SUMMARY by LORRAINE CHAFFER for GTANSW 2017

Note: Participants can email me at lchaffer@tpg.com.au for additional resources for this presentation

Special report: New Zealand's rivers (NEWSHUB)

27/02/2017

By Tony Wright

http://www.newshub.co.nz/home/new-zealand/2017/02/special-report-how-polluted-are-new-zealand-s-rivers.html

VIDEO – WEBLINK

The health of New Zealand's rivers and lakes is undeniably a controversial and divisive subject.

Kiwis feel passionate about the health of their waterways, and rightly so, but sometimes the real facts behind what is polluting them can be buried behind hyperbole and over-zealous views.

This was on display in abundance when Environment Minister Nick Smith announced his '90 percent Swimmable Rivers by 2040' decree last week.

Dr Smith laughed off criticism of the plan, which is essentially to fence off all Kiwi waterways from livestock by 2030 and change the criteria of what swimmable water actually is, as 'junk science'.

In a special report into the state of NZ's waterways, Newshub has interviewed and gathered resources from several independent freshwater scientists, the dairy farming industry, (including farmers and scientists) and NIWA, to give you the full picture on the health of New Zealand's rivers.

Part one of Newshub's special investigation will focus on what exactly is the pollution being put into our rivers and the effects.

Part two will analyse the efforts being undertaken to protect Kiwi waterways from further pollution, and what is being done to reinvigorate those rivers that are failing.

Part three will examine the effects of climate change, and whether we've reached a tipping point for overall river health decline in New Zealand.

Part four will look at the battle over the blame of our failing river health, and conclude just who is responsible for the overall decline in freshwater quality.

Part One - What is polluting our rivers?

It's hard to argue that many of our low-lying rivers are being polluted and that the agriculture industry, and in particular beef and dairy farming must take a fair share of the blame.

To their credit, Kiwi dairy farmers have spent over a billion dollars in combating river pollution, while DairyNZ has implemented science-based regulations that leading water experts say have helped turn the tide in improving the health of many our waterways. And while it's easy to simply point the finger at dairy farming, all agricultural industries, and indeed all New Zealanders, even city dwellers, must carry some of the blame for our water pollution.

Some of New Zealand's rivers have seen a rapid decline in health, such as the Selwyn River in Canterbury. (Dr Mike Joy)

What is the main cause of this pollution?

That question at least has an easy answer: Agriculture - but it's not been a recent occurrence, it's been happening since the first pastoral farms were created in New Zealand in the 1800s.

But with the agriculture industry being a big player in the New Zealand economy, examining the link between pollution and agriculture can be tough to evenly gauge.

What are the main contaminants?

Sediment: Fine material from deforestation

Nutrients: Nitrogen and phosphorus from livestock urine and fertilizer
Bacteria: E. Coli from livestock excrement
Sediment from deforestation

It's easy to forget New Zealand is one of the most deforested nations on Earth, with only 25 percent of our native forests left untouched, and they're mostly on the west coast of the South Island.

So while New Zealand does have pockets of beautiful and unspoiled native forests, the majority of our land has been cleared and is used in the agriculture, and in particular, the farming industries.

We've also cleared 95 percent of our native wetlands, which if they were still in existence, would play a major part in protecting waterways from pollution.

New Zealand's native forests have been burnt off and cleared ever since human settlement began 800 years ago, and our waterways are now paying the price.

Dr John Quinn is NIWA's chief scientist of freshwater and estuaries, and told Newshub this initial clearing of New Zealand's forests has a continuing impact on our waterways.

