

From 51 Birds to 325: The Parrot That Almost Vanished

Learning target: I can describe what happened to the kākāpō, record what I notice and wonder, and write a first explanation of why a species nearly disappeared and why a growing population can still be at risk.

Phenomenon exploration

About 35 min

Individual

MS-LS2-4 · practice

MS-LS2-5 · supports

discussion

writing

data analysis

Standards connections

MS-LS2-4 (practice): Students use real population counts and a timeline to start an argument that changes to the biological parts of an ecosystem (introduced predators, cleared forest) changed a population. It is a first draft, not yet a full evidence-based argument.

MS-LS2-5 (supports): Moving birds to predator-free islands and choosing mates by their genes are real design solutions for keeping a species alive; this sheet introduces them so students can evaluate solutions like these later in the chapter.

Purpose: activate · **Time:** about 35 minutes · **Format:** individual

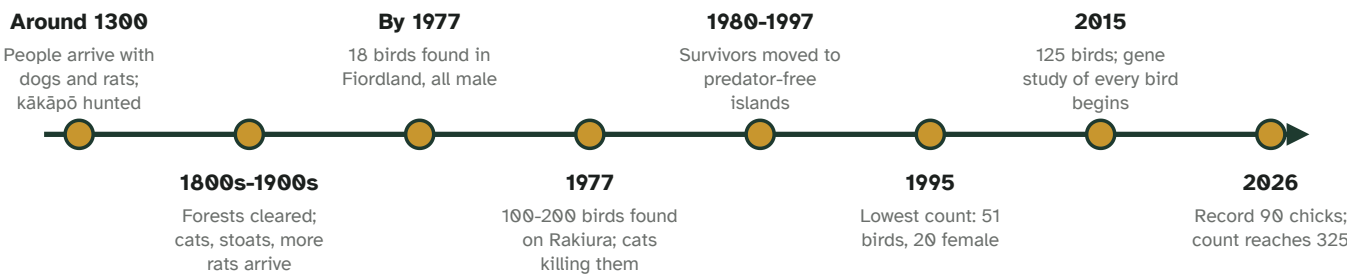
Answers with reasoning

Meet the kākāpō

The kākāpō is a large, moss-green parrot that lives only in New Zealand. It cannot fly, it is active at night, it eats only plants, and it can live for many decades. For millions of years New Zealand had no land mammals except bats, so the kākāpō's natural enemies were large birds of prey, such as Haast's eagle, which went extinct centuries ago. When a kākāpō is disturbed, it freezes and stays perfectly still. Its mottled green feathers then blend into the forest, which made it very hard to spot for a predator searching from the air.

Then people arrived. Polynesian settlers reached New Zealand about 700 years ago. They hunted kākāpō for food and feathers, and the dogs and rats they brought also ate the birds and their eggs. Later, European settlers cleared large areas of forest and brought cats, stoats and two more kinds of rats. These mammals can track prey by smell, and kākāpō have a strong, musty scent. A bird that freezes in place is easy prey for a hunter that follows its nose.

The kākāpō's story in eight moments



Dates and counts from New Zealand's Department of Conservation (DOC). Rakiura is also called Stewart Island.

Known kākāpō alive (real counts reported by DOC)

Date of count	Known kākāpō alive
1995	51
2015	125
30 June 2025	242
1 September 2026	325

Every kākāpō is named and tracked, so these are counts of individual birds, not estimates. The September 2026 count includes the 90 chicks from the 2026 breeding season, which DOC added once the youngest surviving chick was 150 days old.

Two more clues — Clue 1: Kākāpō breed only in years when rimu trees produce a huge crop of fruit, which happens about once every two to four years. There was no breeding at all in 2025. Clue 2: Every kākāpō alive today descends from a small group of survivors, so many of the birds are closely related. Many kākāpō eggs never hatch because they are infertile, a problem scientists link to low genetic diversity (little variety in the genes the birds carry).

Part A: Notice and wonder

1. Write three things you **notice** in the timeline, the table or the clues. At least one must use a number.
- Answer:** Any three accurate observations, for example: the count fell to 51 known birds in 1995 and rose to 325 by September 2026; only male birds were found in Fiordland by 1977; the decline came after people, dogs, rats, cats and stoats arrived; the count rose by 83 birds in about 14 months; there was no breeding in 2025.

Why: Observations describe what the timeline, table and clues show, not why it happened. A number anchors at least one of them.

