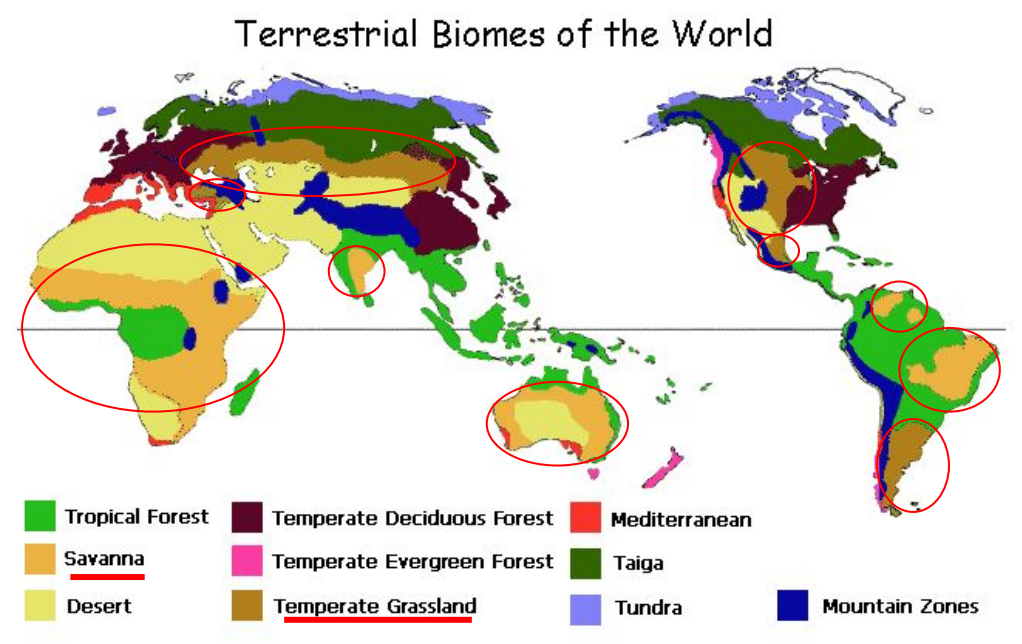
Grasslands

By: Tyler Wetzel, Evan Jenkins, Regina Pan, Emily Buhl

What is A Grassland Biome ?

- Grassland biomes are areas that are continuously dominated and covered by various grass species.
- There are several different types of grassland (Tropical , subtropical, Temperate, Flooded, Mountain grasslands)
- Examples of temperate grasslands include Eurasian steppes, North American prairies, and Argentine pampas.
- Tropical grasslands include the hot savannas of sub-Saharan Africa and northern Australia.
- Subtropical grasslands include southern Mexico, southeastern Africa, the Lesser Sundas, central India,
- Flooded grasslands include flooded savannas, Angola , Tanzania, and Mozambique
- Mountain grasslands are in montane landscapes typically above 6,500 to 7000 feet in elevation and alpine areas above timberline.

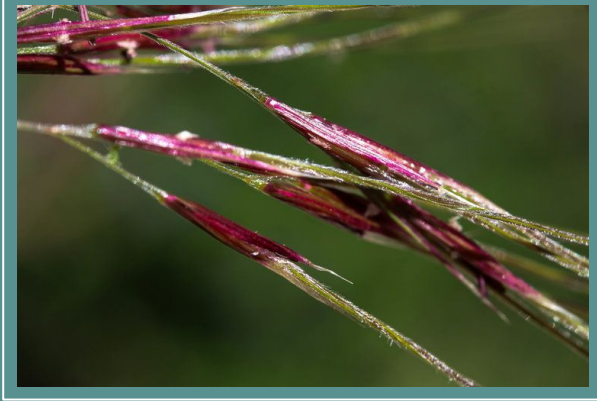
Abiotic Features Of Grassland



- The abiotic components of a grassland ecosystem are the nonliving features of the ecosystem that living organisms depend on.
- 4 Major abiotic features of grassland biomes are Temperature, Precipitation, humidity, Topography.
- Other small abiotics factors are sun, rocks & soil, water from streams
- Tropical Grasslands
  - 20-50 inches of rain, 6-8 month rainy months followed by drought, porous soil, seasonal fires, height of dry season is around January, heavy thunderstorms around March and again in October, warm or hot climate.
  - Includes the Savanna in central Africa, parts of Australia, India, and South America.
- Temperate Grasslands
  - Hot summers, cold winters, moderate rainfall, seasonal droughts and fires have a lesser effect, soil is dark and nutrient rich, summer temperatures can exceed 100 F, winter temperatures can drop to -40 F, rainy period is late spring to early summer, 20-35 inches of rain.
  - Includes the veldts of South Africa, the putsa of Hungary, pampas of Argentina, the steppes of central Asia, and the prairies of North America

