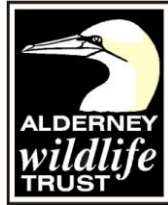


ALDERNEY WILDLIFE TRUST

Annual Ramsar Project Review 2014



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Executive Summary

Storms in the Channel throughout February caused a seabird wreck that caused the fatality of nearly 50,000 seabirds, half of which were puffins, with implications for colonies within the Ramsar site and its associated areas (**Section 1.2**).

The puffin population decreased to 143 AOB (from 168 AOB in 2013), most likely as a result of the seabird wreck, and productivity decreased to between 0.36 and 0.60 (**Section 2.1.1**).

A full AON count for all three gull species' shows an increase in population for all three whilst productivity was much higher than in 2013 with nearly 300 chicks ringed between them (**Section 2.1.2**).

Storm petrel ringing conducted for the first time since 2008; despite reduced effort total numbers caught were very high, 433, indicating an increasing population level, 2,800 individuals (after review of population estimate techniques) (**Section 2.1.4**).

A public awareness campaign was launched to promote community driven conservation of the ringed plover breeding sites. This aided the expansion of the colony and increased productivity (**Section 2.1.7**).

University of Liverpool PhD continued with 28 gannets tagged, 15 with accelerometers. 18 tags were recovered (although 5 were corrupt) with 11 accelerometers. Shag tagging was discontinued but gannets were expanded to include the trial of remote download tags on two individuals (**Section 2.1.9**).

A series of marine surveys were implemented both within the Ramsar Site and around Alderney. This included a marine intertidal habitat survey, intertidal species assessments and marine mammal species surveys (**Section 2.2**).

Ramsar commitment to research expanded by incorporating an intertidal and sub-tidal MSc project from the University of York (**Section 2.2.4**) and an invasive rat presence project from Nottingham Trent University (**Section 2.5.1**).

The associated islet of Casquets was surveyed for the first time in the Ramsar management, incorporating ornithological, entomological, marine, intertidal and botanical surveys (**Section 2.4**).

The work of the AWT and the Ramsar site were promoted via national TV pieces with The One Show (BBC) in the UK and Des Racines et des Ailes (Channel 3) in France; whilst on island promotion and awareness continued through a full schedule of events and tours (**Section 2.6**).

The rebranded LIVE: Teaching Through Nature project expanded to include input from The Birds on the Edge project, via Durrell Conservation Trust; a total of 72 schools actively participated (**Section 2.6.5**).

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1. Introduction

2014 is the third year of work within the second five-year management strategy for the Alderney West Coast and Burhou Islands Ramsar Site, Alderney Ramsar Strategy 2 (ARS2), establishing ecological baselines and trends; carried out by the Alderney Wildlife Trust (AWT) on behalf of the States of Alderney (SoA). This report describes and analyses the work program for 2014 and reviews results against the work plan and recommendations for the year laid out in ARS2 and the 2013 annual project review.

1.1 A Note on Previous Reports

After the publication of the 2013 Ramsar Report a change was discovered in some of the figures quoted for seabird populations when compared to the data in the original reports. Lesser black-backed gull and herring gull numbers for 2005-2007 had been adjusted, as shown in **Table 1**.

Table 1. Historical gull spp. population total review

Species	Year	Population quoted in 2005-2009 reports	Population quoted in 2011-2013 reports
Herring Gull	2005	217	202
	2006	123	109
	2007	170	148
Lesser Black-backed Gull	2005	1085	1103
	2006	923	937
	2007	972	994

In 2010, in preparation for Soanes *et. al.* (2010), Charles Michel checked all the original results using the total nest count and ratio of herring gulls to lesser black-backed gulls from each year. He found small errors in the original calculations, and by redoing them he arrived at the values that were subsequently quoted in the 2011-2013 reports, **Table 1**. To confirm these changes the calculations that were completed are as follows:

In 2005 there was a ratio of 1 HG to 5.46 LBBG in a total of 1,305 nests so:

- $1,305/6.46 = \mathbf{202\ HG} * 5.46 = \mathbf{1,103\ LBBG}$

In 2006 there was a ratio of 1 HG to 8.5 LBBG in a total of 1,046 nests so:

- $1,046/9.5 = \mathbf{110\ HG} * 8.5 = \mathbf{936\ LBBG}$

In 2007 there was a ratio of 1 HG to 6.7 LBBG in a total of 1,142 nests so:

- $1,142/7.7 = \mathbf{148\ HG} * 6.7 = \mathbf{994\ LBBG}$

These figures correspond to Charles' change in the data (with a discrepancy of 1 for the 2006 values). The 2013 report was adjusted after publication to reflect the values in bold above. This preface serves as a confirmation of these results so that the correct gull

population values are carried forward in to all subsequent reports, and as a note on the reason for the different values quoted in the 2005-2009 reports.

Additionally shag populations levels for 2007 and 2011 were recorded as 31 and 20 respectively in the Ramsar 2012-2016 Management Plan. However, in the original 2007 and 2011 reports they were actually recorded as 19 and 23 respectively. The values were not quoted in any other report aside from the original year of recording reports and the 2012-2016 Management Plan until the 2013 Ramsar Report. The 2013 Ramsar Report was again adjusted after publication, this time to reflect the data in the original reports.

Storm petrel ringing data has also been corrected from previous reports allowing for a new and more accurate population estimate (**Section 2.1.4**).

All corrections are reflected in the full population table in **Appendix 5.1**.

1.2 Seabird Wreck

2014 was a year of particular importance for ascertaining the health of seabird colonies through continued, and expanded, monitoring works due to the seabird wreck of February and March. Back-to-back storms in the English Channel throughout February meant that migratory seabirds were not able to feed efficiently and many died as a result. Over 47,000 seabirds washed up dead around Western Europe, over half of them were puffins. To put into context, the Torrey Canyon oil spill disaster killed around 15,000 seabirds, so the wreck is 3 times worse. Additionally, due to Alderney's rapid tides birds washing up here are rare, usually just a dozen a year, but in 7 weeks through February and March 138 dead seabirds washed up on Alderney's shores.

It was confirmed through the autopsy of guillemots (*Uria aalge*), carried out by the Groupe Ornithologique Normand (GONm), AWT and Alderney Animal Welfare (AAW) staff on the 22nd and 23rd March 2014, that the birds were in an emaciated state and most likely died of drowning (evidenced by spume in the lungs) caused by starvation (**Table 2**).

Table 2. Guillemot autopsy results

ID	Corpse Condition	Oiled	Pectoral Muscle	Fat (Chest)	Fat (Intestine)	Stomach Contents	Lung Condition
ALD-001	Fresh	No	Emaciated	None	Some	Empty	Spume
ALD-002	Rather old/Old	No	Moderate	None	None	Empty	n/a
ALD-003	Rather fresh	No	n/a	None	n/a	n/a	n/a
ALD-004	Fresh	No	Emaciated	None	Some	Empty	Good
ALD-005	Fresh	No	Emaciated	None	Marked	Empty	Spume
ALD-006	Very old	No	n/a	n/a	n/a	Empty	n/a
ALD-007	Rather old	No	Moderate	None	Some	Empty	n/a
ALD-008	Fresh	No	Moderate	None	Marked	Empty	Good
ALD-009	Rather fresh	No	Emaciated	None	None	Empty	Spume
ALD-010	Rather fresh	No	Emaciated	None	Marked	Empty	Good
ALD-011	Fresh	No	Emaciated	None	None	Empty	n/a
ALD-012	Fresh	No	Emaciated	Some	Marked	Empty	Good

Whilst populations of seabirds in the Ramsar site did not crash as originally feared some species did suffer from poor seasons compared to previous years (**Section 2.1**). However, as recruitment of juveniles may be impacted the next five years could all see populations respond to the seabird wreck, something that will be monitored in future breeding seasons. The final data for Auk deaths, and total seabird deaths, is shown in **Table 3**.

Table 3. Total death toll of Auks and overall total, by region, in February-March seabird wreck

	Puffin	Razorbill	Guillemot	Total
PORTUGAL	121	9		163
SPAIN	277	99	1410	1989
FRANCE				
SW (Biscay to S Brittany)	24,347	772	10,472	36,909
West Cotentin				430
CHANNEL ISLANDS				
Alderney	9	46	43	138
Jersey	104	397	323	1,022
Guernsey	3	21	52	97
Sark	3	4	5	14
ENGLAND				
Isles of Scilly	7			24
Cornwall	75			1651
Devon	6	902	1311	338
Dorset	27			1117
Hampshire Coastline	2			55
Isle of Wight	2	10	20	38
East/West Sussex & Brighton	34	149	87	330
Kent				3
Suffolk				4
Norfolk			3	17
Lincolnshire				8
East Riding of Yorkshire			5	18
Cleveland			1	6
Durham			1	1
Northumberland			10	39
Cumbria		317	177	580
WALES	8			656
SCOTLAND		90	370	1797
SHETLAND			49	239
NORTHERN IRELAND		43		84
	25025	2859	14339	47767

NB. Data sourced for **Table.3** from personal communications with staff of non-governmental organisations (NGO's) and local government participating in the response to, and clean-up of, the seabird wreck:

- Spain – Sociedad Española de Ornitología (SEO, Birdlife)
- France – Groupe Ornithologique Normande (GONm) and Ligue pour la Protection des Oiseaux (LPO)
- Channel Islands – Alderney Wildlife Trust (AWT), Durrell Conservation Trust (DCT) and States of Guernsey
- United Kingdom – Royal Society for the Protection of Birds (RSPB)

2. Work Areas

2.1 Seabirds

Population and productivity monitoring continued throughout 2014 for the 10 species previously monitored, using the standardised monitoring techniques and forms as detailed in the Annual Ramsar Project Review 2013 (Morley, 2013). Results for each species are described in **Sections 2.1.1 – 2.1.8** and a full historical record of all population trends are presented in **Appendix 5.1**.

2.1.1 Atlantic Puffin (*Fratercula arctica*)

Due to the potential impacts the seabird wreck (**Section 1.2**) could have had on the puffin colony it was decided at the beginning of the season that monitoring effort should be focused on the main area of the existing colony to try and ascertain its recovery and health. As such, raft counts continued throughout the season, focusing on the south bay besides the main colony. Vantage point watches to ascertain apparently occupied burrows (AOB) were also focused on the main colony with extra surveys carried out on the extended colony when timings allowed.

The puffins arrived back on Burhou on the 10th April, three weeks later than expected. This was probably due to the seabird wreck delaying the arrival of most seabird species' and causing turbid waters prohibiting foraging opportunities. Consequently it was predicted that the Burhou colony would decrease in 2014 due to direct deaths in the seabird wreck, or due to a lack of breeding quality individuals amongst the survivors.

Puffin monitoring continued to utilise raft counts within 200m of the shore around Burhou and AOB counts, gathered from vantage point watches and burrow entrance checks, to ascertain population and productivity.

Population monitoring

Figure 1 shows that AOB did decrease, as predicted by the seabird wreck, whilst the raft counts also declined. The final counts indicate the population was not as negatively and immediately impacted as initially predicted. However, it is possible that effects of the wreck will be seen within the colony for the next five years as recruitment of juveniles is impacted. **Figure 2** shows the distribution of the puffin colony on Burhou.

