

## CFC rise slows

International efforts to limit the emission of ozone-depleting chemicals into the atmosphere appear to be working, albeit slowly. While the amount of these chemicals continues to rise, the rate of increase has dropped markedly.

According to Dr Paul Fraser, at CSIRO's Division of Atmospheric Research in Melbourne, the rate of increase of chlorofluorocarbons (CFCs) has declined from about 5% a year during most of the 1980s to about 3% since 1988, the year after the negotiations establishing the Montreal Protocol, an international treaty limiting CFC production. Measurements taken at the joint CSIRO-Bureau of Meteorology Cape Grim Baseline Air Pollution Station in Tasmania show that rises in the concentration of two important CFC compounds (CFC 11 and CFC 12) in the troposphere (lower atmosphere) appear to be levelling off.

The good news comes amid further warnings that the impact of chlorine-based compounds (including CFCs) on ozone in the stratosphere will probably get worse before it gets better. Scientists recently measured record levels of chlorine monoxide, a potent ozone-destroyer, over the United States and Canada. About half of the total chlorine in the atmosphere comes from CFCs. Earlier, satellite-borne instruments detected the lowest levels of ozone yet recorded in the air above Antarctica. The satellite data suggest that a statistically significant loss of stratospheric ozone has occurred over the southern parts of Australia. The ozone layer above Sydney, for example, is being depleted at a rate of about 3% each decade, according to a set of measurements extending back to 1978. Apparent ozone losses in tropical Australia (about 1% a decade) are not statistically significant.

Under the Montreal Protocol (as amended in 1990), the total chlorine concentration in the stratosphere is likely to peak at 4.1 parts per billion (p.p.b.) in 2000, and not return to its 1987 level of about 2 p.p.b. until 2060. Dr Fraser says the current concentration of chlorine in the troposphere is about 4 p.p.b., a concentration we can expect to find in the stratosphere by 1997.

While the 1990 Protocol calls on nations to ban the use of CFCs and

carbon tetrachloride by 2000, and of methyl chloroform by 2005, pressure is mounting for an accelerated phase-out to limit the stratospheric chlorine peak to less than 4 p.p.b. The United States has pledged to phase out CFC production by the end of 1995. Many nations, however, have yet to ratify the 1990 Protocol.



Illustration: Brian Gosnell

## Boost for pest-control research

Environmentally benign, humane and species-specific control agents for pests such as rabbits and foxes (see *Ecos* 71) are the targets of a recently announced Co-operative Research Centre under the direction of Dr Hugh Tyndale-Biscoe, Assistant Chief of CSIRO's Division of Wildlife and Ecology.

The Centre, which will operate for 7 years, has \$36 million in funds from the four institutions participating in it and from the federal government — according to Dr Tyndale-Biscoe, 'money that allows us to do better what we're already doing'. Its management board will include members of all bodies involved and, Dr Tyndale-Biscoe hopes, people from the Australian National Parks

and Wildlife Service and the Australian Wool Corporation. Representatives from the National Farmers Federation and the Australian Conservation Foundation will be invited to serve on an advisory committee that also includes senior scientists.

At the Australian National University, the Division of Cell Biology at the John Curtin School of Medical Research will conduct research into immunology, virology and recombinant viruses, while the Division of Biochemistry and Molecular Biology in the School of Life Sciences will provide undergraduate courses in reproductive and developmental biology and contribute to courses in wildlife ecology.

The Vertebrate Pest Research Section of the Western Australian Agriculture Protection Board is involved with CSIRO in determining the effects of sterilisation on wild rabbit populations, and will also be contributing to the Centre's fox studies. It has a long history of research into the biology and pest status of rabbits and foxes, and in developing control strategies for these species.

The Wildlife Research Branch of the Western Australian Department of Conservation and Land Management has been involved in studies of fox biology and ecology for more than a decade and, in collaboration with the Agriculture Protection Board, has developed control strategies that make use of indigenous Western Australian wildlife's tolerance to 1080 poison to develop baits that are lethal to foxes, but that don't harm native animals. The program has been spectacularly successful, with native species re-established in a number of areas as fox numbers have declined. The Department has established a special research unit dedicated to carrying out co-operative ecological research in relation to the Centre.

The Division of Wildlife and Ecology has restructured its research priorities to bring together its experience and expertise in field ecology, reproductive biology, physiology, biochemistry and molecular biology, reproductive immunology and virology to develop viral-vectored immunosterilisation. Its research is being closely integrated with the work at the Australian National University and in Western Australia.