Environmental Policy in Australia: A Photojournal

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HONORS THESIS

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Introduction

This past summer, as a participant in the International Student Volunteers program, I had the opportunity to travel across the Pacific and to work with an Australian environmental organization in the Hunter Valley of New South Wales. My unforgettable experience allowed me to make a lasting contribution to the local environment as well as to take part in a number of very memorable activities—scuba diving in the Great Barrier Reef, gliding through the canopy of North Queensland's tropical rainforests, flying in a small plane over the largest sand island in the world, and seeing the national capital and Parliament of a foreign country, among other things. It also inspired me, as a political science major, to learn more about how Australia's government manages its natural resources and addresses environmental challenges, mainly at the federal, or Commonwealth, level.

International Student Volunteers (ISV) is a non-profit organization committed to advancing environmental and humanitarian goals through the efforts of students from universities throughout the United States. In addition to volunteer work directed toward either conservation or community development, ISV programs feature "Adventure Tours" during which participants are able to see and experience places of environmental significance in their host countries. These objectives are reflected in the organization's stated purpose: "To create an environment that combines conservation, education and recreation into the ultimate adventure travel program for students who desire to make a difference by volunteering in local communities abroad" (ISV, 2004). ISV currently offers programs in Australia, New Zealand, Costa Rica, the Dominican Republic, and the United States.

I learned about the organization in the fall of 2003, when representatives from ISV gave a classroom presentation at Western Washington University. I thought that it would be a wonderful opportunity to travel and to help the environment. I applied and was accepted into the Australia program; it was a country that I had always wanted to visit, principally because of its unique

ecosystems. There were a number of specific volunteer projects available as part of the Australia program, all of which were conservation-based, and I was assigned at random to work on a tree-planting project organized by Conservation Volunteers Australia (CVA), an Australian non-profit organization. My group departed for Australia on August 18, 2004 and stayed for one month. Our first two weeks were spent in the state of New South Wales working on the volunteer project with CVA, and the remainder of our time was spent on an Adventure Tour, during which we traveled to Cairns, Cape Tribulation, Airlie Beach, Fraser Island, Byron Bay, and Sydney.

This paper is presented in the form of a photographic journal; each entry details the activities in which I participated that day and presents further information regarding environmental policy in Australia. Most of the photographs were taken with a digital camera, although I used an underwater or regular disposable camera for some shots. All photographs were taken by me or of me, and were taken on the date in which they appear in the journal, unless otherwise indicated. The last section of this paper discusses Australia's environmental policy in broader terms. For the purposes of this paper, I will define environmental policy as laws or programs enacted to protect, prevent the depletion of, or restore a natural habitat, species, ecosystem, resource, or related element of the natural environment. I will generally use the terms "environmental protection," "environmental sustainability," and "conservation" interchangeably when referring to the objective of such policies. Although Australia has made significant advances in environmental protection since the 1970s, it does not consistently rank well in international comparisons, and many critics advocate a stronger, more active role for the Commonwealth Government in order to reverse environmentally destructive trends.

Our Conservation Project

Wednesday, Aug. 18, 2004—

Our ISV orientation program was held this morning and afternoon in Los Angeles, California. Participating students from universities throughout the United States gathered at the Quality Hotel, all dragging backpacks and suitcases heavy with supplies for the trip. I felt particularly weighed down, as I was bringing my laptop computer in addition to a large backpack and a smaller one. Volunteers bound for New Zealand and Costa Rica attended the orientation in addition to the 43, including myself, who were traveling to Australia. I was introduced to the six other students in my particular project group: Ilynne Bayan (from California), Jane Hsu (California), Jenny Marmion (New York), Sandy Meier-Schwandt (Wisconsin), Whitney Willis (California), and Patrice Woida (Oregon). During the orientation, which was conducted by ISV leaders, we played games to get to know each other and learned about what to expect and what was expected of us in the month ahead. Later that night I departed for LAX airport with my project group; our flight left at 10:30 p.m. We were all very excited about the journey upon which we were embarking. This would be my first time traveling to another continent and crossing the equator.

FIGURE 1: Map of Australia, showing major cities and landforms

Thursday, Aug. 19—

We "skipped" this day due to flying over the International Date Line. The flight was fourteen-and-a-half hours long, and it was night the entire time. Each seat had a television screen built into the back, and we were able to watch movies and television and play games such as Tetris and trivia, which helped to pass the time. One student in our group, Ben, was unfortunate enough to have his 21st birthday fall on this skipped day. He could only celebrate for about one hour before it became August 20.

Although I had always been interested in Australia, I realized that I was soon to arrive in a country about which I actually knew very little. I was aware that Australia was both the Earth's largest island and its smallest continent. I would later learn that it was the flattest continent and

also the hottest and driest, although we would not be visiting the arid interior. The value of Australia's environment to conservationists has much to do with its uniqueness; because of the continent's isolation over the past fifty million years, eighty percent of the animals and plants that evolved here exist nowhere else on Earth (Bryson, 2001, p. 7). There are also many places, including Fraser Island, the Blue Mountains, and the northeastern rainforests, in which very ancient plant species can be found. Some of these "relic" varieties of palms, ferns, and trees were once glimpsed by the eyes of the dinosaurs, and are an invaluable source of information about prehistoric ecosystems.

Sharing Australia's environment with its unique animals and ancient plants are about 20.2 million people (Australian Bureau of Statistics, 2004). The majority are concentrated on the eastern and southeastern coasts, which are less arid and more habitable than the interior of the continent; 84 percent of the population is concentrated in the most densely inhabited one percent of land area (Vernon, 2000, p. 1). Like the United States, Australia is a federal nation. It consists of six states—New South Wales, Queensland, Victoria, Tasmania, South Australia, and Western Australia—and two major territories, the Northern Territory and the Australian Capital Territory, the latter containing the national capital, Canberra. Australia's federalism is expedient given the vast size of the country, but it also imbues policymaking with the complexity inherent in the division of power between the Federal, or Commonwealth, and State Governments.

Australia's system of government is a parliamentary democracy based upon the British, or Westminster, model. The Head of State is the Queen of Great Britain, Elizabeth II, who is represented in Australia by the Governor-General. The powers of this official are generally only ceremonial, including rubber-stamping the acts passed by the Parliament, the elected legislative body. The Parliament is bicameral, with its upper and lower chambers termed the Senate and the House of Representatives, respectively. As in the U.S, each state's number of Representatives is proportional to its population, while each elects an equal number of Senators. The head of the

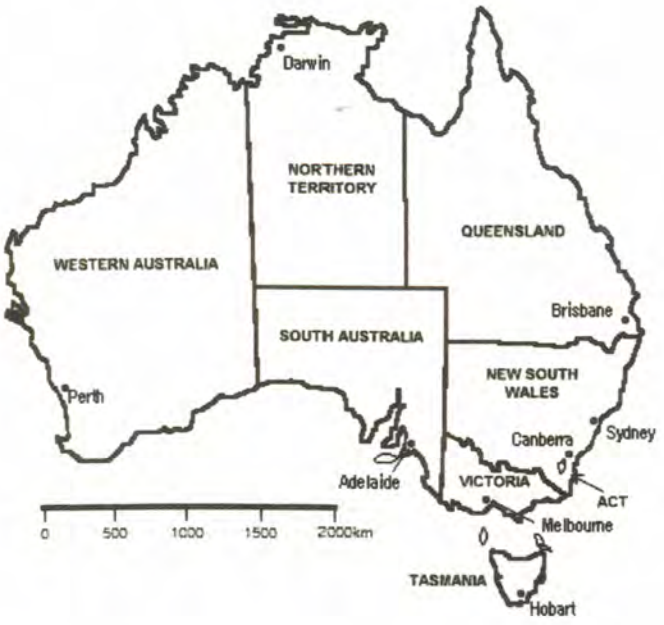
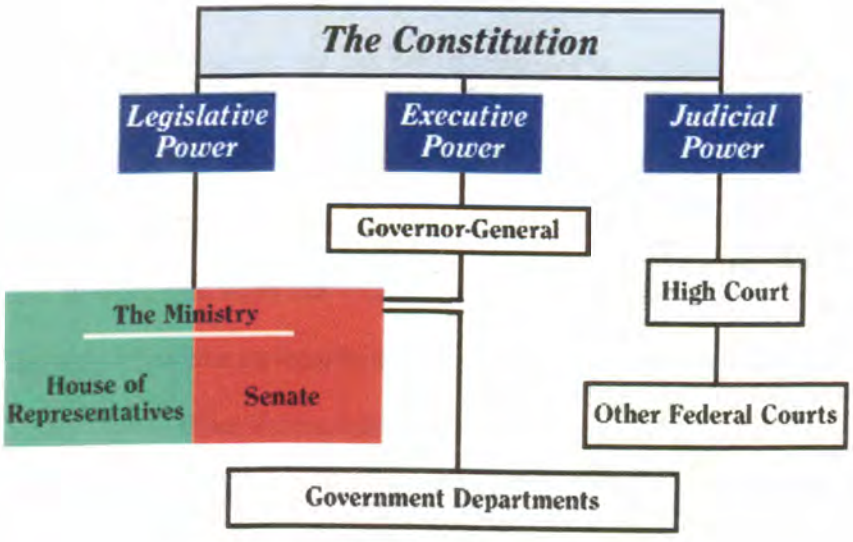


FIGURE 2: Map of Australia, showing states, territories, and capitals

FIGURE 3: Australia's climate

Executive branch of government is the Prime Minister, who is the leader of the political party that holds a majority of seats in the House of Representatives. In this arrangement, known as responsible government, the executive and legislative branches are not entirely separate. Proposing new policies is mainly the responsibility of the Prime Minister and his appointed Cabinet, which consists of the ministers in charge of the sixteen major executive departments. These include the Department of the Environment and Heritage, which is primarily responsible for environmental policy.



Agriculture, Fisheries and Forestry
Attorney-General
Communications, Information Technology and the Arts
Defence
Department of the Prime Minister and Cabinet
Education, Science and Training
Employment and Workplace Relations
Environment and Heritage
Family and Community Services
Finance and Administration
Foreign Affairs and Trade
Health and Ageing
Immigration and Multicultural and Indigenous Affairs
Industry, Tourism and Resources
Transport and Regional Services
Treasury

FIGURE 4: Diagram of the Australian Commonwealth Government, with the sixteen major Cabinet departments listed.

Currently the Australian Prime Minister is John Howard of the Liberal Party, which has formed a governing coalition with the National Party. The Opposition, or party with the second-most seats in the House of Representatives, is the Labor Party, led by Mark Latham.

I had only a vague understanding of the preceding information while on my lengthy flight over the Pacific, but I was looking forward to learning more about the fascinating country upon which I was soon to set foot for the first time.

Friday, Aug. 20—

Our plane landed in Sydney, New South Wales at around 6:00 a.m. local time—there is a 17-hour time difference between Sydney and Los Angeles. Together with the six other women in my project group, I met our ISV faculty leader, Christina Stosic, who had come to the airport to pick us up. She is to work with us on our volunteer project and lead our ISV-mandated group discussions. The eight of us then traveled by train and bus from Sydney to Cardiff, a little town in the Hunter Valley region, about sixteen miles south of the city of Newcastle. During the trip of several hours we passed many eucalypts, or gum trees, as well as some palms, which surprised me a little. Upon reaching Cardiff we met "Stevo" Travers, our project leader from Conservation Volunteers Australia, who picked us up at the bus station and took us to our accommodations. This weekend and the week after next, we will be staying at the "Volunteer House" in Cardiff, provided by CVA. After getting settled in we listened to a short orientation about our project by Stevo and Leonie Koshoorn, the regional manager for CVA.

Conservation Volunteers Australia is a non-profit organization whose stated mission is "to attract and manage a force of volunteers in practical conservation for the betterment of the Australian environment" (CVA, 2004). The nation's largest such group, CVA recruits around 1,800 volunteers from overseas every year in addition to the many Australians who contribute to its conservation projects. Among the environmental problems that CVA seeks to mitigate are soil

salinity and erosion caused by the clearing of native vegetation, introduced weeds that threaten native plant species, and endangered animals and plants.

The specific conservation project that will occupy me for the next two weeks is part of a broader program called River Paramedics. Initiated in March 2003, the program involves improving the Hunter River Catchment (watershed) through planting trees along riverbanks, clearing weeds, and monitoring water quality. Labor is provided by volunteers from CVA, while funding comes from the Coal and Allied mining company, the Government of New South Wales, and/or the Federal Government. Both levels of government have grants available for conservation projects in local communities—the New South Wales Environmental Trust and the Commonwealth's Envirofund. The latter is a division of the Natural Heritage Trust, through which the Australian Government is contributing approximately $3 billion (Australian) to environmental causes. Government policy also contributes to the River Paramedics program in a second way. The Hunter/Central Rivers Catchment Management Authority, an agency established by the New South Wales Department of Infrastructure, Planning and Natural Resources, has developed river care plans in collaboration with landowners and environmental groups. These plans guide the River Paramedics program in its rehabilitation efforts.

After our orientation, my group and I explored Cardiff. We will not be starting work until Monday, so this weekend is free. Among the features in the small town are a skateboard park, a library with Internet access, a used book store, and a video rental store. It is somewhat unnerving to walk along the road and watch the vehicles driving on the left-hand side.

PHOTO 1: The Volunteer House in Cardiff, New South Wales, with Sandy and Whitney on the porch

PHOTO 2: The view down the street from the Volunteer House

Saturday, Aug. 21—

Today we took the train into the city of Newcastle. I am impressed with Australia's public transportation system; the trains are convenient and travel to most major cities. In Newcastle we saw the beach, which has white sand, large waves, and many tide pools. We found interesting starfish and several pelicans, and also met some Americans who were studying at Newcastle University.

Newcastle is the sixth-largest city in Australia and is the world's largest coal port, exporting the substance from coalfields in the Hunter Valley. Despite the fact that much of its income is derived from an environmentally destructive activity, Newcastle has made a considerable effort "to transform the historical reputation of our city and to emerge...as a centre of excellence in sustainable living" (Newcastle City Council, 2004). In accordance with state legislation—the *Local Government Act 1993*, section 7e—the City Council has taken a number of measures to promote ecologically sustainable development (ESD). The Commonwealth has defined ESD, which was formally endorsed by all levels of government in 1992, as "using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased" (as cited in ESD Steering Committee, 1992, pt. 1).

After exploring the beach, we walked out on a spit of land to see the sunset and a nice view of the city, then had dinner at a Thai restaurant, of which there were many. We returned to Cardiff later that night. The temperature here fluctuates a lot—it gets at least up into the seventies during the day and then falls after sunset, so that I have to wear my jacket to bed and am still cold.

PHOTO 3: The other volunteers in my project group, at the train station en route to Newcastle. From left to right: Sandy, Whitney, Jane, Ilynne, Jenny, and Patrice.

PHOTO 4: Pelicans on the beach in Newcastle

Sunday, Aug. 22—

Today we walked to Blackbutt Reserve, a wildlife park near Newcastle, where we saw wallabies, kangaroos, koalas, wombats, and many birds. It was the first time that we had seen these animals in Australia, and so it seemed a bit more interesting at the time than it does in retrospect, after having seen many more. Australia's unique and interesting animals are a large part of what attracted me to the country. According to the State of the Environment Advisory Council (1996), 84 percent of Australia's land mammals, 89 percent of its reptiles, 45 percent of its birds, and 93 percent of its frogs are found nowhere else in the world (p. 4-1). The loss of these animals would mean their permanent elimination from the planet. I was discouraged to learn that more than 360 species of Australian animals, as well as about 1,240 species of plants, are currently listed as threatened (NSW National Parks and Wildlife Service, 2004).

The *Threatened Species Conservation Act 1995* is probably the most significant piece of legislation concerning the protection of animals in New South Wales. This state law allows threatened animal and plant species within NSW to be listed as Presumed Extinct, Endangered, or Vulnerable, depending on the severity of the threat to the organisms' existence. Populations—individuals of the same species living in a certain area—can also be listed as Endangered. In addition, ecological communities—individuals of different species living in a certain area—can be classified as Endangered or Vulnerable. The Threatened Species Act protects these animals and plants in several ways. First, any action that is likely to cause harm to a listed species, population or ecological community is prohibited unless licensed by the Director-General of the NSW National Parks and Wildlife Service. Second, the Director-General must prepare recovery plans to help restore the populations of these animals and plants. Third, threat abatement plans may be developed to address key threatening processes—either processes that could cause a species, population or ecological community to become threatened, or processes that cause harm to those already listed. Fourth, the Minister of the NSW Department of

PHOTO 5: Sleeping wombats at Blackbutt Reserve

PHOTO 6: Sandy and I (left) with a koala at the reserve

Environment and Conservation may classify the habitat vital to a listed threatened species, population or ecological community as "critical habitat," which it is illegal to damage.

