

© International Baccalaureate Organization 2025

All rights reserved. No part of this product may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without the prior written permission from the IB. Additionally, the license tied with this product prohibits use of any selected files or extracts from this product. Use by third parties, including but not limited to publishers, private teachers, tutoring or study services, preparatory schools, vendors operating curriculum mapping services or teacher resource digital platforms and app developers, whether fee-covered or not, is prohibited and is a criminal offense.

More information on how to request written permission in the form of a license can be obtained from <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organisation du Baccalauréat International 2025

Tous droits réservés. Aucune partie de ce produit ne peut être reproduite sous quelque forme ni par quelque moyen que ce soit, électronique ou mécanique, y compris des systèmes de stockage et de récupération d'informations, sans l'autorisation écrite préalable de l'IB. De plus, la licence associée à ce produit interdit toute utilisation de tout fichier ou extrait sélectionné dans ce produit. L'utilisation par des tiers, y compris, sans toutefois s'y limiter, des éditeurs, des professeurs particuliers, des services de tutorat ou d'aide aux études, des établissements de préparation à l'enseignement supérieur, des fournisseurs de services de planification des programmes d'études, des gestionnaires de plateformes pédagogiques en ligne, et des développeurs d'applications, moyennant paiement ou non, est interdite et constitue une infraction pénale.

Pour plus d'informations sur la procédure à suivre pour obtenir une autorisation écrite sous la forme d'une licence, rendez-vous à l'adresse <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organización del Bachillerato Internacional, 2025

Todos los derechos reservados. No se podrá reproducir ninguna parte de este producto de ninguna forma ni por ningún medio electrónico o mecánico, incluidos los sistemas de almacenamiento y recuperación de información, sin la previa autorización por escrito del IB. Además, la licencia vinculada a este producto prohíbe el uso de todo archivo o fragmento seleccionado de este producto. El uso por parte de terceros —lo que incluye, a título enunciativo, editoriales, profesores particulares, servicios de apoyo académico o ayuda para el estudio, colegios preparatorios, desarrolladores de aplicaciones y entidades que presten servicios de planificación curricular u ofrezcan recursos para docentes mediante plataformas digitales—, ya sea incluido en tasas o no, está prohibido y constituye un delito.

En este enlace encontrará más información sobre cómo solicitar una autorización por escrito en forma de licencia: <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