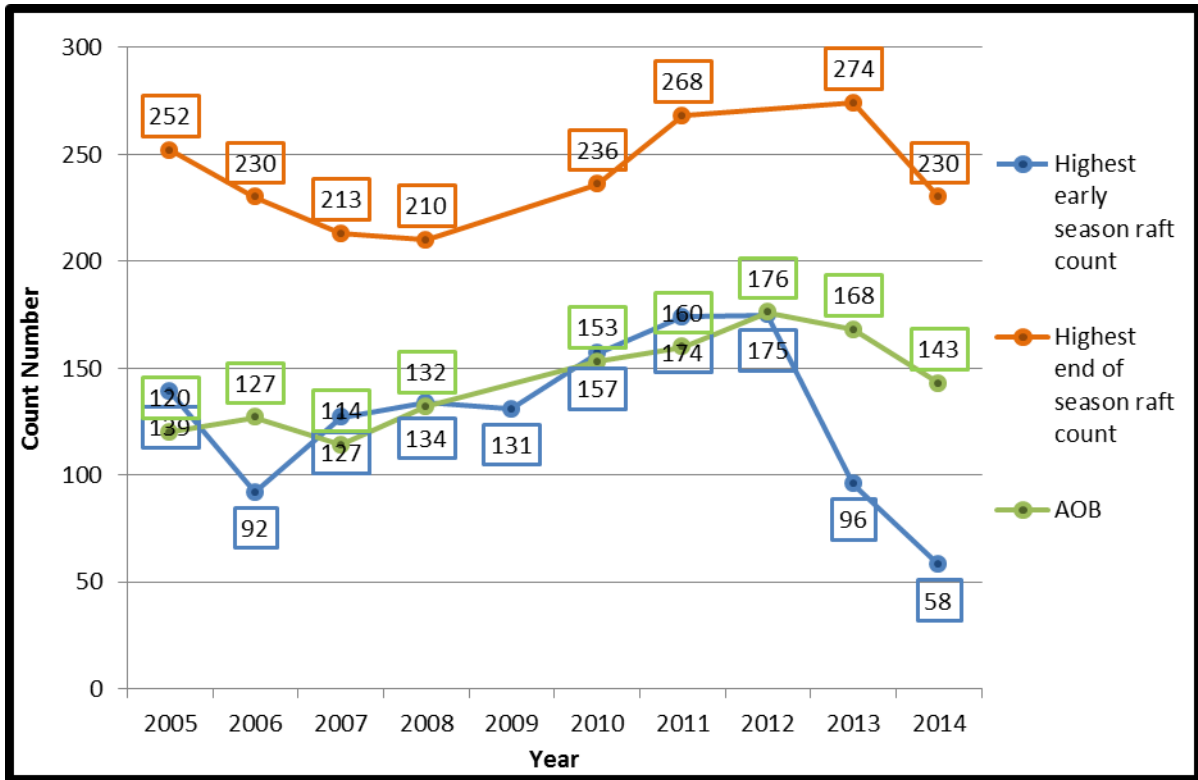


Figure 1. Annual population counts of puffins since 2005



Figure 2. Distribution of puffin burrows on Burhou

- Hannaine population

Aside from the population on Burhou puffins continue to be sighted in the water by Hannaine stack. Maximum raft counts of two individuals indicate that up to two pairs again attempted breeding on the stack. Regular monitoring was not carried out in 2014 but rat presence surveys were conducted (**Section 2.5.1**) to ascertain the viability of protecting the colony from predation in subsequent seasons.

- Gull exclusion zone

Whilst the removal of gull nests is sanctioned, depending on species and distance from puffin burrows, by ARS2 the gulls continue to nest a considerable distance from the puffin colonies and therefore no removal of nests was required in 2014.

Productivity monitoring

Productivity was determined by ascertaining active burrows within a sample of the colony during the incubation stage of breeding, with the same burrows then monitored for the presence of fish carrying adult (as indicator of chick rearing) during July. Monitoring was focused on the main colony, by the hut on Burhou to allow for the largest sample possible given work force and timing constraints.

However, the storms appeared to cause an unexpected impact on Burhou detrimentally impacting the ability to monitor the colony this closely. The flooding on Burhou, followed by a hot summer, caused the grass to grow much longer than usual. The flooding is also believed to have impacted the rabbit population, decreasing it to a level where the amount of vegetation eaten down by rabbits was greatly reduced. Therefore, the long grass, and prolonged period in which it remained such on Burhou, meant that the location markers for puffins could not be seen across most of the colony during the chick rearing stage and when puffins landed their exact location was hidden despite the use of maps of the colony.

Consequently the actual productivity value for puffins in 2014 can only be given as an estimated range rather than a precise figure. Monitoring between the 15th May and 4th June indicated 25 AOB before the first puffin carrying fish was seen on the 5th June. Monitoring between 5th June and 8th July showed between 9 and 15 of these AOB to still be active with chicks inside. Therefore, productivity: $9/25$ to $15/25 = 0.36$ to 0.60 . This is lower than in previous years (**Table 4**), likely due to the turbid waters after the storms prohibiting effective foraging and condition of the surviving adults not being fully fit for breeding.

Table 4. Puffin productivity since 2005

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Productivity	0.64	0.61	0.63	0.65	-	0.66	0.66	-	-	0.36 – 0.60

2.1.2 Gulls (*Larus spp.*)

All three species of gull; lesser black-backed gull (*Larus fuscus*), herring gull (*Larus argentatus*) and great black-backed gull (*Larus marinus*), were monitored for population on Burhou using apparently occupied nest counts (AON) from within the colony whilst AON counts were conducted for the Alderney population from offshore using the boat. The movement of chicks outside the nest once hatching make productivity plots near impossible for all three species' so breeding success continues to focus on the results of the chick ringing scheme.

Population monitoring

- Burhou

The gull population census was completed on 31st May. The regular methodology of a three person team systematically going through the entire colony and marking nests with a piece of pasta was used to locate every nest; nests with 0 eggs were also counted if they were in good condition as these nests will still be being defended as active territories.

Great black-backed gull eggs and chicks are noticeably larger than the other two species and could therefore be differentiated from whilst going through the colony. However, herring gull and lesser black-backed gull eggs and chicks are very similar at this stage so they could not be differentiated between at such an early stage of nesting. In previous years vantage points were chosen around the colony to do head counts of lesser black-backed gull to herring gull ratio. This ratio was then used to determine the number of nests counted that should belong to the two species. However, with the decline in herring gull population since surveys began in 2005 the number of herring gulls can now be counted by using a scope on the colony from vantage points and counting every individual herring gull to be confirmed as incubating a nest.

Using these methods the gull AON count was completed for all three species (**Table 5**) and positioned on a map of Burhou (**Figure 3**).

Table 5. Gull spp. AON since 2005

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Lesser black-backed gull	1103	936	994	1001	640*	1074	1236	991**	-	1392
Herring gull	202	110	148	164	52*	85	73	5	18	32
Great black-backed gull	18	18	16	17	-	23	23	4	1	6

*Partial colony count only; **AOS not AON



Figure 3. Location of gull spp. AON on Burhou

- Alderney

Due to inaccessibility of much of the Alderney cliff line the count of AON for gulls on the mainland was conducted by boat on the 29th May. However, the distance involved in monitoring from a slightly unstable platform using binoculars meant that individual species could not be deciphered. As such an AON count of 315 includes all three gull species' with anecdotal and observational evidence indicating a noticeable majority being herring gull.

Productivity monitoring

Chick ringing was conducted mainly on the 12th and 13th July when the majority of chicks were of an age to take the ring. Additional ringing was conducted on the 19th to 21st July during the storm petrel ringing (**Section 2.1.4**) trip to Burhou as the added personnel on Burhou allowed for a quick and thorough sweep of the colony to find any remaining chicks.

The ringing was led on each occasion by Paul Veron (fully trained ringer). Catherine Veron (fully trained ringer) and Tim Morley (AWT staff) assisted on the first trip; whilst on the second trip Chris Mourant (fully trained ringer), Ian Buxton (fully trained ringer), Phil Alexander (trainee ringer), Tim Morley and Nicola Cox (AWT staff) were all present.

On the 12th and 13th July 209 lesser black-backed gull and 11 herring gull chicks were ringed on Burhou. An additional 67 lesser black-backed and 4 herring gulls were ringed between the 19th and 21st July on Burhou with 3 herring gull and 2 great black-backed gull chicks also ringed on Little Burhou during this trip.

These ringing results indicate a much more successful breeding season for all gull species'. However, the questions formulated in the Annual Ramsar Project Review 2013 (Morley, 2013) continue to be proposed in order to explain the drastic variation in breeding output from year-to-year. As such a PhD proposal has been submitted to the University of Liverpool to study lesser black-backed gull foraging habits and productivity on Burhou, and Sark/Lihou for comparison; subject to funding study could start work as early as 2016 (**Appendix 5.2**).

Table 6. Gull spp. chick ringing totals since 2003

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Lesser black-backed gull	308	-	386	140	-	3	281	335	11	202	28	276
Herring gull	16	-	-	3	-	1	8	17	6	4	12	18
Great black-backed gull	-	-	-	-	-	0	5	0	1	4	1	2

2.1.3 European Shag (*Phalacrocorax aristotelis*)

As initiated in 2013 by the University of Liverpool PhD (**Section 2.1.9**) the shag monitoring continues not just for Burhou, but also on Little Burhou, Coque Lihou and cliffs of Alderney.

Population and productivity monitoring

Shag apparently occupied nests (AON) on the islets of Burhou, Little Burhou and Coque Lihou are determined by surveys conducted walking around them; therefore nests are checked for productivity on all surveys. However, due to Little Burhou and Coque Lihou being harder to access the counts on these locations are limited to two trips: one during incubation to identify all AON (5th May, Little Burhou; 14th June, Coque Lihou), and one when chicks are close to fledging to ascertain productivity (29th June, Little Burhou; 3rd July Coque Lihou). Due to the limited surveys these results should be considered a minimum only. Burhou population was surveyed about every 7 days (**Figure 4**).

The inaccessibility of the cliffs of Alderney means that the whole population can only be counted from boat; this count was conducted on 17th May by three staff members to ensure an accurate count. AON and productivity results for all locales can be viewed in **Table 7**.

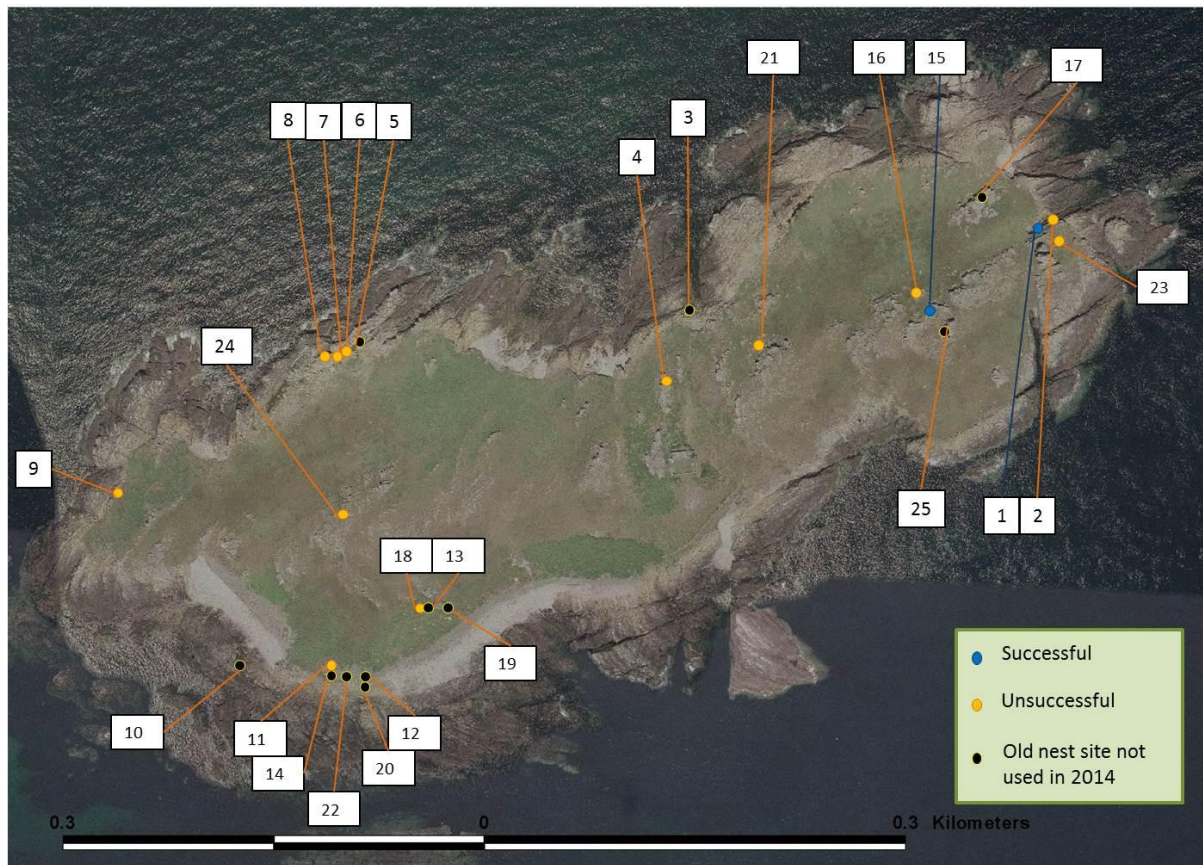


Figure 4. Map of shag AON on Burhou

Table 7. Shag AON and productivity since 2007

Location	2007	2008	2009	2010	2011	2012	2013	2014
Burhou	19	21 (0.14)	19 (0.21)	24	23	20 (1.24)	21 (0.57)	14 (0.21)
Alderney	-	-	-	-	-	-	18* (1.00)	51** (0.41)
Little Burhou	-	-	-	-	-	-	35 (0.74)	36 (0.61)
Coque Lihou	-	-	-	-	-	-	77 (0.69)	66 (0.62)

*Monitored nest count only; **Full AON count, of which 17 monitored for productivity

2.1.4 Storm Petrel (*Hydrobates pelagicus*)

The nesting habits of storm petrels, in burrows and rock cavities, means that surveys can only be carried out by playback or ringing. Equally these can only be conducted at night due to storm petrels only returning to nests at night to avoid predators. The aim is to combine both playback and ringing techniques to fully describe the storm petrel population of Burhou; however time constraints mean that in 2014 only ringing was conducted and personnel constraints meant that as many mist nets were not erected as initially hoped.