Plants, invertebrates, Vertebrates in Grassland

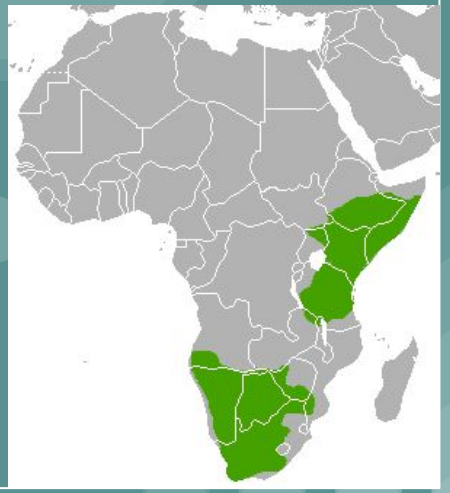
- Purple needlegrass are plants grown in grasslands, in areas receiving between 8 and 40 inches (20 to 100 cm) of annual precipitation.
- **Scientific name : Nassella pulchra**
- **Phylum : Vascular plants**
- **Adaptation : It is well adapted to droughty soils, clays and serpentine soils. This is due to its extensive root system that can reach 20 feet in the ground. It grows well in full sun as well as partial shade and is tolerant of extreme summer heat and drought.**



Plants, invertebrates, Vertebrates in Grassland

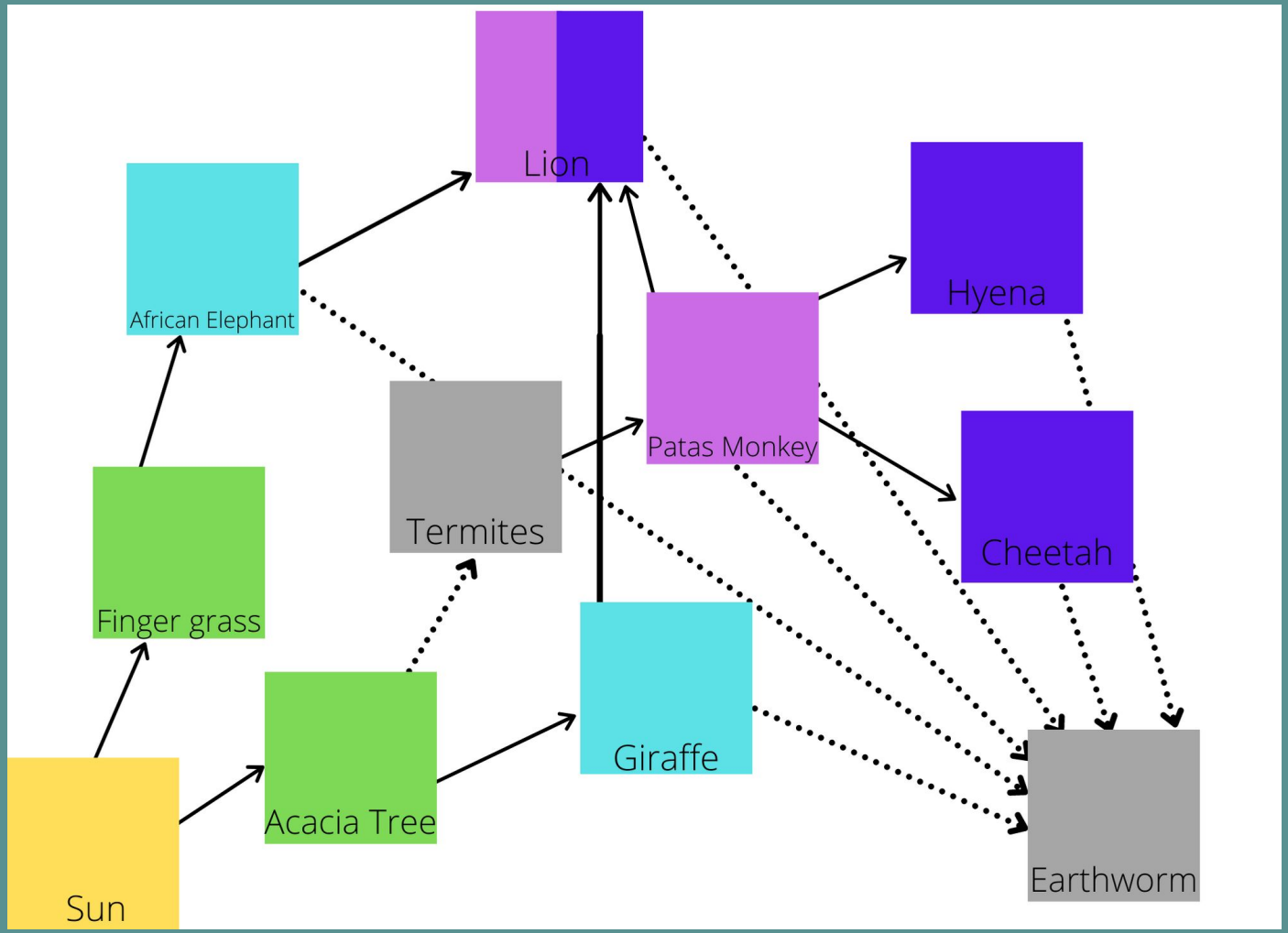
- **Common name : Mozambique Harvester Termite**
- **Scientific name : *Hodotermes mossambicus***
- **Phylum : Arthropoda**
- **Adaptation : The diet of the Mozambique Harvester Termite consists primarily of ripe and/or drought-killed grass while tree and shrub material is consumed to a lesser degree. The grass component of their diet was found to constitute upwards of 94% of their food intake. This is unusual compared to most termites because most species of termite the wood component of their diets is much larger. This is an important adaptation because in the savannas and grasslands where this termite lives there is a much higher concentration of grass than trees and shrubs.**

