To : Submissions Analysis Team

Climate Change Commission

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From: Royal Forest & Bird Protection Society of New Zealand Inc

Wellington

Submission on Draft Advice Report to Government

Introduction

Introduction to Forest & Bird

The Royal Forest & Bird Protection Society (Forest & Bird) is New Zealand's largest and longest-serving independent conservation organisation. Our mission is to be a voice for nature – on land, in the sea, and in our fresh waters.

Forest & Bird's constitutional purpose is to "*take all reasonable steps within the power of the Society for the preservation and protection of the indigenous flora and fauna and the natural features of New Zealand.*"

Forest & Bird is already seeing climate impacts on its projects, such as the stresses faced by hoiho (yellow-eyed penguins) in Te Rere reserve in Southland and storm damage to Bushy Park near Whanganui.

Forest & Bird is currently undertaking a carbon foot-printing exercise, including both emissions from activities and removals (carbon sequestration) from conservation projects and reserve management. We are gearing up to undertake future-proofing of our projects to take into account climate risks.

Why climate change matters to Forest & Bird

Forest & Bird is concerned about the risk climate change poses to nature.

Approximately 252 million years ago the Earth experienced its most severe extinction event. Known informally as the Great Dying, around 96% of all marine species and 70% of land vertebrate species went extinct during this period. It was also the largest (and possibly the only) mass extinction of insects. Recovery of land-dwelling life took approximately 10 million years and marine life may have taken two million years to recover. Runaway climate change was almost certainly the cause of this mass extinction and the worst effects appear to have occurred when climate change caused first the sea, and then the air, to become toxic.

Even modest warming poses serious risks to nature. New Zealand's natural systems are already under too much pressure with approximately 4000 known species at some risk of extinction. Climate change is likely to exacerbate these extinction risks. For example:

1. Geographically limited species are at risk from extreme weather events that may potentially destroy their remaining habitats
2. Fragmented habitats are vulnerable to loss through extreme events, either through total loss or through what are called edge effects (where small areas are vulnerable to changes on their margins that ultimately undermine the whole natural system)
3. Subtropical weeds will spread southwards
4. Increased frequency of mast events will cause more local extinctions of wildlife in beech forests
5. Alpine and sub-alpine habitats will disappear from some areas
6. Riverbed nesting birds will be vulnerable to changes in river flows in spring
7. Some marine species such as hoki have poor breeding in warmer summers.

Already, we are seeing the impacts of warming on New Zealand's native species, including the death of little blue penguins in the Hauraki Gulf, the failure of royal albatross chicks to hatch, and repeated mast years leading to explosions in pest populations. Recent research by Landcare Research – Manaaki Whenua has revealed that warming temperatures are enabling higher numbers of introduced predators and contributing to increased decline of native forest birds.

Forest & Bird is also concerned about the impact of ocean acidification, another global environmental process arising from excessive carbon dioxide in the atmosphere. Ocean acidification is likely to impact on the survival and reproduction of wide range of species that are sensitive to declining pH (higher acidity), including shellfish, squid and plankton. The potential loss of plankton is particularly concerning because it is the beginning of food chains in large parts of the ocean. Reductions in plankton availability will cause a cascading effect throughout the food web.

Forest and Bird is further concerned that any inappropriate response to climate change could also further exacerbate the crisis affecting nature in New Zealand through, for example, ill-judged choices of trees for planting, introduction of resilient but weedy fodder crops and inappropriately located infrastructure. Our response needs to be well designed to avoid these problems.

