The Drivers of Extinction

Discussion Questions:

- For a specific ecosystem or animal (e.g. African elephant), brainstorm examples of threats that would fall under each of these drivers.
- How might the indirect drivers listed here impact the direct drivers?
- Can you see any feedback loops between the indirect and direct drivers?
- Do you foresee any indirect drivers changing in the future? If yes, what impacts might that have?

Direct Drivers

(as defined by WWF Living Planet Report 2018 pg. 74)

Habitat Loss and Degradation	This refers to the modification of the environment where a species lives, by complete removal, fragmentation or reduction in quality of key habitat. Common causes are unsustainable agriculture, logging, transportation, residential or commercial development, energy production and mining. For freshwater habitats, fragmentation of rivers and streams and abstraction of water are common threats.
Overexploitation	There are both direct and indirect forms of overexploitation. Direct overexploitation refers to unsustainable hunting and poaching or harvesting, whether for subsistence or for trade. Indirect overexploitation occurs when non-target species are killed unintentionally, for example as bycatch in fisheries.
Pollution	Pollution can directly affect a species by making the environment unsuitable for its survival (this is what happens, for example, in the case of an oil spill). It can also affect a species indirectly, by affecting food availability or reproductive performance, thus reducing population numbers over time.
Invasive Species	Invasive species can compete with native species for space, food and other resources, can turn out to be a predator for native species, or spread diseases that were not previously present in the environment. Humans also transport new diseases from one area of the globe to another.
Climate Change	As temperatures change, some species will need to adapt by shifting their range to track suitable climate. The effects of climate change on species are often indirect. Changes in temperature can confound the signals that trigger seasonal events such as migration and reproduction, causing these events to happen at the wrong time (for example misaligning reproduction and the period of greater food availability in a specific habitat).

Indirect Drivers

(As defined by IBPES Global Assessment and WWF's Living Planet Report)

Value Systems	"Values differ across people, and evolve over time, informed by cultures and experiences. Values toward nature may be grounded in ethical principles, and relationships, or predominantly utilitarian, focused on immediate preferences or leaning toward consideration of the future." IPBES pg 7
Knowledge Systems	"Indigenous and local knowledge generated within IPLCs [(Indigenous People and Local Communities)] increasingly is seen as relevant for sustainable production. It offers broadly applicable alternatives to centralized and technically oriented solutions..." IPBES pg 8
Education	"Education causes and is caused by economic growth – which in turn degrades, lowering human capital – yet education also can influence the rates of degradation." IPBES pg 8
Demographics: Migration and Urbanization	"Migration is both a cause and an effect of nature's degradation. Links in both directions are connected to patterns of vulnerability, in rural as well as urban areas. Urbanization has been rapid, with enormous consequences including spatial patterns of land use that affect nature and NCP [nature's contribution to people] provision in urban and rural areas." IPBES pg 8
Technology	The arc of technological progress underlies many of the direct drivers of environmental crises. For instance advances in agricultural technologies shift food systems to monocultures thus lowering food security for communities formerly reliant on subsistence agriculture, leading, in time, to migration and/or urbanization. See IPBES pg 9
Economy	Funding for some of the world's most extractive entities and industries is concentrated in the hands of a few, while consumption is concentrated in the high/middle income countries. Both realities impact degradation in low-income countries as well as highlight market failures due to failed realization of environmental degradation from extractive activity. See IPBES pg 10-11
Governance	Governance supplies the parameters for all activity (e.g., civil, business, ect) and although trends towards decentralization continue to gain prominence, positive impacts remain rare this far.
Conflict	"Biodiversity has significant economic value, which should be recognised in national accounting systems; it is a security issue insofar as the loss of natural resources, especially in poor developing countries, can lead to conflict..." WWF pg 13