**Environmental systems and societies**  
**Standard level**  
**Paper 1 – resource booklet**

2 May 2025

**Zone A** afternoon | **Zone B** afternoon | **Zone C** afternoon

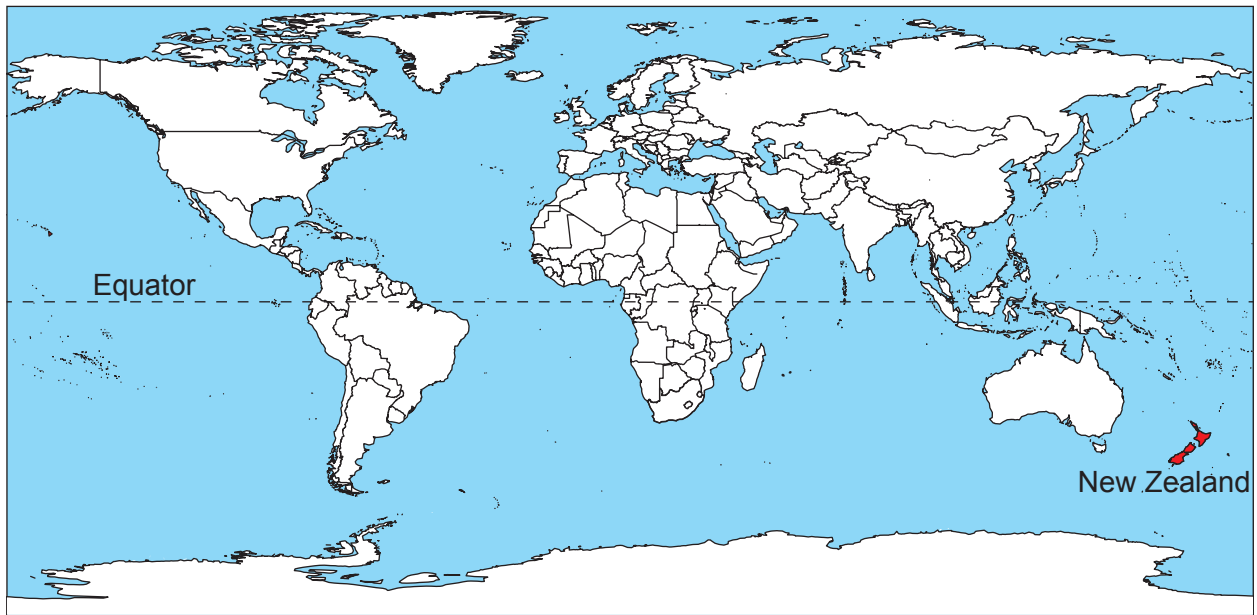
1 hour

---

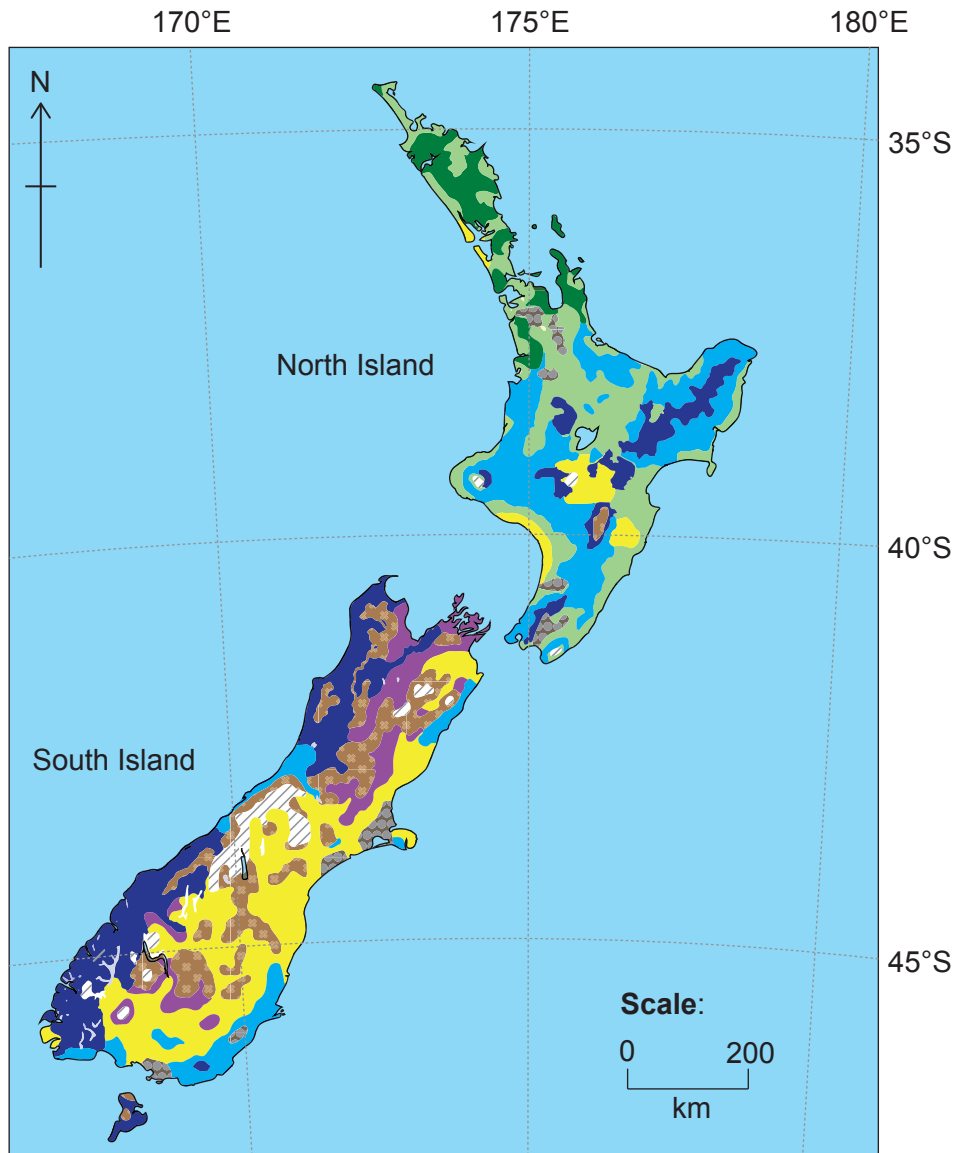
**Instructions to candidates**

- Do not open this booklet until instructed to do so.
- This booklet contains all the resources to answer paper 1.

**Figure 1(a): World map showing the location of New Zealand**



**Figure 1(b): Vegetation map of New Zealand**



**Key:**

- |                             |                              |                 |
|-----------------------------|------------------------------|-----------------|
| ■ Subtropical rainforest    | ■ Temperate broadleaf forest | ■ Shrub steppe  |
| ■ Subtropical laurel forest | ■ Highland steppe            | ■ Grass steppe  |
| ■ Temperate rainforest      | ■ Alpine shrubland           | ■ Bog and swamp |

**Figure 1(c): Fact file on New Zealand**

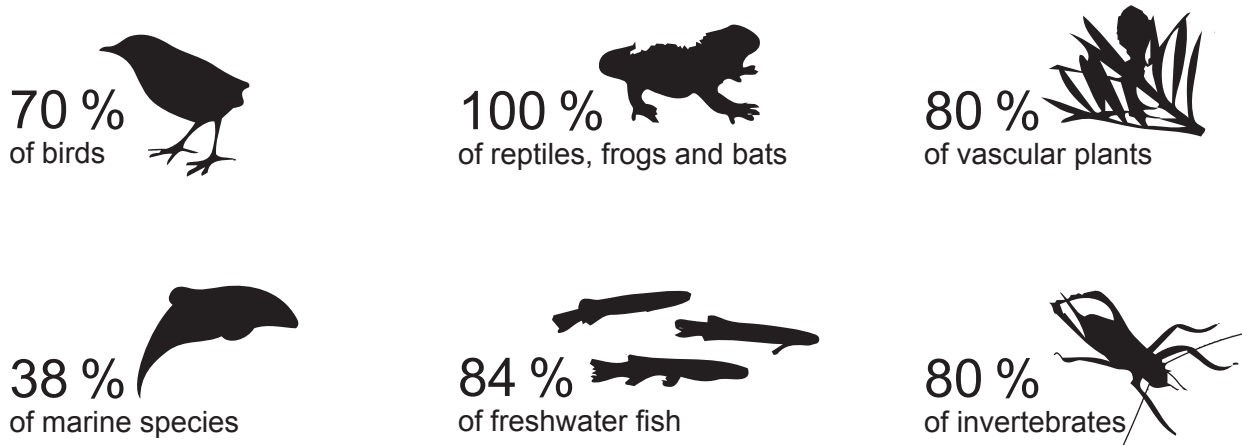
- Over a third of the land area is covered by forest.
- Over half the land area supports crops or livestock.
- Main exports include dairy products (eg, milk powder, butter, cheese), eggs, honey, meat, wool and wood.
- Main imports include vehicles, machinery, electrical goods and fuel oil.
- Car ownership levels are high and in 2021, there were 889 vehicles per 1000 people.