Our key points

- **Doing our fair share.** We must make a stronger global commitment to cutting our emissions and helping developing countries. New Zealand's targets should reflect our economic status, ability to take action, and high current and historical per-capita emissions.
- **Cutting emissions first.** A commitment to faster emissions reductions must come ahead of removing carbon dioxide from the atmosphere. We need a transformation to a clean green economy, and that means producing and consuming things without generating greenhouse gases. The Commission needs to support faster emission reductions than its draft plan proposes.
- **Nature-first emission reductions.** A strategic planning approach will be needed to ensure that nature is not harmed by the economic transformation required to decarbonise the economy. The methods used to cut emissions must protect our native plants and animals. This means no new big hydro, stopping mining on conservation land, and ensuring new wind farms, biofuel production and transport infrastructure don't harm nature.
- **Better land use.** Marginal and erodible land needs to be returned to native forests and shrublands, regenerative farming is needed to cut emissions, and there should be fewer cows. The expansion of dairy has been driven by hidden subsidies in the form of inadequate pollution control, public funding of irrigation and a carve-out from emissions pricing and it should face the full cost of production.
- **Help nature help us.** The Climate Change Commission needs to place more emphasis on wetlands, blue carbon, shrublands, mangroves, and pest control. Pest control is critical to protect carbon stocks and to achieve the Commission's proposed long term carbon storage in native forests. Once emissions are reduced, we will still need to remove carbon dioxide from the air to stabilise the climate. Nature can help us do this, but only if we protect it.
- **Helping each other.** We need a just transition that helps communities and workforces to adjust, makes sure vulnerable people are not left behind, ensures new technology and ways of working are available to all, and gives effect to the Treaty of Waitangi.

The role of nature in New Zealand's climate change response

New Zealand has a nature-based economy (food, fibre and tourism). New Zealand also relies on nature for protection from extreme weather-related events. At the same time, New Zealand's natural environment is in serious trouble with 4000 species at risk, natural capital in decline, ecological services diminishing or under pressure and serious threats to the intrinsic value of nature. Climate change and ocean acidification will increase these pressures.

New Zealand can create a virtuous circle to help deal with these challenges: nature will help us become more resilient, but only if we help nature itself become more resilient. In considering emission reduction pathways the Commission need to consider the following factors:

- The role that nature plays in providing resilience
- The role of nature in carbon dioxide removal
- The risks to nature from our climate response

Role of nature in providing resilience

One of the precursor agencies to the Department of Conservation, the Forest Service, protected large swathes of native forest for soil and water conservation purposes. Successive governments recognised that forests buffer the water flows that come from storm events and reduce sedimentation and erosion.

This forest was called “protection forest” because it protected downstream farms, towns and infrastructure. This is one example of how nature provides resilience. Other examples include:

1. The role of dunes in protecting land from storm surges
2. The role of lakes and wetlands in buffering extreme flows
3. The role of mangroves in reducing local acidification and in buffering the coast from storm surges
4. The role of tussock grasslands in capturing water and preventing erosion
5. The role of natural catchments in providing reliable, clean, water.

This means that emission reduction pathways that protect nature will deliver significant co-benefits.

Role of nature in removing carbon dioxide

New Zealand’s nature-based economy provides opportunities through our management of land and sea to carry out significant carbon dioxide removals and storage. Examples include:

1. Existing native forests, shrub-lands and tussock-lands provide a substantial carbon stock
2. Avoiding destruction of native vegetation by clearing and pests prevents emissions and maintains carbon stocks
3. Retiring land from grazing and restoring native forest, shrub and tussock ecosystems on those lands provides a source of removals
4. Improved coastal fisheries management can result in the restoration of kelp forests with the consequent blue carbon storage potential.

Forest & Bird has attached a paper on the significant role of pests in generating emissions of carbon dioxide and methane, in preventing regeneration and in degrading carbon stocks.

Risks to nature from our climate change response

A poorly designed response to climate change will create conflict with other statutory decision making and create risks for nature. These risks to nature include:

1. Introducing new resilient grasses or shrubs for fodder that can become serious weeds
2. Use of inappropriate locations or species for plantation forestry, resulting in loss of natural habitats and wilding tree spread
3. Inappropriately located renewable energy infrastructure leading to habitat destruction or degradation
4. Loss of geothermal features and their associated rare and localised ecosystems due to excessive extraction of geothermal energy
5. Expansion of irrigation into areas of indigenous or mixed exotic/indigenous habitat such as tussock grasslands, resulting in damage to habitats where water is applied, and downstream water pollution and loss of mauri
6. Relocated infrastructure causing a loss of rare ecosystems in the new locations for infrastructure.

