

Case Study: RED KNOT



Photo: Allie Anderson

RED KNOT (*rufa*)

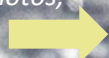
The Red Knot is a bulky, robin-sized shorebird in the Sandpiper family. They gather in large groups to forage and roost along coastlines and estuaries.

LATIN:
Calidris canutus

FRENCH:
Bécasseau maubèche

SPANISH:
Chorlo Rojizo

INUKTITUT:
Qajorlak

[Click here to view photos, videos and audio](#) 



Non-breeding:
Pale gray upper and white breast



Sturdy, dark bill

*Weight: 100-200 g
Length: 23-26 cm*

Short, dark legs

PHOTO: MARK PECK



Breeding:
Cinnamon plumage on face, throat and breast


PHOTO: YVES AUBRY

CONSERVATION

Red Knot populations have declined by 70% over the past 30 years, and are designated an Endangered Species in Canada where they breed. Taking spectacular long-distance migrations, they depend on very specific 'staging' areas, where the birds gather, rest and replenish energy resources along the journey.

Key conservation concerns:

- Habitat availability and quality
- Changing climate and seasonal shifts result in mismatched timing of food availability
- Over-harvesting of horseshoe crabs at key migratory stopover sites

[Click here for IUCN assessment](#) 



NOT EVALUATED NE	DATA DEFICIENT DD	LEAST CONCERN LC	NEAR THREATENED NT	VULNERABLE VU	ENDANGERED EN	CRITICALLY ENDANGERED CR	EXTINCT IN THE WILD EW	EXTINCT EX
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RED KNOT (*rufa* subspecies)

Annual Cycle

Click here to view Bird Migration Explorer



BREEDING

The entire *rufa* subspecies breeding population breeds in the high arctic. Males prepare nest sites by scraping a depression in the ground where females lay 3-4 olive-colored eggs. The young birds forage on plants, spiders, midges, and other arthropods to grow and prepare for migration.

FALL MIGRATION

Red Knots depart the arctic in 3 waves. Females leave mid-July, once young birds have hatched and nesting is complete. Adult males follow a couple of weeks later. The juvenile, hatch-year birds spend more time growing and storing energy before leaving the arctic late-August.

SPRING MIGRATION

Red Knots are neotropical migrants, travelling long distances to the high arctic to breed. The large flocks rest and refuel at important stopover sites along the way. The birds feast on horseshoe crab eggs and marine invertebrates on beaches and mudflats to double their body weight before they continue on to the arctic.

NON-BREEDING

Red Knots spend the non-breeding season on the southern coasts of South America, probing the beaches, mudflats and tidal zones for worms, molluscs and crustaceans. They moult their flight feathers in preparation for an extraordinary journey.



Super Bird:
Plight of the Red Knot

<https://youtu.be/xLy6G53VOPw>

Red Knot

- Resident year-round
- Breeding only
- Wintering only
- Migration only

Map: A. Couturier, Bird Studies Canada
Source: NatureServe

RESEARCH IN FOCUS:



Adapted from Motus Wildlife Tracking System Projects:

[James Bay Shorebirds \(#38\)](#)

[Red Knot Staging and Migration Ecology \(#47\)](#)

[Project Bahia Lomas Shorebirds \(#174\)](#)

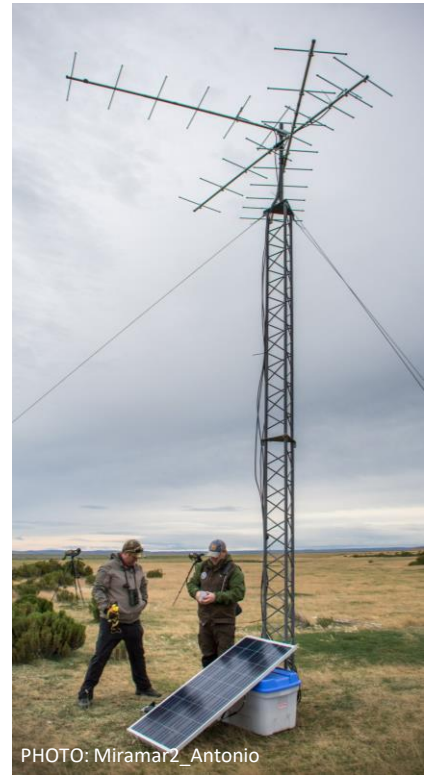
Red Knot Migration Ecology

To help conserve this species, it is important to understand its full (annual) life cycle, and the healthy habitats and resources it needs to survive. This project investigates the migration ecology of Red Knots across the Americas.