Blank page

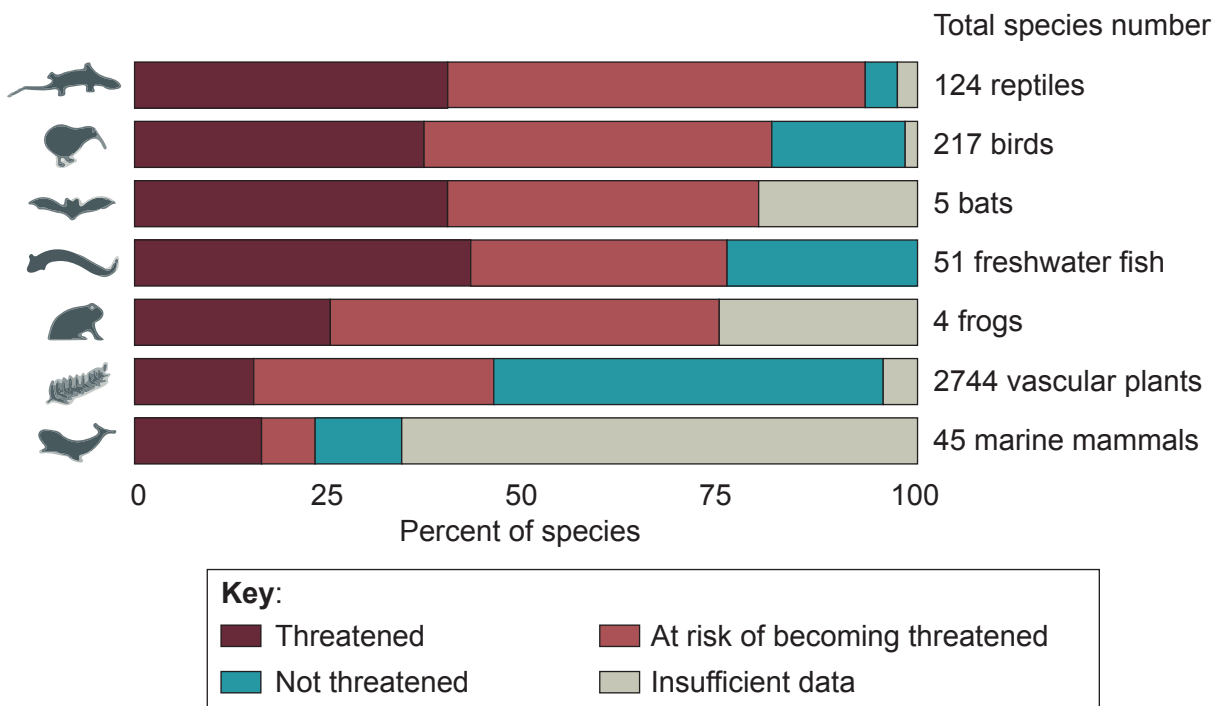
**Figure 2(a): Fact file on biodiversity in New Zealand**

- New Zealand is a geographically isolated island system which became separated from the southern supercontinent 85 million years ago.
- New Zealand has many endemic species (found nowhere else). These include flightless birds (eg, Kiwi, Kākāpō and Takahē) which evolved in the absence of terrestrial ground predators.

**Figure 2(b): Proportion of New Zealand species that are endemic (found nowhere else)**



**Figure 2(c): Percentage of New Zealand species by extinction threat categories**



**Figure 3(a): Image of a Northern Island brown kiwi (*Apteryx mantelli*)**



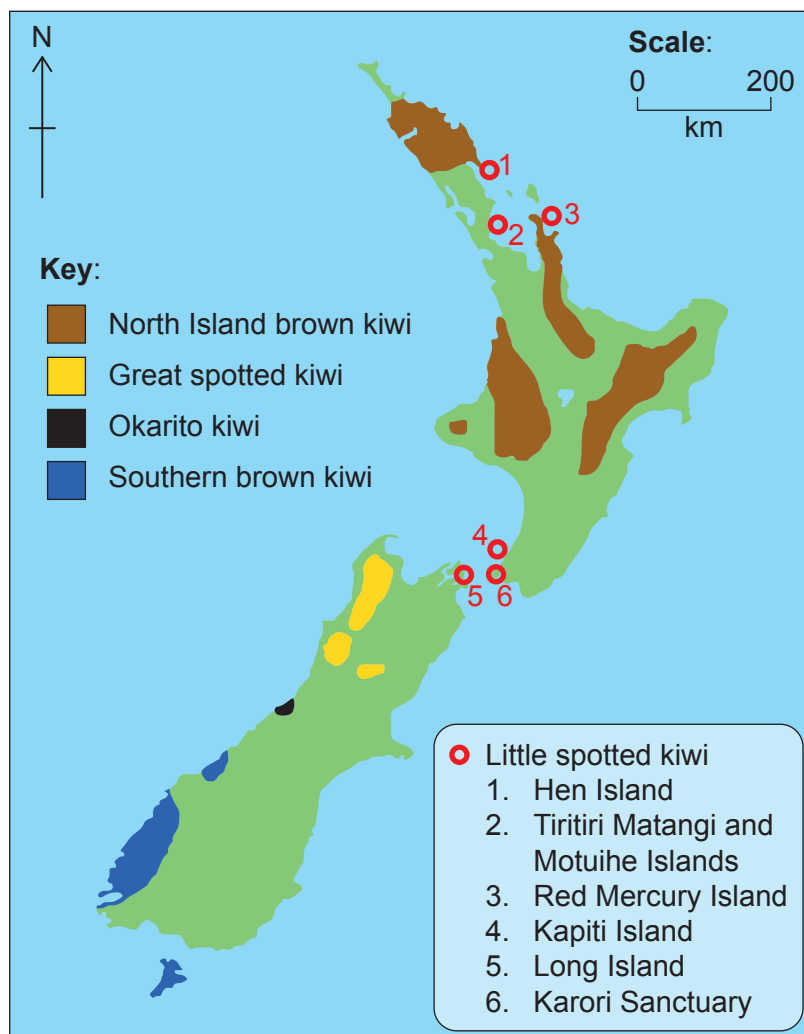
**Figure 3(b): Fact file on the kiwi**

- Comprises of 5 species which are only found in New Zealand.
- Kiwi are flightless, nocturnal birds which were common throughout mainland New Zealand.
- They are a national icon, symbolising the uniqueness of the wildlife of New Zealand.
- Kiwi have important cultural and spiritual significance to the Māori (indigenous people of New Zealand).
- Threats include habitat loss (deforestation) and introduced invasive predators (eg, stoats, ferrets, rats, cats, dogs).
- Numbers have fallen from an estimated 12 million about 1000 years ago to 100 000 in 1998 and 68 000 in 2023.
- Conservation strategies have included:
  - partnership between government departments, non-governmental organisations (NGOs), local groups and volunteers
  - control of predators
  - establishing kiwi sanctuaries
  - adoption of Operation Nest Egg (ONE) in which eggs are removed from their nest in the wild and hatched in captivity, away from the risk of predation. The chicks are returned to the wild when they are able to fend for themselves. ONE has increased the number of Okarito kiwi birds successfully reaching adulthood from 2 out of 80 to 50 out of 80 eggs laid each season.

