Ringed Plover conservation in Scilly April – August 2024

Photograph by Abigail O'Leary

Summary

This project was undertaken by the Isles of Scilly Wildlife Trust in the 2024 breeding season, with funding from the RSPB England Beach-nesting Bird Programme, funded by Natural England. This project focused on improving the breeding success of Ringed Plovers in the Isles of Scilly. Following declines across England, this is now the only place southwest of Dorset where Ringed Plovers are breeding.

The project achieved this goal by surveying for breeding Ringed Plovers (*Charadrius hiaticula*), gathering information on the risks they faced in Scilly, and working out how best to manage and mitigate these risks. There was a strong emphasis on public engagement. Beach surveys were undertaken between April and July. Continuous monitoring was maintained throughout with the use of trail cameras. Existing community connections established during work before the project (January to March 2024) were built upon throughout the season through both social media and face-to-face conversations.

This project has been a success and has given us more insight into the potential causes of the visible decline in breeding pairs across the islands as well as creating a solid basis for ongoing community engagement surrounding behaviour changes. Overall, this season saw 13 breeding pairs with an additional two unconfirmed breeding pairs and demonstrated a preference for nesting on St Martins. The report includes a discussion on the lessons learned this year and recommendations for future work to protect Ringed Plovers.

Introduction

The Isles of Scilly comprise around 200 islands and significant rocks. All of Scilly is designated as a National Landscape (previously known as an Area of Outstanding Natural Beauty). Over 450 species of bird have been recorded on the Isles of Scilly, but only around 50 of those species breed on the islands.

Ringed Plovers (*Charadrius hiaticula*) is a small wader. Plovers are now a red-listed UK bird of conservation concern due to declines in their breeding population. They are being adversely affected by predation and recreational disturbance, with coastal change and climate change also likely to be factors. Breeding in England is now largely confined to the least disturbed beaches and areas where conservation management is in place. The Isles of Scilly's breeding population is a key geographical outlier with the next closest breeding population being on Chesil Beach in Dorset.

Despite increasing pressure from people and dogs on their beach-nesting grounds in Scilly, the beaches on the isles tend to be significantly less disturbed than most other beaches on the English coast. The Isles of Scilly also has a more limited range of nest and chick predators than Mainland Britain. Mammalian predators are limited to domestic and feral cats (which may be present on all the inhabited islands) and Hedgehogs (just present on St Mary's), with Foxes and mustelids being absent. Whilst the islands have a small resident Peregrine population (one to three pairs), and Carrion Crows and a range of large gull species are frequent, Scilly lacks Magpies, with Kestrels being scarce and generally only present in passage periods.

Aims

The primary focus of this season's efforts was to build a foundational understanding of breeding sites, productivity and the factors affecting breeding success. Objectives were:

1. Improve understanding of Scilly's Ringed Plover population and their pressures.
    a. Repeatedly survey islands to identify all nests and record development stages.
    b. Monitor Ringed Plover nests to understand the impacts of disturbance and predation using trail cameras.
    c. Increase foundational data to improve baseline understanding

2. Attempt to protect vulnerable nests using cordoning and interpretation.

3. Raise awareness within the community (local people and visitors) of Ringed Plover population decline using interpretation and social media.

Methodology

Surveys for Ringed Plover nests were conducted from mid-April to the end of July focusing on locations with appropriate habitats and locations where nests have been previously reported. Two approaches were used to identify nest sites which worked in conjunction:

1. Systematically walking along the beach

    a. If working in a team having one person at the top of the beach and another walking along the high tide mark scanning for eggs.

    b. When working alone a zig-zag pattern was adopted along the distance between the high tide mark and the top of the beach scanning for eggs.

2. Monitoring Adult Behaviour

Observing for nesting behaviour from adults (i.e. alarm calling, circling over an area, or running to and from a particular area), waiting roughly 5-10 minutes for adults to return to the nest to accurately locate eggs.

These approaches were also applied when conducting productivity/chick checks. In addition to this vantage points were selected, and observations were taken for a period of 1 hour to ensure chicks could be accurately counted. Once the nests/chicks were located, they were immediately logged on the monitoring app.

Monitoring App

One of the key goals for this season was to build a foundational understanding of Scilly's Ringed Plover population. This population project was a pilot to establish foundational evidence. Various population surveys of Ringed Plovers have been conducted on Scilly over the years. This project aims to establish a clear methodology to allow for comparisons between breeding seasons. To more effectively monitor and protect Ringed Plovers in the future the project team created and trialled an app that allowed simple and accurate data collection in the field.

To collect spatial information during Plover surveys, a bespoke project application was developed using ArcGIS QuickCapture. Data collected using the app fed directly into ArcGIS Online feature layers, where it could be displayed on the IoS Ringed Plover Breeding Dashboard (Annex A).

Once a nest observation was made, the app was used to log the current "status" of the nest: Active (eggs), Hatched, Failed, or Unsure. App users can upload a photo of the nest. The user is then asked which breeding pair to assign the observation to, from a list of current nesting pairs. Additional information could then be added if needed before the record is submitted to ArcGIS Online e.g. in the instance of a new nest.

