Profiling Punakaiki Penguins

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Abstract and introduction

The overall aim of the project was to raise the profile of the Little Blue Penguins residing in the West Coast, Punakaiki area. This was to be achieved through three main objectives;

1) Estimating the population of nesting penguins and to map the exact location of their nests.
2) Engage in at least one local school in the project to build camera-compatible nesting boxes and install these boxes in strategic areas to collect valuable information.
3) Profile the project with pictures and video from the artificial nesting boxes on a website dedicated to the biodiversity and conservation within the Punakaiki Coastal Reserve.

However, due to the time constraints between collecting data and the breeding cycle of the penguins, some of these aims could not be achieved during this scholarship period.

I did manage to collect a reasonable quantity of pictures of the penguins using infrared cameras placed along the main trail, capturing their journeys back and forth from the coast to their nests.

From this data, I have been able to estimate approximately how many individual penguins are using the main beach track within the Punakaiki Restoration Site to access their nests. I have also been able to very roughly estimate where the penguins are leaving the track and moving into the thicker bush to access their nest sites.

There are plans to engage Barrytown School and invite them to take part in designing artificial nesting boxes for the penguins in the area. These will then be installed into chosen locations for the penguins to use in June, at the beginning of the breeding season. I have designed and written, using various data sourced from this scholarship, a pamphlet we can send to the children at Barrytown School. This will provide them with fun and exciting information to get them enthusiastic about the biodiversity and ecology in their neighborhood. (See the attached pamphlet).

Fig 1. This Picture was taken on the 20th November 2014 at 10:58 pm. This penguin is traveling towards the coast from the nest site.

Methods

The pictures were captured using six infrared cameras, set up along the main beach track located within the Punakaiki Restoration site. These cameras have several different functions and settings that allow you to take a single or a series of photographs throughout the night. I used a mixture of the settings throughout the three weeks including; a single picture taken when a moving object triggers the sensors at the bottom of the camera; continuous photos taken with a specific time interval between each flash along with a combination of camera and video, where a single picture is taken while capturing a video for a set time limit.

I made three separate trips to Punakaiki to collect data on the penguins and during my spare time there, I helped out with another students summer scholarship project that was working in the same area. The trips were as follows: 11th – 15th November, 18th – 21st November and the 26th – 28th November. I would have made more trips to the West Coast but prior commitments rendered me unavailable until majority of the breeding season had finished.

I began setting up the cameras on the evening of 11th November 2014, leaving the cameras overnight and walking back to the site each morning to collect the data chip and batteries for re-charging. I would return in the late afternoon to the beach track to reset the cameras for the following night. The first few days were a trial and error of where to the place the cameras to gain the most and best data. After the first couple of nights, it became evident that some locations were more successful than others; this allowed me to learn where to best position the cameras and adjust accordingly.

As I continued to gather data from the cameras, during the second week it became evident that the penguins where only using approximately half the track, moving into the bush at around the midway point. I noticed this as none of the cameras were taking a single picture past a particular point, even when the camera was placed in the middle of the track. Therefore, the penguins must have been leaving the pathway in favour of the denser bush at some point. After this, I attempted to position the cameras facing towards the bush, targeting locations where I suspected they were leaving the track. However, by this time it was getting towards the end of the breeding season, when the chicks begin to fledge and the adults moult. During this time, the adult penguins do not leave their nests, as it is this point they are at their most vulnerable. This meant fewer penguins were being captured on the cameras, so I was unable to gain solid evidence of the exact locations the penguins were delving into the bush. I did have some suspicions they were leaving the track approximately half way up through two channels in the

undergrowth, but as previously mentioned I have no solid photographic evidence to prove this theory.

The last week of data collection carried out 26th to 28th November 2014 showed signs of the penguins beginning to slow down. I gained the least amount of pictures of penguins from this trip; evidence the breeding season was coming to an end. I also waited up on the track from 10pm until 12:30pm on the 27th November, planning to follow the penguins and see where exactly they left the track, but this was unsuccessful.

As I had previous travel commitments, Dr Stéphane Boyer returned to Punakaiki in my stead during early December to set up more cameras and to try and catch a glimpse of the penguins. It was evident that the chicks had fledged the nest and the adults were beginning their moult as there were no photographs of penguins taken on any of the cameras or on the track.

Due to the life and breeding cycles of Little Blue Penguins, there was little more I could achieve in the field. The remainder of the scholarship period was spent researching the best designs, sizing and materials to use for the artificial nesting boxes. I contacted various organisations and governmental departments, networking with important sources to gain the best knowledge for the nesting box overall design. I also had the exciting opportunity to partake in a behind the scenes tour of the Christchurch Antarctic Centre, where I was able to get very close to their 20 individual strong penguin colony. The keepers graciously provided me with the exact measurements the centre uses to build their own nesting boxes.

I have since designed and written a pamphlet aimed towards the children at Barrytown School on the West Coast, inviting them to join Lincoln University to design artificial nesting boxes for the penguins. The hope for these nesting boxes is that they will be installed before June, when the breeding season begins. We hope the penguins will start to use these boxes, as their nests if they cannot find a suitable site themselves, this will enable data to be gathered much more easily for future research.

Fig 2. This picture was taken on the 11th November 2014 at 10:01 pm, showing a penguin using the track to access their nest site.