**Figure 3(c): The five kiwi species, population size, IUCN red list status and population change**

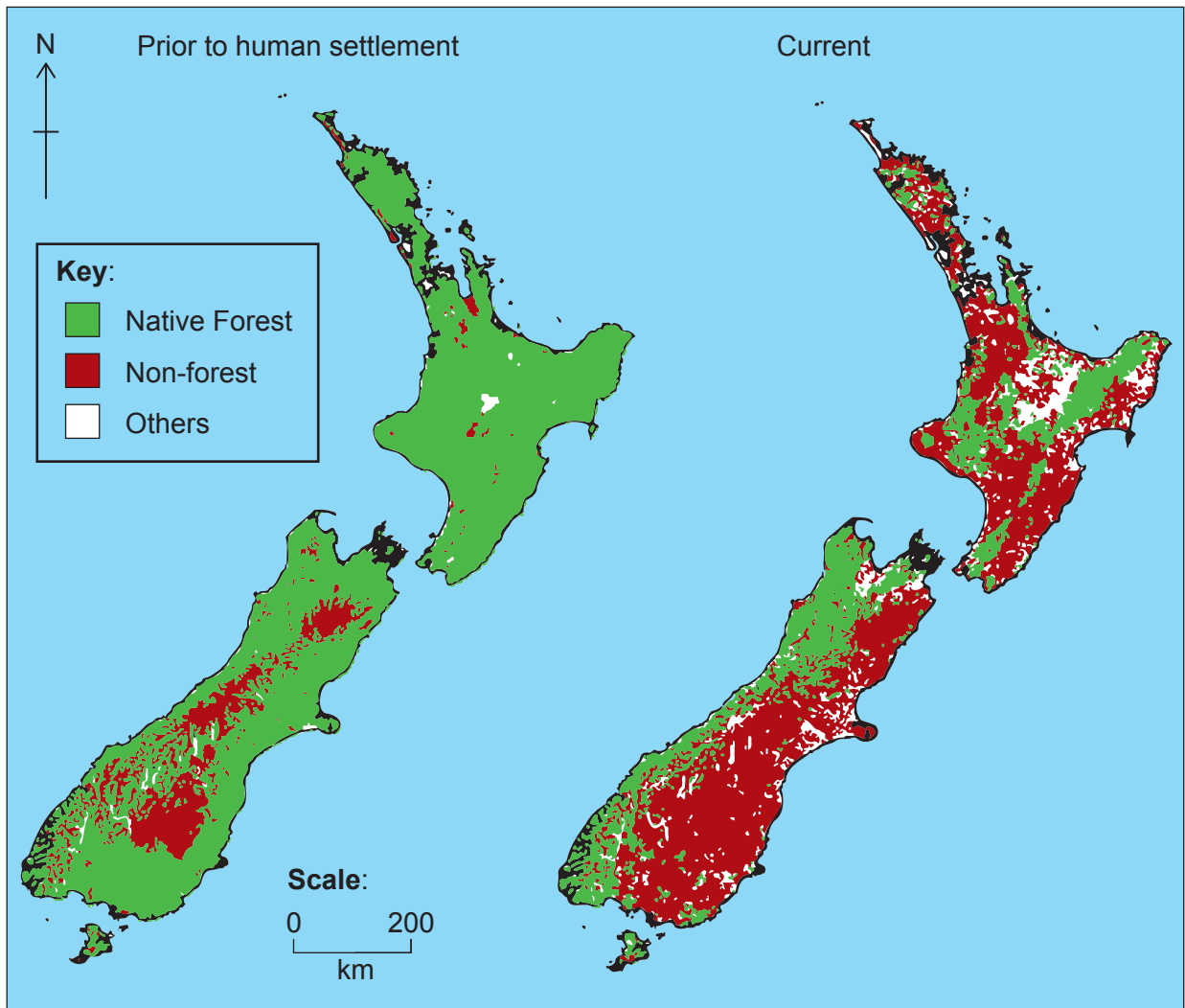
Kiwi species	Population size	IUCN red list status	Population change
North Island brown kiwi ( <i>Apteryx mantelli</i> )	26 000	Vulnerable (in 2017)	Declining at 2.5 % per year
Great spotted kiwi ( <i>Apteryx haastii</i> )	14 000	Vulnerable (in 2022)	Declining at 1.6 % per year
Little spotted kiwi ( <i>Apteryx owenii</i> )	1900	Near Threatened (in 2022)	Increasing; previously became extinct on main island
Okarito kiwi ( <i>Apteryx rowi</i> )	160 in 1995 450 in 2015 500-600 in 2019	Vulnerable (in 2020)	Increasing
Southern brown kiwi ( <i>Apteryx australis</i> )	29 800 in 2008 24 850 in 2018	Vulnerable (in 2022)	Decreasing

**Figure 3(d): Distribution of each species of kiwi**

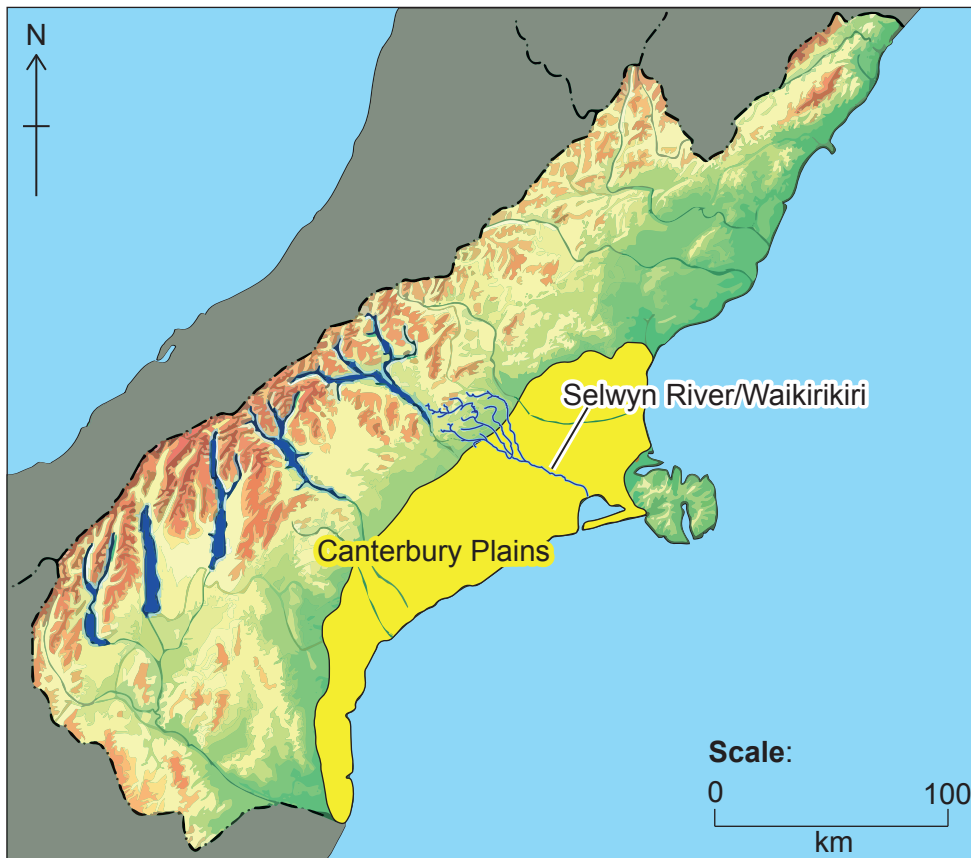


Blank page

Figure 4: Change in forest cover in New Zealand



**Figure 5(a): The Canterbury region on the South Island, New Zealand**



[Source: <https://www.freeworldmaps.net/oceania/new-zealand/canterbury/canterbury-blank-map.jpg>.]