We saw varying success with the app, whilst useful to log data in real-time. There were certain limitations, for example, the link between the nest observations and the dashboard. Since there were two feature layers, one for nest observations and one for the status and location of nests (which was displayed on the dashboard), the nest status layer had to be manually updated based on the nest observations layer when a nest status changed. This could potentially be resolved and automated in the future by creating a table join link between the two layers which updates periodically.

Trail Cameras

One of the aims for this season was to monitor as many Ringed Plover nests as possible, in order to understand the impacts of disturbance and the main causes of predation. Initially, Reconyx HyperFire2 cameras were used, however, the infrared light appeared to be disturbing the Plovers at night. As a result, a decision was made to switch models to the Browning Spec Ops Elite HP 5 which had the option of turning the light off while still achieving visible footage at night.

Results

The data presented below is based on data collected during the 2024 season and is compared to data collated from several different sources including the annual seabird monitoring survey by the IoSWT and the Special Protection Area breeding bird survey. It is important to note that these results are not representative of the total population of Ringed Plover on the Isles of Scilly as several locations previously noted as nesting sites were not monitored this season.

Figure 1. Map depicting the total number of Ringed Plover nests observed throughout the season and the respective outcomes. This map was obtained through the monitoring app.

Between April and July, a total of 16 nests were located and monitored. Three of these nests are suspected to be 2nd and 3rd broods, as a result, it is estimated that in total this season there were 13 active breeding pairs.

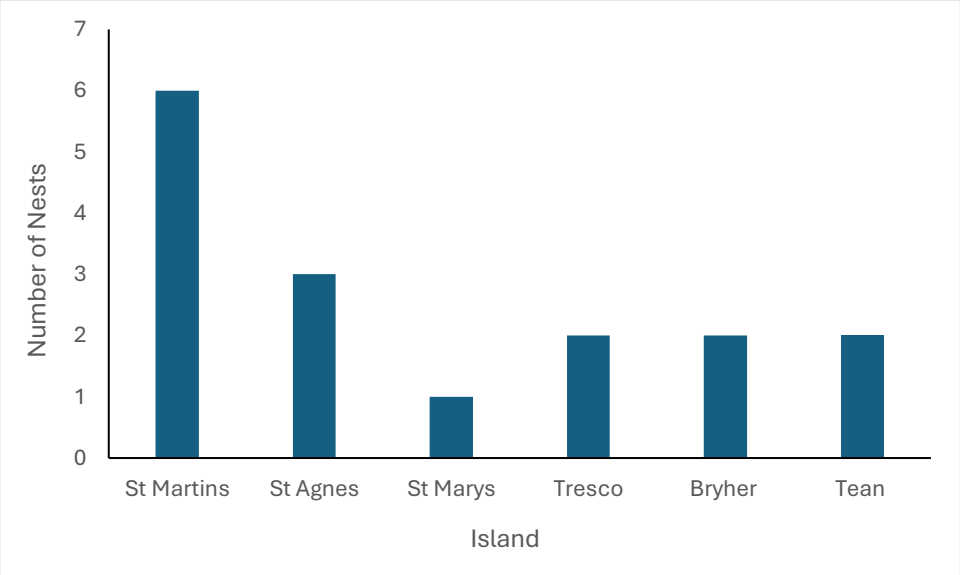


Figure 2. Bar graph showing the distribution of nests across all inhabited islands, St Martin's, St Agnes, St Mary's, Tresco, and Bryher as well as one uninhabited island Teän.

The data suggests that St Martin's beaches are favoured by Ringed Plovers as nesting sites. No data was collected this year on beach preferences however in future it would be beneficial to record the length and width of the beaches, the type of substrate, and the proximity to feeding flats.

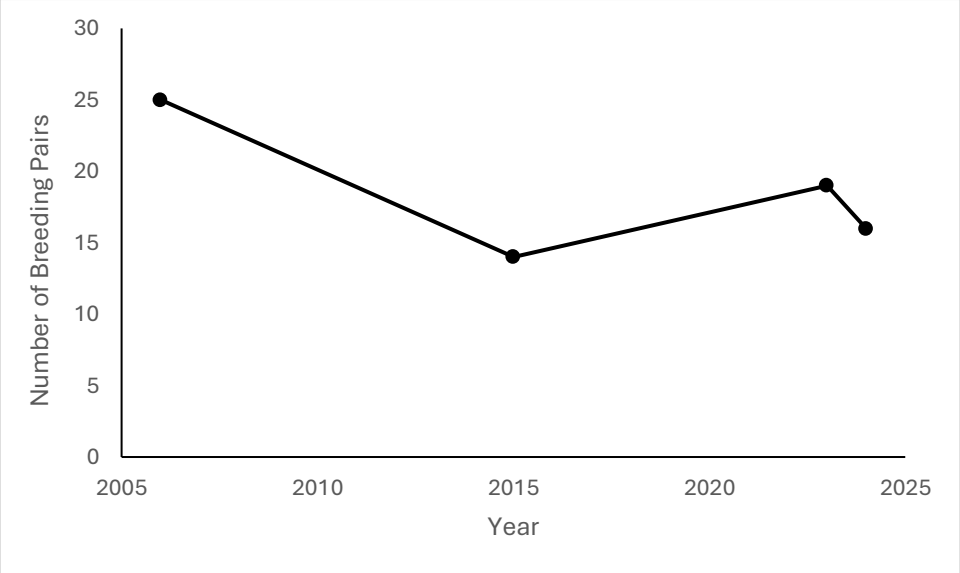


Figure 3. Graph depicting population change of Ringed Plovers between 2006 and 2024. Data extracted from Special Protection Area breeding bird surveys.

