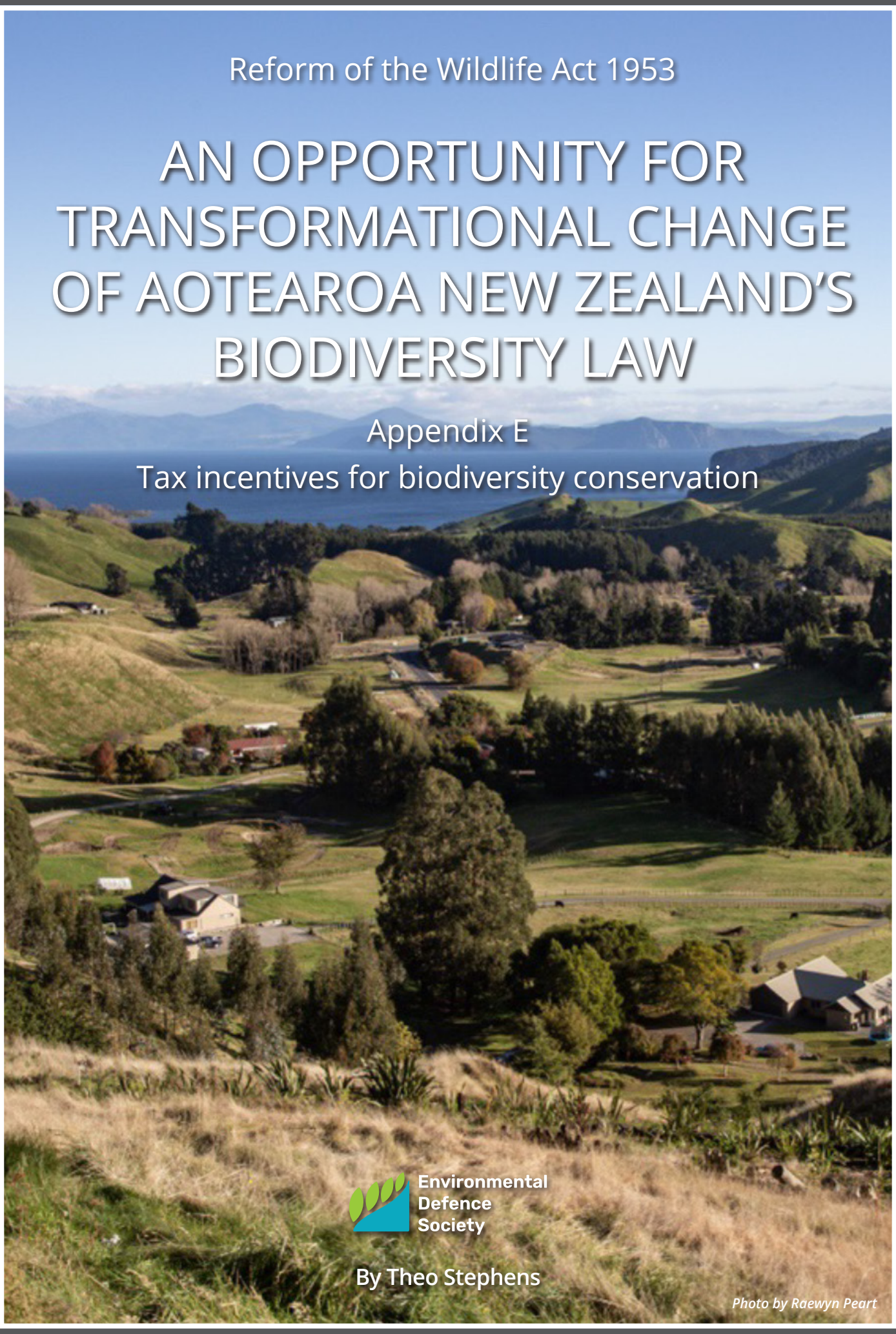
Reform of the Wildlife Act 1953

AN OPPORTUNITY FOR TRANSFORMATIONAL CHANGE OF AOTEAROA NEW ZEALAND'S BIODIVERSITY LAW

Appendix E

Tax incentives for biodiversity conservation



Environmental Defence Society

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Photo by Raewyn Peart

Tax incentives for biodiversity conservation

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What is the problem?