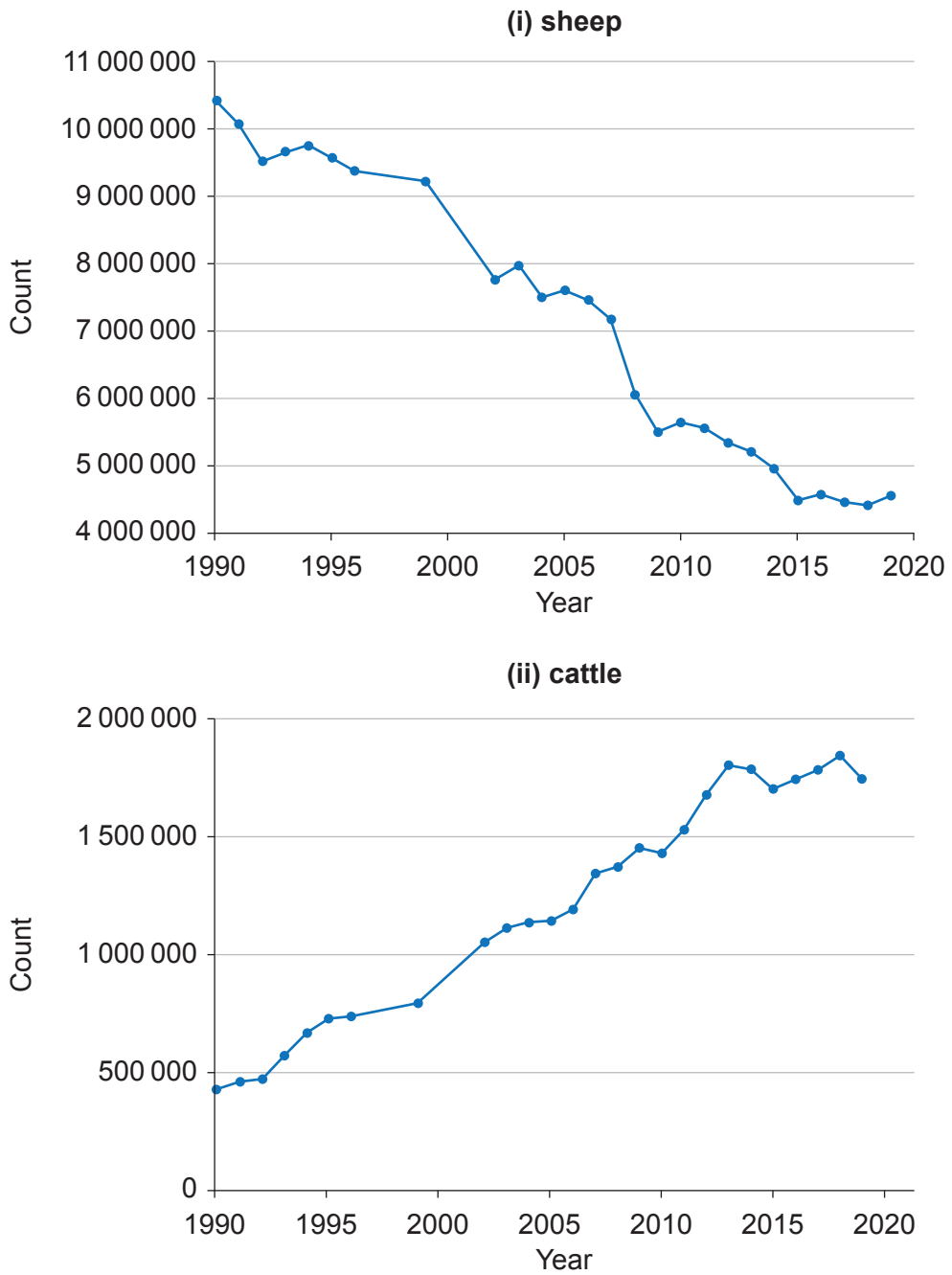
**Figure 5(b): Fact file on the Canterbury region**

- The largest region in the country by area.
- Includes the Canterbury Plains, New Zealand's largest area of flat land which:
  - is used for a mix of intensive farming activities ranging from growing wheat and barley to sheep and cattle (dairy and beef) farming
  - produces the majority of New Zealand's grains and crops.

Figure 5(c): Agriculture on the Canterbury Plains



Figure 5(d): Sheep and cattle numbers in Canterbury region, 1990-2019



**Figure 6: Population statistics for New Zealand, 2022**

<b>Population</b>	5 157 100
<b>Live births</b>	58 887
<b>Deaths</b>	38 574
<b>Total fertility rate</b>	1.66 children per woman

