



CLIMATE CHANGE AND THE EFFECT ON OUR PARKS

RESILIENCE IN OUR WILDEST PLACES

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Our national and regional parks play a significant role in safeguarding our most threatened natural and cultural heritage, alongside hosting a wide range of outdoor recreation and wilderness experiences. However, being located in some of the most extreme environments, our parks are increasingly vulnerable to the severe and chronic effects of climate change.

With a past career building visitor experiences in some of New Zealand's most iconic national parks and working in a world-leading threatened species recovery programme, Climate Change Specialist Sam Parsons provides a first-hand account of how climate change is affecting our parks, lessons learnt from the field, and our pathways towards resilience. Sam will address the looming question of just how important are our parks in mitigating climate change.

OUR PARKS

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extreme environments, our parks are increasingly vulnerable to the severe and chronic effects of climate change.

As conservationists are now experiencing, the planning measures that formerly protected our parks from habitat destruction and exploitation are no longer sufficient for preserving these places in perpetuity. The direct and indirect effects of climate change are quickly exacerbating the global

biodiversity crisis, increasing the degradation of natural ecosystems at an alarming rate and introducing new perverse threats.

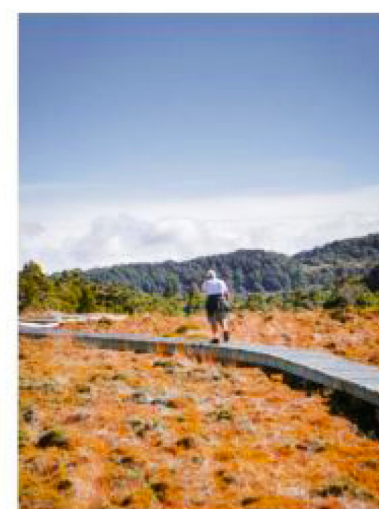
Increasing frequency and intensity of storm events, more severe drought conditions, sea-level rise, changing seasonality, and the growing range of invasive species present a range of new challenges for park managers to contend with.



In some areas, the chronic effects of climate change risk reversing decades of hard-fought conservation efforts. For example, populations of iconic kiwi based on offshore predator-free islands are declining, as increasing drought conditions prevent them probing for food. In other parts, increasingly severe climate events are driving a steady decline in the quality of recreation experiences, due to the already limited funding available to park managers being directed towards repairing and replacing assets not fit for a more extreme climate.

New Zealand's Fiordland National Park, home to internationally iconic alpine ranges, glaciers and deepwater fjords, alongside a diversity of ancient flora and fauna, is a prime example of climate change making its presence felt in recent years. With its iconic destination, Milford Sound Piopiotahi, hosting approximately 870,000 visitors in 2019, the park plays a critical role in both the southern economy and New Zealand's tourism identity. However, the impacts of climate change are putting increasing pressure on park infrastructure and its intrinsic value.

In early 2020, an extreme rainfall event occurred over several days across Fiordland and neighbouring Mt Aspiring National Park, with the heaviest rainfall occurring near Milford Sound. Milford Sound received 566mm of rain in a single day and 1124mm of rain across the four-day event – over 16 percent of its average yearly rainfall. The storm saw at least 380 people stranded and significant damage occurred to two huts, 32 bridges, over 440km track, with a loss of over 20 percent of predator control assets in the area. Recovery efforts, which are



still ongoing, required a \$13.7 million budget investment from central government to support a park rebuild.

This event in Fiordland National Park highlighted how vulnerable our parks are to the effects of climate change. Assets planned and built years earlier, based on previous climate conditions, were quickly exposed to a new normal. In addition, new unknown visitor-risks were found.

However, this event only highlighted the evident vulnerability to one of the many climate-related hazards parks like Fiordland are facing. More troubling for park managers than the shock of severe weather events, is the uncertainty of how long-term chronic changes such as warming will alter the natural processes that park values depend upon.

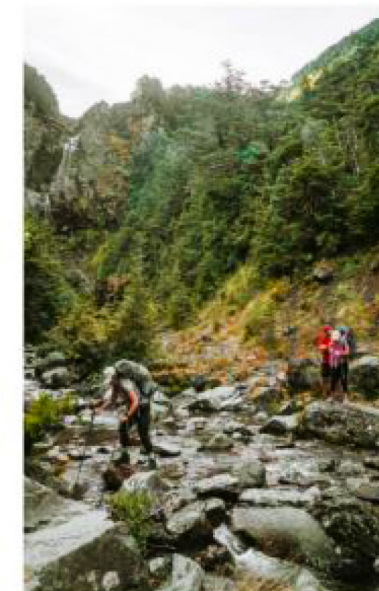
Human-induced climate change is altering the biosphere, upon which humanity as a whole depends, at an unprecedented scale. Globally, on average, around 25 percent of known species are threatened. This suggests that around 1 million species already face extinction, many within the next decades, unless action is taken to reduce the intensity of climate-related biodiversity loss. Our biodiversity is declining faster today than at any other time in human history.

If our parks, and the natural, cultural and intrinsic values they seek to protect, are to remain resilient and thrive in a changing climate, management practices must quickly adapt to plan for a future of deep uncertainty, and recognise the opportunities that a nature-based response can bring.

There is no question that our climate is changing and will continue to change for decades to come. However, there is uncertainty in what change pathway the world will take in its urgent transition to achieve net-zero, and how climate change will impact and interact with existing values and threats.

While our parks are highly vulnerable to the effects of climate change, they also offer some of the most significant solutions in the fight against it. Parks offer the perfect proving ground for high quality Nature-based Solutions (NbS). NbS address the challenges of climate change through the protection, sustainable management and restoration of both natural and modified ecosystems, benefiting both biodiversity and human wellbeing. NbS are underpinned by the services that flow from healthy ecosystems.

Effectively designed and managed,



NbS offer the opportunity to not only protect and enhance the natural and cultural heritage held within parks, but also enhance the value that parks have within society. Through protection and enhancement of healthy natural ecosystems, parks can help sequester and store higher quantities of carbon, to play a key role in nations achieving their net-emission reduction targets and mitigating the most severe impacts of climate change.

They also offer significant benefits in wider climate-related risk management. In review of the 43 priority risks identified across all value domains within New Zealand's First National Climate Change Risk Assessment, high quality NbS have the ability to mitigate at least 34 of these risks, either directly or indirectly. These benefits appear to be consistent internationally. The United Kingdom's climate adaptation planning has recognised that NbS can help address 33 of the 34 priority risks identified in their third Climate Change Risk Assessment.

While climate change response and natural resource management is beginning to recognise the significant role of NbS in climate change response, there is still much work to be done to see these opportunities impacting park management efforts on the ground. As focus now shifts to how to design and deliver high quality NbS, park managers and conservationists alike must be central in the development of the frameworks, pathways and tools available to deliver these. Objectives for parks must remain in preserving and enhancing natural environment as the NbS that deliver countless co-benefits. ■