Core Range of Hodotermes mossambicus



Plants, invertebrates, Vertebrates in Grassland

- **Common name : Cheetah**
- **Scientific name : *Acinonyx jubatus***
- **Phylum : Chordata**
- **Adaptation : Cheetahs possess an enlarged heart, oversized liver, adrenals, bronchi, and lungs, and large arteries. These are necessary adaptations for an animal that relies on explosive bursts of speed to capture its prey. This rapid acceleration necessitates a cheetah to have high oxygen intake adaptations including enlarged nostrils and extensive, air filled sinuses. Cheetahs are able to reach speeds of up to 70 miles per hour and are capable of accelerating from 0 to 50 miles per hour after just 3 strides.**



Key

- Sun
- Decomposers
- Primary Producers
- Primary Consumer
- Secondary Consumer
- Tertiary Consumer

Global Warming Cause & Effect on Grassland

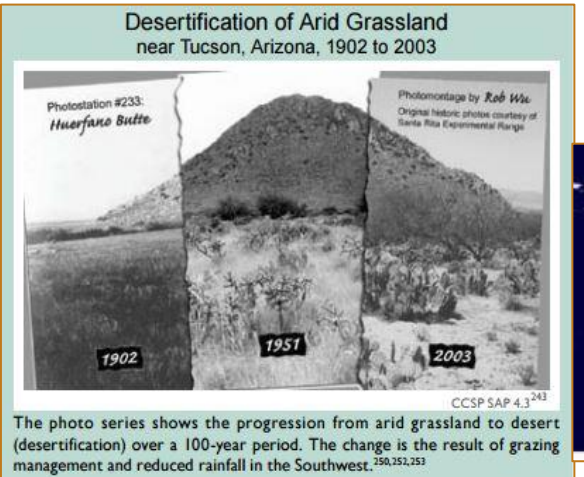
Brenda Wiens Bio 102, Wiens

Introduction:

The grassland ecosystems we see today have an extensive history of human activity including burning, hunting, crop production, livestock grazing, and urban development. As the Earth's climate changes in response to human involvement, the grasslands become vulnerable. Climate change causes ecological succession such as drought. Change impacts to grasslands and prairie bioregions. Because these ecosystems are relatively dry with a strong seasonal climate, they are sensitive to climatic changes and vulnerable to shifts in climatic regime. Dryer and hotter conditions may also lead to the discovery of new species and Wildfire. In order to prevent long-term effects of climate change on grassland biomes we must act quickly to prevent the rapidly increasing surface temperature of the earth caused by global warming.

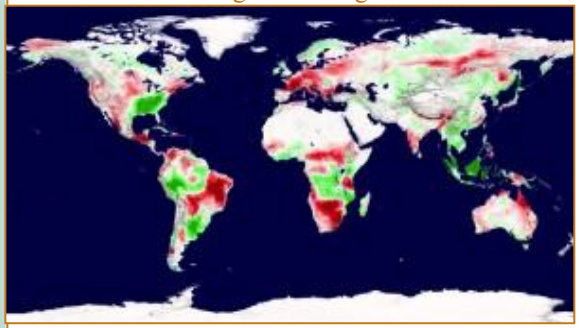
Results:

1. progression from grassland to desertification over a 100-year period, a shift that can be attributed to grazing management as well as reduced rainfall in the Southwest.

