



SOTEAG

SHETLAND OIL TERMINAL
ENVIRONMENTAL
ADVISORY GROUP

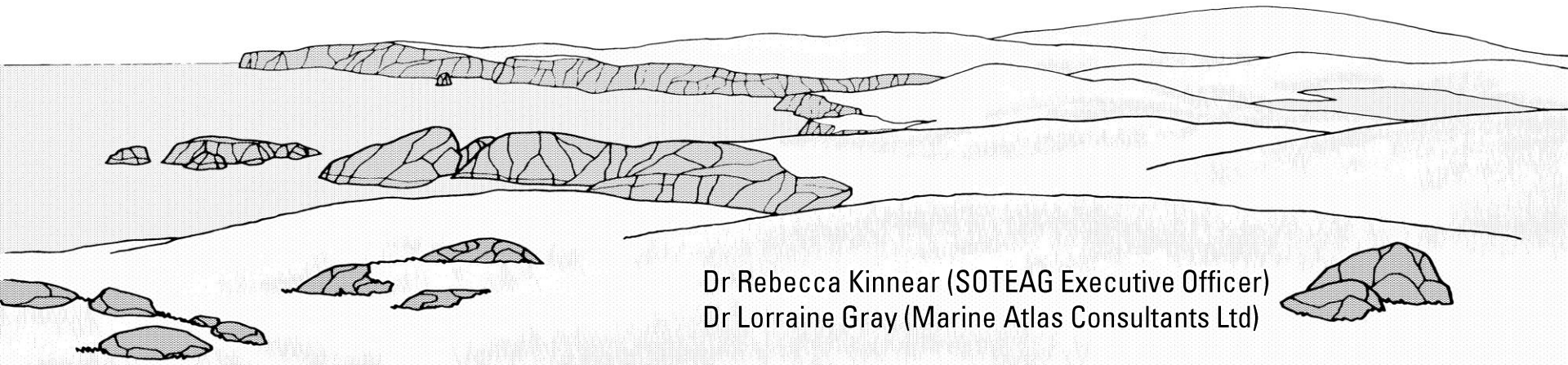


University of
St Andrews



PREMIAM conference

June 2016



Dr Rebecca Kinnear (SOTEAG Executive Officer)
Dr Lorraine Gray (Marine Atlas Consultants Ltd)





SHETLAND OIL TERMINAL
ENVIRONMENTAL
ADVISORY GROUP



SIC meeting - Update



SOTEAG's role is relevant and essential to:

- Preserve Shetlands natural heritage.
- Share the many years experience of environmentally responsible industrial activity in a sensitive environmental setting.

SOTEAG will provide early warning of environmental change and advise on remedial action, where appropriate, which if neglected, could lead to unacceptable environmental consequences.





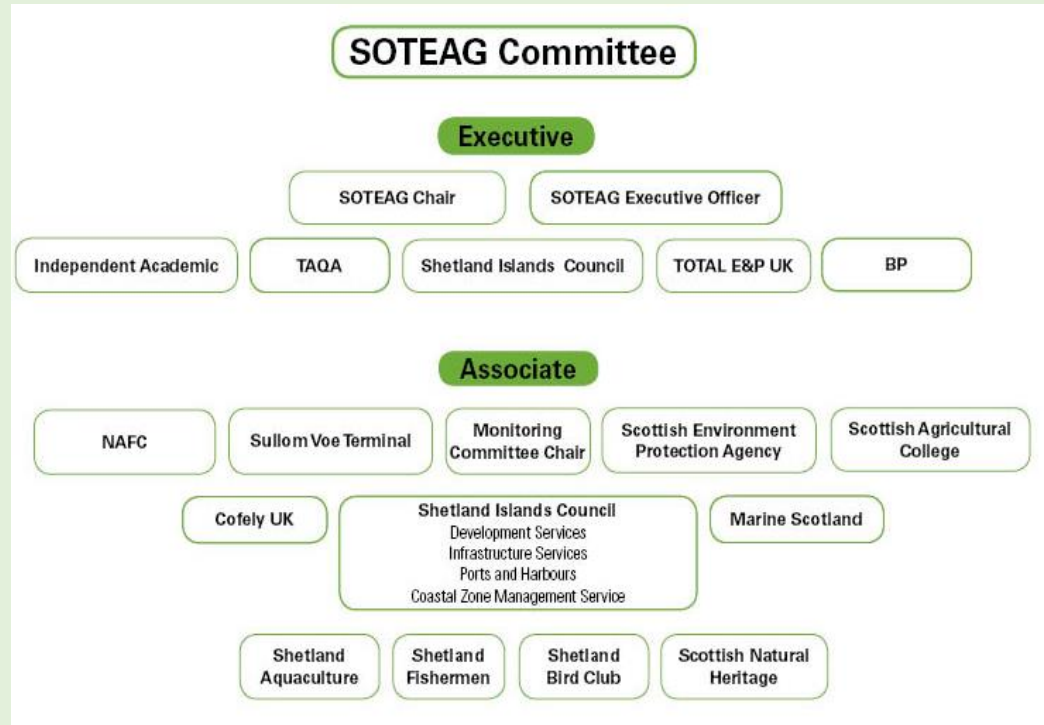
SIC meeting - Update



SOTEAG has monitored the environment around Shetland’s Sullom Voe Oil Terminal and Port for more than 3 decades.

Integrity is assured by the selection of:

- an independent Chairperson & Executive Officer
- a diverse membership drawn from academia, the oil industry, central and local government, government statutory agencies, indigenous industries and environmental NGO’s.
- The number of Oil Industry Reps and Shetland Island Councillors are always balanced.





Core environmental monitoring programme

The monitoring committee is based on the expertise of the person, not the institution to which they are affiliated.

