

NATIONAL  
GEOGRAPHIC

READING EXPEDITIONS®

国家地理

科学探索丛书

ON ASSIGNMENT

专题研究

# Tracking Animal Migrators

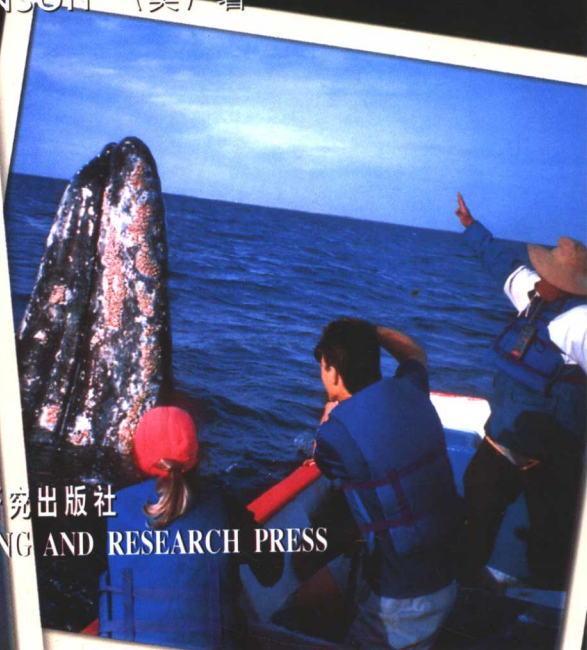
## 追踪迁徙动物

REBECCA L. JOHNSON (美) 著

外语教学与研究出版社

FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

英文注释



京权图字: 01 - 2005 - 2581

Copyright © (2004) National Geographic Society. All Rights Reserved.

Copyright © (2005) (English-Chinese bilingual) National Geographic Society. All Rights Reserved.

国家地理科学探索丛书(英文注释版)由美国北极星传媒有限公司策划并授权外语教学与研究出版社在中华人民共和国境内(不包括香港、澳门特别行政区及台湾省)独家出版、发行。

### 图书在版编目(CIP)数据

追踪迁徙动物 = Tracking Animal Migrators / (美) 约翰逊 (Johnson, R.L.) 著. —北京: 外语教学与研究出版社, 2005.6

(国家地理科学探索丛书: 注释版. 专题研究)

ISBN 7-5600-4775-0

I. 追… II. 约… III. 英语—语言读物 IV. H319.4

中国版本图书馆 CIP 数据核字(2005)第 031390 号

出 版 人: 李朋义

责任编辑: 周 晶

美术编辑: 孙莉明

出版发行: 外语教学与研究出版社

社 址: 北京市西三环北路 19 号 (100089)

网 址: <http://www.fltrp.com>

印 刷: 北京画中画印刷有限公司

开 本: 740×975 1/16

印 张: 2

版 次: 2005 年 6 月第 1 版 2005 年 6 月第 1 次印刷

书 号: ISBN 7-5600-4775-0

定 价: 5.90 元

\* \* \*

如有印刷、装订质量问题出版社负责调换

制售盗版必究 举报查实奖励

版权保护办公室举报电话: (010)88817519

---

## 致读者

---

**如**果你希望在享受英语阅读乐趣的同时又能增长知识、开拓视野，由外语教学与研究出版社与美国国家地理学会合作出版的“国家地理科学探索丛书”（英文注释版）正是你的选择。

“国家地理科学探索丛书”（英文注释版）第二辑分为8个系列，共46本，内容涉及自然科学和社会研究，除对本套丛书第一辑已包含的“生命科学”、“物理科学”、“地球科学”和“文明的进程”4个系列进行了补充外，又推出了4个新的系列——“生活中的科学”、“科学背后的数学”、“专题研究”以及“站在时代前沿的科学家”。

这套丛书秉承《国家地理》杂志图文并茂的特色，在书中配有大量精彩的图片，文字地道易懂、深入浅出，将科学性和趣味性完美结合，称得上是一套精致的小百科全书。特别值得一提的是本套丛书在提高青少年读者英语阅读能力的同时，还注重培养他们的科学探索精神、动手能力、逻辑思维能力和沟通能力。

