

MARINE IGUANAS — WHERE HAVE ALL THEIR BABIES GONE?

by

Andrew Laurie

Dr. Laurie recently completed the first stage of his 3-year investigation of the population dynamics of the marine iguanas, which he has undertaken with the support of the Leverhulme Trust and the Royal Society. He gives his preliminary findings regarding the grave threat to many local iguana populations and his personal views on the control of feral predators in general.

Perched high on a pinnacle of rock I watched in awe as wave after wave swept in from the south and crashed with a noise like thunder onto the rugged, rocky coastline below me. Spray shot skywards, soaking me to the skin; dark clouds blotted out the sinking sun and I began to feel quite cold. But, being warm-blooded, I sat there a moment longer and spared a thought for the serried ranks of cold-blooded reptiles also perched high up above the sea but nevertheless chilled by the cold spray and cooling breeze. Rough seas or bad weather mean poor foraging for the marine iguanas of the Galapagos Islands, and big swells on the southern coast of Santa Fé had prevented the sea-going Iguanas from gathering their daily ration of seaweed for several days. They had retreated higher up the cliffs and some had taken to eating crabs or gull chicks, drowned or abandoned by their parents. It is a tough life, ruled by the tides and the sun, and, resistant as the iguanas are to the pounding of the Pacific swell, there is a limit to how much they can withstand while feeding in the intertidal zone.

A group of sea lions gambolled in the dusk, riding the big waves in and out of a narrow channel to dice with death in their favourite rock pools, now foaming cauldrons of white water. I left them to it and made my way through the half-torpid iguanas to our windswept camp 100 metres above the sea. We chose to camp at Miedo on the south coast of Santa Fé because there is an enormous breeding colony of marine iguanas here, and I am in Galapagos for three years to find out something about the population dynamics and social organization of these animals. We have made furniture of driftwood washed up in a little cove below the camp, and we carry all our supplies, including fresh water, from the landing place 3kms away across a cactus-covered plateau. On calm evenings we fish for hawk-fish and groupers, sharing the cliff-edges with unperturbed iguanas. During the day, when we want to catch them, they run away warily, but they seem to know when we are after fish and not after them, and they sit there watching us or even eating our bait.

Like the marine iguanas, we have been living in, on or beside the sea. We hear it constantly and watch its moods with fascination. We are sprayed by it 1km inland at Miedo and have never yet dared to enter the rough, open sea, contenting ourselves with baths in sheltered rock pools in the company of inquisitive sea lions. We share our camp with finches and mocking birds and voracious rice-rats with insatiable appetites for plastic and paper. Diminutive doves gather at safe distances, only venturing near the camp in the early mornings, while over on the rocks behind camp live a number of ancient land iguanas, whose day starts with a warm up in the sun at about 7.30 a.m., after which they move back into the shade until feeding time at about 2 p.m. and then return to soak up the last of the sun outside their holes before finally retiring for the night around 6 p.m.

It is July 1981; Dick Watling and I have spent the last two days sitting on rocks by the sea and peering through binoculars at baby iguanas, sometimes waiting an hour or more at each place to make sure that we have seen even the most recalcitrant, which tend to stick to the safety of their cracks and crevices for long periods. The young iguanas are between 25 and 30cms long now, and have grown almost 2cms since they hatched nearly three months ago. It was then that Justin Marshall and I surrounded the sandy nesting ground with a fence of plastic sheeting and captured more than 600 newly hatched iguanas as they emerged from their holes and made for the sea. We marked each individual with a unique colour-coded combination of glass beads threaded on nylon line and attached to the crest on the back of the neck. Now, almost three months later, I want to know how many are still surviving. It is an exercise in comparisons: I am investigating the effects of introduced predators such as cats, rats, pigs and dogs on marine iguanas populations, and Santa Fé, where there are no such feral predators, serves as a standard with which to

compare survival of the hatchlings on other islands.

During the last two days we have identified almost 300 of the 600 hatchlings marked, so survival seems quite good; particularly so as in this cold, overcast weather there is little chance of being able to spot all the hatchlings. They dislike being out on such days and prefer to huddle together in their holes and crevices. So far I have not found any marine iguana colony with a survival rate of hatchlings as high as at Miedo. The same applies to the younger animals in general. I have circumnavigated all the major islands now, and gone ashore to census the major iguana colonies, determining the age composition of the populations at each place. In general, on all islands with introduced predators the marine iguana populations are unbalanced, with a predominance of old animals and very few young animals or hatchlings.