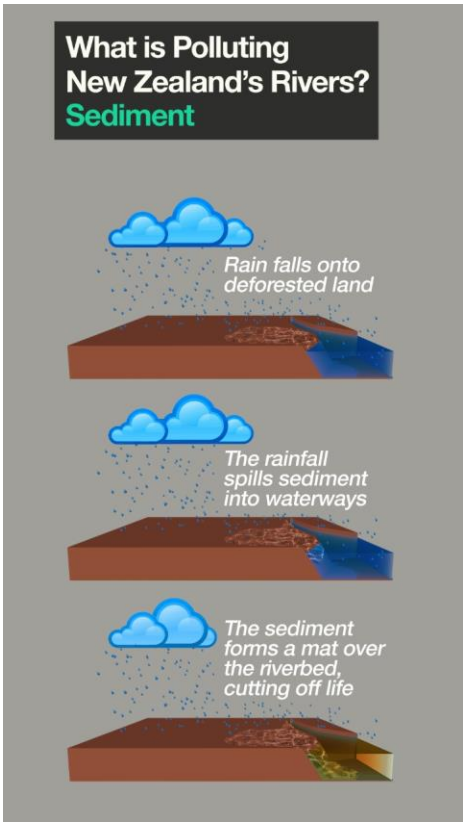
"There would have been a huge dollop of sediment happen when land was first cleared, and often that was just done with burning and pretty unfriendly sorts of approaches and there are legacy effects of all that deforestation that are still around our river channels

today.
"Some input of sediment in rivers is part of a natural process, it creates sandy beaches. You have to have a level of erosion that is part of the natural system; it's just how much has it been accelerated."

Dr Mike Joy teaches environmental sustainability at Massey University. He's studied the declining health of New Zealand rivers for decades and has long been a vocal figure in raising awareness.

"When we get heavy rainfall events we get huge amounts of fine material from deforested areas.

"This sediment comes off the land and clogs up the rivers making them brown and dirty, but the biggest impact is that the sediment then forms a mat over the bed of the stream, and cuts off all the habitat for the life in it."



Dr Tom Stephens works as a water scientist for DairyNZ and his chief job is to help farmers try and improve their water quality. He says one of the industry's biggest battles is to protect our rivers from further sediment gain.

"Once it starts to move on the land it takes a long time to slow down. If it gets in our waterways it takes a long time to get out, so we're talking decades to century's worth of sediment loss. It's what we're currently trying to address through our water quality

levels."

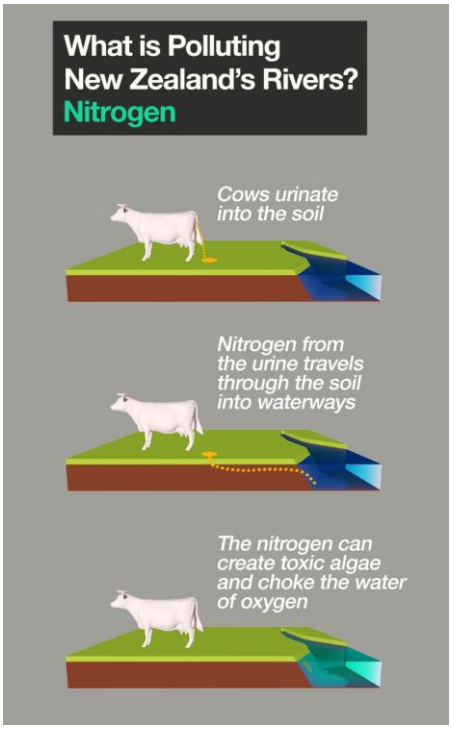
Dairy farming is only part of the sediment problem

Dr Quinn says high intensive dairy farming is 'a' cause, but drystock farming (farming animals for meat and wool) is much more widespread - and has been since the 1800s. "If you look at the amounts of sediment that comes off that drystock farming, and partly because it's on the steeper hill country, it's more erodible as well.

"So dairy's part of the problem but is certainly isn't all of the problem."

Nutrients from farm animals

This is where the booming dairy and beef industries must take a fair share of the blame for the high levels of nitrogen being put into New Zealand's waterways - the direct effect of high volumes of cow urine.



Dr Joy says nitrogen produced by cow urine is having a major detrimental effect on New Zealand's waterways.

"If anyone's seen a cow peeing it's a huge volume in a small area, and the land and the plants can't possibly cope with most of it and it makes its way through the soil.

"Depending on soil moisture, levels of rainfall and a whole lot of other factors, most of it makes its way through the ground to lakes to rivers.

"It's not so much the nitrogen itself that's the problem, but that it's a nutrient, and it grows in the plants and the lakes, and there's algae and then algal bloom; either toxic algae, or algae that grows to such an extent that it takes the oxygen out of the river, out of the water itself and the animals die."