本套丛书既适合学生自学，又可用于课堂教学。丛书各个系列均配有一本教师用书，内容包括背景知识介绍、技能训练提示、评估测试、多项选择题及答案等详尽的教学指导，是对课堂教学的极好补充。

# 国家地理科学探索丛书 (第二辑)

## 生活中的科学

家小学问大  
怎样坐飞机?  
奇趣水族馆  
食品店里的学问  
商场里的秘密  
公园乐事多  
五光十色的海滩  
动物园里的科学  
为什么眨眼睛?  
为什么打呵欠?

探险热带雨林  
了解海洋动物  
窥视黑暗  
亲历火山冰川

## 站在时代前沿 的科学家

理解运动定律  
寻找疫苗  
揭示放射现象  
解密 DNA 结构  
揭秘晶体管

## 科学背后的数学

咀嚼数字  
解读数据  
多少蚂蚁是一家?  
数字的奥妙  
比比就知道  
方圆之间  
思前想后  
机会几何?

## 文明的进程

印度  
日本  
马里  
秘鲁  
维京人的世界

## 生命科学

动物的适应性  
分类的线索  
生态系统  
生活周期

## 地球科学

地球、太阳和月亮  
灾害天气  
岩石与矿物  
恒星与星系  
奇妙的水

## 物理科学

酸，还是碱?  
化学变化  
磁体的奥秘  
牛顿定律

 NATIONAL  
GEOGRAPHIC

国 家 地 理

科学探索丛书

英文注释

ON ASSIGNMENT

专题研究

# Tracking Animal Migrators

## 追踪迁徙动物

REBECCA L. JOHNSON (美) 著

外语教学与研究出版社

FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

北京 BEIJING

此为试读, 需要完整PDF请访问: [www.ertongbook.com](http://www.ertongbook.com)

# Contents

## 目 录

### Introduction..... 5

#### 引言

Follow the Leader

追随头领

### Chapter 1..... 6

#### 第一章

Frequent Fliers

常见的候鸟

### Chapter 2..... 14

#### 第二章

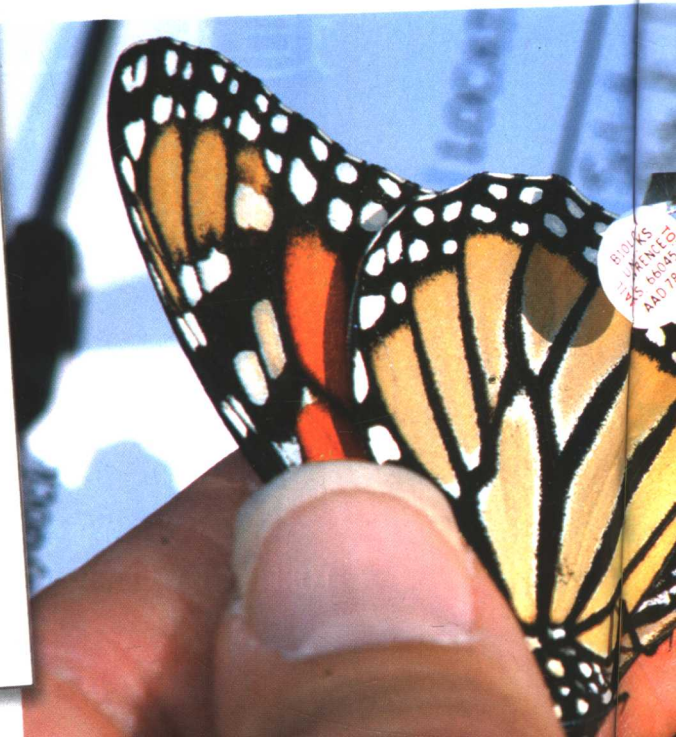
Whales on the Move

迁徙的鲸



*Arctic terns have the longest migration of all birds—from the Arctic to Antarctica.*

A scientist tags a monarch butterfly to study its migratory movements.



