NAME _____ CLASS _____ DATE _____

IB BIOLOGY · A4.2

Conservation of biodiversity

Notes to fill in alongside the guide. Each numbered block matches a chapter of the guide, and of the lesson slides. Write in the gaps, answer the cues, annotate the figures, and sum up each section in your own words.

BY THE END YOU CAN

- [ ] Describe biodiversity at three levels: ecosystem, species and genetic diversity A4.2.1
- [ ] Compare the number of species alive today with past levels, from fossil evidence A4.2.2
- [ ] Explain the causes of anthropogenic extinction, using the moa, the Caribbean monk seal and a local example A4.2.3
- [ ] Explain the causes of ecosystem loss, using mixed dipterocarp forest and a local example A4.2.4
- [ ] Evaluate the evidence for a biodiversity crisis, and why surveys must be repeated A4.2.5
- [ ] Explain the causes of the current crisis, with human population growth as the overarching one A4.2.6
- [ ] Explain why conservation needs several approaches, in situ and ex situ A4.2.7
- [ ] Explain how the EDGE of Existence programme chooses species to prioritise A4.2.8

01 Counting the variety

A4.2.1

CUES

Predict: A cheetah population passed through a bottleneck and now has very little genetic diversity. Why does that put it at risk?

What is meant by biodiversity?

What is meant by species richness?

What is meant by evenness?

NOTES

1 _____ is the variety of life, and it comes at three levels. _____ is the range of habitats and communities in an area: a coast with dunes, salt marsh, woodland and a river has more than one covered in wheat. _____ is the number of species and how their numbers are shared. _____ is the variety of alleles within a species, which lets a population survive a new disease or a changing climate.

2 Species diversity has two parts. _____ is how many species there are. _____ is how equally the individuals are shared among them.

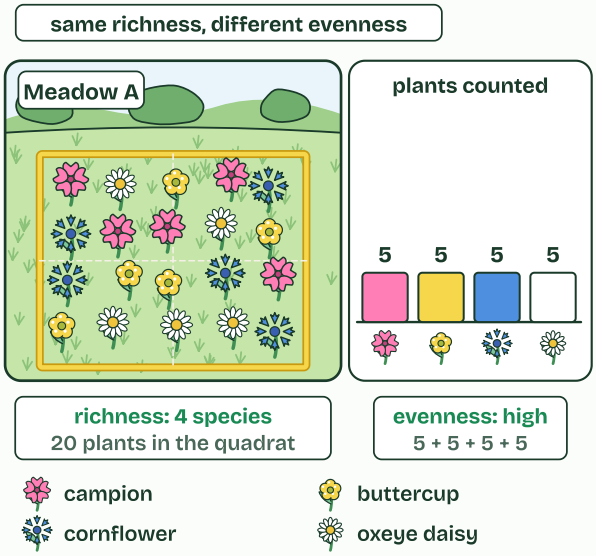
3 Three levels: _____.

4 Richness: how many species. _____: how equally individuals are shared.

Your own notes

ANNOTATE THE FIGURE

The figure shows it as Meadow A and Meadow B. Note what changes each time.



SPOT THE MISTAKE

What do students often get wrong about biodiversity as the variety of life in all its forms, levels and combinations? Write the mistake, then put it right.

The mistake

Put it right

SUMMARY

Sum up section 01 in two or three sentences of your own.

02 More than ever, for now

A4.2.2

CUES

Predict: Why are so many of the species not yet described thought to be insects and other small invertebrates?

What is meant by mass extinctions?

