Preservation of the Natural Environment and Biodiversity

Target Audience: B2/C1 English Learners

Objectives:

1. To understand and define biodiversity and its global importance.
2. To identify key threats to biodiversity (habitat loss, pollution, invasive species, climate change).
3. To learn and apply complex B2+ vocabulary related to ecology and conservation.
4. To analyze cause-and-effect relationships regarding environmental degradation.
5. To practice descriptive language (speaking/writing) using detailed images.

Student Worksheet 1: Image Analysis and Initial Discussion

This worksheet focuses on observation and the activation of descriptive vocabulary. B2 students should be able to move beyond simple description ("I see a tree") to analysis ("This image represents the loss of critical habitats").

Activity 1: Describe, Analyze, Connect

Instructions: In pairs or small groups, look carefully at each of the four images. Discuss the questions that follow. You should use a range of descriptive adjectives and try to use B2-level terms where possible.

Image 1: Loss of a Critical Ecosystem

[Image showing a large, pristine wetland ecosystem with various wildlife (birds, amphibians, unique plants) compared to an adjacent image of that same wetland drained and converted into a parking lot with only a few struggling non-native plants remaining]

1. **Describe:** Compare the "before" and "after" scenes. What has been lost, visually? Describe the transformation of the landscape.
2. **Analyze:** What specific ecological functions did the wetland provide that the parking lot does not?
3. **Connect:** List three potential *impacts* this change might have on the biodiversity of that specific area.

Image 2: The Cascade Effect of an Invasive Species

[Image showing a native, balanced forest ecosystem with diverse insect species and birds, contrasted with an adjacent image of that same forest after being dominated by an invasive insect like the Asian Longhorned Beetle, showing many dying native trees and a notable decrease in native bird and insect populations]

1. **Describe:** What is happening in the second scene? Use words like *overrun*, *infested*, *dominated*, or *decimated*. How is the forest's health different?
2. **Analyze:** How does the arrival of just one species (the invasive beetle) negatively affect so many *other* parts of the food chain (trees, other insects, birds)?
3. **Connect:** What are common human activities that lead to the *introduction* of invasive species?

Image 3: The Threat to Wildlife and Global Warming

1. **Describe:** What does this image visually represent? How would you describe the *mood* or *tone* of this photograph?
2. **Analyze:** How does the melting of *this specific habitat* (sea ice) directly threaten the survival of the polar bear? Consider its hunting patterns.
3. **Connect:** Explain the cause-and-effect link between increasing global temperatures (climate change) and this scene.

Image 4: Human-Driven Habitat Contamination

1. **Describe:** Contrast the health, color, and diversity in these two images. What visual clues tell you the second image represents a dead ecosystem?
2. **Analyze:** We know oil and plastic are "pollution," but *how* specifically does each of these (oil vs. plastic) damage the coral reef habitat and the animals living there?
3. **Connect:** List four specific sources from which this pollution might originate (e.g., from where does plastic enter the ocean?).

Student Worksheet 2: Reading and Vocabulary (B2/C1)

Activity 2: Read and Find

Instructions: Read the text on biodiversity. Find words or phrases that mean the same as the definitions below.

The Complex Web: Understanding Biodiversity

Biodiversity, the intricate, living web of our planet, is not simply a list of species; it's a measurement of life's complex variety. It can be observed on three critical levels. **Genetic diversity** is the subtle variation within a single species (like different varieties of tomatoes), giving them the potential to adapt. **Species diversity** is the vast number and variety of different species across different taxonomic groups. Finally, **ecosystem diversity** is the entire range of complex, interconnected habitats, from vast rainforests to tiny tide pools.

This variety is paramount because biodiversity underpins **ecosystem services**. Healthy, diverse systems are naturally more **resilient**, meaning they can better bounce back from disturbances like droughts or floods. They clean our air, purify our water, and, critically, provide crucial global services like the **pollination** of essential crops. This complex, living network is not just important for its own sake; it is essential for the stabilization of the entire planet's systems, providing us with food, medicine, and a functional, breathable atmosphere. It acts as a massive global **carbon sink**, pulling CO_2 from the air, a key process in **climate mitigation**. To damage it is to unravel the very safety net we depend on.

Find the Word (Definitions):

1. The specific variety and differences *within* the genes of a single species: _____
2. The entire range of dynamic, physical habitats on Earth: _____

3. Fundamental benefits provided to humans by nature (cleaning air, pollinating crops): _____
4. The ability of an ecosystem to recover and "bounce back" after a major disturbance: _____
5. The vital process where animals (like bees) transfer pollen to fertilize plants/crops: _____
6. Actions taken to reduce or control the severity of climate change: _____
7. The total variety of *all* distinct species across a large area: _____
8. A natural or artificial reservoir (like a forest or ocean) that stores carbon, removing it from the atmosphere: _____

Activity 3: Advanced Vocabulary Exercises

Matching: The Five Great Threats

B2 students must connect vocabulary with concepts. Match the five main threats to biodiversity with their correct definitions and a typical source.

Threat to Biodiversity	Definition	Typical Human Source / Cause
1. Habitat Loss/Fragment.	**A.** Chemical, physical, or biological contamination of air/water.	**I.** Moving goods globally (shipping containers, firewood).
2. Invasive Species	**B.** Altering Earth's climate and severe weather patterns globally.	**II.** Expanding agriculture, deforestation, urban sprawl.
3. Overexploitation	**C.** Breaking large habitats into small, isolated "islands."	**III.** Burning fossil fuels (coal, gas, oil), industrial emissions.
4. Pollution	**D.** Unsustainable harvesting of resources at a rate they cannot recover.	**IV.** Unregulated commercial fishing (trawling), illegal wildlife trade.
5. Climate Change	**E.** Introduction of a non-native species that dominates and harms ecosystems.	**V.** Industrial waste (chemical/plastic), agricultural runoff, oil spills.

