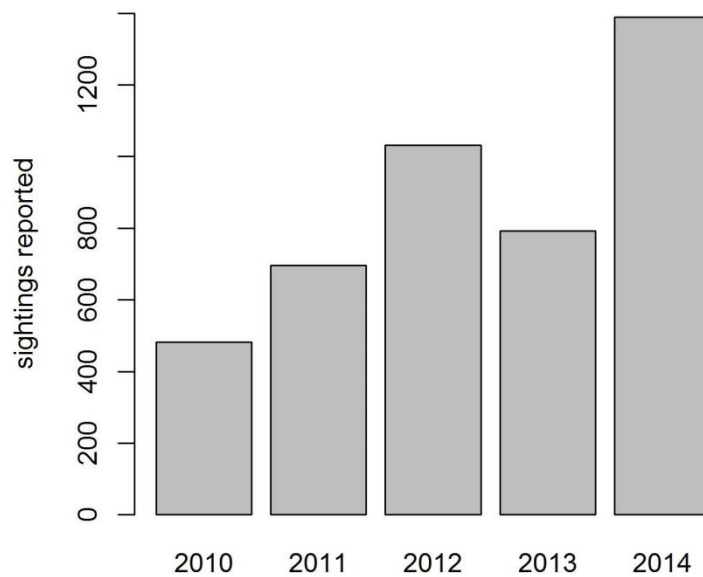


Figure 9. Number of cetaceans, basking shark and sunfish sightings received via the Community Sightings Network in the last five years.

Sea Life Surveys

Since in 1994 when Sea Life Surveys (SLS) was established, HWDT has received effort-related sightings data from SLS. This dataset is the longest continuous dataset of its kind in the UK, going back to 1992 when the data were collected under the auspices of the Mull Cetacean Project. SLS use an onboard program (Logger, IFAW, 2010) to consistently record megafauna sightings, survey effort, vessel track and environmental conditions during each of their whale-watching trips around the north of Mull, Coll, and Ardnamurchan (Appendix III). The collaboration between HWDT and SLS continues, and we now hold a 22 year dataset. Maps summarising the effort-corrected sighting rates are presented in Appendix III. HWDT is encouraging other whale-watch operators to collect similar effort-related data consistently, by engaging with whale-watch operators through the SeaChange project.

Strandings

During 2014, a total of 20 strandings was reported to HWDT, comprising eight marine mammal species (harbour porpoise (4), common dolphin (4), striped dolphin (2), pilot whale (3), killer whale (1), minke whale (1), humpback whale (1), unidentified cetacean (1), grey seal (1) and common seal (2)). A single leatherback turtle was also reported. HWDT responded to one mass-stranding of between 12 and 20 common dolphins at Laggan Sands, Loch Buie on Isle of Mull on 24 July 2014. Despite being one of the hottest days of the year, only two dolphins died and the rest were re-floated and swam out to sea

before HWDT arrived. HWDT assisted with the care of a malnourished common seal, which died two days after it was found at Fishnish. Two separate live-strandings of individual striped dolphins occurred on Islay this year, one was re-floated but died, the second was re-floated and its fate remains unknown. A single pilot live-stranded on Colonsay during stormy weather in early October and was re-floated several times by locals. After repeatedly re-stranding, the animal was dispatched by the island vet (using a rifle), with the remote guidance of BDMLR.

The Sightings and Strandings Officer met with Scottish Marine Animal Strandings Scheme (SMASS) vets in Oban in June 2014 to discuss continuing and strengthening the collaboration between HWDT and SMASS. All of our stranding records are sent to SMASS and HWDT assists with securing carcasses and collecting tissue samples and measurements where possible. SMASS has agreed to cover expenses incurred by the Trust for these activities. In 2014, the Sightings and Strandings Officer attended seven strandings to collect tissue samples and, in June, assisted with the necropsy of a humpback whale that drowned in a salmon pen at Fishnish, Isle of Mull (Figure 10). This was the first humpback whale to be necropsied by SMASS vets in Scotland. It was found to have been drowned following a struggle and most likely died under the salmon pens in which it was discovered. Staff at Allied Whale who maintain the North Atlantic Humpback Whale Catalogue were not able to find a match among the ca. 8,000 individuals in their catalogue, using images of the fluke provided by HWDT. Three staff members attended a tissue sampling course hosted by the Scottish Marine Animal Strandings Scheme in Oban on 31 July 2014.



Figure 10. A recently weaned dead humpback whale being craned onto the timber pier at Fishnish

Biodiversity Objectives and Actions

Since 2003, HWDT has monitored marine biodiversity and conservation priority cetaceans in west coast waters, in particular harbour porpoises, minke whales and bottlenose dolphins. This monitoring has directly addressed actions identified in local and national Biodiversity Action Plans (BAPs) and is linked to EC Habitats Directive priority species, thus delivering locally, nationally and internationally recognised biodiversity objectives.

HWDT data were used by SNH to advise Scottish Government on the identification of Nature Conservation Marine Protected Areas (ncMPAs) for cetaceans and basking sharks under the Marine Scotland Act of 2010. HWDT has continual input into process of designating ncMPAs for cetaceans and basking sharks through our membership and participation in LINK and our attendance at their fisheries policy meetings, MPA workshops and the annual LINK environmental congress. The management and implementation procedures at the sites still need to be decided. As the only organisation conducting regular standardised effort-based cetacean and basking shark surveys on the west coast of Scotland (where most candidate cetacean MPAs are located), the Trust will face a major challenge and responsibility in this area. HWDT is committed to ensuring that high standards for habitat preservation and species protection are achieved. This process is expected to play out over the coming two years.

HWDT will continue its involvement in the various management projects as the only organisation collecting long-term effort-based survey data in this area.

Military Activity

HWDT has ongoing environmental concerns regarding the military exercises that take place on the west coast of Scotland, specifically the Joint Warrior exercises and the use of military sonar. Joint Warrior (JW), a UK led NATO exercise conducted in the spring and the autumn of each year, is the largest tactically focused exercise in Europe. At-sea operations take place over two weeks and up to 85 aircraft, 22 ships and 3 submarines operate in the area during this massive international exercise.