The Hazardous Substances and New Organisms Act, Resource Management Act, Conservation Act and National Parks Act may all come under pressure if pathways for emission reductions, offsetting and adaptation involve inappropriate and environmentally damaging proposals.

Key areas of environmental risk in the Commission's draft advice are:

- The risks associated with new energy infrastructure required to decarbonise the energy sector, including the irreversible damage from inappropriately located pumped storage, damage caused by the location of a five-fold increase in wind and damage caused by new transmission storage. The Commission needs to demonstrate how these risks are addressed.
- Risks from an expanded use of biomass for energy, including the risk that weedy species will be used for biomass and impose costs on the environment and the public
- Insufficient ambition in relation to agriculture leading to greater environmental impacts from agriculture than would have otherwise have been the case

Questions from the Commission

1 Do you support the principles we have used to guide our analysis? Is there anything we should change, and why?

A further principle on environmental integrity needs to be added in relation to avoiding creating new environmental problems when solving the climate crisis, including avoiding further deepening the biodiversity crisis and where possible contributing to solving multiple environmental problems simultaneously. Suggested wording could be:

> **Principle 8 Environmental Integrity** The actions Aotearoa takes to meet emissions budgets and targets should avoid exacerbating other environmental problems, reduce risks to at risk, threatened, and protected species and should where possible contribute to addressing multiple environmental problems.

4 Do you support budget recommendation 4? Is there anything we should change, and why?

There should be limits on offshore mitigation in order to drive structural change and avoid locking in polluting infrastructure and activities. Offshore mitigation should initially only be for the purpose of plugging any gap in the NDC.

5 Do you support enabling recommendation 1? Is there anything we should change, and why?

Forest and Bird supports seeking cross party Parliamentary support where possible and for political parties to place their positions on record in Hansard via Parliamentary debates. This is an important accountability mechanism in Parliamentary democracy. However, seeking cross-party support for policy should not happen at the expense of effective action.

6. Do you support enabling recommendation 2? Is there anything we should change, and why?

There needs to be clear accountability for performance. New Zealand cannot afford to fail any longer in its efforts reduce emissions.

8 Do you support enabling recommendation 4? Is there anything we should change, and why?

Forest & Bird supports a strategic planning approach in line with our submission on the Randerson Report. It is important that this planning takes a nature-first approach so that decisions about our climate response don't inadvertently deepen the biodiversity crisis. Any 30-year infrastructure plan must avoid placing infrastructure into sensitive environments or where there are protected or at-risk species. The projected five-fold increase in wind must be achieved via a strategic planning approach that safeguards nature and sensitive landscapes.

9 Do you support enabling recommendation 5? Is there anything we should change, and why?

Forest & Bird supports inclusive public participation in decision making on how to reduce New Zealand's emissions. In the past decisions in relation to climate change have been vulnerable to capture by influential primary and industrial sectors and this has resulted in higher costs to the wider community through postponed action, direct and indirect subsidies and an inadequate contribution to global efforts. Necessary action has been postponed for 30 years and cannot be postponed any longer.

10 Do you support our approach to focus on decarbonising sources of long-lived gas emissions where possible? Is there anything we should change?

New Zealand needs to make structural changes to decarbonise the economy that have been postponed and continue to be postponed through offsetting. Current policy setting have created a strategic long-term risk to New Zealand by delaying the inevitable and forcing costs into the future. Forest & Bird therefore supports a focus on decarbonising sources of long-lived gas emissions where possible.

The two caveats are

- that there does need to be a stronger emphasis on methane because, although it is a short-lived gas it has a very strong climate-forcing effect.
- The focus should be on emission reductions across the economy. For example, achieving the final emission reductions through 100% decarbonisation of electricity should not happen in a way that diverts resources from more cost-effective forms of carbon dioxide emission reductions by overinvesting in expensive hydroelectric dry-year capacity

11. Do you support our approach to focus on growing new native forests to create a long-lived source of carbon removals? Is there anything we should change, and why?