Monitoring Programme	Frequency
Marine chemistry and macrobenthos (1978)	Biennial (even years)
Rocky shore (1974)	Annual
Dog whelks (1991)	Every three years
Seabirds (1978)	Annual

Designed to detect and measure both chronic and acute change in the surrounding environment.

It provides an up to date and accurate baseline should a spill occur.

SOTEAG is contributing to the 2015-2018 National Seabird Census with RSPB, JNCC and SNH etc.

The monitoring programme is reviewed by independent reviewers annually.



SIC meeting - Update



SOTEAG data is one of a kind; over 30 years of almost continuous environmental data for rocky shores, seabirds and marine chemistry/macrobenthos.

Reports for the last three years can be obtained through the SOTEAG website.

All SOTEAG data is being collated and is due to be deposited in nationally recognised/managed data archives.

Data will conform to MEDIN data standards (marine environmental data and information network).





Wildlife Response Co-ordinating Committee

Established 1990 and tested thoroughly by Braer (1993) Oil Spill.

The WRCC have a contingency in place to enable them to act quickly and efficiently, carrying out the collection, cleaning and rehabilitation of oiled wildlife.

A desktop exercise was carried out last year to test the procedures in place should a spill occur.

It was very useful and highlighted a number of areas that needed to be improved – however it was also a good opportunity to test the oil spill response maps.



Members

- Royal Society for the Protection of Birds*
- Scottish Environment Protection Agency*
- Scottish Natural Heritage*
- Scottish Society for the Prevention of Cruelty to Animals*
- Marine Scotland*
- Hillswick Wildlife Sanctuary
- Shetland Islands Council
- Shetland Biological Records Centre
- Sullom Voe Terminal

* Local representatives of national organisations



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SIC meeting - Update



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Marine Atlas commissioned by SOTEAG to create oil spill response maps.

- Working Group made up of local and national oil spill responders
- Huge involvement of key stakeholders in the process.
- Local Data Providers heavily involved.

The Sullom Voe maps went online August 2014. Updated oil spill response maps for Sullom Voe and Yell Sound have been created for inclusion in the Sullom Voe Harbour Oil Spill Plan and the Shetland Marine Pollution Contingency Plan.

The maps identify areas that are environmentally sensitive in the event of an oil spill and can be used to advise how to protect these areas.

The maps provide an effective visualisation of a wide array of data available.

The maps are available through the SOTEAG website as layerable pdf's, GIS, and google earth files.



The Shetland wide oil spill sensitivities maps are nearing completion and should be ready for circulation in July.



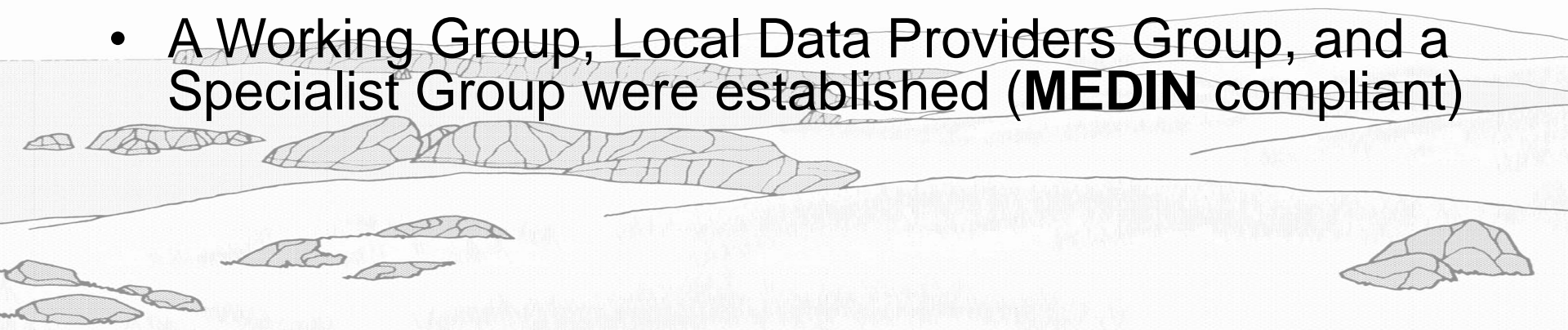
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SHETLAND OIL TERRORISM
ENVIRONMENTAL
ADVISORY GROUP

Sensitivity Maps – Working Together

High quality tactical, strategic and operational maps tailored by the oil spill responders:

- Available in GIS, Google Earth and layerable PDF - oil spill responders prefer Google Earth
- Benefited from previous exemplar work (Shetland Marine Atlas and SOTEAG) - **established fora and quality baseline data**
- A Working Group, Local Data Providers Group, and a Specialist Group were established (**MEDIN** compliant)



SHORELINE RANKING

Google Earth

- ch
- es
- My Places
- Shetland.kmz
- Shetland
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- Temporary Places



Coastal Protection and Clean-Up

Data © SOTEAG copyright (2016).

Saltmarsh; lagoon (houb); sand dune; mudflat; spit (ayre); rare plants; wildfowl / wader ground

Sensitive areas.

Avoid oil entry.

Leave alone where possible.

Gross contamination to be removed by hand tools.

Generally of high biological interest.

Physical disturbance or dispersant application may be damaging.

Oil should be prevented from entering these areas.

Recovery rate is slow.

Protective measures:

1. Containment and recovery using booms.
2. Direct to less sensitive shore to avoid wide-spread contamination.

Preferred clean-up option:

1. Containment and recovery using booms.
2. Natural cleansing.

Possible clean-up option:

1. Manual beach cleaning.
2. Sorption methods.
3. Low pressure sea water flushing.
4. Removal of oiled vegetation.

Exposed coastline; Cliffs.


