

# HUMAN ACTIVITIES

SBI4U Population Dynamics



#### **Many Beautiful Places on Earth to Travel!**







#### THINK-PAIR-SHARE



#### THINK INDEPENDENTLY

What is on your travel bucket list? If you could travel anywhere right now, where would you go? What would you do there?



#### **PAIR**

Discuss your bucket list destination with your partner!



#### **SHARE**

Discuss as a class where everyone wants to travel. Are any of these locations at risk of changing or being harmed in some way due to human activities?

## **Learning Goals:**

#### By the end of this lesson, you should be able to:

- Understand that human activities and travel impact ecosystems in a variety of ways, and provide examples of such activities
- Discuss how unsustainable human practices can have cascading effects on the organisms within different ecosystems
- Explain what ecological footprints are, and how one can reduce their ecological footprint through a variety of actions
- Understand ecotourism, and be able to apply sustainable practices to a trip of your own

#### INTRODUCTION

- There are a variety of different threats to the sustainability of natural aquatic and terrestrial ecosystems on Earth
- Many of these threats are caused by human activities
  - These human activities have resulted in climate change, pollution, and and habitat destruction, ultimately impacting many species



#### PLASTICS & POLLUTION

- Humans have produced huge amounts of waste over the last hundreds of years
  - Due to increasing human population size, and the invention of toxic and persistent chemicals which have been released into the environment



#### PLASTICS & POLLUTION

- Most plastics end up in landfills, where they will take hundreds or thousands of years to break down
- Can also enter waterways, eventually accumulating in the ocean
  - Marine animals often mistake this for food, which can result in the **injury or death** of the organism



## **DO YOU RECOGNIZE THIS?**







#### HABITAT FRACMENTATION

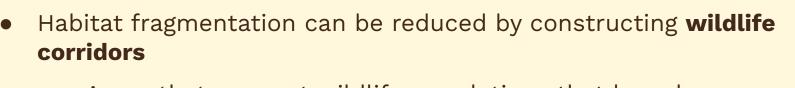
- Many natural habitats have been lost to urban sprawl and the construction of transportation routes, leading to habitat fragmentation
- Habitat fragmentation is the dividing up of a region into smaller pieces of land
  - This reduces habitat sustainability





#### HABITAT FRACMENTATION

- The sustainability of fragmented ecosystem depends on many key factors:
  - Fragment size
  - Number of fragments
  - Proximity of fragments to each other
  - Connectedness of fragments
  - Integrity of habitat
- When these factors are considered, it helps to protect and conserve areas that are vital for organism survival and reproduction



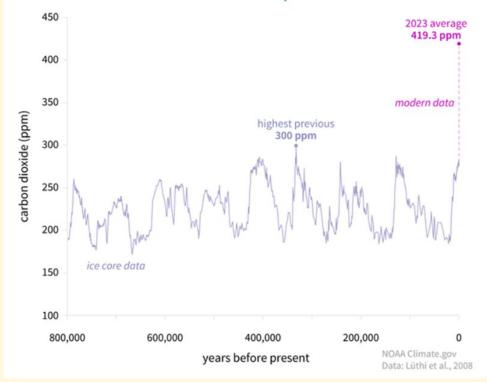
 Areas that connect wildlife populations that have been separated by human activities or structures





- Through the burning of fossil fuels, humans release stored carbon into the atmosphere
- Deforestation also increases the amount of carbon dioxide into the atmosphere
- The concentration of carbon dioxide in the atmosphere is higher than it has been in past 800,000 years

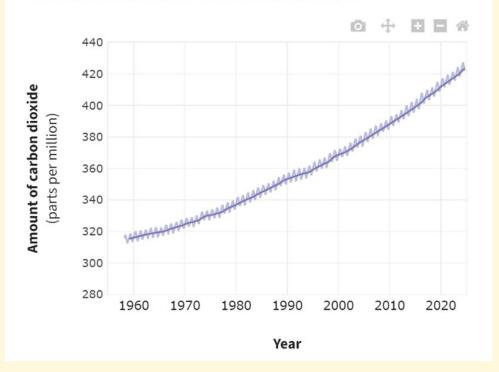






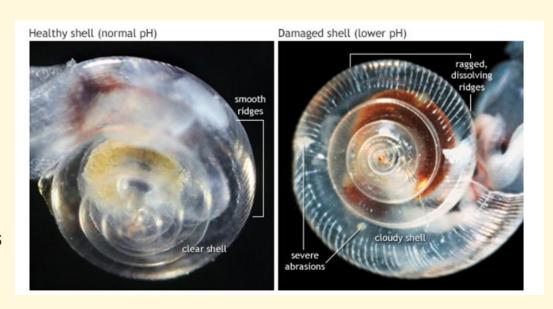
 This dramatic increase in atmospheric carbon dioxide is occurring because we are putting more carbon dioxide into the atmosphere than the carbon sinks can remove