Some rare and threatened animals in Australia are defended at a Commonwealth level under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. Biodiversity, or biological diversity, is a term used to describe the "variability among living organisms...and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems" (United Nations Convention on Biological Diversity, 1992, Art. 2). I will discuss the EPBC Act in greater detail later; for now suffice it to say that the law allows animals and plants to be listed as either Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, or Conservation Dependent, if they are threatened on a national level. Some species are listed on both a state and a national level. The EPBC Act protects these species in ways similar to the Threatened Species Act. Any action that is likely to have a significant impact on a listed species is prohibited unless approved by the Minister of the Department of the Environment and Heritage. The Minister must prepare recovery plans, which are to be carried out with the cooperation of the states. Threat abatement plans must also be developed to address key threatening processes if the plans are "feasible, effective and efficient" (EPBC Act 1999, section 270A). In addition, the areas of ocean owned by the Commonwealth were declared the Australian Whale Sanctuary, in which it is a crime to kill or otherwise interfere with any species of whale or dolphin.

Monday, Aug. 23—

Today was the first day of working on our conservation project. This week we are staying in different accommodations, at a state park in the upper Hunter Valley region near the town of Scone. The environment here resembles more closely what I expected Australia to look like—dry, with many gum trees and brightly-colored birds. Stevo drove us to our work site,

which is about thirty-five to forty minutes away, in the truck provided to us by CVA. This is the way we will be traveling every workday. Stevo and Christina sit in the front, and the rest of us sit sideways in the back with our cooler on the floor. It is not exactly the most comfortable way to travel. Ilynne and I get motion sickness nearly every time, and I often find myself expecting to hear the music from the Indiana Jones ride at Disneyland come blaring forth as we bump along over the less-developed roads. Nevertheless, it is entirely tolerable. This week our work site is located along a dry riverbed, one of the tributaries of the Hunter River, on land owned by a local farmer. The creek is dry because there has been a drought for the past several years, but when water does flow, erosion is a problem and can result in the pollution of the water with silt. We will be planting trees along the bank to mitigate this problem. Erosion, a significant problem throughout Australia, is exacerbated by the clearing of native vegetation for agriculture, pasture, and other development.

FIGURE 5: Map showing the Hunter River, tributaries, and regional cities and towns

In addition to erosion, the Hunter River and its tributaries are threatened by other sources of pollution. Runoff from agriculture in the Hunter Valley contaminates the river with nitrogen and phosphorus, while urban stormwater can carry other pollutants. The upper Hunter region also supports extensive coal mining, which generates a saline waste contributing to the already serious problem of soil salinity—the concentration of salt within the soil. Coal and Allied, a mining company that operates in the region, has attempted to compensate for some of its adverse environmental impacts by contributing to conservation efforts, including the River Paramedics program.

A probably incomplete list of the tree species that we are planting is swamp oak, rough-bark apple myrtle, river sheoak, forest red gum, native willow coobah, slaty box, kurrajong, spiny-headed mat-rush, and weeping acacia. We learned how to drill holes in the earth with a motorized auger, plant the small seedlings, water them, and refill the holes. Most of the plants are only a few inches tall at this point. We worked for a short time today, planting about fifty trees. I have borrowed some work boots from the Volunteer House that are about a size too big for me, but if I stuff them with tissue and wear thick socks they work well enough. We ate lunch at the site, as we will do every day—sandwiches and fruit from the cooler. We usually start work at around 9:00 or 9:30 a.m, take a short break for a snack or work until lunch, and then work again for another hour-and-a-half or so before leaving at around 2:00 p.m.

PHOTO 7: The seven of us in the truck on the way to our work site

PHOTO 8: Our first work site

Tuesday, Aug. 24—

We planted over 400 trees today and also learned how to place stakes and cardboard cartons over the seedlings to protect them. I used the auger for the first time, which is hard work. Later Stevo drove us out around sunset to see wild kangaroos, which are far more numerous than I had expected. We saw dozens of them on the hills along the side of the road, including joeys in their mothers' pouches. They were timid and hopped away when we came too close. When we arrived back home this evening we had the first of our ISV group discussions. This one was about general conservation issues, both in Australia and elsewhere. I mentioned that I am trying to approach the concept through the lens of government environmental policy and think about what political leaders can do to promote conservation, particularly at a national level.

The role played by the Commonwealth Government in protecting the Australian environment has changed over the past two centuries. Since the time of the first European settlement in 1788, the individual governments of the British colonies in Australia focused on promoting development and paid little if any attention to the impact that land clearing, logging, hunting, and other activities had on the environment. This attitude persisted after the states' federation in 1901 created the nation of Australia. The Australian Constitution did not address conservation, and the Commonwealth Government continued to facilitate development at the expense of the environment. In the eyes of Australia's early leaders and citizens, development and economic progress merited precedence over protecting an environment that was viewed as an impediment:

> European settlers came to the Australian environment with certain concepts and ethics derived from Western cultural traditions. From philosophical foundations, especially the influences of Francis Bacon and Rene Descartes, was derived the dominant environmental ethic that humans were free to exploit nature as they wished. (Frawley, 1994, p. 56)

This outlook instigated a variety of types of environmental degradation: soil erosion from the clearing of native vegetation for farmland, the depletion of soil nutrients due to overgrazing, soil

PHOTO 9: One of the seedlings just after planting

PHOTO 10: A planted seedling protected by a cardboard juice carton

PHOTO 11: A goanna—a large Australian lizard—climbing a tree at our work site

PHOTO 12: Wild kangaroos at sunset

salinity resulting from the overuse of water, and the introduction of animals such as rabbits, foxes and cane toads that quickly became pests, eating crops or competing with native species. During the period from federation until the 1960s, there was some effort by the Federal Government to manage natural resources, and government departments were created for this purpose, but the intent was to enable the resources to be most efficiently used, not to preserve them. Similarly, the first national parks were created during this time, but their purpose was seen as merely recreation. Population growth and the expansion of human settlements were encouraged.

Governmental policymaking with the intent to preserve the environment began in the 1960s, compelled by the nascent conservation movement. The first major environmental legislation was passed under Prime Minister Gough Whitlam of the Labor Party in the 1970s. This trend was continued by the governments of Malcolm Fraser and, to a greater degree, Bob Hawke, who endorsed "national responsibility for the environment" (as cited in Lynch & Galligan, 1996, p. 212). Dozens of environmental laws have been enacted by the Commonwealth over the past three decades, including the *Environment Protection and Biodiversity Conservation Act 1999*, which will be discussed later in this paper.

The Australian Constitution enumerates specific powers to be exercised by the Commonwealth, with the rest reserved for the states. The Australian Constitution also says very little about protecting the environment, and hence it would be inferred that such concerns fall exclusively under the jurisdiction of the states. How then has the Commonwealth been able to legitimately enact its environmental policies, sometimes against the wishes of the states? The Federal Government of the United States has been able to take a stronger role in environmental legislation by appealing to its power to regulate interstate commerce, which the Supreme Court has interpreted generously. Similarly, the Australian High Court has interpreted several of the Commonwealth's constitutional powers in a way that has given the Commonwealth the authority to legislate for the environment. These powers include the following:

- The Overseas Trade and Commerce Power (Australian Constitution s 51 i) – This is the Commonwealth's authority to control exports and imports. An example of its use for the purpose of environmental protection is the *Prohibition of Export of Mineral Sands Act 1974*, which was intended to stop sand mining on Fraser Island.

- The Taxation Power (s 51 ii) – This power can be used to create incentives for actions that have an environmental benefit. For example, in 1994 the Commonwealth began taxing unleaded gasoline less than leaded in order to encourage its use. A more recent example is the Product Stewardship (Oil) Scheme, or PSO, which came into effect in January 2001. Under the PSO, certain petroleum-based oils, lubricants and greases are subject to an excise tax, and the revenue that this generates is used to reward people who recycle these substances.

- The Corporations Power (s 51 xx) – This is the Commonwealth's constitutional power to legislate for "foreign corporations and trading or financial corporations formed within the limits of the Commonwealth," which includes most corporations in Australia. An example of the exercise of this power was in the 1983 Franklin Dam Case (*Commonwealth v State of Tasmania*), in which the Commonwealth wished to stop the Tasmanian Hydro-Electric Commission from constructing the Gordon-Below-Franklin Dam. The High Court of Australia ruled, in part, that the Commission was a trading corporation and thus subject to Federal law.

- The Races Power (s 51 xxvi) – The Commonwealth can use this power to legislate for the "people of any race, for whom it is deemed necessary to make special laws." It was also invoked in the Franklin Dam Case, as the proposed dam threatened several sites, including Kutikina Cave and Deena Reena Cave, that have cultural value to the Aborigines.

- The External Affairs Power (s 51 xxix) – This power gives the Commonwealth the authority to make legislation necessary to uphold international treaties. For example, Australia has agreed to protect certain regions, titled World Heritage Areas, under the UNESCO Convention for the Protection of the World Cultural and Natural Heritage. The Franklin Dam Case is also an illustration of the use of this power, as the area around which the dam would have been constructed was on the World Heritage List. The Commonwealth was able to successfully argue that it had the right to make laws to protect the region in accordance with the Convention.

- The powers over defense, territories, statistics, and overseas tourism have also been invoked to justify the enactment of Commonwealth environmental policy (Saunders, 65).

Another way in which the Commonwealth can promote environmental goals is to give grants to the states to be used for conservation purposes. These "tied grants" can be given "on such terms and conditions as the Parliament thinks fit" (Australian Constitution s 96).

Although the Federal Government does have an extensive reserve of powers that it may use to promote environmental protection, some have contended that it has been hesitant when it

comes to actually using them. Part of this may be due to political concerns—the more populous, developed states have more seats in the House of Representatives, and the Prime Minister is chosen by the majority party there. Thus, Prime Ministers have a personal incentive not to oppose the wishes of powerful states like New South Wales by forcing environmental legislation upon them (Holland, 1996, p. 7). It should be noted, however, that the states have also recognized a responsibility to protect the environment, and the last decade or so has seen a greater degree of cooperation between the two levels of government regarding the promotion of environmental goals.

The Department of the Environment and Heritage (DEH) is the structure through which the Commonwealth administers many of its environmental policies. Currently headed by Ian Campbell, the department includes four statutory authorities: the Director of National Parks, the Great Barrier Reef Marine Park Authority, the Office of the Renewable Energy Regulator, and the Sydney Harbor Federation Trust, and three executive agencies: The Australian Greenhouse Office, the Commonwealth Bureau of Meteorology, and the National Oceans Office. Among the programs that it helps to administer is the Natural Heritage Trust (NHT), which since 1997 has provided local communities with nearly A$3 billion for use in achieving conservation objectives such as cleaner rivers and beaches, sustainable land management, and restored animal habitat. The Trust is divided into four categories, termed Rivercare, Coastcare, Landcare, and Bushcare, and funds projects at regional and national levels in addition to local. Another important program is the A$1.4 billion National Action Plan for Salinity and Water Quality (NAP), initiated in 2000, which is aimed at reducing soil salinity and improving water quality; the plan is funded by both the Commonwealth and the States and Territories and involves the participation of local communities.

Although the DEH is the most significant Cabinet department involved in environmental policy, other departments play a role as well. Figure 6 illustrates the breakdown of environmental expenditure by department or agency presented in the Commonwealth's 2004-2005 budget.

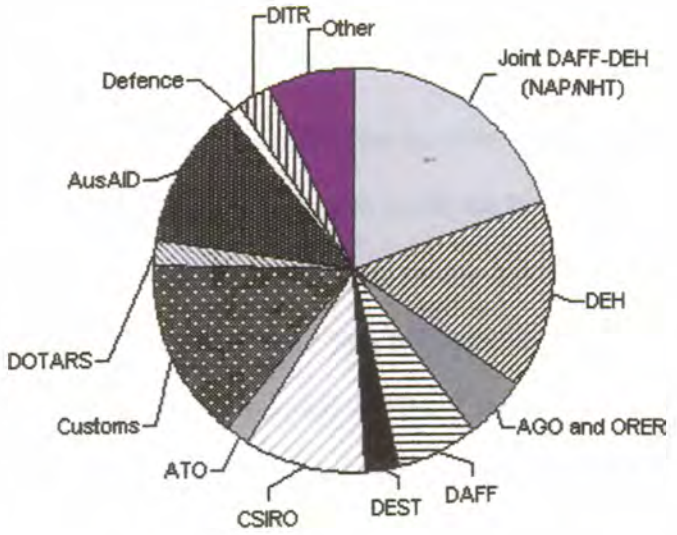


FIGURE 6: Breakdown of environmental expenditure by department or agency, 2004-5
AGO – Australian Greenhouse Office
ATO – Australian Taxation Office
AusAID – Australian Agency for International Development
CSIRO – Commonwealth Scientific and Industrial Research Organisation
DAFF – Department of Agriculture, Fisheries, and Forestry
DEST – Department of Education, Science and Training
DITR – Department of Industry, Tourism, and Resources
DOTARS – Department of Transport and Regional Services
ORER – Office of the Renewable Energy Regulator

Wednesday, Aug. 25—

We planted around 250 trees today. Afterward we went to Towarri National Park, which is managed by the NSW National Parks and Wildlife Service. We went for a walk along a small stream and Stevo pointed out some different types of trees and plants, including wild grass and stinging nettles. He mentioned that willow trees are weeds in this part of Australia. We heard kookaburras, which sound like monkeys, and fed crumbs to magpies. We were all impressed that a covered barbeque area with a grill was provided at the park. We later went to a pub, where Stevo won about A$150 at a slot machine. I tried a "shandy," which is a beer and Sprite mixture. We stopped to see the Southern Cross in the night sky on the way home.

Thursday, Aug. 26—

Today we lost some time because a part of the tip of the auger had fallen off, and we had to dig up some of the trees we had already planted to search for it. We finally found it near the last tree we planted yesterday. We are working on the other side of the creek now, where the bank is very steep and difficult to climb, and we have to be careful not to stand too close to the edge in case it crumbles. Hopefully the trees will stabilize it and prevent erosion in the future. We had our second discussion tonight, this time about specific environmental problems in Australia. Some of the issues that we discussed were soil salinity, land clearing, introduction of alien species, pollution of the air and water, and sea level changes due to global warming.

I found the information about climate change particularly interesting. Most of Australia's population lives along the coast, meaning that a rise in sea level would be very detrimental. Australia itself is contributing to the threat—due to its low population and its distinction as the world's biggest exporter of coal, the nation has the highest rate of greenhouse gas emissions per capita of all industrialized nations, as is apparent in Figure 7. However, Australia is, with the significant exception of the U.S, the only developed country that has refused to ratify the international Kyoto accord on reducing greenhouse gas emissions. Australia signed the accord in 1997 and accepted a goal of restricting emissions to no more than eight percent above 1990 levels between 2008 and 2012. However, the Howard Government announced in 2002 that it would not ratify the accord, meaning that it is not internationally bound to honor that goal. Howard warned that "to ratify the protocol would cost us jobs and damage our industry," and criticized the accord, as the United States does, for its failure to mandate reduction goals for developing nations (as cited in Roarty, 2002). The fact that the United States has not ratified the Kyoto pact was also a factor in Australia's rejection of the agreement, as this renders the treaty less effective than it would have been with U.S. participation.

On the other hand, the Australian Government is not ignoring the threat of global

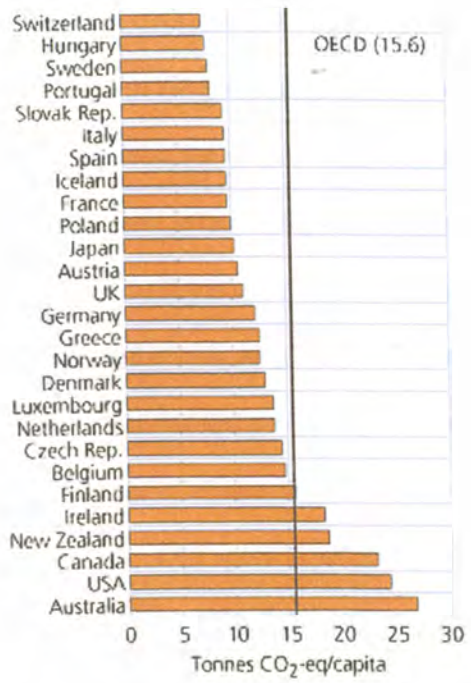


FIGURE 7: Per capita greenhouse gas emissions by country, 2004.
15.6 is the average for all OECD nations.