Largely self-cleaning due to high energy wave exposure.

Access generally difficult.

Safety considerations are essential.

Recovery rate is moderate to fast.

SHORELINE RANKING



Source	SOTEAG. Contains BGS and Ordnance Survey data
Copyright	SOTEAG / DEFRA / Ordnance Survey
Notes	Bay dunes, rare habitat
Feature	Local Conservation Site
Ranking	Sensitive
BGS_Sediment	BOULDERS/LOOSE ROCK

BASEMAPS

Google Earth

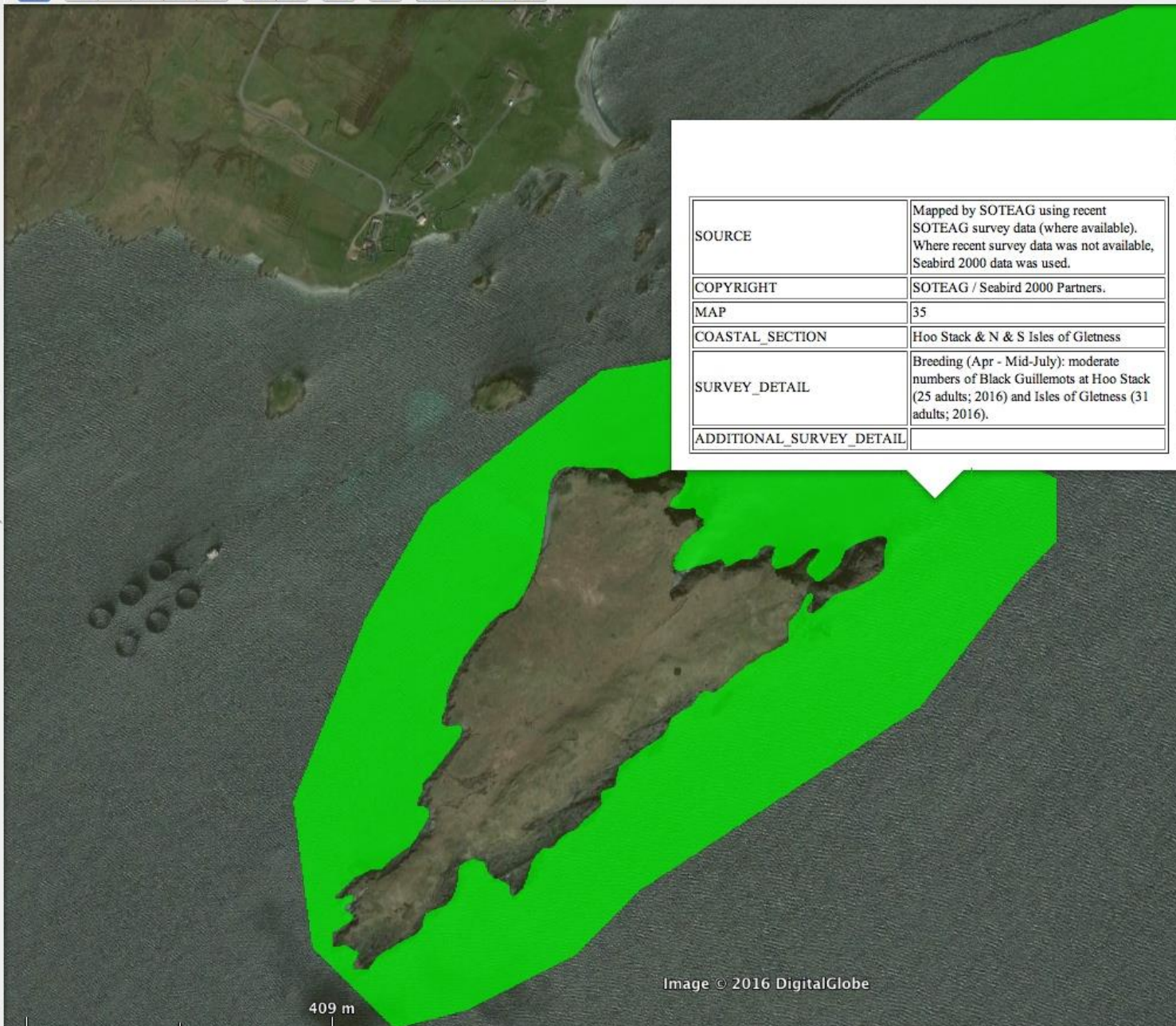


- My Places
- Shetland.kmz
- Shetland
 - Coastal Protection and Clean-Up
 - Data © SOTEAG copyright (2016).
 - Basemaps and Information
 - Supplementary Information
 - Land Contours 10m and 20m
 - Contains Ordnance Survey data © Crown copyright and
 - Place Names
 - Roads, Tracks and Paths
 - Biological Resources
 - Human Use and Activities
 - Logistical and Operational Res...
 - Temporary Places



BIOLOGICAL RESOURCES - SEABIRDS

- Places
- Shetland.kmz
 - Shetland
 - [Coastal Protection and Clean-Up Priorities](#)
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- Basemaps and Information
- Biological Resources
 - Conservation Designated Area
 - [Birds](#)
Note before use:
 - [Birds Black Guillemot](#)
Notes on Black Guillemot and their Vulnerability to Oil Pollution
 - [Birds Apr - Mid-July](#)
Note on Main Breeding Bird Species and their Vulnerability to Oil Pollution
 - [Birds Mid-July - Sept](#)
Data & copy SOTEAG copyright (2013).
 - [Birds Oct - Mar](#)
Notes on Wintering Bird Species and their Vulnerability to Oil Pollution
 - [Birds Waders \(All Year\)](#)
 - [Sea Mammals](#)
Note before use:
 - [Seabed Habitats](#)
Note before use:
 - [Human Use and Activities](#)
 - [Logistical and Operational Resources](#)
 - [Boat Access](#)
Data originally from Shetland Islands' Marine Spatial Plan (© NAFC Marine
 - [Potential for Enhanced Collection](#)
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 - [Fixed Spur Boom Sites](#)
- Temporary Places