Two nights of ringing were conducted between the 19th and 21st July; led by Chris Maurant the extraction of birds from the nets and ringing was conducted by Chris, Paul Veron, Ian Buxton and Phil Alexander with AWT staff in attendance to assist with equipment. Ideally six fully trained ringers would be present so that eight mist nets can be used in two groups in different locations on Burhou. However, with three fully qualified ringers, one trainee and two non-ringers present only four mist nets could be erected on the first night and three on the second.

On the first night the four nets were positioned in a SE direction on the eastern end Burhou, whilst on the second night the three nets were positioned running up the gulley going towards the NE corner (**Figure 5**).

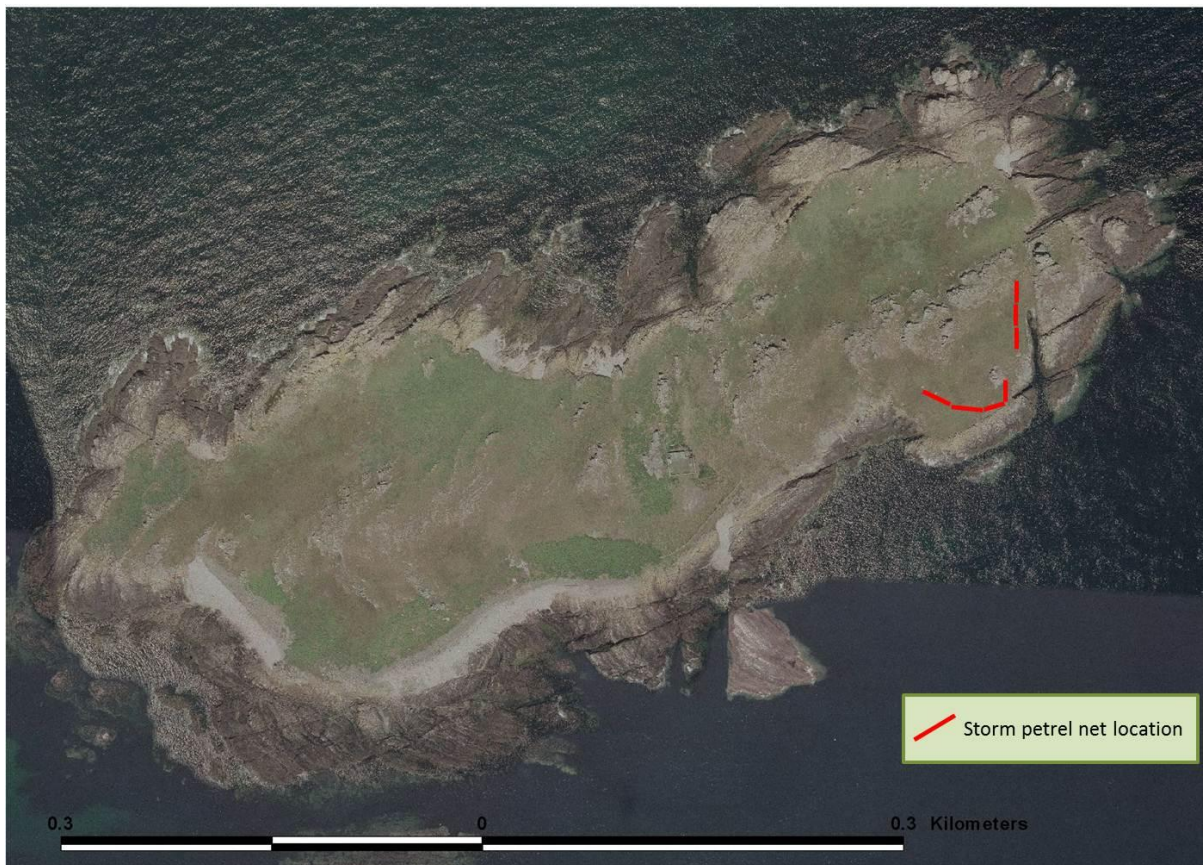


Figure 5. Map of storm petrel mist net positions on Burhou

Perfect wind conditions on the first night, and excellent conditions for the majority of the second night, meant that despite the reduced effort two productive nights of ringing could be carried out. A total of 433 storm petrels were caught: 246 new birds on night one, 91 new birds on night two and 96 re-trap birds over both nights; consisting of 83 Burhou re-traps, 4 Jersey birds, 5 UK birds and 4 French birds.

The high level of storm petrel ringing recorded in 2014 led to a review of the previous data collected between 2000 and 2008. Population estimates from this period range from 40 to

90 apparently occupied nests (AON); this is despite the ringing totals being much higher (**Table 8**). Data in **Table 8** is different from quoted in previous Ramsar reports due to new records being reported, as with the amended gull data (**Section 1.1**) these data for storm petrels is to now be carried forward as the correct values.

Table 8. Storm petrel ringing totals

Year	2000	2003	2005	2006	2008	2014
Number of petrels caught (including re-traps)	204	300	465	317	171	433

With so many individuals being caught it was determined by Phil Atkinson of the British Trust for Ornithology (BTO) that enough ringing data was available to attempt a population estimate from these records. First it had to be determined that transient birds would not be impacting the results of any population estimate and a goodness of fit test* in the package U-Care, using the 2000 to 2008 data, indicated no issues with transience (**Equation 1**).

Equation 1. Storm petrel test of transience

$$N(0,1) \text{ statistic for transient}(>0) = 0.95$$

$$P\text{-level, two-sided test} = 0.34$$

$$P\text{-level, one-sided test for transience} = 0.17$$

*Goodness of fit indicates any discrepancies between the observed values (in this case storm petrel numbers ringed) and the expected values from the model (in this case estimated storm petrel population size). So a P-value of <0.05 would indicate transient birds were impacting the overall population estimate and a P-value >0.05 confirms transient birds are not skewing our modelled population estimate higher than what is actually occurring. Therefore these P-values confirm transient birds are not skewing our population estimate.

As transience is proved to not be a factor, as also indicated by the high proportion of Burhou re-trap individuals in 2014 evidencing breeding birds, the data was used in survival type analyses. Survival was constant over time (0.804 ± 0.0252 {95% CIs 0.7498-0.8487}*) as was the likelihood of recapturing marked birds on subsequent occasions (average 0.24). Therefore, from the mark recapture data a Jolly-Seber** population estimate indicates 2,800 individuals.

*Confidence intervals (or CIs) indicate that 95% (the value accepted as the statistical majority) of data collected falls within this range. This adds statistical accuracy to claiming that survival has remained constant over time as the overall value of 0.804 falls within this range.

**A model used to estimate biological populations using the mark-recapture ringing data of multiple censuses.

2,800 individuals is much higher than any previously quoted population estimate for storm petrels on Burhou, and with 433 individuals caught with reduced effort in 2014 all indications are that such a population estimate is much more realistic; although further study is required that will aim to combine the statistical estimate of individuals from ringing with playback surveys to confirm breeding to produce a full breeding population estimate.

2.1.5 Northern Fulmar (*Fulmaris glacialis*)

Fulmar monitoring continues in Trois Vaux Bay and along the cliffs north of this main location. This has been taken as a full population as fulmars are seldom seen elsewhere; but confirmation of an apparently occupied site (AOS) on Coque Lihou, two to four pairs nesting east of Vau du Fret and a few sightings along other areas of the cliffs from the boat mean that all fulmar population values should be taken as a minimum. Productivity monitoring is conducted alongside population counts.

Population and productivity monitoring

The fulmars were monitored four times in late May and early June to confirm that any perching spots were in fact AOS; confirmed by having an adult present on every occasion. The AOS were then monitored every seven days from early July to determine productivity. **Table 9** shows that the fulmar population continues to be steady in comparison to previous years with 29 AOS; whilst productivity is equally stable at 0.55.

Table 9. Fulmar AOS and productivity since 2007

Year	2007	2008	2009	2010	2011	2012	2013	2014
Population	26	20*	38	34	16	34	29	29
Productivity	-	-	0.47	0.53	-	0.56	0.52	0.55

*Partial colony count only

2.1.6 Northern Gannet (*Morus bassanus*)

Due to the requirement of aerial photography the population of gannets is only counted on a five year cycle. Having been done in 2005 and 2011 the next scheduled count is in 2015, also to coincide with the conclusion of the University of Liverpool PhD (**Section 2.1.9**). However, productivity monitoring is still carried out annually.

Productivity monitoring

The edge of the gannet colony is monitored for productivity due to visibility from Alderney, therefore all estimates of productivity are likely a minimum due to the more experienced and successful breeders actually being located at the centre and top of the colony. Five plots containing a total of 250 birds were chosen and monitored every seven days once chicks were visible. Prior to chicks being visible apparently occupied nests (AON) were identified on the plots by the presence of regularly incubating adults. Plot locations are shown in **Figure 6** and productivity results detailed in **Table 10**.

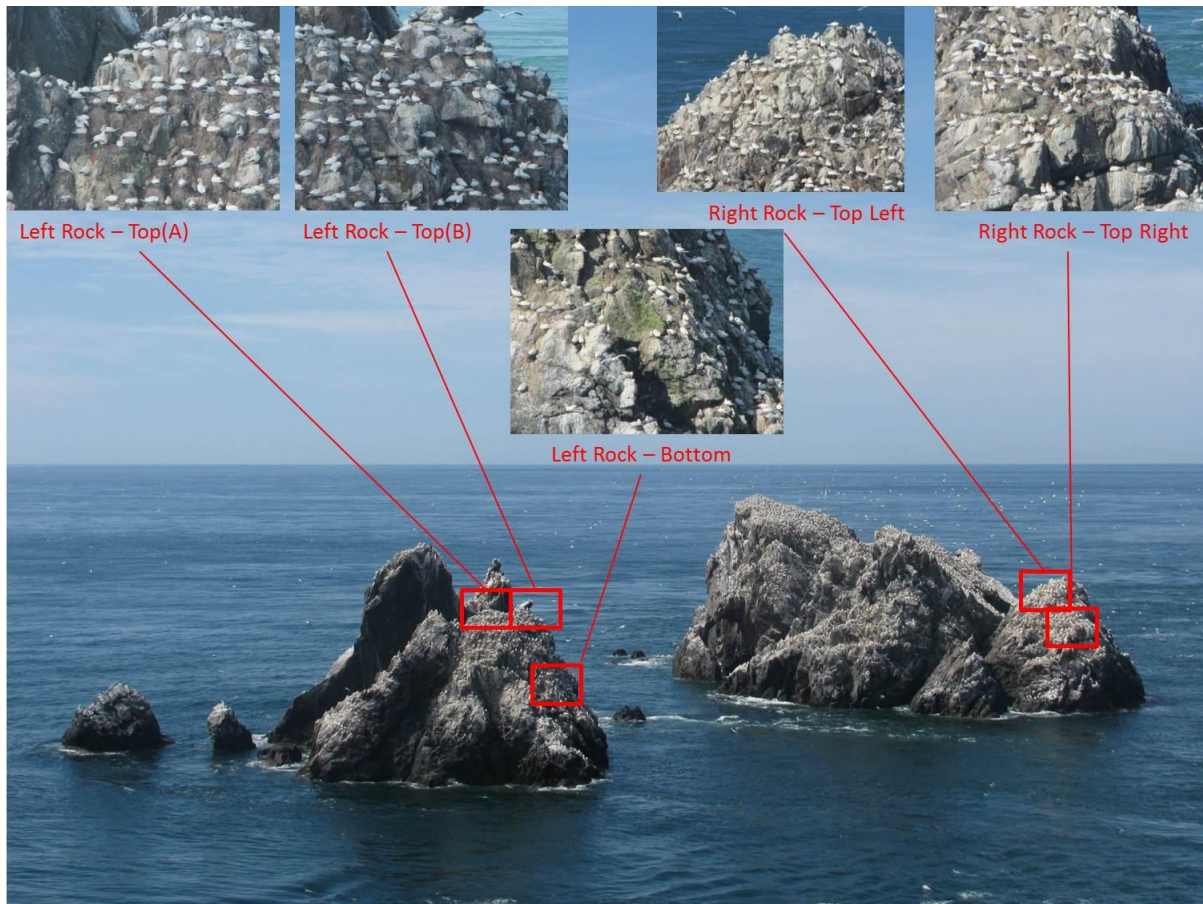


Figure 6. Location of gannet productivity plots on Les Etacs

Table 10. Productivity of gannet plots

Plot	Nests monitored	Chicks fledged	Productivity
Left Rock – Top(A)	50	32	0.64
Left Rock – Top(B)	50	29	0.58
Left Rock – Bottom	50	32	0.64
Right Rock – Top Left	50	27	0.54
Right Rock – Top Right	50	33	0.66
Total	250	153	0.61

2.1.7 Ringed Plover (*Charadrius hiaticula*)

Due to ringed plovers being ground nesting birds, and locating their breeding colony on Platte Saline, which is public access throughout the year, the conservation of this species has been regarded as a priority. Conservation of the species relies on community driven support to alter public behaviour around the colony. As such a public awareness campaign was instigated in 2014 highlighting the fragility and importance of protecting the last regular breeding site for ringed plovers in the Channel Islands. Particular emphasis was put on refraining from using the high tide area in locations where they are known to breed, as they nest just above the water line, and the control of dogs on the beach, keeping them moving in directions away from any ringed plovers sighted.