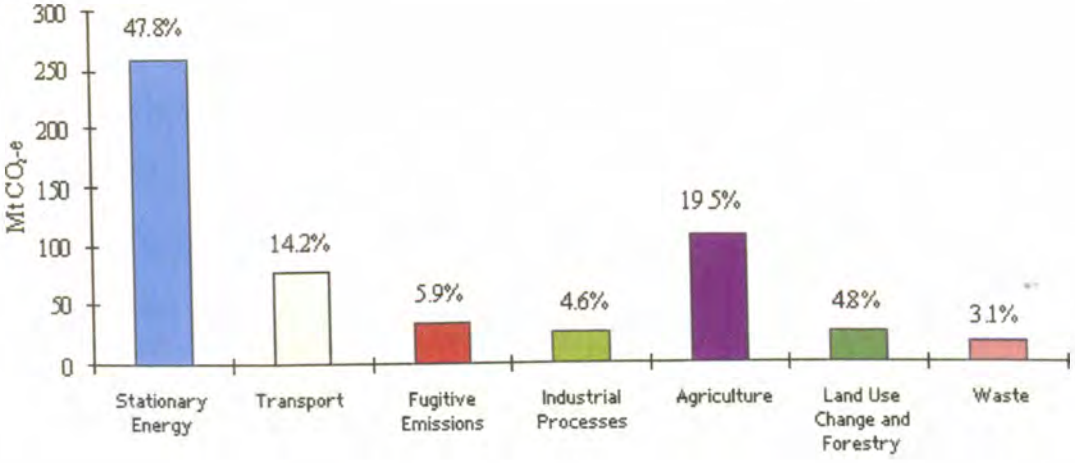


FIGURE 8: Australian greenhouse gas emissions by sector, 2001.
Land clearing is here referred to as Land Use Change.

warming. It is still attempting to meet the emissions reduction target upon which it originally agreed at Kyoto. In 1998 the Australian Greenhouse Office (AGO) was established as an executive agency under the Department of the Environment and Heritage and charged with administering the Commonwealth's policies for addressing global warming. The AGO recognizes the threat of climate change and acknowledges that "most of the world's leading scientists agree that global warming caused by human activity is occurring" (AGO, 2004). Among the Commonwealth's strategies for mitigating the problem are investing in renewable energy, monitoring greenhouse gas emissions and promoting research, promoting technologies that lower emissions, encouraging the use of alternative fuels in the transportation sector, and promoting sustainable land management. One specific program, the Mandatory Renewable Energy Target (MRET), was created as part of the federal *Renewable Energy (Electricity) Act 2000* (s 40). It sets a goal of generating an additional 9,500 gigawatt hours of renewable electricity, from sources such as biomass and solar power, per year by 2010. The Commonwealth is spending approximately A$1.8 billion in all on its climate change programs.

Nonetheless, environmental groups such as the Australian Conservation Foundation and Greenpeace continue to criticize the Australian government, charging that it is misconstruing its handling of the issue. At the recent Conference of the Parties to the Kyoto Protocol, held in Buenos Aires from December 6 to 17, 2004, non-governmental organizations awarded Australia the shameful "Fossil of the Day" distinction:

> For trying to mislead the world about its abysmal record of rising greenhouse gas emissions. In a statement released on Monday, they went as far as claiming that they would in fact be meeting their Kyoto target, despite the fact that the administration of Premier Howard has chosen NOT to join the treaty. The reality behind this newest act from the Ozzie Climate Theatre Group are mind-boggling emission increases in both the energy and the transport sector, which are both projected to rise by 40-50% over 1990 levels by 2010 and 60-70% by 2020. Framing such growing pollution levels as successful climate change policy is truly a very bad joke. (as cited in Australian Conservation Foundation, 2004a)

PHOTO 13: Lunch break at our work site; Christina is in the truck

PHOTO 14: The steep riverbank with a row of trees planted above it

Some analysts contend that Australia is on track to meet the emissions goal agreed to at Kyoto only because restrictions on land clearing have reduced one significant source of greenhouse gas emissions. This is not a permanent solution, for "as land clearing emissions stabilize at a low level in the next few years the underlying, and rapid, increase in energy-related emissions will see Australia's total emissions rise" (Turton, 2004, p. vii). As indicated in Figure 8, the energy and transport sectors account for a majority of the nation's greenhouse gas emissions. Conservation groups have also taken issue with the Commonwealth's MRET, contending that it aims low compared to other countries investing in renewable energy, including Germany, the United Kingdom, and the United States. The Howard Government's climate change policy appears to be inadequate even from the point of view of the Australian people, 71 percent of whom favor ratifying the Kyoto protocol and 83 percent of whom would favor a higher MRET even if it meant an increase in their energy bills (Greenpeace, 2002, 2003).

Friday, Aug. 27—

Today was our final day of planting trees at the site near Scone. We finished early and then did a bit of mulching—placing straw around the trees to help keep in moisture. The site looks very different now than it did when we started—small cartons cover the banks of the creek. We have planted about 1,000 trees in all this week. We then drove back to Cardiff and the Volunteer House, where we rented movies and ate pizza. It was nice to relax after all of our work.

PHOTO 15: Me in front of the riverbank after our planting was complete

Saturday, Aug. 28—

I stayed in Cardiff today while the others went to Newcastle again. I like Newcastle but did not feel like going shopping, so I stayed here and read the paper and an Australian travel guide I brought along. It made me realize that I should see the capital, Canberra, while I am here, although the author did not make it sound particularly appealing (Bryson, 2001). I started thinking about when and how to get there. The trip is about three-and-a-half hours by bus or train south from Sydney, and Sydney itself is about two-and-a-half hours from Cardiff, so the entire journey would be too long for one day. I decided that I would go to Sydney tomorrow and do some sightseeing there, so that at the end of our Adventure Tour, when the rest of our ISV group is in Sydney, I can spend a day in Canberra instead. I am very excited about seeing the capital, and particularly the Parliament House, in which Commonwealth laws, or Acts, are debated and passed.

I previously mentioned the *Environment Protection and Biodiversity Conservation Act 1999*, or EPBC Act, as it relates to the protection of threatened animals and plants. The Act also does considerably more than that. Described as the "first comprehensive attempt to define the environmental responsibilities of the Commonwealth" (DEH, 1999, p. 2), it is perhaps the most far-reaching piece of federal environmental legislation ever passed by the Australian Government. In brief, the Act stipulates that before any person or group may take an action likely to have a significant impact on a matter of national environmental significance, he must first acquire the approval of the Minister of the Department of the Environment and Heritage. There are seven issues of national environmental significance, or NES:

- World Heritage Properties – These are areas that Australia has agreed to protect under the World Heritage Convention, which will be discussed later. There are currently sixteen such properties in Australia, including the Great Barrier Reef and Fraser Island.

- National Heritage Places – Included under this title are "natural, historic and Indigenous places that are of outstanding national heritage value to the Australian nation" (DEH, 2004). An example is Dinosaur Stampede National Monument in Queensland.

- Ramsar Wetlands – These are areas that have been declared Wetlands of International Importance under the Ramsar Convention, which Australia and 17 other nations signed in 1971. There are 64 such wetlands in Australia, including Cobourg Peninsula Aboriginal Land and Wildlife Sanctuary, the first property in the world to be added to the list.

FIGURE 9: Location of Ramsar Wetlands in Australia

- Nationally Listed Threatened Species and Ecological Communities – As noted before, threatened species of animals and plants may be identified and classified according to their threat level. Ecological communities can also be listed as Critically Endangered, Endangered, or Vulnerable.

- Listed Migratory Species – This category includes birds and other animals listed as migratory species under several international agreements: the *Convention on the Conservation of Migratory Species of Wild Animals, the Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment* (CAMBA), and the *Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment* (JAMBA).

- The Commonwealth Marine Area – This region includes all areas of the sea around Australia that are under Commonwealth ownership; it extends off the shore from about three to two hundred nautical miles.

- Nuclear Actions – These actions include establishing or modifying a nuclear facility, transporting spent nuclear fuel, creating a facility for storing or disposing of nuclear waste products, and uranium mining. Any such action that has a significant impact on the environment must first be approved by the DEH Minister.

Under the Act, an "action" is defined as a project, development, undertaking, activity, series of activities, or alteration of any of these things (EPBC Act, s 523) and includes such things as clearing vegetation, emitting pollution into the environment, or building a road or other structure. If a person or group wishes to undertake such an action and believes that the action is likely to have a significant impact on one of the above-listed matters of NES, a proposal must be submitted to the Minister for DEH. The proposal will then be assessed through one of several methods and either approved or denied. The penalty for taking an action without going through this process is a fine and/or imprisonment. In addition, the Act stipulates that a State of the Environment Report is to be prepared every five years.

Despite its significance, the EPBC Act is only one of many pieces of Commonwealth legislation protecting the environment. Examples of others are the following:

- *Environment Protection (Sea Dumping) Act 1981* – Requires all vessels, platforms and planes within or over Australian waters, as well as all Australian vessels and planes everywhere, to obtain permits before dumping waste materials into the sea.

- *Wildlife Protection (Regulation of Exports and Imports) Act 1982* – Regulates the export and import of animals and plants, with the goal of protecting native species and preventing the introduction of foreign pest species.

- *Hazardous Waste (Regulation of Exports and Imports) Act 1989* – Protects the environment and complies with international agreements by regulating the export and import of hazardous waste.

- *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* – Requires one to obtain a license before manufacturing, importing, or exporting synthetic greenhouse gases or chemicals that cause ozone depletion, or importing equipment that uses these chemicals, such as air conditioners and refrigerators.

- *Antarctic Mining Prohibition Act 1991* – Prohibits mining by anyone within the six-million-square-kilometer Australian Antarctic Territory, and by Australian citizens or corporations anywhere in Antarctica, except when the mining a part of scientific research.

Sunday, Aug. 29—

I went with Ilynne and Jane to Sydney this morning on the 7:47 train. They were planning to go to a famous church, so I separated from them and spent the day on my own. I first took a taxi to the Sydney Aquarium, which was very impressive. One of the largest aquariums in the world, it is divided into sections featuring animals from different Australian habitats, including mangrove swamps, rivers, tide pools, the Great Barrier Reef, and the Great Australian Bight. Among the more than 11,500 animals featured are platypuses, penguins, crocodiles, seals, turtles, sharks, rays, and many fish and crustaceans. In both the seal and the shark exhibits, people are able to walk along the bottom of the tanks in clear acrylic tunnels and watch the animals swimming around and above them. The shark tank was especially thrilling, containing sharks of various sizes and species, enormous turtles four or five feet across, and huge manta rays, all in the same tank.

Sydney is the capital of New South Wales, and after leaving the aquarium I walked over to the State Parliament building. States play a very significant role in creating environmental policy, so I thought it would be interesting to visit the State Parliament in addition to the one in Canberra. Unfortunately the building was not open for tours on Sundays, but I took photographs

PHOTO 16: Seals at the Sydney Aquarium

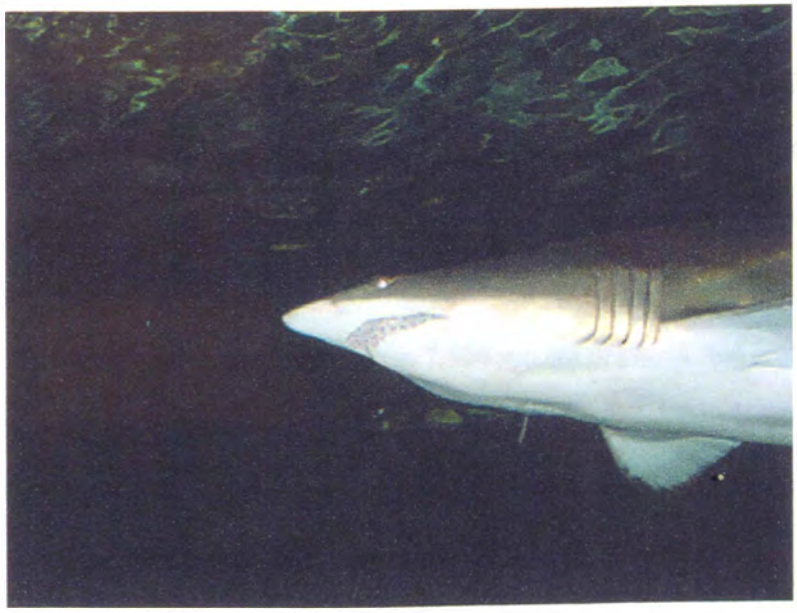


PHOTO 17: The shark exhibit was particularly impressive

of the outside. The governmental structure of New South Wales largely mirrors that of the Commonwealth government, as do those of the other Australian states and territories. The elected, bicameral Parliament consists of the 93-member Lower House, or Legislative Assembly, and the 42-member Upper House, or Legislative Council. The leader of the political party with a majority in the Legislative Assembly is the Premier, analogous to the Prime Minister. Currently, the Premier of New South Wales is Robert Carr of the Labor Party. There is also a state Governor, currently Marie Bashir, whose functions are mainly ceremonial. As in the Commonwealth Government, the Ministry or Cabinet consists of the heads of the executive departments. Among these are the Department of Environment and Conservation, which includes the National Parks and Wildlife Service, and the Department of Infrastructure, Planning and Natural Resources, to which the Hunter/Central Rivers Catchment Management Authority reports.

I continued past the Parliament building to the Sydney Opera House, where I walked up the steps and took pictures of it and Sydney Harbor. I also walked around the outside of the Government House, where the Governor of New South Wales lived in the mid-1800s, and walked through the Royal Botanic Gardens and the Palace Garden, which are managed by the Department of Environment and Conservation. It was raining by then, which probably made it more peaceful and less crowded in the gardens than it otherwise would have been. I saw white ibises on the lawn. The gardens contain more than 7,500 species of plants, and probably look even nicer in the spring and summer when there are flowers blooming. I then headed back to the train station and met up with Ilynne and Jane, who had decided to stay late so they could go to another church. I returned to Cardiff on my own and got there at around 7:00.

PHOTO 18: The State Parliament House in Sydney

PHOTO 19: On a path in the Royal Botanic Gardens, with the Sydney Opera House and the Harbor Bridge in the background

Monday, Aug. 30—

Today was the first day of work at our second site, the dry bed of the John Elm Creek in the Congewai Valley, south of Cessnock. This week we will commute here every day from Cardiff, a trip of about an hour each way. It is a beautiful site surrounded by horse and cow pastures and hills. The land is owned by Louise and Steven Dews, a British couple who have a very nice house with a view of the scenic valley. This week we have 1,500 trees, of the same species as last week, to plant along the bank to prevent erosion. It is easier to drill holes here because the soil is softer, but this time we have to pound three stakes in around each tree and slide a plastic bag over them, which is more difficult to work with than a carton. The purpose of the bags is to trap heat inside near the young trees like a greenhouse, and also to keep rabbits, wombats and other animals from harming them—the many burrows visible in the bank are evidence that these creatures are common to the area.

The bank is very steep and it is not easy to put stakes and bags over some of the trees planted on the incline. We have to make sure that there is enough tension on the bags so that they will not blow away, which sometimes requires pulling up a stake and pounding it in again in a better location. We planted about 150 trees today before returning to the Volunteer House in Cardiff. We saw a wombat crossing a field as we were leaving the work site, but unfortunately I was unable to take a photo of it.

PHOTO 20: Our second work site

PHOTO 21: Close-up of one of the planted seedlings, protected by a plastic bag

Tuesday, Aug. 31—

We planted more trees today. I spent practically the entire time putting on the stakes and bags; it can make one's hands sore after a while. Division of labor helps us to work most efficiently—some of us use the auger while others place trees in the holes, pour in water, backfill the holes with soil, or pound in the stakes—but usually we switch tasks now and then throughout the day. Louise is very nice; she helped us with the work and gave us coffee, tea, and chocolate cake. She mentioned that Australia had "inherited a history of poor environmental management." She also showed us a diamond python, which was just coming out of hibernation, behind her barn. Her husband Steven Dews is a famous artist who was commissioned by the British Government to paint a picture of a famous naval battle involving Lord Nelson, which we were able to see in its nearly completed state. We finished with the trees for the day and went to a pub in the nearby town of Wollombi, where we tried "Dr. Jurd's Jungle Juice," a famous fortified wine, and bought some bottles as souvenirs. Stevo then took us on a drive through a State-owned forest in the mountains where logging had been taking place, and we saw some clear-cut areas. The bases of some of the trees were charred, evidence of controlled burnings done to reduce the risk of forest fires. We also saw the Australian Grass Tree, a tree endemic to Australia that has become rare due to land clearing—one species is currently listed at a national level as Endangered, and another is Vulnerable (DEH, 2004b). We went for a walk through the bush using trails created by previous CVA groups, and saw some other interesting plants. At one point Stevo pointed out some red ochre of the type that Aborigines once used to paint their faces. Later we went to a lookout point to see a beautiful nighttime view of Newcastle.

On the way home we had a rather humorous adventure. A flat tire forced us to stop by the side of the highway. We needed a bigger jack in order to change the tire, so Stevo called for assistance and stood a short distance up the road with a flashlight (or torch, as they are called in Australia) to signal our presence to approaching drivers. Meanwhile, the rest of us began trying

to signal passing trucks in creative ways. Jenny wrote the letters J-A-C-K on pieces of paper, which we held up to the windows in hopes that they could be read. I taught Ilynne how to signal S-O-S with her flashlight. A small truck with some guys from an auto shop finally stopped. They had a jack and the tire could be changed, and we went home at last.

Wednesday, Sept. 1—

Three children from what sounded like the Australian equivalent of Boyscouts/Girlscouts came to help us plant trees today—Glen, Natalie, and her brother Daniel—along with their mothers. They were around ten years old and were earning their "landcare" badges. At first I worried that they might slow us down, but they were very diligent and helpful. We planted about 500 trees, and Louise gave us coffee, tea, cake, and Oreos on our break. Tonight we had a discussion about "ecotourism"—a term given to environmentally conscientious tourism that seeks to have a minimal impact on the sites visited. We will be acting with this principle in mind during our upcoming Adventure Tour, during which we will be visiting four areas protected under World Heritage status: the Wet Tropics of Daintree/Cape Tribulation (#12 in Figure 10), the Great Barrier Reef (13), Fraser Island (11), and the Blue Mountains (14).

