

Background Teacher Information and Blank Student Response Sheet

Woodland Land Use Comparison Table

Think about the observations you have made and the conclusions you have reached studying past and recent/present land use practices. Complete the table.

Natural Resource type	Traditional non-Aboriginal land use	Traditional Aboriginal land use
Land	- Land clearing - Intensive land use requiring soil disturbance to produce food surplus to sell - Areas fenced, mostly according to a grid for management purposes and to denote ownership - Restricted movement (within a property). Ability to survive extreme weather conditions is influenced by access to redirected water, ability to pay for alternative food supply for stock (brought in or to move stock elsewhere).	- No land clearing - Minimal soil disturbance - No fences /communal guardianship of <i>Country</i> - Movement according to seasonal breeding cycles of endemic plant and animal food sources. Ability to survive extreme weather conditions influenced by the group's fitness/ability to move to and with the food sources they harvested.
Water	- Rainwater collected and stored for later domestic use - Surface water dammed, stored and redirected to water animals and to irrigate plant crops away from watercourses. Also stored, redirected and treated for use by large town (urban) populations - Rivers used to take away treated and untreated water waste from towns (urban population centres) along the way - Artesian/subterranean water sources tapped stored and redirected to water animals and to irrigate plant crops away from watercourses and in arid areas	- Surface water used when and where it was found by people (guardians of the <i>Country</i>) and the animals and plants which were endemic to and moved around a given habitats. - Rivers used for transport by canoe, a source of shelter, (living things, including a rich variety of plants gather along watercourses) food (e.g. fish, mussels, water birds and their eggs) and water
Plants	- Introduced domesticated species bred for a variety of market requirements - Some endemic plants retained for fodder, wood and shelter value for people, introduced animal and plant crops. - Crop rotation and fertilizers used to maintain high levels of	- Use of endemic species only - No domestication of medicinal, otherwise useful or food plants - Harvested according to the season and the daily requirements of the group. - Plants grew in their ecological niches, scattered throughout the woodland.

Plants continued	production to supply clothing, shelter and food needs of growing population. • Monoculture - one crop to a given area for a season • Harvesting generally means collecting everything planted and starting from the beginning for each season's crop. • Not so much now but use of fire to clear stubble from paddocks after harvest. Today chemicals are used to clear areas of plant competition and/or to hasten the harvest.	• Harvesting always meant leaving enough breeding stock for the next season. • Use of fire to stimulate fresh native grass growth • Use of endemic species for medicinal purposes
Animals	• Use of a small number of introduced/domesticated, mainly hard hoofed species, bred for a variety of market requirements • Stock rotated around defined areas (paddocks). To maintain high levels of production, at various levels; chemicals used to maintain health and control parasites and intensive feeding practices can be implemented (from fodder crops to feedlots) to supply the clothing and food needs of an increasingly town based (urban) population. (These products are supplemented by a range of primary and secondary imported products.) • Most endemic animals are removed with time as their habitat is removed/modified. Larger animals and some birds can become pests as they take advantage of the provision of water and introduced crops and their numbers increase.	• Use of a range of undomesticated, endemic native species only • Harvested according to the season and the daily requirements of the group. • Animals lived in their ecological niches, scattered throughout the woodland. • Harvesting always meant leaving enough breeding stock for the next season. • Use of fire to stimulate fresh native grass growth to encourage animals out into the open for easier of hunting. • barter for imported/traded products (weapons, ochres)

Look at the information in your table. What conclusion/s can you draw from the information in this table?

Student responses should reflect an understanding that the Australian environment has over time been influenced by two different landuse regimes. 1. That of the Aboriginal peoples which prevailed for tens of thousands of years, successfully sustaining a relatively small population and a rich biodiversity of flora and fauna in what was an increasingly arid landscape, using the resources about them. 2. The land use regime, which has prevailed for the past 200+ years, which began when the British settled on the East coast of Australia and began the systematic 'take over' of the country was based on the European knowledge and understandings, practices and species. All that was native, if not useful to or if it did not fit into the European model, was swept aside and/or replaced. This removal has intensified with an increasing population, the consequences of which are becoming more obvious (erosion, salinity, feral animals, increasing extinctions, lack of sustainability, water contamination etc). We need to discover ways to combine an appreciation and understanding of the native resources (plant and animal) with improved farming methods to sustainably support a larger population while maintaining a healthy environment. Students could perhaps have a 'what if' brainstorming session where

they could come up with combinations of ideas from the *indigenous landuse practices* and *non-indigenous land use practices* to enhance and improve future landuse and environmental quality. Following are some 'real life' ideas/examples scientists are currently studying/developing to stimulate you and get you started!

- "It means agriculture, biodiversity, river systems, forests, all being managed from now on as a single complex, biological system. And this, they say, will require a complete change to the way Australians work their land.
It will involve new crops, new cropping cycles and even the re-breeding of established crops like wheat so they imitate the biological and hydrological characteristics of deep-rooted native grasses. If Australia is to keep earning a living from agriculture then it must radically redesign its farming. We need to create new systems tailored to the unique biophysical characteristics of Australia's soils and climate ... to make agriculture a natural feature of the landscape."