Also acceptable: Accept observations about the freezing behavior or the strong scent from the description.

 - Three distinct observations
 - At least one uses a number from the timeline or table
 - Observations are descriptions, not explanations

2. Write three questions you **wonder** about. Start each with *why*, *how* or *what would happen if*.

Answer: Examples: Why do kākāpō breed only when rimu trees fruit heavily? How do scientists keep cats and rats off the islands? What would happen if a disease spread on one of the islands? How can scientists tell which birds are closely related? Why were all the Fiordland birds male?

Why: Good wonder questions can be investigated and connect to the evidence on the page.

Also acceptable: Accept any testable or researchable question about the kākāpō or its recovery.

- Three questions
- Each starts with why, how or what would happen if
- Each connects to something on the page

3. How many times larger was the September 2026 population than the 1995 population? Show the division and round to one decimal place.

Answer: $325 \div 51 = 6.37\dots$, so the 2026 population was about **6.4 times** larger than in 1995.

Why: Dividing the later count by the earlier count gives how many times larger it is; rounding 6.37 to one decimal place gives 6.4.

Also acceptable: Accept 6.37 or 'a little more than 6 times'.

4. Between 30 June 2025 and 1 September 2026 the count went from 242 to 325. Find the increase. The 2026 season added 90 chicks. What does the difference between your answer and 90 tell you about the birds that were already alive?

Answer: Increase: $325 - 242 = 83$ **birds**. The chicks added 90 birds, which is $90 - 83 = 7$ more than the increase, so about **7 birds that were already alive must have died** between the two counts.

Why: The change in a population equals births minus deaths when no birds are added or lost any other way. Ninety births with a net gain of 83 means 7 deaths in that period.

Also acceptable: Accept 'some adults or young birds died' if the subtraction is shown.

- Increase of 83 calculated
- Compares 83 with 90 (difference of 7)
- Concludes that some existing birds died

Part B: What you already know

5. In earlier lessons you studied how organisms interact. Name the kind of interaction between a stoat and a kākāpō. Then explain why a predator brought in from another land can be far more dangerous to a species than a predator it has lived alongside for thousands of years.

Answer: The interaction is **predation**: the stoat is the predator and the kākāpō is the prey. A predator from another land is especially dangerous because the prey never evolved defenses against it. Kākāpō evolved alongside birds of prey that hunt by sight, so freezing and camouflage worked; mammals that can track prey by smell find a frozen, strong-smelling bird easily. Predators and prey that have lived together for thousands of years have had time to evolve ways of escaping and ways of hunting that keep both populations going.

Why: This draws on the interactions lesson (predation) and sets up the idea that introduced species cause harm partly because native species lack defenses against them.

Also acceptable: Accept 'predator-prey relationship'. A student who adds that New Zealand had no native land mammals except bats is reasoning especially well.

- Names predation
- Explains that kākāpō lack defenses against the new predator
- Uses the freezing behavior or the scent as evidence

Part C: Your first explanation

6. Why did the kākāpō come so close to disappearing? Write your best explanation using at least two pieces of evidence from the description, the timeline or the clues. Include at least one cause that came from people.

Answer: Model response: People caused most of the decline in several ways at once. Hunters and their dogs and rats killed birds and ate eggs, and settlers cleared forest, so the kākāpō lost both lives and habitat. Then cats and stoats arrived; the kākāpō's defense of freezing only works against predators that hunt by sight, so these mammals, which can track prey by smell, caught them easily. The evidence: the timeline shows the decline after people and introduced mammals arrived, by 1977 only males were left in Fiordland, and cats were killing the last large group on Rakiura until the survivors were moved to predator-free islands.

Why: A strong first explanation links at least one human-caused change (hunting, introduced predators, forest clearing) to the falling population and uses page evidence.

Also acceptable: First drafts may name only introduced predators; full credit still requires two pieces of evidence and a mechanism.

- Names at least one cause that came from people
- Uses at least two pieces of evidence from the page
- Explains how the cause reduced the population (deaths, lost habitat or failed defense)

7. There are now 325 kākākō, more than six times as many as in 1995, yet scientists still call the species critically endangered. Using the clues and the timeline, explain **two** reasons why 325 birds may still not be safe.