The dairy industry is of course incredibly aware of the nitrogen problem from cow urine, and is trying to use the latest science to combat it.

"The biggest challenge for us is actually catching, and interrupting that urine patch," says DairyNZ water scientist Dr Tom Stephens.

"When it's deposited it's in a very dense, sudden pool, and it can escape the surface layers of the sediment where the root systems are and where the growth is occurring and where that nitrogen would otherwise be captured, and once it escapes that then it's going to travel.

"It will either go into the ground water, and it will take years and decades to then emerge or, and a lot of the nitrogen on a dairy farm will do this."

Human health issues from bacteria and in particular: E. Coli

E. Coli comes from the faeces of animal livestock, and has become a major factor in stopping Kiwis from swimming in their rivers. E. Coli is a major health hazard - it can make you sick, especially if you drink water contaminated with it such as what occurred in Hawke's Bay in 2016.

DairyNZ regulations mean its farmers must fence off all waterways on their land and 96 percent have done so - but no such regulations exist for beef, sheep or deer farming. Environment Minister Nick Smith wants this compulsory across all farming industries by 2030. One wonders why it has taken the Government so long to implement such a measure.

It's not just agriculture and farming polluting New Zealand's rivers

The Tasman Pulp and Paper Mill is continuously polluting the Tarawera River in the Bay of Plenty, and is being allowed to do so because the mill hires local people. The Tarawera River now has an unenviable nickname, the 'Black Drain'.

This perhaps sums up the great dichotomy of employment versus the environment: Our Kiwi communities want jobs, but they also don't want to pollute our rivers.

In 2009 the Government granted permission to the mill's owners, Norwegian company Norske Skog, to keep polluting the Tarawera River for another 25 years, despite official protests from local iwi.

In essence, the Tarawera river is being destroyed to keep a few hundred local people employed. The profits made by the mill go back to 'clean, green' Norway.

Invading species is also a massive problem

Remember those "have you seen didymo" TV ads a decade or so ago?

Invasive plants and animals in our waterways are still a major problem in 2017, with foreign species of fish like toy carp wreaking havoc on the natural vegetation in our Kiwi lakes, exacerbating the decline in water quality.

Dr Quinn says noxious plants like didymo are still common in New Zealand but have been overshadowed by the pollution saga from agriculture.

"We see a whole lot of nuisance plants getting into our lakes which eventually results in quite major deterioration.

"It's quite difficult at times to get simple messages across to the public because it really is quite complicated and often people want to reduce it down to one or two things and what we're dealing with is a syndrome of impacts that humans are having and we really need to understand is how to manipulate a number of things at once if we're to restore these water bodies to what we want them to be."

On Wednesday, in part two of our special Newshub investigation into river health, we'll examine what exactly is being done to help protect New Zealand waterways and hear extensively from dairy industry scientists and perhaps the most important people in all of this - the farmers.

PART 2: What is being done to save New Zealand's rivers?

01/03/2017
By Tony Wright

http://www.newshub.co.nz/home/new-zealand/2017/02/special-investigation-what-is-being-done-to-save-new-zealand-s-rivers.html

In part one of our special Newshub investigation into the health of New Zealand's rivers, we looked at exactly what the main contaminants polluting them are:

Sediment: Fine material from deforestation
Nutrients: Nitrogen and phosphorus from livestock urine and fertilizer
Bacteria: E. coli from livestock excrement

DairyNZ, an organisation funded by New Zealand's 10,000 dairy farmers, implemented a plan entitled the 'Sustainable Dairying: Water Accord' in 2013 which it hopes will be the blueprint for protecting all Kiwi waterways on farmland.

DairyNZ say its farmers have spent over a billion dollars protecting waterways from contaminants - so what exactly have they spent this money on?

Building modern effluent systems
Fencing off waterways from livestock
Planting riparian systems to protect waterways from sediment, nitrogen, phosphorus and heat from the sun

Brian Gallagher has run a dairy farm in Patumahoe, south of Auckland, for 25 years. He and his wife Pirkko didn't wait for the water accord to act - they began protecting their farm's waterways by fencing them off from cows two decades ago.

