Hampshire Water Transfer and Water Recycling Project

Environmental Statement – Appendix 9.11 Eastney Long Sea Outfall environmental DNA sampling and analysis

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1 Introduction

1.1 Overview

1.1.1 This technical report has been prepared in relation to the Hampshire Water Transfer and Water Recycling Project (hereafter referred to as the 'Proposed Development') and has been prepared to support the marine biodiversity assessment presented in ES Chapter 9 Marine biodiversity, Volume I (Document reference 6.1, DCO Volume 6). Details of the Proposed Development are described in ES Chapter 3 Description of the Proposed Development, Volume I (Document reference 6.1, DCO Volume 6) and have informed the scope of this study.

1.1.2 This report details species around the Eastney Long Sea Outfall (LSO), as a result of environmental DNA (eDNA) samples being taken. This survey was carried out between December 2023 and February 2024. The survey scoping and methodology used for establishing the ecological baseline is provided in section 2 of this report.

1.2 Site information

1.2.1 The Eastney LSO is located in an area of confluence between various outfalls within the Solent. The survey area is rectangular and covers an approximate 9km² area across the central Solent channel covering the Eastney LSO to the east. This area is approximately 2.5km from the shore at its westernmost corner, and approximately 8.5km from the shore at its most easterly corner.

2 Sampling and analysis methods

2.1 Extraction

2.1.1 Samples were processed in dedicated clean rooms, designed for the handling of eDNA samples, at NatureMetrics with all work undertaken in class II biosafety cabinets and all workstations decontaminated with a chemical disinfectant and UV irradiated before and after use.

2.1.2 Samples were collected with 0.8µm Polyethersulfone (PES) filters with a modified Longmire's solution added to the filter housing to preserve DNA prior to extraction. DNA was extracted from the 0.8µm PES filters using a DNeasy Blood and Tissue Kit (Qiagen) following Spens et al., 2017 [1] method for disc filters in buffer, with proteinase K added directly to the filter housing to reduce the risk of contamination arising from handling of the filter. A negative control, consisting of molecular grade water, was processed with each batch of samples to monitor for exogenous DNA contamination. Extraction yields were checked by measuring DNA concentration using a Qubit fluorometer with the Qubit dsDNA broad range assay kit (Thermo Fisher Scientific).

2.2 DNA amplification

Marine water eukaryotes

2.2.1 Replicate PCRs for each sample and extraction blank were amplified via a two-step PCR process, with tails added to the 5' end of taxon specific primers to complement downstream adapter and index primer sequences. Amplification was performed with a commercially available Hot Start DNA polymerase following manufacturers guidelines using the 1380F 5'- CCCTGCCHTTTGTACACAC-3' and 1510R 5'-CCTTCYGCAGGTTCACCTAC-3' primers [2] targeting the 18S ribosomal RNA (18S rRNA) gene for the target taxa. See the Report Interpretation Guide [3] for information on target and non-target taxa.

2.2.2 Positive and negative controls, consisting of proprietary synthetic sequences (that do not match known biological records) and PCR-grade water, respectively, were included with every PCR plate to verify amplification performance. PCR amplification success was confirmed visually by gel electrophoresis.

Marine water invertebrates

2.2.3 Replicate PCRs for each sample and extraction blank were amplified via a two-step PCR process, with tails added to the 5' end of taxon specific primers to complement downstream adapter and index primer sequences. Amplification was performed with a commercially available Hot Start DNA polymerase following manufacturers guidelines using the mlCOIintF 5'-GGWACWGGWTGAACWGTWTAYCCYCC-3' and jgHCO2198 5'-TAIACYTCIGGRTGICCRAARAAYCA-3' primers [4] targeting the mitochondrially encoded Cytochrome c oxidase subunit I (mt-COI) gene for the target taxa. See the Report Interpretation Guide [3] for information on target and non-target taxa.

2.2.4 Positive and negative controls, consisting of proprietary synthetic sequences (that do not match known biological records) and PCR-grade water, respectively, were included with every PCR plate to verify amplification performance. PCR amplification success was confirmed visually by gel electrophoresis.

Marine water vertebrates

2.2.5 Replicate PCRs for each sample and extraction blank were amplified via a two-step PCR process, with tails added to the 5' end of taxon specific primers to complement downstream adapter and index primer sequences. Amplification was performed with a commercially available Hot Start DNA polymerase following manufacturers guidelines using the F1 5'- ACTGGGATTAGATACCCC-3' and R1 5'- TAGAACAGGCTCCTCTAG-3' primers [5] targeting the mitochondrially encoded 12S ribosomal RNA (12S rRNA) gene for the target taxa. See the Report Interpretation Guide [3] for information on target and non-target taxa.

2.2.6 Positive and negative controls, consisting of proprietary synthetic sequences (that do not match known biological records) and PCR-grade water, respectively, were included with every PCR plate to verify amplification performance. PCR amplification success was confirmed visually by gel electrophoresis.

2.2.7 As these primers are known to amplify primate DNA, a blocking primer was used during first round PCR to limit the amplification of non-target human DNA (12S_V5_blkhum; 5'-TACCCCACTATGCTTAGCCCTAAACCTCAACAGTTAAATC–spacerC3-3') [6].

Library preparation and sequencing

2.2.8 Successfully amplified first round PCR replicates were pooled per sample and purified using MagBind TotalPure NGS magnetic beads (Omega Biotek). A sequencing library was prepared from the purified amplicons using unique dual indexes, following Illumina's 16S Metagenomic Sequencing Library Preparation protocol [7]. Indexed PCR products were subsequently purified, quantified, normalised, and pooled in equal volumes. The final pooled library was sequenced on an Illumina MiSeq system using a V3 600 cycle reagent kit (Illumina).

Bioinformatics

2.2.9 Sequences were demultiplexed with bcl2fastq based on the combination of the i5 and i7 index tags. Paired-end FASTQ reads for each sample were merged with USEARCH [8] requiring a minimum of 80% agreement in the overlap. Forward and reverse primers were trimmed from the merged sequences using cutadapt [9] with a length filter of 100-160bp, 300-330bp and 80-120bp (post primer removal) respectively for marine water eukaryotes, marine water invertebrates and marine water vertebrates. Sequences were quality filtered with USEARCH to retain only those with an expected error rate per base of 0.01 or below and dereplicated by sample, retaining singletons. Unique sequences from all samples were denoised in a single analysis with UNOISE [10] requiring retained zOTUs (zero-radius Operational Taxonomic Units) to have a minimum abundance of eight in at least one sample. Consensus taxonomic assignments were made for each zOTU using sequence similarity searches against NCBI nucleotide (NCBI nt), and SILVA [11] [12] for marine water eukaryotes or BOLD [13] for marine water invertebrates.

Searches against databases were made using blastn [14] [15] and required hits to have a minimum e-score of 1e-20 and cover at least 90% of the query sequence. The taxonomic identification associated with all hits was converted to match the GBIF taxonomic backbone. Assignments were made to the lowest possible taxonomic level where there was consistency in the matches, with minimum similarity thresholds of 98%, 95% and 92% for species, genus, and higher-level assignments respectively in marine water eukaryotes and marine water invertebrates.

2.2.10 For marine water vertebrates the minimum similarity thresholds are 99%, 97% and 95% for species, genus, and higher-level assignments respectively. Automated identifications were sense-checked against Global Biodiversity Information Facility (GBIF) occurrence records for presence in the sampling country, and elevated to higher taxonomic levels where required [16]. In countries where species are poorly documented and have limited occurrence records, the occurrence search may be expanded to include records from surrounding countries. In cases where there were hits to multiple species at the top similarity, GBIF occurrence records were used to resolve the conflicts and further improve taxonomic resolution where possible.Following taxonomic assignment, zOTUs were clustered into OTUs to reduce the number of sequence variants for a species (that may be present due to intra-specific variations, or amplification or sequencing artefacts). Supervised clustering was done using a combination of USEARCH UPARSE [17] and a custom pipeline that takes into account sequence similarity, co-occurrence patterns, abundance profiles, and taxonomy to prevent the over-clustering of distinct, closely related species. Chimeric sequences were excluded, and an OTU-by-sample table was generated by mapping all dereplicated reads for each sample to the OTU representative sequences with USEARCH at an identity threshold of 97%.

2.2.11 All OTUs with species-level identifications were queried against the IUCN Red List [18] to obtain global threat status, and the Global Register of Introduced and Invasive Species (GRIIS) to obtain their invasive status in the sampling country.

2.2.12 The OTU table was filtered to remove low abundance OTUs from each sample. It is aimed to keep the minimum read count for a detection of an OTU within a sample at approximately 20 reads. To do this the percentage threshold across all samples is identified within the dataset that most closely achieved this and applied this threshold across all samples. Unassigned OTUs, and OTUs identified to human and domesticated mammals, were removed from the dataset for subsequent analyses.

3 Results

3.1 Marine water eukaryotes

Three field samples were submitted and all three were reported. There was a species richness of 243 and the average species richness per sample was 35. There was no record of IUCN Red List species or any invasive non-native species (INNS). A full list of species recorded can be seen in Annex A.1.

