

Documentation DECO3100 A2:

Code: More detailed comments in respective html, css, js files.

The tools that i used to write this code includes:

- GitHub Copilot, for layouts (flexbox, bootstrap library, etc)
- Stackoverflow for troubleshooting
- GPT 3.5 for troubleshooting and ideas to implement code.

Content:

I tried to follow most of the outline that I had from A1. Although, I removed some like costs, and I also try to include more things, such as the charts, that I synthesised from many different sources. Here's the explanation and resources for all the content on the website.

Part 1: Living on Borrowed Time

The Australian biodiversity is under constant threat of collapse. Since the introduction of non-native species in the local environment, Australia's local populations have had to compete with these new species. Putting invasive species aside, The Australian biodiversity has faced challenges with changing landscape and nature. They have to adapt and change, but these changes have decimated their ability to survive in the long run.

Explanation: To introduce the users to the subject that is being discussed, Australian biodiversity and its major threats

References:

Koala picture: <https://unsplash.com/photos/CIMk0FSOrAE>

Part 2: State of Australian Biodiversity

Australia has one of the world's highest rates of native species extinction in the world. The volatile balance of the Australian nature, which prior to the colonisation by Europeans in the late 1700s was largely left intact and free from outside influence. This environment is susceptible towards the smallest of changes in nature. The Australian government, through relevant legislation such as the Environment Protection and Biodiversity Conservation (EPBC), has listed over 100 extinct species, 10 of which were added within the last 2 years alone, and the number of threatened animal species is continuing to rise.

Links used: [Threatened Species and Ecological Communities, DCCEEW](#)

Explanation: To provide users with a more detailed outlook of the Australian biodiversity condition, with relevant datasets and links.

Chart: showing Users the list of animal extinction events in Australia, and its cumulative amount. Visualised with line chart using plotly.js library

Data sources: [Why is Australia a global leader in wildlife extinctions?](#)

Part 3: Meet some Australian Animals in Danger of Extinction

Animals: Numbat, Gouldian Finch, Koalas. Animals chosen from NatureAustralia: [Australia's Endangered Animals](#)

Numbat:

This is the Numbat. Numbat is currently known to exist in the woodlands of Western Australia. They prefer areas with dense vegetation, and since they are also known as anteaters, they have an appetite for termites. Numbats are on the verge of extinction due to habitat loss, predation by invasive species, and other threats. Their population is limited to several isolated areas, and they might not exist in the next few decades.

Sources: [Australia's Endangered Animals](#), IUCN.

Picture from: NatureAustralia

Button leads to: [Numbats - IUCN](#)

Gouldian Finch:

Gouldian Finch is a small bird that has many different colours of feathers. However, because of their pretty colours, they were once the target of poachers and the likes. As such, their population has declined significantly, and their survival is under threat, due to habitat changes through forest fires and the likes.

Sources: [Australia's Endangered Animals](#), IUCN.

Picture from: NatureAustralia

Button leads to: [Gouldian Finches](#) IUCN

Koala:

Koalas are one of the world's most notable marsupials that can only be found in Australia. They are often thought to be bears, but they are actually not. Their diet primarily consists of eucalyptus tree leaves, and as such, they dwell on these trees most of the time. They are known to be sedentary, and they spend most of their time sleeping, moving only when it is necessary. Koalas are under the threat of extinction, due to habitat loss and climate change. Deforestation has affected their limited spread, and when combined with a lot of different climatic factors, their survival in the coming decades are under the watchful eyes of conservationists.

Sources: [Koala facts | Environment](#)

Picture from: [Brown animal on branch photo](#)

Button leads to: [Koalas](#) - IUCN

Note: Code for carousel is provided from GPT 3.5 and Copilot

Part 4: What are the threats?

Threats to the Australian biodiversity comes in many different kinds, but according to a recent report, the top 3 threats to the Australian biodiversity are Invasive Species, Ecosystem Modifications, and agricultural activities. When compared to the world, the top 3 threats are Agriculture, Overexploitation, and Urban development. The top 2 threats to Australia are significantly larger in portion when compared with worldwide trends, as shown in the chart.

Chart: Shows 5 different threats to biodiversity for Australia and the world. Bar chart made with plotly.js

Source for Chart data: [Kearney et al., 2019](#). Document source notes all the top threats to Australian biodiversity and compares it with the world.

Part 5: Invasive Species

First, let's cover introduced organisms. It's a massive problem in Australia, as a lot of these introduced species have no natural predators. Their numbers grow exponentially, as combined with favourable conditions, they decimate local resources, competing with the local flora and fauna. Take for example, One of the largest threats to Australian biodiversity is the European Feral Rabbit. As shown in the chart, The Rabbit is responsible for threatening around more than 300 native Australian species, both directly and indirectly, which adds up as that is more than the second and third most threatening species combined.

Chart: Shows top 3 Invasive fauna that has significantly affected the Australian wildlife

Explanation: Introducing the readers to the invasive species problem. Data collected from [Australia state of the environment 2021](#). Chart data sifted from the same source. Readers can read more through the given link provided through the button, and it leads to the Australian Government Report about the State of the Environment.

Button links: [Australia state of the environment](#)

Part 6: Rabbits?

Rabbits were introduced to Australia in the middle of the 19th century for hunting, but not long after they went loose their population exploded, as they have no natural predators, and the Australian environment suits their breeding patterns as a whole. Rabbits are invasive in many different ways, for instance, they overgraze lands, which leads to lack of food supply in the area, and soil erosion that changes the whole landscape. Take Phillip Island as an

example, Phillip island was once a home to a large rabbit population, but once they were eradicated, we can see that the island is in a much better shape than it was before. These are some of the harsh realities that the native Australian fauna is facing. There have been previous attempts of population control, but in reality as shown through the graph, the rabbit population will always recover. It's a race against time, and we only have finite resources.

