1. **Character of Abbotsford being erased**

2. **Existing residents (many multi generation families) and lifestyle being disrespected**

3. **Natural character**

4. **Human health:** People brushing with nature, having natural views. Dunedin is losing these views and natural local character. Not everyone can afford holidays to Central Otago etc. Being near nature is one of the greatest health benefits and cures for disease.

5. **A natural corridor obliterated.**
   Environmental values, Existing wildlife threatened.

6. **Mining history:** mining shafts all through those hills, whether they've been found or documented or not.

7. **What is the vision for Dunedin?**
   A vision that's 30 years out of date?
   – 4 bedrooms, pesticided expanse of unused lawn, concrete yard, triple garaging. Lived in by a couple. Driving 2 cars, complaining about how "dead" the centre of the city is and how there are no carparks.

8. **Local food security.** We are smothering all productive land near the city. It can never be unsmothered.

9. **Macro geopolitical factors - macro influencing micro**

10. **Kaitiakitanga**

11. **Macro geopolitical factors - macro influencing micro**

- Older population coming very soon: Abbotsford large sections do not suit older or disabled people

- Fuel, trade and food insecurity is knocking on our door – 99% of everything is shipped through South China Seas. Could be next year that we are no longer able to import food or drive our cars everyday - Abbotsford subdivisions rely on multi- car ownership, and on smothering agricultural and horticultural land.
  Need for views and "nature in our backyard or suburbs"

- Global population decrease in 50 years; "global population at threat of withering". Who will live in all of these big houses in the sprawl? Demand is about to boom in 1 and 2 bedroom places near health services, shops etc.

12. Climate change – the need for every city to have urban forests and nature - population won't be traveling.

Fuel, transport and food insecurity is part of our near future:

Dunedin needs to preserve its remaining nearby agricultural and horticultural landbanks. They are not "profitable" now. But they will be needed soon.

War between China and Taiwan will paralyse food imports. We are already suffering fuel insecurity. Shipping companies have NZ as their lowest priority. 99% of our imports come via container ships.

Dunedin's market garden and fertile land now is buried under housing. Preserve what we have left.

When fuel insecurity bites, Dunedin should have protected itself by focusing on inner city small dwellings, not on semi rural developments that require multi cars per household and which smother productive land.

NZ fuel reserves kept secret

This story first published by RNZ

Photo: RNZ

Officials are refusing to release briefings about how much fuel New Zealand has or should keep on shore.

In April New Zealand became totally reliant on tanker-imported fuel, after the Marsden Point Refinery ended processing.

It came amid a widespread international focus on resource security, as the Russian invasion of Ukraine and shutdowns of European gas pipes disrupted international supplies and prices of food and fuel. And as shipping and logistics routes suffered ongoing bottlenecks triggered by the pandemic.

But despite an RNZ Official Information Request, officials refused to release ministerial briefings about how much fuel New Zealand had or should keep on shore.

In February, Minister of Energy Megan Woods said none of New Zealand's fuel supply was from Russia or Russian products, and the The International Energy Agency had advised that world oil production capacity could meet any disruptions caused by the Russian war on Ukraine.

New Zealand also had access to strategic reserves overseas, she said.

But in March Woods asked officials to hurry up with a report on mandatory onshore holdings.

The Ministry of Business, Innovation and Employment told RNZ it had since provided two briefings to her.

However it said because the minister was still considering them, it would not release them to protect the confidentiality of the advice

But potential supply vulnerabilities were crucial concern given the wider international environment, a Christchurch commercial lawyer who specialises in infrastructure and construction said.

Buddle Findlay special counsel Bassam Maghzal has said it is vital that New Zealand carefully consider its minimum onshore stockholding requirements for fuel wholesalers in case of fuel supply shocks.

Rationing, such as New Zealand's 'carless days' imposed during the 1979 fuel crisis, might not be such a distant prospect as it once was.

"One would assume a 'carless day' is part of New Zealand's efforts to decarbonise the economy - but this risks missing the point about New Zealand's energy security and how quickly our economy could unravel if New Zealand was deprived of sufficient fuel supplies for as little as 24 days," Maghzal said.

And, while relying completely on international supply meant New Zealand was no longer so exposed to a single-point vulnerability where disruption to refining at Marsden Point could have created problems, "if New Zealand was unable to physically import refined fuels, we won't be able to refine the oil we produce locally."

The long delay for shipping to reach New Zealand also made it vital that enough reserves be held, he said.

If changes were made to increase the amount of fuel reserves held onshore, the sooner plans were set in motion the better, Maghzal said, as there would likely be a lag before those amounts could be met.

Our trade comes through the South China Sea. If conflict in Taiwan etc., our containers are trapped. Food insecurity. We need to preserve semi rural and rural land around Dunedin.