Important to note that Special Protection Area breeding bird surveys are conducted every 7-8 years so there is little to no data for the years in between. Regardless, the graph depicts a 36% population decline in Ringed Plovers on Scilly between 2006 to 2024. However, it appears that there was a slight increase in breeding birds recorded on the islands between 2015 and 2023 which may be attributed to the global pandemic and the subsequent lockdown.

*Table 1. indicates where breeding pairs were recorded on Scilly over the years and how many pairs were located. Values between 2006 and 2023 have been extracted from Special Protection Area breeding bird surveys. Islands marked with an * indicate islands that were monitored with trail cameras. NC stands for 'not checked'.*

Island	2006	2015	2023	2024
St Agnes and Gugh *	10	1	1	3
Samson	2	2	0	NC
Gweal	0	1	0	NC
Bryher and Shipmans Head	3	1	7	2
Tresco, Green & Plumb Island	6	5	4	2
Norwethel	1	0	1	NC
Foremans Island	1	0	0	NC
Tean & Pendenbrose	1	3	3	2
St Marys & Tolls Island *	0	1	2	1
St Martins & White Island *	1	0	1	6
TOTAL	**25**	**14**	**19**	**16**

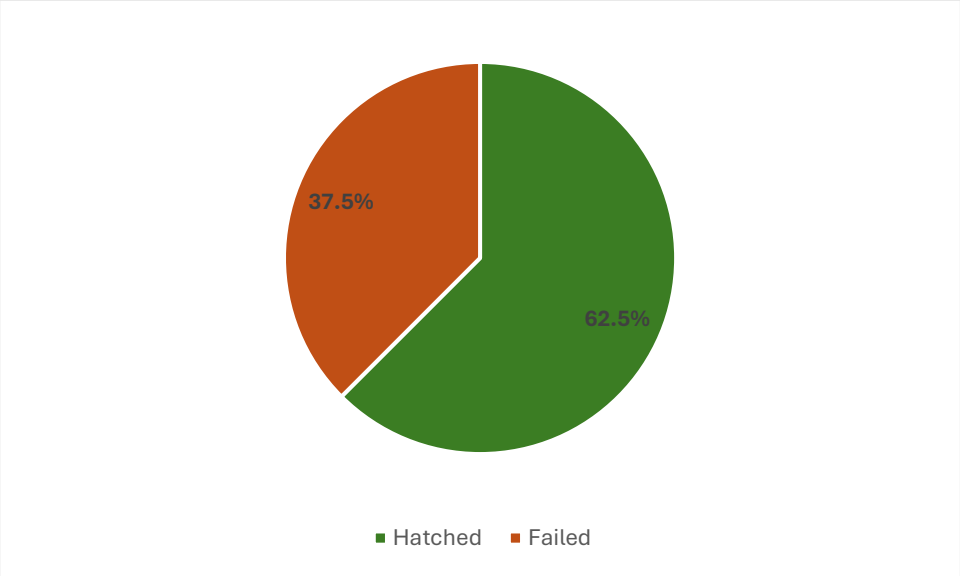


Figure 4. Pie chart showing the total percentage of hatching success and failure across all nests.

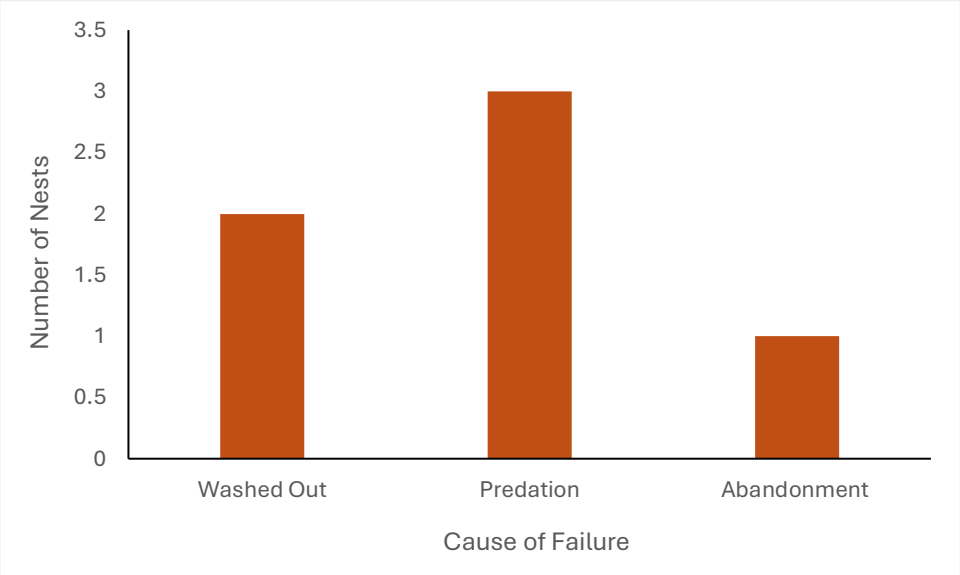


Figure 5. Graph depicting the various causes of nest failure. 'Washing out' here describes several instances where nests were washed away by a high tide. Abandonment was not a result of interference from the survey team and was most likely caused by the proximity of nests to the main entrance to the beach.