Australia ratified the United Nations Educational, Scientific and Cultural Organization (UNESCO) *Convention Concerning the Protection of the World Cultural and Natural Heritage*, or World Heritage Convention, on August 22, 1974. This international treaty facilitates the preservation of areas that are "of outstanding universal value" (UNESCO, 1974, Art. 1, 2) and "as such worthy of special protection against the dangers which increasingly threaten them" (World Heritage Committee, 2003, para. 1). Signatory countries nominate sites for inclusion on the World Heritage List, and if the World Heritage Committee accepts them, these properties become World Heritage Areas. Such areas can either be examples of cultural heritage—monuments, groups of buildings, or sites—or natural heritage—natural features and sites or geological and

PHOTO 22: Trays of trees waiting to be planted. The seedlings were generally taller at this site.

PHOTO 23: Everyone involved in the project on 9/1/04. Back row, from left to right: Ilynne, Steven Dews, Jenny, Louise Dews, Christina, Stevo, the two mothers of the children, Whitney, Jane, Sandy. Front row, from left to right: Glen, Natalie, Daniel, Patrice.

physiographical formations. Countries that contain World Heritage Areas are obligated to "[ensure] the identification, protection, conservation, presentation and transmission to future generations" of these sites, and "not to take any deliberate measures which might damage directly or indirectly the cultural and natural heritage" (UNESCO, 1974, Art. 4, 6[3]). Management plans must also be developed for the sites.

There are so far 178 participating nations and 788 World Heritage Areas—611 cultural, 154 natural, and 23 mixed (UNESCO, 2004). The majority of Australia's World Heritage Areas are in the category of natural heritage and were assessed to meet the following four criteria: the site embodies major stages of Earth's history, the site represents important continuing ecological and biological processes, the site contains outstanding natural phenomena or natural beauty, and the site has value for the conservation of biological diversity (World Heritage Committee, 2003, para. 44a). In addition to the four listed above, Australia contains twelve other World Heritage Areas, distributed among almost all of its states and territories:

FIGURE 10: Location of World Heritage Areas in Australia; numbers correspond to the sites listed below

- New South Wales – the Willandra Lakes Region (7); the Central Eastern Rainforest Reserves (6); the Lord Howe Island Group (5)
- Queensland – the Central Eastern Rainforest Reserves (6); the Australian Fossil Mammal Sites (8a)
- South Australia – the Australian Fossil Mammal Sites (4a)
- Tasmania – the Tasmanian Wilderness (3); Macquarie Island (2)
- Victoria – the Royal Exhibition Building and Carlton Gardens (16)
- Western Australia – Shark Bay (8); Purnululu National Park (15)
- Northern Territory – Uluru-Kata Tjuta National Park (9); Kakadu National Park (10)
- The Territories of Heard and McDonald Islands (1)

Thursday, Sept. 2—

After planting trees today we went with Louise to see some Aboriginal cave art on their neighbor's land. The paintings, which could be thousands of years old, were in a cave beneath a large overhanging rock shelf in the hills. There were adult and child handprints, which the Aborigines would have created by chewing white stones and spitting out the substance around their hands. There were also the figures of humans, a kangaroo, an emu, an eel, and a one-legged spirit. These had been outlined with chalk earlier so that they could be better photographed. A book brought by Louise in which the images were featured (and whose title and author I unfortunately did not note) said that they probably represent hunting and family scenes. Louise said that such caves were Aboriginal gathering places, and the book explained that the art had a spiritual purpose and was meant to appeal to the deities. It also said that the Aborigines in this region were driven out by European settlers. We then drove past Louise's neighbors' house, which was from the 1800s or early 1900s and in which three generations had lived. I wondered if its earlier residents had been among those who had clashed with the Aborigines. After that we had a barbeque in a clearing in the hills. There was a large tree nearby—I believe it was a fig tree—as well as a large boulder; we had fun climbing both. We later went home and packed in preparation for tomorrow, when we will be leaving for Cairns and our Adventure Tour.

PHOTO 24: Trees planted on the riverbank

PHOTO 25: Aboriginal hand prints

Friday, Sept. 3—

Today we worked until noon, accomplishing our goal of planting 1,500 trees for the week. We then went to the train station and said goodbye to Stevo. We all appreciated how much he had contributed to our experience over the past two weeks, both by helping us plant trees and by taking us to interesting places in the Hunter Valley region and providing us with information about our surroundings. We took the train to Sydney and said goodbye to Christina. Our flight to Cairns, in northern Queensland, took about two-and-a-half hours, and we arrived at around 10:00 p.m. The temperature outside was 21 degrees Celsius—about 70 Fahrenheit—a pleasant change from the often cold nights in Cardiff. It was too dark for me to discern much about our surroundings. We went to our accommodations, the Serpent Hostel, which reminded me of a college dormitory. There were two sets of bunk beds to a room, large shared bathrooms, and downstairs a pool and a pub/cafeteria where we would get free breakfasts and dinners.

PHOTO 26: All of us, minus Ilynne, with Stevo after planting our last trees

Our Adventure Tour

Saturday, Sept. 4—

Our Adventure Tour orientation took place outside the pub this morning at 9:00. We are now reunited with the other ISV groups who completed volunteer projects elsewhere in Australia. There are 43 of us in all, plus four ISV staff members—Mike Parenteau, Lance Elam, Sarah Cowper, and Todd Chaudry—and the bus driver, Robbie. The people in each project group had fun performing skits about incidents that happened to them during the past two weeks. The staff then discussed the Adventure Tour to come. We will be traveling in a large tour bus, first north to Cape Tribulation and then down the eastern coast of Australia, stopping in Airlie Beach, Fraser Island, Byron Bay, and finally Sydney again.

Figure 11: Map showing the major stops on our Adventure Tour (including Canberra, to which I traveled on my own)

After the orientation we explored Cairns briefly. The city is smaller than I expected—I was envisioning something like Sydney—but it is the largest city built in a rainforest. Forested hills and mountains surround us and the climate is tropical. There are many souvenir shops and cafés, and a shallow wading and swimming pool, embellished by a fountain, extends out to the coast. The day was cloudy but warm.

We then traveled by bus to the nearby Tjapukai Aboriginal Cultural Park, passing fields of sugarcane along the way. The Park, established in 1996, is owned mainly by Aboriginal tribal councils and employs around eighty Aboriginal staff members. We saw a presentation about an Aboriginal creation myth, according to which the Earth, sun and moon, spirits, animals, and everything in the universe came out of the egg of a cassowary—a large, flightless, taloned Australian bird. An important part of their mythology is the story of two brothers, one representing the "dry" (*Guyala*) and one the "wet" (*Damarri*). Different totems are associated with each of these two forces, and Aborigines would identify themselves with one or the other. We then watched several Aborigines perform traditional dances and chants and start a fire using sticks. After that we tried throwing spears and boomerangs; I had little success. We saw a presentation about how to play the didgeridoo, and then one about fruits and plants native to the rainforest. Finally we watched a film about the tragic history of the Aborigines. Similar to the Native Americans, they were displaced and killed by European settlers and their children were forced to go to missionary schools. Fortunately, their culture has received greater recognition and respect in recent years. The Tjapukai language is being revived and is even taught in elementary schools in the region.

PHOTO 27: Me in Cairns

PHOTO 28: Aborigines performing a dance at the Tjapukai Aboriginal Cultural Park

Sunday, Sept. 5—

Today we left at 7:15 a.m. for our expedition to the Great Barrier Reef, a part of the Adventure Tour to which I had particularly been looking forward. We boarded a tour boat with the company Passions of Paradise and traveled for about two hours until we reached our first stop, a point on Paradise Reef. I went snorkeling behind the boat and saw coral and many colorful fish, which I took pictures of with an underwater camera. I wore a wet suit, although the water was not cold—the guides told us that it was about 24 degrees Celsius. The coral formed an underwater plateau. The average depth of the water was probably around ten feet, but if we swam too far we would come to a drop-off where it became deeper. There were many striped fish and some large multicolored ones—probably parrotfish. I also saw a large sea turtle with a shell approximately a foot-and-a-half in length. I then went on an introductory scuba dive for thirty minutes. It was a wonderful experience, although slightly intimidating at first when I was not yet accustomed to breathing and moving underwater. I went with a small group, including Jenny and Ilynne. I was able to swim on my own, following our guide, and had my picture taken holding a sea cucumber and near a large clam. I saw an even bigger clam, probably one-and-a-half to two feet across, and a clownfish hiding in an anemone. We were probably around fifteen to twenty feet underwater.

We then went to a second site where the snorkeling was even better. This time there was a small sand island, called Upolu Cay, to which we could swim from the boat. The guides warned us to watch out here for cone shells, a type of poisonous marine animal—if anyone were unfortunate enough to be stung by one, he or she would have about fifteen minutes to live. I was very careful where I stepped. The only negative aspect of Australian biodiversity is the number of dangerous animals that are found here, including the most poisonous animal in the world (the Box Jellyfish), the poisonous Blue Ring Octopus, and the most poisonous snakes and spiders in the world, as well as sharks, crocodiles, dingoes, and cassowaries. Fortunately I did not

PHOTO 29: Me in scuba gear at Paradise Reef

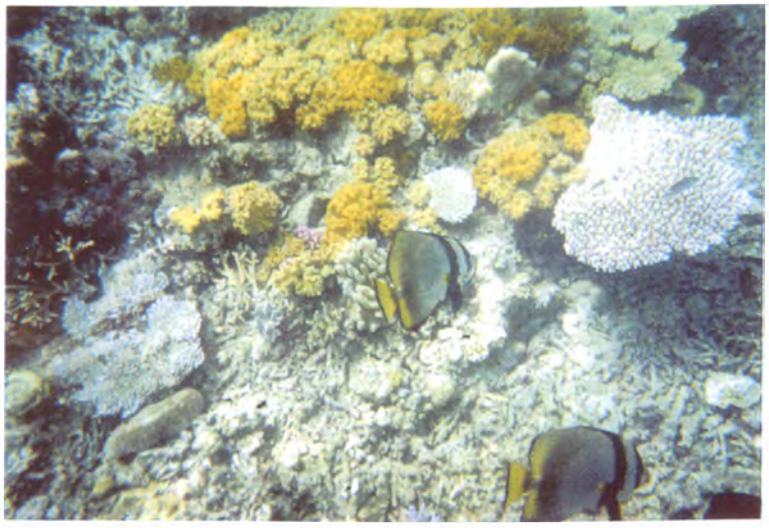


PHOTO 30: Fish and coral

encounter anything dangerous, but I did see fish, clams, starfish, and sea cucumbers. We were reminded not to walk on the coral or to take anything away, since this is both a national marine park and a World Heritage Area.

The Great Barrier Reef is now Australia's "most managed" environmental area (Bowen, 1994, p. 234), but it has not always been protected. In the 1800s the Reef was exploited for turtles, pearls, sea cucumbers and trochus shells, and later tourism and oil drilling also damaged it. The impetus for protecting the region began in the 1960s, as conservation groups took a stand against oil and limestone mining companies and the Queensland Government to oppose the further degradation of the Reef. Encouraged by further activism on the part of environmentalists, including the Australian Conservation Foundation, the Commonwealth passed the *Great Barrier Reef Marine Park Act 1975*, establishing the Reef as a park under the protection of the Federal and Queensland Governments. Later, in 1981, the area was added to the World Heritage List.

The Commonwealth created the Great Barrier Reef Marine Park Authority (GBRMPA) along with the Park in 1975. A federal body within the Department of the Environment and Heritage, the GBRMPA is charged with "provid[ing] for the protection, wise use, understanding and enjoyment of the Great Barrier Reef in perpetuity" (GBRMPA, 1994) and has authority over the Queensland Parks and Wildlife Service, which manages the Park on a day-to-day basis. In order to balance the needs of tourists, researchers, fishers, and others with conservation, the Park is divided into various color-coded zones in which different activities are permitted. Approximately one third of the Park is within the Green Zone, in which snorkeling, diving, boating, and research are allowed but all extractive activities, such as fishing, are prohibited. Most of the rest of the Park is included within zones that offer a lesser degree of protection, with the exception of the Scientific Research or Orange Zone, which does not always permit public access, and the Preservation or Pink Zone, in which only scientific research is allowed. In all of the zones, some activities require permits. In addition, in accordance with the EPBC Act, any

activity likely to have a significant impact on the Great Barrier Reef World Heritage Area must be approved by the Minister for Environment and Heritage.

ZONE	COLOR	ACTIVITIES ALLOWED WITH PERMIT	ACTIVITIES ALLOWED WITHOUT PERMIT
Preservation	Pink	Research	None
Marine National Park	Green	Research; Shipping; Tourism; Traditional use	Boating, diving, photography; Limited impact research
Scientific Research	Orange	Research; Shipping; Tourism; Traditional use	Boating, diving, photography; Limited impact research
Buffer	Olive Green	Research; Shipping; Tourism; Traditional use	Boating, diving, photography; Limited impact research; Trolling
Conservation Park	Yellow	Aquaculture; Harvest fishing for aquarium fish, coral and beachworm; Research; Shipping; Tourism; Traditional use	Bait netting; Boating, diving, photography; Limited crabbing; Limited collecting; Limited impact research; Limited spearfishing; Limited line fishing; Trolling
Habitat Protection	Dark Blue	Aquaculture; Harvest fishing for aquarium fish, coral, beachworm, sea cucumber, trochus, and tropical rock lobster; Research; Shipping; Tourism; Traditional use	Bait netting; Boating, diving, photography; Crabbing; Limited collecting; Limited impact research; Limited spearfishing; Line fishing; Netting; Trolling
General Use	Light Blue	Aquaculture; Harvest fishing for aquarium fish, coral, beachworm, sea cucumber, trochus, and tropical rock lobster; Research; Tourism; Traditional use	Bait netting; Boating, diving, photography; Crabbing; Limited collecting; Limited impact research; Limited spearfishing; Line fishing; Netting; Shipping; Trawling; Trolling
Commonwealth Island Zone	N/A	Traditional use	Non-extractive activities

TABLE 1: Activities allowed with and without permits in each zone of the Marine Park. Traditional use refers to customary activities carried about by Aboriginal and Torres Strait Islander peoples.

The total size of the Great Barrier Reef World Heritage Area, almost 350,000 square kilometers, is slightly larger than the Marine Park and makes it the world's largest World Heritage Area. Its 2,904 individual reefs provide an essential habitat for many marine animals,

PHOTO 31: A starfish amid coral

PHOTO 32: Upolu Cay from the boat

including whales, dugongs, turtles, sponges, echinoderms, mollusks, 359 species of hard coral, and over 1,500 species of fish, and also about 2,200 species of native plants (GBRMPA, 2004). Unfortunately, although the area is now protected, threats to the Reef remain, including pressures from tourism. While I was snorkeling and scuba diving I tried not to touch the coral, but could not help periodically bumping into it. Another volunteer said that she noticed that the sink on the tour boat drained directly into the water, and we wondered if this was detrimental. Perhaps the greatest current threat to the Great Barrier Reef is pollution—fertilizers, pesticides, nutrients, sediment, sewage, heavy metals, toxic chemicals, and litter—that is carried to the Reef by rivers that empty into the sea. Such contaminants enter the rivers through erosion from vegetation clearing and runoff from grazing, mining, urban areas, and agriculture—particularly sugarcane and banana farming. These pollutants are harmful to marine animals and plants. Nutrients can also cause algae blooms that lead to an expansion in the population of crown-of-thorns starfish, a species that is notorious for feeding on coral. To address this problem, in late 2003 the Commonwealth and Queensland Governments completed the *Reef Water Quality Protection Plan,* which aims to reduce the amount of pollutants entering the Reef within ten years. The Plan is overseen by the heads of both State and Federal agencies. Its strategies include promoting economic and legal incentives for farmers and landowners to adopt sustainable land use practices, setting water quality targets for rivers entering the Reef and monitoring progress, and carrying out research on the effects of pesticides and other chemicals.

Another threat that may be just as serious is coral bleaching, which results from an increase in water temperature that causes the coral to grow pale and malnourished. Global warming is believed to be responsible for this phenomenon. Alarmingly, a report by economist Hans Hoegh-Guldberg and reef expert Ove Hoegh-Guldberg (2004) predicts that coral bleaching will destroy much of the Reef by 2050 if nothing is done to reverse the trend. According to the report:

> The flora and fauna of the Great Barrier Reef is going to change dramatically if current estimates of climate change are correct....Coral cover will decrease to less than 5% on most reefs by the middle of the century under even the most favourable assumptions. This is the only plausible conclusion if sea temperatures continue to rise. Reefs will not disappear but the will be devoid of coral and dominated by other less appealing species such as macroalgae and cyanobacteria....Many organisms that are coral dependent will become rare and may become locally or globally extinct. (pt. 1)

Many environmentalists believe that the current actions of the Australian Government will be insufficient to save the Reef if more is not done to address the problem of global warming. "Global warming and coral bleaching are the cancers that will eat the guts out of all the good work being done on the reef," said John Connor of the Australian Conservation Foundation (as cited in Fickling, 2003). "If the world doesn't act on climate change, we'll end up losing the Barrier Reef altogether." Seeing the Reef was an amazing experience, and the thought that it might not exist in its current condition for later generations to enjoy is a somber one.

