Royal Albatross Centre Education

Seabird Behaviour

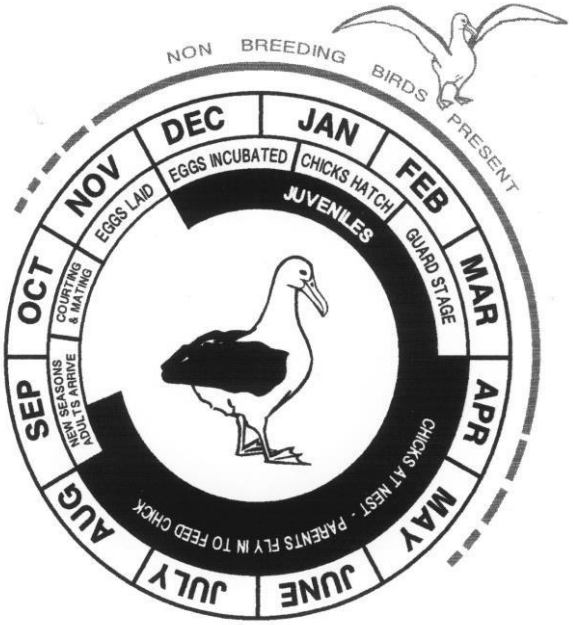
A Biology Programme for
Secondary Students
at the **Royal**
Albatross Centre

Student Worksheets

2022

Seabird Behaviour – Activities

Annual Cycle of the Royal Albatrosses



Northern Royal Albatross - Toroa
Diomedea sanfordi

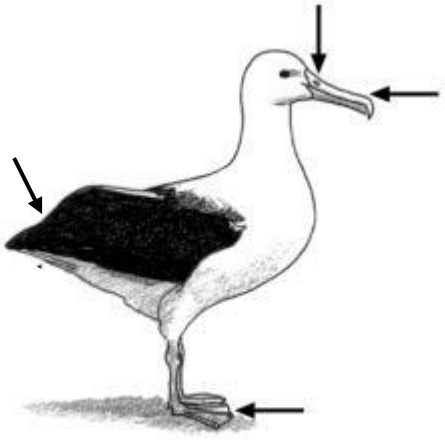
- white body, black on backs of wings
- feeds on surface shoaling fish and squid
- male and female equal share in rearing 1 chick every 2nd year
- mature at 6 years - live about 30 years
- mate in October 1 egg laid in November
- incubation 79 days
- chick guarded for the first 6 weeks
- young depart late September

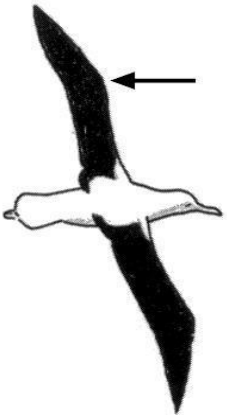
Annual Cycle of the Spotted Shag

Annual Cycle of the Otago Shag

FEATURES AND ADAPTATIONS OF A SEABIRD

1. Albatross spend 86% of its life at sea. What adaptations do they have that makes them a seabird? Identify the 5 key features of an albatross and explain how each feature helps them adapt to life at sea.





_____

_____

_____

2. If albatross spend most of their time at sea, why do albatross come to land and what considered as an ideal nesting site?

_____

_____

ANNUAL CYCLE OF ALBATROSS

3. The breeding behaviors of animals are influenced by abiotic and biotic factors.

What are some examples of abiotic and biotic factors that affect the breeding behaviors of the albatross? Give examples below:

Abiotic factors	Biotic factors

4. Based on the weather (abiotic conditions) and the time of year (annual cycle) – what behaviours would you expect to observe today for the albatross?