There was one instance where a nest was at risk of being washed away by a very high tide and the decision was made to attempt to move it. The relocation was successful. However, not long afterward, the nest was predated by a gull. It was unclear whether this was a direct result of the team's actions or not. It should be noted that in this case, the nest would have failed regardless of whether the team had not stepped in or not.

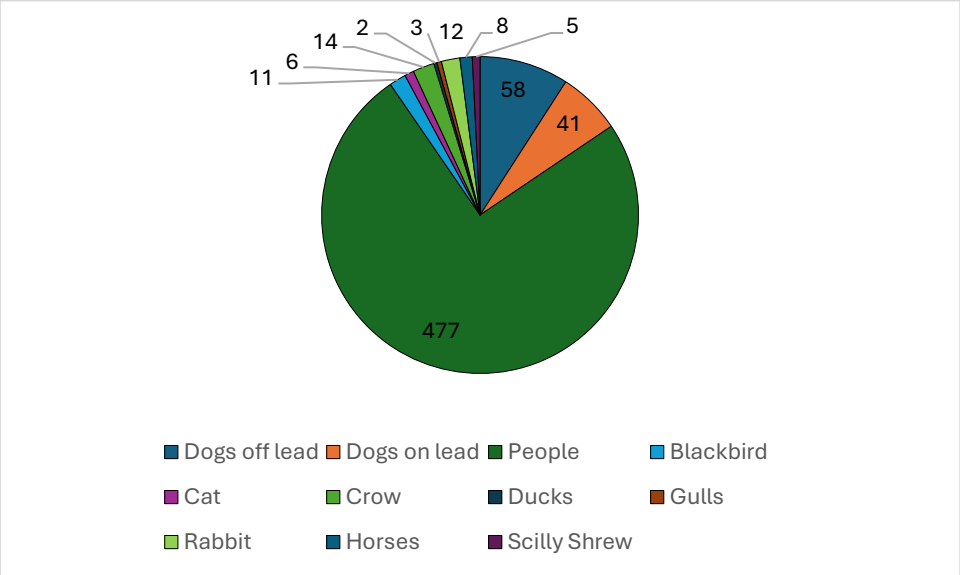


Figure 6. Pie chart shows the proportion of each type of disturbance captured on the trail cameras out of 637 videos from Porth Hellick, White Island and Lawrences Bay.

There were 1287 videos where Ringed Plovers were recorded being disturbed but the cause was unclear, this has not been included in the graph above. In total, there were 1924 videos recorded that captured instances of disturbance out of around 4000.

Trail Camera Analysis

In total, this year, 4 nests were monitored from discovery (usually 1-2 eggs) until hatching (unless predation events occurred). This footage was then analysed by Rahul Jaitly, a post-doctorate graduate from the University of Exeter, to monitor the long-term impact of disturbance, as well as being used for social media posts.

In total 2102 videos were captured at Porth Hellick: 1196 and Lawrence Bay: 906 covering 10hrs 52 min of footage. People are present in 542 videos and approach or are close to the cordon (within ~5m) in 159 videos. Dogs are seen in 104 videos and are off-lead in 59 of those videos.

Plovers are significantly less likely to be on the nest at the start of a video where a dog is visible and is not on a lead (LLM; $\beta = -1.66$, $SE = 0.484$, $p < 0.001$). The presence of people in a video also significantly reduces the probability that a Plover is on the nest at the start of a video, particularly if they are close (within ~5m) to the cordon (LLM; By cordon, $\beta = -3.66$, $SE = 0.511$, $p < 0.001$; Away from the cordon, $\beta = -1.12$, $SE = 0.141$, $p < 0.001$).

Table 2. Counts of Plovers on and off nest at the start of nest camera videos from Porth Hellick and Lawrence Bay

	Plover on Nest	Plover off Nest
People		
<5m	4	143
5m+	93	268
No people	726	629
Dogs		
On lead	16	33
Off lead	5	53
No dogs	816	961

Discussion

This pilot study has been incredibly useful as an evidence and data-gathering exercise as well as a learning opportunity. Whilst there is plenty to improve for next year, there are many positive outcomes from this year:

- The engagement from the local community and visitors in their dedication to helping protect Ringed Plovers.
- Identifying preferential breeding areas on Scilly for Ringed Plovers.
- Building a sound baseline for the population size of Ringed Plovers on Scilly.

Plover Lover Fridays

Plover Lover Friday (PLF) was a social media series that started on the 10th of May and ended on the 19th of July. This series was set up to engage visitors before they arrived on the islands for their holidays as well as increasing awareness within the local community. In total, the series saw 31,084 users view the videos posted with each post reaching on average over 1000 views, the highest viewed video reaching 6800 social media users.