Results

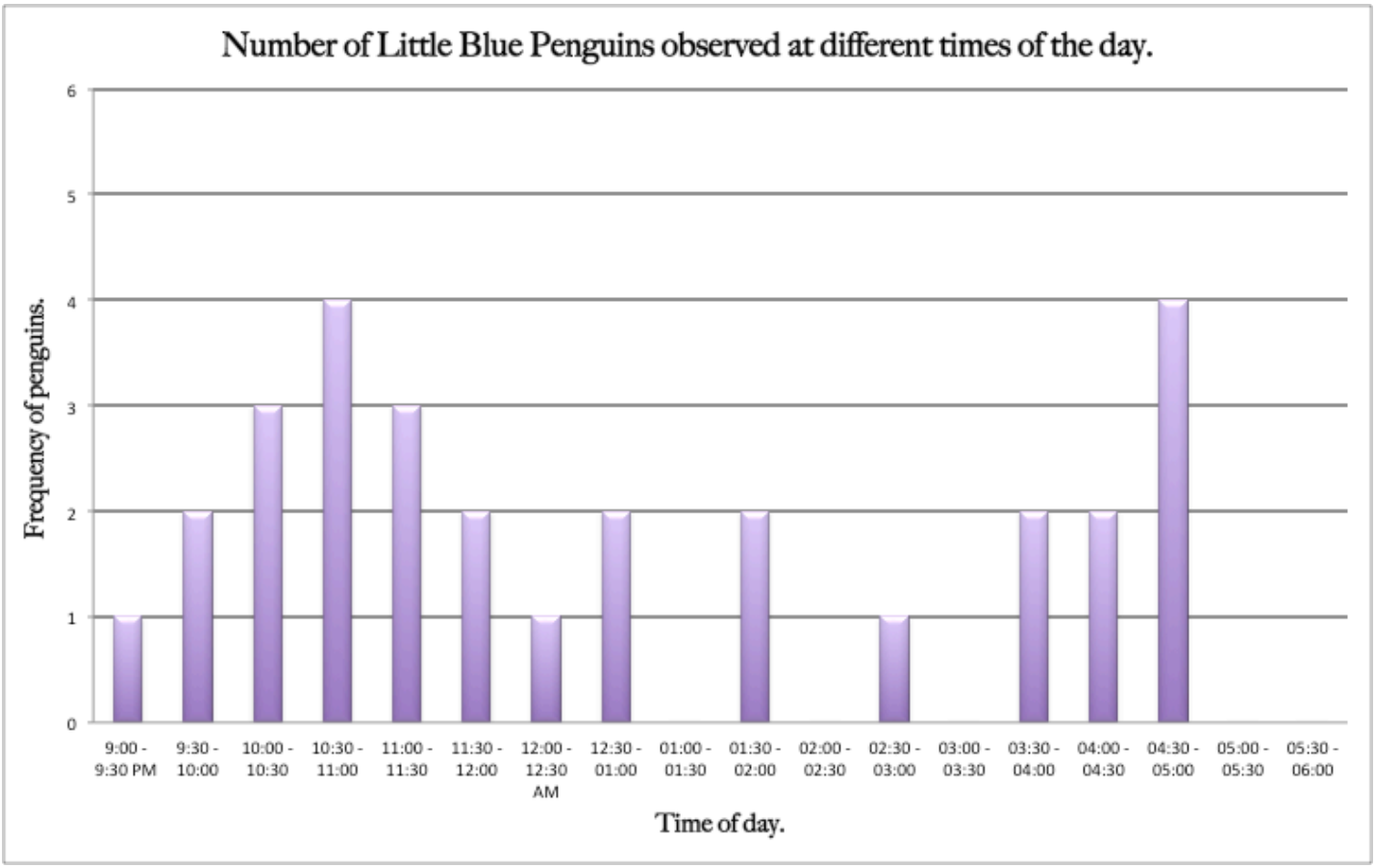

Fig 3. The number of penguins seen at different times of the day.

This graph was compiled using the collaborated data from the three weeks worth of raw data collection. All the pictures I gathered from the cameras were separated into individual time intervals of when the penguins set off the camera flash. Therefore, this graph does not show if the penguins were the same returning individuals from a specific night as all three weeks were combined.

There were two main time periods of activity for the little blue penguins, once in the evening and once again in the early morning. During the evening, the main time the penguins were captured on camera was between 10:30pm and 11pm. The photographs show that four individuals used the main beach track as a pathway to their nests from the coast. The early morning time that was most active was between 4:30 am and 5am. During this time, four individuals again used the track to access the coast from their nests. The penguins will stay out in the ocean all day before coming ashore to their nests the next evening under the cover of nightfall so to reduce the likelihood of predation.

Throughout the three weeks there was no recognised penguin activity caught on the cameras before 9pm and past 5am. This may be due to it being too light for the penguins to feel comfortable moving into the open space of the beach. There were three other periods of zero recorded activity of the penguins using the track; these were between 1am and 1:30am, 2am and 2:30am and 3am and 3:30am. Oddly enough these were all on the consecutive hour, but this is probably due to a strange coincidence.

Reflection

I found this scholarship to be valuable in regard to providing me a taste of what it is like conducting fieldwork without constant supervision. I was able to plan my time how I saw fit and most beneficial along with making important decisions over the locations of the cameras. It has also provided an opportunity to network with representatives from the Little Blue Penguin Trust, who have since requested copies of my raw data, histogram and pamphlet for their media outlets. I was able to work in a beautiful part of New Zealand over the summer and take a behind the scenes tour at the Christchurch Antarctic Centre to visit their large penguin colony up close and personal. I found this a great experience to gain knowledge and learn about an exciting (and very cute) species and thank you for the opportunity.

Fig 4 & 5. These pictures were both taken during my visit to the Christchurch Antarctic Centre.