Taxonomic resolution

3.1.1 Table 3-1 provides the number of OTUs detected and the percentage of OTUs identified to each taxonomic level.

Table 3-1 Number of OTUs detected for marine water eukaryotes and percentage of OTUs identified at each taxonomic level

Number of OTUs	Phylum	Class	Order	Family	Genus	Species
243	95.88%	79.84%	62.96%	55.97%	33.74%	15.23%

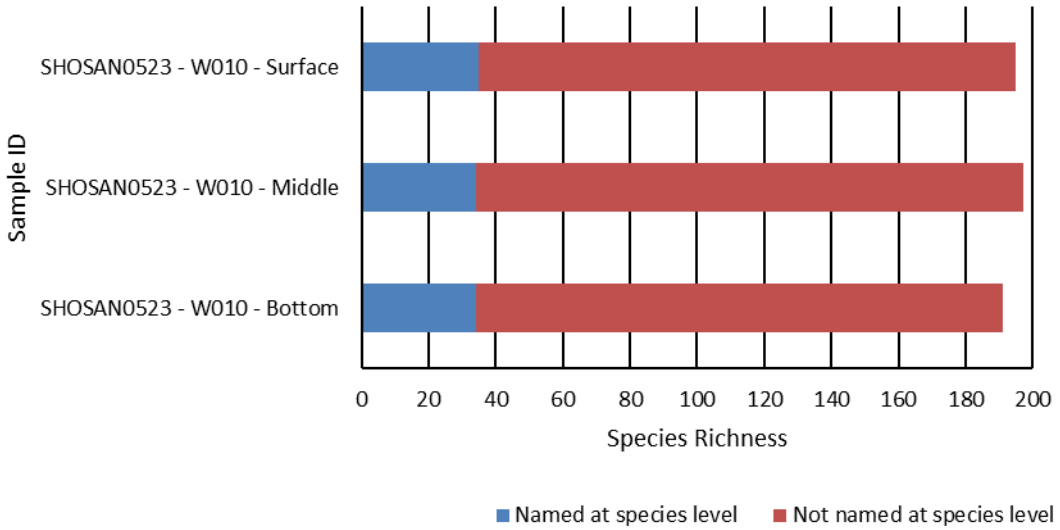
Community composition

3.1.2 A full list of the community composition can be seen in Annex B.1.

Species richness

3.1.3 High Species Richness generally indicates a healthier and functioning ecosystem and is the simplest biodiversity metric that is consistently reported in biodiversity monitoring. The total count of OTUs in each sample can be seen in Graphic 3-1.

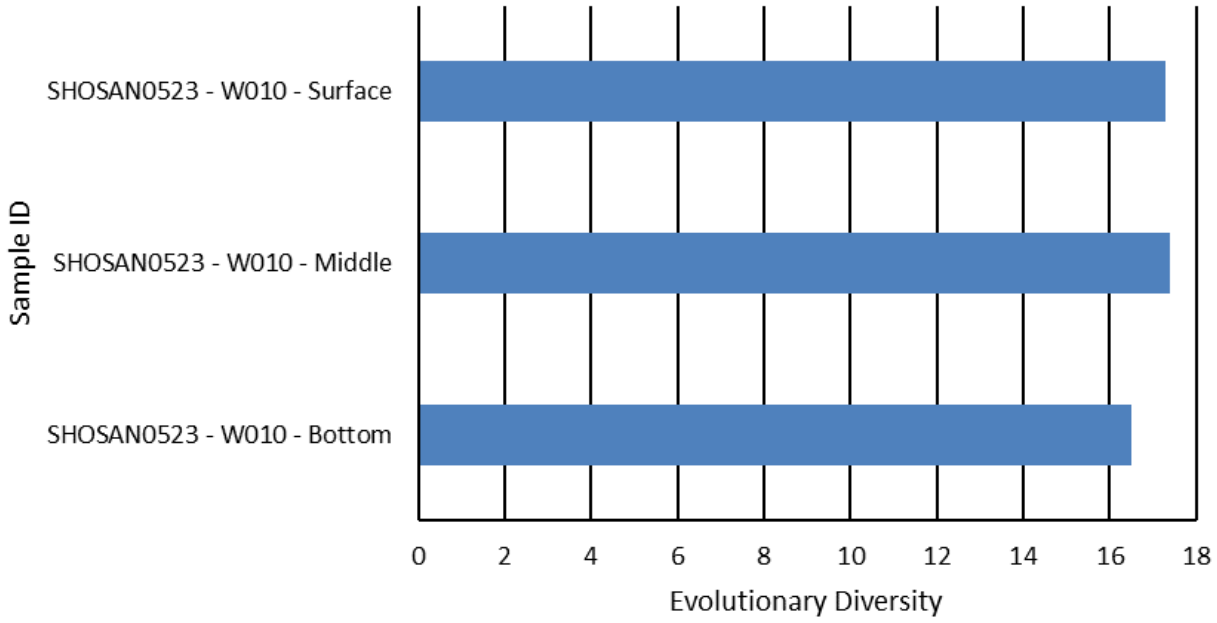
Graphic 3-1 Marine water eukaryotes species richness recorded around the Eastney LSO



Evolutionary Diversity

3.1.4 Evolutionary Diversity is a strong complementary indicator of biodiversity progress alongside species richness. Increasing Evolutionary Diversity can indicate an increasing resilience of the community. Evolutionary Diversity for marine water invertebrates in the Eastney LSO can be seen in Graphic 3-2.

Graphic 3-2 Evolutionary Diversity recorded for marine water eukaryotes around the Eastney LSO



3.2 Marine water invertebrates

3.2.1 Three field samples were submitted and all were reported. There was a species richness of 4 and the average species richness per sample was 1. There was no record of IUCN Red List species or any INNS. A full list of species recorded can be seen in Annex A.2

Taxonomic resolution

3.2.2 Table 3-2 provides the number of OTUs detected and the percentage of OTUs identified to each taxonomic level.

Table 3-2 Number of OTUs detected for marine water invertebrates and percentage of OTUs identified at each taxonomic level

Number of OTUs	Phylum	Class	Order	Family	Genus	Species
4	100%	100%	100%	0%	0%	0%

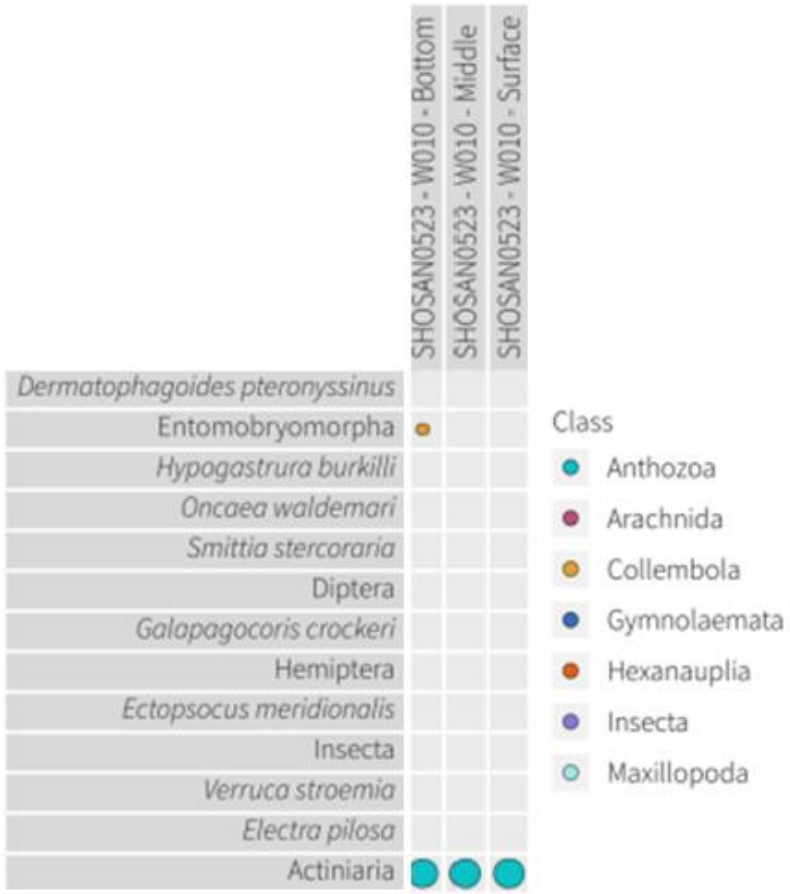
Community composition

3.2.3 Graphic 3-3 lists the species found in each sample. The presence of a bubble means a species was detected in that sample. The graphic displays at species

level, unless the number of species detected is too great to display clearly in the document. In these cases, the chart displays at a higher taxonomic level.

3.2.4 The size of the bubbles represents the proportion of DNA sequences within a sample. A larger bubble size can indicate a stronger eDNA signal. This signal may be linked to abundance of species in the environment but should be interpreted only as a coarse measure because the signal is also impacted by biological (e.g. biomass, life stage, activity, body condition), environmental (e.g. temperature, pH, salinity, conductivity), and technical factors (e.g. primer bias, PCR stochasticity).

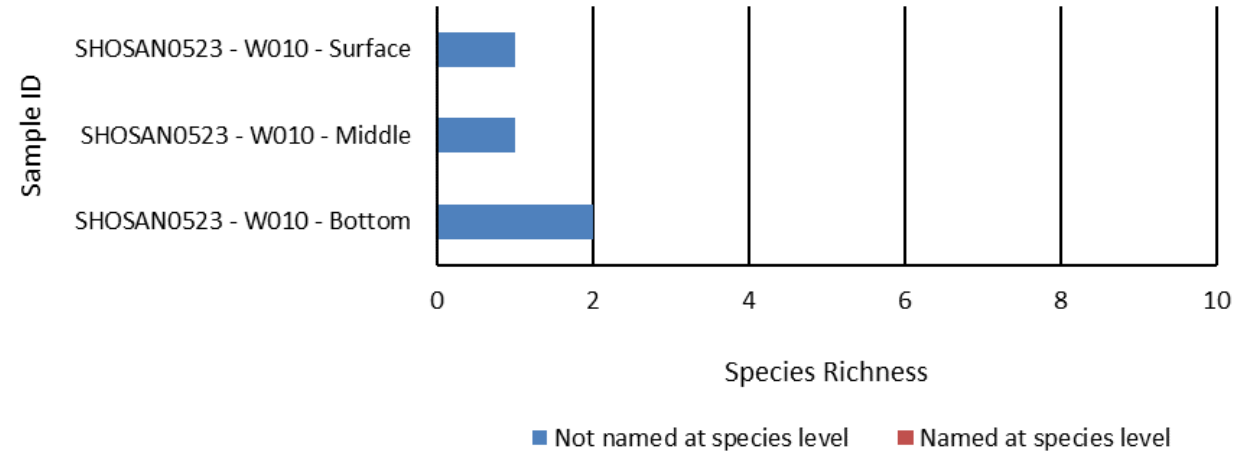
Graphic 3-3 Community composition of marine water invertebrates around the Eastney LSO



Species richness

3.2.5 High Species Richness generally indicates a healthier and functioning ecosystem and is the simplest biodiversity metric that is consistently reported in biodiversity monitoring. The total count of OTUs in each sample can be seen in Graphic 3-4.