International trading is likely to become more uncertain as global geopolitics in the shifts and trading patterns change

Changing geopolitics could increase the risk of supply chain disruption. These could take the form of more frequent trade wars, an uncertain trajectory for globalisation, or rising competition for resources amid climate change-driven shortages. Geopolitical tensions could also disrupt the security of key trade routes, including the maritime sea lanes which carry 99% of New Zealand's trade.

Intra-regional trade is expected to grow as emerging and fast-growing economies gain larger shares in global trade and increasingly trade with each other. This shift is already underway with the Association of Southeast Asian Nations becoming China's largest trading partner in 2020. This may also be driven by countries turning to regional trade agreements because of relatively slow progress in multilateral trade liberalisation.

As emerging economies in Asia, South America, and Africa grow and lift their standards of living, New Zealand export patterns may shift from Western markets to these new ones.[21] These

Geopolitics and vital shipping routes

The South China Sea (SCS) is a key shipping route with an estimated one-third of international shipping trade passing through it each year. In 2016, 18% of New Zealand trade passed through the SCS.[22] This percentage is likely to have grown since.

This waterway is at the heart of an international territorial dispute between several Asian countries. Many countries including New Zealand have direct interests in the region's peace and security and the maintenance of freedom of navigation and overflight. Commercial shipping could be disrupted in the event of conflict or restrictions in the SCS.

> "Changing geopolitics could increase the risk of supply chain disruption."

Internationally, 99% of New Zealand's imports and exports travel along global shipping routes to reach consumers. The remaining 1%, generally made up of high-value, time-sensitive, or critical goods, travels via air - most of which is carried in the belly hold of passenger airplanes.

The maps on pages 16 and 17 show the previous or next international port for the top 90% of containerised imports/exports. There they are

99%

Internationally, 99% of New Zealand's imports and exports travel along global shipping routes to reach consumers

Border closures and the decline in tourism have created uncertainties for the future of airfreight

Before the pandemic, 80% of New Zealand's airfreight was carried in the cargo hold of passenger aircraft. This was driven by strong international passenger movements rising 53% from 2010 to 2019,[16] allowing more airfreight to be carried at lower costs. While a small number of regular dedicated freight aircraft serve New Zealand, these tend to serve Australia as well, reducing the capacity available for New Zealand. Border closures and decline in passenger travel therefore led to a drastic fall in airfreight capacity. To maintain air connectivity for passengers and freight, and protect New Zealand's links to critical supplies, the Government provided funding support to airlines to manage the gap between operating costs and the lower revenues earned. Under this scheme, airfreight capacity recovered to 90% of pre-pandemic levels.

In the immediate term, the recovery of airfreight capacity without government support is highly dependent on tourism resuming. But there is still

- remote working practices reducing the need for some business travel[17]
- airlines being slow to bring aircraft back into service
- foreign airlines moving aircraft to other routes where countries have already resumed passenger travel, which could take years to reverse.

All of this suggests that airfreight capacity for New Zealand imports and exports will remain constrained in the near future. With the high global demand for airfreight, it is also less profitable for dedicated airfreighters to service New Zealand given our distance from major markets. Airfreight rates are likely to remain at two to three times pre-pandemic levels. This is already impacting some of New Zealand's export industries, especially those with lower profit margins.

There are also some uncertainties around New Zealand's airfreight capacity in the medium to longer term. The pandemic has provided an opportunity for New Zealand to 'reset' its tourism sector towards a high-value and sustainable model, but this may reduce passenger volumes and airfreight capacity. New aircraft models powered by low emissions energy sources like electricity

13. Global population DECLINE now during next 50 years.

We are building as if the population is growing. Yes in next 10 years. But then ... International population scientists tell us that the birth rate is too low and populations will decrease dramatically in the next 1 and 2 generations. Many advanced nations will have halved populations within our lifetimes.

This science is finally coming into popular culture: Elon Musk tweets population decline is more pressing that the climate crisis.

Dunedin is using precious semi-rural and rural land to build:

* 200m - 300m "dream homes"
* with 4 or 5 bedrooms; double - quad garaging
* concrete yards and pesticided lawn deserts.
* needing multi vehicles for couples to drive in to town for doctors and shopping

In ten or 15 years, will there be demand for this type of home in Dunedin?

There will be an oversupply. Older owners of 200m "dream homes" will be complaining about lack of parking due to needing to drive in to town etc etc.

They will want 2 bedroom townhouses near infrastructure with handkerchief-sized gardens.

At the global level, population decline is **driven by low and falling fertility levels**. In 2019, more than 40 per cent of the world population lived in countries that were at or below the replacement rate of 2.1 children per woman; in 2021, this share climbed to 60 per cent.11/07/2022

2. **Build resilient institutions and societies**. Countries need to consider and plan for future demographic changes and build institutions and societies that are resilient to and can thrive amid these demographic changes. Rather than focusing efforts on changing population numbers to meet the needs of economic systems, for example, countries should create economic systems that meet the needs of the population.

