

JANUARY 06

President's Report 2005

Following on from our financial deficit last year, my focus has been to ensure the financial viability through some difficult times. The year has thrown up some financial challenges and we have had to make some hard decisions. Keeping control of expenditure is one of the most difficult tasks for a management committee. To try and get our finances into balance we unfortunately had to stop paying Christine Belshaw earlier this year. This was an extremely difficult decision we had to make. I am pleased to say though, that Christine has continued to work with us as a volunteer and I thank her very much for her efforts.

Discussions for relocation to Planet Ark were unsuccessful. I have been pursuing discussions with council to provide us with land in the mid mountains region. Earlier this year Judy and I met with Mayor Jim Angel. He assured us that we have the support of councillors for our move. I also held talks with both Kerry Bartlett and Bob Debus, both of whom were supportive. Our request for land is currently with council. The submission has been with council for a long time and they are finding it difficult to make a decision. I hope the ongoing discussions will have a successful outcome in due course.

We have sought funding from a variety of sources and have received some small support from council and the federal government. To me, the most pleasing financial support has come from Australian Ethical Investments. This recognition from the business community is a positive move for us and I would suggest this as a good way to

ensure our financial security for the future. Any members able to assist us with their experience or expertise in fundraising, marketing and writing of grant applications would be most welcome.

As far as plant sales go this past year, there has been a wonderful increase in sales to council for their bush regeneration works. My thanks go to Tanya McLean for her great liaison work with council. More sales this year have been from bulk orders and this is set to grow further.

All volunteers have made a valuable contribution to the success of Wildplant this year. I would particularly like to pay tribute to, and sincerely thank our wildplant "veteran" volunteers, who have actively supported the organisation over very many years. We can be very proud of our efforts. After two terms, I am now standing aside as the President of BMWRS. I wish the new leadership all the best in the coming year.

Esther Scholem

From the Office

Passing of Win Miller

Win Miller, one of the inaugural members of Wildplant and a continuing member until her death on 23rd August 2005, would have been known to many of our members. Win was very much an active volunteer, involved and interested in all aspects of our work. Even when Win found it difficult to walk, she sterilized hundreds of tubes, which we delivered dirty and picked up clean from her. Win also looked after at home, many rescues, weeding them and keeping them watered. Her rather beautiful garden became our secondary nursery. Win not only loved native plants but also

the native animals of the Blue Mountains and was one of the early members of WIRES. When Mikla Lewis set up Wildplant on the same basis as WIRES, Win was a part of the original group, which made history in the establishment of Wildplant Rescue Service. She was a constant visitor to the nursery and she will be missed by all of us who knew and worked with her. Our sincere sympathies to her family.

Judy McLean

Nursery Coordinator's Annual Report

Well it was another busy year for the nursery. Orders from Council have been steadily increasing over the year and we are particularly pleased that the Parks and Gardens section of Council has finally come on board in supporting the use of local plants in the townships. Because of the increase in demand we are finding it difficult to keep up production particularly at this time of year. I do urge anyone who is willing to commit some time to do so and this would help with all the extra watering we have to do at this time of year. We are also trying to get a regular monthly stall going in Springwood but we need a volunteer that has a vehicle to help with transporting of the stock etc. Irene, who is very experienced at running stalls is happy to commit to this but does not have a vehicle.

Schools and Community Tree Day went off very well this year and was even more successful than last year thanks to all the hard work of the volunteers and Adrienne from Council. We managed to supply more groups this year and were able to supply a more diverse area due to propagation efforts earlier in the year. We also have many large orders for Autumn 2006 for Council and other Contractors. This year has seen an increase in the number of rescue plants going back to where they came from, particularly North Katoomba and Leura, as well as some in the Mid Mountains. Thanks to A & S Bushcare Services, Linda, Brit and Jill from Council. There was a marked increase in the interest that local gardeners showed in the Rescues as well.

During the year we have seen seed collection from many more Bushcare/Landcare sites up and down the Mountains with the Rescue Team helping in this area. I would like to encourage those of you that have bush on your blocks to help out with this activity. It is always possible for me to come out and get you started on seed and cutting collecting.

We have had some success with being awarded some small grants over the year and there are still a couple of grants outstanding which we should know about early in the new year including one for two water tanks that will help us save water. However, we do continue to run into the problem of being perceived by various government departments and some sections of local council as being a commercial enterprise. This is particularly annoying because the nursery relies so heavily on volunteer labour and we are definitely a not-for-profit organisation. A special thanks to Australian Ethical Investments for granting us \$1186.98, which will go some way to helping with our costs.