Figure 7(a): Greenhouse gas emissions in 2021 by sector and sub-category

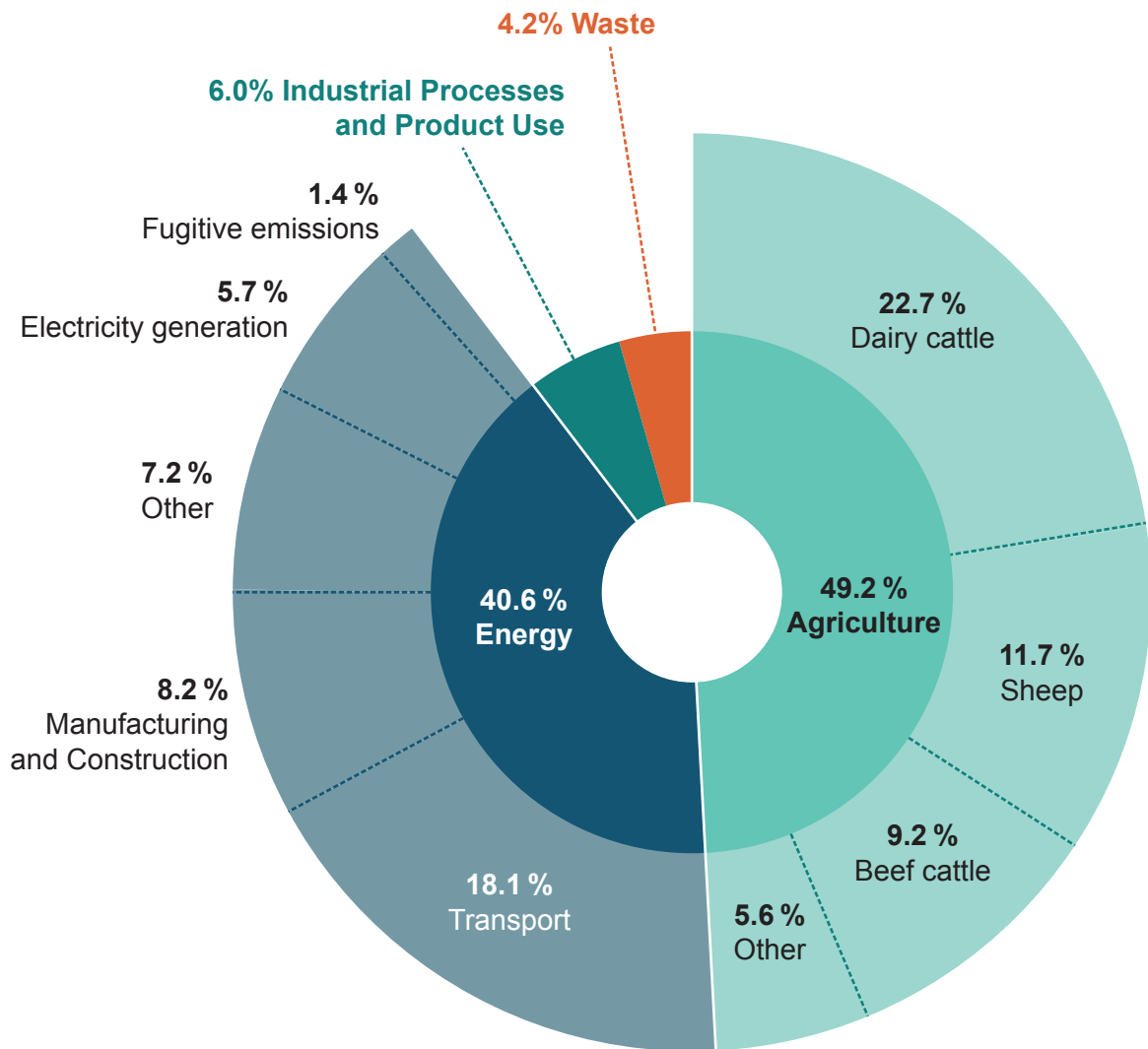


Figure 7(b): Fact file on New Zealand's response to climate change

- They pledged to cut greenhouse gas (GHG) emissions by 30% below 2005 levels by 2030 (Paris 2015 Agreement).
- They aim to reach net zero carbon emissions by 2050.

New Zealand aims to achieve this by:

- increasing renewable energy use
- producing all electricity from renewables by 2050
- improving energy efficiency
- using a carbon emissions trading scheme (ETS) and having reduction emission goals
  - The total allowable emissions of carbon are limited by government and reduced periodically.
  - Industries that emit carbon need to pay per unit of emission.
  - Carbon emissions are traded in units.
  - Activities that have a net absorption of carbon (eg, forestry) can gain credits that can be sold to emitters.
  - To offset their emissions, industries need to buy these units from the government or other businesses.

Figure 7(c): Energy demand by type and sector for 2020 and projected values for 2050