- 15 total posts across Facebook and Instagram, the Plover Lover Friday series ran from 10 May to 19 July.
- Each post reached over 1000 views with the highest viewed post reaching 6800 social media users.
- In total, the series saw 31,084 users view the videos posted.

- Individual 'plays' of the videos were played up to 3,000 times (this means that the same person could have viewed it once or four times, we recorded each time the video was 'played' as well as 'viewed')
- Across the series, the posts saw 1657 impressions (reactions, i.e. likes, comments and shares)

Plover Ambassadors

The Plover ambassadors were a team of volunteers across the off-islands who were passionate about protecting and monitoring the Ringed Plovers. In total, there were 6 regular volunteers based on St Agnes and St Martins who contributed to the project by providing updates on the progress of nests and distributing signs and Plover priority maps (Annex B & C) around the local area. They also got in touch when new nests appeared and helped set up cordons as well as adjusting trail cameras when necessary. On one occasion, a volunteer got in touch to let me know that a nest was at risk of being washed out on a very high tide, so we coordinated a plan to move the nest higher up the beach. Unfortunately, the nest was eventually predated, but we were able to move the nest successfully thanks to the vigilance of the volunteer. This work demonstrated how vital volunteers are for the success of this project. Future goals include increasing involvement and volunteer numbers next year.

Trail Cameras

The trail camera footage gave insight into how the beach is used as well as an indication of footfall and the proportion of people complying with the dogs on lead signs. The aim for next year is to get a trail camera set up on every nest located including those on uninhabited islands as well as cameras set up to take still images along the beach to get a better idea of the number of people using the beaches that Ringed Plovers are nesting on.

Outreach

During the initial phase of the project, professionals within this field were contacted to share knowledge and advice on the most effective approaches.

Wynonna Legg a Plovers in Peril Project Officer based in Norfolk was contacted for advice on predation mitigation measures such as nest cages and chick shelters. Her advice was that unless nests were being repeatedly decimated by predation, particularly at the egg stage, nest cages may do more harm than good. Especially since there is a chance of abandonment after the cage is placed, there is also the risk of learnt behaviour from predators such as birds of prey and cats with a subsequent risk of adult mortality. Nest cages also need to be checked regularly which was another reason for not using them this year. This is potentially something we can implement next year with the help of more volunteers. Chick shelters are potentially something worth implementing next year as it appears predation is most prevalent at the chick stage likely due to compounding instances of disturbance.

Mark Appleton and Adam Bourton in West Sussex hosted project workers to view several of their sites including Pagham Harbour, Langstone Harbour and Medmerry. This trip provided insight into what we can implement next year in order to help with breeding success. The biggest difference was the size of their sites in comparison to the beaches on Scilly. Due to this, the team can fence off large areas of the beach without impacting public access. However, West Sussex also have more predatorial threats to deal with such as foxes and breeding Kestrels which have been contributing to adult mortalities – not something experienced on Scilly. This was mirrored at Chesil Beach the location for the Little Tern Project, managed by Christopher Goding. Whilst the focus at Chesil Beach is predominantly the Little Terns, they do get a few pairs of Ringed Plovers every year nesting within their extensively fenced-off area. They also use lasers to scare away predators, predominantly gulls and foxes, however, these are only effective when it is dark or cloudy.

Additionally, Rahul Jaitly, a post-doctorate graduate, has been volunteering to analyse the thousands of videos from the trail cameras. This has been extremely valuable as this is a time-consuming process and he has

managed to extract important information on the impact of disturbance on Ringed Plovers. He has already expressed an interest in volunteering his time again next year to continue analysing our trail camera footage.

Recommendations

Whilst overall this year should be considered a success, especially when it comes to understanding our population size and the key pressures affecting breeding success, there are several key areas to improve to continue to have a greater impact next year.

Plover Ambassadors

As one of the smallest Wildlife Trusts in the UK, Volunteers, or Plover ambassadors, are crucial for the future success of the project. With plans to develop this project over the coming years, there is a need for additional support when it comes to deploying trail cameras, conducting both nest and chick checks and setting up cordons to allow capacity for community engagement events and other research opportunities.

With this project set to expand next year, the goal is to encourage the recruitment of volunteers within the local community. This in itself is a form of community engagement directly connecting our local communities with conservation projects on their islands. Ideally, events would be run on each of the five islands throughout March before the birds start settling in April with the aim of increasing the number of volunteers recruited. Recruiting Plover Ambassadors on each of the off-islands will be extremely helpful for reducing staff time and boating costs to check on nests on off-islands. This will also help for reacting quickly with signage (to be located on off-islands before the breeding season) where needed when new nests are reported.

With the hope of recruiting a strong volunteer team next year it will be imperative to create a document that explains the 'do's and don'ts' of surveying beach nesting birds. This is to ensure that birds are not being flushed off the nest repeatedly so as to not jeopardise the hatching success or increase the risk of predation to both eggs and adults.

Winter Work

Over the winter we will be working with the St Martin's Interest Group (SMIG), which is a community-led group working to protect their sand dunes in response to climate change and rising sea levels. St Martin's is the 'favoured' island for breeding by Ringed Plovers largely due to the island's vast sandy beaches and the sand dunes providing ample cover from predators. This partnership aims to produce interpretation boards displaying:

- Information about the important work SMIG is doing to protect sand dunes
- Directing people to use designated paths rather than trampling through the dunes
- A joint message about how healthy vegetated dunes also benefit wildlife, specifically Ringed Plovers.