Global demographic trends mask great diversity

In 1994, widespread concern over population growth brought world leaders together at the International Conference on Population and Development (ICPD), held in Cairo, Egypt, in 1994. Today, however, countries are concerned with a much wider range of demographic changes. Over previous decades, all world regions have seen marked improvements in life expectancy and falling fertility rates, which explain the rapid aging of populations everywhere, but important differences exist between regions. Population growth is currently concentrated in the world's poorest countries, which remain at a relatively early stage of the demographic transition, while some of the richest countries are beginning to see population decline. Such decline has happened before—mostly during wars and famines—but this time it is different.

At the global level, population decline is driven by low and falling fertility levels. In 2019, more than 40 per cent of the world population lived in countries that were at or below the replacement rate of 2.1 children per woman; in 2021, this share climbed to 60 per cent. Net immigration has circumvented population decline in some Western European countries, for example, but high net emigration has exacerbated population decline in some of their Eastern European neighbours.

> "While the status quo might be comfortable for many, we need to recognize that the notion of a stable population is unrealistic.

Growing concerns about demographic shifts

Growing demographic diversity means diverging concerns about demographic change: While some of the poorest countries are concerned with how they can meet the needs of a large and growing population, some of the richest are worried about how they can promote fertility. Accordingly, countries now increasingly pursue divergent population

Fertility rate: 'Jaw-dropping' global crash in children being born

By James Gallagher

Health and science correspondent

- Published
- 15 July 2020
-
- comments
- Comments
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IMAGE SOURCE, GETTY IMAGES

The world is ill-prepared for the global crash in children being born which is set to have a "jaw-dropping" impact on societies, say researchers.

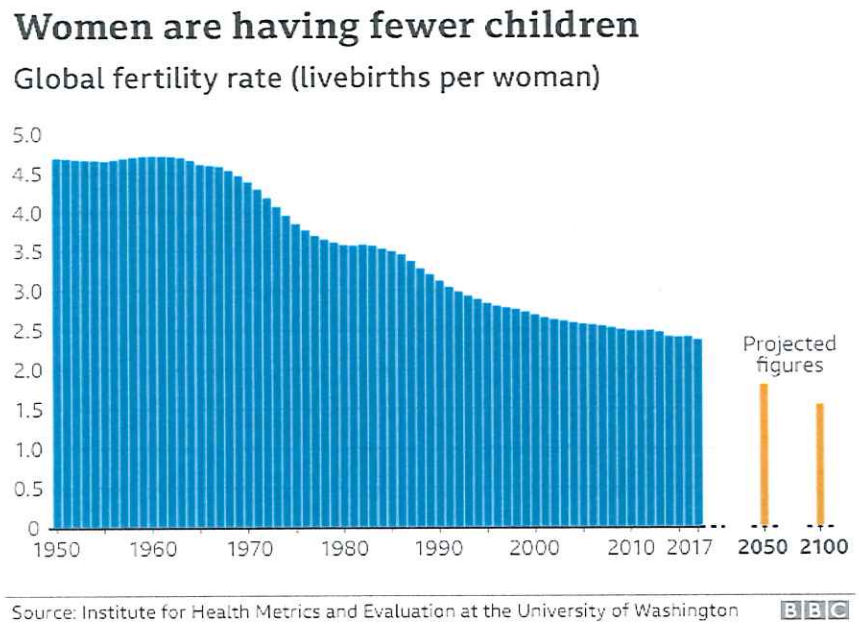
Falling fertility rates mean nearly every country could have shrinking populations by the end of the century.

And 23 nations - including Spain and Japan - are expected to see their populations halve by 2100.

Countries will also age dramatically, with as many people turning 80 as there are being born.

What is going on?

The fertility rate - the average number of children a woman gives birth to - is falling.
If the number falls below approximately 2.1, then the size of the population starts to fall.
In 1950, women were having an average of 4.7 children in their lifetime.
Researchers at the University of Washington's Institute for Health Metrics and Evaluation showed the global fertility rate nearly halved to 2.4 in 2017 - and their study, **published in the Lancet**, projects it will fall below 1.7 by 2100.



As a result, the researchers expect the number of people on the planet to peak at 9.7 billion around 2064, before falling down to 8.8 billion by the end of the century.
"That's a pretty big thing; most of the world is transitioning into natural population decline," researcher Prof Christopher Murray told the BBC.
"I think it's incredibly hard to think this through and recognise how big a thing this is; it's extraordinary, we'll have to reorganise societies."

Why are fertility rates falling?

It has nothing to do with sperm counts or the usual things that come to mind when discussing fertility.
Instead it is being driven by more women in education and work, as well as greater access to contraception, leading to women choosing to have fewer children.
In many ways, falling fertility rates are a success story.

Which countries will be most affected?