This year, for the first time since 2010, HWDT conducted a dedicated survey to coincide with the Joint Warrior military exercise. Visual and acoustic line-transect surveys were conducted using standard HWDT methodology and in addition to this, new passive acoustic monitoring technology (Sound Trap) was tested to make calibrated recordings of military sonar. Video range tracking (VRT) of surfacing minke whales was carried out to document minke whale surface behaviour with and without active sonar. Our ultimate aim is to aid the Ministry of Defence in developing better sound mitigation protocols

when using sonar around cetaceans (i.e. not to use in the presence of deep diving species, conduct more thorough and transparent EIAs and not to use sonar at night, etc.). Data from the 2014 Joint Warrior exercise will be analysed this winter, and HWDT look to continue monitoring during exercise Joint Warrior in the spring and autumn of 2015.

Public Consultation

Improved staffing resources have enabled HWDT to become more involved in the Scottish Environment LINK's Marine Task Force during 2014. In 2015, HWDT looks to become more involved in LINK, allowing its expert voice on cetacean and marine biodiversity issues to be strongly represented on a national scale through this umbrella body.

HWDT also provided comments with regards to planning applications for two finfish farms at Loch Eishort, Isle of Skye (Ref: 14/02574/FUL and 14/02577/FUL) citing concerns over the lack of proper impact assessment for harbour porpoises (and other marine mammals), as previously outlined on p20.

Students

HWDT continues to work with and support students at all levels. In addition to contribution to education, both the Trust and conservation generally benefit from these valuable collaborations. Nienke van Geel is completing the final year of her PhD at SAMS, her thesis is entitled "Bottlenose dolphin (*Tursiops truncatus*) movement patterns on the west coast of Scotland". In 2014, HWDT shared data with one MSc student at Bangor University studying Risso's dolphins and three BSc students undertaking research on basking sharks (Plymouth University and Cardiff University) and cetacean community composition (Liverpool John Moores University).

2014 saw the seventh year of the University of St Andrews Marine Mammal Science MRes, to which the Trust's monitoring trip at the start of June was devoted as a survey techniques module.

Dissemination of Results

If our research is to impact on policy-makers, fellow researchers and members of the public, it is essential that our results be communicated to as wide a range of audiences as possible, both within and outside of the scientific community.

Publications

Published by HWDT

- Beck, S., Foote, A.D, Koetter, S., Harries, O. R., Mandleberg, L., Stevick, P.T., Whooley, P. and Durban, J. (2013) Using opportunistic photo-identifications to detect a population decline of killer whales (*Orcinus orca*) in British and Irish waters. *Journal of the Marine Biological Association of the United Kingdom*, 94(6): 1327-1333.
- Mäkeläinen, P., Esteban, R., Foote, A.D., Kunnigas, S., Nielsen, J., Samarra, F.I.P., Similä, T., van Geel, N.C.F. and Vikingsson, G.A. (2014). Variation in pigmentation patterns among North Atlantic killer whale (*Orcinus orca*) populations. *Journal of the Marine Biological Association of the United Kingdom*, 94(6): 1335-1341.
- Ryan, C., Whooley, P., Berrow, S.D., Barnes, C., Massett, N., Strietman, W.J., Broms, F., Stevick, P.T., Fernald Jr, T.W. and Schmidt, C. (2015). A longitudinal study of humpback whales in Irish waters. *Journal of the Marine Biological Association of the United Kingdom*, In Press.
- Ryan, C., Wenzel, F., Lopez-Suárez, P. and Berrow, S.D. (2014). An abundance estimate for humpback whales *Megaptera novaeangliae* breeding around Boa Vista, Cape Verde Islands. *Zoologia Caboverdiana*, 5(1): 20-28.

Unpublished Literature

Contract Reports

In Preparation

- Ryan, C. and Froud, K. 2015. Documenting Ghost Fishing Gear and Cases of Cetacean Entanglement in Western Scotland. Report to World Animal Protection. Hebridean Whale and Dolphin Trust, Tobermory, Isle of Mull, UK. Pp. 15.
- Evans, P. and Harries. Report to Marine Harvest on the cetacean species occurring around Loch Shell and Loch Erisort, Isle of Lewis.

Academic Dissertations

- Abernethy, R. (2014). Environmental Parameters affecting the Spatial Variation of Minke Whale Sightings off the Isle of Mull, Scotland. BSc Thesis. University of Glasgow. 47 pp.
- Cunningham, E. (In prep). Advances in current understanding of natural range and distribution of Common Bottlenose Dolphins (*Tursiops truncatus*, Montagu 1812) in the UK Irish Sea. MSc Thesis. University of Bangor.
- van Geel, N. (In prep). Bottlenose dolphin (*Tursiops truncatus*) movement patterns on the west coast of Scotland. PhD Thesis. Scottish Association for Marine Science.

Data Provision

- Dolman, S. and Hodgins, N. (In prep) Photo identification of Risso's dolphin (*Grampus griseus*).
- Joint Nature Conservation Committee (JNCC) and Scottish Natural Heritage - detailed modelling of species density for MPA project.
- Weir, C. and Jefferson, T. (In prep) Global review of the distribution of Risso's dolphin (*Grampus griseus*).

Presentations

- HWDT, 20 years of research and conservation, WhaleFest, March 2014 and WhaleWeek, Tobermory June 2014.
- Presentation on whales and dolphins of the Hebrides to boat users of the World Cruising Club, "Classic Malts Cruise", Tobermory, July 2014.
- Presentation on the natural history of cetaceans in the Hebrides and HWDT's research findings, SeaChange Road Show, September 2014.
- In 2014, Sightings Officer Conor Ryan was added as a WiSe Scheme Instructor and will deliver accredited responsible whale-watching training courses to skippers and other boat users in the West of Scotland in 2015.

Video

- WhaleWeek, species introduction video, June 2014.
- Joint Warrior survey tracks and military vessel locations, October 2014.

