Project 3, Milestone A Report

Wicked Problem: BIODIVERSITY

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Resource One: *Primary Drivers of Biodiversity Loss*
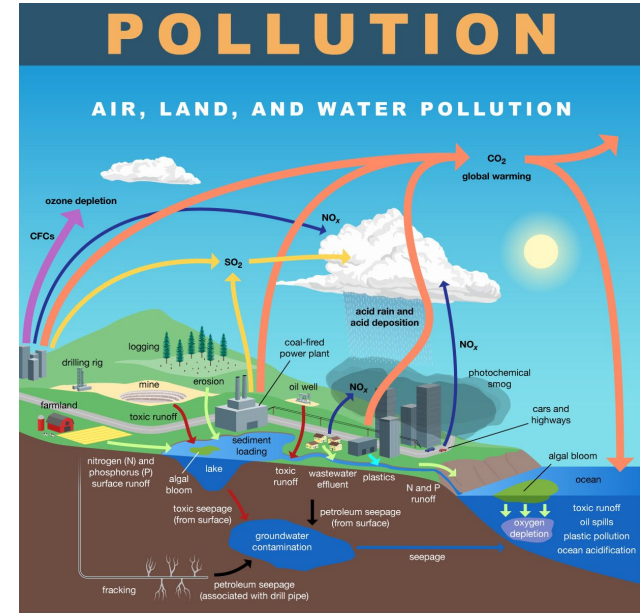
FACTORS THAT CONTRIBUTE TO BIODIVERSITY LOSS:
- HABITAT LOSS
- INVASIVE SPECIES
- OVEREXPLOITATION
- POLLUTION
- CLIMATE CHANGE AND GLOBAL WARMING

HOW THIS PERTAINS TO OUR GAME
- Why does this phenomenon occur?
- Understanding the problem's origins and causations

MAIN TAKEAWAY
- Variety of causes amounting to biodiversity loss
- How these causes intertwine

Resource Two: *Biodiversity and Health*

CONTENTS OF RESOURCE TWO

- Information about the connection between biodiversity and health
- Threats to biodiversity
- Diseases altering biodiversity
- Importance of biodiversity
- Biodiversity key facts

"Biodiversity supports human and societal needs, including food and nutrition security, energy, development of medicines and pharmaceuticals and freshwater, which together underpin good health" (WHO 2015).

HOW WE CAN USE THIS FOR OUR GAME

- May use the facts about what causes biodiversity loss in our game
- The possibility to create a game where the player needs to certain tasks to protect an ecosystem
- Possible to include references to possible health effects/nutritional concerns

MAIN TAKEAWAY

- The possible health effects
- The factors mentioned in the article that contribute to biodiversity loss

CONTENTS OF RESOURCE THREE

Species extinction (biodiversity loss) has accelerated

Other problems from biodiversity loss: economy, health, food security

Statistics: 20% decrease land-based, 40% amphibian, 33% corals, 33% marine mammals

5 primary sources: (1) changes in land and sea use; (2) direct exploitation of organisms; (3) climate change; (4) pollution and (5) invasive alien species.

GAME DESIGN USAGE

Conflict in shareholders

MAIN TAKEAWAY

While the situation seems grim, it is still not too late to slow (and ideally stop) biodiversity loss.

Resource Four: *Classification & Effects of Biodiversity loss*

TYPES OF BIODIVERSITY LOSS:

1. Natural: wildfire, floods, and volcanic eruptions.
2. Human Driven: Forest clearing, wetland filling, stream channeling and rerouting, and road and building construction.

EFFECTS OF BIODIVERSITY LOSS:

Animals: Unbalanced ecosystem because of lacking prey or predators in a food chain.

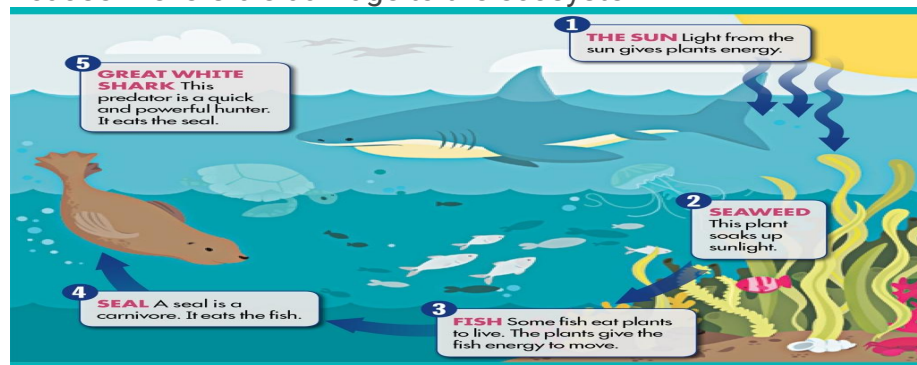Plants: Insufficient oxygen on earth.

Microorganisms:
"If all the viruses suddenly disappeared, the world would be good for about a day and a half, and then we would all die -- that's the bottom line," said Tony Go, an epidemiologist at the University of Wisconsin-Madison.