Last week we were at Muñeco on the northern coast of Isabela where we found evidence that cats have been responsible for killing almost all the hatchlings. We found remains in nearly all cat faeces examined and there were half-consumed carcasses of hatchlings on the nesting grounds. Hatchlings made up less than 1% of the population counted, compared with more than 10% in most areas which have not been colonized by introduced predators. More worrying even than this is the fact that there are no young animals in between hatchling size and adult size. Populations can withstand one or two bad years but at Muñeco and at many other sites on Isabela and on some other islands it appears that the hatchlings suffer complete predation by the end of the first year. The result is that these populations are aged and effectively sterile and have been in serious decline for many years. It is striking that the small offshore islands of Crossman and Tortuga (which have no feral predators) have enormous and virile populations, yet iguanas are practically extinct on the adjacent shores of Isabela. There is no doubt that many of the marine iguana populations of Galapagos are in severe danger of extermination once the present populations die of old age. It could be that iguanas will only survive on islands without introduced predators or at places with steep cliffs which are inaccessible to the predators.



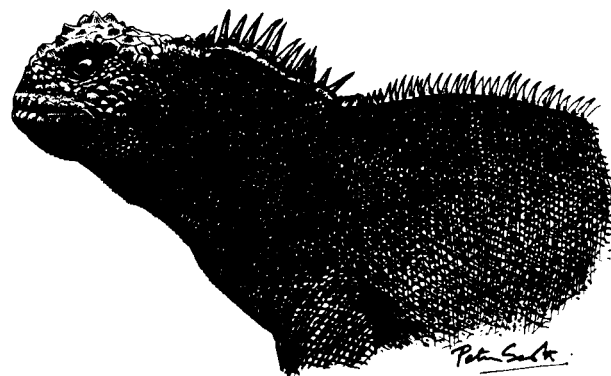
Marine Iguanas *Photo by Alan Root*

During the next two years I hope to be able to gather more detailed information on the factors controlling marine iguana distribution, abundance and population composition and to be able to compare the population dynamics and social organization of colonies of islands with and without introduced predators. I can provide information, but what is done with it is another question.

The disastrous effects of introduced mammals on the native fauna and flora of Galapagos have been described again and again. Goats have been eradicated from some islands and a dog eradication programme has recently been started on Isabela. However, as in all such cases, the consequences of elimination, or attempts at elimination of one species may have serious repercussions on other species or even on the endemic species it was designed to protect. On Isabela the only marine iguana colony with a viable recruitment rate is at Caleta Webb, where until recently dogs slaughtered the adults and dug up the eggs but may also have kept the cats at bay, and hence reduced predation on the vulnerable hatchlings. The wary young animals are too quick to be caught by dogs but fall easy prey to patient cats which wait outside their holes for them to re-emerge. Now that attempts to eradicate the dogs are being made, it will be interesting to see how the iguanas fare. Control of cats, even if it ever proved possible, could lead to an increase in the rat population.

The problems seem never-ending. As I travel from the windswept cliffs of southern Santa Fé to the sunbaked lava fields of predator-free Fernandina, where one can hardly move without treading on an iguana, I sometimes wonder whether we are fighting the right battle. New species have been arriving in Galapagos from the moment the islands emerged from the sea, and man has acted and is acting as simply another vector of countless species to the islands. Total eradication on every island of all species brought in by man would be impossible. Perhaps what is needed, rather than over-ambitious attempts to totally eradicate feral animals on an island the size of Isabela is more emphasis on local control and the protection of certain breeding colonies of the species which it is the National Park's policy to conserve.

I am not suggesting that we do nothing; simply that we change our outlook. It remains to be seen whether feral dogs can be eradicated, but there is no possibility of eradicating cats, given our present control techniques. Any control operations would have to be periodically repeated and will inevitably be difficult and expensive. It is therefore essential that the overall seriousness of cat predation be carefully evaluated, the locations where it is most serious identified, and the most efficient control methods be found so that at least some of the presently endangered populations of marine iguanas can build up again into healthy well-balanced communities.



Iguana *Drawing by Peter Scott*