Submission on Managing exotic afforestation incentives by changing the forestry settings in the NZ Emissions Trading Scheme

To	**Ministry of Primary Industries**
Attention	Managing Exotic Afforestation Consultation
	Climate Change Policy
	Ministry for Primary Industries
	PO Box 2526
	Wellington 6140
	New Zealand
	MPI.Forestry@mpi.govt.nz
From	**Royal Forest & Bird Protection Society of New Zealand Inc.**
	PO Box 631
	Wellington
	Dean Baigent-Mercer, Northland Regional Conservation Manager
	d.baigent-mercer@forestandbird.org.nz
Date	29th April 2022

About 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."

Climate change is one of Forest & Bird's strategic priorities. Climate change is having and will continue to have a significant worsening impact on nature. Nature can also play a key role in New Zealand's climate change response. There are also major risks posed to nature from a poorly designed climate change response. Forest & Bird has a connected priority of seeking economic transformation so that the economy supports rather than harms nature. A core principle of Forest & Bird's economic transformation priority is that transformation should adhere to just transition principles.

Forestry and Climate Change

Forest & Bird welcomes the opportunity to work collaboratively with MPI in developing the future role of forestry in New Zealand's climate change response.

There is considerable work to be done. The starting position is not as advanced as it could or should be given the importance placed on forestry in our national response and the advice provided by the Climate Change Commission in line with the Zero Carbon Act. The Zero Carbon Act established a clear expectation that the Government will take on board the advice on the Commission.

Progress in line with the recommendations from the Climate Change Commission about restoring large areas of native forest, shrublands and tussock lands is lagging. MPI has a key role to play in accelerating work on building a system to restore and protect native forest at a large scale. Leadership and action by MPI is needed for New Zealand to be able to meet the targets proposed by the Commission.

The wider policy context of our submission

The Climate Change Commission proposed a change in emphasis away from relying on plantation forest for long term carbon storage and instead to rely on permanent native forests for long term carbon storage. The reason for this is that although exotic pine forests are good at rapid sequestration in the short term, larger storage in the long term is what matters most for removals (ie the size of the bath is more important than the size of the tap).

The three key elements in the Commission's approach were:

1. limiting plantation forestry's access to carbon markets
2. encouraging large scale replanting and restoration of native forests
3. protecting forests from introduced browsing pests

In particular, the Commission proposed:

- comprehensive national programme to incentivize reversion and planting of new native forests
- reduce reliance on forestry removals (pines as carbon sink)
- managing browsing pests in an integrated way to ensure native forests are established and all native habitat carbon sinks are maintained long term
- protect and increase carbon stocks of pre-1990 native forests with fire and pest control

Forest & Bird is pleased to see that progress on limiting plantation forestry's access to carbon markets is now being considered. We remain concerned that the work needed to encourage large scale re-seeding, replanting and restoration of native forests and protecting native habitat carbon sinks from introduced pests is still very under-developed.

At the time of last year's consultation on the development of the Emissions Reduction Plan, Forest & Bird noted that thinking around the role of forestry was behind other sector thinking and actions. We remain concerned about the pace of progress in relation to encouraging the large-scale restoration of native forests. Given where we are now, and the 10,000-15,000 ha per year of native forest reestablishment that the Climate Change Commission has identified as being necessary, this is increasingly urgent.

This urgency is reinforced by the all-of-government New Zealand Biodiversity Strategy Te Mana o te Taiao. In particular its objective "*Biodiversity provides nature-based solutions to climate change and is resilient to its effects".* This Strategy contains fast approaching 2025 goals on the potential for carbon storage from the restoration of indigenous ecosystems, including wetlands, forests, and coastal and marine ecosystems (blue carbon).

Looking at solutions, we feel that early progress could be made by focusing efforts on working with Māori and other large landowners on the East Coast of the North Island as well as with all Government administered land. This includes public conservation land, particularly stewardship land, and Crown pastoral leased lands. These could provide opportunities for climate and biodiversity benefits to all New Zealanders.

The forestry section of our submission on proposals for an Emissions Reduction Plan has been attached to this submission.

Forest & Bird's overarching principles for this submission

Forest & Bird's submission aims to tackle the twin crises of biodiversity collapse and the climate crisis. Nature can help us cope with climate heating but only if we protect nature first. We have aimed to safeguard and increase indigenous biodiversity and ecological resilience in the face of a rapidly changing climate and sink the greatest amount of carbon using nature-based processes and habitats.

There are opportunities and risks in these endeavours. A huge risk is to the genetics of native plant species in any region if seed from elsewhere is used in carbon farming. Eco-sourcing local seed from within the ecological district for planting or scattering in permanent carbon sinks is essential. This is as important as reducing introduced browsing mammals eating the gains within carbon sinks and predator control to increase native bird numbers to naturally bring seed that will create the new forests.

Forest & Bird believes there needs to be clarity about terms and categories because the current discussion is confusing. In the absence of clarity, it is likely that loopholes will exist.

Below, we propose that there are four categories that landowners can earn NZU carbon credits:

1. Permanent native habitat carbon sinks

This includes old growth (including partially logged), naturally regenerating, assisted regeneration, planted permanent native forest, shrublands, wetlands, peatlands, and tussock lands. These natural habitats are very significant existing carbon sinks. Holistic biodiversity management is important because the more complex an ecosystem is, the more stable it is and the more resilient it is to any disturbances or damage that comes along.

Policy in relation to these native forests and other native habitats should be aimed at maintaining and increasing their long-term ability to store carbon, and at enabling these native habitats to achieve full ecological structure and function, including their ability to minimise the impact of natural hazards, resilience and assist with climate change adaptation.

This would be the top classification because both carbon and biodiversity gains are paramount and should receive premium ETS payment to act as an incentive for other categories to work towards this level of success and funding.

All carbon sinks within this first category also need to be registered as current Significant Natural Areas (SNAs) within district or regional plans (under the Resource Management Act) to create alignment between the ETS and RMA. This action would help to achieve Te Mana o te Taiao strategic priority of *Getting the system right*.

2. Forests in transition

These are areas manipulated to transition to permanent native forest and away from flammable species. This could include older pine plantations in transition, shrubland in transition, and gorse in transition to native forests and shrublands.

Post-2023 planting transitional forests should be discouraged where natural regeneration is rapidly occurring. Species, such as douglas fir and tree privet, that can germinate and grow in low light to become canopy dominant species should be excluded and plantations managed to ensure diverse seed sources are available and plant and animal pests controlled.

Policy in relation to these forests should be aimed at expediting the transition to permanent native forests by eco-source planted ‘seed banks’ or drone scattered eco-sourced seed with financial bonds to ensure actions are carried out to accelerate change to native habitats. There would be no log extraction in this classification.

The aim would be to include these areas as SNAs when regional plans are revised each decade to acknowledge when the carbon sink has appropriately transitioned to majority native cover.