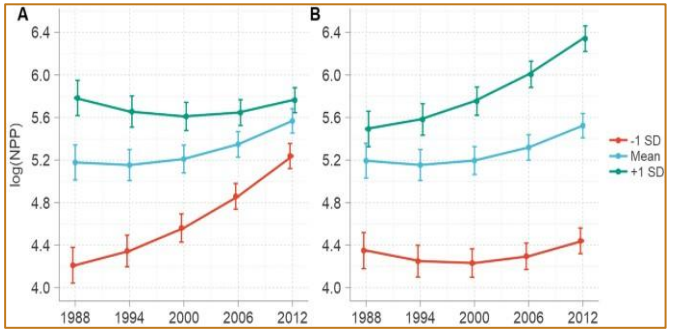


The photo series shows the progression from arid grassland to desert (desertification) over a 100-year period. The change is the result of grazing management and reduced rainfall in the Southwest.[250,252,253]

2. Earth's plant productivity in 2003 shows regions of increased productivity (green) and decreased productivity (red). Tracking productivity between 2000 and 2009. researchers found a global net decrease due to regional drought.



3.Grassland Ecosystem responses to climate change. Interactions between time and climatic factors predicting grassland NPP



Conclusion:

Slight changes in temperature and precipitation can substantially alter the composition, distribution, and abundance of species in arid lands, and the products and services they provide. vegetation shifts in grassland communities and phenological shifts will impact ecosystems and species, and changes in species composition and plant productivity may also impact the human communities that rely on agricultural production in these regions

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Poaching and the Grasslands

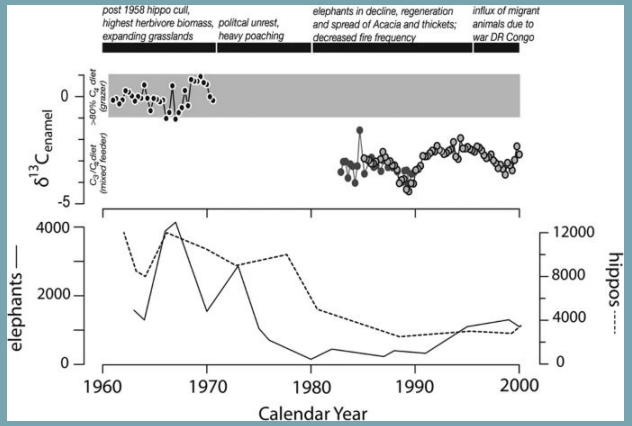
Evan Jenkins Professor Wiens Bio Lab 102

Thesis: The illegal harvesting of animals, otherwise known as poaching, has altered wildlife populations and the ecosystems of the grassland biomes.

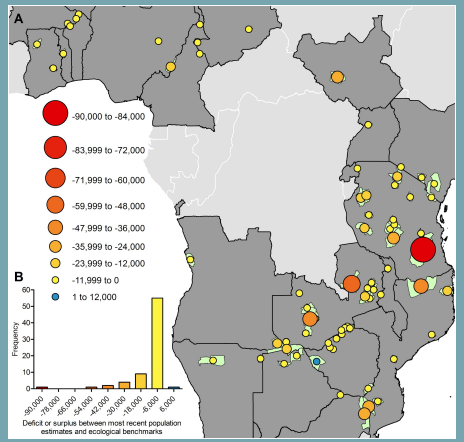
Introduction: Poaching is much more than just an issue of declining populations. Megaherbivores are vital to shaping their environment. Megaherbivores prevent the takeover of trees, so they are vital to keeping the grasslands as they are. Animal diets are having to adjust to these changes. Smaller animals also rely on the terraforming of these large animals. (Critz, 2016).

Conclusion: Populations of megaherbivores are declining from poaching and this allows the environment to change as these large species act as ecosystem engineers to keep larger plants out of grasslands. The life of the grasslands has to adapt to the wide reaching effects of this.