**Chapter 3..... 20**

**第三章**

Marvelous Monarchs  
不可思议的黑脉金斑蝶

**Problem Solving Think Tank ..... 26**

**锦囊妙计**

Synthesizing to Solve a Problem  
用综合法解决问题

Problem Solving on Your Own  
自己动手解决问题

**Science Notebook..... 30**

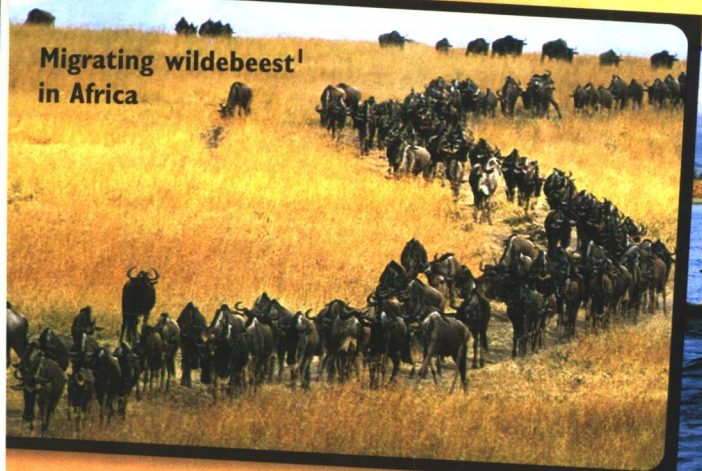
**科学备忘录**

**Index ..... 31**

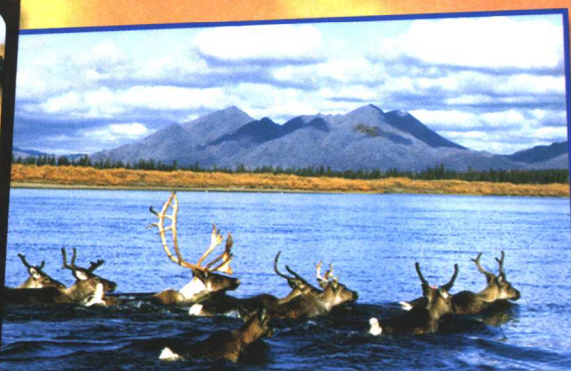
**索引**



Migrating wildebeest<sup>1</sup>  
in Africa



Caribou<sup>2</sup> cross an  
Alaskan<sup>3</sup> river.



- |                        |             |        |
|------------------------|-------------|--------|
| 1. wildebeest          | <i>n.</i>   | 牛羚；角马  |
| 2. caribou             | <i>n.</i>   | 北美驯鹿   |
| 3. Alaskan             | <i>adj.</i> | 阿拉斯加州的 |
| 4. whooping crane      |             | 美洲鹤    |
| 5. ultralight airplane |             | 超轻型飞机  |

Whooping cranes<sup>4</sup> follow the  
lead of an ultralight airplane<sup>5</sup>.

## Introduction

### 引言

# Follow the Leader

## 追随头领

Signs<sup>1</sup> of spring are everywhere. The grass is getting green. Tulips<sup>2</sup> are blooming<sup>3</sup> in crayon-bright colors. High overhead, a flock<sup>4</sup> of birds wings its way north. The bird in front is bigger than the rest. Wait a minute—that's not a bird in the lead. It's an airplane! What's going on up there?

The pilot in the plane is helping young birds called whooping cranes travel, or migrate, to a new home. A migration is a special, seasonal journey<sup>5</sup> that some animals make from one region<sup>6</sup> to another and then back again. Every spring, for example, many kinds of birds migrate. In the Northern Hemisphere<sup>7</sup>, migrating birds fly north to places where they raise their chicks<sup>8</sup>. In the fall, the birds fly south again.