Japan's population is projected to fall from a peak of 128 million in 2017 to less than 53 million by the end of the century.
Italy is expected to see an equally dramatic population crash from 61 million to 28 million over the same timeframe.
They are two of 23 countries - which also include Spain, Portugal, Thailand and South Korea - expected to see their population more than halve.
"That is jaw-dropping," Prof Christopher Murray told me.
China, currently the most populous nation in the world, is expected to peak at 1.4 billion in four years' time before nearly halving to 732 million by 2100. India will take its place.
The UK is predicted to peak at 75 million in 2063, and fall to 71 million by 2100.

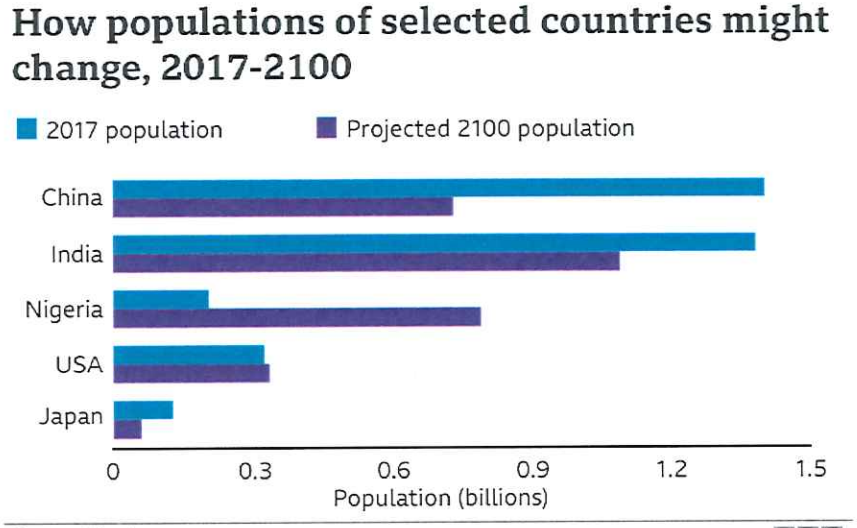


IMAGE SOURCE, BBC SPORT

However, this will be a truly global issue, with 183 out of 195 countries having a fertility rate below the replacement level.

Why is this a problem?

You might think this is great for the environment. A smaller population would reduce carbon emissions as well as deforestation for farmland.
"That would be true except for the inverted age structure (more old people than young people) and all the uniformly negative consequences of an inverted age structure," says Prof Murray.

IMAGE SOURCE, GETTY IMAGES

Image caption,
The world faces a shift from young to old

The study projects:

- The number of under-fives will fall from 681 million in 2017 to 401 million in 2100.
- The number of over 80-year-olds will soar from 141 million in 2017 to 866 million in 2100.

Prof Murray adds: "It will create enormous social change. It makes me worried because I have an eight-year-old daughter and I wonder what the world will be like."
Who pays tax in a massively aged world? Who pays for healthcare for the elderly? Who looks after the elderly? Will people still be able to retire from work?
"We need a soft landing," argues Prof Murray.

What do the experts say?

Prof Ibrahim Abubakar, University College London (UCL), said: "If these predictions are even half accurate, migration will become a necessity for all nations and not an option.
"To be successful we need a fundamental rethink of global politics.
"The distribution of working-age populations will be crucial to whether humanity prospers or withers."

How the new human right to a healthy environment could accelerate New Zealand's action on climate change

October 20, 2021 7.11am NZDT

Last week's formal recognition by the United Nations Human Rights Council that the right to a healthy environment is an essential human right has been heralded as a historic victory for environmental protection and an important step forward for the world's most vulnerable people.

It's also significant for coming on the eve of the UN Climate Change Conference (COP 26) in Glasgow next month, billed as the last best chance to pledge emissions reductions large enough to head off the worst consequences of global heating and associated ecological harm.

On the other hand, UN recognition doesn't make the right to a healthy environment legally binding. No New Zealander can now claim a remedy from the courts because our environment doesn't meet the standard of being clean, healthy and sustainable.

So, what does a human right to a healthy environment really mean? Is it largely rhetorical, or will its adoption have tangible consequences both internationally and in Aotearoa New Zealand?

Better global standards

Despite its limitations, this new human right is certainly not useless. It's the first time a right to a healthy environment has been explicitly recognised at the global level.

The right obliges states to protect against environmental harm, to provide equal access to environmental benefits and to ensure a minimum standard of environmental quality for everyone to enjoy.

Arguably, this paves the way for better global standards, bolder climate litigation, and even for more equitable sharing of the burdens and benefits of climate change.

It also creates a Special Rapporteur on Human Rights and Climate Change, focused on tackling the effects of climate change on people's enjoyment of their human rights.

And it's likely other global and regional bodies, including the UN General Assembly and the Council of Europe, will soon acknowledge the right to a healthy environment.