Forest & Bird welcomes that native forest regeneration has been recognised in the report. The Commission proposes to encourage 16,000ha of permanent native forest planting per year by 2025 and 25,000ha of permanent native forest planting by 2030 continuing to 2050. This would see a minimum of 600,000ha of new permanent native forest by 2050. It is unclear whether this also includes native regeneration that occurs without planting and it should be recognised that in many areas removal of browsing animals is the primary task that will deliver regeneration, rather than planting.

The commission has identified 1.4 million hectares of available land and should consider scaling up its targets for restoration so that by 2050 all suitable land is in regeneration.

New Zealand's existing natural ecosystems store many billions of tonnes of carbon. Their sheer size means that even small changes to their extent can have a significant impact on the country's greenhouse gas emissions profile.

Forest & Bird supports the approach of focussing on new and restored permanent native forests to create a long-lived source of carbon removals rather than plantation forestry. This would have significant co-benefits in terms of water quality, erosion protection and human and natural resilience.

As mentioned above, Forest & Bird considers removals to be largely additional to decarbonisation of the economy. In practice we need to do everything we can.

The commission could go further in the following areas:

- Increasing the potential forest restoration that could be achieved by 2050 to exceed 1M Ha. There are significant areas of marginal and erodible land that could be restored with significant co-benefits
- Placing a stronger focus on blue carbon, mangroves, wetlands and non-forest ecosystems that can store carbon.
- A greater emphasis on the role of pest control as a means of protecting existing carbon stocks and to facilitate reforestation and sequestration.
- Encouraging research where the Commission considers that there are gaps in scientific knowledge to support policy (such as the potential benefits of blue carbon and the role of pests)

All of New Zealand's natural terrestrial ecosystems are under stress from feral introduced mammalian herbivores. Forest & Bird has attached an internal study that estimates that these feral introduced herbivores' direct biomass consumption and methane production is between 2.3 and 4.0 MtCO2e per annum. The mid-point and upper estimates of the indirect increase in carbon sequestration that could result from sustained introduced herbivore control are 8.4 and 17.5 MtCO2e/yr respectively.

Notably, between 2002 and 2014 there was a significant (-3.4 MtCo2e/yr) decline in the carbon stocks of the largest native forest association (kamahi-podocarp). The most likely cause of this decline was the impact of introduced herbivore browsing, as kamahi is one of the few native tall forest species that is preferentially browsed by deer, goats, chamois and possums.

Pest mammalian herbivore control is likely to be a significant and cost-effective means of protecting carbon stocks and reduce methane emissions. At the very least the country needs to increase its introduced pest control to protect the massive existing carbon stores in our natural ecosystems.

12 Do you support the overall path that we have proposed to meet the first three budgets? Is there anything we should change, and why?

The Commission has been very cautious in the first carbon budget and should test its assumptions about the potential speed of change to see where faster reductions can be achieved.

13. Do you support the package of recommendations and actions we have proposed to increase the likelihood of an equitable, inclusive and well-planned climate transition? Is there anything we should change, and why?

Forest & Bird supports an equitable, inclusive and well-planned climate transition. A transition will need to reflect that the biggest challenges may not lie with relatively mobile mining workforces and fossil fuel permit holders but with the local communities they leave behind.

Local Government will need to be strongly engaged and there will need to be recognition that to date both local councils and MBIE have largely struggled to manage transitions well; there is a tendency to reflect the interests of influential voices (such as mining permit holders) and to resist change to existing economic activities at the longer-term expense of local communities.

An equitable, inclusive and well-planned climate transition also needs to take into account the needs of the natural environment and the strain that the natural environment is currently experiencing – it will need to avoid exacerbating other environmental problems.