Birds aren't the only animal migrators. Many whales migrate. So do caribou, wildebeest, and some kinds of fish. Even some insects<sup>9</sup> migrate. But how do these animals know where they are going? And how do they find their way? In this book, you'll meet scientists who are on assignment trying to answer these questions. They are tracking animal migrators in the air, through the seas, and across the land. We've got a lot of ground to cover. So get set to follow animal migrators far and wide!

- |          |           |
|----------|-----------|
| 1. sign  | <i>n.</i> |
| 2. tulip | <i>n.</i> |
| 3. bloom | <i>v.</i> |

- |     |            |           |
|-----|------------|-----------|
| 迹象  | 4. flock   | <i>n.</i> |
| 郁金香 | 5. journey | <i>n.</i> |
| 开花  | 6. region  | <i>n.</i> |

- |    |                        |                 |
|----|------------------------|-----------------|
| 鸟群 | 7. Northern Hemisphere | 北半球             |
| 旅行 | 8. chick               | <i>n.</i> 小鸟    |
| 地区 | 9. insect              | <i>n.</i> 昆虫; 虫 |

## Chapter 1

## 第一章

# Frequent Fliers

## 常见的候鸟

Birds are probably the most familiar migrators. Long ago, people noticed that some birds disappeared every fall but came back in the spring. The people made up stories to explain where the birds went. In the 1500s, people in northern Europe thought that swallows<sup>1</sup> spent the winter sleeping underwater! Careful scientific observations<sup>2</sup> later put such silly stories to rest.

1. swallow *n.*

燕：雨燕

2. observation *n.*

观察：观测



Canada geese<sup>6</sup> sometimes fly above the clouds when they migrate.

Canada goose



So how do scientists find out where migrating birds are going? They have to track them. One way to track birds is to band<sup>1</sup> them. Birds are caught in fine<sup>2</sup> nets. Tiny numbered bands are put on their legs. Then the birds are released<sup>3</sup>. When birdwatchers and scientists spot banded birds, they read the numbers on the bands with binoculars<sup>4</sup>. They record the numbers and where and when the birds were seen.

Researchers have been putting together all this information. They've figured

out the routes<sup>5</sup> that different kinds of birds follow on their migrations. They've also figured out why the birds make such long journeys. Migrating birds spend the winter months in warm places. In the spring, they go where there is plenty of space to build nests and lots of food for growing chicks.

- |                 |      |           |
|-----------------|------|-----------|
| 1. band         | v.   | 给(鸟)套上标记环 |
| 2. fine         | adj. | 纤细的       |
| 3. release      | v.   | 释放        |
| 4. binocular    | n.   | 双筒望远镜     |
| 5. route        | n.   | 路线        |
| 6. Canada goose |      | 加拿大黑雁     |

## Which Way Is North?

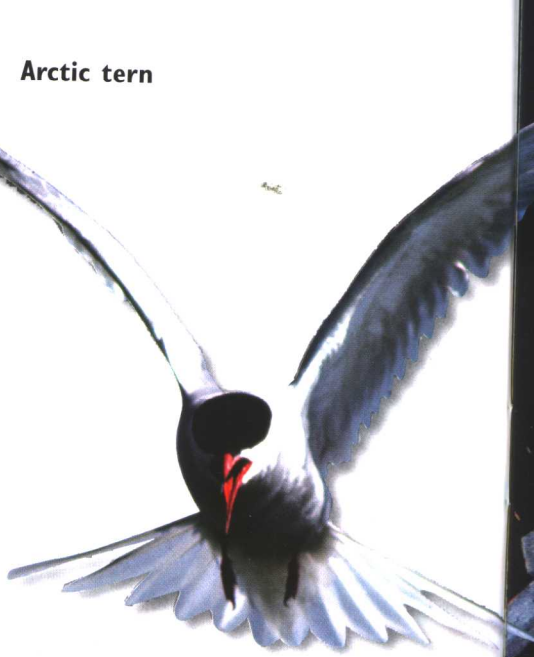
Next, researchers moved on to a harder question. How do migrating birds find their way? National Geographic writer Michael Long went on assignment to find out. He worked with bird migration experts from all over the world. They told him about experiments they had done. The experiments showed that migrating birds use several different strategies<sup>1</sup> to find their way from place to place.