This campaign included local press publications, radio segments (Alderney and Guernsey) and signs located at all the major entranceways to Platte Saline (**Figure 7**). Feedback on the campaign indicates that many residents and visitors became more aware of ringed plovers, with some altering their habits on Platte Saline so as to not disturb them.

Ringed Plover awareness at Platte Saline

The Alderney Wildlife Trust and Living Islands project are asking the public to be aware of Ringed Plovers nesting on Platte Saline when out walking in this area.

Platte Saline has been the home for nesting Plovers for many years and is the last known regular breeding place in the Channel Islands.

They would like people to be especially careful when walking their dogs and to try and keep to the lower part of the beach.

The breeding season is between now and July. Plovers have been monitored for breeding success as part of Alderney's Ramsar Management Plan since 2008. In this time six chicks have been successfully raised, with three in 2013. A nest has already been spotted on the beach with another possibly being established.

Although the eggs are well camouflaged and not easy to spot they need



Ringed plover nesting area

to be incubated so it is important that the adult is not frightened away. If you come across a nest, please leave the area quickly.

The Alderney Wildlife Trust and Living Islands project are doing their part by monitoring the birds for breeding suc-

cess, they will be putting up some information boards in the area and ask the public to read them and make themselves aware of the wildlife around them. It is with the help and residents and visitors that a difference can be made to help improve the breeding success of these birds.

Exploring and Protecting Alderney's Marine Life

Exploring Alderney's shorelines and rockpools is a must for your summer plans this year. Alderney hosts a variety of marine life for you to discover, from the common limpet and fleshy seaweeds to grumpy crabs and funky sea anemones. Barnacles and sea anemones can be found during the springtime with colourful fish, crabs and seaweeds in the summer and autumn times. Marine life under boulders is particularly sensitive and susceptible to damage, therefore please turn boulders back over after your marine exploration expeditions. The Seashore

Code below can help you protect Alderney's marine life for you and others to enjoy in the future.

The Seashore Code
Look after yourself.
Keep an eye on the incoming tides and watch out for slippery rocks. The best time to start exploring is a couple of hours before low tide.

Put rocks and marine life back.
Replace rocks, boulders and the marine life where you found them for them to survive. Also check shells are empty before you take them home.



Right: A Topshell

HOMES & GARDENS
OVER 20 YEARS OF EXPERIENCE
FULL GARDEN MAINTENANCE UNDERTAKEN
INCLUDING REGULAR CONTRACTS
GARDEN WASTE REMOVAL
LIGHT GARDEN CONSTRUCTION INCLUDING
WATER PONDS, DECKING, GARDEN SHEDS AND FENCING.
PRESSURE CLEANING AND EXTENSIVE PROPERTY PAINTING.
QUALITY WORKMANSHIP FOR
ADVICE AND ESTIMATES CONTACT
MARK 07911 723301
ANDREW 07911 758037

12 alderneywildlife@hotmail.com

Handle marine life with care.
Avoid poking and dislodging soft-bodied creatures like sea anemones as this can harm them.
Take your litter home.
When you get home, wash your hands.
Enjoy Alderney's amazing marine life!
For further information or if you fancy joining a rockpooling session this summer with the Alderney Wildlife Trust, please phone: 01481 822935 or see what's going on via <http://www.alderneywildlife.org>.



Figure 7. Ringed plover public awareness campaign

Whilst ringed plovers were originally considered solely as an important species in an associated area to, but outside of, the Ramsar site, this year they were also identified as nesting in Clonque Bay. This, unlike their regular site of Platte Saline, is within the Ramsar site, so the species can now be fully considered within the management plan; increasing the importance of public awareness and increased conservation measures in the future.

Population and productivity monitoring

The pebble beach nature of Clonque Bay makes monitoring more difficult than on the sand of Platte Saline. Additionally, the expansion into Clonque was only discovered halfway through the breeding season meaning results gained from this site are a minimum for population and productivity. Two apparently occupied sites (AOS) were identified with at least two, and up to four, chicks successfully fledge. Monitoring of Platte Saline was regular from the start of the breeding season with results shown in **Table 11**.

Table 11. Ringed plover AOS and productivity since 2008

Year	2008	2009	2010	2011	2012	2013	2014
Population	1	3	5	3	2	2	4
Productivity	-	0.66	0.20	0.00	0.00	1.50	1.00

2.1.8 Common Tern (*Sterna hirundo*)

Whilst common terns nest on Houmet des Pies, outside the Ramsar site, they are reported here as an important species in an associated area.

Population and productivity monitoring

As a possible consequence of the storms (**Section 1.2**) the turbidity of the water made foraging more difficult for terns causing a delay in their breeding season and impacting their productivity. The apparently occupied nest (AON) count showed that the recruitment of adults continues to increase but productivity was lower than in 2013 (**Table 12**).

Table 12. Common tern AON and productivity since 2012

Year	2012	2013	2014
Population	5	14	25
Productivity	-	0.57	0.44

2.1.9 University of Liverpool PhD – Gannet and Shag Tagging Study

Victoria Warwick-Evans, PhD student of the University of Liverpool, completed a second field season studying the foraging behaviour of gannets and shags in order to create predictive models analysing the potential impacts of changes in the ecosystem on their habits.

The capture rate of shags continued to be poor despite targeting areas away from the gull colony, which cause shags to take flight when disturbed, such as eastern Burhou and Little Burhou. Remote download tags were proposed so as to only require one capture of each

individual, but only a single shag was caught and attached with a tag that malfunctioned. Due to the continued difficulties in targeting this species it has been decided that the project is to focus solely on gannets for GPS tagging in the final field season of 2015.

Gannet GPS tagging continued to be successful, 28 gannets were caught from their nests and fitted with tags, 15 of them also being fitted with accelerometers. The use of barometers was discontinued for this field season as the shrink wrapping process to make waterproof disturbs the pressure system required within them to gather reliable data. 18 gannets were retrieved with 13 working GPS and 11 accelerometers attached. Two of the recaptured gannets were then fitted with remote download tags to continue data collection for these two individuals further into the breeding season, eventually lasting for a further seven weeks.

This level of data collection has meant that Victoria can now create predictive models and papers are being written for publication, details of which will be provided to the Ramsar management plan when appropriate.

2.2 Marine

2.2.1 Intertidal Mapping

The intertidal habitat surveying of Clonque Bay is currently ongoing (October, 2014) under the current management structure. It is aimed to complete this survey by the end of November (2014). This is due to the large size of the bay, the availability of spring low tides and trained staff. As such an updated version of this report, with the completed intertidal work, will be released later in the year.

It should be noted that during this survey, surveyors also recorded the presence of important (**Section 2.2.2**) and invasive species (**Section 2.5**), when found.

2.2.2 Important Marine Species

A number of important marine species were recorded during the year within the intertidal and sub-littoral environments within the Ramsar Site and Alderney's territorial waters. This primarily includes:

- **Green Ormer (*Haliotis tuberculata*)**

As the green ormer (*H. tuberculata*) is considered an important species within the Channel Islands, a survey was conducted to assess its population dynamics within Clonque Bay. This survey was undertaken in April and September (during spring and autumn equinox spring tides), in-conjunction with La Société Guernesiaise. During the April survey, one green ormer was recorded, with two green ormers recorded in September. All recorded specimens showed good shell quality, with shell length and height ranging from 70 – 110 mm and 20 - 70 mm respectively.

It should be noted that during this survey, surveyors also recorded the presence of important (**Section 2.2.2**) and invasive species (**Section 2.5**), when found.

- **Eelgrass (*Zostera spp.*)**

Within Europe, eelgrass species are considered an important marine habitat. Past records identify eelgrass present (primarily dwarf eelgrass, *Zostera noltii*) within a number of bays throughout Alderney (within both intertidal and sub-littoral environments). An intertidal eelgrass habitat survey was undertaken within one of these bays (Longis Bay) to assess its presence and distribution. The survey showed the presence of eelgrass within the intertidal region of Longis Bay. Its distribution (within the intertidal region) was smaller than previously recorded (anecdotal records), which may be due to this year's intense storm events.

In addition, the MSc research project (**Section 2.2.4**) also recorded the presence of Braye Beach Bay. This is of importance, given the potential proposal of a marina within Braye Beach Bay in the future.

- **Pink Sea Fan (*Eunicella verrucosa*)**

This species is considered important as it sustains other endemic species (such as the sea slug, *Tritonia nilsohdneri* and sea anemone, *Amphianthus dohrnii*) and acts as a 3-dimensional habitat. Within the UK, it is considered uncommon and vulnerable to natural and anthropogenic pressures. This year, one record of this species has been submitted to the AWT by the Alderney Maritime Trust (AMT). The presence of this species was recorded by underwater photography methods during archaeological scuba-dive surveys of the Elizabethan Wreck (September, 2014), which is situated offshore North-East of Alderney.

2.2.3 Marine Mammal Species Surveys

A number of different surveys and recording strategies for marine mammal species have been instigated this year. Primarily this includes:

- **Monthly land-based observation surveys.** A survey was implemented to record marine mammal species from a land-based observation point, every month from April until October. This was trialled at a location at the South of the island (with the viewpoint overlooking France, Guernsey and Jersey) and from Fort Tourgis (with the view-point overlooking the Ramsar Site). The survey method follows guidelines from the Sea Watch Foundation (SWF). No marine mammal species were recorded during these surveys. The information will be passed onto the SWF at the end of 2014.
- **Marine user boat-based observation surveys.** A number of local marine users were contacted to undertake boat-based observation surveys (along their general transit routes) within Alderney's terrestrial waters and beyond. Marine users included

commercial and private shipping and tour boats, which frequently transit to Alderney, Guernsey, Jersey, Sark and Poole (UK). At present, one marine user (Alderney Shipping/Channel Seaways Ltd) has submitted marine mammal species data to the AWT. This marine user recorded a total number of 52 individuals, predominately bottle-nosed dolphins (*Tursiops truncatus*), throughout the Channel Island, during June and July. Further data from other marine users is expected by the end of this year. The survey method follows guidelines from the SWF. The information will be passed onto the SWF at the end of 2014.

- **Marine user and public recording forms.** A new recording form for marine users and the public has been created for opportunistic sightings of marine mammal species. The forms have been given out at key locations round Alderney (the harbour office, sailing club and tourism office) and at key events (wildlife week, August fayre and boat trips). At present, 2 forms have been received, which outline 6 marine mammal species, primarily bottlenose dolphins (*T. truncatus*).
- **Grey seal photographic identification catalogue.** A photographic identification catalogue has been created to identify individual grey seals (*Halichoerus grypus*) throughout the Channel Islands. This will enable a more in-depth population assessment of the species (i.e. presence, abundance, life stage and distribution). The method entails a number of Channel Island photographers (currently: Alderney, Guernsey and Sark) submitting photographs of grey seals to the AWT. The individuals within the photographs are identified and distinguished in terms of: body markings, fur patterns, head/torso shape, sex and size. At present, 25 individual grey seals have been identified using this method. The catalogue is shared between key grey seal experts and photographers within the Channel Islands and the UK for guidance and photograph verification.
- **Grey seal population dynamics survey.** A trial survey will be undertaken to assess the grey seal (*H. grypus*) population dynamics (presence, abundance, individual and life stage (i.e. pup, adult) within the offshore islet, Les Renoquets. This follows the survey methods provided by the JNCC. It is aimed to potentially trial this survey during October. As such an updated version of this report, with the completed intertidal work, will be released later in the year.