Native wildlife, threatened and taonga species are a liability for private landowners because protective regulation constrains land development and adds cost to achieving higher value land uses. This is a disincentive to recognizing their presence on private land and to actively conserving them there. Its impacts are made worse by the absence of tax on the capital gains achieved through habitat destruction and the tax deductibility of expenses incurred to clear natural habitats. Consequently, there is little economic incentive for landowners to conserve native species and their habitat; rural landowners are inclined to be unsupportive of protective regulation and resist government efforts to survey and document native species and habitat on their land. For some, there is a compelling incentive to 'shoot, shovel and shut-up'. However, there are also several thousand public spirited landowners who have generously resisted conservation disincentives and, at some personal cost, have not only voluntarily covenanted habitat remaining on their properties but also maintain ongoing pest control programmes. Nevertheless, the overall result nationally is rising species extinction risk, ongoing habitat loss and increasing environmental degradation.

Payments to conserve threatened species

Cap and trade schemes can be an efficient way to achieve environmental outcomes. They provide outcome certainty via the 'cap' but the price polluters pay is uncertain. In contrast, tax and payment schemes provide price certainty but uncertain outcomes. The tax or payment rate must be periodically reviewed to achieve the desired outcome, and these reviews present opportunities for vested interests to intervene in price setting. In general, cap and trade schemes better serve the public interest in achieving socially desirable outcomes while tax and payment schemes favour polluters whose interest in price minimisation exceeds that in harm reduction.

Cap and trade schemes rely on the environmental feature of concern being amenable to measurement as a simple quantity that captures what we care about (tonnes of carbon, litres of water, kilograms of nitrogen etc.). This works well for water and many pollutants because it is the absolute amount that matters and a given quantity at one time and place has similar value to an equal quantity elsewhere at another time. However, what matters about species is more nuanced than the number of individuals or the area of their habitat. Not all individuals contribute equally to the population and habitat quality varies across patches.

Consequently, cap and trade schemes based on these simple measures are rarely satisfactory. Similarly, biodiversity and ecosystem services cannot be described by simple fungible quantity measures. Thus tax and payments schemes are the most feasible mechanisms to create economic incentives for conservation of multiple species, biodiversity and ecosystem services.

Conservation of native species and habitat on private land could be incentivised by paying landowners for any retained on their property. A payment based on some combination of a species' threat or taonga status and the contribution of population or habitat present on the property makes to its national security appears to offer a way forward. Payments for highly threatened 'nationally critical' species would be higher than for 'at risk' species and the payment would increase with the proportion of the national population supported on the property. Landowners would have certainty over the price paid to create the incentive to retain them but the payment would not ensure that they did so.

Unfortunately, this simple strategy has some serious practical drawbacks. It requires staff with expertise in species identification, survey to define species distributions and threat status assessment process to robustly establish species' threat status. These three pieces of information are needed to estimate the significance of the property population to the species' security. Capacity for species identification is robust for birds, a little less so for fish and lizards and wanting for many invertebrate groups, non-vascular plants, fungi and lichens. Robust distribution and population size data are available for only a small proportion of threatened species and these data can better reflect where experts have looked than species' actual distributions. Systematic, unbiased species survey data are unusual. The 'data deficient' threat category is large because of these issues. Thus there will be a substantial proportion of species requiring conservation effort for which threat status is 'data deficient' or for which robust estimation of the contribution a given property makes to a species' security is impossible.

A payment scheme reliant on taxonomic, distribution and threat assessment information of variable reliability will lack credibility and so be contested. It could work for a few easily identified species whose distributions are well-known. However, this small subset would be insufficient to reverse ongoing losses and increasing extinction risk for many of our native species. Also, the survey and data management costs required for such a system would be substantial.

Practical technical issues are not the only drawback. This simple payment scheme is at odds with the 'polluter pays' principle. There is no mechanism to transfer funds from those who benefit from the absence of native species and habitats on their properties to those who conserve them and forgo economic benefits by doing so. Payment would have to come from general tax revenue and so would be in competition with every other demand for public expenditure - a recipe for chronic underfunding.

Key attributes for an efficient and effective system

A 'polluter pays' approach is preferable. It should be aimed at natural capital conservation supplemented as required with provisions for specific aspects of natural capital (such as threatened and taonga species conservation, greenhouse gas emissions, carbon sequestration, sediment runoff, nitrate pollution, water abstraction etc.). A low-cost approach will be essential if transaction and operating costs are to be acceptable. This is possible if core data are already available and the system can be fully automated. Last, but certainly not least, if

the scheme can help address some pressing social and economic issues as well as biodiversity conservation, it may be more likely to find public and political support.