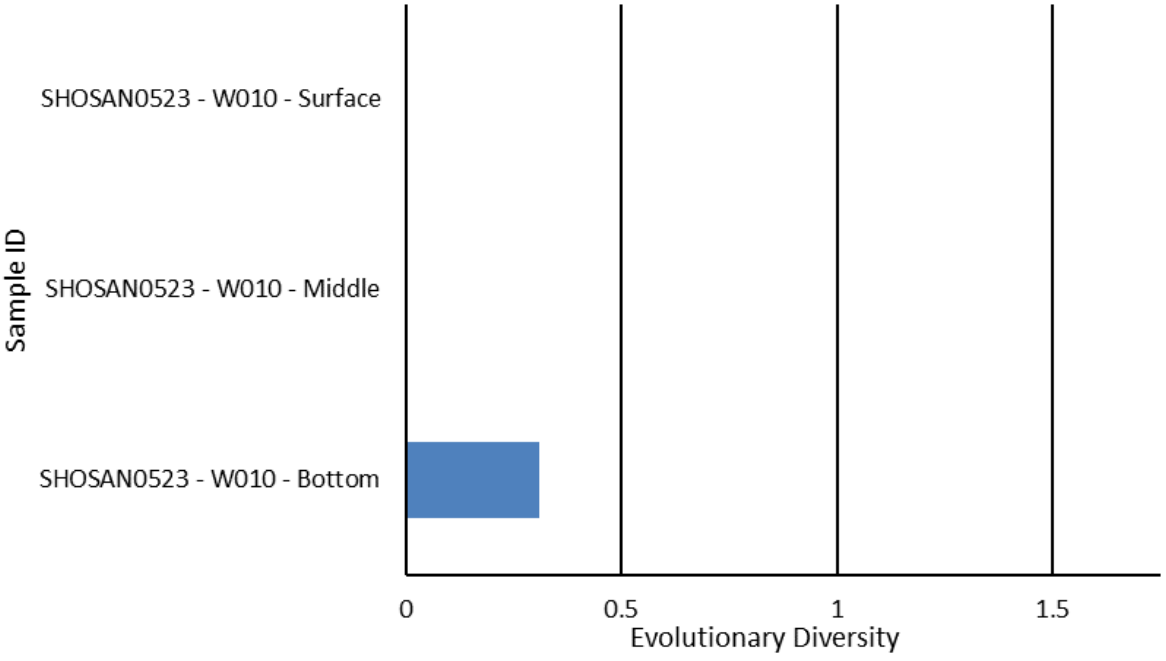
Graphic 3-4 Species richness of marine water invertebrates around the Eastney LSO



Evolutionary Diversity

3.2.6 Evolutionary Diversity is a strong complementary indicator of biodiversity progress alongside species richness. Increasing Evolutionary Diversity can indicate an increasing resilience of the community. Evolutionary Diversity for marine water invertebrates in the Eastney LSO can be seen in Graphic 3-5.

Graphic 3-5 Evolutionary Diversity recorded for marine water invertebrates around the Eastney LSO



3.3 Marine vertebrates

3.3.1 Three field samples were submitted and all three were reported. There was a species richness of 25 and the average species richness per sample was 5. There was no record of IUCN Red List species. Three INNS were recorded. A full list of species recorded can be seen in Annex A.3.

Taxonomic resolution

3.3.2 Table 3-3 provides the number of OTUs detected and the percentage of OTUs identified to each taxonomic level.

Table 3-3 Number of OTUs detected for marine water vertebrates and percentage of OTUs identified at each taxonomic level

Number of OTUs	Phylum	Class	Order	Family	Genus	Species
25	100%	100%	100%	100%	48.72%	41.03%

Invasive non-native species

3.3.3 Table 3-4 shows the INNS detected within the samples. These species are invasive according to the Global Register of Introduced and Invasive Species (GRIIS) in the country where sampling occurred. GRIIS is an IUCN Invasive Species Specialist Group initiative. The Convention on Biological Diversity defines an invasive species as one whose introduction and/or spread threatens biological diversity. An increase in the number of invasive species is generally associated with enhanced pressures at the site and reduced resilience of the native community. Please note: this label is only available for animals; and GRIIS lists marine species as invasive for a country, even if the species is known to be invasive in only one marine area bordering the country.

Table 3-4 Vertebrate INNS recorded around the Eastney outfall

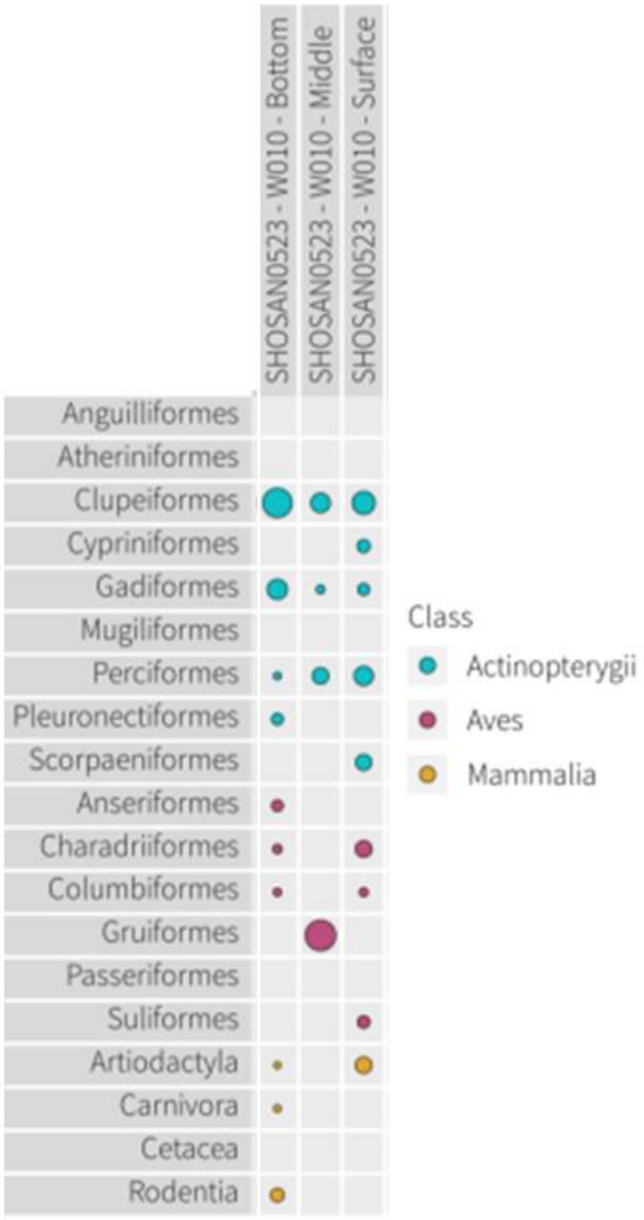
Species	Common name
Cervus nippon	Sika Deer
Rattus norvegicus	Brown Rat
Sciurus carolinensis	Grey Squirrel

Community composition

3.3.4 Graphic 3-6 lists the species found in each sample. The presence of a bubble means a species was detected in that sample. The graphic displays at species level, unless the number of species detected is too great to display clearly in the document. In these cases, the chart displays at a higher taxonomic level. The full species level chart can be seen in Annex B.2.

3.3.5 The size of the bubbles represents the proportion of DNA sequences within a sample. A larger bubble size can indicate a stronger eDNA signal. This signal may be linked to abundance of species in the environment but should be interpreted only as a coarse measure because the signal is also impacted by biological (e.g. biomass, life stage, activity, body condition), environmental (e.g. temperature, pH, salinity, conductivity), and technical factors (e.g. primer bias, PCR stochasticity).

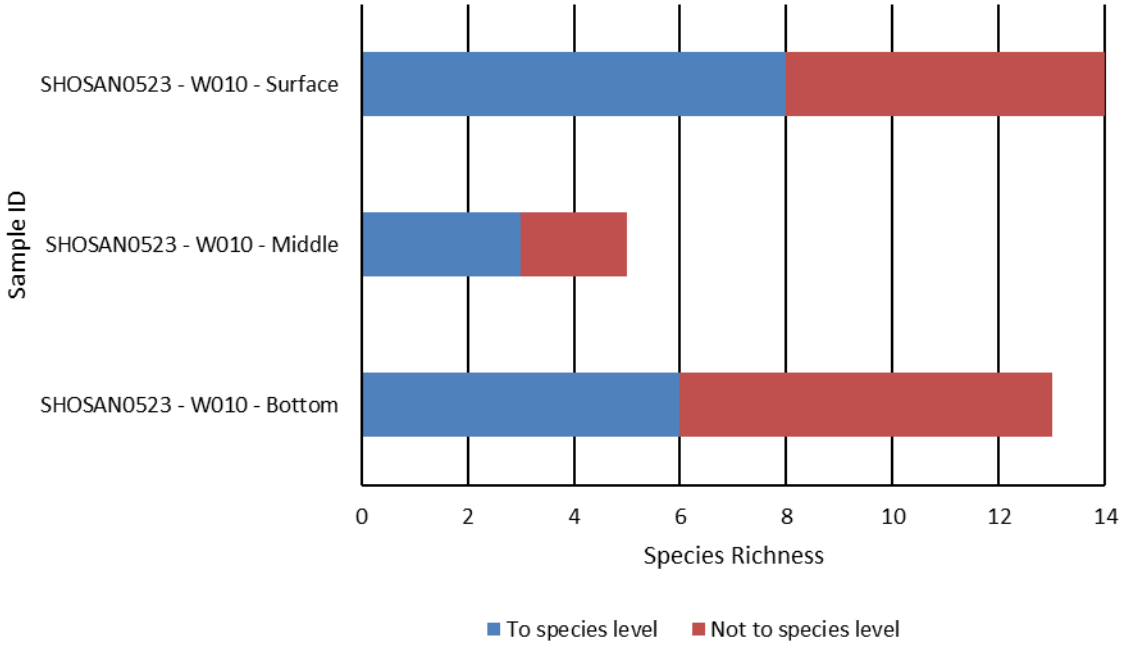
Graphic 3-6 Community composition of marine water vertebrates around the Eastney LSO



Species richness

3.3.6 High Species Richness generally indicates a healthier and functioning ecosystem and is the simplest biodiversity metric that is consistently reported in biodiversity monitoring. The total count of OTUs in each sample can be seen in Graphic 3-7.