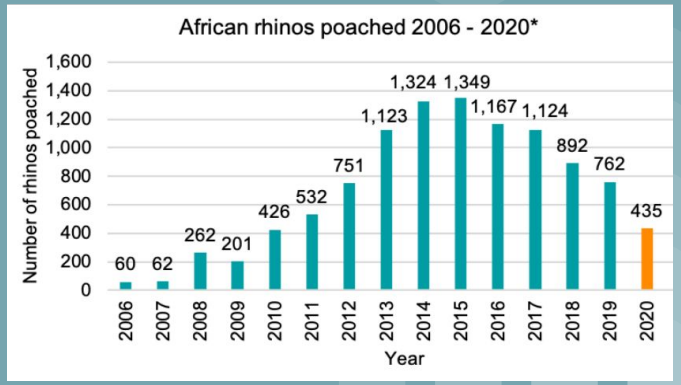
1: The top part of the graph shows the switch between grass based grazing diet and a mixed diet. The shift coincides with the massive drop of megaherbivore populations shown at the bottom.



2: This graphs shows the how far below elephant populations are behind projected estimates. Red orange, and yellow means they are below estimates. The one blue dot is ahead of estimates (Robson, 2017).



3: The number of African rhinos poached between 2006-2020, though not all in the grasslands biome. The totals were over 9000 recorded poached rhinos (Save the Rhino).



Habitat Loss in the Grasslands

By: Tyler Wetzel

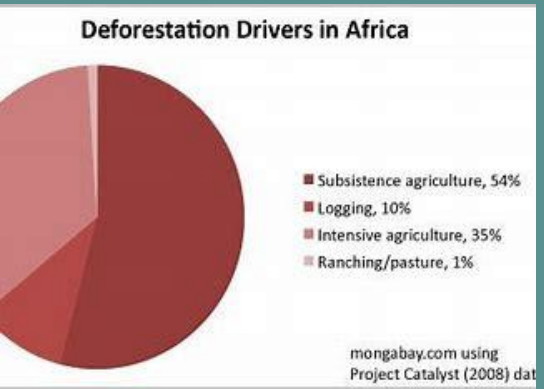
Professor Brenda Wiens, Bio Lab 102

Thesis: Unsustainable farming practices and urbanization threaten the grasslands and all the animals in it.

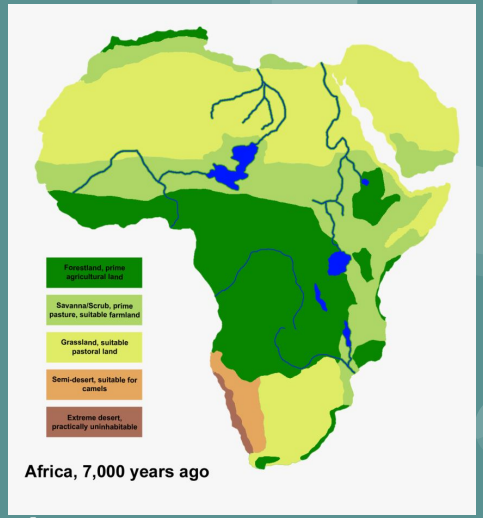
Introduction: Humans have been farming and urbanizing areas for thousands of years as it is in our nature. But these methods are devastating to the environments

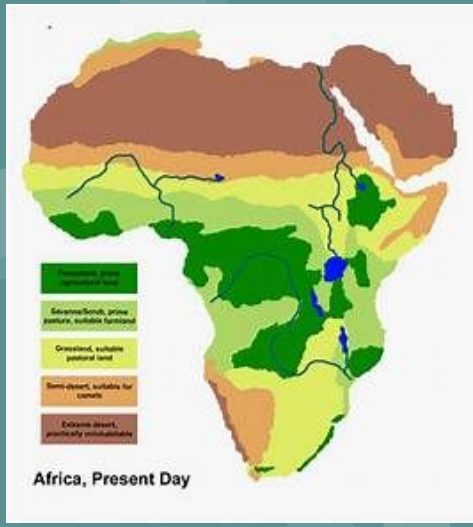
Results:

1. Monocropping(only farming one species of crop at a time) and Improper rotation of crops deplete the soil of essential nutrients. Grasslands flourish on the biodiversity of plants and animals. Over time, if a plant species is not changed, then that species will pull all or most of a particular nutrient from the soil, which can severely harm the soil and make that land infertile for years to come.



2. Grazing certain livestock can lead to selective grazing, which is when an animal eats a particular species of plant but not another. The plant species consumed by the animal will decrease while the plant species that remain intact will thrive and overpopulate. As mentioned before, grasslands do best with biodiversity, and a single plant growing in a given area can deplete the soil of vital resources.





3. Urbanization is probably the most apparent cause of habitat loss that you can think of. This is caused by the growing population of humans needing more space to live. Humans clear-cut areas to make room for towns and cities.

Conclusion: The results directly support the thesis that habitat loss is most notably caused by urbanization and agriculture purposes.