2.2.4 University of York MSc – Braye Biotope Mapping Study

Thomas Rossiter, MSc student in Marine Environmental Management with the University of York, completed a thesis studying the intertidal and sub-tidal composition of Braye Bay (Rossiter, 2014).

The project set out to ascertain the ecological composition of Braye Bay through the use of intertidal and sub-tidal biotope mapping and survey techniques for specific species,

including green ormer and eelgrass (**Section 2.2.2**). The project was deemed vital as a comparison site to those being studied within the Ramsar designation itself (**Section 2.2.1**) and as an ecological information base for any future development in the Braye area.

A total of 26 intertidal biotopes were described in the area and mapped. Included in these biotopes were the identification of key species including eelgrass (**Section 2.2.2**), Japweed (an invasive species, **Section 2.5**), *Cystoseira spp.* and *Ulva spp.* alongside the confirmation of presence of green ormer (**Section 2.2.2**). Identifying and mapping of such species allows environmental impact assessment works to be implemented for any developments and for habitat changes over time to be documented during revisit studies of the site in the coming years.

Further information on the project is documented by the Alderney Wildlife Trust and the University of York and available for future studies in this area.

To continue the Ramsar marine programme, and to keep links with the University of York, projects will be made available to the same course as completed by Thomas each year. Topics will be submitted by October and the student confirmed as early as possible. The topic options for 2015 can be viewed in **Appendix 5.3**.

2.2.5 Navitus Bay Wind Farm Development

In addition to this year's scheduled Ramsar work-streams, the AWT with the States of Alderney (SoA) have been formally engaging with the UK Planning Inspectorate (PINS) regarding the proposed Navitus Bay wind farm development. The potential wind farm (area size: 153 square kilometres²; maximum number of turbines: 194; size of turbine: 5 – 8 MW capacity; approximate total capacity: 970 MW) is to be developed South-West of the Isle of Wight by the developers, Navitus Bay Development Limited (NBDL). The AWT and SoA have highlighted to PINS and NBDL the use of the proposed site as a location where the Alderney gannet population transit to and forage within, and hence, the potential for environmental impacts such as disturbance. The AWT and SoA are currently recommending to PINS and NBDL to instigate an environmental monitoring programme (EMP) across potential development timescales (pre-construction, construction, operation, decommissioning) to assess the true impact upon Alderney's gannet population. Engagement activities between all parties regarding this topic are still on-going.

2.3 Terrestrial

Bracken control was again not undertaken as it did not encroach on to the puffin colonies on Burhou. But the grass did grow unexpectedly high on Burhou this year impairing visual access to puffin burrows affecting surveys (**Section 2.1.1**). This may be a cyclical event or, most likely, a consequence of the storms (**Section 1.2**) greatly reducing the rabbit colony on Burhou. Terrestrial surveys focused on the presence of small mammals and invasive brown rat presence as part of an MSc thesis (**Section 2.5.1**).

Whilst specific studies weren't carried out the use of the live webcams (**Section 2.6.3**) did confirm the presence of myxomatosis in the rabbit colony of Burhou that would've contributed to the lower population allowing for higher vegetation growth reducing visibility of the puffin colony (**Section 2.1.1**).

2.4 Casquets

Permission was given by Trinity House for the first full ecological survey of Casquets Island in 2014 with a view to continued efforts in the future. Whilst the islet is not within the Ramsar site it is within Alderney's territorial waters and is considered an associated site of the Ramsar designation. Such a survey will gather publicity and as such The One Show were invited to join to promote the work of the AWT (**Section 2.6.1**). A survey team was taken on 12th June to conduct a comprehensive study of ornithological, entomological, marine, intertidal and botanical flora and fauna.

- Ornithological

Ornithology surveys consisted of general observations and nest counts. A pair of peregrines (*Falco peregrinus*) was sighted perching on the tower but calls from them were not continuous after the survey team landed. This shows that they were present whilst hunting but did not have a nesting site on the island. 6 Manx shearwaters (*Puffinus puffinus*) were spotted in transit from the western tip of the island.

Likely storm petrel nesting locations were identified in the old courtyard where dry-stone walls provide the best potential for breeding sites. Playback surveys revealed no storm petrels present, although the surveys being carried out during the day in early June mean that the presence of storm petrels cannot be entirely ruled out.

Of the breeding species there were: 25 lesser black-backed gull, 20 herring gull, 13 shag, 5 rock pipit and 4 oystercatcher apparently occupied nests (AON). One herring gull and one lesser black-backed gull present were colour ringed through the Channel island scheme on Burhou and Guernsey indicating that Casquets is indeed an extension of the Channel Island population.

- Botanical

A botanical survey was conducted on the terrestrial region of the Casquets. This included assessing terrestrial plant species presence and distribution. To assess terrestrial plant species distribution, the Casquets was split into 5 sections (named bands), with plant species identified and recorded in each band (**Figure 8**).

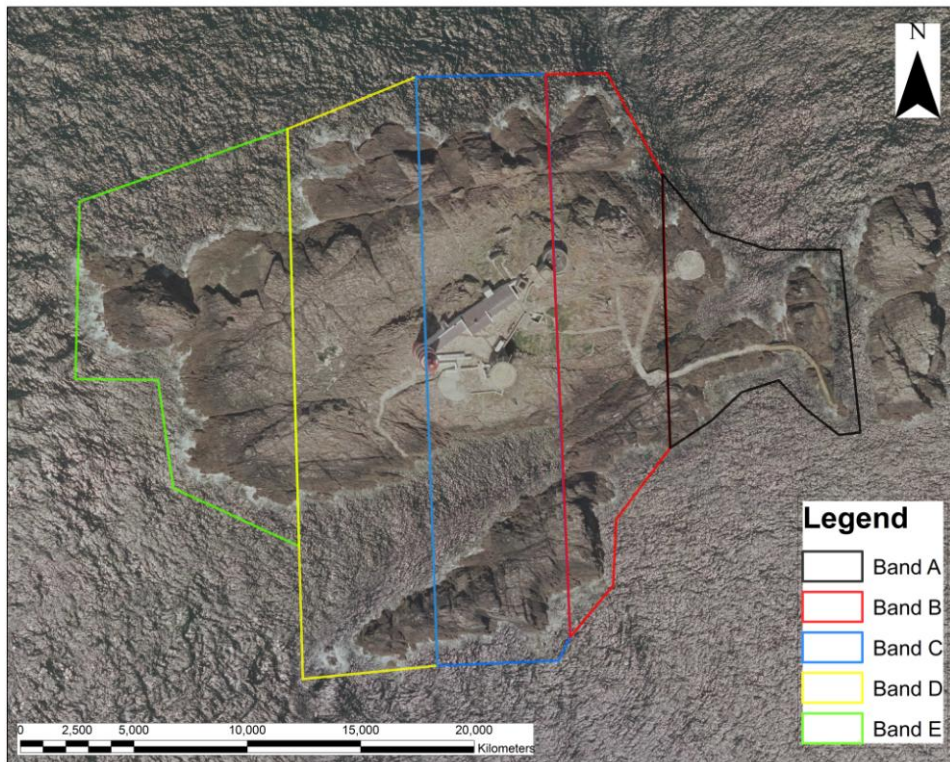


Figure 8. Botanical survey bands on Casquets

A total number of 27 terrestrial plant species were recorded within the terrestrial region of the Casquets. This included species such as: Hottentot Fig (*Carpobrotus edulis*), Thrift (*Armeria maritime*) and Hedge Veronica (*Hebe* species). Two new species were also recorded (compared to a botanical survey conducted in 1989), Sally My Handsome (*Carpobrotus acinaciformis*) and Dandelion (*Taraxacum* species).

The largest biological diversity (25 species) of the recorded plant species were found in band C, with the lowest biological diversity in bands A and E. Species such as Thrift, Sand Spurrey (*Spergularia rubra*) and Sea Purselane (*Atriplex portulacoides Hamilione*) were recorded throughout the Casquets survey bands. The newly recorded species Sally My Handsome and Dandelion were recorded in bands B and C respectively. In general, the southern side of Casquets is extensively covered in vegetation, with evidence of a terraced garden. The Southern side also comprises of an extensive area of Hebe (approximately 10 m²), which is an introduced shrub. The northern side of Casquets is more rugged, hence reduced plant species biological diversity.

- Entomological

Samples were recovered for identification during the course of the botanical surveys. **Figure 9** shows the survey areas and **Table 13** the species present in each area.

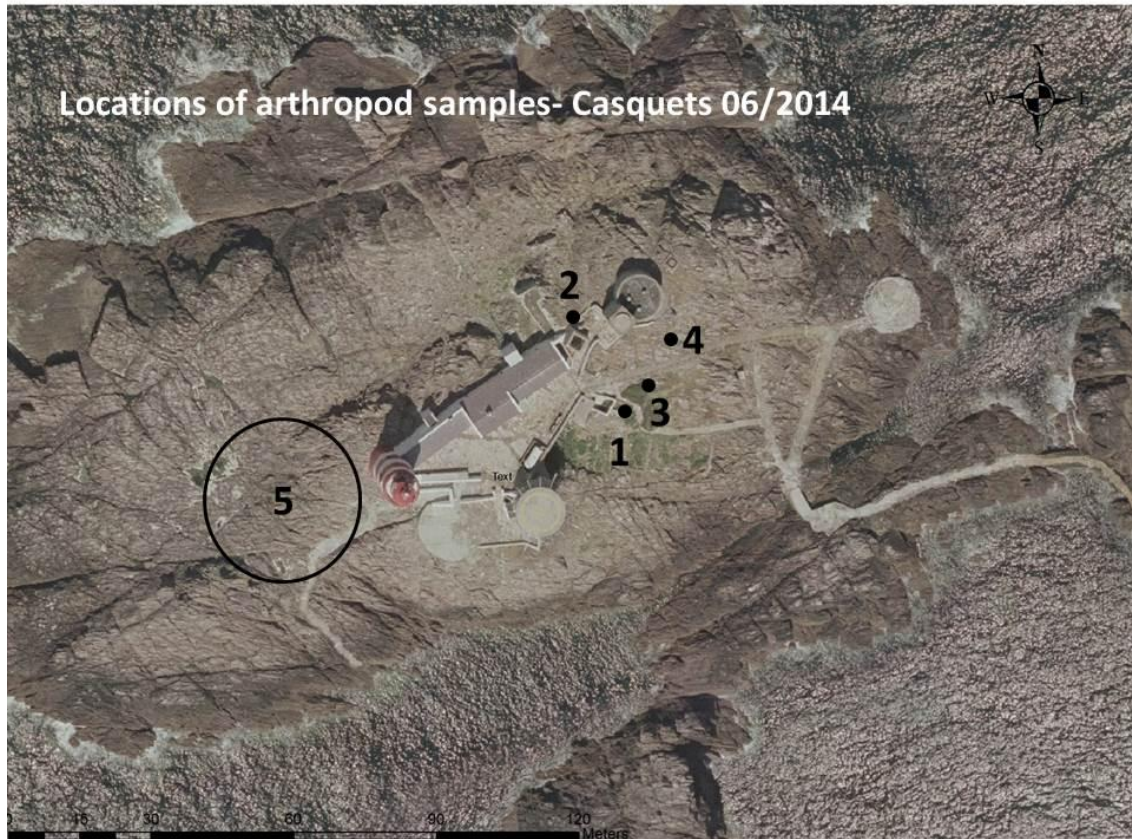


Figure 9. Entomological survey locations on Casquets

Table 13. Entomology spp. present on Casquets

Class	Location	Latin name	English name
Insecta	1	<i>Bombus</i> sp.	Bumble bee
	1	<i>Vanessa atalanta</i>	Red admiral
	1,2	<i>Lycogoris pabulinus</i>	Green capsid bug
	1,2,3,4	<i>Formica rufa</i>	Ant
	1,2,3,4	?	Hoverfly
	2	<i>Amara aulica</i>	Black beetle
	1,2,3,4	?	Fly
	3	<i>Pterostichus cupreus</i> (<i>Feronia cuprea</i>)	Ground beetle
	5	<i>Diaphora mendica</i>	Muslin moth (caterpillar)
	5	<i>Ephiphyas postvittana</i>	Light brown apple moth
Collembola	5	?	Rove beetle
	5	<i>Laothoe populi</i>	Poplar Hawk-moth
Arachnida	2	<i>Petrobius maritimus</i>	Springtail
	2	?	Crab spider

- Marine ecological

A number of marine ecological surveys were conducted on and around the Casquets offshore islet. This included:

- Intertidal habitat survey;
- Intertidal species assessment survey;
- Sub-tidal snorkel assessment;
- Marine mammal species survey.

The full report which details the marine survey methods and results can be found in **Appendix 5.4**.