NOTES

1 But the rise was broken five times by _____, when most species died out in a geologically short time.

2 Five _____: 444, 372, 252, 201 and 66 million years ago.

3 Fossils of sea animals show the number of kinds _____ over 540 million years, to more than ever today.

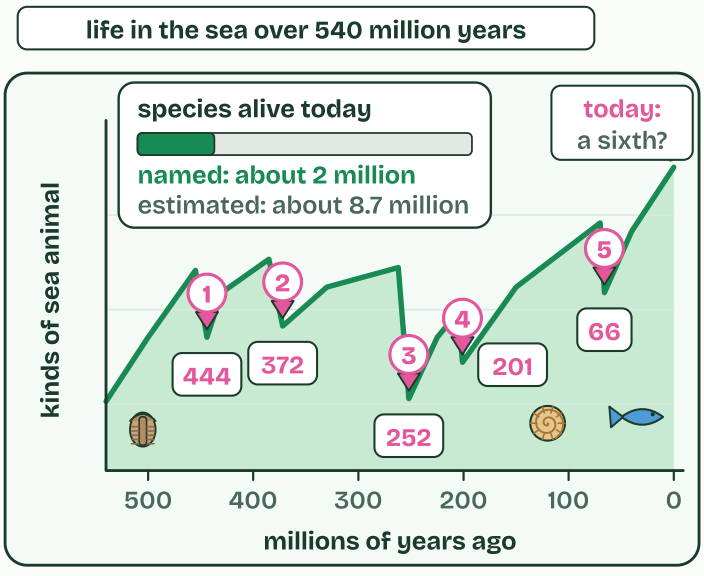
4 Five times it crashed: the _____. Each time, recovery took millions of years.

5 About _____ species are named today, of perhaps _____, and losses are speeding up.

Your own notes

ANNOTATE THE FIGURE

Number the 3 steps on the figure and note what happens at each: 1 rising; 2 mass extinctions; 3 2 million, 8.7 million.



SUMMARY

Sum up section 02 in two or three sentences of your own.

03 Gone for good

A4.2.3

CUES

Predict: Large, slow-breeding animals, such as moa, were wiped out far faster than small birds on the same islands. Why?

NOTES

1 Many biologists now speak of a sixth, and this one is _____: caused by humans.

2 The _____ (*Dinornis novaezealandiae*) was a flightless bird up to about 2 m tall.

3 Moa bred slowly, so even modest hunting outpaced their births. It is one of many losses of _____, large animals, after people arrived.

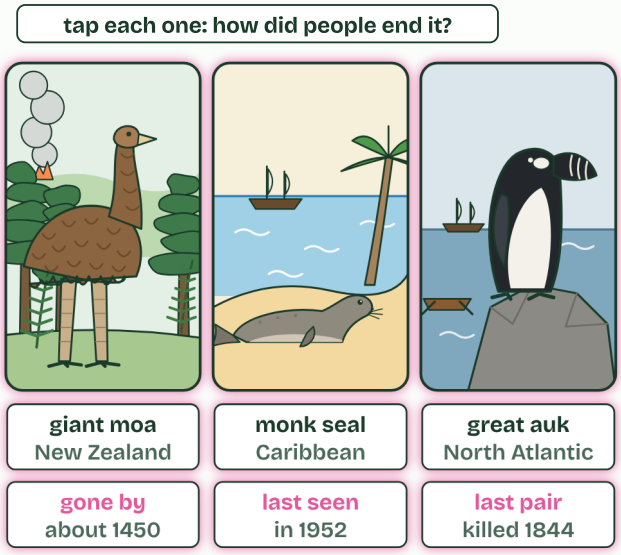
4 The _____ (*Neomonachus tropicalis*) basked on beaches and did not flee from people.

5 The _____, a flightless seabird of the North Atlantic, went the same way in 1844.

Your own notes

ANNOTATE THE FIGURE

Label the key parts and add a note on what it shows.



SUMMARY

Sum up section 03 in two or three sentences of your own.

04 Losing a whole forest

A4.2.4

CUES

Predict: On Borneo, the lowland forest near the coasts went first, and mountain forest in the interior is still mostly standing. Why?

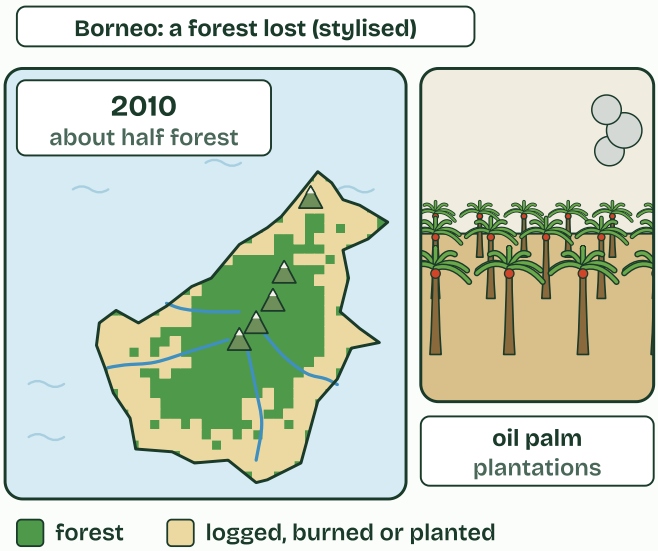
NOTES

1. Whole ecosystems are lost too, with every species that depends on them. _____ is the lowland rainforest of Southeast Asia, named after the dipterocarps, tall hardwood trees that tower over the canopy.
2. The causes, all human, build on each other. _____ took the valuable dipterocarp timber first, starting with lowland forest near the coasts and rivers.
3. Logging roads opened the forest to _____ for _____ and other plantations.
4. Dried-out logged forest and drained peat swamps burned in _____, most fiercely in El Niño droughts.
5. One example: the _____, once the fourth largest lake in the world, shrank to a fraction of its size after its rivers were diverted to irrigate cotton, and its fishery and wetlands collapsed.