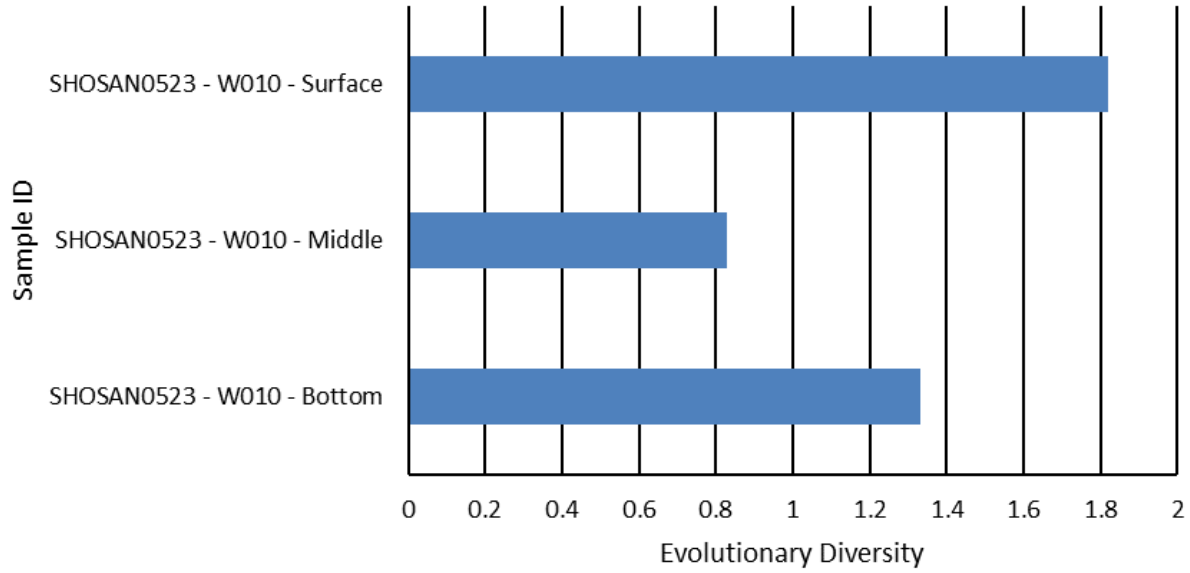
Graphic 3-7 Species richness of marine water vertebrates around the Eastney LSO



Evolutionary Diversity

3.3.7 Evolutionary Diversity is a strong complementary indicator of biodiversity progress alongside species richness. Increasing Evolutionary Diversity can indicate an increasing resilience of the community. Evolutionary Diversity for marine water invertebrates in the Eastney LSO can be seen in Graphic 3-8.

Graphic 3-8 Evolutionary Diversity recorded for marine water vertebrates around the Eastney LSO



Annex A. Species data tables

A.1 Marine water eukaryotes – read counts species data

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Animalia	Annelida	Polychaeta	Sabellida	Sabellidae	*Parasabella*		Target		-	93	-
Animalia	Annelida	Polychaeta	Terebellida	Terebellidae			Target		752	63	311
Animalia	Annelida	Polychaeta	Terebellida	Terebellidae			Target		57	-	25
Animalia	Annelida	Polychaeta		Arenicolidae	*Arenicola*	*Arenicola marina*	Target		-	-	39
Animalia	Annelida	Polychaeta		Capitellidae			Target		39	62	18
Animalia	Arthropoda	Arachnida	Trombidiformes	Eriophyidae			Target		-	114	-
Animalia	Arthropoda	Arachnida	Trombidiformes	Eriophyidae			Target		-	-	33
Animalia	Arthropoda	Collembola	Poduromorpha				Target		-	53	-
Animalia	Arthropoda	Hexanauplia	Calanoida	Centropagidae	*Centropages*		Target		-	195	-
Animalia	Arthropoda	Hexanauplia	Calanoida	Temoridae	*Temora*		Target		-	-	48
Animalia	Arthropoda	Hexanauplia	Cyclopoida	Oncaeidae	*Oncaea*		Target		-	57	19
Animalia	Arthropoda	Hexanauplia	Cyclopoida				Target		-	-	85
Animalia	Arthropoda	Hexanauplia	Harpacticoida	Tachidiidae	*Euterpina*	*Euterpina acutifrons*	Target		36	-	-
Animalia	Arthropoda	Maxillopoda	Kentrogonida	Sacculinidae			Target		-	-	46
Animalia	Arthropoda	Maxillopoda	Sessilia	Verrucidae	*Verruca*	*Verruca stroemia*	Target		39	106	54
Animalia	Bryozoa	Gymnolaemata	Cheilostomatida	Electridae	*Electra*		Target		-	22	37
Animalia	Bryozoa	Gymnolaemata					Target		-	25	-
Animalia	Bryozoa	Stenolaemata	Cyclostomatida	Tubuliporidae	*Tubulipora*	*Tubulipora lobifera*	Target		-	34	23
Animalia	Bryozoa	Stenolaemata	Cyclostomatida				Target		21	39	20
Animalia	Chordata	Ascidiacea	Stolidobranchia	Molgulidae	*Molgula*		Target		52	43	37
Animalia	Chordata	Ascidiacea	Stolidobranchia	Styelidae			Target		43	134	88
Animalia	Cnidaria	Anthozoa	Actiniaria	Actiniidae			Target		521	104	297
Animalia	Cnidaria	Anthozoa	Actiniaria				Target		120	150	2495
Animalia	Mollusca	Bivalvia	Adapedonta	Hiatellidae	*Hiatella*		Target		256	250	211
Animalia	Mollusca	Bivalvia	Venerida	Mactridae			Target		27	-	43
Animalia	Platyhelminthes	Trematoda	Plagiorchiida				Target		-	56	-
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Aplanochytriidae	*Aplanochytrium*	*Aplanochytrium kerguelense*	Target		311	182	201
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae	*Oblongichytrium*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	232	216	255
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae	*Oblongichytrium*		Target		91	103	116

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae	*Oblongichytrium*		Target		50	43	56
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae	*Oblongichytrium*		Target		41	56	100
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae	*Oblongichytrium*		Target		564	498	604
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae	*Oblongichytrium*		Target		176	167	184
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae			Target		-	-	18
Chromista	Bigyra	Labyrinthulea	Thraustochytrida	Oblongichytriidae			Target		22	38	19
Chromista	Cercozoa			Allapsidae	*Allantion*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	458	72
Chromista	Cercozoa			Matazidae	*Mataza*	*Mataza hastifera*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	56	54	58
Chromista	Cercozoa			Paulinellideae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	28	-	-
Chromista	Cercozoa			Protaspidae			Target		128	98	114
Chromista	Cercozoa			Protaspidae			Target		22	-	-
Chromista	Cercozoa			Protaspidae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	221	121	157
Chromista	Cercozoa			Pseudopirsoniidae	*Pseudopirsonia*	*Pseudopirsonia mucosa*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	18	31	20
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	262	227	264
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	19	-	19
Chromista	Cercozoa						Target		-	33	-
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than	27	-	18

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
								three matches to sequences in the reference database.			
Chromista	Cercozoa						Target		27	-	-
Chromista	Cercozoa						Target		80	33	38
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	19	-	18
Chromista	Cercozoa						Target		156	129	116
Chromista	Cercozoa						Target		28	29	48
Chromista	Cercozoa						Target		21	31	34
Chromista	Cercozoa						Target		44	49	-
Chromista	Cercozoa						Target		19	28	-
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	25	44	22
Chromista	Cercozoa						Target		51	32	46
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	83	78	75
Chromista	Cercozoa						Target		326	348	310
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	21	-	-
Chromista	Cercozoa						Target		59	-	37
Chromista	Cercozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	22	-	-
Chromista	Cercozoa						Target		1320	784	1072
Chromista	Cercozoa						Target		72	48	45
Chromista	Cercozoa						Target		108	83	94
Chromista	Cercozoa						Target		1655	869	1160
Chromista	Ciliophora	Colpodea	Sorogenida	Sorogenidae	*Sorogena*	*Sorogena stoianovitchae*	Target		-	40	-
Chromista	Ciliophora	Colpodea					Target		82	628	154
Chromista	Ciliophora	Colpodea					Target		-	43	-

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Chromista	Ciliophora	Hypotrichea					Target		46	212	137
Chromista	Ciliophora	Kinetofragminophorea	Apostomatida	Foettingeriidae			Target		41	-	-
Chromista	Ciliophora	Oligohymenophorea					Target		-	44	35
Chromista	Ciliophora	Oligotrichea	Choreotrichida	Strombidinopsidae	*Parastrombidinopsis*	*Parastrombidinopsis minima*	Target		168	207	181
Chromista	Ciliophora	Oligotrichea	Choreotrichida	Strombidinopsidae	*Parastrombidinopsis*	*Parastrombidinopsis shimi*	Target		-	48	22
Chromista	Ciliophora	Oligotrichea	Oligotrichida	Tintinnidae	*Salpingella*		Target		-	-	19
Chromista	Ciliophora	Oligotrichea	Strombidiida	Strombidiidae	*Strombidium*	*Strombidium caudispina*	Target		176	55	120
Chromista	Ciliophora	Oligotrichea	Strombidiida	Strombidiidae			Target		133	122	227
Chromista	Ciliophora	Oligotrichea	Tintinnida				Target		51	72	98
Chromista	Ciliophora	Oligotrichea					Target		302	268	388
Chromista	Ciliophora						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	21	-	-
Chromista	Cryptophyta	Cryptophyceae	Cryptomonadales	Cyathomonadacea e	*Telonema*	*Telonema antarcticum*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	174	107	140
Chromista	Cryptophyta	Cryptophyceae	Cryptomonadales	Cyathomonadacea e	*Telonema*		Target		64	71	59
Chromista	Cryptophyta	Cryptophyceae	Cryptomonadales	Cyathomonadacea e	*Telonema*		Target		79	58	78
Chromista	Cryptophyta	Cryptophyceae	Cryptomonadales	Cyathomonadacea e			Target		19	-	-
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s	Geminigeraceae	*Teleaulax*	*Teleaulax amphioxeia*	Target		411	338	445
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s	Geminigeraceae	*Teleaulax*	*Teleaulax amphioxeia*	Target		163	98	136
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s	Geminigeraceae	*Teleaulax*		Target		425	331	483
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s	Geminigeraceae			Target		356	236	301
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s	Geminigeraceae			Target		160	129	172
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s	Pyrenomonadacea e			Target		256	251	269
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s	Pyrenomonadacea e			Target		83	89	78
Chromista	Cryptophyta	Cryptophyceae	Pyrenomonadale s				Target		18	23	22
Chromista	Cryptophyta	Cryptophyceae					Target	There is lower support for this taxonomic identification	36	30	31