SOURCE	Mapped by SOTEAG using recent SOTEAG survey data (where available). Where recent survey data was not available, Seabird 2000 data was used.
COPYRIGHT	SOTEAG / Seabird 2000 Partners.
MAP	35
COASTAL_SECTION	Hoo Stack & N & S Isles of Gletness
SURVEY_DETAIL	Breeding (Apr - Mid-July): moderate numbers of Black Guillemots at Hoo Stack (25 adults; 2016) and Isles of Gletness (31 adults; 2016).
ADDITIONAL_SURVEY_DETAIL	

SEABIRD CAVEATS



Birds

Note before use:

1. Not all data has been collected systematically and all areas have not been surveyed so there will be an observer bias.
2. Seabirds breeding elsewhere in Shetland can use areas as flyways, and can feed there.
3. This data was created in 2016 and has not been updated since.
4. For further bird-specific detail on oil sensitivity, click on blue map titles.

BIOLOGICAL RESOURCES - OTTERS

- Basemaps and Information
- Biological Resources
 - Conservation Designated Area
 - Birds
 - Note before use:
 - Sea Mammals
 - Note before use:
 - Otters
 - Note before use:
 - Seals
 - Note before use:
 - Porpoise
 - Note before use:
 - Seabed Habitats
 - Human Use and Activities
 - Logistical and Operational Resources
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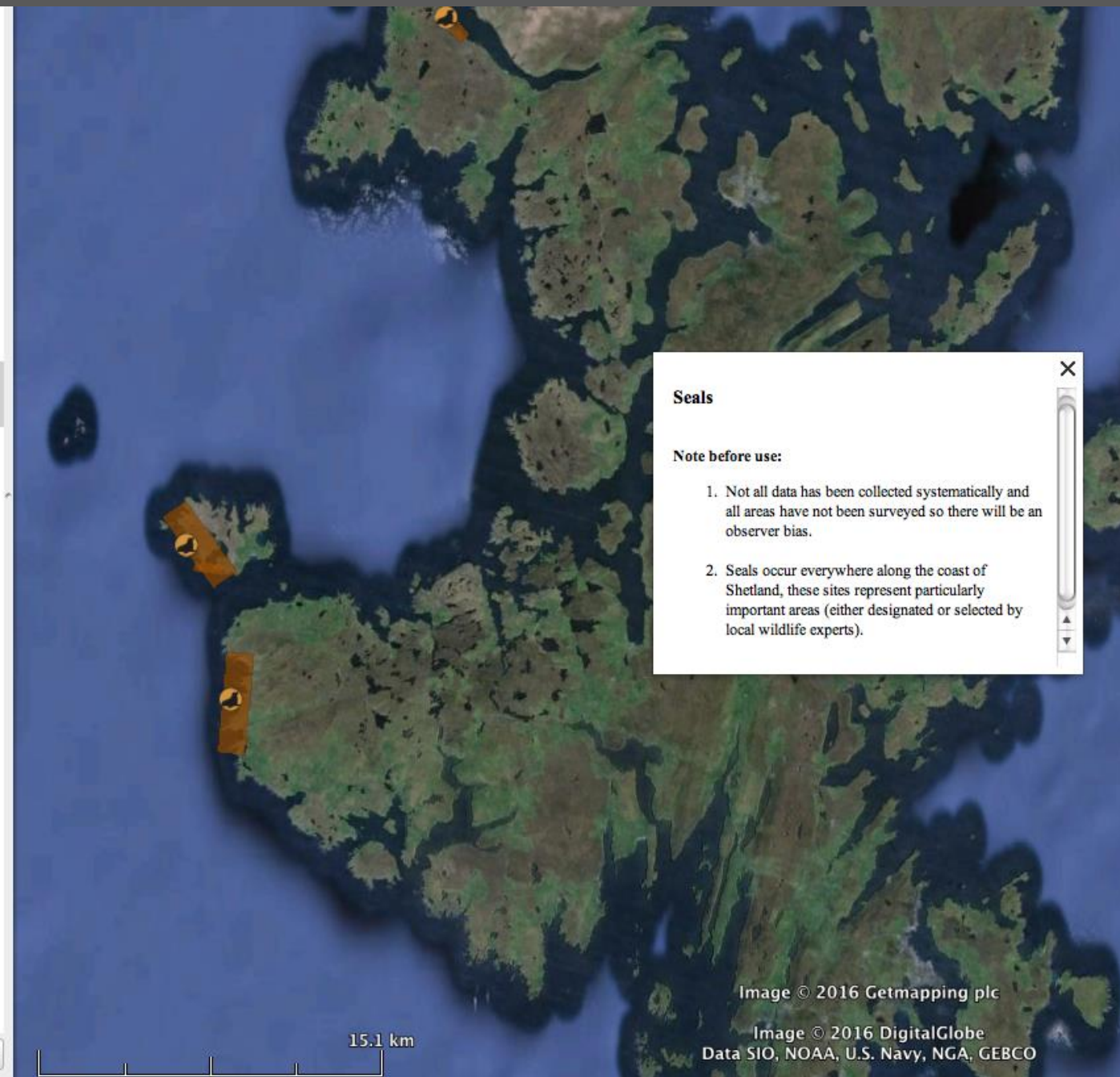