We returned to Cairns at around 5:00. My arms and especially the backs of my legs were sunburned, because I forgot to put sunscreen there. One might imagine that I would have learned from this, but the worst was yet to come...

Monday, Sept. 6—

Today we went whitewater rafting on the Tully River, which is located approximately an hour-and-a-half south of Cairns, with the Raging Thunder company. We wore helmets and life vests and went in a group of seven—my project group—plus our guide, Marty, who was very fun. The water level is controlled by a power station and allocated between agricultural, recreational and other uses. Today the level was lower than usual, causing our raft to get stuck on rocks intermittently, but it was still very enjoyable. At several places we swam in the blue-green water, which was colder than it was at the Reef but still relatively warm—about 20 degrees Celsius. We passed rainforest, high cliffs, and waterfalls, and saw a lizard called a water dragon on the rocks

PHOTO 33: The seven of us in our raft on the Tully River

PHOTO 34: Rafting down the Tully

by the edge of the river. The forest here is protected as part of the Wet Tropics World Heritage Area, which I will discuss later. The rapids that we navigated were up to level four in difficulty and I fell out on one of them; I clung to the side of the raft and was pulled back in by Jenny and Whitney. Jane had fallen out on the previous rapid, so I did not feel too embarrassed. We all fell out again on one called the "Guide's Revenge"—I think Marty purposely capsized us. During the bus ride back, we watched videos of people falling out of the rafts. We later went out to a bar in Cairns called the Woolshed. There was a large tree in front of it in which fruit bats could be seen.

The Tully River is unfortunately among the rivers that carry contaminants into the waters of the Great Barrier Reef. A study by researchers from the Australian Institute of Marine Science (2001) found increasing concentrations of nitrates and particulate nitrogen in the waters of the Tully over a thirteen-year sampling period (Mitchell, Reghenzani, & Furnas). This increase coincides with a growth in agricultural activity in the region, particularly sugarcane and banana farming, both of which use fertilizers containing nitrogen. In addition, levels of phosphate and suspended sediment in the lower Tully River have also increased since the early 1990's, coinciding with land use changes in the region (Reef Science Panel, 2003, p. 11). All of this strongly suggests that agriculture and development contribute pollutants to the river. Hopefully the *Reef Water Quality Protection Plan*, noted earlier, will be successful in reducing the level of contaminants in the Tully and other rivers that empty into the Great Barrier Reef.

Tuesday, Sept. 7—

Today we left the Serpent Hostel and traveled north by bus and ferry to Cape Tribulation, aptly known as the place "where the rainforest meets the reef." Here the Wet Tropics World Heritage Area includes both the Cape Tribulation and Daintree National Parks, and is next to another World Heritage site, the Great Barrier Reef. It is the only location on Earth where two World Heritage areas are adjacent. We arrived at our accommodations, PK's Jungle Village,

where we will be staying seven to a room. It is so warm here that the beds are supplied only with sheets. A short walk through a mangrove swamp leads to Myall Beach, a beautiful, spacious stretch of sand bordered by palm trees and forest. There is a river somewhere down the beach where saltwater crocodiles live.

The Wet Tropics were added to the World Heritage list in 1988 after having been assessed to meet all four criteria for listing. The rainforest here is the oldest on Earth—over 135 million years—and contains some of the world's oldest species of plants. It is also home to many animals that are found nowhere or almost nowhere else on the planet. To protect the region, the Queensland Government passed the *Wet Tropics World Heritage Protection and Management Act 1993*, which established a Wet Tropics Management Authority in collaboration with the Commonwealth. This agency, based in Cairns, is headed by a Ministerial Council appointed by both the Federal and Queensland Governments. The Authority is responsible for ensuring that the World Heritage values of the Wet Tropics region are protected and maintained. To do this, it develops management plans and policies in cooperation with local landowners and promotes research and community education programs. The *Wet Tropics Management Plan 1998* regulates activities that may be carried out within the World Heritage Area by banning some types of actions and allowing others with permits. For example, building a road is prohibited, but building a walking track is allowed with a permit (Wet Tropics Management Authority, 1998, p. 10).

A number of activities were available in the area around PK's. The first thing that I tried was "jungle surfing" through the rainforest canopy on privately owned land adjacent to the national park forest. The only people participating at the time were a French couple, the guides, and myself. There were six platforms built around trees and connected by cables, or zip lines, and we were secured in harnesses and helped to glide from platform to platform on the lines. It provided a beautiful view of the forest, and I was able to see some of the 3,000 or so plant species that inhabit the World Heritage area. This number includes more than 395 species considered rare or threatened, forty species of ferns found nowhere else on the planet, and thirteen out of the

PHOTO 35: Myall Beach at Cape Tribulation

PHOTO 36: View of the rainforest canopy from one of the platforms during my "Jungle Surfing" tour. The ocean is visible in the distance.

PHOTO 37: View of the rainforest, with one of the Jungle Surfing platforms and cables visible

PHOTO 38: Me hanging upside-down!

Earth's oldest nineteen families of flowering plants (Wet Tropics Management Authority, 2002a and b). While in the canopy I saw a strangler fig, a type of tree that grows from the top down—it starts on a host tree and extends roots to the ground, ultimately completely engulfing the host tree, which dies. Many plants grow this way because it is too dark on the forest floor for them to grow upward. I also saw epiphytes—ferns that grow in trees—a bridal veil orchid, and a native banana tree. In addition, I was invited to lick a green ant and taste the ascorbic acid that these insects have in their abdomens. I have always wanted to see a rainforest canopy, and this was a fun activity.

Later tonight we had our first discussion as a big group, this one again on ecotourism. We were broken into smaller groups and had to invent accommodations, tours or attractions exemplifying what our ISV staff called the eight principles of ecotourism: a natural areas focus, interpretation, benefiting local communities, environmental sustainability, contributing to conservation, cultural respect and sensitivity, customer satisfaction, and responsible marketing. My group came up with the "Daintree Exotic Plant Park."

Wednesday, Aug. 8—

This morning I followed the nearby Dubuji Boardwalk, which extends for 1.8 kilometers through rainforest, freshwater swamp, and mangrove swamp habitats. It was a very beautiful walk, and signs along the way provided information about plants and animals. I saw many fan palms, some with fronds as big as four-and-a-half feet across; they can reach widths of up to ten feet. There were many mangrove trees in the swamps. These salt-tolerant plants have unique root systems that enable them to draw oxygen directly out of the air rather than from the mud in which they grow. I saw examples of "pencil roots," which stick out of the mud like pencils on end, and "prop roots," which rise high out of the mud around the bases of the trees. Mangrove swamps are important because they provide a habitat for countless animals, including snails,

PHOTO 39: Rainforest flora near the beginning of Dubuji Boardwalk

PHOTO 40: Fan palms along the boardwalk

crabs, shrimp, spiders, birds, bats, and juvenile fish that will later swim out to sea.

In the afternoon I went sea kayaking in the water off Myall Beach. It provided a nice view of the beach and Mt. Sorrow in the distance, but it was tiring, even with two of us per kayak. This was when I made the fateful mistake of not putting sunscreen on my legs and feet. We paddled around the Cape Tribulation headland and stopped to swim briefly. The water was very blue and a good temperature. Our guide told us the story of how the cape got its name—Captain James Cook's ship the *HMS Endeavour* struck a reef here in 1770 and nearly sank, leading to considerable tribulations for him and his crew. The region was already called *Kurangee*—"place of many cassowaries"—by the Aborigines. (There are still cassowaries here, although they have become rare, due largely to loss of habitat. They are territorial and can be aggressive. At one point while on a boardwalk I thought that I heard one behind me, which was somewhat unnerving, but it turned out to be only a brush turkey.) Later that afternoon, after returning from the kayak trip, I walked along Myall Beach and admired the beauty and tranquility of the area. It felt like paradise. Cape Tribulation would be my favorite place on the trip overall.

For our ISV discussion tonight we went to the "Bat House" and listened to Hugh Spencer, head of the Australian Tropical Research Foundation (AUSTROP), a non-profit institution dedicated to conservation and research in the Wet Tropics. AUSTROP is currently fighting to preserve the Daintree lowlands, an area which, unlike the uplands, is not protected as a World Heritage site. Much of the lowland forests have already been destroyed due to agricultural and urban development. The region is important from a conservation standpoint primarily because of its unique diversity of plants, including primitive and threatened species. Mr. Spencer hopes to raise money to buy back some of the privately-owned land in this region so that it can be returned to public ownership and saved from further development. He has received money from the Commonwealth Government, but believes that it does not support his objectives and remarked that the administration of Prime Minister Howard is not encouraging of conservation in general.

PHOTO 41: A mangrove swamp seen from the boardwalk

PHOTO 42: A view of Myall Beach from my kayak, with Mt. Sorrow in the distance

The struggle for the Daintree lowlands offers a good illustration of how the actions of government, at local, state, and federal levels, can either advance or hinder conservation. For most of its history, the government of Queensland, like all of the Australian states, prioritized development over environmental concerns. The campaign to make the Wet Tropics a World Heritage Area was originally waged by conservation groups against the wishes of the Queensland Government, whose premier at the time, Johannes Bjelke-Petersen, was determined that "not one more square inch of Queensland will go on the World Heritage list" (as cited in Wilderness Society, 2001). John Howard, then leader of the Liberal Party in Parliament, joined with the Queensland Government in an "Anti-Heritage alliance" intended to prevent the addition of the Wet Tropics to the list (CAFNEC, 2004a). It was not until the Labor Party administration of Prime Minister Bob Hawke used the Commonwealth's external affairs power to overrule the Queensland Government that the area became a World Heritage Site. The Daintree lowlands along the coast, however, were not included.

Although development of this area has been hindered by lack of easy access to the region and lack of infrastructure for electricity, there has been recent pressure to open the lowlands to more settlement. Conservationists like Hugh Spencer warn that this would lead to the destruction of rare plants and of animal habitat, the introduction of domestic animals and weed species, and the ultimate loss of the coastal rainforest as a viable ecosystem. Four environmental organizations, including AUSTROP, are now attempting to implement a "buy-back program" which, as explained above, involves purchasing privately owned pieces of land in the region to prevent their development. According to the Cairns and Far North Environment Centre (CAFNEC), another organization involved in the effort, the plan needs about A$40 million total (CAFNEC, 2004b). Some money has been provided by the Queensland Government, now under the control of the Labor Party and more supportive of conservation than it was in the 1980s. The Howard Federal Government has contributed "reluctantly," but the amount that it has provided is not considered by conservation groups to be sufficient ("Threats," n.d.).

The other level of government involved the Daintree controversy is local, represented by the Douglas Shire Council. The attitude of the Council toward development in the Daintree lowlands has been somewhat inconsistent. On the one hand, in 2004 it contributed A$5 million to the buy-back effort and also imposed a ban on new housing on about 450 parcels of land north of the Daintree River. However, the Council voted on September 14, 2004, to repeal this ban, even though it enjoyed popular support; the ban had been opposed almost exclusively by affected landowners, who comprised 150 out of the 160 people who voiced their opposition to it (Spencer, 2004a). Mayor Mike Berwick, who supported the ban and had once led a protest against a previous Council's decision to bulldoze a road through the forest, was ill at the time of the vote. He felt "appalled" by the actions of the rest of the Council, who seemed to have taken advantage of his absence (as cited in "Daintree housing ban," 2004). Conservation groups shared this sentiment. Hugh Spencer called it "the absolute nadir for the Douglas Shire Council" and berated the Council's "total contempt for community attitude and for Mayor Mike Berwick" (Spencer, 2004b).

However, the State Government intervened almost immediately. Desley Boyle, Queensland's Minister for Local Government and for the Environment, has overturned the Council's decision and mandated that the housing ban remain in place, at least temporarily. Justifying her intervention, she remarked that "it is a decision of conscience, the Daintree must be protected for our children and our grandchildren" (as cited in "Qld reinstates," 2004). Conservation groups welcomed her support, while others felt that she had overstepped her bounds. "We do not want to see a situation where ministers regularly intervene in the local government planning process," commented Greg Hallum of the Local Government Association of Queensland (as cited in "Local govt upset," 2004). The future of the Daintree lowlands will likely depend on how much funding the State and Federal Governments choose to contribute to the buy-back project, and whether the development ban will remain in place after the Douglas Shire Council finishes its Planning Scheme in 2005.

After his discussion about the Daintree, Hugh Spencer planned to show us one of the flying foxes at the Bat House, but I had to leave a bit early to participate in a "Croc-Spotting Night Walk." A small group and I were given flashlights and led through the rainforest, looking for crocodiles and other animals. We searched several sites for crocodiles first. It was exciting, if a bit unnerving, to sweep our flashlights over the dark water while knowing that a crocodile could be lurking beneath it. I was unaware of this at the time, but the Estuarine Crocodile of North Queensland is known as the most aggressive species in the world. We eventually found one, although I saw only its eye, which shone like a small orange star in the glow of the flashlight. We also saw a stingray, insect-eating bats, cane toads, spiders, two large crickets, and what might have been a python in a tree. Our guide saw a bandicoot and a rat, but they ran away before the rest of us could see them. He said he was surprised that we did not see more mammals. The walk was very enjoyable, but halfway through it my sunburn from the afternoon caught up with me and my legs started to hurt. My feet were also burned and had already been feeling sore. By the end, the pain was keeping me from enjoying my surroundings, and I could not focus on anything besides walking. I started trying to pretend that I was a guerrilla fighter following Che Guevara through the jungle and I had been shot in both legs, because it felt a little like that. I got back to PK's and went to bed; I had been planning to go down to the beach and see what it looked like at night, but that was now out of the question. My legs felt as if they were on fire. I find it interesting that some of my best and one of my worst experiences of the trip were all today—I loved the walking on the beach and through the rainforest, but because of my sunburn tonight was a low point.

PHOTO 43: A cane toad spotted during the Night Walk

Thursday, Sept. 9—

Today we left Cape Tribulation and drove south to the holiday and tourist town of Airlie Beach, stopping briefly back in Cairns along the way. We passed many sugarcane fields, some of which were ablaze with intentional fires, and I got a glimpse of a beautiful sunset. It was a long drive—650 km—and we arrived at Airlie Beach at around 7:00 in the evening. The climate here is still tropical; there are many palm trees. We are staying at a place called Reefo's, which offers probably the nicest accommodations so far; each room has its own bathroom and kitchen, with a good amount of space.

Friday, Sept. 10—

My feet and legs are so sunburned that it hurts to walk, and they look terrible, so I stayed at Reefo's today instead of going sailing around the Whitsunday Islands and snorkeling with the rest of the group. I read, used the Internet, and relaxed. I heard from the people who went snorkeling that the reef was very close to the surface here and that they were afraid of stepping on

the coral, and also that the water was slightly murkier than in Cairns, but that there were many fish and a turtle.

Saturday, Sept. 11—

Today I went to Whitsunday Tropical Bird Park with Ilynne and several other people from ISV. Here we met the "Barefoot Bushman" Rob Bredl, who was indeed without shoes. He is also the host of "Killer Instinct," an Australian wildlife television series, and has been handling animals, particularly crocodiles, for many years. He had an obvious conservative bias and seemed even anti-conservation at times, and I felt like telling him that I had come to the park to see animals, not to hear his political message. After everything he said I felt a bit nervous when he held a poisonous snake mere feet from us and told us that it would not bite. He was a character though, and hearing different opinions is good. He let us hold a koala, a carpet python, a blue-tongued lizard, and a baby crocodile ("Snappy"). He allowed a mildly poisonous snake bite his hand just for demonstration, and walked close around his crocodile ponds to show us that the animals are not as dangerous as their repute. He even gently kicked one. One of the themes he stressed was that Australian animals are not as dangerous as they are thought to be. They can still be deadly, but he tried to put the threat in perspective by giving us statistics on the actual number of people killed by animals versus those killed in more mundane ways. Many more people die in accidents at home or on the road. I had been slightly worried about dangerous animals throughout the trip, and this was good to hear. At the Park we were also able to feed kangaroos, including a joey, and two emus. There were many tropical birds, as well as a pen with dingoes and one with cassowaries. Overall it was a very fun place. We left Airlie Beach tonight at 8:00 for our overnight bus ride to Fraser Island.

PHOTO 44: Me feeding kangaroos at the Whitsunday Tropical Bird Park

PHOTO 45: Holding a koala

PHOTO 46: Rob Bredl holding a snake

PHOTO 47: Me with a blue-tongued lizard

Sunday, Sept. 12—

The overnight bus ride was somewhat uncomfortable, mainly because I was too cold, but I did manage to sleep a little. We took a ferry to Fraser Island and arrived at around 9:30 a.m. This World Heritage site is the largest sand island in the world, measuring 122 kilometers long and five to 25 kilometers across; there is apparently more sand here than in the Sahara desert. It is the only place on Earth where rainforests grow out of sand dunes. The island also supports dry forests, woodlands, and marsh regions. The forests are interspersed with exposed dunes and half of the perched freshwater dune lakes in the world. We stopped to swim at one such lake, Lake McKenzie, "the most beautiful lake in the world" according to our bus driver. It was beautiful, but I stayed on the shore because of my sunburn. We then continued along the sand roads—there are no paved roads on the island—to Eurong Beach Resort, which offered probably the best accommodations on the whole trip. I was in a room with Jane and Ilynne, and we had our own bathroom and kitchen and a balcony with a nice view of the palm trees and bottlebrush outside.