Newsletters

- HWDT Ripple, Ed. 1, March 2014. Hebridean Whale and Dolphin Trust.
- HWDT Ripple, Ed. 2, June 2014. Hebridean Whale and Dolphin Trust.
- HWDT Wave Summer 2014. Hebridean Whale and Dolphin Trust.
- HWDT Ripple, Ed. 3, August 2014. Hebridean Whale and Dolphin Trust.
- HWDT Ripple, Ed. 4, October 2014. Hebridean Whale and Dolphin Trust.
- HWDT Wave Winter 2014. Hebridean Whale and Dolphin Trust.

Digital Media

The HWDT website remains a key method of communicating with a wide audience on a global scale. Monthly sightings updates have contributed to staff efforts to keep the site up to date and relevant. A daily blog is written by volunteers onboard research trips and is published on the HWDT website (<http://www.whaledolphintrust.co.uk/blog.asp>). The *Silurian* blog has been well-used throughout the 2014 field season, giving readers an insight into life onboard our research vessel. Social media is an effective means by which to reach our target audience. We have 3005 followers on Facebook and the number of followers on Twitter is up 24% since 2013 to 717. Our 'Twitter Follower-Friend Ratio' is 3.19. This metric is used to determine how influential an organisation is and the effectiveness at which it reaches its audience (values >1 are deemed influential in their community). The Facebook and Twitter accounts are being actively maintained, and serve as additional free advertising opportunities. Information is also available on the HWDT page on Planet Whale, which showcases HWDT alongside other cetacean charities and organisations.

Mass Media

28 June – 5 July 2014: Story about a young humpback whale that died as a result of entanglement in a salmon pen. 10 online and several printed news articles including BBC, The Times, Press and Journal.

7 July 2014: Article and fact file about killer whales and bottlenose dolphins. National Geographic Kids Magazine (Tim Herbert)

28 July 2014: Story about mass-stranding and successful refloat of common dolphins on Mull. BBC Drivetime interview

1 August 2014: Feature article about cetaceans and the work of HWDT. Scottish Field (Polly Pullar)

5 – 6 December 2014: Story about the international movements of solitary bottlenose dolphin "Clet": 61 print and online articles including BBC News Scotland, Island News and Advertiser, WDC.

Meetings, Courses and Conferences

- European Cetacean Society (ECS) conference.
- Scottish Strandings Scheme collaborative meeting, SAMS, Oban. June 2014.
- The British Ecological Society's Introduction to Policy in Scotland Workshop. October 2014.
- Protecting Scotland's Biodiversity: Monitoring in Action Conference, Edinburgh October 2014
- Nature of Scotland Awards Ceremony, Edinburgh. November 2014.
- Global Ghost Gear Initiative (GGGI) round table meeting, Ljubljana, Slovenia. November 2014.
- Scottish Environmental LINK Annual Congress, Perth, Scotland. December 2014.

PUBLIC OUTREACH

SeaChange Roadshows

An integral part of the SeaChange project is public outreach. The motivation for this is to assist those living in coastal communities to up-skill in areas such as whale-watching (both shore and land-based), and to encourage greater public participation in biological recording schemes. A road show was completed of all the major Inner Hebridean islands during autumn 2014. During this six-week-long event, HWDT visited different coastal communities (Colonsay, Islay, Seil & Easdale, Coll, Tiree, Arisaig, Rum, Eigg, Elgol and Dunvegan) and engaged 229 school pupils, 164 people at public talks and 14 tour boat operators. We also attended a number of key meetings and events in-line with project objectives. In the coming months, we will analyse the data collected from questionnaires completed by boat operators (they were asked for their views on the economic value of the whale-watching industry, as well as the challenges they face) and maintain contact with the newly established community contacts. Plans are underway to deliver the next road-show events on Barra, Uists, Harris, Lewis and at Ullapool in May 2015. *Silurian* will be used as a mode of transport to re-visit the coastal communities, tying in with the annual cetacean surveys and education programme that comprise the mainstay HWDT's work.

Volunteer Programme

Onboard *Silurian*

Paying volunteers were recruited for all surveys during the 2014 field season, including the Joint Warrior survey which ran much later in the field season than HWDT usually operates. Just over 9% of berths were sold at a reduced cost to meet capacity; notably, 2/3 of these reductions occurred in the early season (May) and the others were to fill the berths of the Joint Warrior survey.

Land-based Volunteers

HWDT conducted a Sightings and Strandings internship programme in 2014 through which an intern joined HWDT for five months, gaining scientific and also educational experience working for a small charity. The intern focused on public outreach and the Community Sightings and Strandings Network, largely through assisting with the planning and delivery of the SeaChange project, as well as working on photo-identification.

The Education Department also recruited an intern who played a key role in delivering the aims and objectives of the Trust's longstanding education programme, providing maternity cover for the Education Officer over a period of seven months.

HWDT would like to extend its thanks to all the interns and volunteers who joined HWDT over the 2014 season: Vivi Bolin (Sightings and Strandings intern), Philippa Garrard (Education intern) and Andrew Simpson (Education volunteer). Alongside the interns, HWDT hosted a number of local volunteers who assisted with various tasks throughout the year. Many thanks to Jane Putsey who assisted with many tasks over the year, most notably helping with shop duties, as well as Leanne Blair and Emma Parkinson who assisted the team on *Silurian*.

Public Workshops, Talks and Events

HWDT organised and attended a number of workshops, talks and events to increase public awareness and understanding of cetaceans and marine biodiversity on the west coast of Scotland (Figure 11). These key events enable the Trust to involve many people, from local residents to seasonal visitors, in learning about their natural coastal and marine heritage, and encourage them to participate actively in the conservation of marine biodiversity. Community events serve to increase interest in, and awareness of, cetaceans and HWDT’s work, including ways to become involved in projects, such as via the Community Sightings Network and beach cleans.

In 2014, the location of events has targeted, where possible, Argyll and the Inner Hebrides, to tie in with the SeaChange Strategy, funding project targets and to maintain the Trust’s presence locally. As Gemma Paterson (the Education Officer) was on maternity leave, this year’s educational and outreach elements have been heavily supported by other members of staff and volunteers, particularly this year’s Education Intern, Pippa Garrard. This year a programme of 33 events was delivered with a total estimated attendance of 1762 people. Table 4 outlines events delivered from January 2014 to December 2014. Donations were gratefully received at many of these events.