Anne and Irene managed to get a final stall in at Blackheath before the New Year and congratulations for doing so well! I would also like to thank Esther for all her input as 'El Presidente' over the past two years and particularly her past and ongoing commitment to helping Wildplant find more suitable premises – a particularly long term project! Whilst I am at it I would also like to thank all the other active volunteers for their unflinching help and commitment. Their input is invaluable. A special thanks to Christine for her commitment via all the courses she has and is undertaking and in so doing the increased knowledge she is able to pass on and put into practice in the nursery.

Tanya McLean

Rescue Coordinator's Annual Report

I would like to thank all the members of the 'rescue' team that I have worked alongside throughout the year. Irena, Robert, Phil, Don and Diane have formed the basis of a diligent and regular team who have worked each week to rescue plants from various sites throughout the mountains. I have enjoyed their company and

dedication to the task of 'rescuing' beautiful plants, identifying, and of course, admiring them. There have been other team-members who have worked with us and I am grateful for their support.

We have carried out rescues from Mt Vic, Blackheath, Katoomba, Leura, Wentworth Falls, Bullaburra and Winmalee. Most of those plants have been returned to those areas and replanted by home gardeners, and some have been used by professional workers in bush regeneration and landcare. Some were part of a large consignment of plants produced for 'Schools and Community Tree Day'. This is the essence of our work.

The team also completed some seed collecting and thanks to Janet and the Christian Centre in Winmalee for organising a great day. My favourite though was an adventure with Irene in Mt Vic, where we tried to identify seeds to collect whilst the snow was blanketing every shrub in the sparkling landscape. Thawing out with a cup of tea in Irene's snow covered, beautiful native garden was a real treat.

I have also enjoyed working alongside the nursery team of Tanya, Christine, Esther, Judy, Veronica, John and Anne. Their work is constantly demanding: the tasks of seed collection, cleaning, propagating, pricking out (into clean pots) and watering is done with such good grace and sharing that it's a small wonder to behold.

I have learned a lot. How can I not have. Everyone who works with this organisation has an expertise, or at least 'has a go' at something – administration, newsletter production, plant production, grant submissions, website creation, plant identification, plant care and essential coffee making.

There is always more to do and my seven and a half hours a week may never be enough, but with the support of the team, I'll be happy to have a go. It's been a rewarding year. Thankyou.

Lynn Godfree

Summer Features

Desalination: Panacea or Last resort?

By Tanya McLean

Of all the water on Earth only about 3-6% of it is fresh and most of that is held in ice or underground. Agricultural and industrial activity and an ever-increasing world population have meant that much of this available precious resource has become polluted and/or increasingly saline. Many countries recycle water and have done so for a long time. Increasingly countries are looking to desalination, as a means to provide potable water, particularly as there is a seemingly unlimited supply of seawater.

Desalination technologies

Desalination is a water treatment process that separates salts from saline water to produce potable water that is low in total dissolved solids (TDS). Currently the main desalination technologies in use around the world are membrane and distillation (evaporation) processes. Membrane technologies include Reverse Osmosis (RO) and Electrodialysis (ED). Distillation technologies include Multistage Flash Distillation (MSF), Multiple Effect Distillation (MED) and Vapour Compression Distillation (VCD). Distillation accounts for about 65% of world production of desalinated water with membrane technology accounting for about 30%. Together MSF and RO provide over 90% of desalinated water from both the sea and brackish sources of water.

In membrane technologies the feed water (seawater or brackish ground or aquifer water) is pushed through a membrane that is impermeable to larger molecules. In distillation technologies the feed water is boiled under pressure so that some of the water (distillate or product) is extracted leaving brine in which most of the suspended solids are concentrated (waste).

Unfortunately, desalination plants use large amounts of energy, which at present is overwhelmingly supplied by the burning of fossil fuels. RO and ED require less energy than distillation and MSF uses by far the most energy.

Due to high energy use it is cost effective to couple the desalination plant to a localized source the desalination plant. RO and ED facilities are generally easier to construct and operate, as they are relatively smaller, whereas MSF and MED plants are more complex. VCD plants are designed to be mobile and consequently are used in resorts, industry and drilling sites. Membrane technology is particularly sensitive to high salinity levels. Distillation technologies are more robust and can cope with much higher levels of salinity. The average life expectancy of desalination facilities is currently considered to be about 25 years.