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
								as it is based on fewer than three matches to sequences in the reference database.			
Chromista	Cryptophyta	Katablepharidophyceae		Katablepharidaceae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	-	25
Chromista	Haptophyta	Prymnesiophyceae	Isochrysidales	Noelaerhabdaceae			Target		18	28	19
Chromista	Haptophyta	Prymnesiophyceae	Phaeocystales	Phaeocystaceae	*Phaeocystis*		Target		445	436	478
Chromista	Haptophyta	Prymnesiophyceae	Prymnesiales	Chrysochromulinaceae	*Chrysochromulina*	*Chrysochromulina scutellum*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	-	30
Chromista	Haptophyta	Prymnesiophyceae	Prymnesiales	Chrysochromulinaceae	*Chrysochromulina*	*Chrysochromulina simplex*	Target		250	202	270
Chromista	Haptophyta	Prymnesiophyceae	Prymnesiales	Chrysochromulinaceae	*Chrysochromulina*		Target		55	43	71
Chromista	Haptophyta	Prymnesiophyceae					Target		36	22	34
Chromista	Myzozoa	Conoidasida	Eugregarinorida	Selenidiidae	*Selenidium*		Target		698	883	396
Chromista	Myzozoa	Conoidasida					Target		23	-	-
Chromista	Myzozoa	Conoidasida					Target		-	22	-
Chromista	Myzozoa	Dinophyceae	Gonyaulacales	Gonyaulacaceae			Target		-	24	-
Chromista	Myzozoa	Dinophyceae	Gonyaulacales	Ostreopsidaceae	*Alexandrium*		Target		19	-	-
Chromista	Myzozoa	Dinophyceae	Gymnodiniales	Gymnodiniaceae	*Gyrodinium*	*Gyrodinium dominans*	Target		119	78	107
Chromista	Myzozoa	Dinophyceae	Gymnodiniales	Gymnodiniaceae			Target		81	49	66
Chromista	Myzozoa	Dinophyceae	Gymnodiniales	Kareniaceae	*Karlodinium*	*Karlodinium veneficum*	Target		925	908	807
Chromista	Myzozoa	Dinophyceae	Gymnodiniales	Polykrikaceae	*Polykrikos*		Target		-	31	-
Chromista	Myzozoa	Dinophyceae	Gymnodiniales				Target		637	492	657
Chromista	Myzozoa	Dinophyceae	Gymnodiniales				Target		504	257	329
Chromista	Myzozoa	Dinophyceae	Peridiniales	Heterocapsaceae	*Heterocapsa*	*Heterocapsa rotundata*	Target		280	193	338
Chromista	Myzozoa	Dinophyceae	Peridiniales	Oxytoxaceae	*Adenoides*	*Adenoides eludens*	Target		628	767	739
Chromista	Myzozoa	Dinophyceae	Peridiniales	Peridiniaceae			Target		-	-	19
Chromista	Myzozoa	Dinophyceae	Peridiniales	Peridiniaceae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	21	-	-
Chromista	Myzozoa	Dinophyceae	Peridiniales				Target		193	162	196
Chromista	Myzozoa	Dinophyceae	Syndiniales	Amoebophryaceae			Target		-	-	18

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Chromista	Myzozoa	Dinophyceae	Syndiniales				Target		204	200	165
Chromista	Myzozoa	Dinophyceae	Syndiniales				Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	36	31	23
Chromista	Myzozoa	Dinophyceae	Thoracosphaerales	Thoracosphaeraceae			Target		58	27	47
Chromista	Myzozoa	Dinophyceae					Target		1212	686	894
Chromista	Myzozoa	Dinophyceae					Target		63	56	45
Chromista	Myzozoa	Dinophyceae					Target		23	-	31
Chromista	Myzozoa	Dinophyceae					Target		79	55	72
Chromista	Myzozoa	Dinophyceae					Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	23	-
Chromista	Myzozoa	Dinophyceae					Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	-	28
Chromista	Myzozoa	Dinophyceae					Target		581	410	490
Chromista	Myzozoa	Dinophyceae					Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	18	33	36
Chromista	Ochrophyta	Bacillariophyceae	Bacillariales	Bacillariaceae			Target		805	812	728
Chromista	Ochrophyta	Bacillariophyceae	Chaetocerotales	Chaetocerotaceae	*Chaetoceros*		Target		23	-	23
Chromista	Ochrophyta	Bacillariophyceae	Chaetocerotales	Chaetocerotaceae	*Chaetoceros*		Target		77	99	98
Chromista	Ochrophyta	Bacillariophyceae	Coscinodiscales	Hemidiscaceae			Target		28	-	-
Chromista	Ochrophyta	Bacillariophyceae	Cymatosirales	Cymatosiraceae	*Brockmanniella*	*Brockmanniella brockmannii*	Target		226	176	219
Chromista	Ochrophyta	Bacillariophyceae	Melosirales	Stephanopyxidaceae	*Stephanopyxis*	*Stephanopyxis turris*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	440	362	382
Chromista	Ochrophyta	Bacillariophyceae	Naviculales	Naviculaceae	*Navicula*		Target		2237	2383	2015
Chromista	Ochrophyta	Bacillariophyceae	Naviculales	Naviculaceae	*Navicula*		Target		25	30	28
Chromista	Ochrophyta	Bacillariophyceae	Naviculales	Naviculaceae	*Navicula*		Target		839	561	575
Chromista	Ochrophyta	Bacillariophyceae	Naviculales				Target		223	224	243
Chromista	Ochrophyta	Bacillariophyceae	Naviculales				Target		125	77	114
Chromista	Ochrophyta	Bacillariophyceae	Rhizosoleniales	Rhizosoleniaceae			Target		18	-	-

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Lauderiaceae	*Lauderia*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	333	291	311
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Skeletonemaceae	*Skeletonema*		Target		385	192	280
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae	*Thalassiosira*	*Thalassiosira oceanica*	Target		42	29	30
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae	*Thalassiosira*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	40	-	21
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae	*Thalassiosira*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	26	28	27
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae			Target		89	174	101
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	73	62	104
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales				Target		1847	988	1196
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales				Target		70	138	64
Chromista	Ochrophyta	Bacillariophyceae					Target		419	332	380
Chromista	Ochrophyta	Bacillariophyceae					Target		195	117	126
Chromista	Ochrophyta	Bacillariophyceae					Target		81	83	95
Chromista	Ochrophyta	Bacillariophyceae					Target		133	63	67
Chromista	Ochrophyta	Bacillariophyceae					Target		129	49	80
Chromista	Ochrophyta	Bacillariophyceae					Target		33	-	-
Chromista	Ochrophyta	Bacillariophyceae					Target		133	117	106
Chromista	Ochrophyta	Bacillariophyceae					Target		18	29	21
Chromista	Ochrophyta	Bacillariophyceae					Target		77	58	67
Chromista	Ochrophyta	Chrysophyceae	Parmales	Triparmaceae	*Triparma*	*Triparma pacifica*	Target		48	38	45
Chromista	Ochrophyta	Chrysophyceae	Synurales	Synuraceae	*Synura*		Target		167	181	178
Chromista	Ochrophyta	Chrysophyceae					Target		34	31	35
Chromista	Ochrophyta	Dictyochophyceae	Pedinellales	Pedinellaceae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	49	50	61
Chromista	Ochrophyta	Dictyochophyceae	Pelagomonadales	Pelagomonadaceae	*Aureococcus*	*Aureococcus anophagefferens*	Target		32	34	28

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Chromista	Ochrophyta	Eustigmatophyceae	Eustigmatales	Monodopsidaceae	*Nannochloropsis*		Target		-	-	21
Chromista	Ochrophyta	Phaeophyceae	Laminariales				Target		-	35	23
Chromista	Ochrophyta	Phaeophyceae					Target		67	143	138
Chromista	Ochrophyta	Raphidophyceae		Thaumatomastigaceae	*Thaumatomastix*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	136	105	128
Chromista	Oomycota	Peronosporea	Peronosporales	Peronosporaceae	*Peronospora*		Target		-	54	-
Chromista	Oomycota	Peronosporea	Peronosporales	Peronosporaceae	*Plasmopara*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	90	1541	257
Chromista	Oomycota	Peronosporea	Peronosporales	Pythiaceae			Target		68	125	85
Chromista	Oomycota	Peronosporea	Peronosporales				Target		236	421	295
Chromista	Picozoa	Picomonadea	Picomonadida	Picomonadidae	*Picomonas*	*Picomonas judraskeda*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	1184	985	1278
Chromista	Picozoa						Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	30	-	26
Chromista							Target		-	145	-
Chromista							Target		50	43	43
Chromista							Target		-	60	-
Chromista							Target		74	44	54
Chromista							Target		27	-	-
Chromista							Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	19	-	19
Fungi	Ascomycota	Dothideomycetes	Capnodiales	Cladosporiaceae			Target		330	1160	406
Fungi	Ascomycota	Dothideomycetes	Capnodiales				Target		46	81	62
Fungi	Ascomycota	Dothideomycetes	Capnodiales				Target		33	113	38
Fungi	Ascomycota	Dothideomycetes	Dothideales				Target		47	94	47
Fungi	Ascomycota	Dothideomycetes	Pleosporales	Didymellaceae			Target		-	67	-
Fungi	Ascomycota	Dothideomycetes	Pleosporales	Phaeosphaeriaceae			Target		51	258	70
Fungi	Ascomycota	Dothideomycetes	Pleosporales				Target		58	680	231
Fungi	Ascomycota	Dothideomycetes	Pleosporales				Target		23	141	34