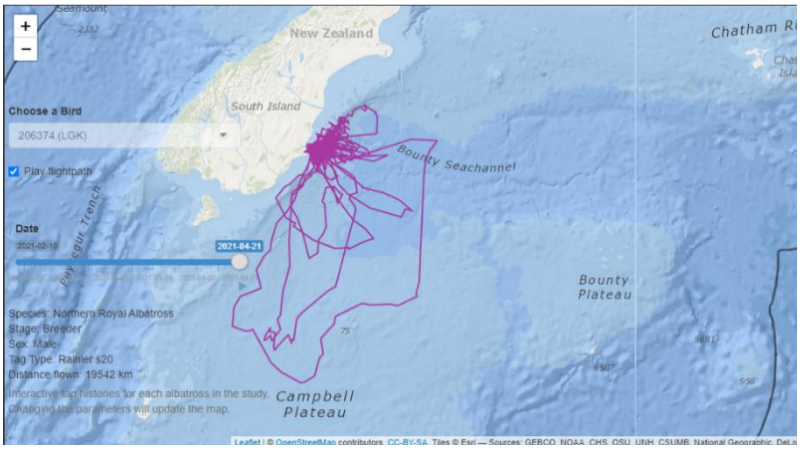
TRACKING ALBATROSS: HOMING AND MIGRATION

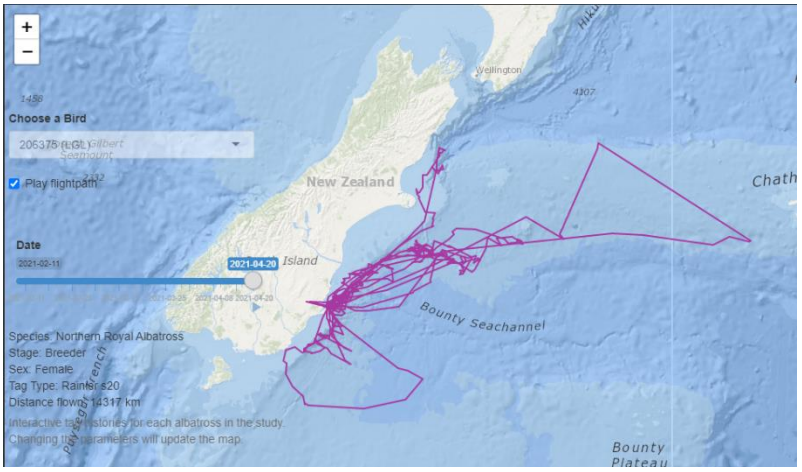
5. Seabirds are great navigators. Homing and migration are two common movements across both involve the ability to navigate their way "back home again". How does migration differ from homing behavior?

	Homing	Migration
Travel distances		
Travel time		
Travel period		

Over the years scientists were able to use GPS to track the navigation behaviour of the albatross. Look at the maps and answer the following questions:

6. The maps shown below are the total flight paths of two parents (LGK & LGL) during the first half of their breeding season (11/02/21 -30/04/21):





A) Is this behaviour migration or homing?

B) Where on the map does each parent spent most of their time (look for overlapping lines)

C) Does the bathymetry of the sea affect their foraging route? If so, how?

7. (Reading): Below is GPS tracking of four juveniles back in 2008 – 2009. Read through the paragraph and the maps and answer the questions below:

Each of the birds had lightweight satellite transmitters attached to their back feathers and GPS locations were given every 6 hours and the data was plotted onto Google Earth Maps for visitors to our web- site to view. These birds were tracked for approximately one year.

All four albatrosses are currently no longer transmitting. We may never know the reason for this, but speculations include detachment of the transmitter (due to natural wear and tear of moulting of the feathers), malfunction, or mortality of the albatross. However, if these albatrosses return to the colony as expected in the years to come, it may be possible to ascertain the reason.

Journey

They appeared to head north from Taiaroa Head up the coast of NZ. From here they travelled across the Southern Ocean in and almost straight line, taking between 11 and 80 days to reach the coast of Chile from NZ waters.

The speed of the albatrosses ranged between 105 and 110 km/hr and the altitude was approximately 37m above sea level. The average daily minimum distance travelled ranged from 500km to just over 1000km and the total maximum distance travelled during the tracking period was 46,000km.

