# 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


Standards
Coppiced trees

# 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.