Your own notes

ANNOTATE THE FIGURE

Number the 3 steps on the figure and note what happens at each: 1 1973:; 2 1990:; 3 2010:.



SPOT THE MISTAKE

What do students often get wrong about causes of ecosystem loss? Write the mistake, then put it right.

The mistake

Put it right

SUMMARY

Sum up section 04 in two or three sentences of your own.

05 Reading the evidence

A4.2.5 A4.2.6

CUES

Predict: A bird count in a park finds 30 species in 2024. Why is this not, on its own, evidence of a biodiversity crisis?

NOTES

1 The _____ tracks almost 35,000 populations of vertebrates around the world.

2 The UN's biodiversity panel, the _____, drew on thousands of studies in 2019 and estimated that about a million species face extinction.

3 The causes are many, but one lies under all of them: _____, with each person using more land, water and resources.

4 Across almost 35,000 monitored populations of vertebrates, average size fell by _____ from 1970 to 2020.

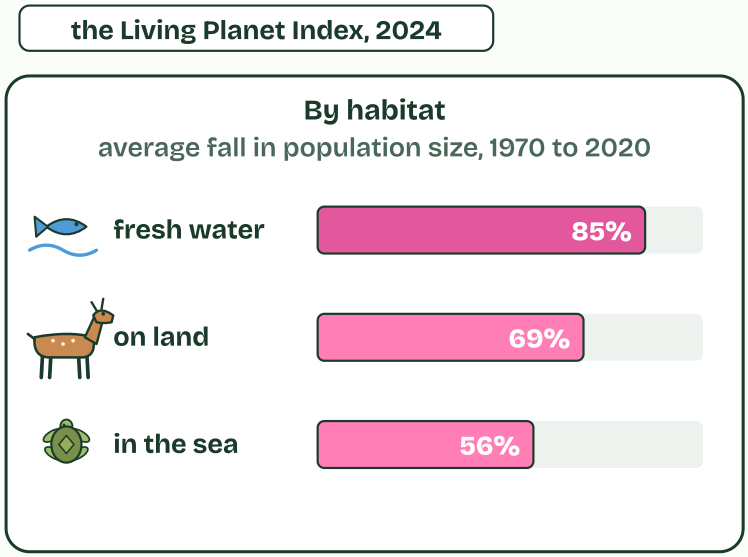
5 The fall is steepest in _____, where tropical forest is being cleared.

6 By habitat, _____ has lost most: rivers are dammed, drained and polluted.

Your own notes

ANNOTATE THE FIGURE

Number the 3 steps on the figure and note what happens at each: 1 73%; 2 Latin America and the Caribbean; 3 fresh water.



SUMMARY

Sum up section 05 in two or three sentences of your own.

06 Saving what is left

A4.2.7 A4.2.8

CUES

Predict: Why is ex situ conservation alone not enough to save a species such as the orangutan?

What is meant by in situ?

What is meant by ex situ?

NOTES

1 The _____ programme, run from the Zoological Society of London, prioritises species that are both _____, with few or no close relatives, and _____ on the IUCN Red List.

2 _____: reserves, managed; rewilding and reclamation.

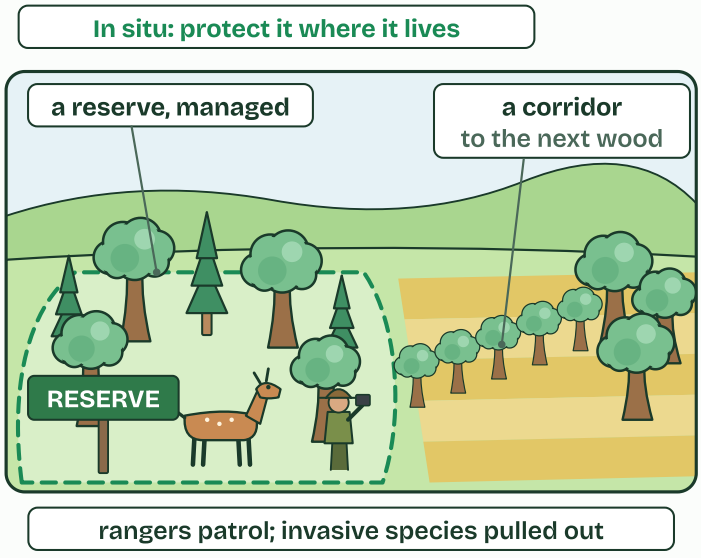
3 _____: zoos, botanic gardens, seed and tissue banks.