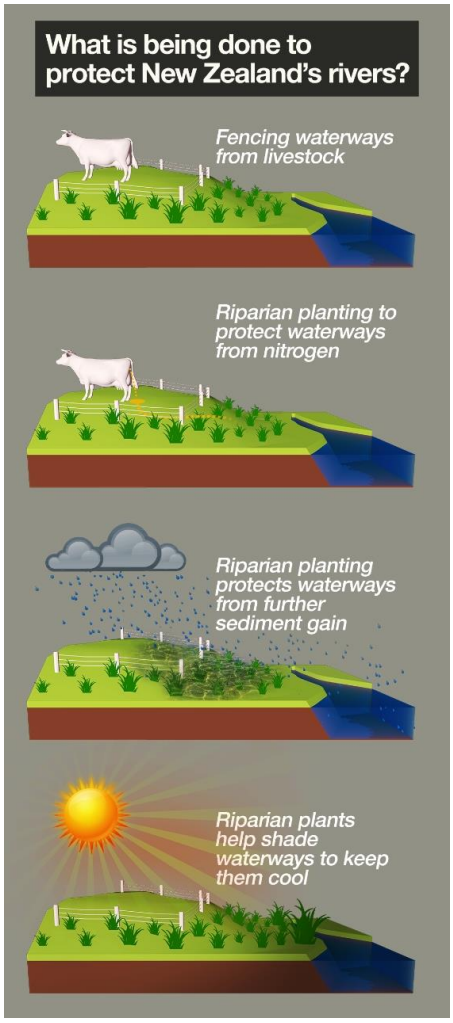
"It was fenced primarily because I didn't want any stock in a waterway. We have to use that water as a resource, as do the people downstream," says Mr Gallagher.

He says he has spent a quarter of a million dollars to make his farm more environmentally friendly - and most of that money was used to build a high-tech effluent system that he can basically control from his mobile phone, even when he is off the property.

"It's paramount that not one drop of effluent gets into a waterway, so that the next generation coming through can go and fish in the Manukau Harbour, for example, or the Kaipara," says Mr Gallagher.

"It's really, really important that they can go water skiing in the Waikato River like I did when I was a kid."

Obviously, Mr Gallagher is an environmentally conscious farmer, but he can only protect one side of the waterway that borders his property. His neighbour, a beef farmer who doesn't fall under DairyNZ's water accord, does not.



DairyNZ say up to 98 percent of its farmers have protected waterways with fencing. (DairyNZ)

"As a farmer we've a responsibility to look after the environment," says Mr Gallagher. "If there are any farmers in New Zealand that are flouting the laws, whether if that's internally through Fonterra or Auckland Council in our case, or any council around New Zealand, my personal opinion is that they should be prosecuted.

"There should be zero tolerance is far as I'm concerned."

These are strong words from a proud farmer, and they perhaps differ from the view that some Kiwis have of dairy farmers making millions with little regards to the health of the rivers running through their property.

When will the water accord bear fruit?

DairyNZ water scientist Dr Tom Stephens has played a major role in implementing and improving the water accord, including developing a world-first online riparian planting programme. The riparian area is the land immediately adjacent to a waterway.
"It promotes gold standard riparian management that allows you to map out your waterways, it then prompts you to do stuff to them like create a 3m set-back," says Dr Stephens.