The New Zealand tax system is heavily weighted towards taxing the consumption of outputs (such as GST), labour (i.e. income tax) and energy (i.e. fuel tax and carbon charges) inputs and company profits (i.e. company tax). There is comparatively little taxation on land, financial capital and environmental *inputs*. This produces distortions. For example, a failure to tax capital encourages the accumulation of the least-taxed forms of capital (such as land and housing) and hence wealth inequality. Land and environmental inputs to the production process are almost untaxed and therefore cheap relative to highly taxed labour, energy and product inputs. This promotes high rates of greenhouse gas emissions, biodiversity loss, and degradation of ecosystem services at the expense of lower employment and workforce training; it creates wealth inequality associated with land-based property ownership; leads to an economy weighted towards environmentally intensive commodity volume production (such as milk, logs and hamburger meat) rather than sustainable high-value-added production (such as eco-tourism, technology, nutraceuticals and pharmaceuticals). There is therefore a case for a broad-based environmental taxation scheme to promote businesses' productivity, economic diversification and resilience by substituting revenue from productivity impeding income and company taxes, and from regressive GST, with revenue from environmental taxes.

Furthermore, there are some substantial and growing unfunded public expenses coming in the next few years: superannuation, infrastructure renewal, climate change adaptation and mitigation. An environmental taxation scheme could be designed to provide some of the additional revenue needed to fund these liabilities.

Most recently (October 2022), the Government proposed farm-level greenhouse gas taxation scheme. The tax will have less impact on the profitability of high-margin intensive dairy farms than on barely economic low-intensity sheep and beef farms, some of which will likely quit. These marginally economic farms are typically on steep hill country where much native biodiversity remains. Also, many are Māori owned. It seems perverse to allow the scheme to diminish the viability of low impact farming relative to the viability of high-impact dairy farming and to further disadvantage Māori landowners. An environmental tax and rebate scheme akin to our proposal could redress this perverse outcome.

A solution: an Environmental Footprint Tax

A solution that has all the above attributes is a form of land tax, set according to the intensity of land use and consequent impact on the environment as described by Stephens et al. (2016)[1] and Brown and Stephens (2017)[2]. This tax would be assessed primarily from satellite &/or aerial imagery and land title data optionally supplemented with owner supplied information such as the presence of threatened species, legal protection (e.g. covenant), fencing, the level of pest control, nitrate levels, etc. It is not a traditional tax on land *per se*, and so is better described as an "environmental footprint tax (EFT)" rather than a land tax. It would normally be paid annually by the landowner, but could be capitalised and paid from sale proceeds if means-testing shows that an annual payment is unaffordable (for example, retirees).

1 Brown M and Stephens T, 2017, 40-45
2 Stephens T et al, 2016, 26-34

The EFT would implement the polluter/user-pays principle and achieve environmental outcomes by:

- Reducing incentives to destroy biodiversity and degrade ecosystem services, by putting a price on many of the environmental costs of land use.
- Increasing incentives to sustain biodiversity and ecosystem services, by paying a rebate to compensate landowners for the cost of their maintenance.

It could also be designed to facilitate desirable social outcomes, by:

- More fairly and evenly distributing the tax burden across different sources, thereby enabling materially lower income, company and/or consumption taxes.
- Promoting a shift away from volume-based commodity production to high-value added production by reducing the cost of labour inputs relative to environmental inputs.
- Mitigating wealth inequality, which in part arises from low taxation on returns from land-based assets relative to other forms of income.
- Complementing the farm-level greenhouse gas tax scheme with rebates for conservation to mitigate impacts of emissions charges on marginally economic low-intensity farming operations;
- Funding future liabilities such as climate change mitigation & adaptation, superannuation and infrastructure

An EFT would have all the merits of a land tax as described by the 2010 Victoria University Tax Working Group, while being rather more progressive and contributing to a variety of desirable social and economic outcomes. It might also prove to be among the least disliked of possible tax initiatives due to its:

- Reasonableness (the idea that a polluter or user should pay while providers of environmental services should be rewarded);
- Highly progressive nature (the land area owned and the intensity of its use are generally correlated with wealth);
- Ability for landowners to manage and control their tax liabilities via good land use and management actions;
- Ability to reward landowners for socially desirable actions, not just penalise them for bad ones, via rebates for maintenance and enhancement of biodiversity and ecosystem services;
- Benefits to Māori provided by rebates for low-intensity land uses commonly associated with Māori owned land; and
- Low compliance and transaction costs for tax payers relative to those associated with GST, income and company tax.