This funding has been secured through the IOS National Landscape funding in partnership with SMIG with the output aiming to be complete by March 2025.

Trail cameras and further monitoring

The trail cameras provided excellent insight into the disturbance and the behaviours of the Plovers on the nest. Next year it would be beneficial to have trail cameras stationed on every nest that is visible in order to have a comparative dataset, this would also include nests located on uninhabited islands. With this comparison of hatching success, chick success, and adult behaviours between breeding pairs on beaches with high footfall compared to those on beaches with considerably less (but not 0) footfall will be easier. In addition to cameras focused on each Ringed Plover nest, it would be beneficial to have cameras taking still images down the length of the beach every hour during the breeding season. These images can then be used to understand how often people, boats, dogs, etc are using the beach. Additionally, this data can be uploaded to a citizen science hub called Zooniverse to aid with analyses.

The introduction of thermal data loggers as a monitoring tool next year is favoured. These small pieces of equipment rest under the eggs in the nest and track changes in the temperature of the eggs over time. This, in combination with trail cameras, may provide insight into the impacts of disturbance and if this is causing any knock-on effects in terms of incubation time, subsequent hatching success and the potential increase in predation risk. Using thermal data loggers will also back up the footage of disturbance captured on beaches and hopefully provide hard evidence that can be used for community engagement and education.

Monitoring App

The creation of the monitoring app this year was a key component to the success of the project overall. Being able to easily record sightings of adults, eggs, and chicks, as well as document nest failures and predation centrally meant that analysis and site-specific work were more effective. One of the key challenges at the beginning of this project was the scattered nature of previous data between digital files and paper documents, being able to pool all the information into one easily accessible dashboard was incredibly beneficial.

This year the app was only used by the project lead and was not distributed amongst volunteers; we aim to change this for next year with a few small updates to the app to make it easier to use. Monitoring productivity and chick survival is a challenge and there is no standardised method that will provide reliable or accurate results, the current procedure is to sit and scan the beach with binoculars and watch adults for defensive behaviour. However, the majority of this method relies upon waiting and watching for periods longer than about 20-30 minutes. When including volunteers this work will be beneficial, for the reliability of the data, to record how long they spend monitoring for chicks. To overcome this issue, a timer and GPS logger will be added to the app so volunteers can just press a button at the start of their survey and then again once they've finished. This will track where they walked or stood and how long for, they will then be prompted to answer questions about number of chicks observed and their approximate age.

In addition to the monitoring app, an additional Ringed Plover sighting Microsoft form for the general public will be produced. A QR code for this form would be generated and distributed across each island for people to scan as and when they see a Ringed Plover, utilising the public as an untapped resource for further monitoring. Whilst this won't be as sophisticated as the monitoring app it would paint a clearer picture of population size and potentially nesting sites that haven't been located before. When a submission is made through the QR code the project team will be notified via email and a decision can be made depending on location priorities. This will further benefit our continued efforts to improve the monitoring of Ringed Plovers as well as simultaneously acting as a community engagement tool.

Bird Ringing

Across the country similar projects have begun ringing their Ringed Plovers for several reasons; it improves the ability to estimate local population size, ringing allows for accurate records of 2nd broods, and it can help us identify if we get migratory individuals during the winter as well as track where our breeding pairs are spending the winter. Ringing individuals provides an opportunity for advanced data collection which will be beneficial for the future of the project overall.