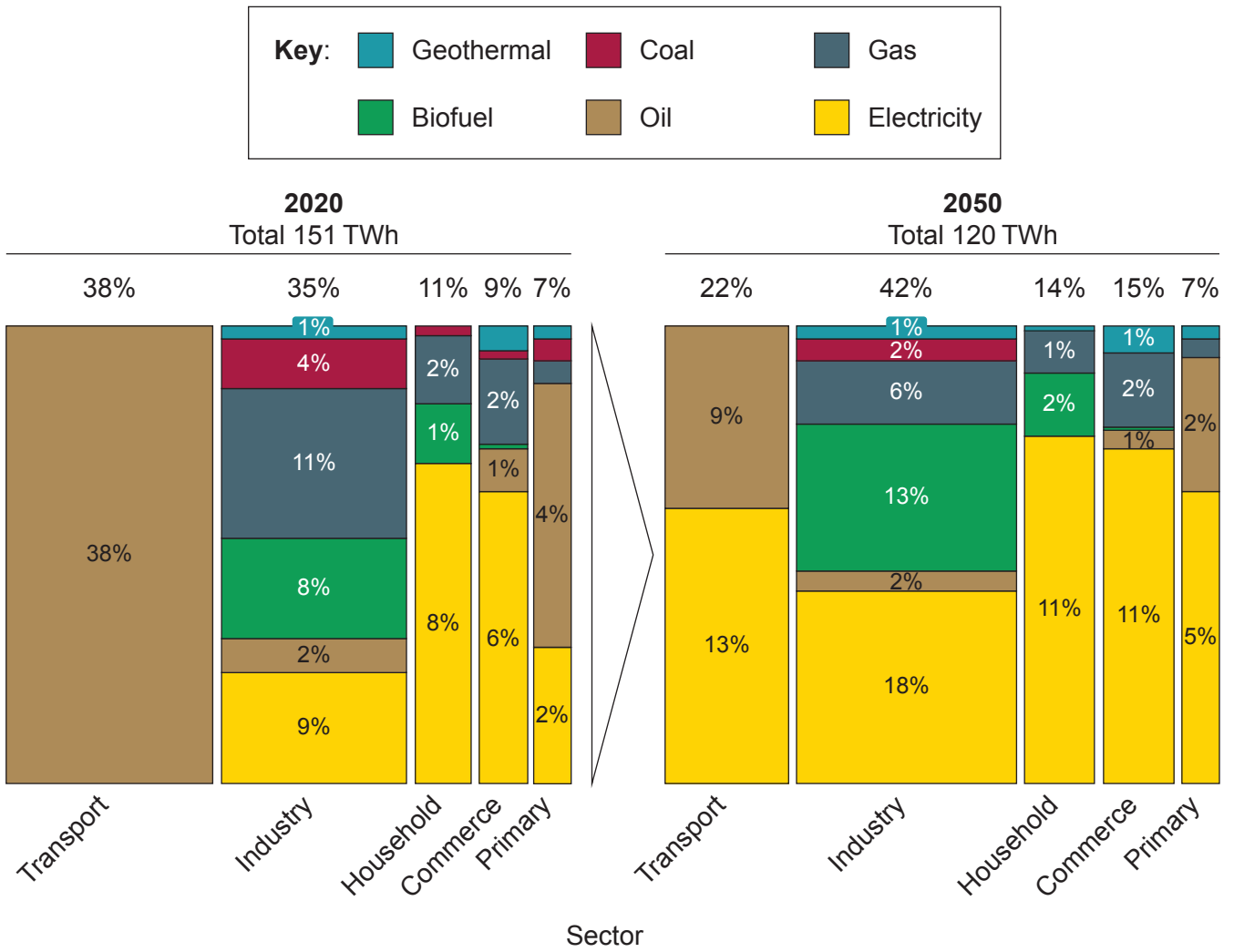
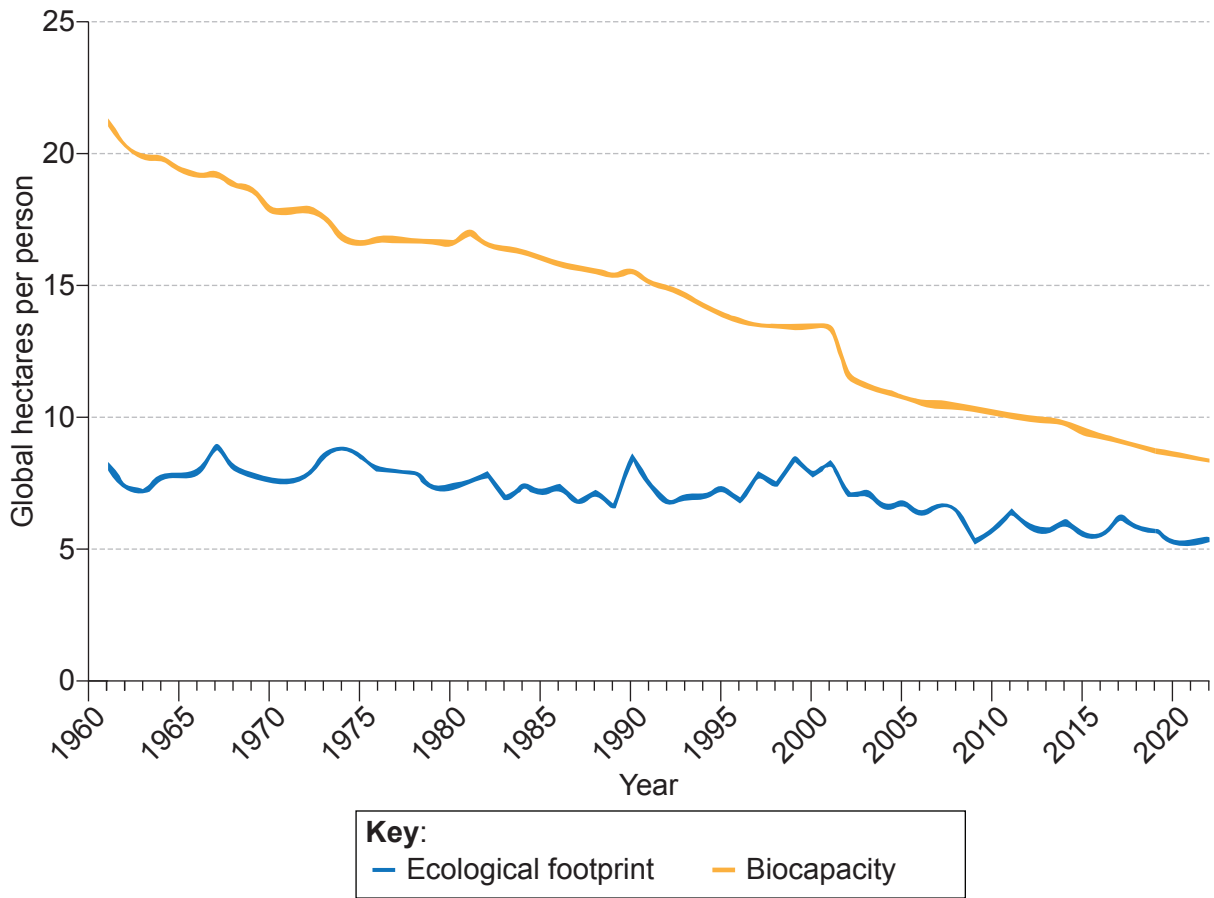


Figure 8: Ecological footprint and biocapacity for New Zealand (1961-2022)



Biocapacity is the amount of biological productive land, measured in hectares per person.

---

**Disclaimer:**

Content used in IB assessments is taken from authentic, third-party sources. The views expressed within them belong to their individual authors and/or publishers and do not necessarily reflect the views of the IB.

**References:**

- Figure 1(b)** Fährtenleser. [https://commons.wikimedia.org/wiki/File:New\\_Zealand\\_Natural\\_Vegetation.png](https://commons.wikimedia.org/wiki/File:New_Zealand_Natural_Vegetation.png). Licensed under CC BY-SA 3.0 <https://creativecommons.org/licenses/by-sa/3.0/deed.en>. Image adapted.
- Figure 1(c)** This work uses data sourced from the Ministry of Transport – <https://www.transport.govt.nz/assets/Uploads/Report/AnnualFleetStatistics.pdf>. This material is licensed under the Creative Commons Attribution 4.0 International (BY) Licence. To view a copy of this licence, visit <https://creativecommons.org/licenses/by/4.0/>.
- Figure 2(b)** Department of Conservation (NZ). <https://www.doc.govt.nz/globalassets/documents/conservation/protecting-and-restoring/biodiversity-discussion-document.pdf> - Figure 1. Licensed under CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Image adapted.
- Figure 2(c)** Stats NZ Tatauranga Aotearoa. <https://www.stats.govt.nz/news/our-indigenous-species-are-at-risk-of-extinction/#percentage%20>. Licensed under CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/deed.en>. Image adapted.
- Figure 3(a)** Lakeview\_Images, 2019. *Common Kiwi*. [image online] Available at: <https://www.gettyimages.co.uk/detail/photo/common-kiwi-royalty-free-image/1167545747?phrase=kiwi+bird&adppopup=true> [Accessed 20 February 2024].
- Figure 3(b)** Department of Conservation (NZ). <https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kiwi/rowi/>. Under Creative Commons license CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.
- Figure 3(c)** Department of Conservation (NZ). <https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kiwi/brown-kiwi/>. Under Creative Commons license CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.
- Department of Conservation (NZ). <https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kiwi/great-spotted-kiwi-roroa/>. Under creative commons license CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.