I was confused about when our group activity, a hike to Lake Wabby, was supposed to start, and I accidentally missed it. Instead I went and saw the beach, which is just outside our resort. The beach is used as a road on the island by buses, jeeps and small planes, so we were warned not to sunbathe on it. Moreover, although the water looks inviting, we have been warned not to go swimming because of the many sharks here. Our bus driver also mentioned an extremely poisonous type of jellyfish, the irukandji. Apparently one brush against this animal can be enough to kill a swimmer. Also on the Fraser Island are the five most poisonous snakes in Australia and the toxic funnel web spider. There is a population of wild dingoes, as well as many signs warning us not to feed them, as they have been known to be aggressive. Of course, not all of the animals on the island are so intimidating. Among the approximately 350 types of birds that can be found here are the cockatoo, the rainbow lorikeet, the rare ground parrot, and many

FIGURE 12: Map of Fraser Island, showing some of the locations we visited

PHOTO 48: Lake McKenzie

migrating species that use the island as a temporary resting place. I also saw another goanna near Lake McKenzie.

Like the Great Barrier Reef and the Wet Tropics, Fraser Island's management is overseen by representatives of both the Commonwealth and the Queensland Governments but is under the day-to-day management of the Queensland Parks and Wildlife Service. Most of the island is incorporated into the Great Sandy National Park. The *Great Sandy Region Management Plan*, adopted in 1994 by the Queensland Government, sets forth policies and regulations for Fraser Island that will be in effect until at least 2010. The purpose of the Plan is to help "pass on to future generations an environmental treasure undiminished by the enjoyment and use of our generation" (Robson, 1994, p. 2). The Plan prohibits some activities, including mineral extraction on the island, the use of vehicles on some beaches, and building bridges to the island. Other activities, such as camping, tourism, whale watching, and vehicle use in general are controlled. All vehicles brought onto the island must have permits.

Some conservation-minded groups, including the Fraser Island Defenders Organization (FIDO), feel that current governmental efforts to protect the island are not yet sufficient. Specifically, FIDO contends that too many authorities have control over the island, leading to jurisdictional confusion, inefficiency, and lack of coordination. Although most of Fraser Island is a national park under the jurisdiction of the Queensland Parks and Wildlife Service, some areas are controlled by local governments or other State agencies. FIDO would prefer the establishment of a single Fraser Island Authority to manage the entire region. FIDO also advocates further restrictions on vehicle use, including aircraft and trail bikes, better fire management, better weed control, tighter management of camping and fishing, a better plan to control dingoes, and greater attention paid to the problem of sediment pollution in island lakes. At all levels of government FIDO is disappointed with what it sees a "lack of political will to both provide the resources and the leadership to get the bureaucracy to deliver better management" (FIDO, 2004, p. 12). Although the Commonwealth has provided funding for conservation on the

island via the Natural Heritage Trust, FIDO in January of 2004 called the Howard administration the "worst ever Federal government FIDO has experienced as far as Fraser Island is concerned" (FIDO, 2004, p. 12) and denounced its financial contribution to the island as insufficient.

Tonight we had dinner in the cafeteria at the resort and had another group discussion, this one on fire management. We saw the silhouette of a dingo pass by in the night outside.

Monday, Sept. 13—

Today was a busy day. This morning we traveled by bus along the aptly named 75-Kilometer Beach, which was empty except for other vehicles and a few campsites. We stopped to see a substance called coffee stone, which looks very much like rock but is actually compacted sand. We also saw fragments of white shells from old Aboriginal trash piles, or "midden heaps"; Aboriginal people lived here for more than 5,500 years, calling the island *K'gari*, or paradise. We next stopped to see cliffs of red-colored sand and to read an Aboriginal story explaining this appearance. According to the legend, a young woman was betrothed to a man, but she fell in love with the Rainbow instead and would come to the beach to see him. The man grew angry and jealous and tried to kill her with an arrow, but the Rainbow protected her and was struck instead. The Rainbow was shattered and his colors dyed the sands. We went on to see a famous shipwreck, that of the Maheno. This former luxury cruiser was en route to Japan in 1935 when a cyclone caused the cable towing it to snap. Much of it is buried under the sand now, but a lot is still visible.

I then went on a flight in a small plane that seated eight people. I had not been planning to do this, but I decided on a whim to participate. We took off from the beach and flew over the island for about fifteen minutes, taking in a wonderful view of the dunes, lakes, forest, and winding sand roads before landing back on the beach. It was the first time that I had been in such a plane, and it was an exhilarating experience. After I rejoined the rest of the group we went

PHOTO 49: Me in front of the cliffs of colored sand

PHOTO 50: The Maheno shipwreck

PHOTO 51: View of the beach from the air, with two vehicles visible far below

PHOTO 52: A butterfly-shaped perched lake seen from the plane

PHOTO 53: A view of the beach and some of the many bare dunes

PHOTO 54: The Champagne Pools

PHOTO 55: The cliffs at Indian Head

PHOTO 56: A view of the beach and its sweeping waves from Indian Head. A bus is visible in the left-center part of the photo, providing a reference for the scale.

swimming in large tide pools called the "Champagne Pools," so named because the ocean waves would splash into them over the rocks and make the water frothy. I went in despite my sunburn this time. We then visited Eli Creek, the largest freshwater creek on the island, although its water level was low. Finally, we climbed the elevated headland, Indian Head, and saw a beautiful view of the vast beach on either side. I saw an osprey, and some people reported spotting dolphins in the brilliant blue water.

We returned to Eurong and had another discussion tonight, this one a role-playing exercise in which were to take on the personas of various stakeholders and attempt to develop a dingo management plan. Such a plan was actually developed after a dingo bit and killed a nine-year-old boy on the island in 2001. This time the discussion was particularly fun for me because my role was simply to attempt to derail the meeting. I think I did a good job.

Tuesday, Sept. 14—

Today we went to Central Station, a former logging camp. Fraser Island was logged for 130 years prior to becoming a World Heritage Area in 1992. Some of the old buildings from the camp remain, including the overseer's house. We were fortunate enough to find a box orchid, which blooms for only one week out of the year, growing on a nearby tree. We then took a short walk to view some of the other flora of the island. We saw a 600-year-old Satinay tree, or Fraser Island Turpentine, which grows naturally nowhere else on Earth. The wood from these trees was once used to support the Suez Canal and to make some of the furniture in the Australian Parliament House. We also saw a 1,500-year-old King Fern, or *Angiopteris evecta.* Not only is this individual plant remarkably old, it also belongs to one of most ancient plant species on Earth, dating back to the time of the dinosaurs.

We then left Fraser Island and continued south by bus to Byron Bay, a tourist town in northern New South Wales. Here we are staying at the Rainforest Resort, where twenty of us

PHOTO 57: The Satinay tree, endemic to Fraser Island

PHOTO 58: A 1,500-year-old King Fern

share a cabin and there is not a lot of room—but we will only have to be here for one night. Tonight we all went to the Cheeky Monkey, a pub in town, where there were various games and a trivia competition that my team lost pathetically.

Wednesday, Sept. 15—

Nearly everyone went surfing today in Byron Bay, but I decided to stay in town and do some shopping instead. I used the Internet and bought Greyhound bus tickets to Canberra for my trip there tomorrow. In the evening we left for our overnight bus ride to Sydney. This time it was even more uncomfortable than the last and I was barely able to sleep at all, but I was looking forward to going to Canberra in the morning.

Thursday, Sept. 16—

This morning we arrived in Sydney, where we will be staying at Hyde Park Inn. Everyone else will be exploring Sydney today while I go to Canberra on my own. I went to the Greyhound station and took the 9:15 bus. We passed miles and miles of pasture on the way, arriving in Australia's capital at 1:00 in the afternoon. I had read that Canberra was isolated, but it was surprising to see how little development there was between the two cities. The travel book that I had read had portrayed Canberra in somewhat unflattering terms, but I found it surprisingly nice. It is more compact and easier to navigate than I had expected, and it is aesthetically attractive, adorned with vegetation and a lake, Burley Griffin, that separates the city center from the government district. It was also smaller and less crowded than I would have expected for a capital, a clear reflection of Australia's small population.

Since I only had about five hours to spend in the city I was worried about time, so I took a taxi to Parliament House to make the 1:30 guided tour. I passed my backpack and purse

through a security scanner and went inside into the Foyer. The tour began upstairs in the Great Hall, where a giant tapestry featuring trees, a cockatoo, and Haley's comet hangs on the far side of the room. We were shown the House of Representatives, which has a pale green scheme—the color of gum tree leaves—and contains desks arranged in a large U-shape. At the front of the room is a chair for the Speaker of the House, now David Hawker. The Clerk and Deputy Clerk sit at the table in front of him. Across from each other at the table are places for the Prime Minister and the leader of the Opposition. Representatives from the governing party or coalition sit on the right-hand side of the room, representatives from the opposition party sit on the left, and those from minor parties sit in the back left. There are areas for spectators and the press above. Currently the governing coalition, the Liberal Party and the Nationals, have together 86 representatives in the 150-member House. The Opposition, the Labor Party, has 60. The Country Liberal Party has 1, and 3 members are independent. All eight states and territories are represented: New South Wales (50 members), Victoria (37), Queensland (28), Western Australia (15), South Australia (11), Tasmania (5), the Northern Territory (2), and the Australian Capital Territory (2).

We then saw the Senate, which is arranged similarly but has a red color scheme, as does the British House of Lords. The President of the Senate, now Paul Calvert, sits in the chair at the front. At the table are places for the leader of Government in the Senate, Robert Hill, and the leader of the Opposition in the Senate, Christopher Evans. The governing coalition currently has 34 members in the Senate, the Labor Party has 28, the Australian Democrats have 7, the Greens have 2, One Nation has 1, the Country Liberals have 1, the Australian Progressive Alliance has 1, and 2 members are independent. The fact that more minor parties are represented in the Senate than in the House is typical; this is because Senators are elected via the principle of proportional representation while members of the House are elected via single-member district representation.

I was curious about political parties in Australia, the ideologies that they endorse, and particularly their attitudes toward the environment. Due to Australia's parliamentary structure,

PHOTO 59: Parliament House

PHOTO 60: Me in the House of Representatives

whatever party controls the executive also controls the legislature, giving it considerable power to enact its agenda; this makes the question of which party leads especially important. Most prominent throughout Australia's history have been the Liberal/National Coalition and the Australian Labor Party, although there are also many minor parties. I discuss below only those parties that currently have at least one member in Parliament.

The Liberal Party, led by Prime Minister Howard, who recently won reelection, is an economically liberal, somewhat socially conservative party roughly equivalent to the Republican Party of the United States. It professes a commitment to "preserving Australia's natural beauty and the environment for future generations" (Liberal Party of Australia, 2004), and Liberal leaders have presided over some measures aimed at conservation. For example, Malcolm Fraser of the Liberal Party was in power when legislation was passed to prevent sand mining on Fraser Island, and John Howard's administration established the Natural Heritage Trust. However, as a party that represents the business class, it also advocates free enterprise and minimal government interference in the economy. These two goals are potentially conflictual, as some governmental restrictions on the activities of individuals and corporations have historically been necessary in the pursuit of environmental objectives.

The conservative, agrarian-based National Party, or Nationals, currently holds far fewer seats in Parliament than does the Liberal Party, but it has been an essential part of the current and historical alliance between the two. It has governed in coalition with the Liberal Party for all but one of the years in which the Liberal Party was in power. It lists among its key principles "security, individual achievement and strong representation for local communities" as well as "traditional values" (Nationals, 2004). Like their coalition partners, the Nationals have not tended to be particularly supportive of environmental causes.

The Australian Labor Party (ALP), currently the Opposition in Parliament, endorses a center-left, social democratic ideology that embraces government as a positive vehicle for progress. In ideology and national stature its closest analogue in the United States is the

PHOTO 61: The Senate

PHOTO 62: View from the roof of Parliament House, looking across Federation Mall toward the Old Parliament House, Lake Burley Griffin, and the Australian War Memorial

Democratic Party, although the ALP is probably a little farther to the left. It strongly supports workers' rights and is a member of the Socialist International, although its policies are moderate and reformist rather than radical or truly socialist; Lenin pejoratively termed it a "liberal bourgeois party" in 1913 (as cited in Palmer, 1999). The ALP is the oldest political party in Australia and has won a total of twelve national elections since federation, the last one in 1993. It has never governed in coalition with another party. It is more emphatic about supporting conservation than is the Liberal or National Party, advocating the view that "economic and social changes can only endure if they are environmentally sustainable" (ALP, 2004a, para. 18). Many pieces of federal environmental legislation were passed under Gough Whitlam and Robert Hawke, two of Labor's recent Prime Ministers, and its current leader, Mark Latham, has called the ALP an "environmentally progressive party" (Latham, 2004). The ALP advocates ratifying the Kyoto Protocol, increasing the MRET from two percent to five percent, and supporting efforts by conservation groups to save the Daintree lowlands (ALP, 2004b).

The Australian Democrats is a successful minor party that also endorses a center-left ideology. Compared to the ALP, it is more concerned with conservation, seeking "to accept the challenges of the predicament of humanity on the planet with its exponentially increasing population, disappearing finite resources and accelerating deterioration of the environment" (Australian Democrats, 1997). Consequently this party has a strong history of environmental activism, including introducing the first bill to include Australian property on the World Heritage List. It currently has seven members in the Senate, although none in the House of Representatives.

Of all of Australia's political parties, the Australian Greens is the most committed to environmental protection. This democratic socialist party is part of an international network of around 70 Green parties, all of which are strongly focused on conservation. It looks forward to a transition to a society that is more respectful of the environment: "To become ecologically sustainable, our society must change from one which recognizes no physical or ecological limits,

to one that lives within the capacity of the Earth to support it and which allows for the Earth to sustain the diversity of living things" (Australian Greens, n.d. p. 1). It is particularly concerned with combating global warming and protecting Tasmania's forests.

Three smaller parties also have members in Parliament. The Country Liberal Party is based in the Northern Territory and aims exclusively to promote the interests of the Territory. Its ideology is similar to that of the Liberal and National Parties and it appears to prioritize economic development in the Territory over environmental protection. One Nation embraces a conservative, nationalist ideology that has been described as right-wing populism. It claims to value the Australian environment and to support the development of cleaner energy technologies, but has opposed the Kyoto Protocol. Finally, the Australian Progressive Alliance (APA) is another moderate leftist party that pays considerable attention to conservation, stating that "sustaining our environment must be a central consideration in everything we do" (APA, n.d.).

	COALITION	LABOR	DEMOCRATS	GREENS
Greenhouse Pollution/Energy Reform	D	B-	A-	A+
Repairing Damaged Land and Waters	C-	B	A	A+
Forests, Marine, Great Natural Areas	D+	C+	B+	A+
Nuclear-Free Australia	D-	B	A+	A+
National and International Leadership	D	B-	B+	A+
Average	*D*	*B-*	*A-*	*A+*

TABLE 2: "Report card" scoring the four major political parties on environmental issues

Table 2 is a "report card" compiled by various environmental groups in November of 2001, just prior to that year's federal election. The Liberal/National Coalition, the Australian Labor Party, the Australian Democrats, and the Australian Greens were rated on their responses to five environmental issues according to their campaign promises and records in the previous Parliament. Grading was on a scale of A+ to D-. Across every category, the ALP was judged as

significantly better than the Coalition, although not as good as the Democrats or the Greens, the latter receiving a perfect score. This general result was corroborated by another evaluation, carried out by the Australian Conservation Foundation, Greenpeace and the Wilderness Society. This time, the same four political parties were judged based on their policies regarding three environmental issues: preserving the forests of Tasmania, restoring the flow of the Murray River, and addressing climate change. Again the Greens were rated highest, followed by the ALP and then the Democrats, with the Coalition once more in last place. "The ALP clearly has a better climate policy than the government," said Helen Oakey of Greanpeace (Wilderness Society, 2004). "The Howard Government does not have a plan to reduce greenhouse pollution or to save Tasmania's forests." One more document is instructive; this one was prepared by the Australian Conservation Foundation prior to the 2004 federal election and charted the policies of the four parties across five areas: national leadership on the environment, reduction of greenhouse gas pollution, protection of great natural areas, repairing land and rivers, and promoting sustainable cities (ACF, 2004b). Again the ALP appeared more willing than the Coalition to use national policy and resources to promote environmental goals.