SCIENCE GOALS:

- Track individual Red Knot movements during migration.
- Determine arrival & departure times between wintering & breeding locations.
- Identify important stopover locations and length of stay during migration.

METHODS:



There are several trapping methods that are used to catch Red Knots. Vertical mist nets trap birds in flight, while cannon nets and whoosh nets catch large numbers of birds on the ground. To do this, science crews set a large net in the sand and wait for the birds to congregate on the beach as the tide rises. The net is rapidly pulled over a flock of birds, containing them under the lightweight mesh. The birds are quickly untangled and safely stored in boxes until each bird can be fitted with a metal band, plastic leg flags and a nanotag. The nanotag is glued onto the back of the bird, released and will emit a unique signal detected by the Motus receivers. Detections of these tags indicate the date and location of the individual bird as it moves across the landscape.

Nanotags have been released on more than 1200 individual Red Knots since 2014.

RESEARCH IN FOCUS:



[James Bay Shorebird Project](#): Moose Cree First Nation Traditional Territory (03:29)



[Delaware Bay Shorebird Project](#): The Manomet Centre for Conservation Sciences (03:28)

STUDENT ACTIVITY



The following 4 tracks from individual Red Knots represent a subset of the population's movements across the landscape.

Explore the Red Knot movements on the provided base map using the following guidelines:

1. Label the bird species in the top right corner of the map page.
2. Use the detection data in the table below to plot the locations on the map.
3. Connect the dots and label each track with the tag identification number.
4. Draw arrowheads on the tracks to point in the direction of bird movement.
5. Label the track dates on the first detection location and the last detection location.
6. Circle the location where the bird stopped for the longest time. Label its length of stay.
7. Using the scale on the map and a ruler, measure and label the total flight track distance from its wintering to breeding location.
8. Choose two detections and calculate the flight speed between locations (distance/time as km/hr). Label this on the map sites.
9. Build a legend in the bottom left corner of the map. Use a different color to label each stage: Breeding, Migration, and Wintering
10. Fill in the Breeding range and the Wintering range of the map, using the legend colors. Trace the flight tracks with the color for Migration.
11. Circle the country names of which this bird was detected in.
12. Draw a big star on your location. Which range (breeding, migration, non-breeding) for this species are you located?

PROJECT DATA

DATE	LATITUDE	LONGITUDE	ALPHA-NUMERIC	NEAREST REFERENCE	LENGTH OF STAY
January 19, 2018	52.47 S	69.39 W	J-29	Tierra del Fuego, Chile	99d 0h 0m
April 28, 2018	52.55 S	69.32 W	J-29	Tierra del Fuego, Chile	0d 0h 1m
May 4, 2018	5.16 N	52.63 W	M-16	Kourou, French Guiana	6d 7h 10m
May 3, 2018	5.96 N	56.86 W	L-16	Wageningen, Suriname	4d 9h 2m
May 18, 2018	38.77 N	75.09 W	I-10	Delaware Bay, New Jersey	9d 0h 3m
May 23, 2019	39.06 N	74.78 W	I-10	Cape May, New Jersey	5d 5h 20m
May 31, 2019	40.41 N	76.08 W	1-9	Philadelphia, Pennsylvania	0d 0h 10m
June 1, 2019	44.94 N	79.50 W	1-8	Gravenhurst, Ontario	0d 0h 5m
June 6, 2019	58.77 N	93.97 W	G-6	Churchill, Manitoba	0d 0h 1m
July 19, 2014	63.99 N	81.70 W	H-5	Southampton Island, Nunavut	0d 0h 2m
July 31, 2014	51.82 N	80.69 W	H-7	Moosonee, Ontario	0d 0m 49m
August 1, 2014	39.06	74.78 W	I-10	Cape May, New Jersey	4d 0h 0m

Check your migration track here:

<https://motus.org/data/demo/educationREKN.html>



PHOTO : ALLIE ANDERSON

DISCUSSION

Use the guided discussion boxes below to analyze the project results from this Case Study. Present and discuss as a class or compare and contrast results with other Case Study species.

POPULATIONS

1 What is the population trend and status for Red Knots?

MIGRATION ECOLOGY

2 What habitat and food resources make a good stopover site for this species?

THREAT ASSESSMENT

3 Identify a threat that might impact survival or success at each stage below.

Breeding:

Migration:

Non-breeding:

CONSERVATION

4 How can human-related threats be reduced or mitigated?

CRITICAL THINKING:

How might **CLIMATE CHANGE** impact the range and resources for shorebirds?

