OFFICE OF THE PRIME MINISTER'S SCIENCE ADVISORY COMMITTEE

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Dr Stephen Goldson's remarks during session 3: *How can we use and manage our resources?*

Transit of Venus Forum, Gisborne

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Thank you for this opportunity to speak at such an interesting and auspicious occasion.

A central question posed at this Transit Event is how can science and technology contribute critically to New Zealand in achieving clean and efficient industry, social cohesion and economic success? In response to this I will say a few words about the defence of what New Zealand already is, with specific reference to its unique biodiversity and land-based industries.

This country will inevitably continue to be a trading nation and a tourist destination and with this there will be increasing volumes of freight and people crossing the border. As a result, New Zealand faces massive and continuous risks of biosecurity failure leading to the invasion and establishment of exotic pests, weeds and diseases. Damage from these species can occur in all ecosystems and of course, climate change is well able to make everything a whole lot worse.

The list of actual and potential invaders is long and full of nasty surprises. Some of many examples that may resonate include the Varroa mite, weasels, the potato psyllid, clover root weevil, Psa in kiwifruit, gorse, painted apple moth, possums, foot and mouth disease, didymo, rabbits, mosquitoes and fruit flies. Pests and diseases like these and believe me there are many, many more, can and will wreck both the productive and native ecosystems of New Zealand if we do not keep them out. These are the ecosystems on which so much of New Zealand's prosperity depends. These are the ecosystems that make New Zealand so different and special.

So why us?

Ecologically New Zealand is almost unique in the world and using Simon Upton's words, 'it is the last bus stop on the planet'.

Until 700 years ago, when people started to arrive with their various accompanying species, the New Zealand landmass had sat unsullied for about 80 million years doing its own thing while the plants and animals continued to adapt. Birds, reptiles and insects evolved to fill the spaces that mammals have inhabited in other places. Many of the bird species became flightless and a bit dopey. The splendid isolation resulted in an array of unique ecosystems pretty much unlike anywhere else. For example, 95% of the country's insects are peculiar only to New Zealand.

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Having developed in the absence of a wide range of sharp-toothed invasives, New Zealand's native ecosystems are wide open to invasion, disruption and extinction. For example, since the arrival of vertebrate predators, 40% of our bird species have disappeared.
There are of course remnants of the original ecosystems as typified by West Coast rainforest, tussock high country and species-rich wetlands. However, depredation continues and we must protect what is left. Arguments rage about how. Do we protect ecosystems with all their diversity, or should we focus on individual iconic species like the little spotted kiwi?

The situation in the productive ecosystems is completely different and with this there is a kind of irony. There are in fact too few species. The landscapes are species-sparse comprising incomplete transplants of the complex primitive habitats from which they were extracted. Significantly, many of the plants arrived at the time of European settlement. As a result of slow and ponderous 19th century sea voyages, many of the accompanying pests never made it. Thus, New Zealand has had relatively pest-free production systems. The party is now over and we are faced with very fast high volume transport from various ports of origin; we are up against it.

When invasive plants and animals arrive in such altered ecosystems they frequently encounter a year-round supply of sometimes thousands of hectares of highly suitable food plants, unfilled niches and a lack of effective natural enemies and competitors. This means that invaders often establish, thrive and build up to devastating population densities far greater than those ever found in their original ecosystems. Even with what we have here now, it is estimated that their impact is of the order of NZ$1 billion per year.

This situation is not stable. The Ministry for Primary Industries is facing severe challenges. Each year more than 600,000 sea containers arrive and somehow these have to be dealt with. Each year there are 4000-5000 interceptions of invertebrates and there are over 3000 identified global insect crop pest invaders hanging around our borders. As if this is not enough, the New Zealand border authorities are also supposed to staunch the flow of threats without materially slowing the rate of commerce.

Scientific research just has to be part of the solution. Technologies must be researched, designed and adapted. They need to be about data handling, risk assessment, pathway risk analysis, automated inspection methods, molecular methods for on-the-spot species identification, forensic techniques to determine pest origins, remote and non-remote surveillance, socially acceptable containment, socially acceptable eradication technologies and so on. Also, the New Zealand public must engage and report promptly on the arrival of threats and ensure biosecurity compliance.

Biosecurity is not just nice to have, it is absolutely essential to New Zealand's future and only through science working very closely with the biosecurity officials in the Ministry for Primary Industries and others is there the prospect of this country keeping up with its biosecurity demands. Please note that science-informed biosecurity is about protecting the very systems and industries that other science can add value to. Such defensive work is fundamental, but is not the sort of work that you can put a precise value on. Funders and decision-makers must understand this.

The environment of this country is what makes it outstanding; it is also that which makes it uniquely vulnerable to biosecurity failure. These considerations are so very much of part of New Zealand's future.

Thank you.
ENDS

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