

older than 19 weeks). In the introduction, the committee states it is particularly concerned about the viability of closely confined layer hens to display normal behaviour and that alternative practical and economic systems should be encouraged and applied at the earliest opportunity.

This publication is clearly essential for New Zealand farmers of laying hens but, like the Code for sheep, would also be valuable for farmers in other countries which lack national guidelines.

Code of Recommendations and Minimum Standards for the Welfare of Sheep. Code of Animal Welfare No 3 (Revised). Animal Welfare Advisory Committee (1996). Ministry of Agriculture: Wellington. 40pp. Paperback. (ISBN 0 477 08550 4, ISSN 1171 090X).

Code of Recommendations and Minimum Standards for the Welfare of Layer Hens. Code of Animal Welfare No 18. Animal Welfare Advisory Committee (1996). Ministry of Agriculture: Wellington. 32pp. Paperback. (ISBN 0 478 07427 1, ISSN 1171 090X).

Both publications obtainable from the publishers, P O Box 2526, Wellington, New Zealand.

Disturbance of marine mammals by man-made noise

Over recent years there has been growing concern about the potential detrimental effects of underwater man-made noise on marine wildlife. This report, produced by the Sea Watch Foundation, is concerned with the sounds emitted by airguns used in seismic survey operations to find oil and gas deposits below the seabed. Sound source levels of airguns are generally greatest at the lower frequencies (50-140Hz) although the report also describes work which found significant levels of energy at much higher frequencies (1-20kHz) closer to the source.

What little is known about the hearing abilities and sound production of cetaceans (whales, dolphins and porpoises) is summarized in the report. The documented effects of seismic sound on the baleen and toothed whales (the two groups of cetaceans) are considered separately because of their different hearing sensitivities (low and high frequency hearing, respectively). The report brings together available information on the direct and indirect effects of this noise on cetaceans. Most of the available evidence supports the theory that baleen whales are more likely to be directly affected by seismic activities than toothed whales. However the report points out that more attention needs to be focused on the significance of seismic sound for toothed whales, including indirect potential effects caused by the displacement of prey fish species which has been well documented in relation to seismic shooting.

The report emphasizes the lack of information on the long-term significance of any noise disturbance effects on cetaceans and gives suggestions for minimizing the effects of seismic activities. This report is a useful addition to the growing literature documenting the effects of human activities on the welfare of marine mammals.

Review of the Effects of Underwater Sound Generated by Seismic Surveys on Cetaceans. Evans P G H and Nice H (1996). Sea Watch Foundation: Oxford. 50pp. Obtainable from Sea Watch Foundation, Unit 29, Southwater Industrial Estate, Station Road, Southwater, West Sussex RH13 7UD, UK. Price £5 plus £1.50 postage and packing.