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Editorial

Bill Ballantine (1937–2015), a father of marine reserves

At the World Conservation Congress, held in Hawai'i in September 2016, IUCN members approved a motion to protect 30% of the world's oceans "in a network of highly protected MPAs". This announcement marked a major milestone in giving recognition that significant areas of the world's marine environment should be protected from extractive activities, through MPA networks. This is significantly greater than the Convention on Biological Diversity Aichi 11 Target which calls for countries to protect 10% of their coastal and marine areas in "well managed and connected MPA networks". The IUCN motion is a timely reminder of the legacy left by Dr. Bill Ballantine, who championed the need for networks of no-take marine reserves and who, sadly, passed away in late 2015.

The first paper on marine reserves published in this journal was by Bill (Ballantine and Gordon, 1979), and fittingly followed up in 2014 by his last sole authored paper which summarised his decades of experience in promoting marine reserves (Ballantine, 2014).

Bill was born in Leicester, England and emigrated to New Zealand in 1964, after completing his PhD (Queen Mary College, University of London). In 1964, he was appointed the first Director of the newly created University of Auckland marine laboratory, based at Leigh, to the north of Auckland city in New Zealand. Sixties students who encountered this new recruit from Britain would have superficially judged him nerdish had the word been invented then. But as they got to know Bill they discovered he could be very personable. What really impressed them was that Bill had no academic airs. He wore shorts, worked hard outdoors as laboratory installations were constructed and treated students as near-equals. He and his wife Dulcie were wonderfully hospitable and frequently invited students to their house, especially when overseas scientists were visiting, which made them very privileged. Bill was always a facilitator, never a barrier to getting things done, and a great mentor. The friendships established between Bill and his students lasted the distance, evidenced by the tributes expressed at his funeral.

Bill held the position of laboratory Director for over two decades and during that time, he put in place a number of initiatives which today, show the extent of his vision at the time. He set the marine laboratory up to become a world-class research and teaching facility. He advocated for and staunchly supported the establishment of a no-take marine reserve in the coastal marine area around the marine laboratory. This marine reserve, established in 1975 and known as the "Cape Rodney – Okakari Point Marine Reserve" (or "Leigh Marine Reserve"), became New Zealand's flag-ship marine reserve and an example for the rest of the world to learn from (Fig. 1). Bill literally put the marine reserve "on the map". He obtained funding to survey and document the reserve's habitats (both intertidal and subtidal), which was undertaken by students who loved diving and were more than happy to be paid a very small stipend for their efforts. The government department in charge of mapping the country (the former Department of Lands and Survey) published this map and it became an important baseline against which to measure changes over time resulting from removal of harvesting pressures. These changes were not evident for another couple of decades and would never have occurred if the reserve had not been established. The recovery of kelp beds from sea urchin barrens was never predicted when the reserve was established. At that time the occurrence of fishery induced trophic cascades whereby the fishing of larger crayfish, *Jasus edwardsii* (Hutton, 1875), and snapper, *Pagrus auratus* (Forster, 1801), released sea urchins from predation and resulted in the urchins grazing the rocks bare of seaweeds. The map developed by Bill enabled the first remapping of a marine reserve anywhere to show the ecological effects of fishing, which was also published in this journal (Leleu et al., 2010).

During his years as Director of the marine laboratory, Bill encouraged researchers and students to investigate the marine life which had begun to flourish in the marine reserve. As a result, a large number of ecological studies were published in the scientific literature (Gordon and Ballantine, 2013, Langlois and Ballantine, 2005).

However, Bill strongly believed there should be more marine reserves. From the 1980s onwards, Bill tirelessly campaigned for more marine reserves to be established around New Zealand. His ideas went global and people around the world wanted to find out about this vision. Bill was invited to give presentations and teaching courses on marine reserves in many countries, including Australia, Canada, USA, Korea, England and Ireland (Fig. 2). Of note was a week-long course he ran in Plymouth, England in 2005, at the invitation of and sponsored by the former English Nature. Staff from a number of UK government and non-government agencies participated and many went away buoyed with enthusiasm and commitment to creating marine reserves in the UK.

In his last year he published a critique of marine reserve establishment internationally, showing that 94% of so-called Marine Protected Areas were not no-take Marine Reserves, most were very small, and most coastal countries had no marine reserves (Costello and Ballantine, 2015). He asserted that the use of the term "MPA" was a pretence of conservation effort, covering up a lack of real protection of biodiversity from the public.