Source	Conroy, JWH & Kruuk, H. (1996). Collation of existing and new survey information for otters: North Shetland (RASD Ref RASD/094/96 N2K)
Copyright	SOTEAG / Conroy & Kruuk (1996).
Notes	Otters were mapped from this report showing key coastal areas and these were extended out to the 10m contour.
holts	12
site	dragon ness
total_individuals	8
ShetlandPopn%	1

by Gifford

BIOLOGICAL RESOURCES - SEALS

- Shetland
 - [Coastal Protection and Clean-Up Priorities](#)
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 - Basemaps and Information
 - Biological Resources
 - Conservation Designated Area
 - [Birds](#)
Note before use:
 - [Sea Mammals](#)
Note before use:
 - [Otters](#)
Note before use:
 - [Seals](#)
Note before use:
 - Oct - Nov Designated Seals (Grey)
 - June - July Designated Haul-Outs
 - Other Seal Areas
 - [Porpoise](#)
Note before use:
 - [Seabed Habitats](#)
Note before use:
 - Human Use and Activities
 - Logistical and Operational Resources
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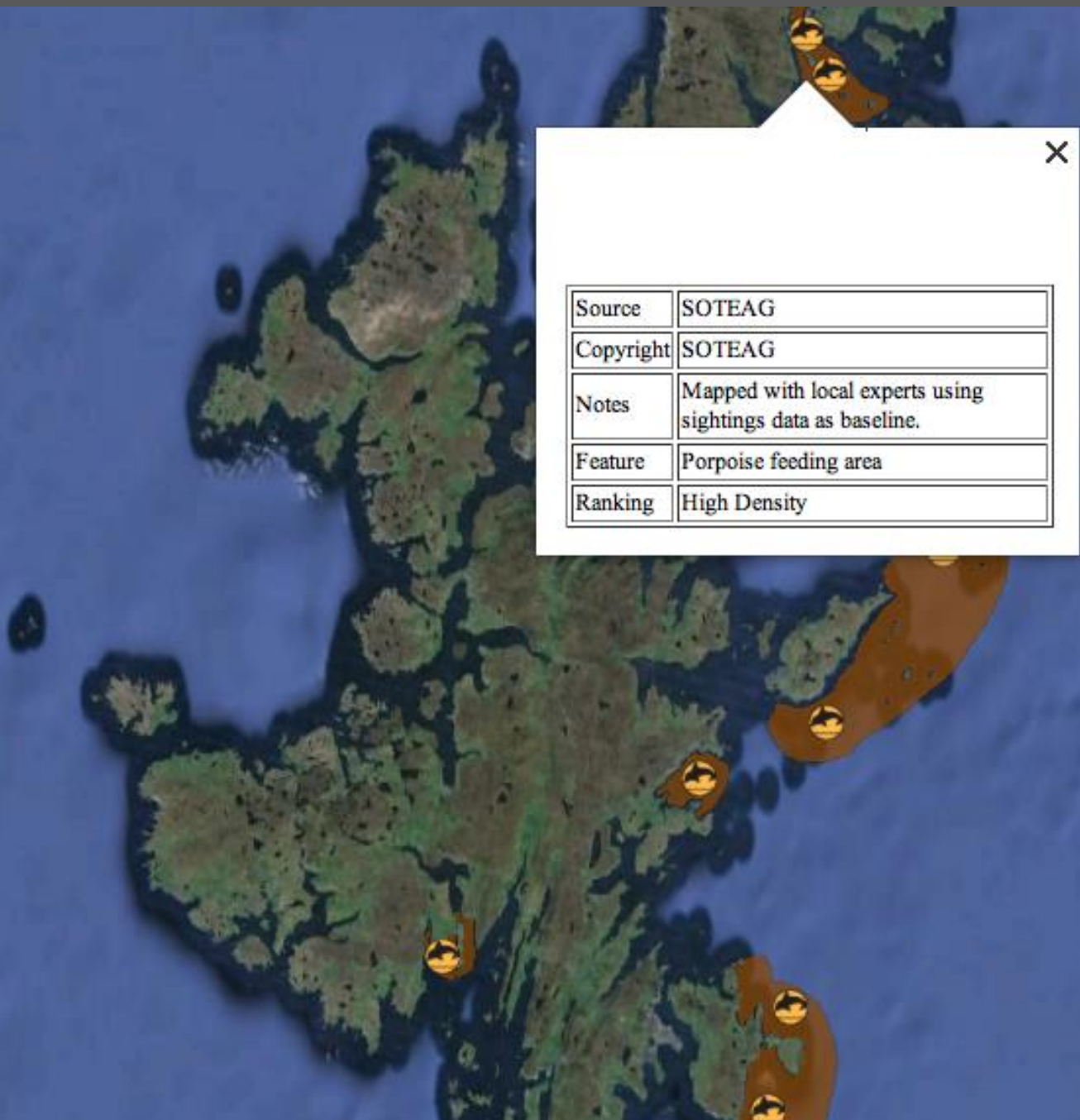


Seals

Note before use:

1. Not all data has been collected systematically and all areas have not been surveyed so there will be an observer bias.
2. Seals occur everywhere along the coast of Shetland, these sites represent particularly important areas (either designated or selected by local wildlife experts).

