



# Sustainability & Conservation

- Explain how an ecosystem can be managed in a sustainable way.
- Distinguish between conservation & preservation.
- Discuss how conservation is a dynamic process.
- Discuss the economic, ethical & social reasons for conservation.
- Outline the effects of human activities on populations in the Galapagos Islands.



# Sustainable Management of an Ecosystem

- Using the resources in a sustainable way.
- Recently, humans have intensively exploited our environment for resources.
  - This destroys ecosystems.
  - It reduces biodiversity.
  - Uses up the resources we originally wanted.

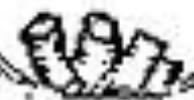


# Managing small-scale timber production

- **Coppicing**
  - Cutting the trunk of a deciduous tree close to the ground.
  - Several new shoots grow from the cut surface.
  - These grow into thin woody stems.
  - These can be harvested for fences/firewood/etc.
  - The cycle continues.



Tree to be coppiced



Cut close to base in winter



Shoots rapidly regrow from stool the following spring



Coppice ready for harvest between 7-20 years



# Managing small-scale timber production

- **Pollarding**
  - Like coppicing but trunks are cut higher up.
    - Useful when large herbivores (eg. Deer) are around.
    - Stops them eating the new shoots as they can't reach.



# Managing small-scale timber production

- **Rotational coppicing**
  - Divide the woodland into sections.
  - Cut one section each year.
  - Continue until all have been cut.
  - The first will be ready to cut again.
  
  - Some trees are left as **standards**.
    - Allowed to grow & eventually harvested to produce large pieces of timber.



# Managing small-scale timber production

- Coppicing advantages:
  - Supply of carbon neutral fuel.
  - Supply of wood for manufacturing.
  - Increased light to woodland floor.
  - Increased biodiversity in the area



**Coppiced  
trees**

**Standards**



# Managing large-scale timber production

- **Clear felling**
  - Provides large-scale wood for timber.
    - Destroys habitats
    - Reduces soil mineral levels
    - Leaves soils susceptible to erosion
      - Soil may run off into waterways causing pollution.
  - So how can this be sustainable?



# Managing large-scale timber production

- We could:
    - Leave each section of woodland to mature for 100 years before felling.
      - Allows biodiversity to increase.
- But
- Timescale too long to be cost effective.



# Managing large-scale timber production

- We sustainably manage forestry by:
  - Planting another tree for each one felled.
    - Only planting the species that grow well.
    - Positioning trees an optimal distance apart.
  - Removing only the largest trees.
    - More timber per tree.
  - Caring for trees to allow them to grow large.
    - Controlling pests & pathogens.



# Conservation

- What do we mean by Conservation?
- We mean: **Maintaining the biodiversity.**
  - Including diversity between species
  - And genetic diversity within a species
- We also mean maintaining a **variety of habitats and ecosystems.**



# Biodiversity is threatened:

- Over exploitation of populations
  - Cod for food
  - Oysters for pearls (money)
  - Trees for timber
- Destruction of habitats
  - Intensive agricultural methods
  - Building
  - Pollution
- Competition
  - By non-native species introduced by humans



# Why bother?

- There are ethical, social and economic reasons why conservation programmes are beneficial



# Ethical reasons

- Many conservationists believe that every species has value (not necessarily financial) and that every living organism has a right to survive.
- They also believe that humans have a responsibility to look after them.



# Economic & social reasons

- Direct value
  - Food source
  - Drug production
  - Biological pest control
- Indirect value
  - Genetic diversity may be useful in future to breed disease resistance.
  - Pollinating crops
  - Breaking down waste products
  - Ecotourism & leisure



# What can conservationists do?

- Raise carrying capacity of a species by providing extra food.
- Add more individuals of a species.
- Restrict emigration of individuals with fencing.
- Control predators/poachers.
- Vaccinate individuals against disease.
- Prevent pollution.
- Restrict succession by coppicing/mowing/grazing.