3. Planted Continuous Cover Production Forests

These are managed, planted forests comprising primarily of eco-sourced native trees whose primary function is to provide high value fibre, honey and energy. This continuous cover forestry would allow for selective timber extraction over time, but any extracted tree would need to be planted, not naturally regenerating. It would be in line with our philosophy that 'if you plant it, you can cut that tree down'. Policy in relation to these forests should be aimed at minimising the environmental impacts of forest management and ensuring traceability to prevent illegally sourced timber entering the market.

4. Exotic planted timber production forestry

Retain the existing framework for exotic production plantations and how they are recognised within the ETS. These are managed, planted forests whose primary function is to provide a fibre and energy feedstock for a circular economy. Policy in relation to these forests should primarily be focussed on managing the environmental impacts of these forests and ensuring that carbon credits allocated to the sector have environmental integrity and do not prevent decarbonisation elsewhere.

For each of these four classifications, introduced browsing pests (including possums, goats, deer, wallabies, pigs, chamois, tahr, cattle, sheep) need to be kept as low as possible to protect carbon sinks, improve sequestration rates and enhance biodiversity.

We note that none of these areas should qualify for the ETS if grazed by livestock – they need to be fenced off. Carbon sinks can't be both regenerating native habitats with claims for ETS carbon credits and at the same time being grazed for agricultural income.

Response to Consultation questions

1. Do you agree with our description of the problem? Why/Why not?

Forest & Bird largely agrees with the problem description. However, the problem definition should be re-phrased as "New Zealand needs to increase carbon sequestration at the same time as it reduces carbon emissions".

The present problem definition focusses too much on the need for afforestation. This is just one method of increasing carbon sequestration. Such a re-phrasing would allow a more comprehensive ecological view of the various ways in which carbon sequestration could be increased. Rephrasing would also help to avoid the many potentially perverse outcomes that could come from a very narrow definition of the 'problem'.

Short to medium term decision making based on carbon prices has resulted in an over-reliance on forest planting at the expense of economic transformation. As a result, New Zealand's economy is becoming further out of step with the kind of economy required in an emissions constrained world. New Zealand's cost of transitioning to a low carbon economy is becoming more expensive relative to other countries placing New Zealand in an economic disadvantage over time.

Large scale permanent forests are needed to soak up emissions in the medium to long term and will be particularly important post 2050 when new emissions are likely to be low, but historical emissions are likely to still be driving warming. This means that the size of the sink will become increasingly more important than the short-term rate of accumulation. This favours native systems over exotic fast-growing plantations. The primary role of plantation forestry should be to provide renewable materials for a circular economy.

There are huge opportunities to increase carbon sequestration from the sustained control of introduced herbivores in existing native ecosystems (mainly native forests but also in shrublands and tussock lands). The mid-point and upper estimates of this increase in carbon sequestration of native forests are over 8 and 17 million tonnes of CO2e per year respectively. The mid-point is equivalent to 60% of the 2018 emissions from road transport (Hackwell & Robinson; 2021). The problem definition should be expanded to include ways of modifying the permanent forest rules to incentivise the management of existing native vegetation to increase its ability to sequester carbon.

Between 2002 and 2014 there was an annual decline equivalent to 3.4 million tonnes of CO2 in the carbon stocks of the largest native forest (kamahi-podocarp) association (Paul et.al 2019). The most likely cause of this decline was browsing by introduced herbivores such as deer, goats, chamois and possums. All of the country's native forests have significantly reduced rates of carbon sequestration as a result of the impact of introduced herbivores (Hackwell & Robinson 2021).

This loss of carbon from our largest native forest association represents 80% of the extra annual sequestration that the Climate Change Commission wants to be generated in the medium term by new native forest plantings. Such a comparison emphasizes the need for New Zealand to take a holistic approach to reducing carbon emissions and increasing carbon sequestration.

Looking at a system-wide -response it is essential that MPI provides leadership to focus effort on multiple fronts. Introduced herbivore control in the country's extensive native forests and regenerating

shrublands will provide climate change benefits many times greater than managed ETS forestry at a fraction of the cost and at a much faster pace This should be prioritised.

The ETS and the rules around permanent forestry are too focused on a 'tree and timber' model of carbon sequestration. While the above-ground component of trees is a significant component of a forest's carbon storage potential, other components of the forest ecosystem – such as under storey, leaf litter, woody debris, soil carbon, etc. - are also very important and need to be included and accounted for in the calculation of carbon credits. As a quarter of the country's remaining native forests are on private land – mostly sheep and beef farms - such incentives could provide important opportunities for continuing mixed land-use while increasing carbon sequestration.

The key gaps that need to be considered in the problem description more directly are:

- What will achieve a scaling-up of native forest restoration to at least match, if not exceed, the rate proposed by the Climate Change Commission?
- What will achieve an increase in the management of existing native vegetation to maintain and increase its ability to sequester carbon (fencing, introduced herbivore management, etc)?
- What are the risks associated with carbon credits for potentially weedy small-scale permanent afforestation by land managers, for example granting carbon credits for riparian willow and poplar planting and weedy native plantings that aren't maintained that act as a weed infestation for other areas

We also agree that it makes sense to separate out what are temporary exotic plantations and the short-term carbon sinking they can achieve from the categories of Permanent Carbon Sinks and their medium to long-term carbon sinking abilities.

Further information

Native forests have an average carbon content of around 300 tonnes of carbon/ha, compared to the average for pine plantations of 100 tonnes of carbon/ha.

As shrublands on reverting farmland are likely to be used for potential permanent afforestation, it is important to ensure that their existing carbon sequestration is not 'squandered' by any perverse incentives that arise from ETS rules. For example, changes that would see the carbon these areas have already stored being released in order to establish a 'managed and subsidised' ETS forest (e.g. clearance of gorse carbon sinks to plant in pines to begin a pine-to-native scheme).

Shrublands are generally considered to occur over 2.5 million hectares of Aotearoa/New Zealand either on their own or mixed with grassland and forest. However, a recent fine-scale image analysis of farmland in Northland detected an additional 11.7% and 14.3% woody vegetation cover than the standard LUCAS and LCDB methods respectively (Case & Ryan 2020).

Many shrubland types are temporary, forming an early stage in the succession to forest. Others are permanent, growing in relatively harsh environments such as exposed coasts, wetlands, infertile soils, alpine areas, and very dry hill country where trees fail to prosper.

Natural forest succession usually begins with grassland areas reverting to shrubland and later being replaced by species of the mature forest. Grasslands began declining in the early to mid-1980s after

farming subsidies were removed. Abandoned agricultural land is usually colonised by shrubland consisting of mānuka and/or kānuka, and/or introduced scrub species such as gorse and broom.