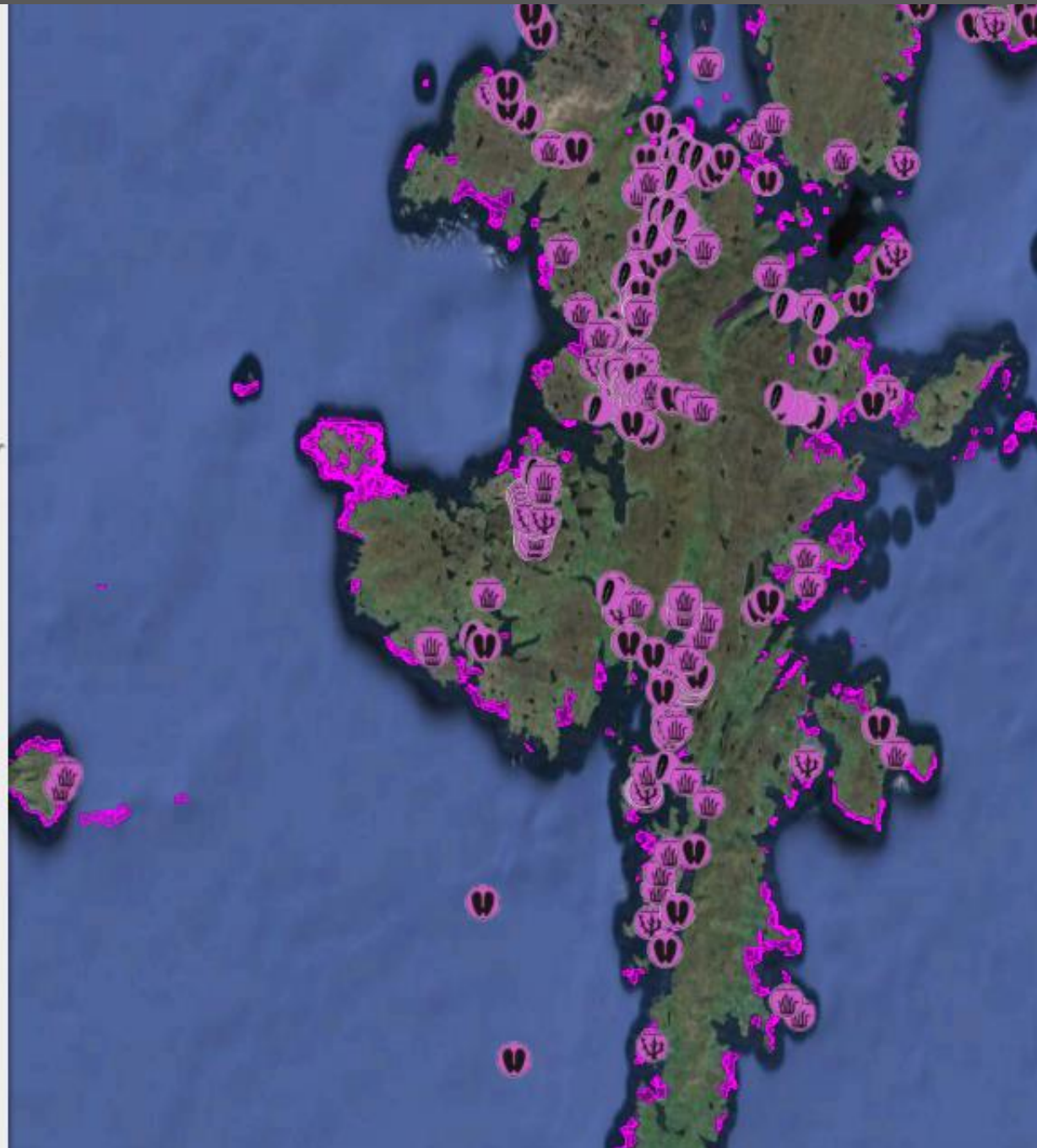
BIOLOGICAL RESOURCES - PORPOISE



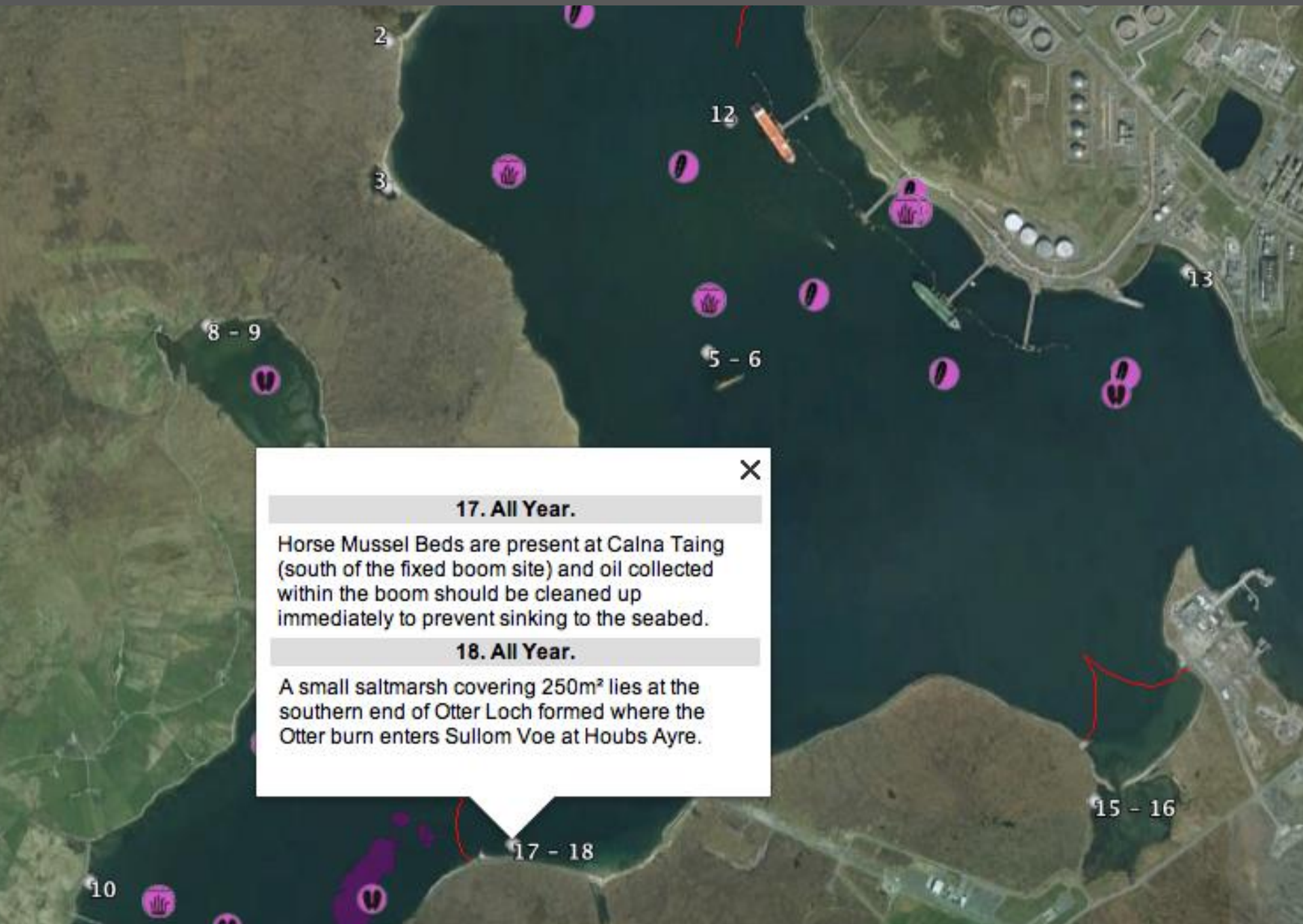
Source	SOTEAG
Copyright	SOTEAG
Notes	Mapped with local experts using sightings data as baseline.
Feature	Porpoise feeding area
Ranking	High Density