Slideshow: there are 3 parts in the slideshow

Exhibit 1: A picture of Phillip island before rabbit extermination, picture from: [Feral European Rabbit \(Oryctolagus cuniculus\) - Fact Sheet - PDF](#)

Exhibit 2: A picture of Phillip island after rabbit extermination, shows that it is covered in lush green. picture from: [Feral European Rabbit \(Oryctolagus cuniculus\) - Fact Sheet - PDF](#)

Chart 1: A picture of a chart that was taken from a study by [Cooke et al., 2013](#)

Data for paragraph: [Feral European Rabbit \(Oryctolagus cuniculus\) - Fact Sheet - PDF](#) and [Cooke et al., 2013](#)

Button leads users to: [Feral European Rabbit \(Oryctolagus cuniculus\) - Fact Sheet - PDF](#)

Part 7: Changing Landscape

Invasive species are one part of the problem. Another one is a changing landscape. Let's take one of the recent disasters in Australian History. The 2019-2020 Bushfires were one of the worst ecological disaster events in Australia's history. The fires burned an estimated \$5 billion dollars, around 8% of Australia's agricultural GDP. But not only that, a lot of different species were affected. Take the koalas for example. After the fires, The Australian government listed Koalas as being Endangered. Koalas primarily live on the East coast of Australia. As shown in the chart, the fires burned a lot of its habitat, resulting in its population decline.

Paragraph data from:

[Destruction of habitat sped up after koalas were listed as vulnerable](#)

[Black Summer bushfire season cost farmers up to \\$5 billion - The University of Sydney](#)

Chart: Reliable data on bushfire spread in Australia, in million ha. Scattergeo plot made with Plotly.js, with guidance and troubleshooting from stackoverflow and chatGPT

Chart data from: [Australia - total area burned by bush fires by state 2020 | Statista](#)

[Australia Cities Database | Simplemaps.com](#) > Latitude & Longitude of Australian cities

Part 8: Forest Cover?

Not only bushfires, but there has been a massive deforestation in Australia since the advent of European colonisation. since 1750's, Australia has lost a significant portion of its forests, as shown through the chart. In all different types of forests, there has been a significant reduction of tree population. These deforestation events are caused by a variety of causes. But in general..

Explanation: Informing the users that there's also been a significant deforestation event in Australia since 1750's. Data from [Wilderness Society](#).

Chart: 4 Stacked bar chart noting the loss of different forest types in Australia. Chart made with Plotly.js

Data from: [Wilderness Society | 10 facts about deforestation in Australia](#)

Part 8: Humans. Its Humans

Since the colonisation of Australia, Humans are responsible for all of these changes. We have introduced invasive species, we have changed the landscape, and we have deforested the land. We are the ones responsible for the current state of the Australian environment, and for that reason, we should do our best to change the course!

Image / Gif: [Artificial Intelligence Steam GIF by iHumanFilm - Find & Share on GIPHY](#)

Part 9: We're Still Destroying Nature!

Take for example, as of now, the Australian government has committed to net zero emissions by 2050. However, we're still far from targets. According to the statistics, We are only going to reach about 85% of net 0 targets, which is still insufficient, and adding salt to the wound, we are still having new coal, gas, and other non renewable resources projects ongoing, and as shown in the chart, Coal project marks a significant amount of new projects

Slideshow:

Chart 1: Australia's Emission targets prediction, showing that we only achieve 85%

Chart 2: Showing the amount of New non renewable resources projects ongoing

Chart 1 Data: [Australia | Climate Action Tracker](#)

Chart 2 Data: [resources-and-energy-major-projects-report-2021.pdf](#)

Part 10: So how can you help?

The future seems bleak. That is undeniable. But when more and more people bind together not as individuals, but as a team, changes are possible. We can donate to charitable sources, like the Australian World Wildlife Fund, or we can volunteer to help conserve local flora and fauna. We can also contact our local representatives, to make sure that they are aware of our concerns, and so that they could call for actions that represent our values better.

Call to action: Let's do more for Australia and protect our Biodiversity!

Resources provided to users:

[WWF Australia](#)
[Contacting Representatives](#)

Footer: TEDI0478 DECO3100 Information Visualisation Design Studio

[Documentation + References](#)> Links to this page

Usability testing:

8 people participated in the usability testing. There are 2 usability testing methods that are being used. in person with the researcher's laptop, with 5 people, and through zoom call and teamviewer remote control application with 3 users. Condensed consent form file can be found in the Zip folder. Documentation was made verbally and noted in the notes application.

Prompts used for usability testing:

- Can you notice any bugs when using the website?
- Are there any issues that you might find jarring and hard to use?
- What do you think of the layout and the content of the website?
- Any general comments?

Notable feedback from users:

7/8: The content in some of the parts were not legible, obstructed by the picture

Solution: added some backdrop

6/8: The white colour background looks bland and boring

Solution: used CSS animation to create changing colour background

5/8: The buttons are hard to see with the green colours

Solution: made button black and white while still following a common design theme

3/8: the page resizes erratically when going through the image carousel

Solution: change images in carousels to the same / similar sizes.

2/8: The website reloads to the middle of the screen

Note: this was said by some users but it was important enough that it needs a solution.

Solution: reload anchored to a section on top of the html page.

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