Table 4. Public engagement events attended by HWDT in 2014

Event	Description		Date	Location	Numbers
WhaleFest	Interpretive stand	500+	14.3.14 - 16.3.14	Brighton	570+
	HWDT, 20 years of research and conservation talk	20			
	Career Speed Dating. Quick fire questions about careers within cetacean conservation and research	50			

World Oceans Day	Screening of Planet Ocean and discussion about climate change, ocean pollution and the impact on cetaceans	2.6.14	Oban, Phoenix Cinema	60	
Whale Week	Opening Talk (E.V.)	25	8.6.14 – 14.6.14	Tobermory	250+
	Humpback Research Talk (IWDG)	30			
	Open Boat (<i>Celtic Mist</i>)	20			
	Killer Whale Talk (NvG)	35			
	Whale Watching Talk (SLS)	15			
	Open Boat (<i>Silurian</i>)	50			
	John Muir (D.M.)	20			
Beach Activities (P.G.)	10				
Lorne HG's	Interpretive stand	22.6.14	Oban	40	
Malts Cruise Presentation	Presentation and provided resource packs for the yachts participating in the Classic Malts Cruise	13.7.14	Tobermory	25	
Tobermory HG's	Interpretive stand	24.7.14	Tobermory	30	
SMASS Tissue Sampling Course	Course attended by HWDT staff, Conor Ryan, Vivi Bolin and Pippa Garrard. HWDT delivered presentation on SeaChange project to other attendees	31.7.14	Oban	15	
NWDW	Cetacean watch	01.8.14	Ardnamurchan Lighthouse	44	
Salen Show	Interpretive stand, shop stock	7.8.14	Salen	100	
Small Acorn Event	Interpretive stand, shop stock	9.8.14 – 10.8.14	Dunoon	120	
Argyllshire Gathering	Interpretive stand	28.8.14	Oban	50	
SeaChange Public Talk	Presentation on the natural history of cetaceans in the Hebrides and HWDT's research findings. Meeting boat operators and local people in island communities	4.9.14	Colonsay	25	
SeaChange Talk	As above	8.9.14	Islay	16	
Calendar Launch Event	Open evening in HWDT Shop for launch of new calendar	9.9.14	Tobermory	35	
SeaChange Talks	As above	10.9.14	Coll	18	
		11.9.14	Tiree	9	
		15.9.14	Easdale	16	
		22.9.14	Arisaig	20	
		24.9.14	Rum	20	
		27.9.14	Eigg	11	
		30.9.14	Elgol	18	
		1.9.14	Dunvegan	20	
Fishnish Hide Opening	Celebrating the opening of the new community hide at Fishnish: craft and Interpretive stand	19.10.14	Garmony	40	
Charity Fair	Fundraising games and shop stock	1.11.14	Salen	35	
Late night Christmas shopping	Shop and Visitor Centre open late for Christmas shopping and education	28.11.14	Tobermory	175	
Total				1762	



Figure 11. HWDT interns attending outreach events in 2014

IT AND MEDIA

Media Coverage

HWDT's media exposure is handled in-house and assisted by Richard Bunting as per our Media Strategy. A summary of media coverage for 2014 can be found in the 'Media' section of HWDT's website.

Website and Office IT

A private grant made it possible for HWDT to upgrade the office IT and storage/back-up system, which will be fulfilled in 2015. It is hoped that in 2015, the HWDT website will be updated.

Shooting and Storing Media

During the research season, HWDT captures a great deal of photographs and video footage, taken by crew, staff and volunteers onboard *Silurian*, and occasionally by independent photographers and film-makers. Photos and footage are also captured on land at the various educational and outreach activities run by and attended by HWDT during the year. There are strict in-house policies followed with regards to ownership, distribution and storage.

EDUCATION

School Visits and Workshops

In accordance with HWDT’s Education Strategy and funding targets, the Trust’s formal education programme in 2014 focussed on its local region of Argyll. Details of school visits are shown in Table 5. HWDT engaged 728 pupils from 20 different schools during 2014 in educational workshops. Figure 12 shows a group of primary school pupils learning about cetaceans at the RSPB’s Marine Magic workshop held in Fort William. Feedback continues to suggest that well-qualified staff deliver a high quality product using materials and practices which have been refined over the last few years. Schools value the unique work Trust staff do, their expertise, and the high staff-to-student ratios offered. Outdoor learning has remained a priority and has been found to be powerful and beneficial to those students involved. *Silurian* provides a unique teaching environment, which allows for direct hands-on learning about the marine environment.

Table 5. School visits in 2014

School	Class	Description	Date	Location	Numbers
Tobermory HS		Careers Event	27.2.14	Tobermory	25
Tobermory HS		Beach Activity – Marine Conservation Day	3.6.14	Tobermory	20
Tobermory PS		Open Boat, <i>Silurian</i> .	11.7.14	Tobermory	20
Tobermory, Dervaig, Salen, Bunessan and Iona PS’s	P4-7	GRAB Trust, Marine Litter Workshop 'Whales Dolphins and Me.'	2.9.14	Craignure	58
Colonsay PS		SeaChange Road Show	4.9.14	Colonsay	9
Bowmore PS		SeaChange Road Show	8.9.14	Islay	24
Arinagour PS		SeaChange Road Show	10.9.14	Coll	24
Tiree HS		SeaChange Road Show	11.9.14	Tiree	58
Easdale PS		SeaChange Road Show	15.9.14	Easdale	26
Lochdonhead PS	P1-7	<i>Silurian</i> Workshop	15.9.14	Salen Pier	9
Home School		<i>Silurian</i> Workshop	15.9.14	Salen Pier	6
Salen PS	P3-7	<i>Silurian</i> Workshop	16.9.14	Salen Pier	25
Salen PS	P1,2 (G) & P1-3	In school workshop with inflatables	16.9.14	Salen Pier	25
Dervaig PS	P1-7	<i>Silurian</i> Workshop + Lifeboat workshop.	17.9.14	Tobermory	25

