Puffin PROTECTORS

Scientists spent last summer counting puffins to see how they are responding to climate change

Puffineer Georgia Longmoor releases a puffin after putting a GPS tracker on it.

They call themselves "puffineers." This group of intrepid researchers trekked to the northernmost point of Scotland last May to count puffins. Their goal: to see how the puffin populations are doing in the face of climate change.

After years of being a species of least concern, puffins were upgraded to vulnerable in 2015—the first step on the way to an endangered species. The Royal Society for the Protection of Birds estimates that puffin numbers across the U.K. and Europe have plummeted in recent years.

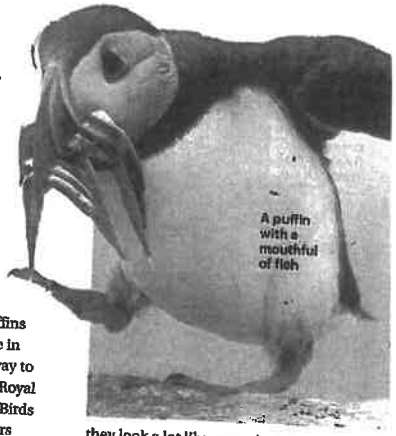
But no one really knows for sure how much puffin numbers have decreased. The last full census of seabirds in the U.K. was in 2000. There have been occasional counts since then, but nothing that paints a clear picture of puffin health.

Enter the puffineers, who are part of the Project Puffin (UK), supported by Heritage Lottery Fund in Scotland. It brings together on-the-ground researchers, technology like GPS trackers, and citizen scientists to understand the threats puffins face. "It's a big fact-finding mission," says Georgia Longmoor. She's one of this summer's puffineers and a Ph.D. student studying animal communication at the University of Edinburgh in Scotland.

The GPS tracker monitored the bird's movements for 10 days before falling off.

TREKKING NORTH

The Atlantic puffin is one of the most recognizable seabirds on the planet. Because of their black-and-white feathers, they look a lot like penguins, but their bright-orange beaks set them apart. The birds are only 10 inches tall and spend their lives at sea. They come to land in the spring to breed. Puffins make their nests along the shores of the North Atlantic—from Northern Europe to Maine.



A puffin with a mouthful of fish

Getting to the puffins isn't easy. Starting from Aberdeen, Scotland, the puffineers took an overnight ferry to reach the Shetland Islands. The chain of islands is about 200 miles to the north of mainland Scotland and is a key breeding ground for puffins.

The team stayed in small cabins called böds to be close to the puffin colonies. Every day, they trekked across craggy highlands to reach the 31 different nesting sites they studied. Tallying puffins requires stamina and speed. The puffineers had to keep track of the different birds walking on land, wheeling—flying in big loops in the sky—and diving for fish out at sea.

Sometimes the puffineers got close to the birds without even trying. "They're really sociable," Longmoor says. "We're trying to keep our distance, but they'd just walk up to us."

Puffineers counted birds flying by their research site.

The initial puffin count took place over 18 days in May 2017, while the birds were mating. The puffineers returned in June, just after the babies had hatched. Puffins mate for life and hatch only one egg at a time.

SNACK TIME

But those two visits weren't enough. Project Puffin also asked citizen scientists to help out. The volunteer "puffarazzi" across the U.K. took pictures of puffins with fish in their beaks. People sent in more than 1,400 photos.

Understanding what the birds are eating is key to their survival. Scientists think their numbers are decreasing because of warming seas due to climate change. The warmer ocean temperatures could be affecting the number and types of fish available for puffins. In the U.K. they mostly eat sand eels, which are small 5-inch-long fish. But puffins sometimes also chow down on cod, herring, and squid.

The decline in puffins isn't just a problem in Scotland. Other colonies in Europe and across the Atlantic in Maine have also been shrinking. In some cases, fewer chicks are surviving. In Maine, some puffins have tried feeding their chicks butterfish, but the fish are too big for the tiny birds to swallow and some simply starve.