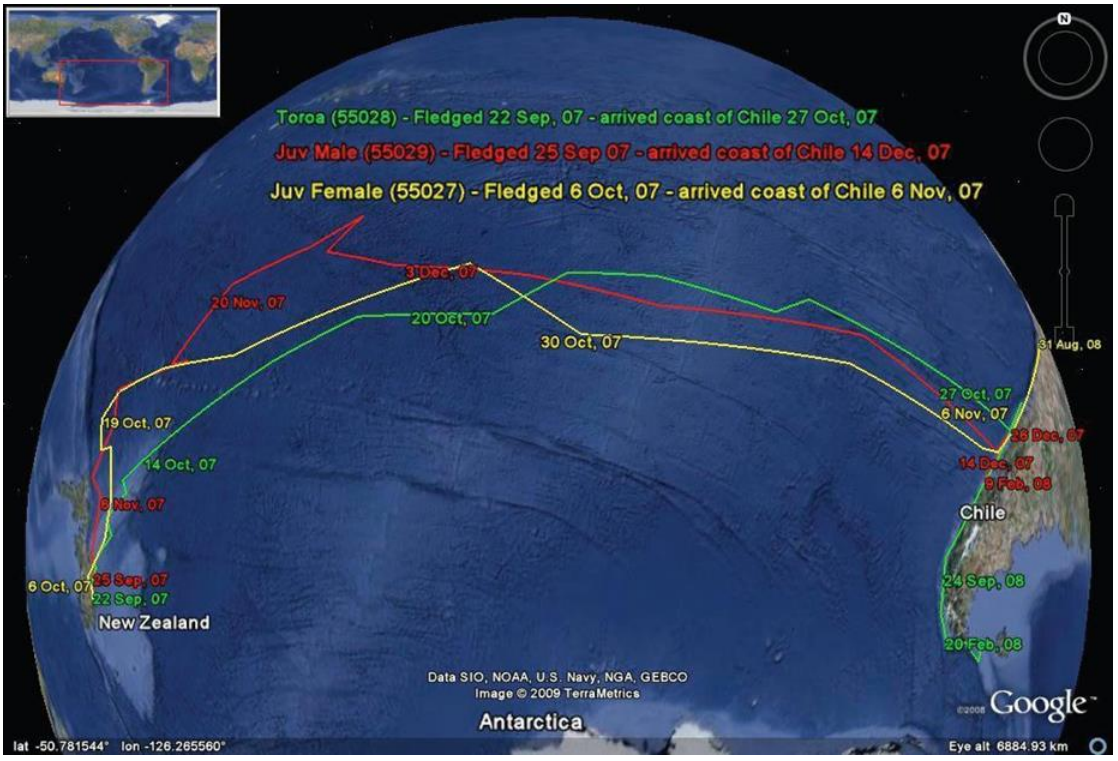
Oceanic and environmental data will be analyzed with location data to find possible behavioural patterns as well as travel routes and ocean hotspots used by the Northern Royal Albatross and the time of the year used.