After the guided tour of Parliament House, I looked at portraits of former Prime Ministers and a copy of the Magna Carta on display, one of only four in the world. I also went onto the roof of the building, which offers a view of the Old Parliament across the green outside and the Australian War Memorial in the distance beyond it. My next stop was the Old Parliament House, which was in use from 1927 until 1988 and is now preserved as a museum. It was the center of government during the time that early environmental legislation was being enacted. I was surprised at how empty the area was as I walked across the green, or "Federation Mall," between the two Parliaments; I was almost the only one there. In front of the Old Parliament I noticed the remnants of what must have been an Aboriginal rights demonstration; there was a large chalk drawing on the pavement and a display with an Aboriginal flag.

PHOTO 63: The Old Parliament House, in use from 1927 to 1988. Chalk drawings from an Aboriginal rights demonstration are on the pavement in front.

PHOTO 64: The old House of Representatives

I went inside the building into King's Hall, which features a statue of George V, the ruler of Britain and Australia in 1927. There are also large portraits of former Prime Ministers, as well as eight bronze bas-reliefs of founding figures such as the first Prime Minister, Sir Edmund Barton. After I briefly looked around the National Portrait Gallery, which features paintings of people important to Australian history, I took the 3:15 p.m. guided tour starting in King's Hall. To the right is the Senate Chamber, which is smaller than the one in the new Parliament, but has the same red color scheme. Opposite is the House of Representatives, similar than the new one but, again, in green. The decorative Speaker's chair here was a gift from Britain in 1926. We then saw the Ministerial Party Room, in which members of the government would meet. It was also where parties would elect their Prime Ministers. There are mannequins here of two former prime ministers, Joseph Lyons and Sir Robert Menzies. We visited the room that served as the Prime Minister's office for Gough Whitlam, Malcolm Fraser and Bob Hawke. We also saw the Cabinet Room, where the Prime Minister and his ministers would discuss policy. On the second floor, above this room, we saw the Press Gallery. We also visited the room in which the Queen stayed when she came to Parliament.

I left the Old Parliament and walked to the nearby High Court, the Australian equivalent of the U.S. Supreme Court. It was 4:30 and the building had just closed, so unfortunately I was not able to go inside. As mentioned earlier, the High Court has historically played an important role in environmental policy in Australia by interpreting the Commonwealth's constitutional powers in a way that gave the federal government more control over the environment. It was the site of several important court cases in the 1980s, including the Franklin Dam Case. However, the Australian judiciary is not as influential or powerful as its equivalent in the United States when it comes to determining environmental policy, for several reasons. Australian courts are less independent of the executive branch, meaning that it is difficult for them to contest government actions. It has also historically been difficult for individuals and groups to use litigation to pursue environmental goals, because plaintiffs have been required to show that they

PHOTO 65: The Ministerial Party Room, with mannequins of Joseph Lyons (seated, Prime Minister 1932-1939) and Sir Robert Menzies (PM 1939-1941, 1949-1966)

PHOTO 66: The Prime Minister's Office, last used by Bob Hawke

PHOTO 67: The Cabinet Room

PHOTO 68: The High Court of Australia

are opposing the violation of a private right or that they have suffered personal damage. This has prevented some organizations from taking environmental battles to court, as they have not been able to show that damage to the environment affects them personally (Lynch & Galligan, 1996, p. 217). More recently standing has been expanded, but the courts in Australia still lack "the will or the means to launch a serious challenge to executive decisions" (Holland, 1996, p. 10).

After viewing the High Court I walked back across the bridge over Lake Burley Griffin and to the city center, where I caught the 6:00 p.m. bus back to Sydney. It would have been nice to have had more time to spend in Canberra, as it was one of the high points of my trip.

Friday, Sept. 17—

On the last day of our Adventure Tour, we visited the Blue Mountains National Park, part of the Greater Blue Mountains World Heritage Area, about 100 kilometers west of Sydney. The region of over one million hectares was only recently added to the World Heritage List—in late 2000—and consists of seven national parks and a conservation reserve. It is managed mainly by the NSW National Parks and Wildlife Service in accordance with a plan that aims to protect the region's biodiversity, natural features, and cultural heritage. The forest here is part rainforest and part dry, and the trees appear from a distance to have a bluish tint, which we noticed when we stopped to take photographs at a lookout site. We rode the Katoomba Scenic Railway, the world's steepest incline railway, to the bottom of Jamison Valley, and then followed a boardwalk with signs providing information about the region. We learned that the area had been mined for coal in the 1800s and early 1900s. We then took the Sceniscender, Australia's steepest cable car, back up to the top.

We next went abseiling in another area of the Blue Mountains. We were given helmets and strapped into harnesses, and taught how to lower ourselves backwards down the sandstone cliffs. We first practiced on small cliffs before attempting the big one—a 155-ft drop. This was

PHOTO 69: The Blue Mountains National Park

PHOTO 70: View from the Sceniscender as we rode to the top of the valley

PHOTO 71: Me rappelling on one of the practice cliffs

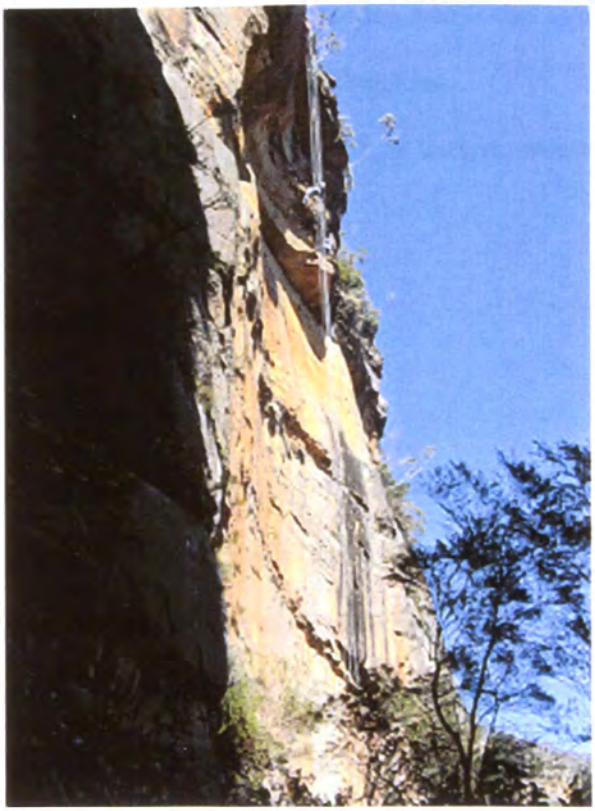


PHOTO 72: The big cliff, 155 feet

probably the most intimidating activity on the entire trip. It took a few minutes for me to convince myself to attempt it. I was particularly nervous because on the previous practice cliff, I had been unsuccessful at "jumping" down the rock face and ended up slipping when I tried. However, on this big cliff our feet were in contact with the rock for only the first approximately fifteen feet; the rest was a free vertical drop. This made it less difficult than it otherwise would have been. It was still very daunting to get past the first few feet of overhang and let myself drop, supported only by the ropes. The view was beautiful, but I was content only to do it once.

Afterward we went to see "The Edge," an IMAX film about the Blue Mountains. We learned how a grove of Wollombi Pines, a species thought to have been extinct since the time of the dinosaurs, was discovered here in the Blue Mountains in 1994. There are only about forty of these trees, and they grow nowhere else on Earth. This discovery is evidence of the ancientness of the Blue Mountains, which are believed to have provided a haven for animals and plants during times of climatic change. The region also contains many other species of rare or threatened plants, as well as threatened mammals and reptiles.

After our day in the Blue Mountains we went back to Hyde Park Inn, and I packed in preparation for our flight home tomorrow.

Saturday, Sept. 18—

This morning we said goodbye to Jenny and Patrice, who will not be leaving on our flight, and went by bus to Sydney Airport. Our plane departed at around 12:30 pm. The trip across the Pacific was slightly shorter this time, about twelve-and-a-half hours, and again made bearable by the many movies available. Due to crossing the International Date Line we arrived in Los Angeles at around 8:00 a.m. Pacific Standard Time the same day. I said goodbye to Ilynne, Jane, Sandy, and Whitney, and stayed in L.A. for another day before going home.

Analysis and Conclusions

Australia has made much progress toward environmental conservation since the 1970s. I was able to experience some of the results of this firsthand during my trip—specifically, a local conservation project funded in part by government grant money, and four regions protected under World Heritage status. However, conservationists and other analysts believe that the Australian Government, particularly the Commonwealth, should enact stronger policy in order to perform as well as other nations and to mitigate persisting environmental problems, including greenhouse gas emissions, land clearing, and biodiversity loss. The following section discusses both the strengths of weaknesses of Australia's environmental policy.

The operation of projects like River Paramedics is possible in Australia at least in part because of government decisions to fund them. At the Commonwealth level, as mentioned before, resources are provided through the Natural Heritage Trust, called by its creators "the largest environmental rescue plan ever undertaken in Australia" (DEH & DAFF, 2004). The community component of the Trust has funded thousands of local conservation projects, including 1,411 in its 2003-2004 year (Kemp & MacDonald, 2003, 2004). Much of the funding provided by the Trust goes to local "landcare" associations, described as a "national network of hands-on conservation groups" (Knack, 2004). This system of local, community-based conservation is being used as a model in the United States and South Africa (Hill, 2000). Money for river conservation projects is also now provided through the various Catchment Management Authorities, an arrangement that Leonie Koshoorn, Newcastle regional manager for CVA, calls "a huge change for the better...as to how funding is distributed for priority environmental works" (personal communication, Nov. 23, 2004). The success of the Natural Heritage Trust, the landcare network, the Catchment Management Authorities, and projects like River Paramedics is very encouraging.

The other positive element of Australia's environmental policy that I had the opportunity to experience was the protection of its World Heritage Areas. Australia contains more World Heritage Areas nominated for natural heritage than does any other country except the United States. I was able to swim with fish and coral in the Great Barrier Reef and view the pristine splendor of Cape Tribulation, Fraser Island, and the Blue Mountains in part because of this protection, as well as their management as National Parks at the State level. It is clear that threats to these sites remain, particularly to the Great Barrier Reef, but their classification as National Parks and as World Heritage Areas have undoubtedly saved them from even more deterioration. Another positive achievement of the Australian government is the EPBC Act 1999, described by Simon Molesworth, chairman of the Environment Institute of Australia, as "equal to any environmental legislation I know of in any comparable jurisdiction around the world," and ahead of the countries of Europe, Asia, and the Pacific (as cited in Hill, 2000).

Despite these achievements, critics charge that Australia's environmental policy is not strong enough. One way to assess the nation's environmental performance is to compare its environmental status and actions to those of other countries. A useful tool for this purpose is the 2002 Environmental Sustainability Index, or ESI, which uses a variety of indicators to rank 142 nations according to their "overall progress towards environmental sustainability" (Global Leaders for Tomorrow Environment Task Force, 2002). Scores range from 73.9 (first place, Finland) to 23.9 (last place, Kuwait), with higher scores indicating greater progress.

As Figure 13 indicates, Australia ranked relatively well—sixteenth out of 142, well ahead of the United States—but was outscored by fifteen countries: Finland, Norway, Sweden, Canada, Switzerland, Uruguay, Austria, Iceland, Costa Rica, Latvia, Hungary, Croatia, Botswana, Slovakia, and Argentina. Furthermore, if one breaks down the total score into its individual indicators and variables, it is clear that Australia's record on some environmental issues is much more impressive than its record on others. Table 3 ranks Australia and four other developed countries—two that received a higher total ESI and two that received a lower—across

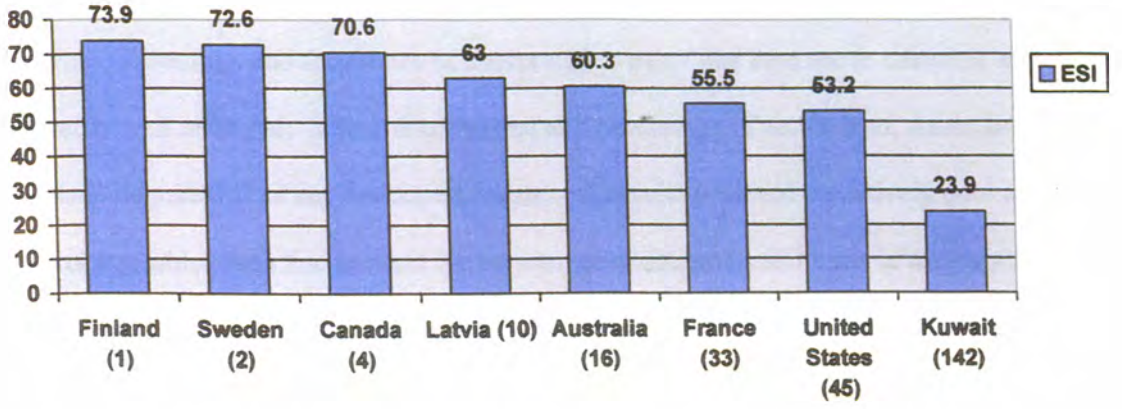


FIGURE 13: ESI scores and rankings (in parentheses) of selected countries

selected indicators. Numerically lower rankings indicate a better performance from a conservation standpoint, and are again out of a total of 142 nations.

INDICATOR	FINLAND	CANADA	AUSTRALIA	FRANCE	USA
Biodiversity	48	36	125	103	101
Land	38	5	7	133	42
Ecological Footprint per Capita	135	134	136	132	141
Environmental Governance	13	12	44	9	5
Renewable Energy Production	46	26	89	73	88
Greenhouse Gas Emissions	116	127	134	83	133
Participation in International Efforts	5	13	14	8	18
Percentage of Land Area under Protected Status	52	56	60	45	12

TABLE 3: Rankings of five countries across selected environmental indicators

Australia placed well on Participation in International Efforts to protect the environment, although it was outranked by Finland, Canada, and France. It also received a good score—seventh place—on Land, which took into account the percentage of total land area impacted by agriculture and other human activity. After all that I had learned about Australia's extensive land clearing, this was initially baffling, until I remembered that a vast proportion of the country's

total area—the arid interior or outback—is almost uninhabited. Thus the seventh place score is somewhat misleading, and should not be interpreted to mean that land use in habitable regions is necessarily well managed. In fact, if calculated as a percentage of arable land, Australia has the worst land degradation of any developed country. Australia achieved a relatively poor rank on Biodiversity, which took into account the percentage of mammals and birds in each country that are threatened. This corroborated a fact that I had read elsewhere—that Australia's rate of mammal extinctions is the highest in the world. All five countries ranked almost last regarding their Ecological Footprints per Capita, a measure of the average amount of resources consumed by each citizen; Australians consumed more per capita than all but six countries. The countries also scored relatively poorly on Greenhouse Gas Emissions, which included emissions per capita and per dollar of GDP, with Australia ranking the worst of the five. In addition, Australia scored poorer than the other four nations on Renewable Energy Production as a percentage of total energy consumption, as well as on Percentage of Land Area under Protected Status. The latter was initially a surprise to me after having visited four World Heritage Areas, but this may again be partly the result of Australia's high percentage of uninhabited land, and could therefore be misleading. It also would appear not to take into account marine reserves such as the Great Barrier Reef. Lastly, Australia did not achieve an impressive rank on Environmental Governance, an indicator that considers a number of variables dealing with the clarity, innovativeness, stringency, and other aspects of environmental regulations. All of this is in stark contrast to a statement by Robert Hill (2000), Minister for the Environment and Heritage, in which he claimed that "Australia compares favourably with the rest of the world across all environmental areas."

An alternate tool for international comparison is the environmental policy index developed by David Roodman (2004) of the Center for Global Development. This index, calculated for 21 wealthy countries, is more focused on the international impacts of environmental policy than is the ESI. The total score consists of two weighted components: 1)

Depletion of Shared Commons, which takes into account greenhouse gas emissions per capita, gasoline taxes, consumption of ozone-depleting substances, and fishing industry subsidies, and 2) Contribution to International Efforts, which considers ratification of the Kyoto Protocol, the Montreal Protocol on Substances that Deplete the Ozone Layer, and the Convention on Biological Diversity, as well as financial contributions to international environmental institutions. Total scores range from 7.8 (Switzerland) to 2.3 (the United States), with higher scores indicating better policy from an environmental perspective. Regrettably, Australia scores low on both components and receives a total score of 3.3, ranking it eighteenth out of 21 nations. It outscored only the United States, Canada, and Ireland. Scores for each component and overall are presented in Figure 14.