These shrubland species are an important carbon sink (Trotter et al. 2005; Paul et al. 2019). During the first 35–50 years, higher rates of net carbon sequestration can be expected than for indigenous-forest growth (Kirschbaum et al. 2009). _Wiser et al. (2011) suggest that 45% (c. 670,000 ha.) of the total pre-1990 shrubland area shows evidence of recruitment of indigenous tree species, including kānuka, and the palatable māhoe, putaputaweta/marble leaf, kāmahi, and fivefinger.

A large portion of naturally reverting shrubland will benefit from the strategic planting of 'seed islands'. The recent review of 134 national plots representing eight shrubland vegetation types between 2002-2007 and 2009-2014 (Paul et al. 2019) gives the most reliable national estimate of shrubland sequestration rates. Total carbon in all of the regenerating forest types increased between measurements by a statistically significant average of +4.8 tC/ha, which gave an average sequestration rate of +0.62 ± 0.26 tC/ha/yr.

Associations with kānuka and tall shrubland sequestered +0.87±0.38 tC/ha/yr, while kānuka shrublands with coprosma and mingimingi also showed higher sequestration rates of +1.05 ± 0.74 tC/ha/yr (table 1).

These national averages are lower than several previous smaller studies that measured carbon gains in a range of regenerating shrublands and suggested national mean sequestration rates for mānuka/kānuka shrubland at about +2.2 ±0.3 tC/ha/yr, with the highest rates measured in cool, moist, high fertility sites. Some kānuka carbon stocks even approached rates modelled for the first 20 years of carbon accumulation for planted pine stands in the same region (Trotter et al. 2005, Kirschbaum et al. 2009), potentially challenging the well-established idea that, to tackle climate change through woody carbon sequestration, it is best to use fast-growing plantations of exotic forest species (see box 6).

Table 1: Estimates of total carbon stock changes for shrubland vegetation types between 2002-2007 and 2007-2014. Numbers in bold represent statistically significant changes at the P<0.05 level. Adapted from table 9 of Paul et al. (2019).

Shrubland type	Number of plots	Carbon changes between measurement periods (tC/ha)	95% Confidence intervals
Kānuka shrubland with *Coprosma* and prickly mingimingi	24	**+8.1**	**±5.8**
Grey scrub with kānuka	30	**3.3**	**±2.8**
Mānuka shrubland	5	0.0	±3.6
Matagouri shrubland	1	1.0	
Turpentine scrub – *Gaultheria* montane shrubland	9	0.6	±1.4
Gorse shrubland with cabbage trees	5	-9.2	±16.0
Total	**74**	**3.5**	**±2.5**

Carswell et al. (2012) noted that the rate of carbon sequestration over the first 50 years (c. +2.3 tC/ha/yr) was the same for the kānuka–red beech succession at Hinewai, Banks Peninsula, as for the coastal broadleaved succession in the outer Marlborough Sounds. They considered that their measured average above-ground carbon stock of 145 ± 19 tC/ha in the coastal broadleaved succession probably represented the upper end of potential carbon stocks for this forest type as a result of extensive wild animal control.

This observation about herbivore control may be key as to why these and other studies reported higher sequestration rates than the more representative SCION report (Paul et al. 2019).

Regenerating forests have smaller total carbon pools than tall forests but have high net rates of carbon sequestration and can therefore be considered strong carbon sinks. However, the average increase in live above-ground carbon is greater in tall forest (+1.29 tC/ha/yr) than in regenerating forest (+1.05 tC/ha/yr). Tall forests also have greater losses in carbon from mortality and it is this that offsets the higher gain in carbon from the growing trees (Paul et al. 2019). Constant recruitment is necessary in tall forests to offset mortality losses that replenish the woody debris pool. The much lower level of mortality in regenerating forests is the reason they consistently show higher net gains in carbon. This is also the reason that regenerating forests are potentially very responsive to the control of introduced herbivores.

The largest positive effects of herbivore control (carbon sequestration rate increases of +1-2 tC/ha/yr) are likely to occur in localised low altitude sites with fertile soils and highly palatable early-successional vegetation, with high herbivore densities where control triggers rapid development of woody vegetation (Holdaway et al. 2012; Bellingham et al. 2014). There may be a time lag in any response to herbivore control, and it may take many years after a control operation before a biomass response is measurable. However, the long-term effects of forest succession, on future forest types, on biomass carbon and total carbon, and on biodiversity is likely to be profound (Burrows et al. 2008).

The role of browser control should therefore not only be seen in the context of short-term emission reductions from reduced browsing but also in terms of the longer-term carbon storage benefits that flow from protecting the structure and function of forests. This is inherently hard to measure and MPI needs be careful to not exclude policies and programmes that will deliver long term strategic benefits simply because quantifying those benefits is difficult.

2. Do you have evidence you can share that supports or contradicts this problem definition? Or that demonstrate other problems?

Wilding conifers currently cover more than 1.8 million hectares of New Zealand, with some regions being more susceptible than others. Despite control efforts they are spreading at an estimated rate of 5% a year. Without large scale funding and control within twenty years 20% of New Zealand will be covered with wilding pines. This is clearly a well-established threat which excluding exotics from the ETS would surely assist in reducing over the long term.

Introduced pines have weed potential and demonstrated fire risks. Monocultural conifer stands also lack of habitat for a wide range of indigenous species.

According to the Ministry for the Environment, indigenous land cover decreased by 16,500 hectares between 1997 and 2002. This included wetland carbon sinks. The ETS has great potential to protect and revive native habitats, if used well.

3. Do you agree with our criteria for managing permanent exotic afforestation? If not, what would you change and why?

Forest & Bird in part supports the criteria proposed by MPI, subject to the explanations provided in italics:

1. Provides sequestration to meet emissions budgets and targets. – Plantation forests help meet New Zealand's emissions budgets and targets (NDCs) by offsetting emissions.
New Zealand's current emissions' targets imply doing the global average emissions reductions; however, this is insufficient to be a fair share of global effort. New Zealand will come under pressure to increase its ambition to reflect a fair share of global efforts. Sequestration should be used to increase New Zealand's ambition, not just meet our existing commitments. We suggest that the criteria are reworded to state "Provides sequestration to meet increases in emissions budgets and targets – Forests help New Zealand increase emissions budgets and targets (NDCs) by offsetting emissions".

2. Supports gross emissions reductions. – Afforestation at a level to avoid reducing NZU prices and impacting gross emissions reductions.
NZU prices will influence the rate at which emission reductions occur. This is a factor in both supply and demand. This is an area where both forestry policy (supply) and industrial policy (demand) need to be considered together. Policy decisions on afforestation therefore need to reduce constraints on demand as well as constraints on supply. In practice this means management of afforestation needs to be matched with the introduction of agricultural emissions into the ETS and a faster phase out of free allocation to industrial emitters.
3. Provides substitutes for emissions intensive products and energy sources – The forestry and wood processing sectors support the transition to a low-carbon bioeconomy by producing substitutes for emissions intensive products and energy sources.
The key to making forestry a substitute for emissions intensive products and energy sources is to stop providing free carbon credits to emissions intense producers. Forestry is not on a level playing field with cement and steel because of the current approach to allocation of carbon credits to cement and steel producers.