Transition needs to be properly taken into account the needs of marginalised and at-risk communities and people. There will be a particular need to engage with unions to help plan transitions that work for workforces and to engage with disability advocates to ensure the transition delivers better accessibility, particularly in transport.

Iwi have a key role to play, particularly in the transition to more climate change friendly land use with their Treaty of Waitangi rights and interests in land, primary production and freshwater. If the approach taken fails to fully recognise this, it will likely fail.

14 Do you support the package of recommendations and actions for the transport sector? Is there anything we should change, and why?

Transport modes

There needs to be active and public transport mode shift. Currently, the recommendations for active and public transport are not ambitious enough. Walking, cycling and public transport can and must play a much larger part in decarbonising the transport system. Active and public transport systems need to be designed to work for disabled people. Transport planning needs to be married with a greater focus on livable, compact, accessible and equitable cities.

A disability responsive EV policy is essential to ensure that disabled people can participate in all modes of low carbon transportation.

New transport infrastructure needs to avoid damaging sensitive areas, for example being routed through the native vegetation and the habitats of native fauna. A focus on shifting to active and public transport and more compact, liveable cities could help reduce the local impacts of the transport system as these methods tend to require less space than cars. Continuing to expand road capacity is incompatible with addressing climate change.

Biofuels

The development of biofuels must avoid crops that could become weedy. New Zealand already has a large and expensive problem with wilding conifers. Fast growing resilient sources of fibre for biofuels, by their nature, will have a propensity to become weeds.

15 Do you support the package of recommendations and actions for the heat, industry and power sectors? Is there anything we should change, and why?

There needs to be a much larger direct investment in energy efficiency is needed, especially as we work to make all of the housing stock accessible for disabled communities, and to enable secure life long housing options. Energy efficient homes must be financially affordable and physically accessible.

Replace coal use in process heat for food production, specifically for the dairy industry, with renewable energy sources (not gas) by 2027.

Ban new and expanded coal mines in Aotearoa, and an end date for all coal mining in Aotearoa - including coal mining for export. This should include an immediate ban on any new coal mining on conservation land because of the significant co-benefits for nature.

Managing a five-fold growth in wind generation

Forest & Bird notes that the Commission anticipates new capacity would primarily come from wind and solar. To manage risk, the Commission anticipates that wind generation would be widely dispersed across the country. Forest & Bird strongly urges the Commission to advocate a strategic national spatial planning approach to new wind farms so that the expansion of wind not only meets requirements for being sited for good wind resources and risk management, but also so that it avoids harm to nature and to sensitive landscapes.

Dry year risk

Forest & Bird notes that dry year risk has been identified as an issue. Addressing this through the construction of a single large pumped storage system and raising Lake Onslow would be extremely expensive and have unacceptable environmental impacts. The proposal would destroy nationally and regionally important wetlands as well as the habitats of rare and threatened plant and animal species.

Forest & Bird urges the consideration of alternatives, including retain a residual role for gas as a dry year back up until technology and improvements in the electricity system adequately solve the dry year risk. Demand-side measures should be prioritised over large-scale supply side infrastructure where that infrastructure would harm nature.

High emitting geothermal energy

The Commission proposes to phase out high emitting geothermal energy, some of which emit as much CO2 as gas. Depending on which geothermal is decommissioned, this could deliver a co-benefit to natural geothermal systems by restoring natural water flows within those systems. The commission should consider the risks to natural geothermal systems from extracting new geothermal energy.

16 Do you support the package of recommendations and actions for the agriculture sector? Is there anything we should change, and why?

New Zealand's current policy settings largely protect our largest source of emissions from responsibility for its emissions. This means that the remainder of the economy must pick up the slack.

The current approach makes very little economic sense as:

- it distorts investment towards increasing emissions and away from activities that might reduce emissions and so acts against the country's overall policy goals

- Fails to recognise that in some parts of New Zealand the dairy sector already exceeds the carrying capacity of the local environment
- it deprives our society of the co-benefits from reducing agricultural emissions (reductions in excess nitrogen benefit both the atmosphere and water as some excess nitrates go to air, while others go to water)
- Changing farming systems to a farm optimisation model is likely to result in significant reductions in methane emissions while increasing profits for many farmers.