www.dairynz.co.nz/riparianplanner

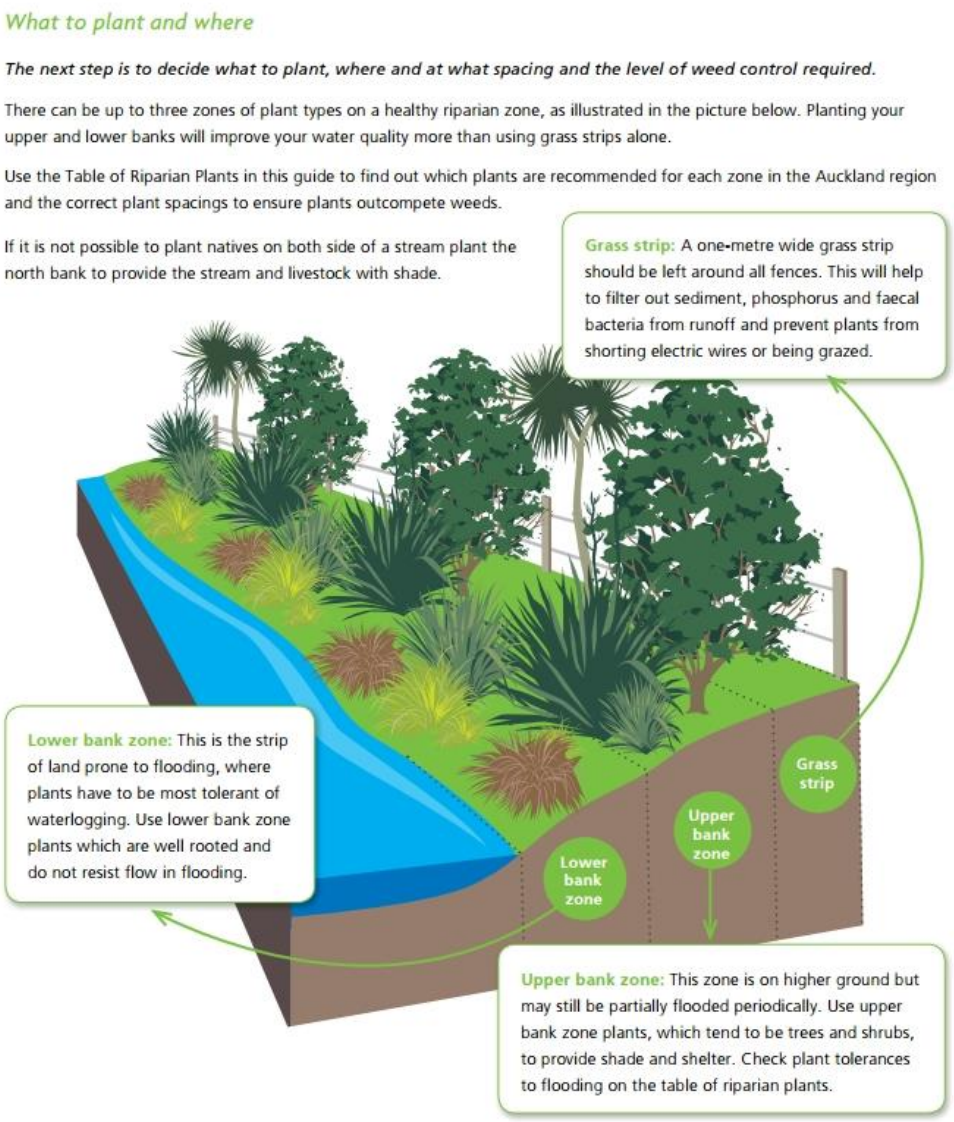
"It then works out what it would cost you to put in a range of native species, or to put it into grass."

Fences exclude livestock while riparian planted margins help filter runoff from waterways. (DairyNZ)

Riparian planting is one of the most useful measures any farmer - dairy or otherwise - can undertake to protect waterways on their land. It absorbs dangerous nutrients from cow urine that produces nitrogen, and phosphorus that can come from fertiliser.

Riparian planting also helps keep the ground and soil together, and can stop invasive sediment from entering the water.

"Planting is all about reinforcing those banks to prevent them from slipping, but it's also about intercepting all that run off, all that flow that's coming off the paddocks ," says Dr Stephens.



Over 1000 dairy farmers are now using his riparian programme, but Dr Stephens says any significant improvements to water health will take time, largely because of New Zealand's immense deforestation and sediment issues.

"We're only four years in, it is a huge undertaking," he says.

"But it's going to take us years to see those effects actually come through, because sediment issues in particular are really long lived. Until they're flushed out of the environment, those sediment grains will still occupy the bed of the river, and if they do so you can't get the insect populations living in those gravels."

Insect populations are crucial

Without insect populations there's no food source for New Zealand's fish species, native or introduced, such as trout or salmon. This has been especially noticeable in some of Canterbury's rivers such as the Rangitata near Ashburton - where the fish stock has all but disappeared.