Gap-Fill: Cause and Effect (B2+)

Instructions: Complete the text using the words provided in the box. You may need to change the *form* of the word (e.g., *pollute \ pollution*).

Word Box: contaminate, resilience, mitigate, impact, severe, service, domino-effect, degrade, species

The widespread (1) _____ of our air, water, and soil is having a profound (2) _____ on global biodiversity. For instance, when chemicals from agriculture (3) _____ a river system, it doesn't just kill fish; it creates a dangerous (4) _____ that harms insects, birds, and even local human communities. The loss of critical insects like bees is a (5) _____ example, as it directly reduces the natural pollination (6) _____ upon which our food supply relies.

As we (7) _____ complex ecosystems like coral reefs, we diminish their natural (8) _____, making them far more vulnerable to (9) _____ environmental changes. This damage is not isolated; it is self-reinforcing, accelerating the very processes of destruction we must desperately work to (10) _____.

Activity 4: The images corresponding to the scenarios described in the lesson.

Image 1: Habitat Fragmentation & Deforestation

sanctuaries.noaa.gov

Image 2: Marine Pollution & Biodiversity Loss

cms.esghub.az

Image 3: Intensive Monoculture vs. Biodiversity

animalsurvival.org

Image 4: Renewable Energy & Land Use

sanctuaries.noaa.gov

Suggested Task for Students:

Ask your students to choose one image and answer the following three questions using at least **three** words from the glossary (e.g., *mitigation, resilience, habitat, degradation*):

1. **Objective Description:** What exactly is happening in this scene?
2. **Environmental Analysis:** What is the long-term threat to **biodiversity** shown here?
3. **Solutions:** What steps could be taken to **mitigate** this problem or protect the **ecosystem**?

Answer Key for Activity 1 (Image Discussion Hints for Teachers)

(These are not "correct" answers but rather a guide for what teachers should listen for or prompts to use.)

- **Image 1 (Wetlands /rightarrow/Parking Lot):**
  - **Lost:** Biodiversity of marsh plants, unique wildlife habitat, natural water filtration, flood sponge, open green space, scenic value.
  - **Analyze:** Wetlands filter pollutants, absorb massive floodwaters, act as fish nurseries, and have high CO_2 storage. Parking lots have zero filtration (they create runoff), intensify flood risk, reflect heat, and are biological deserts.
  - **Impacts:** Loss of local bird populations, collapse of aquatic food webs, localized flooding, increased water pollution in connected waterways.
- **Image 2 (Invasive Species):**
  - **Desc.:** Healthy forest \ dying forest; high diversity \ single insect dominant.
  - **Analyze:** The invasive beetle has no natural predators and outcompetes native insects. It eats/kills native trees that provided food/nesting for local birds and other insects. The entire food web structure collapses from the bottom up.
  - **Connect:** Humans introduce invasive species via: global shipping (beetles in pallets), aquarium releases, gardening with non-native plants, bringing firewood from other regions.
- **Image 3 (Polar Bear):**
  - **Desc.:** Vulnerable, isolated, desperate, precarious, tragic, a powerful symbol.
  - **Analyze:** Polar bears *must* hunt seals on the edge of the sea ice. Less ice means less hunting area, forcing them to swim too far (or starve), leading to drowning, poor cub survival, and population collapse.
  - **Cause:** Rising global temps \rightarrow atmospheric heat melts land-based glaciers and triggers rapid collapse of sea ice at the poles, reducing this critical, specialized habitat.
- **Image 4 (Polluted Reef):**
  - **Desc.:** Vibrant color \bleached/gray; clear water \ opaque/oily; complex structure \ rubble and trash.
  - **Analyze: Oil:** Smothers coral polyps, blocking light, oxygen, and directly poisoning them. **Plastic:** Nets physically break corals, swallow by marine life; floating debris can block light, carry toxic chemicals, and increase risk of disease in corals.
  - **Sources:** Ships (ballast/accidents), urban drainage, litter from beaches, rivers carrying plastic, inadequate waste management systems.

Answer Key for Activity 2: Read and Find

1. Genetic diversity
2. Ecosystem diversity
3. Ecosystem services
4. Resilient

5. Pollination
6. Climate mitigation
7. Species diversity
8. Carbon sink

Answer Key for Activity 3: Advanced Vocabulary

Matching: The Great Threats

1. Habitat Loss/Fragment. \ **C II**
2. Invasive Species \ **E** \ **I**
3. Overexploitation \ **D** **IV**
4. Pollution \ **A** $\rightarrow$**V**
5. Climate Change \ **B** \ **III**

Gap-Fill: Cause and Effect

1. pollution (contamination is also valid here)
2. impact
3. contaminate
4. domino-effect
5. severe
6. services
7. degrade
8. resilience
9. species (Wait, "species" should be replaced by "extreme," the answer is "extreme changes." *Ah, my mistake. Rereading my own prompt, I see 'species' was provided in the box as an option, which makes no sense here.* Corrected Gap-Fill options for that blank would include: severe, rapid, dramatic, extreme. The gap-fill *can* work as designed *without* that problematic word. Let's delete 'species' from that list or use a proper word like "extreme.")

Gap-Fill Answer Key, corrected with the word list: 1. pollution, 2. impact, 3. contaminate, 4. domino-effect, 5. severe, 6. services, 7. degrade, 8. resilience, 9. extreme (I will delete species from my original list and replace it with extreme), 10. mitigate.

Corrected Word Box: contaminate, resilience, mitigate, impact, severe, service, domino-effect, degrade, extreme.