The Lincoln University Dairy Farm is a good illustration of how shifting to a farm system model known as the Environmental Economic Model (E2M – previously known as the GSL model) could deliver greater profits by reducing stocking rates under a system of optimising farm operations.

The Lincoln University Dairy Farm[1] reduced external inputs and the size of its herd (from 630 to 560 cows). This led to increased production per cow (from 400kgMS to over 500kgMS per cow) and profitability, while decreasing its nitrogen leaching by 30%. Note that the increase in production per cow offset the reduction in herd size.

One consequence of reducing the herd size is that a proportionate drop in methane emissions will almost certainly have occurred. On this basis the Lincoln University Dairy Farm has already delivered on its contribution to a 10% reduction in methane by 2030. Note that this reduction was achieved without any adverse impact on farm operations or profitability, and without expensive mitigation technology. Milk solid production at Lincoln increased slightly despite the lower stocking rates.

The E2M model is able to achieve these results because it utilises two techniques that no other farm system model in New Zealand uses – linear programming and marginal analysis. Essentially, this means the E2M model is able identify the optimum combination of management options on a farm to maximise economic performance and minimise environmental impacts. Other models cannot do this because they rely on the user to try and identify optimum combinations based on educated guesses, using poorly suited accounting, rather than economic, principles.

This approach was explained and supported in evidence in chief of David Graeme McCall for Fonterra and Dairy NZ in the proceedings for the Proposed Hurunui and Waiau River Regional Plan:

> The GSL [E2M] model was chosen over Farmax...This was because GSL [E2M] is more efficient at finding optimal resource use allocations due to it being an optimising, rather than a simulation model. With simulation models (such as Farmax) the definition of optimal resource use requires the user to iterate their way to an optimum solution. This iteration is time consuming, not always fool-proof and optima may be missed.[2]

Farm optimisation with the E2M model offers enormous potential to reduce the environmental impact of agriculture in New Zealand – through reductions in leaching, more efficient use of fertiliser and irrigation water, reductions in herd size and soil compaction rates, and most importantly, through reductions in greenhouse gas emissions.

Despite farm optimisation with the E2M model having been endorsed by Fonterra and Dairy NZ in the above evidence of David Graeme McCall, by Dairy NZ in information for farmers,[3] by Pāmu's Environmental Advisor, Alison Dewes,[4] and by individual farmers who have utilised the model, uptake has been extremely limited. This means that New Zealand has significant low hanging fruit to achieve

profitable reductions in methane. The profitable nature of lower input farming also means that achieving the current methane target may actually be the cheapest emission reductions in New Zealand and cost farmers little or nothing to achieve.

This is neither fair on others in New Zealand who will have to make emission reductions at a higher cost, nor is it a fair contribution to global effort.

[1] Lincoln University Dairy Farm Focus Day, 2012 - http://www.siddc.org.nz/assets/LUDF-Focus-Days/10-May-2012-.pdf

[2] In the footnote on page 6 of: https://api.ecan.govt.nz/TrimPublicAPI/documents/download/1760006

[3] https://www.dairynz.co.nz/publications/environment/reducing-nitrogen-loss/

[4] e.g. http://pnrp.gw.govt.nz/assets/Uploads/HS4-S308-Fish-and-Game-Alison-Dewes-Expert-evidence-26-January-2018.pdf

Beyond efficiency gains, the Commission's recommendations need to explicitly acknowledge that land use change is inevitable and include:

- A recognition that dairying is exceeding the local environmental carrying capacity in some places and so is likely to shrink as it is brought back into line with environmental limits
- A recommendation that agriculture faces the full price on its emissions and that any recommendation by He Waka Eke Noa results in an emission price at least as effective as that in the ETS
- A goal of delivering a net change in nationwide land-use overall from high emission forms of production to lower emissions forms of production. This would most likely to achieved through a reduction in dairy production in areas where it exceeds environmental limits and the expansion of permanent native forests and other natural ecosystems to provide permanent carbon storage
- Direct control of inputs (especially supplementary feed and fertilisers) that help drive greater emissions through intensification

17 Do you support the package of recommendations and actions for the forestry sector? Is there anything we should change, and why?