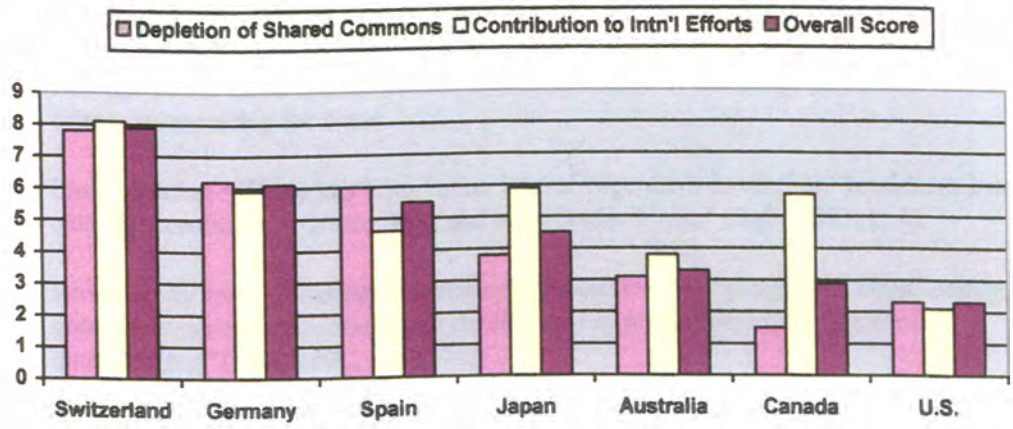


FIGURE 14: David Roodman's environmental policy index for selected countries

All countries have different environmental situations, and the fact that Australia ranks comparatively poorly is not necessarily proof that its government is not doing all that it can to promote sustainability and conservation. However, it does strongly suggest that there is room for improvement. Dr. Peter Christoff, a professor at the University of Melbourne, goes farther than this in his 2002 report "In Reverse." He claims that:

> ...Australia is lagging behind, internationally, in the task of building an ecologically sustainable economy. This is not just because other nations are implementing new policies and investing more heavily in programs to "green" their economies—which they are—but also because we are failing to deal with our environmental problems domestically. (Christoff, 2002, p. 47)

To assess the effectiveness of Australia's environmental policy in a more quantitative way it is necessary to review current threats to the nation's ecological sustainability and the government's response to them. The *State of the Environment (SoE) 2001*, a report prepared by the Department of the Environment and Heritage, is the most recent comprehensive report on the status of Australia's environment. It identifies a number of unresolved problems, including the following:

- Climate Change – Greenhouse gas emissions increased by almost 17 percent between 1990 and 1998 and are still rising (Australian SoE Committee, 2001, p. 5). Energy use per capita is also on the rise.
- Damage to the Great Barrier Reef – Rivers continue to discharge pollutants into the waters surrounding the coral.
- Land clearing – There has been "a net loss of vegetative cover," as "broadacre land clearing continues in Queensland and New South Wales" (SoE, 2001, p. 6).
- Biodiversity loss – Although biodiversity protection has "progressed significantly," genetic diversity is nonetheless in decline and species diversity is "generally deteriorating" (SoE, 2001, p. 82, 71).
- Water quality problems – Salinity is increasing in many areas, and the pollution of rivers with sediment, nutrients, and pesticides continues.

The report concludes that "despite some areas of significant improvement, Australians still have major challenges in the sustainable use of resources and in the maintenance of our natural and cultural heritage" (SoE, 2001, p. 1). This assessment is corroborated by the Australian Bureau of Statistics (ABS), which reported that Australia has experienced "regress during the past decade" on five environmental indicators (ABS, 2002). Biodiversity declined, the rate of land clearing increased by forty percent, more land became affected by salinity, the quality of some of Australia's inland waters deteriorated, and greenhouse gas emissions increased.

I discussed the Australian Government's approach to curbing greenhouse gas emissions, and criticisms of that approach, earlier in this paper. The critics are not solely environmentalists and pro-conservation groups; an Environmental Performance Review by the Organization for Economic Cooperation and Development (OECD), of which Australia is a member, credited Australia with some achievements but nonetheless found that the nation is not doing all that it can combat climate change (OECD, 1998). A 2004 report by the Sydney Centre for International and Global Law even suggests that Australia's failure to ratify the Kyoto Protocol violates international law and could result in a lawsuit at the International Court of Justice. The reasoning behind this relies on the relationship between global warming and episodes of coral bleaching, a serious threat to the Great Barrier Reef World Heritage Area (GBRWHA):

> Under Article 4 [of the World Heritage Convention] Australia is required to "do all it can," "to the utmost of its own resources," in order to discharge its duty of "ensuring the identification, protection, conservation, presentation and transmission to future generations" of the natural heritage of the GBRWHA. As global warming represents the most significant long-term threat to the heritage values of the GBRWHA, and the Kyoto Protocol is the only available legal framework for achieving binding reductions in greenhouse gas emissions, a strong argument can be made that by not ratifying the Kyoto Protocol Australia has failed to "do all it can" to ensure the protection and conservation of the GBRWHA. (Sydney Centre for International and Global Law, 2004, p. 3)

Thus far, most of the measures taken by the Australian Government to reduce greenhouse gas emissions have been voluntary and cooperative rather than regulatory. An example is the National Greenhouse Challenge, which involves corporations making voluntary agreements to reduce their emissions. Ann Vourc'h and Robert Price (2001) of the OECD Economics Department point out that "the effectiveness of such voluntary initiatives can be questioned, due in particular to doubts about accountability and verifiability" (p. 29). In the same paper, Vourc'h and Price suggest other more effective methods that the Australian Government could consider, including setting clear, enforceable targets or emissions quotas, perhaps with a market or trading system, instituting a tax on carbon and land clearing, raising fuel taxes, and planning a "structural adjustment toward a less [greenhouse gas]-intensive economy" (p. 36), which would likely entail increasing investment in alternative fuels and public transport. Australia uses greenhouse gas-

producing fossil fuels to generate more than ninety percent of its energy, as illustrated in Figure 15.

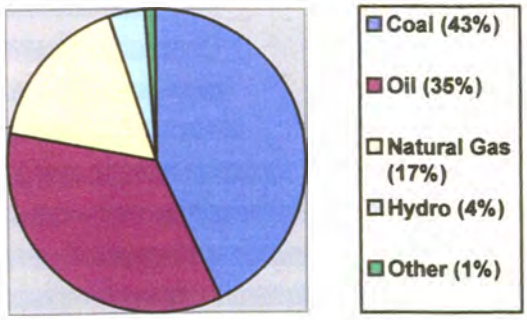


FIGURE 15: Sources of primary energy consumption in Australia, 2000

Australia also subsidizes its energy and transport sectors. As Figure 8 illustrated, these two sectors together account for more than half of the nation's greenhouse gas emissions; they are also the sectors in which emissions are increasing the fastest. Australia's energy and fuel prices are low by international standards, while the cost of alternative energy is higher. A decrease in subsidies or increase in fuel taxes, or a heavier investment in renewable energy, would give consumers an incentive to make more environmentally-friendly choices. Figures 16 and 17 present Australia's energy use and cost of electricity compared to several others countries, illustrating the correlation between low prices and high consumption. Australia has thus far "been slow to use taxes and charges to influence environmental outcomes" (Vourc'h & Price, p. 34).

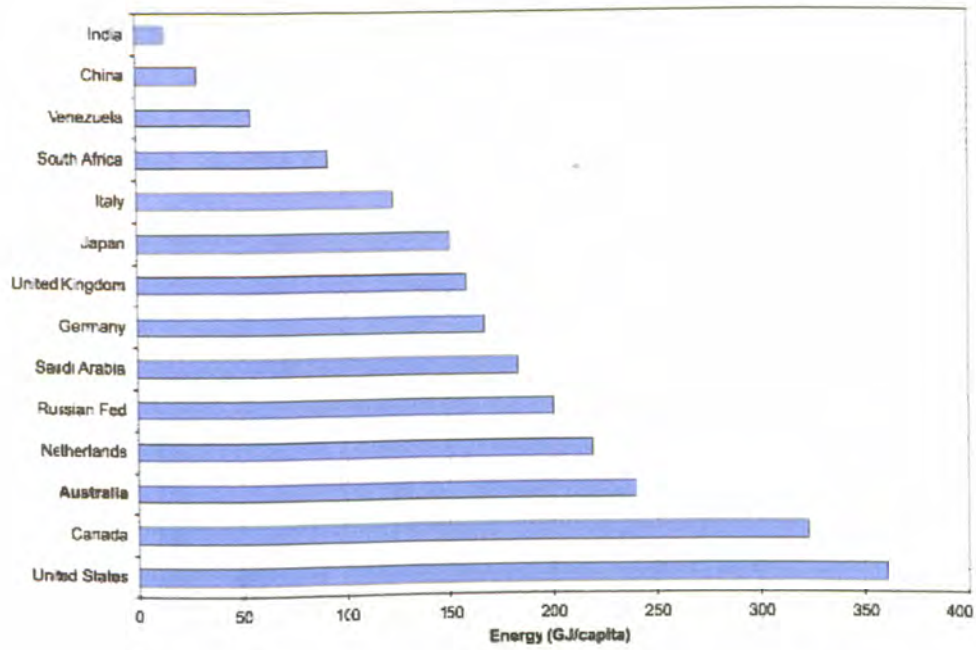


FIGURE 16: Energy use per capita of selected countries, 1995

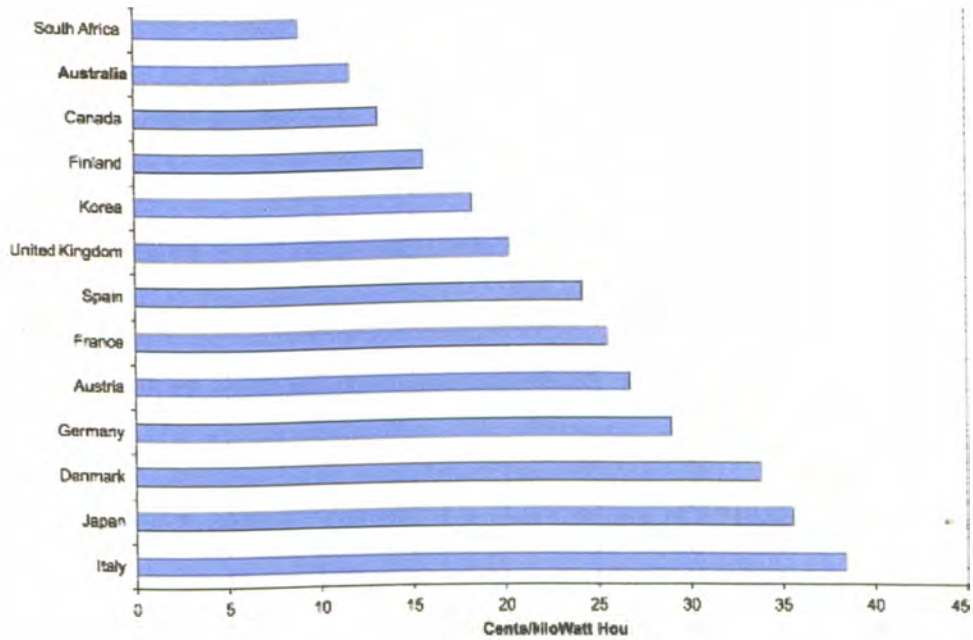


FIGURE 17: The price of residential electricity in selected countries, 1999

Land clearing is a problem that has recently seen a moderate degree of improvement, but it continues to be a matter of concern, as acknowledged in the SoE 2001. Most extensive in New

South Wales, Queensland, and Tasmania, it contributes to a number of problems, including greenhouse gas emissions, biodiversity loss, erosion, and soil salinity. Australia has permanently cleared around 38 percent of its forests, and is the only developed country in the list of the ten nations that cleared the most native vegetation in 1999 (Christoff, 2002, p. 12; SoE, 2001, p. 73).

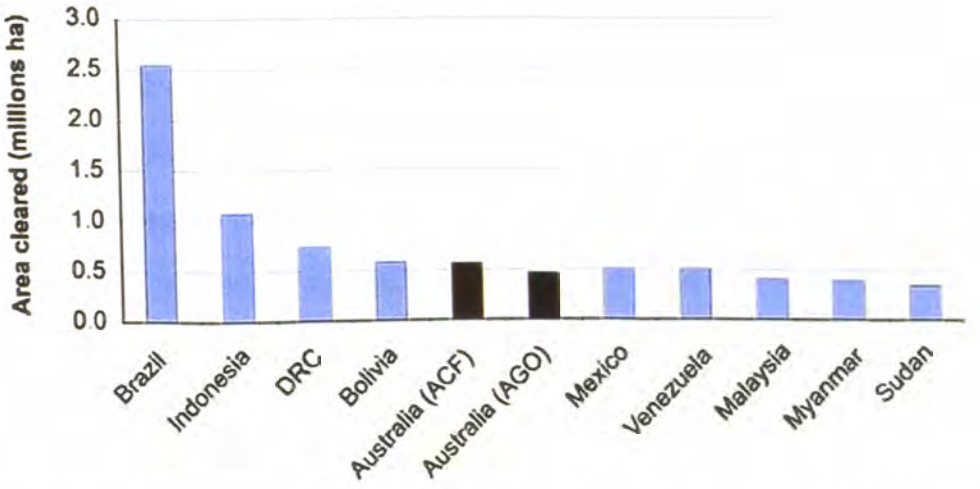


FIGURE 18: Top ten land-clearing nations in 1999, with one estimate for Australia by the Australian Conservation Foundation and one by the Australian Greenhouse Office. DRC is the Democratic Republic of the Congo.

Christoff (2002) regrets that "the one clear [Natural Heritage Trust] target, reversing the decline in the quality and extent of native vegetation by June 2001, was not achieved" (p. 34). He, along with Vourc'h and Price, points out the counterproductivity inherent in funding revegetation programs while simultaneously subsidizing the timber industry and allowing extensive land clearing. From 1996 to 2001, for example, there was a net loss of 2,380,000 hectares of native vegetation, despite funding from the Natural Heritage Trust for the replanting of more than 600,000 hectares (Christoff, 2002, p. 43). Federal legislation to significantly restrict land clearing would help mitigate this problem. Vourc'h and Price (2001) also suggest a tax on land clearing (p. 36). Dealing with this problem would likely be the best way to address other environmental

concerns, most importantly the decline in biodiversity resulting from the destruction of animal and plant habitats.

A common theme among critics of Australian environmental policy at the federal level is that the Commonwealth has not sufficiently asserted its power over the states or taken a leading role in environmental protection. Instead, it "has preferred a cooperative approach to environmental matters, and has only rarely legislated in the face of State opposition" (Wells, 2004, p. 7). This method of policymaking is often referred to as cooperative federalism. In "In Reverse," Christoff (2002) argues that cooperative federalism has "diluted and devolved the Commonwealth's responsibilities for taking national environmental action to the States," which are "generally governed by more parochial and development-oriented political and economic policy concerns" (pp. 2, 31). It can be argued in response that in a large, diverse, federal nation like Australia it is not always desirable for the Commonwealth Government to dictate environmental policy for the states; it could result in costly lawsuits and create a counterproductive hostility between the two levels of government. However, a leadership role for the Commonwealth regarding some environmental issues is appropriate. The Commonwealth has more resources available to it than do the states, which are unable to impose excise taxes, and is potentially better able to deal with environmental problems that affect the nation as a whole. The confusion over jurisdictions on Fraser Island, mentioned previously, illustrates how a single, unitary authority can sometimes be more efficient and coordinated when it comes to environmental management than can numerous separate authorities. Also, unlike the states, the Commonwealth has the authority to negotiate with other nations on matters of international environmental significance, such as protecting World Heritage Areas and addressing global warming.

A report by Katherine Wells (2004), entitled "Greening the Australian Federation," agrees with the argument that Australia's Federal Government must take a leading role in solving

key environmental problems, even if this is at the expense of the states. Among the report's fifteen suggestions are recommendations to:

- "Ensure strong national leadership by the Commonwealth" (p. 27).
- "Establish an independent, statutory National Environmental Sustainability Council," an independent body that would report to the Commonwealth and make policy recommendations (p. 30).
- "Introduce national laws for each of the key broad-scale problems" (p. 38). These problems, as identified in the report, are climate change, the degradation of land and water, biodiversity loss, resource consumption by cities, and the protection of the ocean. The laws should include measurable, time-bound targets. This emphasis on the need to specify targets is shared by other critics of current and historical Australian environmental policy.
- "Provide substantial Commonwealth funding to the States in return for satisfactory implementation of the reform agenda" (p. 39). As mentioned before, the Commonwealth has the power to make "tied grants" to the states with the condition that the money be used for a specific purpose. Wells suggests that the amount of money granted for environmental purposes be increased, and that this cound be funded through reductions in subsidies to environmentally harmful industries or through taxes on environmentally destructive activities.
- "Make more extensive use of the Commonwealth's Constitutional powers" if cooperative approaches to solving environmental problems are not effective (p. 44).
- If possible, amend the Constitution to grant the Commonwealth a specific power to legislate for the environment (p. 45).

Concluding Remarks

I will remember my experiences in Australia for a lifetime. The tree-planting project gave me the opportunity to make a contribution to the protection of a unique and beautiful environment, and the Adventure Tour allowed me to visit and appreciate places of international environmental value. Swimming among parrotfish in the Great Barrier Reef, hiking through the nighttime rainforest at Cape Tribulation, and seeing some of the most unique, ancient plants on Earth—including a fern that started life around the time of the fall of the Roman Empire—made me realize how important it is to protect and conserve these areas, and how significant is the role of government policymakers. Australia has made definite progress in recent decades toward

protecting the environment, but, like many other countries, it has a considerable ways to go—particularly in relation to restricting greenhouse gas emissions, land clearing, and the loss of animal and plant species—before its environmental policies can be considered a true success. Government policy, particularly that of the Commonwealth, is a powerful tool in the pursuit of this goal. "What is happening now in Australia and in the world is serious but it is not terminal...Everything that we are doing wrongly is correctable by us, they are human errors, not almighty ungovernable forces" (Rolls, 1994).

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