4. Supports regional economies and jobs – Forestry and wood processing sectors contribute to regional and economic development and support the wellbeing of rural communities by providing high quality employment.
See above. This criteria should also take into consideration the current and future benefits that indigenous forests can have on local communities. Regional economy and jobs can come through predator control, monitoring, growing of plants from eco-sourced seed and tourism. There is also already proven potential for future opportunities based around low impact use of some indigenous plants. This is above and beyond existing forestry markets and potential growth in these markets through greater demand of low-carbon added-value materials (eg: mass timber for construction) This type of economy and job market has the benefit of being more resilient and sustainable through reduced exposure to global markets.

5. Supports indigenous biodiversity – New and existing indigenous forests provide and support indigenous biodiversity.
This criteria should be reworded to acknowledge Te Mana o te Taiao/NZ Biodiversity Strategy and refer to both protection and restoration of indigenous biodiversity, as well as their contribution to carbon

sequestration. Clear and explicit alignment with this strategy strengthens the credibility of this criteria and ensures accountability.

6. Provides environmental benefits – Our forests support freshwater quality, soil conservation and resilience to climate change, and are not sources of pests.
This should be expanded upon to reinforce and signal the value placed on permanent native forests as these provide greater environmental benefits than exotic forests.

7. Supports Māori aspirations for their whenua – Actively protect Māori interests and ability to make decisions regarding their whenua in line with aspirations. Forests and forest products support the cultural, social, environmental and economic aspirations of Māori whānau, hapū and iwi.
This is a key element of the consultation, and we welcome its inclusion. We also note the important interface between this and wider conservation reforms.

8. Effective, practical and implemented quickly – The option can be implemented quickly. It is operationally feasible, resilient to future changes and avoids unintended consequences. The option should also minimise administration and compliance costs, support the purpose and integrity of the NZ ETS and maintain regulatory certainty.
Forest & Bird welcomes the recognition of the need for accelerated action. We do urge MPI to ensure that new policy settings avoid unintended consequences such as the loss of existing natural carbon stores and indigenous biodiversity in order to establish new forests that can claim carbon credits. To avoid such unintended consequences, it will be essential that a regime of full carbon accounting is implemented.

4. Should we provide for exceptions allowing exotic species to register in the permanent forest category under certain conditions?

Outlining specific exceptions seems to be the best way to frame rules for exotics. We emphasize that these should not be the norm and would need to be accurately mapped, with the exception of gorse (see Question 5) and broom.

Any listed nurse crops will not necessarily evolve to diverse forests. It will depend on environmental conditions, other weed species, and presence of native seed sources and distributors. Pine forests near diverse native forest remnants will be much more successful at reverting than a broom/gorse paddock in the middle of a barren farm. Therefore, key criteria providing exemptions for exotics should include:

- The exotics must be recognised as effective nursery crops for native regeneration and the permanent carbon sink mapped on the land deed title.
- Their ability to transition to native forests should not rely on any significant human intervention/management apart from planting of eco-sourced seed sources where species are missing or using drones to scatter eco-sourced seed of native species, sustained introduced pest animal and weed management, and fire control.
- Any exotic nurse crop requires a management plan which registers transitional criteria, milestones and a bond that reflects the level of intervention required (planting of seed sources where missing, sustained introduced pest animal and weed management and fire control, exotic canopy manipulation, etc).

5. Are there particular circumstances that you support introducing exceptions for (for example, exceptions for certain species of exotics)? Why? • What are the likely impacts, risks and costs of

allowing exceptions in these circumstances? • If we allow exceptions for exotic species under certain conditions, should we place additional conditions on the granting of this exception? What could these be?

If MPI develop cost-effective clear objectives and monitoring requirements, then exotic species that are specifically planted (or retired from production) to transition to native forest could be included. Key things that would need to be addressed to enable this to occur are:

- A covenant lodged against the title protecting the forest as a permanent transitioning forest and
- A bond to enable the Crown to recover costs where management fails (such as bankruptcy of the land manager or some other reason for the necessary work not being done). Bonds are required for some other activities such as mining to ensure rehabilitation occurs so there are models that can be used.
- A management plan outlining how the permanent forest will transition from exotic to native forest will need to be approved before forest establishment.
- Monitoring objectives/audit would need to be achieved over time to confirm the forest is eligible for carbon or biodiversity. If these objectives are not achieved, then the owner could be liable to repay any credits.

Forest & Bird considers that the following conditions should be applied to exotic carbon forestry in the ETS (or indeed any incentives scheme):

1. Weediness. There should be a prohibited list of species that are inadmissible to the ETS on either a regional or national basis. This should include:
   - Any plant on the surveillance pest plant list or subject to a national or regional pest management plan or listed in the wilding tree risk calculator with a score of two or more shouldn't be planted
   - All carbon farmers must be responsible for the weediness of species escaping the designated carbon farming areas. Areas logged of pine and allowed to revert to native species need to have seedling pines killed within the first 5 years with either spray drones, manual cutting at ground level or other appropriate means.

2. Bonds. There should be a bond or similar mechanism to ensure conditions. This could be similar to what mining companies work under but in relating to weed risk, land management and ensuring transition from exotics to native forest are upheld.
3. Full Carbon Accounting. Credits should only be given for the net carbon sequestration that occurs.

Native firebreaks are important both as a seed source and for fire retardant. Harakeke thickly planted has proven successful as have mixed native plantings of eco-sourced less-flammable species.

Because fire is such a threat to any area with flammable species (pines, eucalypts, manuka, kanuka and gorse), it is essential for carbon farmers to manipulate the area quickly beyond flammable species and towards diverse native forest. This highlights the importance of introduced browser and predator control and the protection and restoration of natural seed sources (or their establishment) and the encouragement of native seed dispersal (both natural and managed seed scattering).

There are several known successful South Taranaki and North Wanganui naturally regenerating blocks that have proven successful carbon sinks from minimal or no planting due to the functions of existing gorse acting as nursery crops, existing nearby native forest as well as browser control efforts by landowners allowing for further carbon capture through regeneration (pers. comm. Rebecca Martin, Environment and Sustainability Manager, STDC).

Monitoring will help influence incentives for the greatest carbon capture by keeping all introduced browsing species (eg. possums, pigs, goats, wallabies and deer) as low as possible.