Ulva PS	P1-7	Silurian Workshop + THA + Lifeboat workshops.	18.9.14	Tobermory	8
Bunessan PS	P5-7	Silurian Workshop	19.9.14	Bunessan	17
Arisaig PS		SeaChange Road Show	22.9.14	Arisaig	19
Rum PS		SeaChange Road Show	24.9.14	Rum	1
Eigg PS		SeaChange Road Show	27.9.14	Eigg	7
Elgol PS		SeaChange Road Show	30.9.14	Elgol	15
Dunvegan		SeaChange Road Show	1.9.14	Dunvegan	46
Caol PS	P1-7	Marine Magic (RSPB)	20.11.14	Fort William	201
		Marine mammals and Photo-ID			
Upper Achintor PS		Marine Magic (RSPB)	21.11.14	Fort William	60
			Total		728

HWDT continues to be part of the Argyll and Bute Beach Forum, attending a meeting in September, in addition to receiving regular updates. HWDT is also a member of the Celtic Seas Partnership and was involved in the first Marine Litter (Eco-Schools) Task Group teleconference held in December.



Figure 12 Primary school students learning about cetaceans © Caol PS

Feedback provided by school staff indicates the popularity and value of these visits:

“Brilliant day – pupils engaged throughout and really learned lots.” Dervaig Primary School

“The children thoroughly enjoyed the visit and learned a lot about the boat and the work of the Trust. The crew and education officers were knowledgeable and friendly.”

Salen Primary School.

“Lovely time had by all. Nice crew, nice attitude towards children, patient, respectful. Hope our children will follow in their footsteps!” Home school parent

Youths Onboard

During September, HWDT organised a 3hr trip onboard *Silurian* for four Tobermory Guides and Scouts. The participants were selected as a reward for exceptional contribution to their clubs in 2014. Whilst onboard they learned about the general work of the Trust and specifically what takes place on *Silurian*. They also experienced sailing, gaining valuable transferable skills such as team-work and communication through this activity. The feedback received was positive and HWDT hopes to offer more opportunities of this nature in the future.

“Great opportunity, thanks very much” Tobermory Scouts.

SHOP AND VISITOR CENTRE

In March 2014, the Trust received funding from Coastal Communities for our SeaChange project. These funds enabled HWDT to recruit a full-time Shop and Visitor Centre Manager and to pay for essential repair works to be carried out to the shop and Visitor Centre building.

It has been a good year for the shop, with strong like-for-like sales from June onwards. Longer opening hours (9am to 7pm in July and August) were introduced and the shop was open every day between early June and mid-September. Better than expected sales at the start and end of the season underline the benefits of simply being open.

As in previous years, interns were employed part-time in the shop and, in September, Pauline Massey was recruited as part-time Shop Assistant until the end of the year. With the interns having restricted availability throughout the summer, due to their other HWDT commitments, shop resources were stretched. This highlighted the need for at least one part-time Shop Assistant to be recruited for the full summer period. It is anticipated that this will happen in 2015, in addition to interns being employed.

There were a couple of successful shop-based events this summer. In June the shop hosted a treasure hunt as part of the Whale Week programme. This was very popular with local children and feedback was very positive. This was followed up with a children's calendar competition. Local children were invited to send in their pictures of Mull wildlife with the best entries being made into a calendar, 'The Wildlife of Mull by the Children of Mull', which is on sale now in our shop and webshop. We received 75 entries and launched the calendar in early September with a special prize giving event in the shop. More than 40 people attended and again, the feedback was very good. It is anticipated that a similar competition will be held in 2015, but earlier in the year in order to capitalise on the tourist market.

Despite its poor condition, the Visitor Centre has been really popular, with local children as well as tourists. It has proven a valuable tool for engaging with the local community. A key focus for the winter will be to complete the refurbishment works and re-invigorate the interpretation in the Visitor Centre.

The webshop was updated with new stock and a slightly new look in November. However, online sales remain fairly weak with just 17 orders at a total value of £210 for the year up to 13th December. A key focus for 2015 will be to grow the online aspect of the shop with an eBay shop to be set up in addition to a new webshop as part of our new website.

The key focus for the winter is the refurbishment and re-design of the Visitor Centre. This is progressing well. A survey was undertaken in March 2014 and work has been carried out by our neighbours above on the roofing and chimneys. This leaves the main problem being insufficient pointing and rendering at our level. This work is currently in the tendering process and will be carried out in early 2015, followed by internal refurbishment of the areas damaged by the external problems. The re-design of the Visitor Centre will also take place in early 2015 and it is anticipated that the Visitor Centre will be re-opened in late spring. Shop and Visitor Centre Data (up to end of business on 31st October 2014) are detailed in Appendix IV.

FUNDING

HWDT would like to thank our funders in 2014:

- Miller Philanthropy: monitoring and education programme
- Coastal Communities: SeaChange project, Sightings & Strandings Officer and Shop & Visitor Centre Manager
- The Bromley Trust: grant funding to strengthen the Trust's reserves
- Scottish Natural Heritage (SNH): Environmental Training Officer, monitoring and outreach programme
- WWF-UK: Adopt a Dolphin programme, monitoring and core work
- The Tides Foundation / Patagonia: contribution to Exercise Joint Warrior survey
- World Animal Protection: ghost fishing gear initiative
- ATC: binoculars for *Silurian*
- Charity Bank: HWDT's Shop and Visitor Centre

In addition HWDT would like to thank those who have contributed by donating, becoming a Friend of HWDT or sponsoring a cetacean in 2014. A legacy was also gratefully received. All donations contribute to the Trust's own revenue generating programmes, making HWDT more sustainable and less reliant on grant income.



APPENDICES

Appendix I

Staff, Board of Directors, Committee Members and Patrons in 2014

Staff

Eva Varga (Jan-Sept) and Gemma Paterson (Sept-Dec), Operations Manager

Kerry Froud, Marine Biodiversity Officer

Conor Ryan, Sightings and Strandings Officer

Pippa Garrard, Education Officer

Morven Russell, Volunteer Coordinator and Marketing Officer

Mark Whitaker, Finance and Administration Officer

Tom Reade, First Mate (*Silurian* 2014).