INFORMATION USEFUL TO GAME DESIGN:

1. It is important to know the damage towards biodiversity are due to human factors or natural factors.
2. To know the seriousness of biodiversity loss, we should know main elements included in environment and what will happen after losing them.

MAIN TAKEAWAY:

From this article, we can learn that the biodiversity loss can be caused by different factors. While human can change their business plans to protect environment, natural disaster are hard to prevent. It is also important to know the creatures contained in a environment, even losing only one of them may cause irreversible damage to the ecosystem.

1 THE SUN Light from the sun gives plants energy.

5 GREAT WHITE SHARK This predator is a quick and powerful hunter. It eats the seal.

2 SEAWEED This plant soaks up sunlight.

4 SEAL A seal is a carnivore. It eats the fish.

3 FISH Some fish eat plants to live. The plants give the fish energy to move.

Statement and Comparison

Problem Statement:

Much of the biodiversity loss in the ocean is due to human activities damaging the environment. To repair the damage and ensure that less harm will be dealt in the future, people must learn about how their actions negatively affect the ocean's ecosystem long-term. Throughout our game, players would be able to understand overfishing impacts and importance of sustainability, both in fishing and their lives, by taking the role of a fishing company.

Comparison to Resources:

Our resources address the causes and effects of biodiversity loss, and point out the fact that a lot of it is caused by humans. They also support the notion that in order to undo what has been done to the environment, more specifically, the ocean, it will take a change in the human mindset to undo decades of toxic activity, as well as to prevent the same thing from happening in the future.
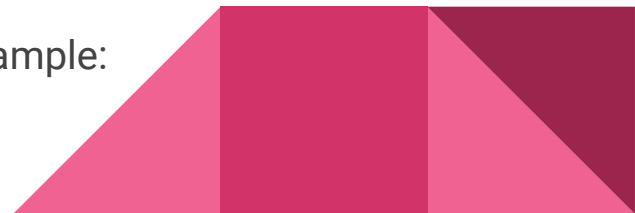
Ideas for Possible Notions of State and Operators

Possible notions of state:
- Objective: The player roleplays as a fishing company, with the goal of making the most profit in a year but being sustainable at the same time because change in ocean biodiversity could cause consequences to humans.

- Basic mechanics: Each round (month), action choices, like which fish species and the amount being caught, are given to the player → These choices affect the fish populations differently (feedback) → Potential consequences on sustainability of industry → Company profit and biodiversity will both be calculated throughout 12 rounds (a year)

- Potential additions: different fishing methods with varied pros and cons, pollution, cost, events

Possible operators:
- Choice of catching what and how many fish with a limit, for example:
  - 50 tuna, 10 seatrout, 30 black cod, 0 pompano;
  - 20 tuna, 20 seatrout, 25 black cod, 25 pompano

Additional Resources?

ADDITIONAL RESOURCE ONE:

Title: 7 Solutions to Biodiversity Loss
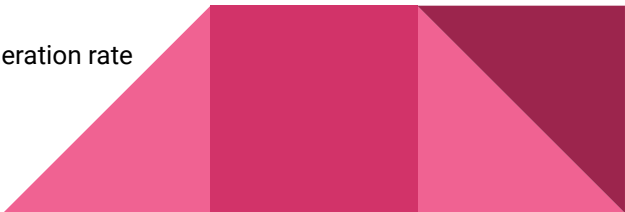
Authors and Date: Jangira Lewis, 31 March 2022

URL: https://earth.org/solutions-to-biodiversity-loss/

ADDITIONAL RESOURCE TWO:

Title:The Harmful Effects of Dynamite Fishing on Coral Reefs

Authors and Date: ReefCause Team, April 11, 2021

URL: https://conservation.reefcause.com/the-harmful-effects-of-dynamite-fishing-on-coral-reefs/

Other Types of Additional Resources Needed:

- How the fishing industry impacts the biodiversity of ocean ecosystems

- The details of a few species of commonly-caught fish, like their abundance, trophic level, & regeneration rate

List of Resources Used

RESOURCE ONE:
Analyzed by Ren
Title: Primary Drivers of Biodiversity Loss
Authors: Britannica Editors
URL: https://www.britannica.com/study/learn-about-the-causes-of-biodiversity-loss

RESOURCE TWO:
Analyzed by Dawson
Title: Primary Drivers of Biodiversity Loss
Authors and Date: WHO Editors, 03 June 2015
URL:
https://www.who.int/news-room/fact-sheets/detail/biodiversity-and-health#:~:text=Land%20use%20change%2C%20pollution%2C%20poor,considerable%20threats%20to%20human%20health\

RESOURCE THREE:
Analyzed by Will
Title: UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'
Authors and Date: IPBES Editors, 06 May 2019
URL: https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

RESOURCE FOUR:
Analyzed by Mason
Title: Biodiversity Loss
Authors and Date: John P. Rafferty, 14 June 2019
URL: https://www.britannica.com/science/biodiversity-loss