An environmental footprint tax would have variable impacts on property values. It would increase the value of properties with low-intensity land uses while depressing the value of large, intensively used properties. Thus owners of large and/or intensively developed property are likely to be most detrimentally affected. Alas these are also more influential members of society with most political power to lobby and obstruct policies they don't like.

However, the key result would be the creation of strong incentives to manage New Zealand's natural capital in a sustainable manner, not the re-distribution of wealth. The costs of natural resource use would be internalised while the benefits of providing conservation and environmental services would be recompensed.

The impact of the EFT would depend on the dollar value per hectare associated with each footprint category and any landowner or land category exemptions. It will be important to model a diverse range of footprint pricing and exemption scenarios to understand their implications and impacts on issues such as land use, conservation, greenhouse gas emissions, water quality, tax revenue, wealth inequality and productivity. This research will be critically important for informing the detail of scheme design and parameter specifications.

Environmental footprint

Here the term 'environmental footprint' means a simple measure of the environmental effects associated with a given footprint category. It has two dimensions:

1. land area (in hectares); and
2. footprint depth, which increases with the level of environmental impact typically associated with the land use and land cover. It is represented by increasing tax rates (in dollars) per hectare.

Footprint depth can be negative, if land provides net environmental benefits (such as carbon sequestration, provision of ecosystem services, biodiversity maintenance, habitat for threatened species etc.). In this case we envisage that a tax rebate would be paid to the landowner as an incentive to manage land in ways that have positive environmental effects. The tax levied on a property would be calculated as footprint depth (expressed in dollars per hectare) times land area (hectares) in each footprint category summed across the entire property.

We envisage a two-tier system in which tax liability is estimated algorithmically by the tax authority (probably IRD) from imagery and land title data only (tier 1). The landowner may then elect to refine the authority's estimate by supplying data about factors such as presence of threatened species, fencing, pest control and pollution levels (tier 2). This two-tier system is intended to enable the tax authority to estimate tax liability in absence of landowner cooperation while also empowering landowners to manage their tax liability by considering how their land management and use affects biodiversity and ecosystem services on their property.

Table 1 illustrates possible categories of footprint depth, based on land use and land cover characteristics. These characteristics would be determined from satellite &/or aerial imagery[3], supplemented by ground truthing and other information provided by landowners. The annual EFT levied on a property would be calculated as footprint depth (expressed in dollars) multiplied by land area (hectares) in each category summed across the entire property.

Category 1 in Table 1 shows that the level of environmental impact is greatest for artificially impermeable surfaces (e.g. paved roads and buildings) that cannot support the most basic of ecosystem services (e.g. photosynthesis, de-nitrification, water infiltration and purification). Such uses rely on ecosystem services elsewhere to assimilate wastes and other harms produced on-site.

3 The resolution and frequency of available satellite imagery are increasing while acquisition cost is falling so that much of it is effectively free. Technologies for automated analysis and categorisation of land cover are also advancing rapidly.

Category 2 includes highly disturbed surfaces such as cultivated soil, clear-felled forest, unpaved roads, mines and quarries. These may retain some capacity for photosynthesis and infiltration, but most wastes are not contained on-site, and their export exceeds assimilative capacity leading to pollution and contamination offsite.

Category 3 captures intensively grazed pasture, which is a net exporter of nitrogen and greenhouse gas wastes and typically sustains negligible native biodiversity.

These 'deep' footprint categories are associated with the highest per hectare tax rates.

At the opposite end of the scale (categories 9 to 11) would be land with riparian vegetation, native vegetation, and natural water bodies that supply natural ecosystem services, retain indigenous biodiversity and support threatened and taonga species. These categories would qualify for a per hectare tax rebate. On some properties, the rebate may be sufficient to more than offset tax liabilities from intensively used parts of the property.