BIOLOGICAL RESOURCES - SEABED HABITATS

- [Birds](#)
Note before use:
 - [Sea Mammals](#)
Note before use:
 - [Seabed Habitats](#)
Note before use:
 - [Maerl bed](#)
Data from Shetland Islands' Marine Spatial Plan (© NAFC Marine
 - [Shellfish](#)
Data from Shetland Islands' Marine Spatial Plan (© NAFC Marine
 - [Seapen](#)
Data from Shetland Islands' Marine Spatial Plan (© NAFC Marine
 - [Algal Communities](#)
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SEABED HABITAT INTERACTIONS



17. All Year.

Horse Mussel Beds are present at Calna Taing (south of the fixed boom site) and oil collected within the boom should be cleaned up immediately to prevent sinking to the seabed.

18. All Year.

A small saltmarsh covering 250m² lies at the southern end of Otter Loch formed where the Otter burn enters Sullom Voe at Houbs Ayre.

HUMAN USE AND ACTIVITIES - AQUACULTURE

- ▼ Biological Resources
- ▼ Human Use and Activities
 - ▼ [Aquaculture](#)

Note that some sites may not be occupied with fish / shellfish despite there being

 - ▶ Shellfish Sites
 - ▶ Finfish Sites
 - ▶ Fishing
 - Note before use:**
 - ▶ [Water Intake](#)

Data © SOTEAG copyright (2016).
 - ▶ [Water Supply](#)

Data © SOTEAG copyright (2013).
Source: Environmental Health Services,
 - ▶ [Oil Pipeline Landing](#)

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 - ▶ [Archaeology](#)

Data © Shetland Amenity Trust copyright (2014).
- ▼ Logistical and Operational Resources
 - ▶ [Boat Access](#)

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- Temporary Places



AQUACULTURE DETAIL

An aerial photograph of a mussel farm in Cribba Sound, showing rows of floating rafts in the water. A blue pin icon is placed on the map, and a white popup window with a close button (X) and a scrollbar is open, displaying a table of details for the selected site.

Owner	Cribba Sound Ltd
Contact	Lindsay Angus
Detail	01806 533345
Site_ref	2
Species	Mussels
Area_Name	Vementry
Location	Cribba Sound
WL_ID	2002/100/VS
Longitude	-1.453783
Latitude	60.318996

91 m

HUMAN USE AND ACTIVITIES - FISHERIES

Fishing

Note before use:

- [Moderate Intensity Fishing \(Dredging and](#)
Data © NAFC Marine Centre. No metadata exists for this data but details
- [Moderate Intensity Fishing \(Creeling\)](#)
Data © NAFC Marine Centre. No metadata exists for this data but details
- [High Intensity Fishing \(Dredging and Tr](#)
Data © NAFC Marine Centre. No metadata exists for this data but details
- [High Intensity Fishing \(Creeling\)](#)
Data © NAFC Marine Centre. No metadata exists for this data but details

Water Intake

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Water Supply

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Source: Environmental Health Services,

Oil Pipeline Landing

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Archaeology

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Logistical and Operational Resources

Boat Access

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Potential for Enhanced Collection