Dr John Williams, CSIRO

Reinventing Australian plant production systems

From: Citizens Wildlife Corridors Armidale Inc., Autumn 2001, Newsletter Number 20

- An excellent collection of information regarding strategies to address current and 'future' land use issues and the moves toward sustainability and biodiversity are to be found in *Rural production and native vegetation conservation: adding value to the natural assets of New South Wales. Information for landholders* (1998) NSW Dept Land and Water Conservation. It contains a series of informative leaflets called *VegNotes*, which NSWDLWC produced with TMC Murray Catchment Management Committee Inc - Series 1 *Getting to know your vegetation*, Series 2 *Managing native vegetation*, Series 3 *Re-establishing native vegetation* and Series 4 *Economics of native vegetation*
- *Your bushland. Tips for Managing Native bush plants in the New England Region* (1998) UNE by Peter J Clarke is very student friendly and covers lots of areas such as problems and solutions, regeneration, assessment, monitoring etc
- *Re-leafing New England: A farmer's guide to trees on farms* produced by New England Trees on Farm (1994) UNE has lots of useful diagrams and information.
- *A farmer's guide to trees and bushland on the North-West Slopes and Plains* produced by North-West Catchment Management Committee (1997) UNE ISBN 07313 11700 also has useful diagrams and information
- *Murray-Darling Basin Resources* (1997) Peter Crabb, Murray-Darling Basin Commission (GPO Box 409, Canberra ACT 2601- ISBN 1 875209 58 1) gives a very comprehensive overview of resources, landuse and management
- Australian Nature Conservation Agency, (1996) *Conserving box-ironbark forests in Victoria education kit*, Department of Natural Resources and the Environment, Victoria, has a comprehensive collection of background information on fauna and flora. Also, a selection of classroom and fieldwork activities. A section (4) entitled, *Conducting a local box-ironbark forest conservation project* is a good model/guide to a similar woodland study in your local area.

- Research into and understanding our soils and the impact our society's land use production systems are having on them are pointing the way to changing methods of production of the foods and fibres we all require: "Healthy soil is literally the foundation of a profitable grazing business..... soil loss out strips the rate of replacementsoil is made up of stuff (minerals and living and previously living organic matter) and spaces (air and water)" 70-90% organisms in an ecosystem can live underground in healthy soil "The key to creating and maintaining a healthy soil is providing habitat and nourishment for the organisms in the soil "According to Australian soil scientist, Dr Christine Jones, "pulsed" grazing (short graze periods with adequate recovery periods) adds organic matter to the soil and is the most effective grazing method for maintaining healthy soils. Leaving adequate residue (plant cover) on the soil surface is also critical. Christine Jones says when a plant is heavily grazed then rested, as occurs under a cell grazing system, the roots get an intermittent 'pruning' which releases organic material into the soil and then allows the root system to regrow However, a conventionally grazed pasture system doesn't allow this type of root growth because when a plant is constantly being eaten off it cannot accumulate the energy needed to grow more extensive roots. Returning adequate organic matter to the soil and encouraging its decomposition into humus are essential for healthy productive soils. But most farming practises deplete organic matter and destroy humus. According to Dr Jones, "Conventional farming and grazing techniques create biological deserts". The use of nitrogen fertiliser, which doubled crop yields, was considered a major break through in agriculture. However, its cost has been enormous. Farmers became miners, depleting their farms of their most valuable resource, humus. You can afford, economically or biologically, to lose the humus. Replenishing soil organic matter and maintaining a thriving soil microbe population are essential"

Dave Pratt: *From: Citizens Wildlife Corridors Armidale Inc., Autumn 2001, Newsletter Number 20*

Top 10 reasons to care about biodiversity

Biodiversity:

1. Feeds and clothes us
2. Keeps our world clean
3. Keeps us healthy
4. Keeps us in touch with our origins
5. Renews our spirit
6. Inspires our artists
7. Will look after our children
8. Boosts our economy
9. Teaches us to wonder
10. Protects our planet

From: Citizens Wildlife Corridors Armidale Inc., Autumn 2001, Newsletter Number 20

Also, no matter where we live...

- Our food and medicines come from biodiversity
- Native birds, bats and insects pollinate our gardens
- We breathe oxygen produced by trees
- Trees take up carbon dioxide produced by our factories
- Plants keep the air fresh in our offices
- Tiny bugs break down our garbage into fertile soils
- Our crops are protected by pests from foraging birds and insects
- Marine organisms clean up the sewerage we put into the oceans

From: Citizens Wildlife Corridors Armidale Inc., Autumn 2001, Newsletter Number 20

Blank Woodland Land Use Comparison Table for student user
on the next page

Woodland land use comparison table

Think about the observations you have made and the conclusions you have reached studying past and present land use practices. Complete the table.

Natural Resource type	Traditional non-Aboriginal land use	Traditional Aboriginal land use
Land		
Water		
Flora (plants)		
Fauna (Animals)		

Look at the information in your table. What conclusion/s can you draw from the information in this table?