Footprint category	Tier 1 land cover type	Tier 1 characteristics	Tier 1 footprint depth ($ per ha)	Tier 2 sub-category	Tier 2 footprint depth ($ per ha)
1	Paved surfaces; buildings	Impervious surface. All indigenous biodiversity eliminated, no ecosystem services provided, wastes exported.	$50,000	Conventional roof	$50,000
				Green roof	$30,000
2	Artificially bare ground; unsealed roads; quarries and mines; recently harvested forestry; feedlots; construction sites; settling and oxidation ponds	Natural vegetation and many ecosystem services eliminated; negligible photosynthesis; waste exported with negligible on-site assimilation.	$20,000	Wastes exported to air, ground or surface waters	$20,000
				All wastes fully contained on-site	$10,000
3	Frequently or recently disturbed but partially vegetated surfaces; cultivated soil; annual cropland; market gardens; recent afforestation	Natural vegetation and many ecosystem services eliminated; some photosynthesis; waste exported with some on-site assimilation.	$10,000		
4	Irrigated pasture; orchards; irrigation water storage dams; domestic gardens and lawns; non-swimmable waters	Natural vegetation highly controlled; some basic ecosystem services remain; most waste exported.	$8,000	>5mg N/l	$10,000
				2-5mg N/l	$6,000
				<2mg N/l	$4,000
5	Improved dryland (i.e. not irrigated) pasture	Natural vegetation usually present but controlled; some basic ecosystem services provided; most waste exported.	$4,000	>2mg N/l	$4000
				<2mg N/l	$3000
6	Unimproved pasture; low intensity pastoral use;	Some natural vegetation present; some ecosystem services	$500	<0.5mg N/l	$100

Footprint category	Tier 1 land cover type	Tier 1 characteristics	Tier 1 footprint depth ($ per ha)	Tier 2 sub-category	Tier 2 footprint depth ($ per ha)
	forestry	provided; little waste exported.			
7	Exotic shrubland (e.g. gorse, broom); Flow controlled swimmable water bodies (e.g. hydro lakes and rivers)	Little native biodiversity but some ecosystem services provided; little or no waste exported.	$100	<0.3mg N/l	$0
8	Amenity plantings, wooded gardens and parks; modified but swimmable uncontrolled water bodies	Restored vegetation cover; provision of ecosystem services are developing; little or no waste exported	-$200		
9	Undisturbed riparian vegetation	Natural or planted riparian vegetation present, ecosystem services provided, wastes received from elsewhere assimilated.	-$4,000	Riparian strip <20m wide	-$4,000
				Riparian strip >20m but <50m wide	-$5,000
				Riparian strip >50m wide	-$10000
10	Native vegetation, including native (tussock) grassland, shrubland and forest	Native-dominated vegetation, provides ecosystem services, waste received from elsewhere assimilated.	-$5000	Unmanaged, not legally protected	-$4,000
				Legally protected	-$5,000
				Legally protected and managed for pest and weeds	-$10000

Footprint category	Tier 1 land cover type	Tier 1 characteristics	Tier 1 footprint depth ($ per ha)	Tier 2 sub-category	Tier 2 footprint depth ($ per ha)
11	Native wetland; Natural potable water bodies	Native dominated wetland, ecosystem services provided, wastes received from elsewhere assimilated.	-$6,000	Not legally protected	-$6,000
				Legally protected	-$8,000
				Legally protected with natural vegetation buffer > 50m wide	-$10000

Table 1: Structure of the proposed environmental footprint tax. Land cover types and associated footprint characteristics are indicative; tax rates are entirely hypothetical and set only to illustrate the concepts, they are not based on and substantive analysis; negative values indicate tax rebate rates. The tax system could be 'single tier' based on a flat (Tier 1) rate for each category, as shown in the first four columns). Alternatively, it could be a two-tier system (the two right hand columns) with the addition of variable rates (Tier 2 footprint) within the category applied at the landowner's discretion, according to defined standards. In addition, a rebate for any listed threatened or taonga species present commensurate with the contribution of the property to the security of the species could be added.

If a listed threatened or taonga species is consistently present, a rebate may be paid. The rebate calculation could be based on the dollar value associated with the threat status of the species and the proportion (P) of the national population or habitat occurring on the property. So, for example:

At Risk	-$20,000
Nationally Vulnerable	-$50,000
Nationally Endangered	-$100,000
Nationally Critical	-$200,000

Thus a property sustaining 10% of the national habitat or population of a Nationally Critical species would be due a rebate of 10% * $200,000 = $20,000.

The single-tier taxation system could progressively develop over time into a two-tier system, as shown in Table 1, with the tax authority deciding what parameters, limits and authentication standards are sufficiently robust and useful for inclusion in tier 2 and individual landowners choosing whether or not to adopt the tier 2 assessment. Under the single-tier system, there would be a single tax rate for each category. Land categorisation would be exclusively the role of the tax authority and there would be no transaction costs to the landowner (although there could be some consultation).