Conclusion

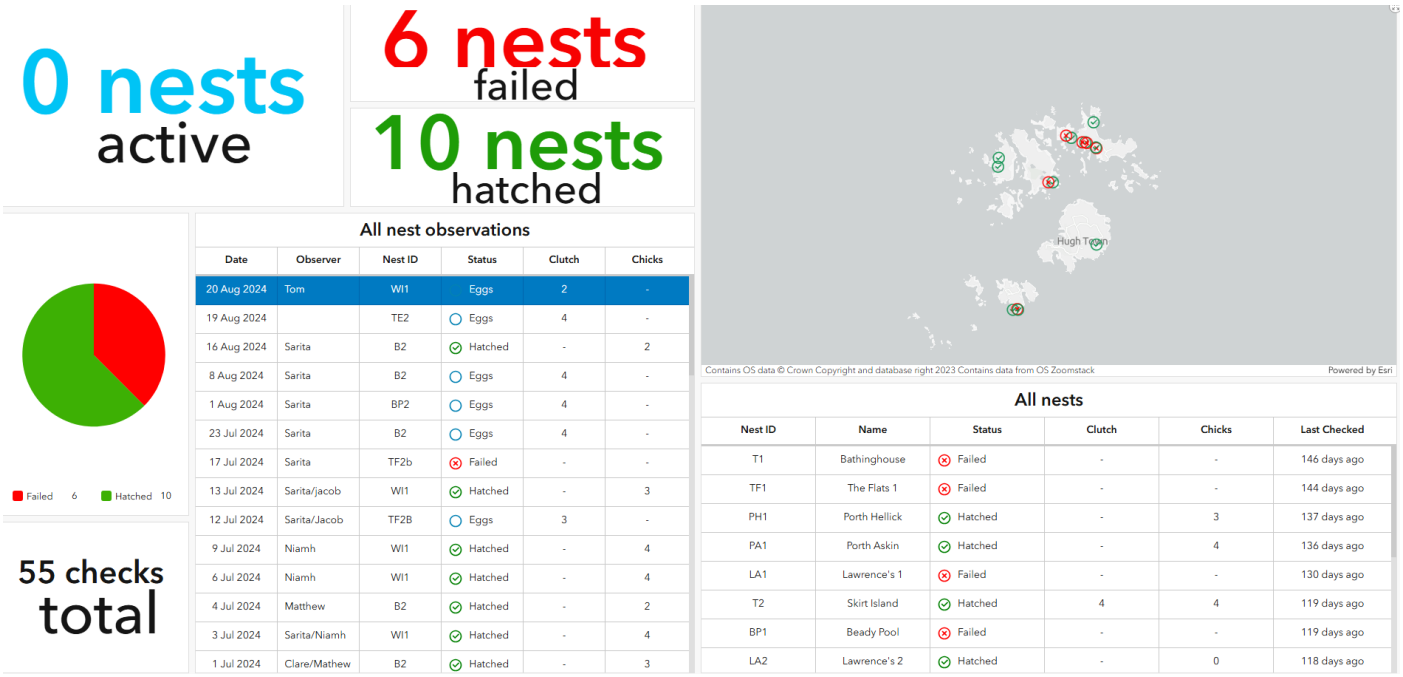
Whilst population counts of Ringed Plovers have been conducted in previous years on Scilly, this project marks the beginning of the Trust's ongoing commitment to monitor and protect these vulnerable birds. Overall, this project has been a success and has given us more insight into the potential causes of the visible decline in breeding pairs across the islands as well as creating a solid basis for ongoing community engagement surrounding behaviour changes.

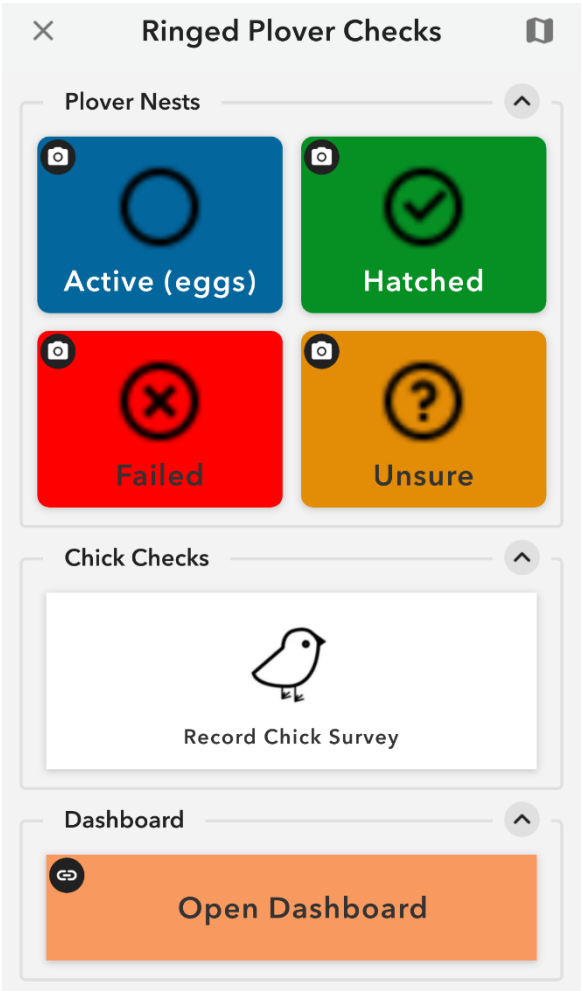
Looking to continue this project in the future the most important area to focus on is recruiting a larger volunteer team, with these additional boots on the ground may of the other improvements become easier such as expanding our survey area to include more of the uninhabited islands. Additionally, small improvements can be

made in the short term such as minor updates to the monitoring app to make it more user-friendly with the hopes of making this accessible to the wider team and volunteers. There is no doubt that this is an important project to follow through within the coming years as the breeding ranges of these birds are rapidly decreasing in the UK. Scilly is an important stronghold for Ringed Plovers and this project has highlighted the unique position we are in to support this species.