- When carbon dioxide is dissolved in large amounts in the ocean, it raises the acidity of the ocean in a process called ocean acidification
- This can weaken the **shells** of the aquatic organisms





 A large-scale **reforestation** and a dramatic reduction in the use of fossil fuels are needed to **slow** the process of climate change





## **AGRICULTURAL PRACTICES**

- Humans often drain wetlands for urban expansion and agriculture
  - This results in a loss of wetland **habitats** and associated species
- Natural wetlands are flat and contain nutrient-rich soil with abundant water flow
  - These are ideal conditions for agriculture







- As such, large wetlands in populated parts of **Ontario** have been drained and converted to **farmland**
  - o i.e. Holland Marsh

#### **ECOLOGICAL FOOTPRINT**

- An ecological footprint is the total amount of land needed to support one person and it includes six major categories of demand:
  - Cropland
  - Grazing land
  - Fishing grounds
  - Forest land
  - Carbon absorption land
  - Building area

 Daily activities like food consumption, daily travel, and energy usage all impact your ecological footprint





## TRAVEL & TOURISM

- Tourism and travel for vacation also greatly contributes to one's ecological footprint
  - These actions can also disturb and disrupt natural environments and the organisms living within them

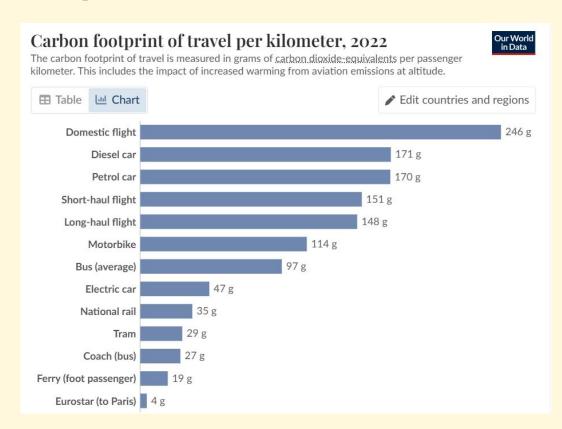




#### **TRANSPORTATION**

 Various forms of transportation for travel can contribute to one's carbon footprint

- Travel by walking,
  biking, or taking the
  train leads to the lowest
  carbon footprint
  - This also helps to lower air pollution





#### **TRANSPORTATION**

 If travelling internationally, train or boat produces less carbon than flying

Flying short
 distances produces
 higher carbon
 footprints than flying
 longer distances

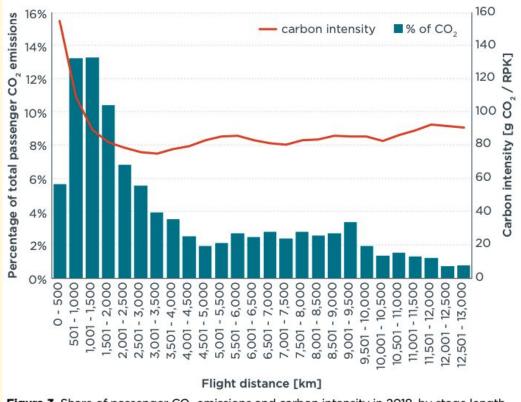


Figure 3. Share of passenger CO<sub>2</sub> emissions and carbon intensity in 2018, by stage length.



#### **TOURISM ACTIVITIES**

 While travelling, tourist can engage in many different activities which can leave an ecological impact on the environment

- Hiking can accidentally introduce non-native species into a new environment
  - For example, seeds from a plant can can stuck in the soles of hiking boots and get carried between new environments





## **TOURISM ACTIVITIES**

- Another common tourism activity is skiing at ski resorts
  - If the weather is not ideal, artificial snow is sometimes created to ensure that conditions are proper for skiing
- The production of artificial snow requires large amounts of energy (which is often fossil fuel-based) and water



It also can impact vegetation and soil composition





#### **IMPACT ON SPECIES**

- Increased numbers of tourists in an area can result in urban expansion and sprawl and can reduce or fragment the habitats of local species
  - Can lead to changes in community structure

 For example, the loggerhead shrike is a predatory bird that once had a range across much of southern Ontario





## **IMPACT ON SPECIES**

- It used to be a common bird, but increased human expansion into their habitats across Ontario and climate change has played a role in the decrease of the population to 12 breeding pairs in Ontario in 2015
  - Habitat conservation strategies are in place to help increase shrike numbers
- It is important for travellers to abide by these strategies, limit their carbon footprints and stay on paths to not destroy vegetation the loggerhead shrike depend on while travelling in their habitats





- Ecotourism is tourism that unites environmental conservation, local communities, and sustainable travel to allow for ecologically responsible tourism
  - This helps to minimize the ecological impacts of travel on environments, while supporting conservation efforts and allowing travellers to view the natural world

How can you travel responsibly?