In 1991 he published his book "Marine Reserves for New Zealand" (it was signed by HRH Prince Charles and the Foreword was written by Auckland University malacologist John Morton). This book was a compilation of papers he had written and presented to conferences and workshops in previous years. Chapter Ten, 'The scientific principles of marine reserves' became the catalyst for the next phase of his campaign – establishing networks of no-take marine reserves (Ballantine, 1991).

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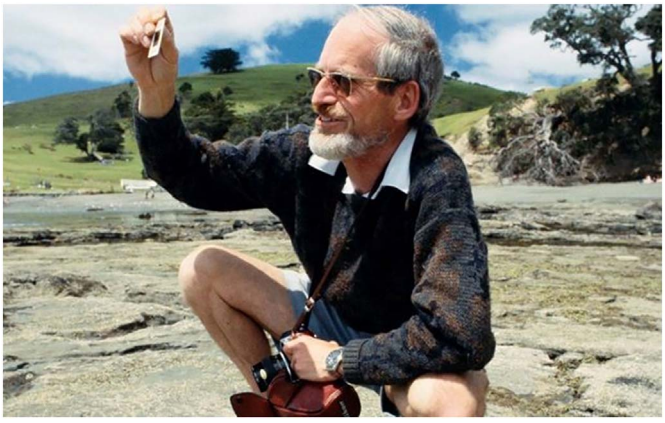

Fig. 1. Bill Ballantine at the Cape Rodney – Okakari Point Marine Reserve, Leigh, Northland, NZ. This is New Zealand's first marine reserves, established in 1975.
Photo: Kennedy Warne.

His work earned him a Goldman Award in 1996. Bill's efforts were recognised in New Zealand, also. He was awarded the Old Blue Award by the Royal Forest and Bird Protection Society in 1989 and in 2002 he received the New Zealand Marine Sciences Society Award for contributions to marine science. He was appointed a Member of the Order of the British Empire in 1994 and made a Companion of the Queens Service Order (2006) for services to marine biology, the environment and the public. Bill became known in New Zealand and around the world as the "Father of Marine Reserves".

Bill saw the importance of measuring change over the long term. He put in place a programme of sea-surface temperature monitoring, alongside

Fig. 2. Speaking at the event 'A Celebration of Highly Protected Marine Reserves', held at the National Marine Aquarium, Plymouth, England in July 2005.
Photo: English Nature.

Fig. 3. Bill revisits one of his PhD study sites in Plymouth, 2005.
Photo: Kathy Walls.

the collection of weather records from the weather station, beginning soon after the marine laboratory's establishment. This has provided a sequence of almost daily sea temperature measurements (sometimes storm surges made it too dangerous to go down the edge of the reef to dip the bucket into the sea) for northern New Zealand. These quality assured long-term records are invaluable to scientists wishing to understand the significance of changes to New Zealand's coastal climate (Evans and Atkins, 2013).

He retired from the University of Auckland in 2003, which gave him more time to focus on marine reserves and to continue with another long-term monitoring programme he'd begun, two decades earlier, studying the complex interactions between species on a small area of rocky shore in the marine reserve. The results of this long-term study, published in *PNAS* 6 months before his death, had the engaging title 'Species fluctuations sustained by a cyclic succession at the edge of chaos' (Benincà et al., 2015). It provided rare field evidence of chaos in natural ecosystems in relation to non-equilibrium population dynamics. It also reflected his original research interests in rocky seashore ecology (Fig. 3). One of the most highly cited papers in European seashore ecology was Bill's simple but practical biologically defined wave exposure scale for rocky seashores (Ballantine, 1961).

A very significant event occurred a month before he passed away. The Prime Minister of New Zealand announced the proposed Kermadec Ocean Sanctuary, located some 500 nautical miles to the north of New Zealand at the United Nations General Assembly on September 29, 2015. Bill was extremely pleased that this large offshore area, comprising a wide range of unique habitats and species, was to finally be afforded complete protection. He was an invited guest and had a front row seat to the Environment Minister's announcement. Without doubt, he would have wanted to see more ocean sanctuaries established – he had already commented after the announcement of the Kermadec Sanctuary that other areas in the EEZ should be protected to form an offshore network of marine reserves.

The motion passed by the IUCN in 2016 reflects Bill's massive influence over the past few decades to protect the marine environment and leave it a better place for future generations. We fondly remember him as a teacher, mentor, dear friend and a true visionary who has left a legacy for New Zealanders and indeed, the world, to be inspired by.

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