The use of exotics plants as transitional forests needs to be considered on a case by case basis taking into account the ecology, climate and geomorphology of the proposed site and the biological characteristics of the species proposed. Factors that need to be considered when allowing exotic plants to be part of a transitional forest include:

- The process by which the introduced species is removed from the system (either naturally or through human removal)
- The risk that the introduced species will persist in the ecosystem (for example shade tolerant species such as Douglas fir should be avoided)
- The current presence or absence of the species in the area
- The benefits of the introduced species in accelerating restoration
- The current state of the existing vegetation (e.g grassland as opposed to already established shrubland)

Gorse (*Ulex europaeus*) should be included as an exception where appropriate. Gorse is the exotic species second-only to *Pinus radiata* at sinking carbon (Egunjobi 1969, MPI 2013) and provides an excellent nursery for native forest trees to germinate, penetrate and overtake. This process does not need labour-intensive cutting out of large pines, for example, in difficult and dangerous terrain. Aotearoa is rich with examples where this has occurred naturally over large areas (Hinewai reserve (Banks Peninsula), Wellington and Hutt Valley hills, etc). After 25 to 40 years, gorse can be naturally replaced by native vegetation. However, the beneficial role of gorse is site specific, and consideration needs to be given frequently disturbed habitats and others where gorse could displace native colonisers and become a permanent feature of the system.

A site management plan will need to identify locations of native seed sources and presence of seed distributors. Where seed sources are missing and unlikely to naturally re-establish, seeds sources will need to be actively planted. Kereru are important for spreading large seeds and generally only disperse seed on average <100m with a maximum dispersal distance of 1.5km (Jordano et al 2007, Wooton & Kelly 2012, Wotton & McAlpine 2015), however if weka are present they may contribute to seed dispersal over >1km (Carpenter et al 2019). Again, seed-dispersing native bird species will only thrive with effective pest management for both predators and browsers as part for the wider site plan and regional management.

If the native plant diversity near a site is limited, drones could be used to scatter seed of native species that would have been historically present. Manual planting of 'seed islands' comprising of a diversity of local native plant species is another option including those that have been historically diminished or regeneration inhibited by browsers such as kohekohe, tree rata species, raukawa, hinau, puriri, tawa, taraire, matai, titoki and turepo/milk tree.

This will allow more marginal or regenerating scrubland, which currently is not available for other production to claim carbon credits.

The main risk with nurse covers such as gorse, manuka, kanuka and pines are their flammability. However, this is a general risk that will have to be mitigated for all types of forest and keeping gorse and pines contained within the boundaries of the carbon sink area.

Another risk is that gorse will be deliberately encouraged in habitats that would not naturally regenerate to native forests, such as wetlands or where there is a sufficient natural disturbance rate in the ecosystem to cause gorse to persistently reinvade in preference to native colonisers such as koromiko and tutu.

A key inhibiting factor that slows down all vigorous regeneration (whether under native or exotic canopy) are introduced browsing mammals.

6. ***Are there alternative ways we can recognise and encourage these forests, either within or outside, the NZ ETS? (For example, through the resource management system.) Options to manage permanent afforestation.***

All carbon sinks within the first category (Native Habitat Carbon Sinks) also need to be registered and mapped as Significant Natural Areas (SNAs) within district or regional plans (under the Resource Management Act) to create alignment between the ETS and RMA. This action would help to achieve Te Mana o te Taiao strategic priority of *Getting the system right* and allow specific financial incentives to be targeted. As reforms to the RMA progress, the principle of system alignment should be maintained. A range of complementary measures have been proposed to support the implementation of the proposed NPS on Indigenous Biodiversity and these should be considered as part of this work.

The managed retreat legislation may drive the availability of land for ecological restoration where it is considered too risky for human infrastructure and uses because of climate risks. Carbon storage on this land could offset some of the costs to the Crown from managed retreat.

Approaches such as those used by the QEII Trust and Nga Whenua Rahui kawanata are other models that could be considered to alongside SNAs.

7. ***Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered?***

We currently don't have a preferred approach.

8. ***Do you agree with our preferred approach (acting before 1 January 2023)? Why/why not? If not, what is your preference? Comparing Option 3a (exceptions by secondary legislation) and Option 3b (exceptions after a moratorium)***

As noted in our previous comments, we welcome a significantly more urgent approach being undertaken by MPI. We have not been able to assess the different options at this time so do not have a view.

9. ***Do you support exceptions by regulations [option 3a] or exceptions after a moratorium [option 3b]? Why?***

No comment.

10. If we choose to introduce exceptions by regulations, what conditions or criteria should be placed on the Minister in choosing to pursue these?

No comment.

11. If we choose a moratorium (Option 3b) – how long should it be? Why?

No comment.

12. Do you think a different type of moratorium (whether it requires a decision to be ended/ continued) would have different impacts? Or do you prefer a different approach? Implementing changes to the permanent forest category

No comment.

13. Currently the NZ ETS defines forests based on the predominant species in a hectare. However, forests change makeup over time. Do you think this definition of exotic and/or indigenous forests is appropriate for the permanent post-1989 category in the NZ ETS?

Forest & Bird has proposed four criteria of forest and this might help address some of the definitional problems with the exotic/indigenous split. These are set out at the start of our submission in detail – as a reminder these four criteria headings are:

1.Permanent native habitat carbon sinks
2.Forests in transition
3.Planted Continuous Cover Production Forests
4.Exotic planted timber production forestry

We understand that ground truthing and monitoring of species present on land is crucial to have a robust and meaningful system.

Therefore, we suggest that a robust criteria for monitoring or audit is developed to determine a carbon sink and appropriate payments. This could see plots sampled by an independent entity and clear plans and benchmarks outlined. For example, a minimum 70% canopy cover of species would need to be indigenous in a series of plot for land to retain its indigenous status. These criteria could also be used to monitor land that has been identified as transitioning to ensure that landowners are genuinely moving towards an indigenous forest.

Council held SNA aerial images would also be a useful tool to show changes over time.

As well as using species ground truthing and monitoring for classification, this plot data could be used to monitor browsing animal control in indigenous forest to ensure a minimum standard is kept so that true carbon capture is being rewarded. Plot mapping of vegetation is currently done by eco consultants, and the Tier 1 DOC monitoring project has done this across the country for several years. These pre-existing

methods and data already captured could provide a base to produce a robust meaningful system to define land and eligibility for credits.

Ultimately, clear classification of forest categories must be outlined with the requirement of ongoing monitoring and data collection to ensure transition objectives are being met and carbon capture is being recorded and rewarded to responsible landowners.

14. What level of exotic species in a forest would be acceptable for the forest to still be classified as an indigenous forest, and registered in the permanent post-1989 category in the NZ ETS?

Any exotic species should only be incidental, not a long term weed species. It is expected that they will not endure within the native habitat carbon sink – that is that they become either shaded out or removed by land managers.

15. If forest changes from indigenous to exotic while registered in the permanent category, do you think it should be removed from the category (Option 1), or be treated as indigenous (Option 2)? Why? Are there other options we haven't considered?

If this change is allowed, it may create a strong incentive to replace native forest with fast growing exotics. New Zealand has past history of "improvement planting" of native forests with fast growing exotics for timber production during Forest Service days. Forest & Bird would strongly object to a return to outdated practices.

