BACK BOX

Animal radio

Near one of the ski resorts in Kosciusko National Park, two wombats regularly come 'on air'. Each carries a couple of radio transmitters — one on a shoulder harness and the other implanted in the abdomen.

Every 6 months, Dr Graham Brown of the CSIRO Division of Wildlife Research leads a 2-week-long expedition up the mountains to hear the latest broadcasts. Tuning their receiver to 27 MHz and ignoring occasional interference from New Zealand and the United States of America, not to mention a great deal of cosmic noise, the scientists locate the wombats and analyse their signals.

The backpack transmitter emits continuous tones that carry information about the animal's movements and pulse rate, as well as the air temperature. 'Beeps' from the abdominal transmitter tell scientists the animal's body temperature.

These transmissions, which often come from underground, contribute to a study of the wombat's behaviour and temperature regulation at different seasons. The researchers particularly want to understand the importance of the burrow. The wombat is, after all, one of the largest animals in the world to excavate an underground home.

The individuals under study stay in their burrows until late afternoon. They then come out to graze, even in the foulest winter weather. At about midnight they return to their burrows.

A mobile radio station: this wombat is broadcasting physiological information.

Below ground, a wombat's body temperature gradually drops by some 2·5°–3°C. The pulse slows, too. When the animal surfaces for food, its temperature rises again to about 37°C, and the heart rate increases.

Marrying the information they have received by radio with measurements of air and soil temperatures below ground, the scientists conclude that alpine wombats do not make burrows to escape blizzards so much as to avoid the hottest summer weather.

Temperatures above 35°C put physiological stress on the animals; their burrows never become that hot.

Some other species being studied by the Division of Wildlife Research carry transmitters simply so that scientists can find individual animals, especially in physiological investigations into the food and water needs of various species. These projects hinge on successful recapture of the individuals under study.

To equip an echidna for transmission, the scientists snip away a few quills, then glue a transmitter to the exposed hairs and quill stumps. Goannas' transmitters are stitched to a harness, which is glued to the base of the tail.

In time, both these species will shed their transmitters by moult, so the researchers must intervene before the equipment is lost.

Tasmanian devils and tammar wallabies also carry transmitters in physiological projects.

The transmitters come from the workshops of two of the Division's staff, Mr Keith Newgrain and Mr Len Taylor, who design and construct a variety of models for different jobs.

Mr Newgrain made the transmitters used in locating animals for recapture, developing the aerial from one designed by NASA for tracking creatures by satellite. For echidnas he chose a high frequency (403 MHz, in the UHF range), so that a small aerial would suffice. Although the transmitter is no bigger than a matchbox, the aerial is built into it.

The frequency used in Mr Taylor's wombat transmitters gives good results over short distances, but not with far-roaming animals or near people with CB radios.

His latest model, which will enable researchers to monitor the physiology of kangaroos in arid areas, transmits over eight channels at 150 MHz, a frequency that brings little interference. At ground level, the signals can be detected up to 10 km away.

By attaching an 'activity device' to the animal's leg, scientists will even be able to tell whether a kangaroo is standing, lying, stepping, or hopping.

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