2.5 Invasive Species

One small patch of Hottentot fig (*Carpobrotus edulis*) was removed from Coque Lihou, an associated islet of the Ramsar site, whilst specific targeting of its removal is conducted by the AWT land management team and its conservation volunteers on a periodical and cyclical basis around Alderney. Areas within the Ramsar terrestrial site are targeted when required by the land management programme.

Japweed (*Sargassum muticum*) is mapped during the Phase I intertidal surveys conducted (**Section 2.2.1** and **2.2.4**) whilst slipper limpets (*Crepidula fornicata*) are recorded during former surveys (**Section 2.2.2**) and rockpooling sessions (**Section 2.6.2**); none of the latter was discovered.

2.5.1 Nottingham Trent University MSc – Rat Presence Study

Nicola Cox, MSc student in Endangered Species Recovery and Conservation with Nottingham Trent University, completed a thesis studying the presence of rats and other small mammals amongst the seabird colonies of Alderney and its islets (Cox, 2014).

The purpose of Nicola's study was to ascertain the populations of brown rat (*Rattus norvegicus*) present around seabird breeding areas with a view to future management. Between June and July, the project set-up 7 transect locations (2 mainland, 2 stacks connected at low tide, 3 offshore islets) around the key breeding areas of multiple species, **Figure 10**.

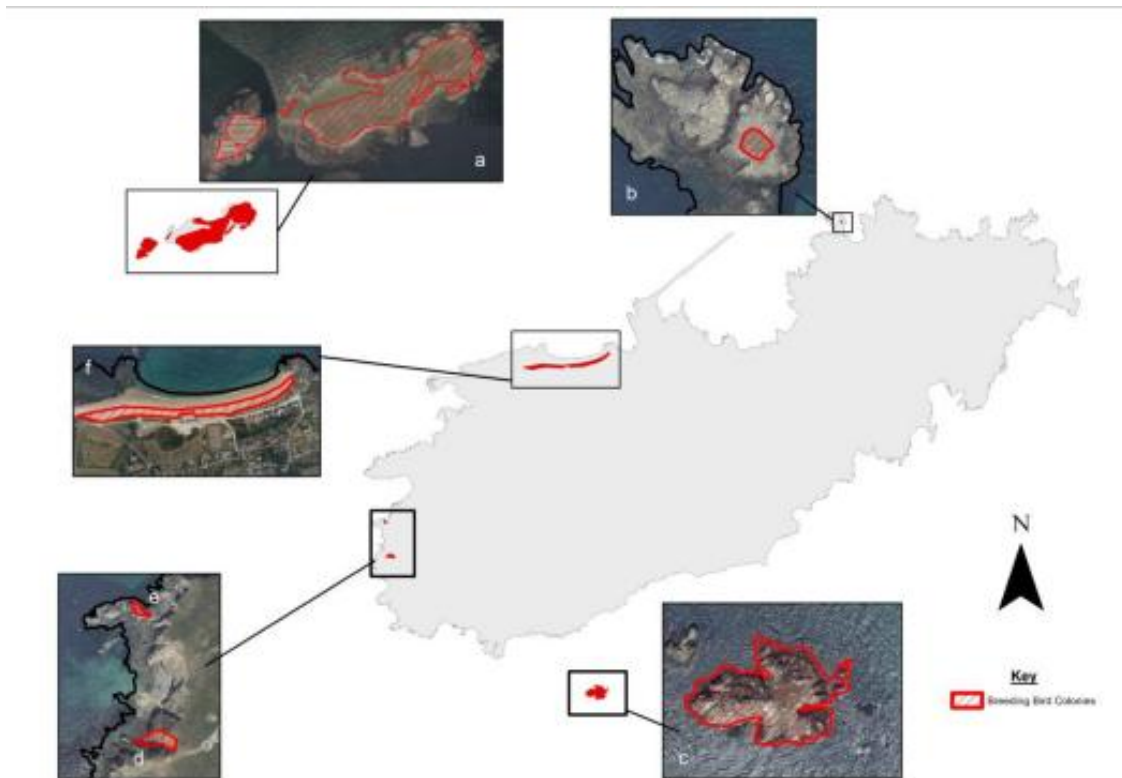


Figure 10. Location of key seabird breeding areas where rat presence was studied

Along these transects chew sticks – wooden dowelling covered in a cocoa solution – were placed and checked periodically for signs of chewing from rats. Rats were found on the two mainland sites near breeding fulmar (**Section 2.1.5**), gull (**Section 2.1.2**) and ringed plover (**Section 2.1.7**); rats were also present on the Hannaine stack, connected at low tide to the mainland, where a satellite puffin population attempt to breed (**Section 2.1.1**).

Results also indicated the presence of other small mammals on all sites but a trial of Longworth trapping on Burhou produced no captures to confirm species.

Future management options are the control of rat populations around seabird colonies. But most imperative is the future study of identifying which small mammals are present on Burhou to determine if they could impact puffin or storm petrel (**Section 2.1.4**) populations; trapping is recommended for winter months when coming to baited traps is more likely in absence of natural food sources.

Further information on the project is documented by the Alderney Wildlife Trust and Nottingham Trent University and available for future studies in this area.

2.6 Education and Publicity

2.6.1 Publicity

Public perception of the Ramsar work was increased in 2014 via the use of a community driven conservation effort for ringed plovers (**Section 2.1.7**); but wider publicity has been achieved by the use of national television in both the UK and France.

The One Show (BBC) recorded the ecological team's surveying of Casquets (**Section 2.4**), along with a historical piece on Trinity House, to be broadcast in autumn/winter. A film crew from the Channel 3 programme Des Racines et des Ailes arrived on Alderney on the 30th June and 1st July to record the work of the ecological team's work monitoring puffins (**Section 2.1.1**) and the work of the University of Liverpool PhD (**Section 2.1.9**). Combining this ecological work with a focus on Alderney's heritage the television show will highlight the tourism potential to the French public in winter.

Continuous links with local media outlets – The Alderney Journal, The Alderney Press, Island FM, BBC Guernsey and ChannelTV – ensure public awareness and engagement in the ongoing works of the Ramsar site and AWT in general.

2.6.2 Events

The use of the AWT boat for a full seabird season allowed for an extensive programme of providing tours to residents and tourists of Alderney's Ramsar site, its flora and fauna, and the importance of its conservation. This tour schedule was such that the majority of survey costs from the ecological team were covered by boat tour income up until an engine malfunction in mid-July caused the boat to be out of action for seven weeks.

The loss of the boat for August meant that Burhou tours could not be carried out in 2014 but they were successful in 2013 and will be incorporated during the open season whenever boat availability allows.

Other events were centred on Wildlife Week (last week of May) and Alderney Week (first week of August) when rockpooling sessions, foraging trips and kids' beach events were carried out. A Living Seas exhibition was held during the Wildlife Fayre on 24th August explaining the importance of intertidal conservation and rockpooling etiquette to the general public.

2.6.3 Live Cameras

Two live cameras were again established on the puffin colony for the duration of the breeding season, with one being transported to a known storm petrel breeding site once the puffins had migrated. However, the use of these cameras was prohibited in 2014 due to the decreased activity of puffins (**Section 2.1.1**) resulting from the seabird wreck (**Section 1.2**) and the decreased visibility caused by extensive vegetation growth around the cameras.

Additionally the software system that streams the live feeds to the website began to fail during the breeding season and replacements are being investigated for the beginning of the 2015 season.

A third live camera was attempted for the first time; it was positioned on Ortac on the 16th April to focus on the gannets. Unfortunately the timing of the arrival of this camera system meant that it was fixed in situ later in the season than planned and return visits were not possible to alter the system in event of failure due to disturbance risk to the breeding gannets. Therefore, when the signal feed failed it could not be corrected during the breeding season. To ensure the system is successful in 2015 it needs to be securely established on Ortac before the arrival of the gannets in 2015.

2.6.4 Website and Social Media

The use of Facebook continues to be the most common outlet for the AWT to provide information on its work to the public. The AWT page itself has increased from 724 to 1,046 likes whilst the dedicated LIVE: Teaching Through Nature (**Section 2.6.5**) page has increased from 888 to 1,220 likes in the same time (13/10/13 to 13/10/14).

Twitter use is increasing with 600 followers (checked 13th October), whilst a YouTube channel was created in August 2014 to better promote and distribute the camera footage collected and created than was done with Vimeo.

2.6.5 LIVE: Teaching Through Nature – SEGfL Education Programme

The joint AWT and South East Grid for Learning (SEGfL) education project was rebranded in 2014 from Living Islands: Live, A Puffin Season on Burhou to LIVE: Teaching Through Nature. This transition emphasised the expansion of the LIVE project into more than just puffins whilst also reducing confusion with Alderney's Living Islands project for tourism.

After a successful pilot of 29 schools in 2013 the project aimed to expand to up to 200 primary schools across the Crown Dependencies and UK. Publicity avenues proved difficult but the project was expanded to 73 schools.

However, these 73 schools participated in an expanded project that didn't just focus on puffins but incorporated not just other seabirds, but also the wider Ramsar works and general works of the AWT. Additionally the project was partnered with the Birds on the Edge project in Jersey, via the Durrell Conservation Trust, to incorporate ecological works on Jersey; specifically their chough (*Pyrrhocorax pyrrhocorax*) reintroduction programme.

Engagement in the project continued to be high with 65.75% of schools using the programme more than 5 times a week, as gauged by number of logins to the website. However, some difficulties with the LIVE cameras (**Section 2.6.3**) and a low level of involvement in direct engagement options (Flashmeetings with the ecologists and Activity

Days) have resulted in the need to expand and improve on some aspects of the programme for 2015 season; details of which can be viewed on the website as they are produced throughout Autumn and Winter, <http://burhou.livingislands.co.uk>.

2.7 Legislation

2.7.1 Conventions List

Alderney is a Crown Dependency of the British Isles, meaning that in terms of legislation it is responsible for its own wildlife protection law and policy; although, if agreed by the States of Alderney, it can still become a signatory to conventions outside of the Channel Islands. As the Ramsar site is located within Alderney's territorial waters it is responsible to all legislation and conventions that Alderney is signed to, these are:

Existing Legislation

- Wild Birds (Alderney) Ordinance, 2005
- Fishery Control Regulation, Enforcement of Community control measures and the enforcement of community satellite monitoring measures - Extended to Alderney EU 1999/45.
- Sea Fish Licensing (Bailiwick of Guernsey) Law, 2012

Conventions & Agreements

- Bonn Convention - Guernsey code A.8 Extended to Alderney 1979.
- Conservation of Afro-Eurasian Migratory water birds (part of Bonn) - EC/GEN 1993/10. Alderney amended law 1995
- Bonn Convention Agreement on Conservation of Bats in Europe
- ASCOBANS - Agreement on the conservation of small cetaceans of the Baltic and North Sea - UN Agreement 60 Guernsey code C.33. Extended to Alderney 1999
- Ramsar Convention on Wetlands of Importance
- Environmental Impact Assessment in Transboundary Context - UN convention Extended to Alderney 2004.
- Convention on Climate Change - Alderney 1992
- Conservation of European wildlife - Agreed 20.04.93
- CITES - Extended to Alderney 1997

2.7.2 Oil Spill Action Plan

An oil spill action plan has been provided to the AWT via Guernsey's Emergency Planning Officer. The liaison in Alderney is the States' Chief Executive Officer but the plans are immediately available in emergency events through the AWT Manager and Ramsar Ecologist.

2.7.3 Ramsar Stakeholder Group

The Ramsar site is monitored and controlled by key stakeholders; the day-to-day running is managed by the AWT on behalf of the States of Alderney (SoA), more specifically the General Services Committee (GSC). All work is overseen by the Ramsar Steering Group (RSG) which contains members specialising in the fields of ornithology and marine ecology, current members are:

- Charles Michel - Chairman
AWT - Board Member
- Paul Veron
States of Guernsey, States Education Department – Projects Director
La Société Guernesiale – Channel Island Bird Ringer
- Phil Atkinson
British Trust for Ornithology – Head of International Research
- Helen Booker
Royal Society for the Protection of Birds – Senior Conservation Officer
- Dan Laffoley
International Union for Conservation of Nature – Marine Vice Chair
- Chris Morris
States of Guernsey, Commerce and Employment – Senior Sea Fisheries Officer
- Paul Chambers
States of Jersey – Natural Environment Officer
La Société Jersiaise – Secretary for Marine Biology Section

On Alderney the other key stakeholders are Mark Gaudion, Harbour Master and the Alderney Commission for Renewable Energy (ACRE) as both have direct influence and responsibility within the marine environment of the Ramsar site.