Answer: Any two of: (1) **Low genetic diversity:** all kākākō descend from a small group of survivors, many are closely related, and many eggs are infertile, so the population grows more slowly than the number of eggs suggests and may be less able to survive a new disease. (2) **Slow, irregular breeding:** kākākō breed only in rimu fruiting years, about every two to four years, and there was no breeding in 2025. (3) **Few places to live:** all the birds live on a few predator-free islands, so a disease, a fire or predators reaching an island could harm many birds at once. (4) **Deaths still happen:** about 7 birds died between the 2025 and 2026 counts.

Why: This targets the idea that population size alone does not measure safety; genetic diversity, breeding rate and the number of separate populations matter too.

Also acceptable: Accept 'the islands may run out of room' as a reason about limited habitat.

- Two distinct reasons
- Each is supported by a clue, the timeline or the table
- At least one reason goes beyond 'there are still not many birds'

8. Scientists describe biodiversity at three levels: the variety of genes within one species, the variety of species in a place, and the variety of ecosystems in a region. Which level or levels does the kākākō story involve? Give one piece of evidence for each level you choose.

Answer: **Genetic** level: the birds descend from a few survivors, many are closely related, and many eggs are infertile. **Species** level: an endemic species found nowhere else came close to extinction, which would have removed it from New Zealand's species diversity. **Ecosystem** level (also acceptable): forests were cleared, and the remaining birds now depend on a few island ecosystems.

Why: The story involves more than one level, which is the key insight for the chapter.

Also acceptable: Full credit for genetic and species levels with evidence; the ecosystem level is a bonus.

- Names at least two levels
- Gives one piece of page evidence for each level named

9. Name one measurement or observation scientists could make to test one idea in your explanation. Say what result would support your idea.

Answer: Examples: Count how many eggs hatch from pairs of closely related birds and from pairs that are less related; if less-related pairs hatch more chicks, that supports the genetic idea. Or compare chick survival on islands that had rats with islands that were cleared of rats; if survival is higher without rats, that supports the predator idea.

Why: Students should link a measurement to a predicted result that would support one specific idea from their explanation.

Also acceptable: Accept tracking birds with radio transmitters, counting predators on islands, or checking rimu fruit before breeding seasons, with a stated supporting result.

- Names a specific measurement or observation
- States the result that would support the idea
- The idea comes from their own q6 or q7 answer

Keep this page — At the end of the chapter you will reread your answers to q6 and q7 and mark what you would keep, change or add. An explanation that changes is a sign of learning, not a mistake.

Teacher notes

The textbook's phenomenon says only 18 kākāpō were left in the 1970s and that about 160 live today. Both numbers need care. The 18 birds were the ones found in Fiordland by 1977, and all were males; in 1977 a population of about 100 to 200 birds was found on Rakiura (Stewart Island), where cats were killing them. The lowest known count was 51 birds in 1995. DOC's count was 242 on 30 June 2025 and reached 325 on 1 September 2026 after a record 90 chicks from the 2026 breeding season were added. The birds live at three predator-free breeding sites (Whenua Hou/Codfish Island, Pukenui/Anchor Island and Te Kāhaku/Chalky Island). Sources: DOC media release 'Kākāpō population reaches new milestone' (1 September 2026); DOC kākāpō recovery history page; DOC kākāpō behaviour page (rimu masting, freezing defense); DOC Kākāpō125 gene sequencing page (begun in 2015, when there were 125 birds). Write the macrons (kākāpō) when you can; the plural is also kākāpō. Keep q6 and q7 for the end of the chapter, when students revise them using what they learn about genetic diversity, habitat loss and invasive species. The extension's condor figures come from the U.S. Fish and Wildlife Service 2025 population status report.

Scaffold offered to students: Sentence starters for Part C

Use these starters if they help. 'One cause was ___, and the evidence is ___.' 'Before people arrived, freezing protected kākāpō because ___. After cats and stoats arrived, freezing failed because ___.' 'A population can grow and still be at risk because ___.' Look back at the timeline: anything that happened just before the numbers fell is a possible cause.

Extension: Two rescues side by side

In 1982 only 22 California condors were left in the world, and by 1987 every remaining wild condor had been captured for a breeding program. Birds raised in that program have been released since 1992, and by the end of 2025 the U.S. Fish and Wildlife Service counted 607 condors, 392 of them flying free. Lead poisoning, mostly from eating carcasses that contain fragments of lead bullets, was the leading known cause of death in the wild. Make a two-column timeline that compares the condor and the kākāpō. Then write a paragraph: how were the threats and the rescues alike and different, and why is neither species considered safe yet?