Under a two-tier system, there would be multiple tax rates per category. The default setting would be the top rate (tier 1), but the landowner would be eligible for a lower rate (or higher rebate) if key

standards are proven by the landowner (a discretionary transaction cost). In this way, tax rates would reflect performance standards rather than arbitrary activity-based classifications. For example:

- Green roofed[4] buildings could have a lower tax rate than conventional roofing, to reflect their reduced runoff.
- Pasture that is managed so as not to exceed specified nitrogen loss and/or soil compaction standards could attract a lower rate than pasture that releases greater quantities of nitrogen to surface and ground waters.
- Fully fenced riparian vegetation could attract a higher rebate than partially fenced riparian vegetation.
- Native vegetation with permanent legal protection (such as through a covenant) could attract a higher rebate. There could also be rebates for land that is destocked and receives a defined level of management of pests and weeds.
- Presence of threatened or taonga species could attract an additional rebate depending on the threat status of the taxon and the contribution of the number present on the property to the overall species' population. In principle, this could be added to any footprint category. For example, a rebate could be added for intensively grazed pasture that is regularly used by threatened black-fronted terns or for stone piles on a Canterbury dairy farm that has become essential habitat for a threatened skink.

Nitrogen loss, soil health, greenhouse gas emissions, stocking rates, fencing standards, conservation management standards, presence of threatened or taonga species and legal protection standards could be among the variety of factors that might be used to define sub-categories associated with more favourable tax rates. The decision to bring any of these factors into Tier 2 would lie with the taxation authority. The decision to opt in to Tier 2 assessment would lie with the landowner.

We do not envisage objective measurement of actual environmental effects at any site. The tax rate per hectare for each land cover category would be indicative of some combination of environmental impact, societal concern about typical impacts and many other policy considerations. It is therefore value-based and largely subjective. But it would be constrained within two technical requirements:

- the principle that increasing per hectare environmental impact is associated with higher tax rates
- primary footprint categories can only be based on land cover types that are reliably identifiable from satellite &/or aerial imagery, and all land cover types must be associated with a footprint category.

Beyond these two matters, we suggest that definition of categories and tax rates should be guided by:

- fiscal goals for the tax (how much revenue is required);
- economic goals (how much substitution of other taxes is desired; desired incentives for value added production);
- environmental goals (water quality; halting biodiversity loss; carbon sequestration and reducing GHG emissions);
- social goals (impacts on wealth inequality; incentives for environmental sustainability);
- social and political considerations about impacts on sectoral interests (e.g. mitigating emission charges on marginally economic low intensity farms).

4 A roof that is covered in plants, which reduces stormwater run-off and lowers cooling costs

Some strategic benefits

One of the most valuable outcomes of the tax reform we propose would be a rebalancing of tax on environmental inputs to production, relative to taxes on labour, energy, profits and the consumption of outputs. Such a rebalancing would promote social, economic and environmental sustainability that is undermined by current tax policy. An environmental footprint tax, combined with lower income, company and/or consumption taxes, should promote employment and enterprise, mitigate wealth inequality, promote environmental sustainability and support agribusiness in its transition from high volume, emission-intensive production to low-emission and value-added production. The transition would be supported by lowering the costs of labor through reduced income tax, company tax &/or GST, while increasing the cost of environmental degradation. This may also be a constructive way to help prepare agribusinesses for the likely emergence of environmental trade barriers and competing low-impact products on the global market such as synthetic milk and meat. It would also facilitate landowner acceptance of biodiversity inventory and monitoring on private land as well as more stringent regulatory environmental bottom-lines.

The footprint tax could usefully be supplemented by much more specific environmental taxes, rebates and cap-and–trade schemes. Schemes for trading water takes and nitrogen emissions may have potential for promoting economic efficiency while reducing pollution.

The principal barriers to acceptance and implementation of an EFT are the:

- hostile political environment for tax policy debate and reform;
- lobbying power of agricultural business owners whose businesses require the depletion or elimination of biodiversity and natural ecosystem services.

An ETF would require these landowners to pay a price for those environmental costs and they are unlikely to do so willingly. It will be important to lead the public narrative by articulating a vision for a fairer more sustainable approach to taxation and a more productive economy while promoting the social, economic and environmental benefits offered by an EFT.

References

Appendix E

Journals

Brown M and Stephens T, 2017, 'Big issues, bigger solutions: are bottom lines enough?' *Policy Quarterly* 13(3), 40-45

Stephens R.T.T., Greenhalgh S, Brown M and Daigneault A, 2016, 'Enhancing the tax system to halt the decline of nature in New Zealand', *Policy Quarterly*, 12 (1), 26-34