**Foodprint**

**Understanding Connections Between Food Choices and Our Environment**

**Prof. Jennifer Jay**

**Session 6: Biodiversity Loss**

**Class Plan**

**Introductions** **(10 min)**

Introduce yourself.

**Section 1. Learning Objectives**

By the end of this chapter, you will be able to:

* Describe the two types of Biological Integrity in the planetary boundaries concept and the control variable for each.
* Identify the current status of the Biological Integrity boundary variables.
* List the main drivers of biodiversity loss.
* Discuss the role of livestock in three of these drivers: habitat loss, climate change, and invasive species.

**Section 2. Slides**

Slides 2 and 3.

You can show the earlier PB diagram and emphasize that Biodiversity Loss was one of the three original PBs exceeding the limit.

The Planetary Boundary diagram for 2015 has changed from 2009, breaking Biodiversity loss into two categories, each with its own control variable and boundary. For genetic diversity, the control variable is the extinction rate. The boundary is set at <10 extinctions per million species per year (E/MSY), with the zone of uncertainty of 10-100 E/MSY. The background rate is approximately 1 E/MSY. We are currently greatly exceeding both this background rate and the planetary boundary with our current rate of 100-1000 E/MSY.

For functional diversity, the Biodiversity Intactness Index (BII) is the control variable. The planetary boundary recommends maintaining the BII at 90% or above, with the zone of uncertainty from 90-30% or above, assessed by biomes or large functional groups. Our current level of BII is 84%, calculated for southern Africa only.

Slide 4. This is just an example showing the high extinction predictions with climate warming. Many sources show similarly dramatic numbers.

Slides 5-8. Major biodiversity loss drivers. You can brainstorm on these before showing them to see what the class comes up with.

Livestock is related to all five of these.

Slide 9. Focus on first factor, and discuss livestock’s role in habitat change. There is a lot of overlap with last week (Land Use change).

Slides 10-13. Review relevant slides from last week.

Slides 14. Machovina slides. Top two panels are for China. Bottom panel shows map and bar charts showing the increased land that will be needed for agriculture if current trends continue.

Slides 15-17. Discuss land grabbing. This is a large issue around the globe. Certain countries (not just China, although that was the case study in Machovina) are buying up land in developing countries, and in many cases it is a lot of land. The poorer countries need the money in the short term, but in the long term it leaves them with less land in their control.

Slide 18. Now we will focus on livestock’s role in the other major factor in biodiversity loss.

Slide 19. Review of different foods carbon footprints per gram of protein.

Slide 20. Shows extensive, or pasture, raising of cows is not more sustainable with respect to climate. When cows are eating grass, their natural diet, the bacteria in the rumen naturally make methane.

**Section 3. Think Pair Share**

**Slide 22. Introduce THINK PAIR SHARE ACTIVITY**

Students should already have read this paper, but it’s so full of compelling facts, it’s not totally necessary—they can still participate by just reading it in the moment and picking out facts that seem important to them.

**The idea is to think pair share about the most compelling/urgent/important/interesting points in Machovina.**

They can say these out loud and you can write a shortened version on the board.

Slides 23-27. These are some high lights that I pulled out. You may not need to use these.

**Slide 28. Introduce INFOGRAPHIC ACTIVITY.**

Students can work in small groups to make an infographic that will help disseminate information that they found to be important. They can do further research on any point, and come up with a creative way to present the information. There is a Powerpoint with some infographics that they can use as a starting point if they want. May need to upload it as a Google Slides document in case they don’t have Powerpoint.

Small groups can use any point that was brought up in the think pair share as a starting point.