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Fungi	Ascomycota	Eurotiomycetes	Chaetothyriales	Trichomeriaceae			Target		28	72	20
Fungi	Ascomycota	Eurotiomycetes	Chaetothyriales				Target		-	106	33
Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae			Target		54	81	-
Fungi	Ascomycota	Eurotiomycetes	Eurotiales	Aspergillaceae			Target		20	-	-
Fungi	Ascomycota	Lecanoromycetes	Lecanorales	Ramalinaceae	*Toniniopsis*	*Toniniopsis dissimilis*	Target		79	1096	221
Fungi	Ascomycota	Leotiomycetes					Target		61	572	136
Fungi	Ascomycota	Orbiliomycetes	Orbiliales	Orbiliaceae			Target		49	490	118
Fungi	Ascomycota	Saccharomycetes	Saccharomycetales	Debaryomycetaceae	*Candida*		Target		-	-	19
Fungi	Ascomycota	Saccharomycetes	Saccharomycetales	Saccharomycetaceae			Target		44	22	29
Fungi	Ascomycota	Sordariomycetes	Coniochaetales				Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	52	-
Fungi	Ascomycota	Taphrinomycetes	Taphrinales	Taphrinaceae	*Protomyces*		Target		64	150	81
Fungi	Ascomycota	Taphrinomycetes	Taphrinales	Taphrinaceae	*Taphrina*		Target		-	47	-
Fungi	Ascomycota						Target		22	120	30
Fungi	Ascomycota						Target		-	28	-
Fungi	Ascomycota						Target		57	740	121
Fungi	Basidiomycota	Agaricomycetes	Agaricales	Pleurotaceae			Target		-	41	-
Fungi	Basidiomycota	Agaricomycetes	Polyporales				Target		-	44	-
Fungi	Basidiomycota	Agaricostilbomycetes	Agaricostilbales	Kondoaceae			Target		41	45	51
Fungi	Basidiomycota	Agaricostilbomycetes	Agaricostilbales	Kondoaceae			Target		18	4456	682
Fungi	Basidiomycota	Cystobasidiomycetes					Target		66	130	37
Fungi	Basidiomycota	Cystobasidiomycetes					Target		-	37	-
Fungi	Basidiomycota	Cystobasidiomycetes					Target		-	-	24
Fungi	Basidiomycota	Exobasidiomycetes	Microstromatales				Target		20	26	-
Fungi	Basidiomycota	Exobasidiomycetes		Golubeviaceae			Target		18	-	-
Fungi	Basidiomycota	Tremellomycetes	Cystofilobasidiales				Target		-	85	27
Fungi	Basidiomycota	Tremellomycetes	Tremellales				Target		51	322	98
Fungi	Basidiomycota	Tremellomycetes					Target		177	55	64
Fungi	Basidiomycota	Tremellomycetes					Target		82	97	53
Fungi	Basidiomycota						Target		-	231	58
Fungi	Chytridiomycota						Target		22	-	26

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Bathycoccaceae	*Bathycoccus*	*Bathycoccus prasinos*	Target		1055	793	1013
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Bathycoccaceae	*Ostreococcus*	*Ostreococcus tauri*	Target		32	24	23
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae	*Micromonas*	*Micromonas pusilla*	Target		95	84	87
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae	*Micromonas*	*Micromonas pusilla*	Target		69	46	79
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae	*Micromonas*		Target		405	354	390
Plantae	Chlorophyta	Prasinophyceae	Pyramimonadales	Pyramimonadaceae	*Pyramimonas*	*Pyramimonas australis*	Target		82	66	95
Plantae	Chlorophyta	Prasinophyceae	Pyramimonadales	Pyramimonadaceae	*Pyramimonas*	*Pyramimonas disomata*	Target		40	27	27
Plantae	Chlorophyta	Trebouxiophyceae	Chlorellales	Chlorellaceae	*Nannochloris*		Target		142	195	119
Plantae	Chlorophyta	Trebouxiophyceae	Oocystales	Oocystaceae			Target		1754	15644	4305
Plantae	Chlorophyta						Target		-	37	-
Plantae	Chlorophyta						Target		54	180	123
Plantae	Tracheophyta	Liliopsida	Poales	Restionaceae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	30	-
Plantae	Tracheophyta	Magnoliopsida					Target		155	79	78
Protozoa	Amoebozoa	Lobosa	Amoebida	Flabellulidae			Target		46	125	88
Protozoa	Amoebozoa	Lobosa	Amoebida	Hyalodiscidae	*Flamella*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	35	287	71
Protozoa	Amoebozoa						Target		-	37	-
Protozoa	Choanozoa	Choanoflagellatea	Choanoflagellida	Acanthoecidae	*Bicosta*	*Bicosta minor*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	372	325	427
Protozoa	Choanozoa	Choanoflagellatea	Choanoflagellida	Stephanoecidae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	-	20
Protozoa	Euglenozoa	Diplonemea	Diplonemida	Hemistasiidae	*Hemistasia*		Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	63	83	82
Protozoa	Sarcomastigophora	Phytomastigophora	Ebriida	Cercomonadidae	*Paracercomonas*	*Paracercomonas astra*	Target		70	3460	376

Kingdom	Phylum	Class	Order	Family	Genus	Species	Target Status	Comments	Eastney LSO survey area		
									SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface
Protozoa	Sarcomastigophora	Phytomastigophorea	Ebriida	Cercomonadidae	*Paracercomonas*		Target		-	316	38
Protozoa	Sulcozoa	Thecomonadea	Apusomonadida	Apusomonadidae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	23	33	22
Protozoa	Sulcozoa	Thecomonadea	Apusomonadida	Apusomonadidae			Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	156	174	181
Protozoa		Haplosporea	Haplosporida				Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	20	31	35
Protozoa				Ebriaceae	*Ebria*	*Ebria tripartita*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	47	28	42
Protozoa					*Solenicola*	*Solenicola setigera*	Target	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	694	708	733
Protozoa							Target		-	167	21

A.2 Marine water invertebrates – read counts species data

Kingdom	Phylum	Class	Order	Family	Genus	Species	IUCN Threat Status	Target Status	Invasive	Comments	SHOSAN 0523 - W010 - Bottom	SHOSAN 0523 - W010 - Middle	SHOSAN 0523 - W010 - Surface
Animalia	Arthropoda	Collembola	Entomobryomorpha					Target		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	18	-	-
Animalia	Cnidaria	Anthozoa	Actiniaria					Target			241	70	50
Chromista	Haptophyta	Prymnesiophyceae	Isochrysidales	Noelaerhabdaceae				NonTarget			35	41	26
Chromista	Haptophyta	Prymnesiophyceae	Phaeocystales	Phaeocystaceae	*Phaeocystis*	*Phaeocystis globosa*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	118	120	163
Chromista	Haptophyta	Prymnesiophyceae	Phaeocystales	Phaeocystaceae	*Phaeocystis*	*Phaeocystis globosa*		NonTarget			43	37	43
Chromista	Myzozoa	Dinophyceae	Peridiniales	Heterocapsaceae	*Heterocapsa*	*Heterocapsa rotundata*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	166	90	234
Chromista	Myzozoa	Dinophyceae	Peridiniales	Heterocapsaceae	*Heterocapsa*			NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	40	19	52
Chromista	Myzozoa	Dinophyceae						NonTarget			34	32	61
Chromista	Ochrophyta	Bacillariophyceae	Naviculales	Naviculaceae	*Navicula*			NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	40	43	88

Kingdom	Phylum	Class	Order	Family	Genus	Species	IUCN Threat Status	Target Status	Invasive	Comments	SHOSAN 0523 - W010 - Bottom	SHOSAN 0523 - W010 - Middle	SHOSAN 0523 - W010 - Surface
Chromista	Ochrophyta	Bacillariophyceae	Naviculales	Pleurosigmataceae	*Pleurosigma*			NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	18	-
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae	*Thalassiosira*	*Thalassiosira nordenskioeldii*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	21	-	33
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae	*Thalassiosira*	*Thalassiosira punctigera*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	19	-
Chromista	Ochrophyta	Bacillariophyceae	Thalassiosirales	Thalassiosiraceae	*Thalassiosira*			NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	44	90	151
Chromista	Ochrophyta	Bacillariophyceae	Triceratiales	Triceratiaceae	*Odontella*	*Odontella regia*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	-	21
Chromista	Ochrophyta	Dictyochophyceae	Pelagomonadales	Pelagomonadaceae	*Aureococcus*	*Aureococcus anophagefferens*		NonTarget			-	-	22
Chromista	Ochrophyta	Eustigmatophyceae	Eustigmatales	Monodopsidaceae	*Nannochloropsis*	*Nannochloropsis granulata*		NonTarget			-	25	-
Fungi	Ascomycota	Dothideomycetes	Capnodiales	Cladosporiaceae				NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	-	-	24