The technologies also differ in the purity of the product (water) with MSF and MED producing very pure water. RO and ED produce a product that is within drinking water quality guidelines. Both technologies tend to decrease the pH of the product to such an extent that sodium hydroxide (caustic soda) has to be added to bring it back up to an acceptable level. The product of distillation is so pure that for human consumption brackish water has to be added to improve the mineral content.

Benefits

Increasingly desalination technology is being used to treat wastewater from industry and urban populations, agricultural runoff and in preparing highly purified water as well as on cruise boats and military ships. Desalination technologies can also be beneficial in areas experiencing increasingly elevated levels of water salinity such as Australia and many other parts of the world. It may also be beneficial in areas that do not have much freshwater storage capacity such as small islands and where populations are expanding.

Costs

Desalination, regardless of which technology is used, is expensive. Certainly in terms of conventional water extraction and purification technologies. The discrepancy in cost may be minimized if all hidden costs of supplying water ordinarily were included and if the cost of water reflected the cost to the environment. There are often hidden costs involved in the supply of desalinated water as well. When it is coupled to a

of power. The rejected cooling water from the power plant can also be used as the feed water for nuclear power plant, as many are in France, the disposal cost of radioactive substances is not included.

The cost of operating a desalination plant is dependent on the salinity of the feed source. Lower salinity allows for a higher rate of conversion (more product, less brine) and lower energy requirements. Building larger plants reduces the cost per unit of product but also increases capital costs. The \$2 billion price tag for the desalination plant proposed for Sydney is presumably due to its large size and that a power supply plant would also need to be constructed to cope with the energy demand that a RO desalination plant producing 500 mL/d would require.

The current price for water in New South Wales is \$1.013/kL (in October this will probably increase to \$1.13). The Australia Institute (2005) calculates that the cost per kilolitre from the proposed desalination plant in Sydney will be about \$2.60. 1996 World Bank figures put the average cost of seawater desalination at between \$1.60 and \$2.70 (US)/m³

Environmental Concerns

Unfortunately there has been little research or reliable data collected on the effects of the waste brine on marine environments. Some of the environmental concerns are:

The killing of organisms that may occur due to feed water intake

Elevated salinity levels of the waste brine (which can be more than double that of sea water)

Effects of chemicals (used during production and maintenance) disposed of in the waste brine

Elevated temperatures (the waste brine is hotter than the ambient temperature of the receiving waters)

Destruction of marine and terrestrial ecosystems during the construction stage (including the amount of land the facility will take up)

Air pollution

Proponents of the technology believe that the waste brine will be quickly diluted as it dissipates

away from the outlet along with the salt and chemicals that it contains. However, environmentalists and some scientists believe that this may not be the case and that the waste brine has the propensity to settle on the bottom, adversely affecting the benthic (bottom) community, certainly in the localized area. The waste brine for the plant proposed for Sydney will have a salinity level of around 55-60 g/L which is one and a half times the level generally found in seawater. Many marine organisms, particularly sessile and slow moving ones, are sensitive to increased salinity

In desalination plants many chemicals are used for pretreatment (of feed water), cleaning of equipment, antiscaling, antifouling and killing microorganisms (biocides). Many of these chemicals will be released in the waste brine and may also cause localized harm. In the case of chlorine (which is toxic) the US EPA recommends a level for seawater of no more than 7.5 µg/L for long-term exposure. Localized levels of chlorine at waste brine outlets are often observed to be 20-50 µg/L at the mixing zone of the brine. There may also be a problem with algal blooms and a possibility that heavy metals leached from the facility may also build up within the benthic zone. Elevated temperatures of the waste brine may serve to change variable temperatures and localized currents. The concentration of salts, suspended particles, chemicals and warmer waters may also serve to change species composition in the environment close to the outlet and may indeed encourage the proliferation of exotic species. Local residents in South Sydney and environmentalists are also concerned about what impacts the proposed plant will have on sea grass beds in Botany Bay (which are already degraded) and what will happen to ecologically sensitive communities (wetlands, etc.) at any of the three proposed sites.

Indirect environmental effects of desalination plants include air pollution, as large amounts of fuel are burned to generate the required energy. Power plants generate pollutants such as unburned hydrocarbons, dust, sulphur oxides, nitrogen

oxides, carbon monoxide and carbon dioxide (CO₂). Raluy et al. (2005) found that MSF plants have the highest environmental load (because they consume more energy) and that RO plants (like the one proposed for Sydney) have the lowest environmental load. However, the Australia Institute (2005), states that this plant will increase the state's electricity use by 1% and that the increase in CO₂ emissions will be the equivalent of putting an extra 220,000 cars on the road. It is proposed that the plant in Sydney will be powered by natural gas, which is meant to be less polluting. The increase in CO₂ emissions will still be like putting an extra 100,000 cars on the road and like any other fossil fuel natural gas is a nonrenewable resource.