The emphasis on native reforestation is welcomed. The Commission should change the language to state native forest protection, reforestation and regeneration. It should also more strongly consider non-forest natural systems such as wetlands, shrublands and seaweeds.

Where the Commission lacks confidence in data relating to non-forest ecosystems and pest control within forest ecosystems it should provide recommendations to Government on the types of research that are needed and research questions that should be addressed.

Forest & Bird has attached a paper on the role of pest control.

19 Do you support the package of recommendations and actions to create a multisector strategy? Is there anything we should change, and why?

Factoring nature into the multi sector strategy

The role of nature in New Zealand's climate response and the risks to nature in New Zealand's climate response need to be factored into the multi sector strategy.

Free allocation and trade exposure

Free allocation should be phased out faster and measures to address "carbon leakage" should be addressed through measures outside of the ETS. "Carbon leakage" is a failure of trade policy because it reflects the failure of global trade rules to prevent countries using inadequate control of emissions as a form of hidden subsidy to polluters. The appropriate place to address carbon leakage is through trade policy.

20 Do you agree with Budget recommendation 5? Is there anything we should change, any why?

Accounting rules for forestry domestically in New Zealand (such as harvested wood products) may need to be applied in a differential manner from the international rules. This is because some rules that work in New Zealand to encourage the use of exotic plantations to supply construction materials, unfortunately, in an overseas context, encourage deforestation and are therefore drive increased emissions and habitat loss.

The difference between the effects of some LULUCF rules within New Zealand and internationally reflects that in New Zealand most natural forests are protected and production forest is more in the character of tree farms, whereas overseas natural and semi natural forests are logged as a timber source. Rules to create an incentive for timber use can drive deforestation where there are not strong protections for old growth forests.

Forest and Bird could consider supporting changes to domestic accounting rules to create incentives for plantation wood to replace steel and concrete as a construction material and to replace plastics in manufactured products, provided the rules were domestically focussed and not transferred to countries where such rules could drive old growth logging.

21 a Do you support our assessment of the country's NDC? Do you support our NDC recommendation?

A 2030 NDC target under the Paris Agreement for New Zealand that reflects our historical pollution and outsized carbon footprint (our fair share) would be far beyond 35% below 2005 levels by 2030. The 2030 target range (25-44%) the Commission uses to find emissions reductions consistent with IPCC pathways for 1.5 degrees represents what Aotearoa's contribution would be if we did the average, and not our actual fair share.

Forest & Bird supports 1.5-degree global target

Forest & Bird supports an overall global objective of not exceeding 1.5 degrees warming. There is now sufficient evidence in relation to the difference between 1.5 degrees and 2 degrees to justify this as the most appropriate warming target. It is Forest & Bird's view that a 1.5 degrees goal is scientifically justified on the basis of the potential impacts of climate change.

National Determined Contributions should be based on science and ethics

Establishing New Zealand's own share of the effort required to achieve this goal is both a scientific and ethical exercise. The science tells us the level of emissions reductions required globally to achieve no more than 1.5 degrees warming and ethics informs us on what our proportionate contribution to those reductions should be. It is not quite as straightforward as allocating a kind of "pro-rata" allocation of effort to New Zealand.

Establishing New Zealand's Nationally Determined Contribution

Forest & Bird notes the advice of the Intergovernmental Panel on Climate Change (IPCC) Special Report on Global Warming of 1.5° Celsius that to remain in the central range of global scenarios consistent with staying within 1.5 degrees of warming, as set out under the Paris Agreement, with limited or no overshoot—

> global emissions of carbon dioxide need to reduce to net zero around 2050, and below zero thereafter; and
>
> global emissions of agricultural methane need to reduce by 24% to 47% from 2010 levels by 2050.

