BIODIVERSITY LOSS

DEFINITIONS & FACTS

DEFINITION

- Biodiversity
  - genetic diversity within population
  - diversity in a community
  - variation of biological diversity
  - monitoring
    - IUCN
    - dodosgone.blogspot.com
  - Hardy-Weinberg
- Biotic indicies
  - within community
  - biome
  - ecosystem
  - redlist extinctions

FACT

- SIXTH MAJOR EXTINCTION
  - first anthropogenic caused
  - non linearand irreversible consequences
  - ecosystems locked into undesired states
  - rate extinction exceeds rate of speciation
  - 25% species threatened with extinction
- RESILIANCE BY BIOPHYSICAL SUBSYSTEMS
  - to disturbances
    - pests
    - disease
    - natural disaster
- ECOSYSTEM SERVICES
  - CULTURAL
    - Health
      - mental
        - sense of home
        - heritage
        - ethics
        - recreation
      - physical
        - respiration
        - biomimicry
        - art
        - design
        - techology
  - REGULATING
    - soil formation
      - cycles
        - Nitrogen
        - phosphate
        - carbon
        - water
      - microbes
        - decomposition of biomatter
        - filtration biomatter
        - nitrogen fixation
          - access to proteins
    - climate control
      - atmospheric gases
        - plants are CO2 sinks
        - plants contribute to water cycle
        - CO2 absorption
        - transpiration
        - O2 production
        - photosynthesis
      - flood mediation
        - plants stabilise soil
        - slow water flow on ground
        - prevent white water flow in streams
      - genetic diversity of plants
        - pest resistance
        - desease resistance
        - heat tolerance
        - larger/higher yields
      - interdependence
        - pollination
        - food webs
        - symbiosis
        - competition
        - resilience
        - predator prey
  - PROVISIONING
    - medicines
      - aspirin
      - quinine
      - penicillin
      - pyrethroi
    - food
    - fuel
    - timber
    - minerals
    - water

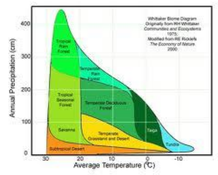
CAUSES

- RAPID POPULATION INCREASE
- DEFORESTATION
  - climate change
    - decreased CO2 uptak
    - fewer trees
  - climate change
    - Combustion
  - LAND CLEARANCE
  - habitat loss
  - habitat fragmentation
  - MATERIALS FOR HOUSES
  - habitat loss
  - habitat fragmentation
  - LAND FOR HOUSES
- SHELTER
  - URBANISATION
    - habitat loss
    - habitat fragmentation
    - pollution
    - ozone
    - climate change
    - oceanic acidification NOx SOx
    - WASTE
      - aerosol use
      - CFCs
      - refrigeration
      - greenhouse gas
      - methane production
      - CO2
      - ozone
    - TRANSPORT
      - combustion fossil fuel
      - invasive species
    - FOOD
      - LIVESTOCK
      - ARABLE
      - AGRICULTURE
      - FISHERIES
        - Over fishing
        - lower genetic diversity
        - food webs changes
      - fertilisers
        - Haber-Bosch process N fixation
        - N P K biogeochemical loading
        - oceanic acidification
        - land use changes
    - WATER
      - CONSUMPTION
        - reservoirs
        - habitat loss
        - diversion of watercourse
        - pollution
      - WASTE DISPOSAL
        - habitat loss
        - overuse
        - habitat fragmentation
    - RECREATION
      - TOURISM
    - ENERGY
      - combustion
      - NOx SO
      - acid rain
      - Waste
      - pollution
    - MANUFACTURE
      - land use changes
        - rainforest to palm oil plantation
      - HEALTH
        - Waste
        - pollution
        - habitat loss
        - Mining for materials
        - Global
          - invasive species
          - competition for resources
        - Waste

SOLUTIONS

- pollution
  - oceanic
  - freshwater
  - terrestrial
  - atmospheric
  - foodwebs affected
  - toxicity of food
  - bioaccumulation
    - tertiary consumers
    - quaternary consumers
      - humans
- ozone
  - UV damage to DNA
    - speciation
    - cancer
    - extinction
    - mutation
  - ozone
    - bicarbonate ions
    - carbonic acid
    - hydronium ions (H+)
    - uptake of CO2

FACT

- CLIMATE CHANGE
  - BIOMASS
    - temperature
      - heat intolerance
      - plant stress
      - intolerance to pests
      - intolerance to disease
      - drought intolerance
      - precipitation
      - photosynthetic rates
    - EXTREME WEATHER
      - hurricanes
      - tornadoes
      - physical damage
      - desertification
      - wind
      - temperature
      - precipitation
      - fires
      - drought
      - flooding
  - changes species present in biome
    - pest species
    - monoculture
    - lower genetic diversity
  - 
- LAND SYSTEM CHANGE
  - habitat fragmentation
  - habitat loss
    - lowers genetic diversity
    - terrestrial
      - climate change
      - Biogeochemical loading
        - erosion of soil
        - use of fertilisers
        - photosynthesis
        - interdependence
        - productivity
      - rainforest
        - high diversity
      - salt marshes
      - reed beds
        - water purification
        - diverse habitat
        - source of beneficial micro
    - freshwater use
      - diversion of river courses
        - dam building
        - loss of habitat
        - flooding land
        - migrating species
        - global food webs
        - fish and water birds
        - local food we
        - food shortage for humans
        - conflict
      - case study
        - China's control of tibettan plateau
        - http://tibet.org
        - exploitation
        - conflict
- INTRODUCED SPECIES
  - water cycle interferance
  - ECOSYSTEM SERVICES
    - groundwater prodution lowered
    - biomatter buid up
  - carbon sinks lowered
  - humans
    - health
      - psychological
        - ethics
        - morality
        - cultural
          - well being
          - sense of place
          - heritage
          - recreation and tourism
          - peace and tranquility
      - physical
        - illness
        - pests causing disease
    - food
      - lower quality food
      - over-fishing
      - low genetic diversity in fish stock
        - food web destruction
        - community collapse
        - population collapse
      - lower yield
        - more pollution
        - more land use
        - conflict over land rights
    - manufacture
      - competition
      - less materials
      - minerals
        - timber
        - medicines
        - water availability
        - Conflict over resources
      - more fertiliser
      - change to biota
      - occupy niche
      - economic cost
        - threat to ecosystem
        - pest species
        - disease
  - extinction of native species
- oceanic acidification
  - coral bleeching
  - decalcification of species
  - depressing immunity of species
  - affects enzymes
  - lowering productivity of oceans
  - food chain affected
  - conflict over resources