16. If we choose to remove forests which have become predominantly exotic over time from the category, how do you think we should do this? Why?

Currently, pines at high country Balmoral Station are claiming carbon credits. In this circumstance these trees are not a long-term forest and this ecosystem will not be transitioned into the appropriate mix of native species because the pines will dominate over them. This is a serious problem in that, at this location, the pine species are invasive weeds and have formed the initial population and seed source for wilding weed pines on which the Government is spending large amounts of funding on eradication.

Collecting carbon credits in this context is a loophole that needs closing. ETS payment for weed species must not be allowed. Where exotic species are being used as a pioneer crop to transition to native forest a management plan must outline the transitional management required and milestones to be achieved to ensure that landowners are genuinely moving towards a permanent indigenous forest. The criteria for removal must be for exotics that will not transition to native due to the context they are growing in.

17. If exotic forests are removed from the permanent category, what would an appropriate penalty be for clearing the forest before the end of the permanent period? Do you think the current penalty needs updating?

We suggest that the penalty must be the cost of carbon at that time that is being emitted into the atmosphere.

18. Are you a PFSI convent holder?

Forest & Bird manages native forests, including regenerating native forest, but is not a PFSI covenant holder.

19. Do you agree with the proposal to allow exotic forest land in the PFSI to transition into the permanent post-1989 forestry activity, or would another approach be more suitable? Long rotation category under averaging accounting?

We would not prefer this option. Any long rotation category needs very strict criteria which looks at why indigenous (or transition) options are not feasible. Our concern is that it will be used in the first instance as it is easier to set up, minimal pest control and provides the ability to change land use in the future. We would only support exotic forest land in the PFSI being included in the permanent post-1989 forestry activity if clear management and monitoring is required to ensure the exotic forest transitions to a permanent indigenous forest. A long rotation pine forest is not permanent in the sense it has a short life and absorbed carbon will be lost once it is harvested, unlike a diverse native forest which will sustain itself indefinitely.

20. Should the Government create a long rotation category under averaging accounting for Pinus radiata forests which are not profitable to harvest at age 28, recognising the additional carbon which is likely to be stored by these long rotation forests?

We believe that an exotic stand of Pinus radiata that has factors that deem it not profitable to harvest under the current average accounting should not be distinguished as different. We suggest that areas where this is occurs should be deemed as areas in which a transition to indigenous forest is more appropriate. This will also enable a healthy diverse native ecosystem.

While long rotation exotic forests may sequester more carbon over their first rotation than 'normal' (average 28-year rotation) plantation forests, the majority of the carbon they store will nevertheless be rapidly returned as emissions to the atmosphere post-harvest. This will mean that, like shorter rotation plantation forests, their net benefit to limiting climate change will be a lot less than a permanent native forest.

21. What do you think the impacts of introducing a long rotation category as proposed would be?

Long rotation exotic forests can have issues that if these trees are left and not harvested, they can be very difficult to manage, and their removal can be unsafe as well as have environmental impacts such as erosion. However, they could fit into the 'Forests in Transition' category and be managed to return to native cover.

See our answer to question 25 for '2) Forests in transition'.

22. Do you think forests in this category are likely to be harvested? Are measures needed to prevent forests in a long rotation category being left permanently and never harvested, or to mitigate potential adverse effects of these forests being left permanently?

Due to the lengthy time involved in long rotation forest there is a high probability that the aims of the landowners may change over time and as a result, harvesting the trees becomes a bad choice due to financial, cultural, environmental or safety factors. See our answer to question 25 for '2) Forests in transition'.

23. What criteria should be in place to restrict the category to Pinus radiata forests which are not profitable to harvest at age 28?

See our answer to question 25 for '2) Forests in transition'.

24. Do you think a long rotation category aligns with the proposed changes to the permanent activity and supports the Governments wider forestry objectives?

Long rotation of exotics does not align with the wider forestry objectives at this current time. This misalignment is also likely to move further away as we better understand the role of indigenous forest and carbon break down of wood products especially those exported. None of the six objectives are met by promoting this course of action by land users.

Long rotation forests fit within the 'Exotic planted timber production forestry'.

25. Are there alternative options to a long-rotation forest category that could be more effective at addressing the concerns raised by stakeholders about remote and marginal land and that align with the Government's forestry objectives? Incentivising indigenous afforestation [Optional]

Forest & Bird believes there needs to be clarity about terms and categories because the current discussion is confusing and may create loopholes that will be abused. As noted, we propose that there are four categories that landowners can earn NZU carbon credits: Permanent native habitat carbon sinks, Forests in transition, Planted Continuous Cover Production Forests and Exotic planted timber production forestry.

Nationally, Aotearoa needs more native habitats returned – not just on marginal farmland – as carbon sinks. We have lost more lowland forest than other ecosystems, so Forest & Bird has no problem seeing lowland farmland being returned and converted to permanent native forests. These could be diverse planted eco-sourced 'seed islands', forest corridors along waterways, lowland and rare habitat restoration plantings, native dryland scrub, re-constructed rainforest in the long burnt off Otago, Canterbury, Marlborough foothills, school and community native habitats restoration activity. Achieving ecological integrity will not be straight forward. We would welcome the opportunity to have a follow up meeting with MPI to discuss a system of native restoration that would work at a regional level.

26. Do you have any further feedback on how the Government can reduce barriers and incentivise to permanent indigenous afforestation to ensure we deliver long-term resilient, biodiverse forests?

Overall incentives need to drive lowest possible introduced browser numbers, eco-sourcing of native seeds, appropriate habitat restoration (right species in the right place), benefit local communities as well as landowners, consideration for microbiota ecosystems and maximum carbon sinking.

There needs to be a comprehensive package of measures:

- Incentive system for restoration and planting
    - Rates relief (linked through to local government reforms)
    - Pricing combination of ETS and public biodiversity good
    - Ecological advice and support, e.g., pest/weed control

    - Fencing support
    - Regional community-based education profile programme
- Adjusting the rate at which plantation forestry gains credits
- Gazette the NPS on Indigenous Biodiversity, especially complementary measures
- Gazette the NPS on Freshwater
- Update National Environmental Standards for Plantation Forestry
- Browsing pest control on all public lands
- Weed control on any adjacent public lands
- Ambitious targets for regeneration and replanting
- Support for capacity building
- Financial disincentives for poor plantation forestry practices, e.g., wilding conifer control

We understand there are assertions from farming industry interests that native vegetation that is being grazed beneath by sheep, cattle or other livestock are carbon sinks deserving of ETS permanent carbon sink status. Forest & Bird seeks that these areas be excluded from the ETS.

A permanent native forest sink must be fenced with pest control keeping all browsing animals as low as possible. Grazing of farmed deer, cattle, sheep and other livestock prevents diverse regeneration and a healthy carbon sink just as grazing by feral deer, goats, possums and pigs do.