HWDT is also fortunate to have a pool of experienced skippers who take *Silurian's* helm each season.

Board of Directors

Chair: Prof. Denis Mollison

Directors: David Govan (Treasurer), Jonathan Gordon, Peter Evans, Phillip Cheek and Tom Walmsley.

Consultants

HWDT also work with consultants Susannah Calderan, Nienke Van Geel and Laura Mandelberg who provide expertise in key areas.

Committee Members:

Scientific Committee: Jonathan Gordon, Susannah Calderan, Peter Evans, Russell Leaper, Nienke van Geel, Jack Matthews and Ben Wilson.

Education Committee: Jack Matthews, Denis Mollison, Andrew Simpson, Leanne Blair and Gemma Paterson.

HWDT Patrons

Richard Balharry and Jack Matthews.

Appendix II

Maps of *Silurian* survey coverage during 2014

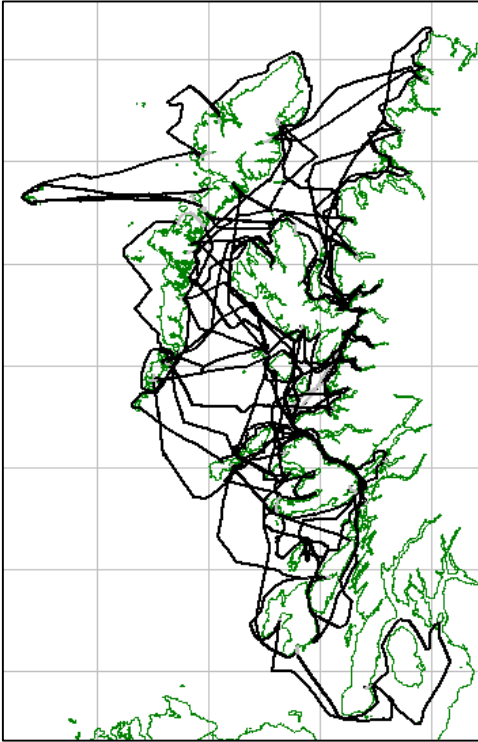


Figure 13. All *Silurian* tracks 2014

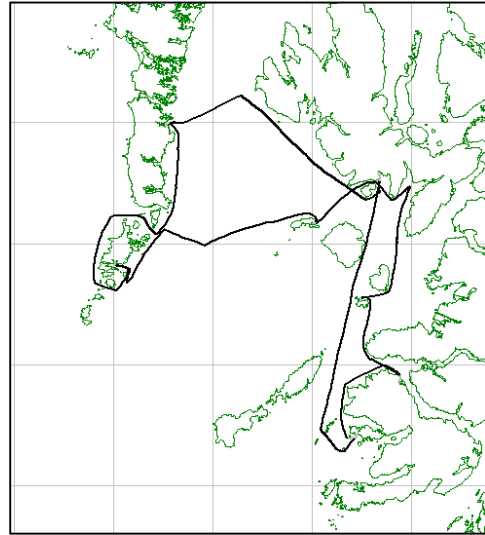


Figure 14. HWDT 1 Survey Tracks

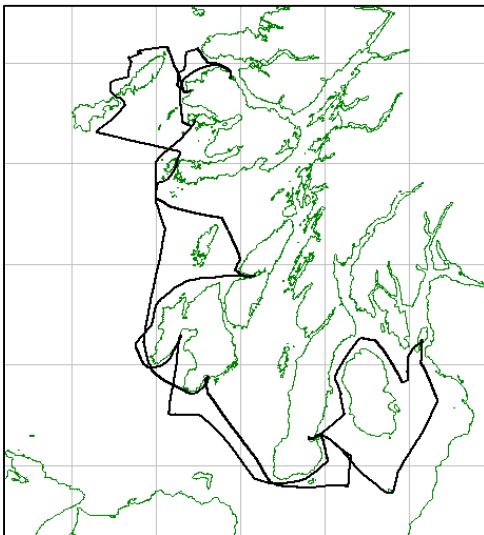


Figure 15. HWDT 2 survey tracks

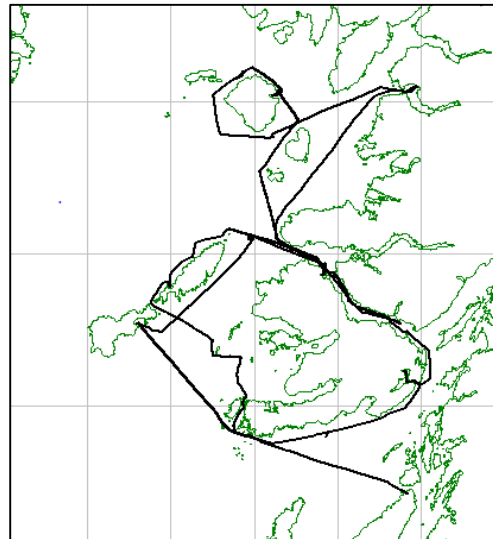