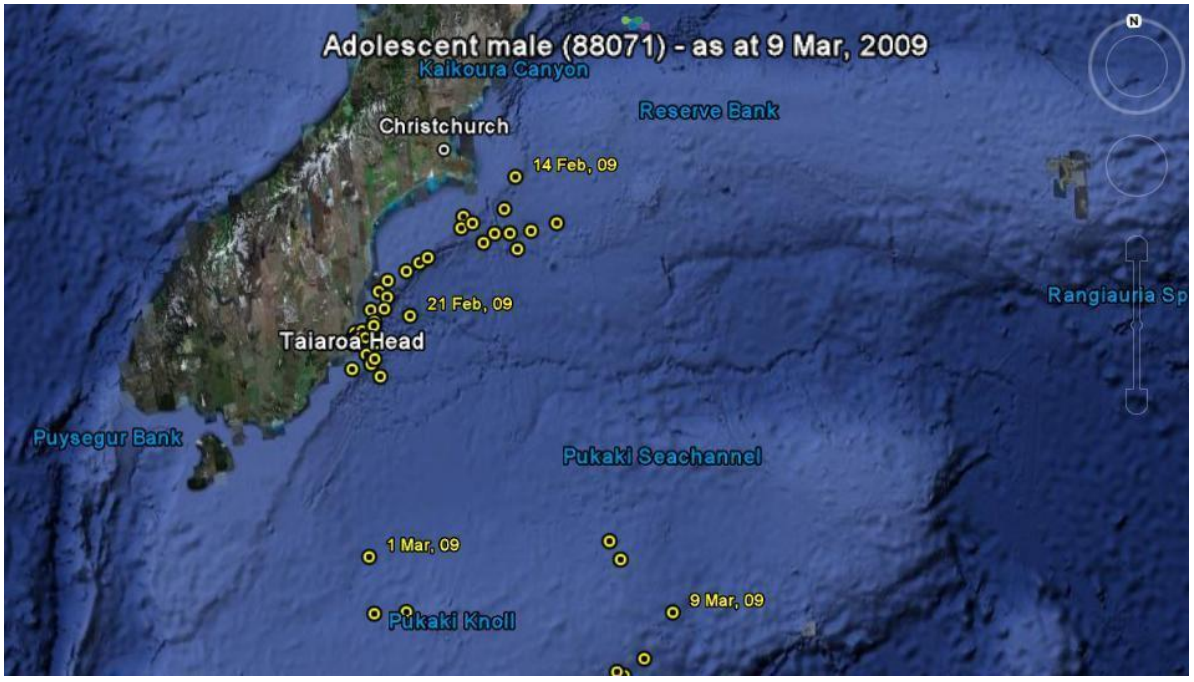
Understanding where the Albatrosses go at every stage of its life is important in identifying possible reasons for population decline and possible management plans can be developed to aid the growth of the colony.

Toroa (55028) – last data received Sep 2008
Juvenile Female (55027) – last data received Aug 2008
Juvenile Male (55029) – last data received Feb 2008
Adolescent Male (88071) – last data received May 2009

1) Why is information from GPS tracking important when studying animal behaviour?

2) Juvenile Female (55027) took about ____ days to travel from Taiaroa Head to Chile.
3) Is this behaviour homing or migration? _____
4) Why do you think non-breeding birds go to Chile? _____
5) Adolescent Male (88071) was tagged in early January, and he spent the first month venturing up to 150-300km from Taiaroa Head, returning every 1-2 days. Is this behaviour homing or migration? _____
6) Is Adolescent Male (88071) breeding? _____





THE USE OF WILDLIFE LIVECAMS

The study of animal behaviour requires careful and lengthy observation. With the advancement of camera technology and interne access, we are given great opportunities to learn and gather valuable information from wildlife. The first Royal Cam was launched in 2016 and is a 24/7 live stream of an albatross nest at Taiaroa Head during the breeding season. Since 2016 it has received more than 2.5 million views globally.

8. What are three benefits of using a webcam tool to study animal behaviour?

1. 2. 3.

9. Royal Cam also allows us to learn about the parental care of the albatross. Watch the following highlights from Royal Cam with your educators and answer the questions below:

Video 1: Royal Cam 2016 Highlights - Chick being fed by Dad

1) What term is used to describe this feeding behaviour? _____

2) What food do parents feed to chicks? _____

3) Do both parents feed chicks? _____ How long do they do this? _____

Video 2: Royal Cam 2017 Highlights - Parents swap over nest duties

1) What is the difference between the guard stage and post-guard stage?