To incentivise landowners to protect native carbon sinks the ETS could fund the fencing necessary upfront with the cost of this fencing repaid interest-free from the time the NZU carbon credits start generating income. This would support national freshwater outcomes as well.

Additionally there needs to be incentives that assist with browser pest control when land is committed to becoming a permanent carbon sink with appropriate covenants, funded from the ETS.

Forest & Bird does not support the prioritisation of large-scale native forest planting while there are outstanding issues around to the plastics and inherent carbon footprint involved with raising native seedlings, including transport and labour required. There are also eco-sourcing issues often associated with large-scale plantings.

Forest & Bird does however support incentives to encourage natural regeneration of pioneer species such as manuka, kanuka and specialist native broadleaves with targeted small-scale planting of native 'seed islands' to facilitate the establishment of a diverse forest community.

Low-cost, large-scale restoration does not face the same constraints or issues as large-scale planting. It should be prioritised at this time.

Regional support for nursery establishment, like the Ngati Whare native nursery (Minginui), Women's Native Tree Project (Gisborne), the Kerikeri Shadehouse or the DOC nursery at Motukaraka, (Canterbury) would help ensure seed collected from the ecological region was grown and available for local carbon farming projects. These wholesale nurseries help break down the cost barriers, difficulty in finding appropriate species and provide employment for local hapu and communities.

Clear rules are required that any native shrubland that has exotic forestry established on it is ineligible for ETS carbon credits. This will incentivise the natural revegetation of difficult farmland and will

disincentivise the conversion of shrubland to exotic tree species. As mentioned previously in this submission, native shrublands include species such as manuka and kanuka (woody plants) while scrub species include gorse and broom. Scrub species can also be found within shrublands. Scrub is habitat for many native plants and animals, including various lizard species, mistletoes (such as the leafless Korthalsella salicornioides) and orchids (such as Linguella puberula). They often form 'corridors' between areas of vegetation and some act as a nursery for regenerating forest. They can also play an important role as buffer to native vegetation (Ref: New Zealand Plant Conservation Network).

Forest & Bird are interested in participating in the process of developing these definitions of ecological terms.

Forest & Bird would like soil health and biodiversity to be highlighted as significant elements to consider in the ecological benefits of permanent native afforestation. These elements not only benefit biodiversity but also contribute to the full carbon cycle. A recent study on interactions between insects and soil microorganisms in Aotearoa has shown that exotic forests cause an imbalance in the abundance of herbivorous insects and soil microorganisms due to the rapid decomposition of plant material, reducing soil carbon storage.

This suggests that planting non-native trees in areas where soil microorganisms have never encountered them may lead to more rapid release of carbon over time (without any felling) as well as potentially destabilising soil health for native regeneration in future.

In addition to consideration for healthy microbiota ecosystems within permanent native carbon sinks, another recent study has shown that "Pathogen accumulation on an invasive plant species can occur over time, through co-invasion, or adaptation of native pathogen species. While accumulated pathogens can reduce the success and spread of an invasive species, they can also spill-over into native plant communities or valuable non-native populations. Transmission of pathogens may be density-dependent, with dense invasive populations creating better opportunities for pathogen spread than scattered individuals." (Steel et al, 2022). This further incentivises the limitation of exotics as a transition tool.

Concluding comment

We welcome the opportunity to engage with MPI in the development of its work in this area. As noted, we recognise the leadership role that MPI needs to play for all New Zealanders and the urgency of action required. We would welcome the opportunity to discuss our submission further and welcome any questions from the Ministry to support their next steps.

Appendix – Forestry component of Forest & Bird's submission on the Emissions Reduction Plan

These are the specific forestry comments that Forest & Bird made in its submission for the Emissions Reduction Plan consultation and form an integral part of this submission.

Advice of the Commission

The Commission proposes a change in emphasis away from relying on plantation forest for long term carbon storage and instead to rely on permanent native forest for long term storage. The three key elements in the Commission's approach are:

- limiting plantation forestry's access to carbon markets
- encouraging large scale replanting and restoration of native forests
- protecting forests from introduced browsing pests

In particular, the Commission proposes:

- comprehensive national programme to incentivise reversion and planting of new native forests
- reduce reliance on forestry removals (pines as carbon sink)
- managing browsing pests in an integrated way to ensure native forests are established and all native habitat carbon sinks are maintained long term
- protect and increase carbon stocks of pre-1990 native forests with fire and pest control

Forest & Bird Recommendations

Expand browsing pest control to:

- *Reduce possum, feral deer, goats (including tahr and chamois), wallabies and pigs on all Department of Conservation, Defence and State-Owned Enterprise managed land to lowest practicable numbers.*
- *Maintain all existing deer free areas in places like Coromandel and Northland.*
- *Reduce feral browsing mammals on land under Land Information New Zealand control to comply with the Land Act.*
- *Eradicate wallabies from Aotearoa New Zealand entirely.*
- *Control tahr to a level that complies with the Himalayan Tahr Control Plan 1993 and the National Parks Act.*

Establish a programme to deliver the restoration of native vegetation cover across all marginal and erodible land in New Zealand. This programme would need to include:

- *Support to scale up private and public pest control*
- *Sound ecological advice and indicators*
- *A financial flow to landowners for restoring native vegetation in perpetuity*
- *Crown buy-out of land that lacks economic land use and that has significant biodiversity*
- *Restoring native ecosystems on degraded Crown land, including any degraded stewardship land*

Gazette and Implement the National Policy Statement on Indigenous Biodiversity to end native vegetation clearance on private land

Support planting of permanent indigenous forests by:

- *Restricting areas where exotic carbon forests can be planted*

- *Providing biodiversity credits to recognise the benefits of native forest restoration and even the economic return (I.e., difference between ETS returns from exotics vs. natives)*

Consultation Questions - Forestry

Do you think we should look to forestry to provide a buffer in case other sectors of the economy under-deliver reductions, or to increase the ambition of our future international commitments?

Exotic plantations should primarily provide materials for a circular economy, long term carbon storage should be in protected and restored native forests, shrublands, tussock lands, wetlands and blue carbon.

New Zealand's current climate change commitments are inadequate and so long-term storage should be used to increase our ambition rather than provide a buffer for under delivery. The solution to under delivery is to ensure that no sector is protected from taking responsibility for its emissions.

What do you think the Government could do to support new employment and enable employment transitions in rural communities affected by land-use change into forestry?

The Government should look at tools to increase local manufacturing from timber as part of a transition to a circular economy, as part of this the Government should consider the trade aspects of the market for wood that sees much unprocessed timber go offshore and the extent to which high emissions materials such as concrete and steel are subsidised under the ETS.

What's needed to make it more economically viable to establish and maintain native forest through planting or regeneration on private land?