Besides the key stakeholders there are multiple other organisations across the Channel Islands, UK and France that contribute to, or have interest in, the Ramsar site. These are:

<ul style="list-style-type: none"> • Alderney Renewable Energy (ARE) • Braye Harbour Developments Limited • Alderney License Fishing Vessel Owners Association (ALFVOA) • Sailing Club • Guernsey Sea Fisheries (GSF) • Local Anglers (includes recreational and commercial) • States of Guernsey (SoG) • La Société Guernesiale • La Société Serquaise 	<ul style="list-style-type: none"> • States of Jersey (SoJ) • La Société Jersiaise • Durrell Conservation Trust (DCT) • Birds on the Edge • British Trust of Ornithology (BTO) • Royal Society for the Protection of Birds (RSPB) • Joint Nature Conservation Committee (JNCC) • International Union for Conservation of Nature (IUCN) • Groupe Ornithologique Normande (GONm) 	<ul style="list-style-type: none"> • Ligue pour la Protection des Oiseaux (LPO) • Seawatch Foundation • Agence des Aires Marines Protégées • Living Islands • Marine Biological Association • Cornwall Seal Group • Trinity House
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3. Summary

A number of key results were achieved throughout 2014; these are reported in the **Executive Summary**. Aside from these key results a number of specific works recommendations from 2013 have been carried out (**Table 14**). Any recommendations from 2013 not carried out, or that require amending, have been projected for 2015 (**Table 14**) to accompany the overall works to be completed as outlined by the 2012-2016 Alderney Ramsar Strategy 2 plan (**Table 15**).

Table 14. Summary of recommendations from 2013 for completion in 2014/15

Recommendations from 2013	Work carried out in 2014	Recommendations for 2015
1 Lesser black-backed gull AON count as not yet been done in ARS2. A specific Burhou trip for this count alone will need to be organised for when most nests have 3 eggs laid in them, but before the chicks begin to hatch and move out of the nest, so as to count the maximum number of AON possible. A count of occupied and empty nests to be done side by side.	Count completed on 31/05/14 (Section 2.1.2). It does not need to be carried forward as a specific recommendation as it falls under the regular monitoring program and the gap that had been creeping into the data for gull AON counts has been stopped.	n/a
2 Benthic ecology and topography survey work needs to be started, if resources allow, by completing large scale bathymetry, video works and sediment analysis.	Resources unavailable, no work completed.	CONTINUED: Benthic ecology and topography survey work continue to be a priority if resources allow.
3 Establish a 3 rd live camera on Ortac to bring live images of the gannet breeding season in to the LIVE: Teaching Through Nature website and educational programme.	Camera established on Ortac (Section 2.6.3).	AMENDED: Future efforts require establishment of camera well in advance of gannets return to enable return visits if necessary. PuffinCam software to be reviewed and improved.
4 Storm petrel monitoring will improve by researching better techniques for population size analysis. A combination of playback and ringing techniques will be used to ascertain population level. The artificial nest site will be improved by including tunnels on the artificial nest boxes and by using playback to attract Petrels to the site. Nest boxes will be tested in a known breeding site to test suitability.	Storm petrel ringing conducted between 19 th and 21 st July with 433 individuals caught and population estimate techniques improved (Section 2.1.4). Storm petrel ringing does not need to be carried forward as a specific recommendation as it now falls under the regular monitoring program.	AMENDED: Combination of playback and ringing techniques to be used to confirm the most accurate way of estimating breeding population.
5 Repeated survey of invasive species (particularly Japweed), whenever workloads allow, to follow spread within the area, mapped on the invasive species GIS map. Removal of these invasive species should be targeted within the Ramsar site whenever possible.	Japweed (Section 2.5) is surveyed as part of the marine Phase I surveys (Section 2.2.1) and will therefore be included in any GIS maps of the intertidal surveys. Hottentot fig (Section 2.5) incorporated in terrestrial Phase I surveys. As such they are included in the regular monitoring program and don't need to be specific recommendations.	AMENDED: If work on invasive species needs to be expanded or improved they could become a topic of study for future MSc students (<i>see point 8 below</i>).

6	Adequately signpost and make the general public aware of the ringed plover nesting sites on Platte Saline.	Full public awareness campaign and signage carried out (Section 2.1.7). This now falls within standard monitoring program and therefore is not a specific recommendation for 2015.	AMENDED: Public awareness to continue. But Clonque Bay now to be included in regular monitoring; it is near impossible to locate nests in the pebble beach but observational recordings at least are now required.
7	Enlist Terrestrial Ecologist to do bat, moth, butterfly and botanical surveys to better understand the terrestrial composition of Burhou.	Staff unavailable, no work completed.	AMENDED: Priority terrestrial work is the completion of Phase I and II surveys of the South Cliffs and Burhou. Small mammal trapping on Burhou and investigation into management of any species confirmed as present required.
8	PhD project: monitor lesser black-backed gull behavioural patterns in the colony (Section 2.1.2 (2013)). MSc project: analysis of the puffin monitoring methods (Appendix 6.8 (2013)).	Gull PhD proposal with University of Liverpool and puffin MSc proposal with University of York. Former awaiting funding approval to begin field work in 2016, latter available for student as soon as viable.	AMENDED: Links have been established with the University of York for a regular MSc student placement (or two) per year within the Ramsar management works. This should be followed up on and cemented for long-term.
9	The puffin population is currently only monitored around the south of Burhou. This programme can be extended to include other known breeding sites of Puffins. A location for a 4 th vantage watch point has been proposed on the west Burhou colony of Puffins and staked with a red peg, a 5 th vantage watch point can also be done at Hannaine Bay (regular raft counts would also be done at both to support the AOB count).	Due to the seabird wreck (Section 1.2) it was decided that the existing monitoring locations are to be kept as the priority and expansion of this monitoring is unnecessary when results that are comparable to previous years are most important. Considering the long-term implications the wreck may have consistent monitoring methods will continue to be the priority; no expansion recommended.	n/a
10	Seabird colony descriptions of the Sister Rocks, South cliffs of Alderney and Casquets.	Surveys of the southern cliffs completed for gulls (Section 2.1.2) and shags (Section 2.1.3), these included the sister rocks. Full survey of Casquets completed (Section 2.4).	NEW: Aerial photography of Les Etacs and Ortac for gannet population count.

Table 15. Outline of works for 2015 from ARS2 (including work due from 2013/14)

	Outline 2013	Notes for 2013	Outline 2014	Notes for 2014	Outline 2015
Marine	Intertidal ecology: Marine intertidal habitat mapping and quadrat surveys of Burhou and Clonque Bay (Phase I & II).	Intertidal ecology: Phase II completed from Fort Raz to the lighthouse. Due to limitations of time the project could not be undertaken on Burhou or Clonque Bay.	Intertidal ecology: Marine intertidal habitat mapping and quadrat surveys of Burhou (Phase I & II), Clonque Bay (Phase I) and Casquets (Phase I & II).	Sections 2.2.1 (Clonque Bay), 2.2.4 (Braye Beach Bay) and 2.4 (Casquets).	Intertidal ecology: a) Marine intertidal habitat mapping and quadrat surveys of Burhou (Phase I), Clonque Bay (Phase II) and South cliffs (Phase I). b) Strandline survey of Clonque Bay. c) Important and invasive species assessments of Clonque Bay (section 2.2.2).
	Benthic ecology & topography: Bathymetry survey. Video habitat and species assessments (Phase I).	Benthic ecology & topography: Lack of necessary equipment and time restrictions meant that this work could not be carried out.	Benthic ecology & topography Bathymetry survey. Video habitat and species assessments (Phase I).	Benthic ecology & topography: Lack of necessary equipment and time restrictions meant that this work could not be carried out. However, anecdotal species records were recorded and qualitative benthic surveys completed of Braye Beach Bay during MSc project (section 2.2.4).	Benthic ecology & topography: a) Desk-based bathymetry study of Ramsar Site from available GIS marine resources. b) Video habitat and species assessments of Clonque Bay (Phase I) using snorkel and Go-Pro video techniques (but dependent on weather and time). c) Potential eelgrass survey – intertidal or sublittoral using snorkel and video techniques.
	Pelagic ecology: None	Pelagic ecology: None	Pelagic ecology: None	Pelagic ecology: None	Pelagic ecology: a) Desk-based abiotic parameter assessment of Ramsar Site which includes: Tidal Flow, Turbidity, pH and Salinity from available GIS marine resources.
	Marine Mammals: Grey seal population dynamics study.	Marine Mammals: Collected effort based data and collated with observational data.	Marine Mammals: Grey seal population dynamics study. Grey seal photographic ID catalogue. Effort	Marine Mammals: Section 2.2.3	Marine Mammals: a) Grey seal population dynamics study. b) Grey seal photographic ID

			based land/boat surveys. Marine user/public marine recording strategy.		catalogue. Effort based land/boat surveys. c) Marine user/public marine recording strategy.
			Academic research: MSc project on marine intertidal and sub-littoral ecology of Braye Beach Bay.	Academic research: Section 2.2.4	Academic research: Potential MSc project on either: ecology of rockpools; invasive species or barnacle population dynamics (section Appendix 5.3).
Terrestrial	Phase I Burhou	Write-up ongoing by external consultant	Phase I & II Habitat Survey South cliffs of Alderney	Staff unavailable to conduct surveys so must be carried forward	Phase I & II Habitat Survey South cliffs of Alderney and Burhou
	Phase I Casquets	Unable to land on Casquets due to other works on the island in 2013, attempt again in 2014	Phase I Casquets	Section 2.4	
			Terrestrial Phase I Habitat Survey Map Review	Staff unavailable to conduct review	Terrestrial Phase I Habitat Survey Map Review
Seabird	Burhou Seabird Monitoring	Section 2.1 (2013)	Burhou Seabird Monitoring	Section 2.1	Burhou Seabird Monitoring
	Full Seabird Survey of Coque Lihou	Shags studied. Fulmar, Crow and Great Black-backed Gull also present. Boat observations of Auks only due to disturbance	Alderney and Other Islet Seabird Monitoring	Section 2.1	Alderney and Other Islet Seabird Monitoring
	PhD	Section 2.1.8 (2013)	PhD	Section 2.1.9	PhD
	Rat survey of Burhou	No specific monitoring carried out, but no signs seen during visits to Burhou and on cameras	Rat survey of Burhou	Section 2.5.1	Small mammal survey of Burhou

Invasives	Control of hottentot fig within the Ramsar site Monitor and mapping of the distribution of Slipper Limpet & Japweed	Small amounts removed on Burhou; ongoing work by conservation volunteers around Alderney No Slipper Limpets; Japweed locations being mapped	Control of hottentot fig within the Ramsar site Monitor the distribution of Slipper Limpet & Japweed Invasive Species (Marine & Terrestrial) Review Report Point	Section 2.5 Section 2.5 Work carried out within standard report but no specific publication	Control of hottentot fig within the Ramsar site Monitor the distribution of Slipper Limpet & Japweed Invasive Species (Marine & Terrestrial) Review Report Point
Education Publicity	Events/programmes for the public and schools	Section 2.4 (2013)	Events/programmes for the public and schools	Section 2.6	Events/programmes for the public and schools
Advisory Legislative	Production of Conventions list Oil Spill Action Plan Production of Ramsar Stakeholder List and Ramsar Stakeholder Group Investigate co-operative CI Ramsar Network	Work on a list has been started Brought forward from 2012 and underway (Section 2.2 (2013)) No work completed Co-operative Ramsar site not specifically discussed but work begun on a co-operative Channel Island Environment Group (Section 2.2 (2013))	Production of Conventions list Oil Spill Action Plan Alderney Environmental Conservation Act Production of Ramsar Stakeholder List and Ramsar Stakeholder Group Investigate co-operative CI Ramsar Network	Section 2.7.1 Section 2.7.2 Section 2.7.3 A topic of discussion during Inter-Islands meeting (Oct 9 th /10 th); any outcomes must be followed up during 2015	Alderney Environmental Conservation Act Investigate co-operative CI Ramsar Network
Ramsar	Update Ramsar Information Sheet	To be completed over the Winter	Update Ramsar Information Sheet	To be completed over the Winter	Update Ramsar Information Sheet

4. References

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Rossiter, T. (2014). *Uncharted waters: A baseline study on the ecological composition of Braye Bay, Alderney, using mapping and environmental surveys*. University of York Research Thesis.

Soanes, L., Ratcliffe, N., Booker, H., Atkinson, P. and Michel, C.C. (2010). *Is an increase in gull numbers responsible for limiting Atlantic Puffin *Fratercula arctica* numbers on Burhou, Channel Islands?* Seabird 23. 91-103.