The Future

Desalination is still only viable in areas that are affluent and the increasing cost (environmental and economic) of fossil fuels may be a hindrance to the uptake of desalination technology. However, as advances are made in the technologies and materials used for desalination it is believed that construction and operation costs will become more affordable. There is also a push to combine desalination with more 'green' forms of power sources including nuclear. Nuclear power has the disadvantage of radioactive waste disposal, so the future use of solar or wind power may be a more attractive alternative, if feasible.

In some inland areas the cost of brine disposal may adversely affect the economics of desalination, making it too expensive to consider.

Another consideration for the future is that the introduction of desalination in some areas (particularly coastal regions) may give the impression that water is readily available. This may lead to changed water consumption patterns, a further concentration of development and an increase in population. Although there certainly are areas that would greatly benefit from desalination as a means of obtaining fresh water in many cases it may be wiser to invest in traditional water supply methods and sources of water along with water conservation as a primary means of water supply. In an area with a relatively plentiful

water supply like Sydney desalination should really be seen as an absolute last resort.

(This is abridged. The full essay can be viewed at www.wildplantrescue.com.au)

Book Review

By Liz Riley

Tim Flannery: THE WEATHER MAKERS (Text Publishing)

For 10,000 years the oceans and atmosphere of Earth have regulated the temperature at the surface of the earth and mediated violent weather events. James Lovelock termed this self balancing interconnected system Gaia. Tim Flannery has found that since the 1960s humankind and the products of civilization have replaced Gaia as the controlling influence on our earth's climate.

Flannery's main concern is with global warming. It is produced by an increase of carbon dioxide (CO₂) in the atmosphere, the result of the burning of fossil fuels. This warming has already resulted in the melting of ice at the poles and increases in sea levels. The irreversible damage done to date will mean that the Pacific Nations will go under water and the Inuit nation will also cease to exist. Flannery details much scientific research to support this prediction. To try and predict when a continuation of this global warming will lead us Flannery uses the geological record of past major climate events. His conclusion is that if we continue with current levels of CO₂ emissions then it is possible that within a few hundred years, due mainly to desertification and the resulting loss of food producing areas, humans will survive but civilization will not and the human population will enter a long dark age.

Besides the loss of entire nations one of the most distressing current effects of global warming is the loss of alpine habitat and all the plants and animals that make up those ecosystems. Flannery details extinctions already observed in these communities and he predicts that the increase in temperature and rising cloud levels will force these habitats off the top of the mountains. Our coral reefs are similarly suffering due to rising ocean temperatures.

Scientists have calculated that we need to reduce the world's carbon emissions 70% by 2050 and Flannery addresses how this can be done. One of the most impressive statistics he quotes is that if the owner of a 4WD vehicle exchanged it for a hybrid car they would have immediately reduced their personal contribution to CO₂ transport emissions 70%! Flannery also discusses wind, solar, nuclear, and geothermal power. While nuclear power does not result in CO₂ emissions once built, Flannery finds them to be too slow to bring online with no safe waste disposal available and too dangerous both from an accidental and terrorist perspective.

There is much that the affluent households of the developed world can do immediately to reduce CO₂ emissions. There is immediate action also required on a national and worldwide scale because domestic production may only account for 30% of worldwide CO₂ production. Flannery holds that if the world's nations managed to eliminate the use of CFCs then a reduction in CO₂ emissions is also possible. Flannery explains how the atmosphere, the oceans and the ice caps operate and influence one another and are influenced in turn by global warming. Global warming itself is explained as are the physical cycles of the earth's orbit and tilt and the influence of sunspots on our climate. While outlining the disastrous outcomes if we do nothing Flannery also tells us what needs to be done. There is no time to lose and the technology is already available. This book is "a manual on the use of Earth's thermostat" and urges us all to get on with taking responsibility for it.

Wildplant Committee for 2006

President: Robert Cameron

Treasurer and Public Officer: Judy McLean

Secretary: Anne Rickwood

Committee members: Irene Domes, John Adey
Alison Hadfield, Esther Scholem, Veronica Paul,
Christine Belshaw