Birds that migrate during the day use the sun as a compass<sup>2</sup>. They figure out directions—north, south, east, and west—based on the sun's position in the sky. Birds that fly at night use the stars in much the same way. Birds also use landmarks<sup>3</sup>, such as rivers and coastlines<sup>4</sup>, as clues<sup>5</sup> on their journeys.

Scientists learned that migrating birds also can sense Earth's magnetic field<sup>6</sup>. Inside a bird's head are tiny grains<sup>7</sup> of a mineral<sup>8</sup> called magnetite<sup>9</sup>. Like the needle<sup>10</sup> in a compass, these grains help a bird figure out what direction it's flying. Just how this system works remains a mystery<sup>11</sup>.

Scientists use radar<sup>12</sup> to track migrating birds. Do you watch the weather news on TV? Then you've seen radar images of thunderstorms<sup>13</sup>. Weather radar systems send out radio waves. Then they pick up the echoes<sup>14</sup> made when the waves bounce<sup>15</sup> off raindrops in the air. Computers translate the echoes into pictures of storms in the sky.

Arctic tern



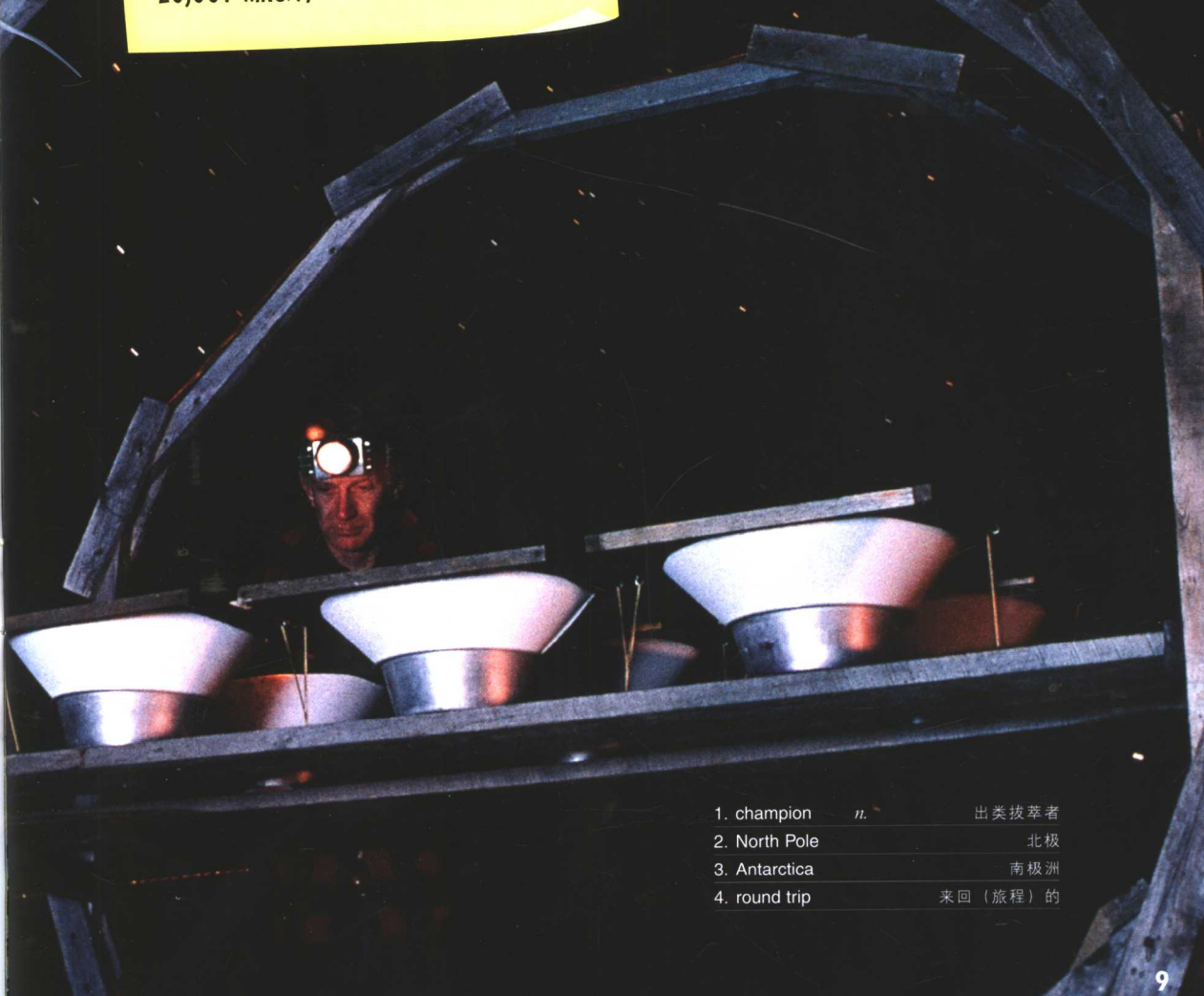
Radio waves bounce off flying birds, too. So bird researchers can use weather radar to make images that show where flocks of migrating birds are flying. Instead of weather forecasts<sup>16</sup>, the images help scientists make “birdcasts”!