_____

2) What are parents guarding the chick from? _____

3) When do parents stop guarding chicks? _____

10. Are albatross r-selected species or k-selected species, explain why?

Comparative Behaviours – use the displays, videos and viewing areas to investigate behaviours listed and answer questions				
Behaviour	Royal Albatross (Adult)	Royal Albatross (Chick)	Otago Shag	Spotted Shag
COMMUNICATION Courtship displays (advertising – finding a mate) 	When albatross return to Taiaroa Head in the spring, they are often seen sky calling with their bill pointed to the sky and wings extended. In addition to the visual display, what other behaviours are involved with this courtship dance?	How would this courtship behaviour increase the chance of successful mating to produce viable offspring?	To advertise to potential mates during courtship, the males display a range of behaviours for 2-3 months including: - Head waves (darts) - Expose colourful plumage on face - Vocalization - Wings frozen in open position - Body held upright Do you think shags tend to be monogamous?	In spotted shags, the courtship dance is called a wing waving display which continues for 2-4 weeks. How do you think the courtship dance in the spotted shags differ from the Otago shags?
COMMUNICATION Pair bond display (recognition – keeping a mate)	In addition to sky calling, what behaviours are observed during the pair bond display?	How do chicks recognize and communicate with their parents?	Mutual head lowering is a key feature of the Otago shag pair bond display. Did you observe mutual head lowering today? Why/why not?	The spotted shag pair bond display is slightly different to Otago shags and includes mutual darting, pointing, and bowing.

Behaviour	Royal Albatross (Adult)	Royal Albatross (Chick)	Otago Shag	Spotted Shag
COMPETITION (intraspecific – within the same species) Nest territory and aggression	Are the nests spaced evenly? How do they react to another adult albatross near their nest?	How does the nest territory at the Chatham Islands differ? What do you think they are competing for?	Are the nests spaced evenly? How do they react to another adult near their nest?	Are the nests spaced evenly along the cliff edge? How do they react to another adult near their nest?
COMPETITION (interspecific – between different species) Predators	Do they compete with any other species on the headland for nest sites? What are the predators of the adult albatross? How do albatross defend themselves?	What are the predators of the albatross eggs and chicks? How do albatross chicks defend themselves? How does DOC control predators?	Do they compete with any other species on the headland for nest sites? What determines the distance between nests? How do shags defend themselves?	Why does the cliff face make such a good nesting site?

Behaviour	Royal Albatross (Adult)	Royal Albatross (Chick)	Otago and Spotted Shags
FEEDING	The main diet of albatross is squid – how do they catch it? What else do they eat?	Chicks are dependent on parents for food – how do they trigger adults to regurgitate?	Unlike albatross, shags are diving birds – what do they eat? Chicks are also dependent on parents for food – how is food transferred to chicks?
THERMO-REGULATION Cooling and conserving heat	How do albatross cool down?	Why are chicks more vulnerable when exposed to high temperatures?	How do shags cool down?
MOVEMENT Flying and walking	Describe how albatross fly? Are they good walkers?	How far do chicks wander from nests?	Describe how shags fly? Describe how shags walk?

Extra questions

DIVORCE IN SEABIRDS

11. Seabirds like albatross and shags tend to be monogamous, but occasionally a pair will divorce and re-pair with a new mate if one is lost or unreliable. Outline two positives and two negatives of a pair divorcing:

Positives	Negatives
1. 2.	1. 2.

HUMAN IMPACTS ON BREEDING BEHAVIOUR

Many factors can influence both the breeding behaviour and the chance of success including human behaviour, climate change, and plastic pollution.

12. Give two positive and two negative examples of how tourism can affect the breeding behaviour of albatross and other seabirds:

Positives	Negatives
1. 2.	1. 2.

13. How does climate change affect breeding behaviour in seabirds?
Think about warming ocean temperatures, food availability etc.

14. Egg shell thickness has reduced in Northern Royal Albatross on the Chatham Islands since the 1970's due to increased stormy weather events which reduces available nesting materials, increased nesting densities and therefore increased stress levels in breeding birds. Why would thinner eggshells reduce the breeding success in albatross?

15. How does plastic pollution affect the feeding behaviour and breeding success of albatross and other seabirds?