Data obtained for previous years from:

Independent Annual Reports for the Alderney West Coast and Burhou Islands Ramsar Site Management Strategy. Reports written by: Soanes, L. (2007), Broadhurst, M. (2008), Skene, A. (2009), Stockdale, J. (2010), Morgan, L. (2011), Allison, J. & Bohan, A. (2012) and Morley, T. (2013).

5. Appendix

5.1 Summary of Seabird Population Monitoring

			SCR	Seabird 2000				-	Burhou Project			Ramsar ARS1					Ramsar ARS2				
Location	Species	Method	1987	1999	2000	2002	2003	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
Les Etacs Ortac	Gannet (<i>Morus bassanus</i>)	AON	2391 1985	3450 2500	- -	- -	- -	4862 2547	- -	- -	- -	- -	- -	5765 2120	- -	- -	- -				
Coque Lihou	Shag (<i>Phalacrocorax aristotelis</i>)	AON	80	-		-	-	-	-	-	-	-	-	-	-	77	66				
Little Burhou			8	-		-	-	-	-	-	-	-	-	-	-	35	36				
Burhou			6 ⁽¹⁾	47		-	-	-	-	-	19	21	19	24	23	20	21	14			
Alderney			31	160		-	-	-	-	-	-	-	-	-	-	-	18 ⁽²⁾	51			
Burhou	Puffin (<i>Fratercula arctica</i>)	AOB (Raft)	210 ⁽³⁾ -	180 ⁽³⁾ -		- -	- -	120 (139)	127 (92)	114 (127)	132 (134)	- (131)	153 (157)	160 (174)	176 (175)	168 (96)	143 (58)				
Burhou	Storm Petrel (<i>Hydrobates pelagicus</i>)	Ind. ⁽⁷⁾ (Rung) ⁽⁸⁾	- (35)	- -	2,800					-	-	-	-	-	-	-	-				
				(204)	-	(300)	(465)	(317)	-	(171)	-	-	-	-	-	-	(433)				
Burhou	Herring Gull (<i>Larus argentatus</i>)	AON (Chicks)	70 -	125 ⁽⁴⁾ -		- -	- (16)	202 -	110 (3)	148 -	164 (1)	52 ⁽²⁾ (8)	85 (17)	73 (6)	5 (4)	18 (12)	32 (18) ⁽⁵⁾				
Alderney			96	285 ⁽⁴⁾		-	-	-	-	-	-	-	-	-	-	-	315 ⁽⁶⁾				
Burhou	Lesser BBG (<i>Larus fuscus</i>)	AON (Chicks)	105 -	313 ⁽⁴⁾ (232)		- -	- (308)	1103 (386)	936 (140)	994 -	1001 (3)	640 ⁽²⁾ (281)	1074 (335)	1236 (11)	991 ⁽⁴⁾ (202)	- (28)	1392 (276)				
Alderney			13	70 ⁽⁴⁾		-	-	-	-	-	-	-	-	-	-	-	315 ⁽⁶⁾				
Burhou	Great BBG (<i>Larus marinus</i>)	AON (Chicks)	22 -	27 ⁽⁴⁾ -		- -	- -	18 -	18 -	16 -	17 (0)	- (5)	23 (0)	23 (1)	4 (4)	1 (1)	6 (2) ⁽⁵⁾				
Alderney			5	21 ⁽⁴⁾		-	-	-	-	-	-	-	-	-	-	-	315 ⁽⁶⁾				
Alderney	Fulmar (<i>Fulmarus glacialis</i>)	AOS	53	50		-	-	-	-	26	20 ⁽²⁾	38	34	16 ⁽²⁾	34	29	29				
Platte Saline	Ringed Plover (<i>Charadrius hiaticula</i>)	AOS	-	-		-	-	-	-	-	1	3	5	3	2 (8)	2 (8)	4 (4)				
Clonque		(Ind.)	-	-		-	-	-	-	-	-	-	-	-	-	-	2 ⁽²⁾ (4)				
Houmet des Pies	Common Tern (<i>Sterna hirundo</i>)	AON (Ind.)	18 -	20 ⁽⁴⁾ -		- -	- -	15 -	- -	11 (64)	- -	- -	- -	- -	5 (24)	14 (43)	25 (28)				

⁽¹⁾ Counted in 1988; ⁽²⁾ Partial colony count only; ⁽³⁾ Individuals on land; ⁽⁴⁾ AOS not AON; ⁽⁵⁾ Inc. Little Burhou; ⁽⁶⁾ All gull spp. together; ⁽⁷⁾ Calc. from ringing; ⁽⁸⁾ Inc. re-traps

5.2 Gull PhD Proposal Submitted to University of Liverpool

Anthropogenic and natural drivers of demographic processes: A comparison between associated seabird colonies

Supervisors: Dr Jonathan A. Green (University of Liverpool), Phil Atkinson (BTO), Paul Veron (La Société Guernesiaise) and Roland Gauvain (Alderney Wildlife Trust).

1. Motivation and Wider Context

Anthropogenic activities, such as climate change, resource exploitation, habitat loss and pollution have the potential to influence demographic processes in natural populations. Our understanding of how anthropogenic drivers' effect natural populations can only be improved through detailed, usually long-term, studies, in particular focusing on populations currently undergoing major changes. While positive and negative effects have been reported, for many populations the impacts of anthropogenic activities are not always obvious, particularly where multiple influences interact.

For example, some seabird species such as gulls might initially be thought of as 'winners' in these interactions, with their obvious colonization of the urban environment and adoption of anthropogenic food sources such as discarded food on city streets, landfill sites and fisheries discards. However recent research has suggested that in the UK gull populations are in decline, and indeed the herring gull (*Larus argentatus*) is currently one of only four seabird species on the UK red list (Eaton *et. al.*, 2009). One suggestion is that seabird populations that have been artificially sustained by fisheries discards may begin to decline to levels observed prior to mass discarding. However previous studies have shown that the result of resource changes such as this can be both complex and irreversible.

Historical changes in discarding within European fisheries are likely to be compounded by the forthcoming European Commission Ban on Discards and other changes in fishing effort and type. Other sources of anthropogenic food such as landfills and city streets change and are subject to different regulations, policies and behaviour. Meanwhile natural food sources fluctuate with oscillations and changes in the natural environment and new anthropogenic influences such as renewable energy installations. Very little is known about exactly how adaptable gulls (and other seabird populations dependent on human resources) are in their ability to switch between food sources. As a result, it is hard to know how their populations are likely to change in future years.

Our project focuses on lesser black-backed gulls (*Larus fuscus*) and herring gulls (*Larus argentatus*). These species are impacted by multiple human pressures including: overfishing, fisheries discards, habitat loss through coastal development, climate change, disturbance and pollution (e.g. discarded fishing lines and landfills). Anecdotal evidence suggests that neighbouring populations on Alderney (Burhou) and Sark/Guernsey in the Channel Islands appear to be responding in very different ways to these pressures. The apparent differences in behavioural ecology between the Alderney and Sark/Guernsey populations allow a unique opportunity to study the differing impacts that a group of human activities has on two populations of the same species, allowing us to make wider predictions to how this species may respond to future change.¹

2. Aims of the Studentship

This project aims to establish and analyze the anthropogenic drivers of gull demographic processes through the following chapters:

- Using innovative GPS tracking² and stable isotope evaluation of diet (supplemented with long-term ringing records?):
 1. How consistent are individual gulls in their foraging behaviour and diet? Do they show adaptability/flexibility and switch between different natural and anthropogenic food types and foraging areas? Or do they have strong niche loyalty?
 2. How do the Alderney and Sark/Guernsey populations differ in their foraging behaviour and diet?
 3. How dependent is each population on natural verses different types of anthropogenic food types and foraging areas? Are any dependencies driven by proximity to different types of resource?
- Using long-term ringing records, population censuses and behavioural observations³:

¹ Field season just for tagging [and recapture] so costs of travel and accommodation from late May to late June per year: Liverpool – Guernsey (Lihou or Sark) – Alderney (Burhou) – [Guernsey (Lihou or Sark) – Alderney (Burhou)] – Liverpool.

² Remote download tags preferential depending on cost, but recapture tags most likely to have to be used to save costs; 40 tags required to cover lesser black-backed gull populations (20 Burhou, 20 Lihou or Sark).

³ Use MARK or E-SURGE to model each individuals ringing history looking for patterns within the study period. Combine with weather/SST historical records and observations in an ordinal regression.

4. How have demographic processes such as migration, mortality, recruitment and productivity varied within and between the populations in recent years (since 2008)? What natural and anthropogenic factors drive these processes and can they explain any inter-population differences?
- Using all study data and comparative data across sites (Texel, Skomer?):
5. How might the two colonies react to changes in anthropogenic activities within the population, in particular discards practices?⁴
6. What can we predict about other populations of these species' from our contrasting sites in the Channel Islands?

3. Work Plan

The student will spend three summer field seasons on the Channel Islands with intervening periods based at the host University. The student will be trained in a range of skills which are both diverse and complimentary. These will include fieldwork observations, biollogging and demographic modeling as well as the opportunity to explore population modeling. Channel Island Bird Ringers and Alderney Wildlife Trust provide high quality logistical and supervisory support as well as extensive datasets.

4. Background of Applicant

We are looking for an enthusiastic and academically accomplished student who will be committed to working not only in the field, but also with large datasets and challenging analyses and modelling. Relevant research experience with seabird colonies will be required as will a desire to produce results for the project and a demonstration of your interest in the fields of behaviour, ecology and conservation.

5. Ongoing Data Collection Available

From Channel Island Bird Ringers:

- Colour ringing at the following effort levels in the stated locations for lesser black-backed gulls:
 - Adults (BURHOU) - 2009-present, minimum sample of 50 each year in early June.
 - Chicks (BURHOU) - 2008- present, through repeated methodology of checking the whole colony for chicks. Some years poor return (3 chicks in 2008) others good return (259 chicks in 2010).
 - Adults (BAILIWICK) - 2009- present, at 15-20 individuals trapped on nests per annum.
 - Chicks (BAILIWICK) - 2008- present, at 40-70 individuals per annum.
 - Adults (CHOUET LANDFILL) - 2009- present, in mid-May to early-June (a one week period between these dates) with a total of 2,000 ringed individuals.
- Access to study on Herring Gull chicks ringed on Guernsey, 1998-2006 inclusive; average of 200 chicks per year.
- 10,000 gulls have been colour ringed since 2008 providing a very reasonable sample size in excess of 80,000 records: 50% herring gull, 45% lesser black-backed gull and 5% great black-backed gull (*Larus marinus*).

From Alderney Wildlife Trust:

- Apparently occupied nests counts for all gull species (BURHOU), 2005-2013 inclusive, with only partial counts in 2009, GBBG missing in 2009 and LBBG missing in 2012/13.

From Joint Nature Conservation Committee:

- Historical data from Operation Seafarer (1969), The Seabird Colony Register (1987/88) and Seabird 2000.

6. References

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Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A. and Gregory, R.D. (2009). *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds 102. 296-341. <http://www.bto.org/sites/default/files/u12/bocc3.pdf>

Votier, S.C. et. al. (2004). *Changes in fisheries discards rates and seabird communities*. Nature 427. 727-730.

⁴ Need a modelling component which relies on differences between the colonies.

5.3 MSc dissertation options for University of York 2015

1. Ecology of intertidal rock-pool habitats.

Assessment: The project will entail investigating species biological diversity and composition of intertidal rock-pool habitats on Alderney, using field-based methods. This will include researching different rock-pool habitats (i.e. *Ulva* spp, *Sargassum muticum* and *Corallina officinalis* rock-pool habitat types) in terms of: species bio-diversity, composition and ecological status (i.e. invasive/rare species). Surveys will be completed across different intertidal environments (including bays within the island's Ramsar Site, harbour and recreational areas). Research methods will include timed species searches and environmental parameter assessments (i.e. size, depth of rock-pools, water temperature).

2. Barnacle population dynamics: measuring future climate change impacts on Alderney.

Assessment: The project will entail investigating barnacle species population dynamics across different intertidal environments (bays and shoreline heights) within Alderney. This will include barnacle species presence, bio-diversity, density (% proportion), individual age structure (adult or juvenile) and predator presence. The field-based survey methods will follow the 2008 MarClim survey protocol, which uses barnacle species as a biological indicator of climate change impacts.

3. Investigating the invasive species, *Sargassum muticum* on Alderney.

Assessment: The project will entail investigating the invasive intertidal algae species, *Sargassum muticum* on Alderney, using field-based and desk-based methods. The field-based survey methods will include determining the presence, distribution, frequency and the composition of associated marine species (i.e. attached marine species) of this invasive species within different intertidal environments. Desk-based methods could include comparative assessments from previous anecdotal surveys and records using GIS analysis.

5.4 Casquets Marine Surveys Report

Full report appended from next page.