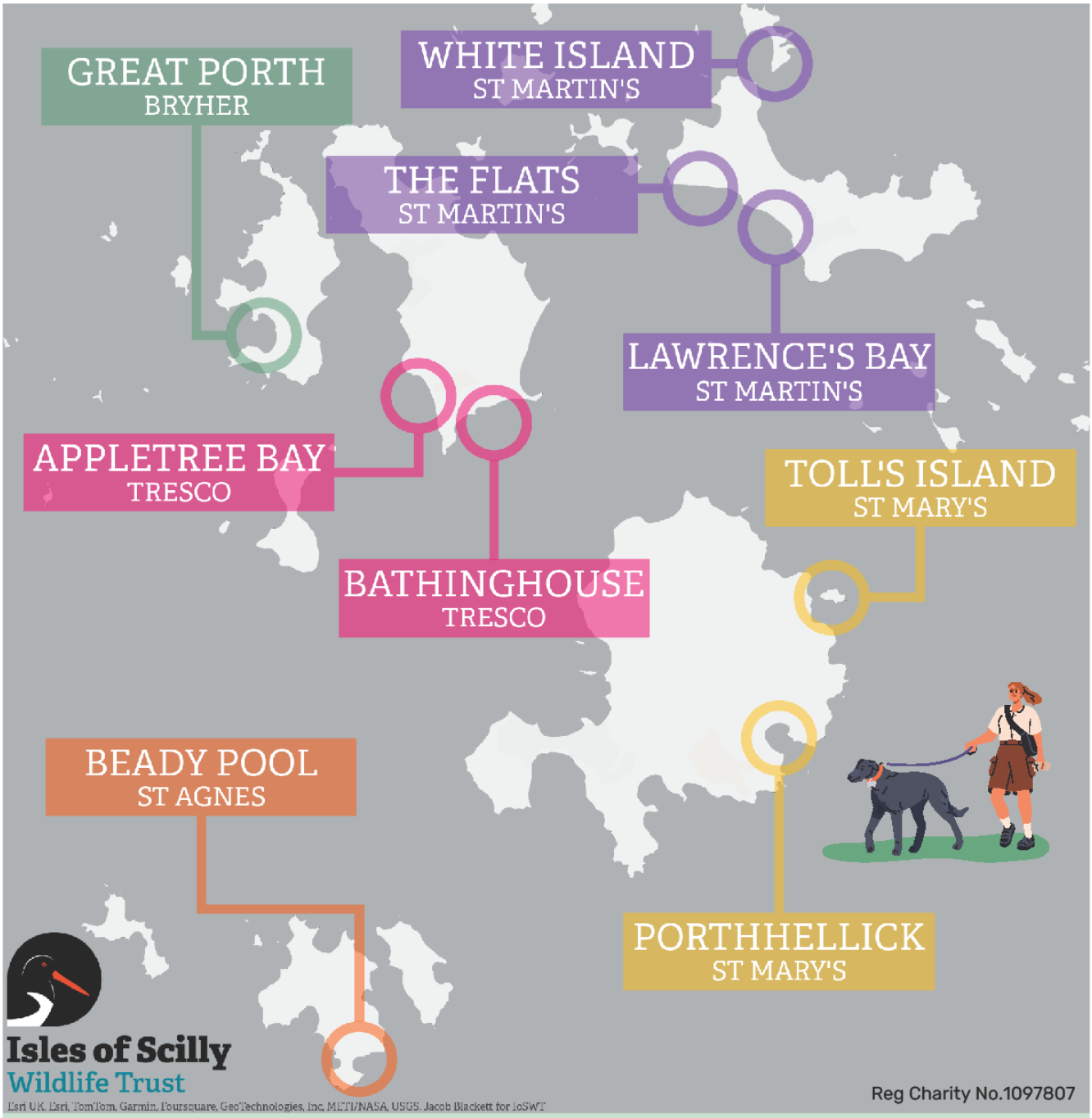
Annex

Annex A: IoS Ringed Plover Breeding Dashboard and App





Annex B: Ringed Plover Priority Map



Plover Priority Beaches

These beaches have been identified as key Ringed Plover nesting sites.

Please look out for our signs and keep dogs on leads at these locations.

If you notice Ringed Plovers nesting on other beaches **PLEASE** get in touch:

t: 01720 422153
e: sarita@ios-wildlifetrust.org.uk
a: Isles of Scilly Wildlife Trust, Trenoweth, St Mary's, Isles of Scilly, TR21 0NS

Annex C: Ringed Plover Beach Signs

Isles of Scilly Wildlife Trust

Protect Our Plovers

Keep Dogs on Leads

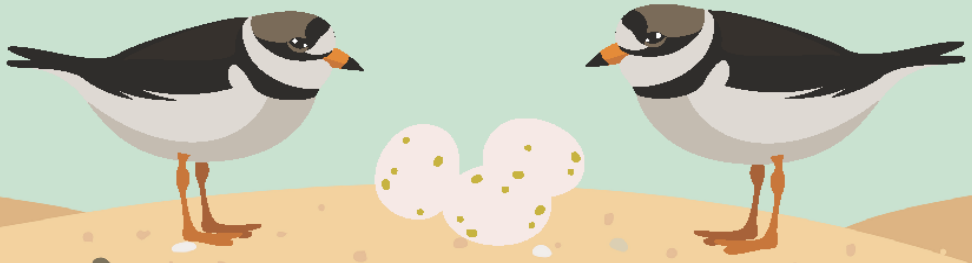
Ringed Plovers like to nest on this beach. They are easily disturbed by your furry friends and may abandon nests.

April to July

Thank you for helping to keep their chicks safe!

Get In Touch

t: 01720 422153
e: sarita@ios-wildlifetrust.org.uk
a: Isles of Scilly Wildlife Trust
Trenoweth
St Mary's
Isles of Scilly
TR21 0NS



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