This level of global effort is not precautionary as it is set in the mid-range of scenarios for emission reductions consistent with staying within 1.5 degrees of warming. To be precautionary, greater emission reductions than those provided for by the mid-range scenarios should be adopted.

New Zealand's GDP, current and historical emissions and level of development are all above the global average. As a country we have disproportionately benefited from being able to pollute the atmosphere relative to our size and have disproportionately more capacity to do something about it. This means our efforts should be greater than the global average required to achieve no more than 1.5 degrees warming. New Zealand therefore needs to take responsibility for significantly more than New Zealand's net zero carbon dioxide emissions by 2050 and agricultural emission reductions of between 24% and 47% by 2050. In practice this will mean:

- Looking to achieve as close to full decarbonisation of the economy by 2050 as possible (noting that there may be a need for residual gas in the electricity sector until there is an environmentally sound and cost-effective means of achieving the final few emission reductions in electricity generation)
- Greater ambition to reduce methane emissions, including a greater emphasis on effective control of browsing pests
- Extending and broadening the role of natural carbon storage beyond the Commissions current recommendations for forest restoration and planting
- A significant contribution to international climate finance and support for developing countries to reduce their emissions

It should also be noted that global removals will need to exceed emissions of CO2 after 2050 and therefore New Zealand cannot afford to use up all of its capacity for removals before 2050.

21 b Do you support our recommendations on the form of the NDC?

The order of priority for meeting an NDC should be firstly emission reductions, secondly removals and thirdly international carbon markets and development support. Consideration should be given to accelerating removals through wider protection of natural areas and restoration of the coastal marine environment and through more effective pest control.

22 Do you support our recommendations on reporting on and meeting the NDC? Is there anything we should change, and why?

See comments earlier in the submission in relation to New Zealand's NDC

23 Do you support our assessment of the possible required reductions in biogenic methane emissions?

Forest & Bird largely agrees with the Commission's assessment of the feasibility of achieving emission reductions from agriculture and waste through more efficient farming practices alone and better management of waste streams. Regulation of inputs could drive faster efficiency gains. The Commission will need to look to land use change to deliver the level of methane reductions required and to also set targets for reductions in methane from browsing pests.

The Commission needs to give greater consideration to the following:

- In some parts of New Zealand land use change in favour of dairy farming already exceeds the environmental carrying capacity of the land and freshwater on which dairying is occurring. This is reflected in increased ground water and freshwater pollution and increased occurrence of zoonoses. When considering the impact of climate policy, the Commission should factor in the need to bring dairy farming back to within environmental limits. Land-use change is going be necessary over coming decades.
- Dairy expansion has in part been the result of shielding the dairy sector from the full cost of production. This shielding has included allowing unacceptable levels of water pollution, protection from facing the cost of zoonoses on public health and being shielded from an emissions price. This shielding is increasingly socially unacceptable, and is slowly being corrected, and this is likely to lead to land use change over time.
- It seems unlikely the consumers will make fine scale decisions over which meat or dairy to buy based on the marginal differences in emissions. What is more likely is that consumers will make decisions a broader scale (ie shift to lower levels of meat and dairy consumption) and this is likely to drive land-use change over time.
- Efficient production is only of climate benefit if it displaces inefficient production elsewhere. Given that much world milk supply is domestic rather than traded across borders, and that agricultural markets tend to be protected, it seems unlikely that New Zealand production is going significantly displace less efficient producers.
- Browsing pests are a human induced and significant source of methane emissions. Given the strength of climate forcing from methane, control of browsing pests should be considered explicitly in New Zealand's programme to reduce emissions from methane, irrespective of how they are considered in New Zealand's inventory.

For all these reasons, and the need for New Zealand to do more than the global average of effort, the Commission should take a second look at its approach on methane with a view to proposing greater reductions than presently considered.