Developments like this would make the right more credible and more visible, transforming it into an effective tool for challenging states and corporations to do more on environmental protection.

Enshrining the right in law

Overall, the right to a healthy environment reflects a new urgency to push environmental issues back up the international agenda. For example, plans to adopt a "Global Pact for the Environment" next year are gaining momentum.

Proponents are describing the pact as the most comprehensive international text ever on environmental rights, essential for protecting everyone and everything from the "triple planetary emergency" of climate change, pollution and nature loss.

Already, in places where a right to a healthy environment is part of domestic law, court decisions are resulting in stronger climate action.

***Read more:** What is COP26 and why does the fate of Earth, and Australia's prosperity, depend on it?*

The Colombian Supreme Court, for example, recently decided that deforestation of the Amazon violated a right to a healthy environment for present and future generations, and required the government to put protections in place.

Meanwhile, the Nepalese Supreme Court has held that the government must take action on climate change as part of its citizens' constitutional right to a clean environment.

From these and many more national examples, we can be confident that recognising a right to a healthy environment will help improve the implementation of environmental laws, help fill gaps in legislation and support respect for human rights generally.

***Read more:** Human progress is no excuse to destroy nature. A push to make 'ecocide' a global crime must recognise this fundamental truth*

Protecting people and nature

The right to a healthy environment, then, could become a new lever for achieving big changes in a small window of time.

A rights-based approach to the environment will encourage a conversation around what a healthy environment means and who should enjoy it. It may even provide a fresh vocabulary for discussing broader issues, such as land use, transport and power.

As we battle COVID-19 at home, it's tempting to take our eye off the grave environmental challenges ahead. To do that would be a mistake.

The full potential of a human right to a healthy environment remains to be seen. What is certain, however, is that a healthy environment is essential for human health and well-being – and that protecting people and protecting nature are always interconnected.

Escape to green space

© Alamy

One of the lessons that coronavirus lockdowns taught us was the value of green space for general wellbeing. But while that was news to some, researchers have been cataloguing the benefits of time spent in nature for decades. One famous study, for example, looked at people recovering from operations in a hospital. Those in a ward with a view of green space recovered sooner and required fewer painkillers than those who didn't have a view.

In Japan, the concept of 'shinrin yoku' or forest bathing is both popular and reasonably well-studied. It describes the process of spending time among trees, staying calm and still, as you observe the sights and sounds of nature. Researchers have found this can lower both your blood pressure and cortisol levels, while increasing the levels of your body's natural killer cells – the frontline soldiers for your immune system that can control infections and even tumours.

"The NHS in Scotland seems to be sufficiently convinced that GPs can prescribe time in nature now," Mosley says. "Plus, it's just enjoyable. I have a wood near me and it's lovely to be there."

Take an early-morning walk

Urban Forests and Climate Change

Preparers

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An archived version of this topic paper is available.

Issues

The urban environment presents important considerations for global climate change. Over half of the world's population lives in urban areas (1). Because cities are more dense and walkable (2), urban per capita emissions of greenhouse gases (GHGs) are almost always substantially lower than average per capita emissions for the countries in which they are located (3, 4). Urban areas are also more likely than non-urban areas to have adequate emergency services (5), and so may be better equipped to provide critical assistance to residents in the case of climate-related stress and events such as heat waves, floods, storms, and disease outbreaks. However, cities are still major sources of GHG emissions (6). Studies suggest that cities account for 40-70% of all GHG emissions worldwide due to resource consumption and energy, infrastructure, and transportation demands (7). Highly concentrated urban areas, especially in coastal regions and in developing countries, are disproportionately vulnerable to extreme weather and infectious disease.

Urban forests play an important role in climate change mitigation and adaptation. Active stewardship of a community's forestry assets can strengthen local resilience to climate change while creating more sustainable and desirable places to live.

Grass Lawns are an Ecological Catastrophe

TOPICS: ChemicalsFertilizerGrassPesticideWeeds
POSTED BY: ONE TEAM OCTOBER 3, 2018


Grass Lawns are
an Ecological Catastrophe

By LENORE HITCHLER

Are American lawns beautiful visions of nature? Or ecological calamities? Unfortunately, the grass leaves in our parks leave havoc in their wake. Lawns are extremely costly in many ways, including dollars spent on them, the deadly consequences of fertilizer and pesticide use, watering, and mowing. Carbon dioxide (CO2) and other greenhouse gases emitted during these stages of lawn care contribute climate change.

There are various estimates of how much land in the United States is covered by turfgrass. Turfgrass is defined as any of various grasses grown to form turf.

Turf is defined as the grass and the surface layer of earth held together by its roots. A new study from NASA finds that there are 63,248 square miles of lawn in America. Another study published in Environmental Management found that turfgrass covers 1.9% of the US, including 700,000 athletic fields and 14,500 golf courses. Many sources state that turfgrass is our largest agricultural crop. An article in Science Line titled

"Lawn Vs. Crops in the Continental U.S." states that "there may be more acres of lawn than of the [combined] eight largest irrigated crops."