4 EDGE: _____.

Your own notes

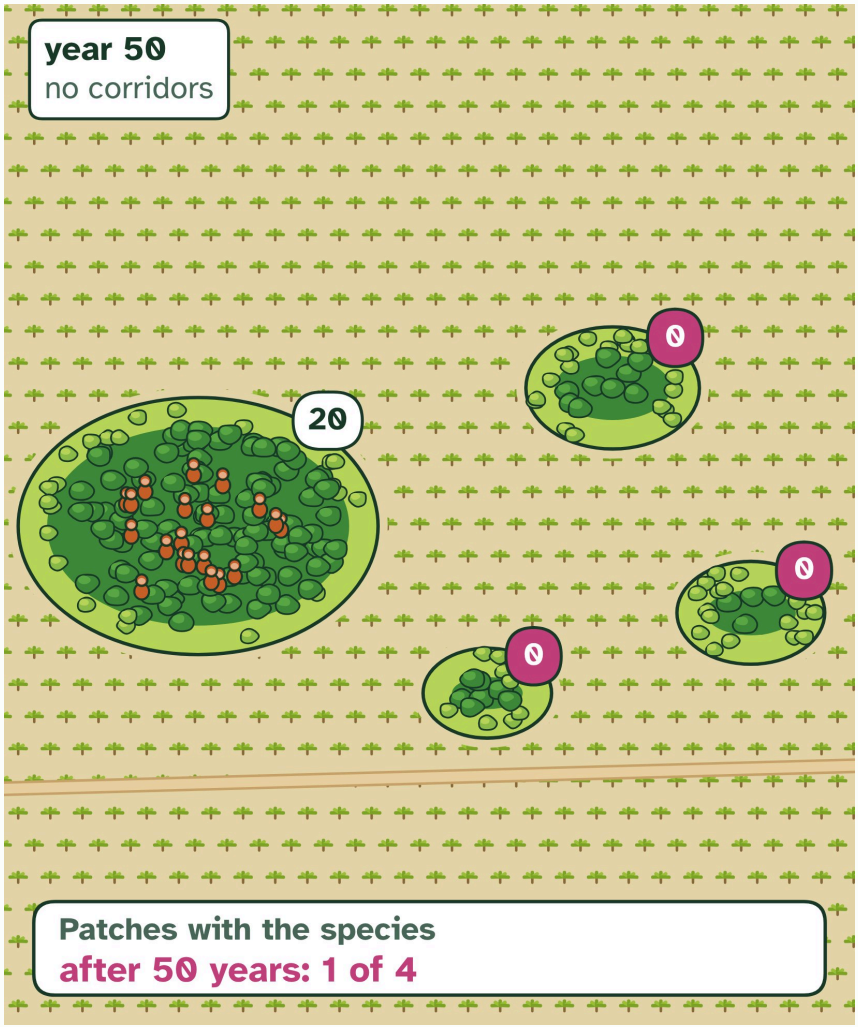
ANNOTATE THE FIGURE

The figure shows it as In situ, Rewilding and Ex situ. Note what changes each time.



ANNOTATE THE FIGURE

Annotate this still from the animation (Patches and corridors): what is happening, and why?



SUMMARY

Sum up section 06 in two or three sentences of your own.

Check yourself

The check for this guide is online: a fresh paper of past-paper style questions from the exam bank on A4.2 each time, marked as you go, and saved to your Exam practice progress when you are signed in. Scan the code, or type the link.

biologybybradford.com/exam-maker/sit?topics=A4.2&level=SL&paper=quiz&marks=15&src=ep

How this was made. The course structure, the activities and the teaching choices come from my own classroom, my presentations and my years of teaching IB and AP Biology. I use Claude, an AI, to help write and build the interactive guides, lesson plans, slides and practice questions, and to draw the diagrams and code the interactives. I direct the work and review it against the IB and AP specifications before it goes live.