- |                      |           |            |
|----------------------|-----------|------------|
| 1. strategy          | <i>n.</i> | 策略         |
| 2. compass           | <i>n.</i> | 罗盘         |
| 3. landmark          | <i>n.</i> | (显而易见的) 地标 |
| 4. coastline         | <i>n.</i> | 海岸线        |
| 5. clue              | <i>n.</i> | 线索         |
| 6. magnetic field    |           | 磁场         |
| 7. grain             | <i>n.</i> | 细粒         |
| 8. mineral           | <i>n.</i> | 矿物         |
| 9. magnetite         | <i>n.</i> | 磁铁矿        |
| 10. needle           | <i>n.</i> | 磁针         |
| 11. mystery          | <i>n.</i> | 谜          |
| 12. radar            | <i>n.</i> | 雷达         |
| 13. thunderstorm     | <i>n.</i> | 雷暴         |
| 14. echo             | <i>n.</i> | 回波; 反射波    |
| 15. bounce           | <i>v.</i> | 反弹         |
| 16. weather forecast |           | 天气预报       |

## Fun Facts!

In the bird world, arctic terns are migration champions<sup>1</sup>. Every year, terns fly from Arctic lands near the North Pole<sup>2</sup> down to the Antarctica<sup>3</sup>. A few months later, they fly back to the Arctic. That's a round trip<sup>4</sup> journey of about 32,200 kilometers (about 20,009 miles)!

In an experiment, scientist Kenneth P. Able used this machine to cancel out Earth's magnetic field around a group of birds. He discovered that the birds could still figure out directions using stars in the night sky.



- |               |    |         |
|---------------|----|---------|
| 1. champion   | n. | 出类拔萃者   |
| 2. North Pole |    | 北极      |
| 3. Antarctica |    | 南极洲     |
| 4. round trip |    | 来回（旅程）的 |

## Lending a Wing

Many young birds learn migration routes from their parents. By following experienced<sup>1</sup> birds, they discover how to fly between summer nesting places and winter homes.

But what happens if parent birds can't show the way? Scientists working with whooping cranes asked that question. Whooping cranes are endangered<sup>2</sup>. Fewer than 300 live in the wild in North America. Until a few years ago, all the whooping cranes lived together in just one big flock. Each spring, the cranes traveled to Canada along a single migration route. In the fall, they migrated south along the same route to spend the winter together in Texas<sup>3</sup>.