According to Lawn People: How Grasses, Weeds, and Chemicals Make Us Who We Are, based on calculations from air photography and tax assessments, 23% of urban areas are covered in turf. According to a 2005 NASA study, lawns cover 10% of Delaware and 20% of Connecticut, Rhode Island, Massachusetts, and New Jersey. Standard grass lawns are very expensive. They require more equipment, labor, fuel and use more agricultural toxins than industrial farming, therefore making them the largest agricultural sector in the US. According to the Economic Research Service, Americans invest roughly $60 billion a year in the turfgrass industry, including lawn care products and engaging lawn care companies. Besides being overly expensive, lawns are incredibly time-consuming. Americans spend more than three million hours per year pushing or riding lawnmowers. It has been estimated that the average American mows their lawn 22 times per year.

According to the online site "People Powered Machines," about 54 million Americans mow their lawns every weekend. Using lawn equipment also significantly adds to noise pollution. The World Health Organization recommends that general daytime outdoor noise levels should not go above 55 decibels. According to Lawn and Landscape Maintenance, the average leaf blower produces 70-75 decibels at 50 feet. And the time spent mowing lawns is disliked by millions of Americans. A study conducted by the Consumer Reports National Research Center in 2008 found that 58% of those polled do not enjoy mowing their lawns.

Moreover, lawn fertilizers are used much too extravagantly. It is estimated that Americans use ten times more fertilizer on lawns per acre than they do on food crops. According to the Environmental Protection Agency (EPA), in 2004 Americans used 70 million pounds of fertilizers on their lawns. According to an article in the June 24, 2011 issue of The Week, Americans use 90 million pounds of fertilizer on their lawns every year.

The manufacturing of synthetic fertilizers leaves a large carbon footprint leading to climate change. Carbon dioxide (CO2), nitrous oxide and methane are produced during the fabrication of fertilizers. In an article titled "Energy Consumption and Greenhouse Gas Emissions in Fertilizer Production" published by the International Fertilizer Association it is estimated that fertilizer production consumes approximately 1.2% of the world's energy and is responsible for 1.2% of total greenhouse gas emissions. For every ton of fertilizers manufactured, two tons of carbon dioxide are produced.

Most conventional fertilizers are produced using ammonia, which is extracted from natural gas, and two-thirds of natural gas is obtained by fracking. Therefore, lawns also contribute to all of the environmental damages, including water pollution, caused by fracking.

Besides the manufacturing of fertilizer leading to climate change, the actual use of fertilizer also contributes to climate change. Research from Michigan State University, in a study published in the Proceedings of the National Academy of Sciences, finds that any nitrogen not used by plants is converted by soil microbes into nitrous oxide, a greenhouse gas estimated to be approximately 300 times more potent than CO2. The University of Florida's Institute of Food and Agricultural Sciences estimated that a 9.88-acre plot in Miami-Dade, in which 85% of the area is covered by lawns, emits over 11 tons of CO2 per year.

Additional evidence of fertilizer use causing climate change is found in research from Dr. Chuanhui Gu, a professor in the geology department at the Appalachian State University. Dr. Gu and his co-authors, in a paper published online January 9, 2015, by the Journal of Environmental Management, found that a 2.47-acre plot of lawn in Nashville, Tennessee, produces greenhouse gases equivalent to up to 2,443 kg of CO2 per year.

This is equivalent to the amount produced by a flight more than halfway around the world. Dr. Gu also states that standard lawns emit about 5 or 6 times more CO2 than what is absorbed during photosynthesis. Nitrous oxide emissions from fertilizers lead to an estimated total equivalent of about 25 million tons of CO2 each year in the US. Gu adds that if clippings were left to decompose on lawns, the US could store up to 16.7 teragrams [16,700,000 tons] of carbon each year in the soil.

Moreover, synthetic nitrogen fertilizers also damage the soil as shown in an article titled "Synthetic Nitrogen Fertilizers Deplete Soil Nitrogen: A Global Dilemma for Sustainable Cereal Production" in the Journal of Environmental Quality. These researchers found that synthetic nitrogen fertilizers were causing the loss of soil carbon and organic nitrogen leading to erosion and runoff. This runoff contributes to water pollution and less sequestration of CO2 in the soil leading to more climate change.

Some runoff from synthetic fertilizers reach wells and contaminate water. Wells with high concentrations of nitrates may cause congenital disabilities, blue baby syndrome, nervous system impairments and cancer. Other runoff contaminated by fertilizers eventually reaches streams, lakes, and estuaries and then finally our oceans. Nitrogen and phosphorus from fertilizers result in excessive growth of water plants, and they initially flourish.

