

Part 5: How can we use our knowledge of science to manage ecosystems?

- Activity 5.1 A very successful attempt to manage a problem in an ecosystem
- Activity 5.2 Can changes in ecosystems caused by human activities create problems for the survival of some species?
- Activity 5.3 Should we allow development in national parks?

5 PART



Activity 5.1

A very successful attempt to manage a problem in an ecosystem

Activity type



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An average-sized dairy cow will produce about three to seven kg of dung (solid waste) per day. This equals the solid waste produced by 20 to 40 people.



Click here to see a video of dung beetles at work and a CSIRO report on the dung beetle program.

The ongoing use of exotic dung beetles from Hawaii, Europe and Africa in the cattle pastures of Australia since the 1970s is a success story in ecosystem management.



Activity 5.2 Can changes in ecosystems caused by human activities create problems for the survival of some species?

Activity type



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There are many types of farms close to rivers, from small market gardens to crop and livestock farms. Farms use water for irrigation to increase the growth of crops and pasture, which may decrease water flowing in the rivers. Farmers use fertilisers to improve crop growth and pesticides to kill pests, which may be washed into nearby rivers. Soil may wash from farmland into streams and increase the turbidity (i.e. cloudiness) of the water.



Click here to see the effect of surface runoff from land into aquatic ecosystems.



When nutrients (compounds containing nitrogen, phosphorus, or both) **increase in streams they feed massive blooms of algae. We call this process eutrophication. Eutrophication is one of the most widespread environmental problems of inland waters.**

Activity 5.3 Should we allow development in national parks?

Activity type



Activity 5.3 Should we allow development in national parks? Continued

ECOSYSTEM REVIEW

In this activity you will work individually to develop an argument about whether we should allow development of tourist attractions, recreational activities, mining or hunting in our national parks.

What makes a good argument?

- ✓ 1. A good argument is balanced and evidence based.
This means that you clearly present your point of view, but also consider alternative points of view. Include scientifically collected data as evidence to support your conclusions.
- ✓ 2. A good argument uses relevant science knowledge to support the argument.
Describe the effect a change in any aspect of an ecosystem might have on the survival of particular organisms. Describe how the food chain or food web will change.
- ✓ 3. A good argument uses appropriate scientific language.



National Parks and native animals UNDER THREAT



Click here to see the stimulus material.

National Parks UNDER THREAT

Native animals IN THE FIRING LINE

Development drafted for STATE FORESTS

"Let's make the most of our natural assets" MINISTER SAYS

5

PART

The average **cow** drops between 10 and 12 **dung pads** per day. Pastures can quickly become **fouled** and provide the **ideal breeding ground** for **flies**.

The ongoing use of exotic **dung beetles** from Hawaii, Europe and Africa in the cattle pastures of Australia since the 1970s is a **success story** in **ecosystem management**. The introduced dung beetles use the **dung** as a **food supply** for both **adults and larvae**. They build their nests under dung pads, building an extensive tunnel system provisioned with fresh dung which is used for egg laying. Some beetles make **dung balls** which they roll away before **burying them in the ground**. Dung beetle activity **destroys fly breeding sites**, it also **releases the nutrients** locked up in the dung pads and returns them to the soil.

Eutrophication is the ecosystem's response to the addition of natural or artificial nutrients (**phosphates** and **nitrogen** compounds) to a waterway. It can lead to an increase in **phytoplankton** or **algae** in a water body (**algal bloom**) which can deplete the oxygen in the water, leading to **death of aquatic animals**.

Sediment loads in **surface runoff** from **agricultural lands** can be reduced by:-

- Setting stocking rates that **maintain vegetation cover** and diversity
- **Managing stock access** to riparian (riverbank) and wetland areas
- **Reducing tillage** of soils and retention of crop residues (stubble)
- Use of **contour embankments** to **reduce surface runoff and soil loss**.