Figure 16. SMRU survey tracks

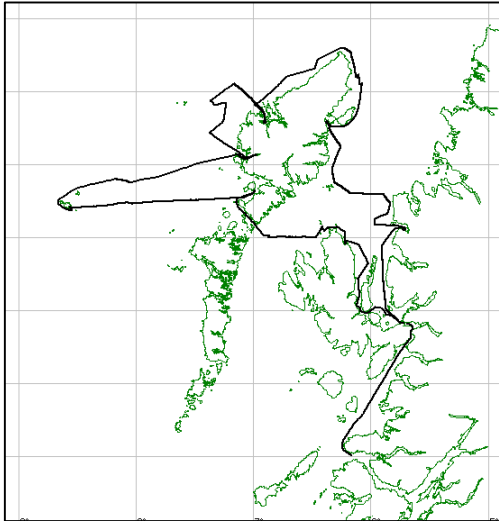


Figure 17. HWDT 3 survey tracks

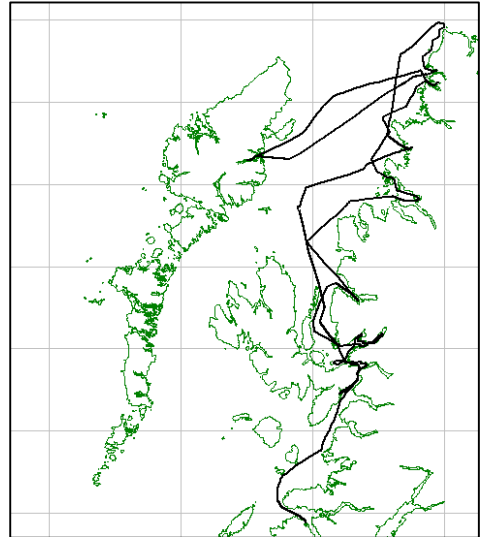


Figure 18. HWDT 4 survey tracks

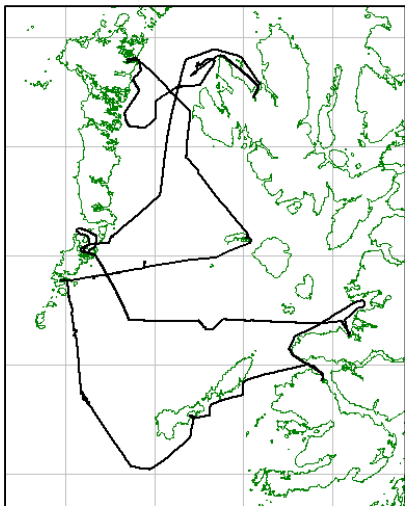


Figure 19. HWDT 5 survey tracks

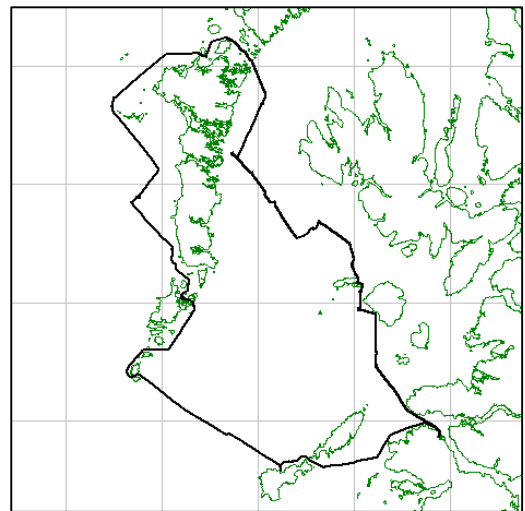


Figure 20. HWDT 6 survey tracks

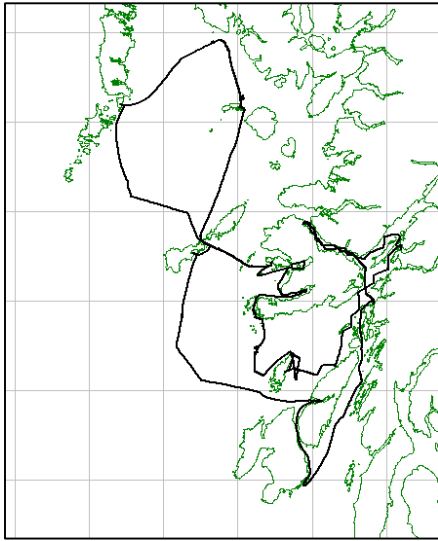


Figure 21. HWDT 7 survey tracks

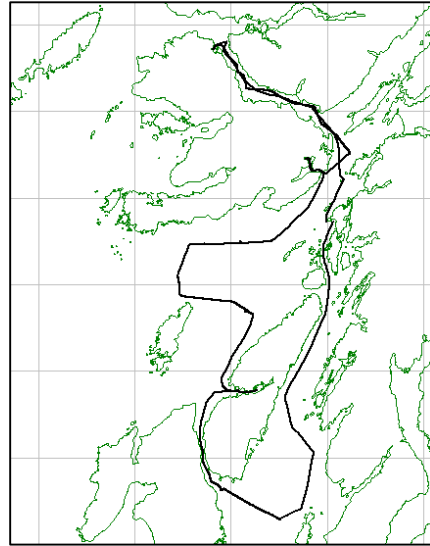


Figure 22. HWDT 8 survey tracks

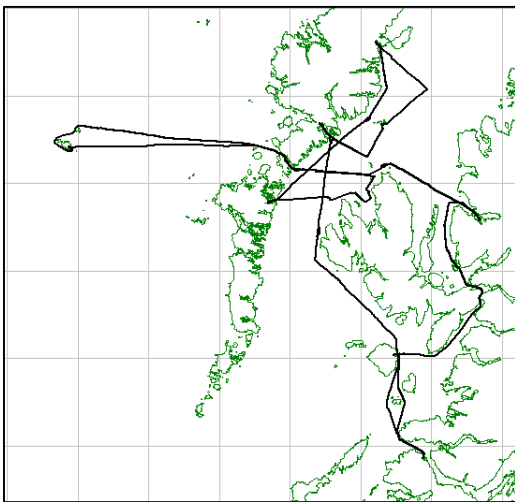


Figure 23. HWDT 9 survey tracks

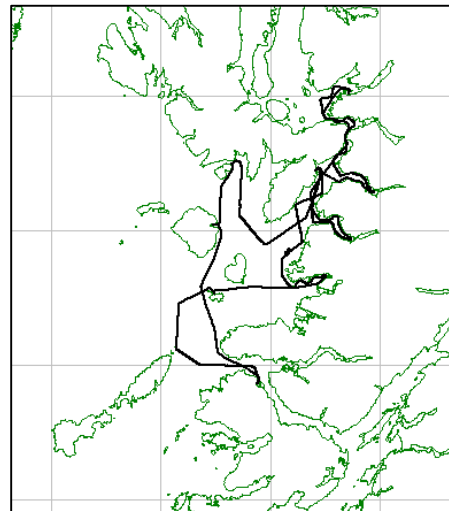


Figure 24. HWDT 10 survey tracks

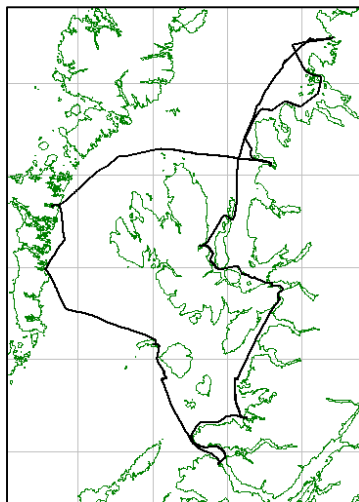


Figure 25. HWDT 11 Joint Warrior survey tracks

Appendix III

Maps showing Sea Life Surveys survey coverage in 2014

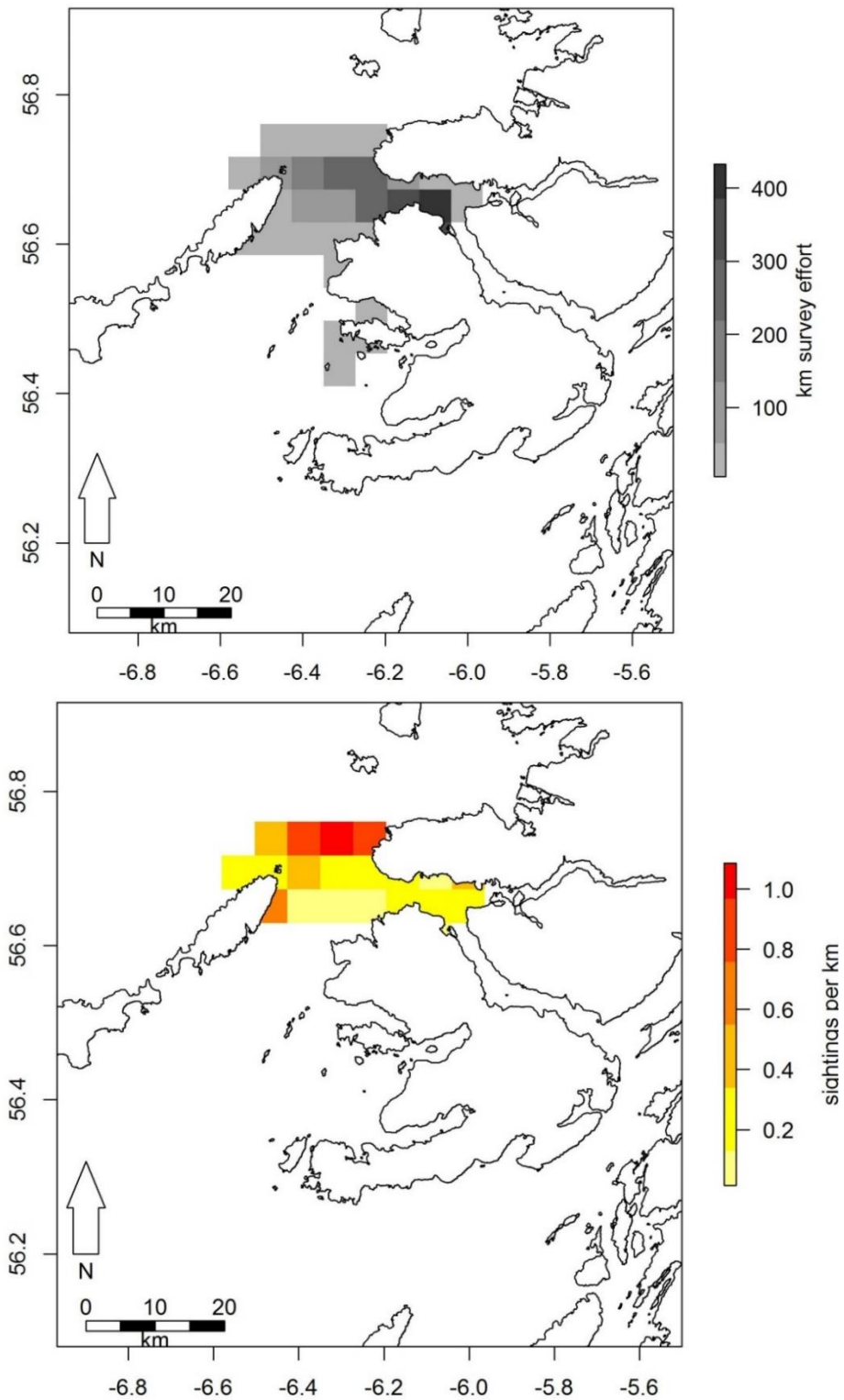


Figure 26. Maps showing Sea Life Surveys survey coverage in 2014

