

*A female tuatara – an animal which has until recently managed to keep many details of its reproduction a secret.* Photo: A Cree



In order to devise an informed management programme for any species, it is vital that we have a detailed understanding of the species' requirements for reproduction. Until recently, information on tuatara reproduction was meagre and largely anecdotal, and in many respects this reflected particular features of the animal itself: its restriction to isolated and inaccessible habitats, its highly protected status, and its tendency to cease activity when disturbed. However, using a combination of field and laboratory techniques, current research is providing new and exciting answers to many questions about the reproductive biology of the tuatara. These results will help direct future research and management not only on Stephens, but also on other tuatara islands and in captivity.

The programme for a typical field trip to Stephens Island illustrates the variety of studies involved. Over the last two years, we and our colleagues have made two-week-long trips to Stephens Island at monthly intervals, catching marked adult tuatara at night, weighing and measuring them to determine growth rates, collecting blood samples to analyse for sex hormones and other substances reflecting reproductive activity, and monitoring soil temperature and moisture conditions in tuatara nests around the clock. Once a year, the Department of Conservation carries out an x-raying study which identifies the proportion of female tuatara carrying shelled eggs each year. When we return to the mainland, blood samples are analysed, data on nest conditions are examined by computer, the development of eggs incubated in the laboratory is monitored, and the next month's field trip is planned.

### Reproductive Cycle

These studies have helped clarify many aspects of the tuatara's reproductive cycle. Like most reptiles, tuatara are seasonal breeders. Mating occurs in late summer. Between January and March, male tuatara spend much of their night-time activity "displaying" in highly visible locations. They erect the spines and crest down the head and back, and adopt an alert, "head-erect" posture which is probably important in attracting females. During mating, the male lies over the female and entwines his tail around hers, serving to bring their cloacae into close apposition so that sperm can be transferred. Copulation is an extended process, having been observed in one instance to last 58 minutes. Following mating, the female fertilises her eggs by April and has at least partly shelled them by July, but does not lay them until the following November or December. The embryos are poorly developed when nesting occurs, and just why a female holds shelled eggs for so long without extensive embryonic development is unknown.



*Courtship and mating have rarely been observed in the tuatara. During courtship, the male (left) circles the female (right) with his crest erect and throat skin extended. Receptive females are mounted by the male until sperm transfer is complete (right).* Photos: A Cree