However, these plants die and sink to the bottom where they decompose resulting in less oxygen in the water. Since fish and other aquatic animals require oxygen, the lowered oxygen levels from eutrophication cause dead zones, defined as an area of water in which the concentration of oxygen is so depleted that most life cannot be sustained. In 2008 it was estimated that there were more than 400 dead zones in the world's oceans. The dead zone in 2016 from nitrogen runoff in the Gulf of Mexico was the size of Connecticut.

Along with fertilizers, pesticides contribute to climate change because they are manufactured using petroleum products, and energy is also used during the manufacturing process and for transportation. Around 78 million US households use pesticides on their yards each year, according to Beyond Pesticides. According to an article in the June 11, 2011 issue of The Week, an estimated 78 million pounds of pesticides are used yearly on our lawns. Weed killers are the most used chemical with 90 million pounds of herbicides being used on lawns every year according to the Pesticide Action Network.

One danger of lawn chemicals is that they are tracked into our homes, thus placing our pets and small children in danger. Small children are at particular risk since their developing bodies are far more vulnerable to toxins. The National Cancer Institute states that children in households that have lawns treated with pesticides have a 6.5 times greater risk of developing leukemia.
Watering our lawns is another way that lawn practices increase climate change. A large amount of energy is used in purifying, transporting, and irrigating with water which is provided by local governments. Thus, our lawns are subsidized by the government. Much of that water is wasted as studies have found that twice as much water as lawns need is used on lawns.

A 2005 NASA study found that in terms of surface area residential and commercial lawns are the single largest irrigated crop in America. Christina Milesi, one of the study's researchers, told NASA's Earth Observatory that she estimated that there are three times more acres of irrigated lawn in the US than irrigated corn. She put the practice of watering our lawns in perspective by stating that farmlands consume 88.5 million acre-feet of water per year in contrast to lawns which use two-thirds as much and that most municipalities use 30 to 60% of their water on lawns. The EPA's figures agree with these percentages of water used on lawns.

The total estimation of greenhouse gas emission from lawn care, which includes fertilizer and pesticide production, watering, mowing, leaf blowing and other lawn management practices, was found by a University of California-Irvine study to be four

times greater than the amount of carbon stored by grass. In other words, our lawns produce more CO2 than they absorb.

Even the lawn mowers that we use are responsible for greenhouse gases. It is complicated to ascertain how many lawn mowers exist in the US. One article found on the online site NBCNews.com provided an estimate by the owner of the American Lawn Mower Co. that 350,000 manual mowers are sold in the US each year. The article also stated that 6 million gas-powered walk-behind mowers were on the market in 2006. According to the online site HBS DEALER, the 2009 lawn mower sales were about 3.2 billion dollars. CO2 is also produced in the manufacturing, transportation, and disposal of these lawn mowers.

The process of mowing lawns produces a large amount of CO2. Scientists use different criteria from each other and therefore their statistics vary from each other. Thus, there is quite a significant difference in the estimates of how much gas lawnmowers use. According to the EPA, the figure is 580 million gallons of gas per year whereas the Department of Energy's value is 1.2 billion gallons per year. Estimates vary from 16 billion to 41 billion pounds of CO2 being emitted from lawn mowers every year.

Another estimate is that every gallon of gasoline burned by lawnmowers emits 20 pounds of CO2. According to the EPA, one gas lawn mower emits 89 pounds of CO2 and 34 pounds of other pollutants per year. According to a Swedish study, using a mower for one hour has the same carbon footprint as a 100-mile car trip. The EPA found that gasoline-powered lawn mowers emit eight times more nitrogen oxides, 3,300 times more hydrocarbons, 5,000 times more carbon monoxide and more than twice the CO2 per hour of operation than electric lawn mowers.

Lawn mowers are not the only cause of greenhouse gases produced in lawn care. According to statistics based on US Census data and the Simmons National CO2 Consumer Survey, 115.5 million Americans own leaf blowers. It has been estimated that thirty minutes of their use produces the same amount of hydrocarbon emissions as driving a car seventy-seven hundred miles at a speed of thirty miles per hour.

Besides producing greenhouse gases, mowing our lawns produces other types of pollution. The EPA estimates that hour-for-hour, gasoline powered lawn mowers produce 11 times as much pollution as a new car. According to the EPA, each gas-powered lawn mower produces as much air pollution as 43 new automobiles driven 12,000 per year – lawn care produces 13 billion pounds of toxic pollutants per year.

Even refilling lawnmowers damages the environment. It is estimated that 17 million gallons of gas are spilled annually while refilling lawn mowers. In contrast, the Exxon

Valdez spill was just under 11 million gallons. A lot of energy was used to extract these wasted fossil fuels and to transport them, resulting in greenhouse gases and climate change in addition to even more pollution of our soils and water supply.

A large number of lawn clippings are sent to landfills. Yard waste is estimated to make up 20 to 50% of US landfills. In 2011, Americans sent 14.4 million tons of yard trimmings to landfills.