There needs to be a comprehensive package of measures:

- Incentive system for restoration and planting
  - Rates relief
  - Pricing combination of ETS and public biodiversity good
  - Ecological advice and support, e.g., pest/weed control
  - Fencing support
  - Regional community-based education profile programme
- Reducing the rate at which plantation forestry gains credits
- Gazette the NPS on Indigenous Biodiversity, especially complementary measures
- Gazette the NPS on Freshwater
- Update National Environmental Standards for Plantation Forestry
- Browsing pest control on all public lands
- Weed control on any adjacent public lands
- Ambitious targets for regeneration and replanting
- Support for capacity building
- Financial disincentives for poor plantation forestry practices, e.g., wilding conifer control
-

What kinds of forests and forestry systems, for example long-rotation alternative exotic species, continuous canopy harvest, exotic to native transition, should the Government encourage and why?

Long rotation native and exotic species, separate or mixed, makes sense for a future timber industry. It would be even better if other crops like honey, fungi, etc. could be factored into planning. Care needs to be taken to protect local genetic diversity of native species.

The principle of 'If you wish to cut down a tree, first you must plant it' should govern future harvest of forest. It is important to recognise the importance of allowing regenerating forests to mature to large old trees because they become centres of biodiversity, such as providing nesting sites for avian dispersers. Regenerating native forests need protection from logging because these are areas of ecological recovery.

Current regulations on collecting seed from natural areas to assist with regeneration efforts need review to ensure that they enable the scaling up of restoration while not compromising ecological processes or local genetic diversity.

Do you think limits are needed, for example, on different permanent exotic forest systems, and their location or management? Why or why not?

Permanent forest for carbon storage should be primarily native forests because, although their sequestration rates may be slower than introduced conifers, the long-term storage capacity of these forests is greater.

Caution should be exercised over the use of fast-growing exotics as a permanent forest cover. Weedy species should be actively discouraged. The establishment of exotic forests should be prohibited in areas of native biodiversity, including degraded natural ecosystems that could be restored. Growers should be responsible for any weed risk that their forests pose.

What policies are needed to seize the opportunities associated with forestry while managing any negative impacts?

The capacity of local nurseries to grow trees for permanent forest sinks and timber crops needs to be significantly increased. This must be based on eco-sourcing of local seed for native forest plantings and regeneration. Already the genetics of manuka are being mixed by nurseries collecting seed from around the country and selling plants of mixed origin to customers - this has the potential to weaken the genetic diversity of native species, create genetic bottle necks and increase vulnerability to new pests and diseases.

It's important to **not** allow logging in regenerating, recovering forest areas or this could open the floodgates to large scale old-growth native forest logging again and create a market that is likely to be partly supplied by illegally logged native forest.

If we used more wood and wood residues from our forests to replace high emitting products and energy sources, would you support more afforestation? Why or why not?

Forest & Bird supports the use of wood waste to partly replace fossil fuels. This does not in any way alter the requirement to apply land use planning and management principles to the planting, maintenance and harvest of forests.

What role do you think should be played by:

- **central and local governments in influencing the location and scale of afforestation through policies such as the resource management system, ETS and investment?**
- **the private sector in influencing the location and scale of afforestation?**

Please provide reasons for your answer.

The primary driver influencing the location and scale of afforestation should be public policy goals. Accordingly local and central government should establish a framework that ensures that afforestation occurs in such a manner to:

- Create a preference for permanent native forests
- Limits plantation forestry to locations and scales that are compatible with sound environmental management and does not result in further loss of biodiversity

Pests are a risk to carbon sequestration and storage in new, regenerating and existing forest. How could the Government support pest control/management?

Forest & Bird has previously provided a briefing to officials on how to effectively control browsing pests to protect carbon stocks and restore native forests. The recommendations in the briefing should be incorporated into the Emissions Reduction Plan.

Key actions include:

- Reducing possum, feral deer, goats (including tahr and chamois), wallabies and pigs on all Department of Conservation, Defence and State-Owned Enterprise land managed land to lowest practicable numbers.
- Maintaining all existing deer free areas in places like Coromandel and Northland.
- Reducing feral browsing mammals on land under Land Information New Zealand control to comply with the Land Act.
- Eradicating wallabies from Aotearoa New Zealand entirely.
- Controlling tahr to a level that complies with the Himalayan Tahr Control Plan 1993 and the National Parks Act.

References

Bellingham P, Richardson S, Gormley A, Husheer S, Monks A. (2014): Department of Conservation biodiversity indicators: 2014 assessment; Landcare Research prepared for the Department of Conservation

Burrows L, Peltzer D, Bellingham P, Allen R. (2008): Effects of the control of introduced wild animal herbivores on carbon stocks. Landcare Research Contract Report for the Department of Conservation, Wellington (unpublished).

Carswell F, Burrows L, Hall G, Mason N, Allen R. (2012): Carbon and plant diversity gain during 200 years of woody succession in lowland New Zealand. New Zealand Journal of Ecology 36(2): 191- 202

Case B, Ryan C. (2020): An analysis of carbon stocks and net carbon position for New Zealand sheep and beef farmland. Dept of Applied Ecology, School of Science, Auckland University of Technology. Sept 2020.

Egunjobi J. (1969): Primary Productivity and nutrient Cycling in Terrestrial Ecosystems: A review with particular reference to New Zealand. Tuatara: Vol 17 Issue 2; PP.50-65

Hackwell K, Robinson M. (2021): Protecting Our Natural Ecosystems' Carbon Sinks. Report for Forest & Bird, Wellington. 49pp.

Holdaway R, Burrows L, Carswell F, Marburg A. (2012): Potential for invasive mammalian herbivore control to result in measurable carbon gains. New Zealand Journal of Ecology 36(2): 252- 264

Kirschbaum M, Trotter C, Wakelin S, Baisden T, Curtin D, Dymond J, Ghani A, Jones H, Deurer M, Arnold G, et al. (2009). Carbon stocks and changes in New Zealand's soils and forests, and implications of post-2012 accounting options for land-based emissions offsets and mitigation opportunities – including appendices. Unpublished Landcare Research contract report for Ministry of Agriculture and Forestry, LC0708/174. 457 p

Ministry for Primary Industries (2013): Indirect estimation of gorse and broom 'non-forest land' to 'forest land' transition Final Report: MPI Technical Paper No: 2019/17

Paul T, Kimberley M, Beets P. (2019): Carbon stocks and change in New Zealand's natural forests: estimates from the first two complete inventory cycles 2002-2007 and 2007 -2014. Scion contract report for MfE.

Trotter C, Tate K, Scott N, Townsend J, Wilde H, Marden M, Pinkney T. (2005): Afforestation/reforestation of New Zealand marginal pasture lands by indigenous shrublands: the potential for Kyoto forest sinks. Annals of Forest Science 62 (8), pp.865-871.

Wiser S, Caceres M. (2011): Updating vegetation classifications: an example with New Zealand's woody vegetation. Journal of Vegetation Science. Vol 24, pp.80-93.