Department of Conservation (NZ). [www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kiwi/little-spotted-kiwi/](http://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kiwi/little-spotted-kiwi/). Under creative commons license CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.

Department of Conservation (NZ). [www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kiwi/rowi/](http://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kiwi/rowi/). Under Creative Commons license CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.

BirdLife International (2021). Species factsheet: Okarito Kiwi Apteryx rowi. Downloaded from <https://datazone.birdlife.org/species/factsheet/okarito-kiwi-apteryx-rowi> on 13 October 2023.

BirdLife International (2017). Species factsheet: North Island Brown Kiwi Apteryx mantelli. Downloaded from <https://datazone.birdlife.org/species/factsheet/north-island-brown-kiwi-apteryx-mantelli> on 13 October 2023.

BirdLife International (2022). Species factsheet: Southern Brown Kiwi Apteryx australis. Downloaded from <https://datazone.birdlife.org/species/factsheet/southern-brown-kiwi-apteryx-australis> on 13 October 2023.

**Figure 3(d)** Grutness, 2012. *NZ-kiwimap 5 species*. [https://commons.wikimedia.org/wiki/File:NZ-kiwimap\\_5\\_species.png](https://commons.wikimedia.org/wiki/File:NZ-kiwimap_5_species.png). Public Domain. Source adapted.

**Figure 4** Nomura M, Ohlemüller R, Lee WG, Lloyd KM, Anderson BJ (2019) Can we predict which species win when new habitat becomes available? *PLoS ONE* 14(9): e0213634. <https://doi.org/10.1371/journal.pone.0213634>. © 2019 Nomura et al. Open access article licensed under CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted (redrawn and simplified).

**Figure 5(a)** © [www.freeworldmaps.net](http://www.freeworldmaps.net). <https://www.freeworldmaps.net/oceania/new-zealand/canterbury/canterbury-blank-map.jpg>. Source adapted.

**Figure 5(c)** simonbradfield, 2019. *High Above The Canterbury Plains, New Zealand*. [image online] Available at: <https://www.gettyimages.co.uk/detail/photo/high-above-the-canterbury-plains-new-zealand-royalty-free-image/1173803326?phrase=agriculture+canterbury+plains&adppopup=true> [Accessed 31 July 2024]. Source adapted.

CHellyar, 2009. *Harvesting wheat on Canterbury plains*. [image online] Available at: <https://www.gettyimages.co.uk/detail/photo/harvesting-wheat-on-the-canterbury-plains-royalty-free-image/152515327?phrase=canterbury+plains+combine+harvester&adppopup=true> [Accessed 31 July 2024]. Source adapted.

John\_Kasawa, 2014. *Sheep farmland in Canterbury region, New Zealand*. [online image] Available at: <https://www.gettyimages.co.uk/detail/photo/sheep-farmland-in-canterbury-region-new-zealand-royalty-free-image/498403435?phrase=agriculture%2Bcanterbury%2Bplains> [Accessed 31 July 2024]. Source adapted.

tsvibrav, 2015. *Grazing cows with Southern Alps in the background, New Zealand*. [image online] Available at: <https://www.gettyimages.co.uk/detail/photo/grazing-cows-with-southern-alps-in-the-background-royalty-free-image/535110033> [Accessed 31 July 2024]. Source adapted.

**Figure 5(d)(i)** This work is based on/includes Stats NZ's data, which are licensed by [Stats NZ](https://www.stats.govt.nz) ([www.stats.govt.nz](http://www.stats.govt.nz)) for reuse under the [Creative Commons Attribution 4.0 International licence](https://creativecommons.org/licenses/by/4.0/deed.en) (<https://creativecommons.org/licenses/by/4.0/deed.en>).

**Figure 5(d)(ii)** This work is based on/includes Stats NZ's data, which are licensed by [Stats NZ](https://www.stats.govt.nz) ([www.stats.govt.nz](http://www.stats.govt.nz)) for reuse under the [Creative Commons Attribution 4.0 International licence](https://creativecommons.org/licenses/by/4.0/deed.en) (<https://creativecommons.org/licenses/by/4.0/deed.en>).

**Figure 6** This work is based on/includes Stats NZ's data, which are licensed by [Stats NZ](https://www.stats.govt.nz) ([www.stats.govt.nz](http://www.stats.govt.nz)) for reuse under the [Creative Commons Attribution 4.0 International licence](https://creativecommons.org/licenses/by/4.0/deed.en) (<https://creativecommons.org/licenses/by/4.0/deed.en>).

**Figure 7(a)** New Zealand Ministry for the Environment. Crown copyright ©. <https://environment.govt.nz/assets/publications/climate-change/New-Zealands-Greenhouse-Gas-Inventory-1990-2021-Snapshot.pdf>. Licensed under CC BY 4.0 <https://creativecommons.org/licenses/by/4.0/>. Source adapted.

**Figure 7(c)** Transpower, 2020. *Whakamana I Te Mauri Hiko: Empowering our Energy Future*. [pdf] New Zealand: Transpower. Available at: <https://tpow-corp-production.s3.ap-southeast-2.amazonaws.com/public/publications/resources/TP%20Whakamana%20i%20Te%20Mauri%20Hiko.pdf?VersionId=FljQmfxCk6MZ9mlvpNws63xFEBXwhX7f> [Accessed 13 October 2023]. Source adapted.

Transpower, 2022. *Whakamana i Te Mauri Hiko – Empowering our Energy Future*. [online] Available at: <https://www.transpower.co.nz/about-us/our-strategy/whakamana-i-te-mauri-hiko-empowering-our-energy-future> [Accessed 13 October 2023]. Source adapted.

**Figure 8** Footprint Data Foundation, York University Ecological Footprint Initiative, and Global Footprint Network: *National Footprint and Biocapacity Accounts, 2023 Edition*. Downloaded 13 October 2023 from <https://data.footprintnetwork.org>. Licensed under CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0/>.