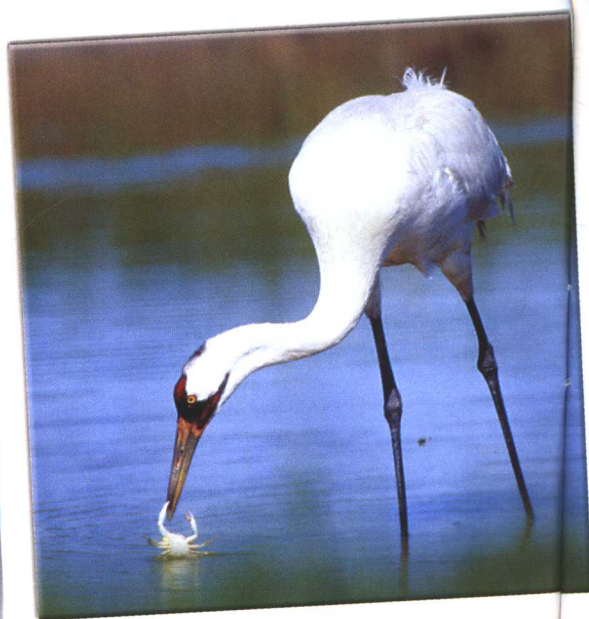
Bird experts thought that having all the whooping cranes in one place was risky. Disease<sup>4</sup> or a disaster<sup>5</sup> could wipe out<sup>6</sup> the whole flock. So they decided to create another flock that

would migrate between Wisconsin<sup>7</sup> and Florida<sup>8</sup>.

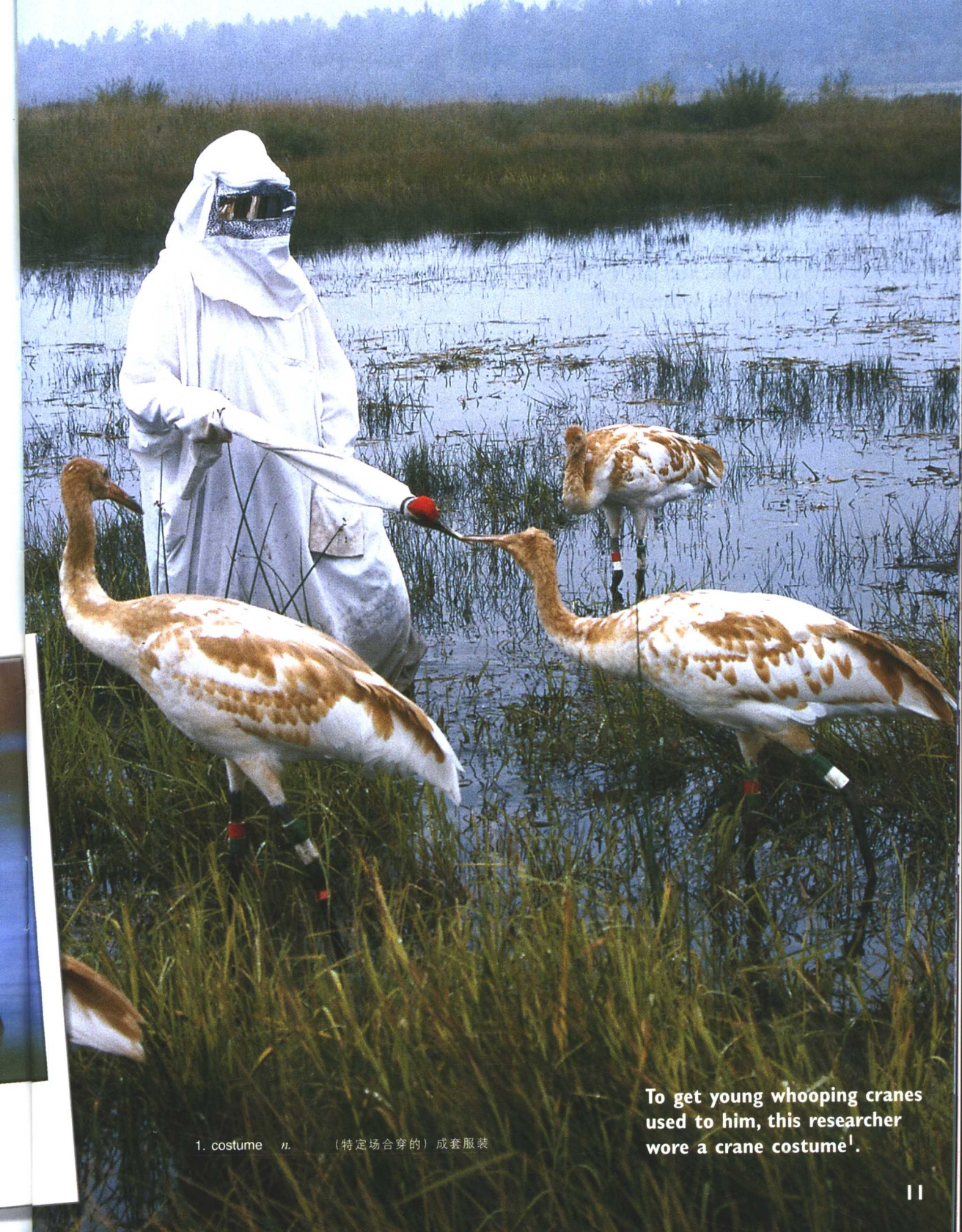
The researchers started the new flock with young birds hatched<sup>9</sup> in captivity<sup>10</sup>. Then came the big challenge. They had to show the birds how to get from Wisconsin to Florida. An ultralight airplane seemed like a possible solution<sup>11</sup>. The researchers thought they could teach young cranes to follow the little plane as if it was their mother.