Besides wasting valuable nutrients, transportation of grass clippings produces CO2 and other forms of air pollution. Frequently, grass decomposes in landfills anaerobically and produce methane, another greenhouse gas. According to the EPA, methane is 21 times more potent than CO2. Additionally, empty containers of lawn chemicals are transported to landfills, thus contributing even more CO2 to the environment.

Thus, even though many people like to look at an undivided expanse of green grass, there is a terrible cost that we pay for this view. Too much money, chemicals, and time are spent maintaining it. Ironically, there is a vast array of options to replace standard American lawns. These options do not involve fertilizers, pesticides, watering, and mowing. Additionally, replacements for lawns can be a thing of beauty.

Next issue will contain alternatives that will be more environmentally suitable in addition to being even more attractive than our current gardens.

From:	Jenny Lapham
To:	Gary Rae; Jim O"Malley; Steve Walker
Cc:	Emma Christmas; Bede Morrissey; Suzie Ballantyne; Wendy Collard
Subject:	FW: verbal submission today -- Lizzy Lukeman
Date:	Monday, 5 September 2022 03:26:44 p.m.
Importance:	High

From: Elisabeth Lukeman <lizzy.lukeman@otago.ac.nz>
Sent: Monday, 5 September 2022 12:36 p.m.
To: Jenny Lapham <Jenny.Lapham@dcc.govt.nz>
Subject: verbal submission today -- Lizzy Lukeman
Importance: High

Hi Jennie

I don't know if it's too late, but I would like this point included in my submission to the panel, please. I forgot to conclude this because I was a bit emotional. Would you mind forwarding this to the panel?

These developer land owners often say

"Everyone deserves a beautiful view" "Everyone deserves to build their family home in a nice area"

At best, their motivations for saying this are disingenious. Land owners planning to develop are ***not*** thinking of community good, however much they say they are. They are thinking of bank balances and retirement funds.

What they mean is "I want to increase my wealth and as a byproduct 20 / 50/ 200 new landowners can enjoy a view whilst building over what was once a pristine and desireable piece of land of high natural value".

However the REAL EFFECT to "the view" is:

"The view" is *lost by all other people in the community now and in the future* – except for the new homeowners whose 200m houses and concreted yards now smother "the view", so that they can look outwards over the community**.**

Current and future people in the community LOSE their view of what *was* beautiful nature. The animals, insect life, birdlife lose their habitat. Smothered by "dream"houses.

The natural values of the area are obliterated and smotherd by houses.

Abbotsford's community identity and charm was that residents – often blue collar – were able to brush with nature, to walk by paddocks, to see uninterrupted views, to see pukeko on the road, for kids to fish for native in the stream.

Many residents (or people from nearby who drive or cycle) would come to walk on North Taieiri Road, Abbots Hill Road, McMeakin Road, to soak up the feel of countryside, nature, quiet.

It was a benefit and feature of living in Abbotsford.

The social and community and medical value of nature in our communities is undervalued. Nature heals. Nature is prescribed in England for health, cancer recovery etc. The UN and medical research is now advising to prescribe casual brushes with real (not organised, manicured) nature as medicine. Where do poorer or "average" Dunedinites like me "brush with nature"? Walking in their local areas, soaking up peaceful natural views. They can't afford to travel to Queenstown or National Parks or Melbourne.

Yet the naturally valuable views in Abbotsford have been systematically obliterated by development in the past 20 years. Developing Campbell's land is the nail in the coffin, smothering the last uninterrupted nature from the area.

The wildlife that hasn't been talked about … Is there. I camped on that land, played there, rode my pony there thousands of times, worked with dad in the macrocarpa bush there, fished for native bullies there, watched the lizards/skinks and beautiful birdlife there for twenty plus years. I saw it and loved it. Of course land owners will not discuss or emphasise animals, insects and birds being there living quietly and unobtrusively. It is all under threat by an influx of cats roaming and concrete and pesticides. **A retired farmer living in a new subdivision in Taeiri Mouth told me that, oops, his cat keeps bringing dead endangered Otago skinks home to his lounge.** One cat can wipe out a whole population. New developments allow cats in to roam where vulnerable animals have oases. Lawns are the largest "crops" in New Zealand, and lawns use more pesticides and nitrogen fertlizers than cows. That will just all run in to Freeman's stream that native fish are in.

What animals do I know about that will die or be threatened with wipe out due to subdivision:

- Kaka
- Pukeko
- Large populations of Bellbirds, tui, waxeyes, wood pigeons
- Moreporks
- Lizards and skinks
- Insect life
- Native bullies and fish in the stream

The identity and habitat of Abbotsford is being built over. More ugly sprawl outward, sacrificing the natural views and values that Dunedin advertises itself to the world about coming to live here due to "Nature on your doorstep" "The Wild South". Really? Sprawling suburbia.