Kingdom	Phylum	Class	Order	Family	Genus	Species	IUCN Threat Status	Target Status	Invasive	Comments	SHOSAN 0523 - W010 - Bottom	SHOSAN 0523 - W010 - Middle	SHOSAN 0523 - W010 - Surface
Fungi	Ascomycota	Taphrinomycetes	Taphrinales	Taphrinaceae				NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	40	-	-
Plantae	Chlorophyta	Chloropicophyceae	Chloropicales	Chloropicaceae				NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	154	901	501
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Bathycoccaceae	*Bathycoccus*	*Bathycoccus prasinos*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	28171	26021	30435
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae	*Micromonas*	*Micromonas pusilla*		NonTarget			1637	1966	2040
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae	*Micromonas*	*Micromonas pusilla*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	146	265	207
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae	*Micromonas*	*Micromonas pusilla*		NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	249	206	246
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae	*Micromonas*			NonTarget		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database.	173	243	234
Plantae	Chlorophyta	Mamiellophyceae	Mamiellales	Mamiellaceae				NonTarget		There is lower support for this taxonomic	119	77	101

Kingdom	Phylum	Class	Order	Family	Genus	Species	IUCN Threat Status	Target Status	Invasive	Comments	SHOSAN 0523 - W010 - Bottom	SHOSAN 0523 - W010 - Middle	SHOSAN 0523 - W010 - Surface
										identification as it is based on fewer than three matches to sequences in the reference database.			
Plantae	Chlorophyta	Prasinophyceae	Pseudoscourfieldiales	Pycnococcaceae				NonTarget			18	44	-

A.3 Marine water vertebrates – read counts species data

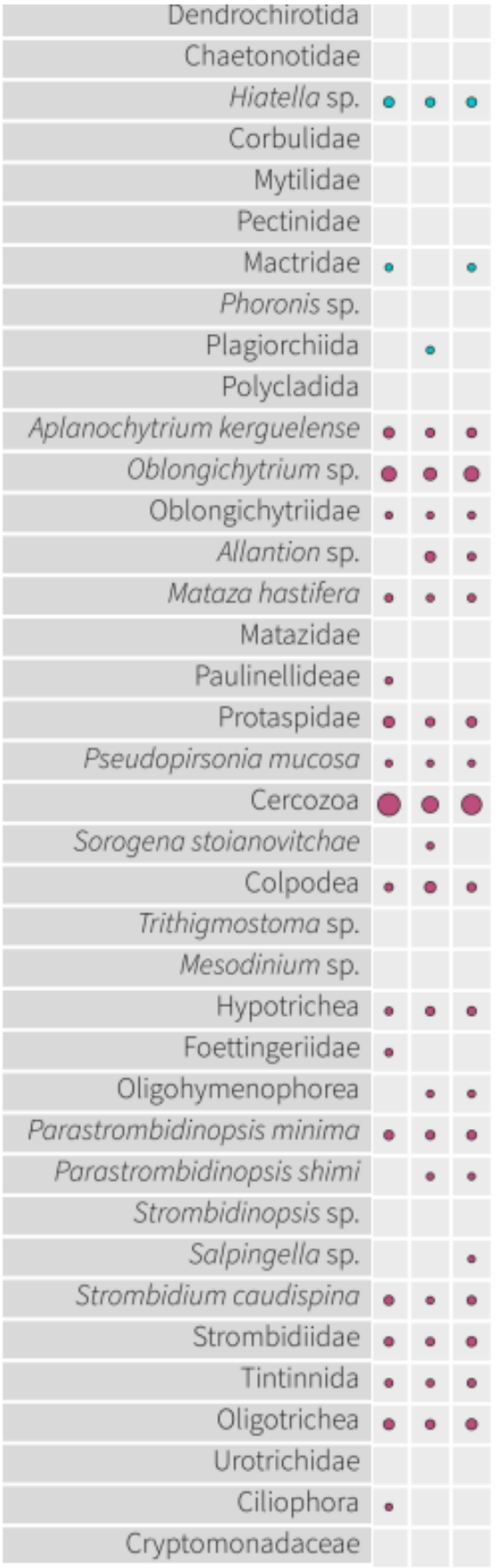
Kingdom	Phylum	Class	Order	Family	Genus	Species	Common Name	IUCN Threat Status	Target Status	Invasive	Comments	SHOSAN 0523 - W010 - Bottom	SHOSAN 0523 - W010 - Middle	SHOSAN 0523 - W010 - Surface
Animalia	Chordata	Actinopterygii	Clupeiformes	Clupeidae					Target			3448	563	2299
Animalia	Chordata	Actinopterygii	Cypriniformes	Cyprinidae	*Abramis*	*Abramis brama*	Common Bream	LC	Target			-	-	384
Animalia	Chordata	Actinopterygii	Gadiformes	Gadidae	*Trisopterus*	*Trisopterus minutus*	Poor Cod		Target			177	-	-
Animalia	Chordata	Actinopterygii	Gadiformes	Gadidae	*Trisopterus*				Target			323	29	177
Animalia	Chordata	Actinopterygii	Gadiformes	Gadidae					Target			744	-	93
Animalia	Chordata	Actinopterygii	Perciformes	Callionymidae	*Callionymus*	*Callionymus lyra*	Common Dragonet	LC	Target		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database, and/or limited geographic occurrence records for the taxon.	-	-	205
Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	*Gobius*	*Gobius niger*	Black Goby	LC	Target			-	-	249
Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	*Gobius*	*Gobius paganellus*	Rock Goby	LC	Target		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database, and/or limited geographic occurrence records for the taxon.	-	113	-
Animalia	Chordata	Actinopterygii	Perciformes	Gobiidae	*Gobiusculus*	*Gobiusculus flavescens*	Two-Spotted Goby	LC	Target		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database, and/or limited geographic occurrence records for the taxon.	-	-	79
Animalia	Chordata	Actinopterygii	Perciformes	Labridae	*Labrus*				Target			39	-	33
Animalia	Chordata	Actinopterygii	Perciformes	Moronidae	*Dicentrarchus*	*Dicentrarchus labrax*	European Seabass	LC	Target			-	221	821
Animalia	Chordata	Actinopterygii	Pleuronectiforme	Soleidae	*Solea*	*Solea solea*	Common Sole	DD	Target			195	-	-
Animalia	Chordata	Actinopterygii	Scorpaeniformes	Cottidae	*Cottus*	*Cottus gobio*	European Bullhead	LC	Target		There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database, and/or limited geographic occurrence records for the taxon.	-	-	794
Animalia	Chordata	Aves	Anseriformes	Anatidae					Target			190	-	-

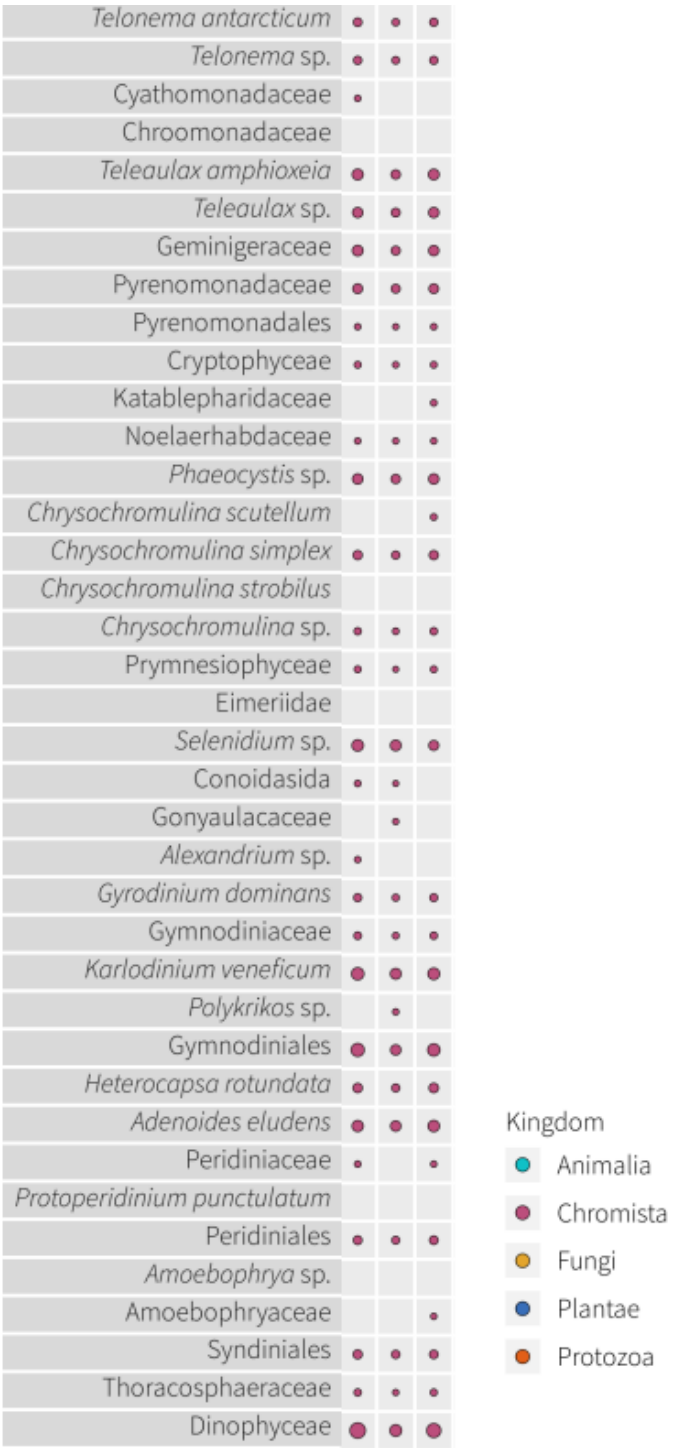
Kingdom	Phylum	Class	Order	Family	Genus	Species	Common Name	IUCN Threat Status	Target Status	Invasive	Comments	SHOSAN 0523 - W010 - Bottom	SHOSAN 0523 - W010 - Middle	SHOSAN 0523 - W010 - Surface
Animalia	Chordata	Aves	Charadriiformes	Laridae					Target			80	-	894
Animalia	Chordata	Aves	Columbiformes	Columbidae					Target			46	-	80
Animalia	Chordata	Aves	Gruiformes	Rallidae	*Gallinula*	*Gallinula chloropus*	Common Moorhen	LC	Target			-	1926	-
Animalia	Chordata	Aves	Suliformes	Phalacrocoracidae	*Phalacrocorax*	*Phalacrocorax carbo*	Great Cormorant	LC	Target			-	-	337
Animalia	Chordata	Mammalia	Artiodactyla	Cervidae	*Capreolus*	*Capreolus capreolus*	Roe Deer	LC	Target			33	-	-
Animalia	Chordata	Mammalia	Artiodactyla	Cervidae	*Cervus*	*Cervus nippon*	Sika Deer		Target	Invasive	There is lower support for this taxonomic identification as it is based on fewer than three matches to sequences in the reference database, and/or limited geographic occurrence records for the taxon.	-	-	855
Animalia	Chordata	Mammalia	Carnivora	Canidae	*Vulpes*	*Vulpes vulpes*	Red Fox	LC	Target			35	-	-
Animalia	Chordata	Mammalia	Rodentia	Cricetidae	*Arvicola*	*Arvicola amphibius*	European Water Vole	LC	Target			53	-	-
Animalia	Chordata	Mammalia	Rodentia	Muridae	*Rattus*	*Rattus norvegicus*	Brown Rat		Target	Invasive		301	-	-