1. experienced	adj.	有经验的
2. endangered	adj.	濒于灭绝的
3. Texas		得克萨斯州
4. disease	n.	疾病
5. disaster	n.	灾难
6. wipe out		彻底摧毁
7. Wisconsin		威斯康星州
8. Florida		佛罗里达州
9. hatch	v.	孵出
10. captivity	n.	樊笼生活
11. solution	n.	解决办法

Whooping cranes



Whooping crane eating a crab



1. costume *n.* (特定场合穿的) 成套服装

To get young whooping cranes used to him, this researcher wore a crane costume<sup>1</sup>.

## Up, Up, and Away

In the fall of 2001, seven young whooping cranes followed an ultralight airplane all the way from Wisconsin to Florida. It took 50 days to make the trip. The cranes quickly settled<sup>1</sup> into their winter home in a wildlife preserve<sup>2</sup>. Sadly, bobcats<sup>3</sup> ate two of the cranes during the winter.

But on April 9, 2002, the remaining five cranes started their journey safely back

to Wisconsin—on their own! They remembered the route they had been taught the year before by their “mechanical<sup>4</sup> mom.”

The first ultralight migration of whooping cranes was a success. Researchers plan to repeat the experiment with more cranes.

- |                      |      |             |
|----------------------|------|-------------|
| 1. settle            | v.   | 定居          |
| 2. wildlife preserve |      | 野生动植物保护区    |
| 3. bobcat            | n.   | 短尾猫（一种北美野猫） |
| 4. mechanical        | adj. | 机械制的；机器操纵的  |

Young cranes follow the ultralight plane, just as they would their mother.



Eventually<sup>1</sup> they hope to have a large flock of cranes that migrates between Wisconsin and Florida. With luck, those cranes will soon be migrating with their own young over the route the scientists taught them.

Like the whooping cranes, millions<sup>2</sup> of other migrating birds fill North American skies every spring and fall. Scientists are finding new ways to study and track them. They are also working

hard to protect prairies<sup>3</sup>, wetlands<sup>4</sup>, forests, and other wild places where migrating birds make their homes.

1. eventually *adv.*

2. million *n.*

3. prairie *n.*

4. wetland *n.*

最终

[~s] 许多; 无数

大草原

(尤指为野生动物保存的) 湿地



The whooping crane research team and their ultralight plane