A CALL TO ACTION

Puffins are just one of the 24 seabird species that could be in danger of extinction if the oceans keep warming. Researchers across the globe are trying to understand how each species will be affected.

In the U.K., Project Puffin's results from the census in the Shetland Islands will be combined with other data, such as a recent survey of how four other seabird species spend their time at sea. Together, this information will help scientists create an action plan to protect all of the U.K.'s seabirds and their feeding grounds.

"Now is the time to protect the places these birds catch the fish they feed to their hungry chicks," says Ewan Wakefield, a scientist at the University of Glasgow. "This will secure the fate of future generations of these amazing creatures."

—Katherine Tweed

Puffins often dig burrows for their nests in cliffs where their eggs will be safe from predators.

FINDING MEAN, MEDIAN, AND MODE

2 SKILLS SHEETS

Finding measures of center like mean, median, and mode can help you analyze and understand the trends in a data set.

MEAN: The sum of numbers in a data set divided by how many numbers are in the data set. It's also called the average.

MEDIAN: The middle value when a data set is ordered from least to greatest. If a set has two middle numbers, add them together and divide by 2.

MODE: The number that appears most often in a data set; a set can have more than one mode or no mode at all.

YOUR TURN

Each day, the puffineers visited different sites. They counted the birds that they saw on land, in the sea, and flying. Below is the data they collected at each site. Use mean, median, and mode to compare their results. Round answers to the nearest whole number when necessary.

1 PUFFIN COUNT AT SEA

SITE	NUMBER OF PUFFINS AT SEA
A	33
B	76
C	84
D	382
E	71
F	48
G	6
H	79
I	1,569
J	7
K	24
Mean	
Median	
Mode	

2 PUFFIN COUNT ON LAND

SITE	NUMBER OF PUFFINS ON LAND
A	8
B	9
C	474
D	2
E	8
F	0
G	2
H	7
I	20
J	3
K	0
Mean	
Median	
Mode	

3 PUFFIN COUNT FLYING

SITE	NUMBER OF PUFFINS FLYING
A	10
B	1
C	242
D	16
E	1
F	10
G	16
H	27
I	78
J	0
K	1
Mean	
Median	
Mode	

4 Use the data in the other three tables to complete the chart below.

TOTAL PUFFIN COUNT

SITE	TOTAL NUMBER OF PUFFINS
A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
Mean	
Median	
Mode	

5 What happens to the mean and median of the total number of birds if you leave out Site I? Why do you think that is so?

SCHOLASTIC MATH
Where Math Gets Real

NAME:

ANSWER SHEET

Puffin Protectors

YOUR TURN

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SCHOLASTIC MATH
Where Math Gets Real™

NAME:

+5 QUESTIONS

Polar Bear Poll

In "Puffin Protectors" on page 8, you learned how to find measures of center for a data set on different puffin populations. The measures mean, median, and mode help you analyze the trends in a data set. Use what you learned to answer five more questions about polar bears in a region of the Arctic Ocean called the southern Beaufort Sea. The chart below shows the number of bears captured and the number marked with trackers by the U.S. Geological Survey (USGS) from 2002 to 2010. Round answers to the nearest whole number when necessary.

SOUTHERN BEAUFORT SEA POLAR BEARS STUDIED OVER THE YEARS

YEAR	NUMBER CAPTURED	NUMBER MARKED
2002	118	36
2003	107	28
2004	148	39
2005	96	37
2006	90	40
2007	80	29
2008	88	35
2009	112	52
2010	75	38

Source: Ecological Society of America

1. Use the data in the chart to find the mean number of polar bears captured.

2. What's the median?

3. What's the mode?

4. Use the data in the chart to find the mean, median, and mode of the number of polar bears marked.

5. If you leave out the year 2004, what happens to the mean and median for both the number of polar bears captured and the number marked?