Annex B. Community composition

B.1 Marine water eukaryotes community composition

	SHOSAN0523 - W010 - Bottom	SHOSAN0523 - W010 - Middle	SHOSAN0523 - W010 - Surface	SHOSAN0523 - W012 - Bottom
Polynoidae				•
Sigalionidae				•
Phyllodocida				•
Parasabella sp.		•		
Spirobranchus triqueter				•
Terebellidae	●	•	●	•
Arenicola marina			•	•
Capitellidae	•	•	•	
Eriophyidae		•	•	
Poduromorpha		•		
Centropages sp.		•		
Temora sp.			•	•
Calanoida				
Oncaea sp.		•	•	•
Pseudanthessiidae				•
Cyclopoida			•	
Nannopodidae				
Euterpina acutifrons	•			
Sacculinidae			•	
Verruca stroemia	•	•	•	
Electra sp.		•	•	•
Gymnolaemata		•		
Tubulipora lobifera		•	•	
Cyclostomatida	•	•	•	
Ascidiidae				
Molgula sp.	•	•	•	
Styelidae	•	•	•	
Stolidobranchia				•
Actiniidae	●	•	●	•
Actiniaria	•	•	●	●


Dendrochirotida
Chaetonotidae
Hiatella sp.
Corbulidae
Mytilidae
Pectinidae
Mactridae
Phoronis sp.
Plagiorchiida
Polycladida
Aplanochytrium kerguelense
Oblongichytrium sp.
Oblongichytriidae
Allantion sp.
Mataza hastifera
Matazidae
Paulinellideae
Protaspidae
Pseudopirsonia mucosa
Cercozoa
Sorogena stoianovitchae
Colpodea
Trithigmostoma sp.
Mesodinium sp.
Hypotrichea
Foettingeriidae
Oligohymenophorea
Parastrombidinopsis minima
Parastrombidinopsis shimi
Strombidinopsis sp.
Salpingella sp.
Strombidium caudispina
Strombidiidae
Tintinnida
Oligotrichea
Urotrichidae
Ciliophora
Cryptomonadaceae

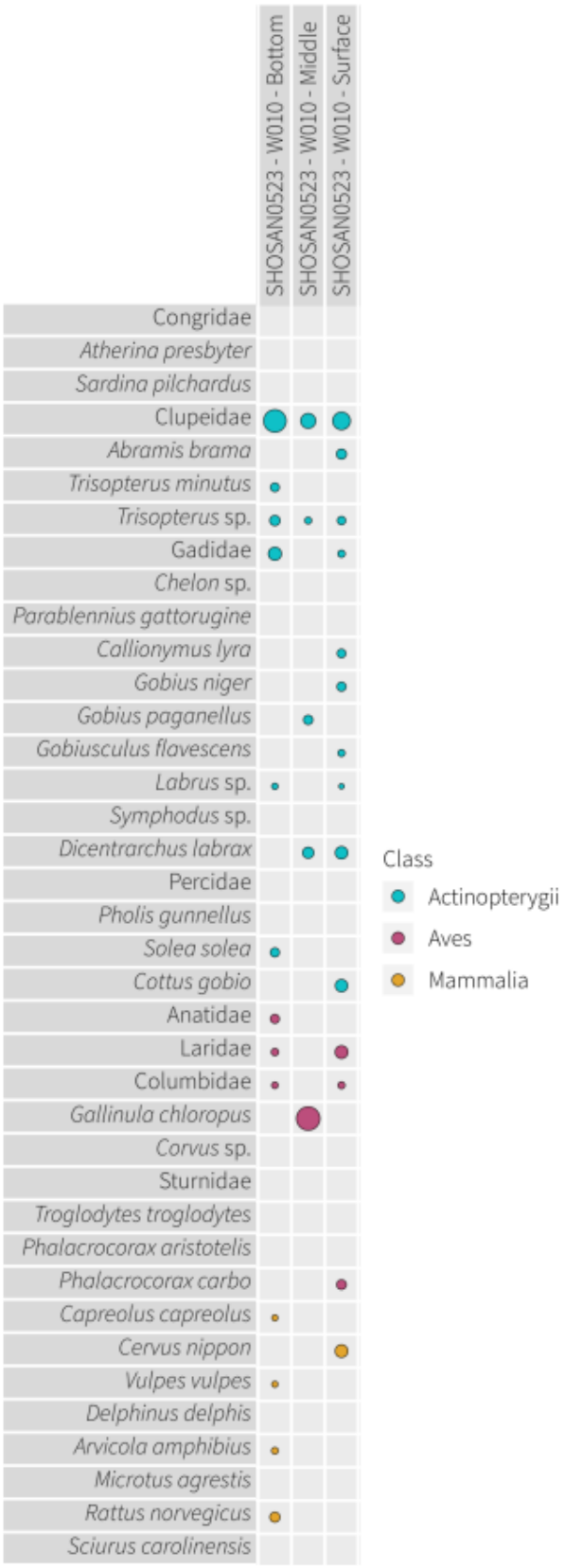

Telonema antarcticum
Telonema sp.
Cyathomonadaceae
Chroomonadaceae
Teleaulax amphioxeia
Teleaulax sp.
Geminigeraceae
Pyrenomonadaceae
Pyrenomonadales
Cryptophyceae
Katablepharidaceae
Noelaerhabdaceae
Phaeocystis sp.
Chrysochromulina scutellum
Chrysochromulina simplex
Chrysochromulina strobilus
Chrysochromulina sp.
Prymnesiophyceae
Eimeriidae
Selenidium sp.
Conoidasida
Gonyaulacaceae
Alexandrium sp.
Gyrodinium dominans
Gymnodiniaceae
Karlodinium veneficum
Polykrikos sp.
Gymnodiniales
Heterocapsa rotundata
Adenoides eludens
Peridiniaceae
Protoperidinium punctulatum
Peridiniales
Amoebophrya sp.
Amoebophryaceae
Syndiniales
Thoracosphaeraceae
Dinophyceae
Kingdom
Animalia
Chromista
Fungi
Plantae
Protozoa

Chaetoceros sp.	•	•	•
Actinocyclus curvatulus			
Hemidiscaceae	•		
Brockmanniella brockmannii	•	•	•
Ditylum brightwellii			
Stephanopyxis turris	•	•	•
Stephanopyxidaceae			
Navicula sp.	●	●	●
Naviculales	•	•	•
Rhizosoleniaceae	•		
Lauderia sp.	•	•	•
Skeletonema sp.	•	•	•
Thalassiosira oceanica	•	•	•
Thalassiosira sp.	•	•	•
Thalassiosiraceae	•	•	•
Thalassiosirales	●	●	●
Bacillariophyceae	●	●	●
Triparma pacifica	•	•	•
Synura sp.	•	•	•
Chrysophyceae	•	•	•
Pedinellaceae	•	•	•
Pedinellales			
Aureococcus anophagefferens	•	•	•
Nannochloropsis sp.			•
Sargassaceae			
Laminariales		•	•
Phaeophyceae	•	•	•
Thaumatomastix sp.	•	•	•
Peronospora sp.		•	
Plasmopara sp.	•	●	•
Pythiaceae	•	•	•
Peronosporales	•	•	•
Picomonas judraskeda	●	●	●
Picozoa	•		•
Chromista	•	•	•
Cladosporiaceae	○	○	○
Capnodiales	○	○	○
Dothideales	○	○	○

Didymellaceae		•	
Phaeosphaeriaceae	•	•	•
Pleosporales	•	•	•
Trichomeriaceae	•	•	•
Chaetothyriales		•	•
Aspergillus sp.			
Aspergillaceae	•	•	
Toniniopsis dissimilis	•	•	•
Leotiomycetes	•	•	•
Orbiliaceae	•	•	•
Candida sp.			•
Saccharomycetaceae	•	•	•
Coniochaetales		•	
Protomyces sp.	•	•	•
Taphrina sp.		•	
Ascomycota	•	•	•
Pleurotaceae		•	
Polyporales		•	
Kondoaceae	•	•	•
Cystobasidiomycetes	•	•	•
Exobasidium sp.			
Microstromatales	•	•	
Golubeviaceae	•		
Sporidiobolaceae			
Microbotryomycetes			
Cystofilobasidiales		•	•
Tremellales	•	•	•
Tremellomycetes	•	•	•
Basidiomycota		•	•
Chytridiomycota	•		•
Conidiobolus osmodes			
Bathycoccus prasinos	•	•	•
Ostreococcus tauri	•	•	•
Micromonas pusilla	•	•	•
Micromonas sp.	•	•	•
Pyramimonas australis	•	•	•
Pyramimonas disomata	•	•	•
Nannochloris sp.	•	•	•


Oocystaceae
Chlorophyta
Restionaceae
Magnoliopsida
Flabellulidae
Flamella sp.
Amoebozoa
Bicosta minor
Acanthoecidae
Stephanoecidae
Hemistasia sp.
Paracercomonas astra
Paracercomonas sp.
Apusomonadidae
Haplosporida
Ebria tripartita
Pirsonia diadema
Pirsonia guinardiae
Solenicola setigera
Protozoa

B.2 Marine water vertebrates community composition



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