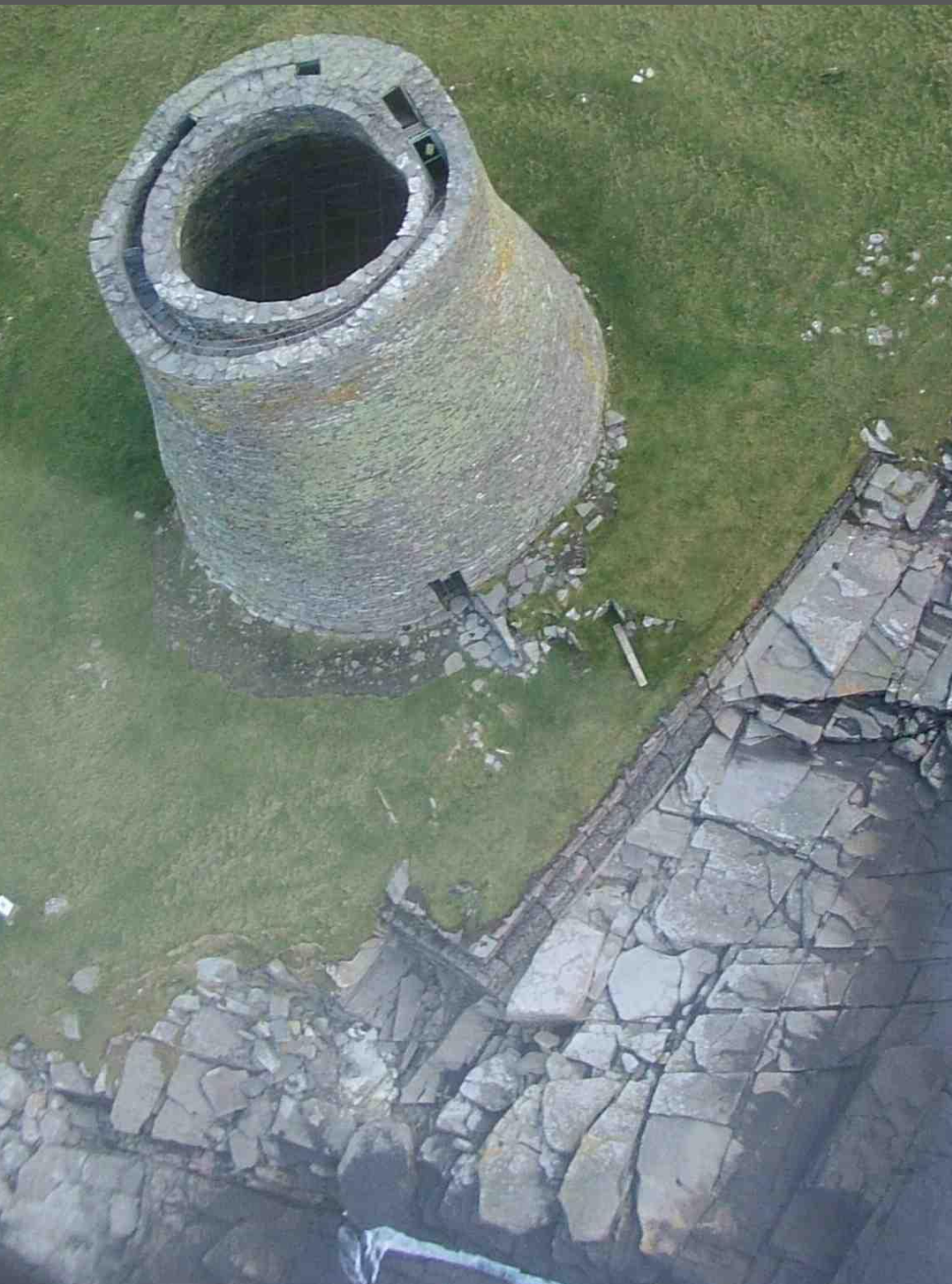
Out of bounds to volunteers

Fixed Spur Boom Sites

Temporary Places



IMPACTS ON OTHER HUMAN USE ASSETS



- **Archaeology** is particularly vulnerable during **clean-up**.
- **Industries** that rely on seawater for operations e.g. **power station & proposed gas plant intakes**.
- A number of houses have vulnerable **Private Water Supplies**.



LOGISTICAL AND OPERATIONAL RESOURCES – PIERS AND SLIPWAYS

- Shetland.kmz
- ▼ Shetland
 - ▶ [Coastal Protection and Clean-Up Priorities](#)
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 - ▶ Basemaps and Information
 - ▶ Biological Resources
 - ▶ Human Use and Activities
 - ▼ Logistical and Operational Resources
 - ▼ [Boat Access](#)
Data originally from Shetland Islands'
Marine Spatial Plan (© NAFC Marine
 - ▶ Pier or Jetty
 - ▶ Slipway
 - ▶ Potential for Enhanced Collection
 - ▶ Out of bounds to volunteers
 - ▶ Fixed Spur Boom Sites
 - ▶ Temporary Places



LOGISTICAL AND OPERATIONAL RESOURCES – ENHANCED COLLECTION

- ces
- and.kmz
- etland
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- asemaps and Information
- iological Resources
- uman Use and Activities
- ogistical and Operational Resources
- [Boat Access](#)
- Data originally from Shetland Islands' Marine Spatial Plan (© NAFC Marine
- Potential for Enhanced Collection
- Collection Beach – Easy Access
- Collection Beach – Sensitive
- Collection Beach – Difficult Access.kmz
- Out of bounds to volunteers
- Fixed Spur Boom Sites
- rinary Places



Source	SOTEAG
Copyright	SOTEAG
Feature_Name	St Ninians
Feature	Sand dune, tourism
Feature_Classification	Sensitive

Image © 2016 DigitalGlobe
Image © 2016 Getmapping plc

554 m

LOGISTICAL AND OPERATIONAL RESOURCES – OUT OF BOUNDS

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 - Fixed Boom / Enhanced Collection Beach
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 - Sensitive
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 - PROTECTION AND CLEAN UP
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SOTEAG – 39 YEARS OF IMPACT MITIGATION

Comprehensive contingency planning, consisting of:

- Pre-agreed clean up techniques and strategy;
- Identification of key sensitivities;
- Incorporating past spill experience;
- Regular exercises and training.



Photo courtesy of RSPB



Thank You
Any questions?