HWDT receives data from whale-watch operators. These maps show survey effort and megafauna (cetaceans, basking sharks and sunfish) relative abundance (at 10 km² resolution) from Sea Life Surveys whale-watch trips during 2014 (in sea state < 4).

Appendix IV

Shop and Visitor Centre Data (All figures up to end of business on 31st October 2014)

Table 6. Shop and Visitor Centre Data

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Total
TOTAL SALES	£83.82	£507.83	£2,963.26	£5,413.83	£8,942.79	£10,784.27	£4,773.14	£3,740.27	£37,209.21
2013 sales	£189.92	£1,589.00	£2,478.48	£3,148.11	£8,742.65	£8,935.15	£2,239.16	£2,978.07	£30,300.54
Percentage difference	-56	-68	20	72	2	21	113	26	23
Total visitors	No data	No data	No data	3118	6244	7934	3017	2427	22740
Total visitors in visitor centre	No data	No data	No data	384	1663	2129	700	739	5615
Total paying customers	No data	No data	No data	516	825	1126	532	406	3405
Ave customer spend per visitor	No data	No data	No data	£1.66	£1.43	£1.36	£1.58	£1.54	£1.64
Ave customer spend per paying customer	No data	No data	No data	£10.00	£10.84	£9.58	£8.97	£9.21	£10.93