Some angry anglers are blaming the agricultural industries for using too much water from the rivers on the Canterbury plains to irrigate their businesses - but in some other New Zealand rivers such as the Waikato there is another problem - too much food for the insects to feed on.

"The majority of algae that we see in our rivers aren't toxic, we're talking about the base of the food web," says Dr Stephens.

"And the problem that we have with them in certain rivers and lakes is that there's just too much of them, and too much food results in too little oxygen, essentially, in this environment."

Farming practices are constantly changing

Adrian Brocksopp is a project manager for DairyNZ who grew up on a farm in Leicestershire in the UK.

He says Kiwi dairy farmers are leading the world in protecting their waterways, but every farmer's situation is unique, depending on the amount of livestock they have and the slope of their land.

"We know the solutions just aren't going to be silver bullets, it's going to be a combination of a lot of things farmers can do, and it's not going to be one size fits all. We need solutions that are different for all farm situations," says Mr Brocksopp.

"Often, change takes time. Time, both financially, and time for skill sets to change on a farm.

"How we farm now is different to how we farmed ten years ago because the challenges are changing all the time, and we now learn more all the time."

Changing what the cows actually eat

Dr Stephens says DairyNZ farmers have begun feeding their cows different types of feed that can reduce the nitrogen in their urine.

"What we're trying to do is reduce the amount of nitrogen that we're losing, so that's feeding stock better sources of energy that have lower protein content because protein is rich in nitrogen," he says.


What a cow eats can change how much nitrogen it produces. (DairyNZ)

"The majority of protein a cow consumes, it's not actually converted into milk, so we're trying to reduce that."

DairyNZ scientists are also experimenting with different types of grasses that can better absorb nitrogen before it seeps into the soil.

Is the dairy industry going far enough?

There is still criticism from some fresh water scientists that DairyNZ's water accord doesn't go far enough.

Dr Kevin Simon teaches freshwater ecology at Auckland University. He says while the dairy industry is taking steps to fix the water pollution problem, it should be being done on a much larger scale.

"The fencing of waterways, replanting what we call riparian plants beside the streams is fantastic, but it hasn't happened on a big enough scale to work very well," says Dr Simon.

"The problem is a big scale problem that occurs over big chunks of the landscape, so we need solutions that are deployed on that same scale.

"I think they're also hard choices, especially the nitrogen issue.
"At the end of the day we're going to have to use less fertiliser more efficiently if we want to solve that problem. So it's a combination of some hard choices mixed with some things we know that can work, but try and do that on a bigger scale."

While some rivers are in decline - many are actually improving

NIWA's chief scientist of freshwater and estuaries Dr John Quinn published a paper in 2016 on the state and trends of nutrients such as nitrogen and phosphorus in Kiwi rivers, using data from around 900 sites around the country.

He says 500 of those sites tended to show signs of improvement with regards to phosphorus, ammonia and visual clarity - while up to 50 percent of sites showed improving trends in the E. coli, the bacteria harmful to humans caused by livestock faeces.

However, Dr Quinn told Newshub nitrogen levels tended to be increasing.

"I don't know if we are in a state where things are turning to custard rapidly, but there are signs of a number of attributes that are actually getting better, although with nitrate, things seem to generally be getting worse," he says.

"With nitrogen it tends to go through the ground water system, whereas with sediment and bugs - the things that make you sick, the pathogens and phosphorus - they tend to travel in surface run-off pathways, whereas the nitrogen tends to leech down through the ground water.

"Because it comes out through the ground water, the time it takes to get into the streams is determined by the residence time of the ground waters, and in some parts of the country those residence times are very short - a year or so, even shorter.
"But in others, areas have 50 to 100 years residence time, so of course it takes quite a while.

"What we're seeing now is actually farming practices from decades ago in those places, and other places it's much more."

Tomorrow, in part three of Newshub's special investigation into the health of New Zealand's waterways, we'll examine the effects of climate change, and whether or not we've reached a tipping point for overall river health decline in New Zealand.

PART 3: Will climate change kill off NZ's rivers?

02/03/2017

By Tony Wright

http://www.newshub.co.nz/home/new-zealand/2017/03/special-report-will-climate-change-kill-off-nz-s-rivers.html

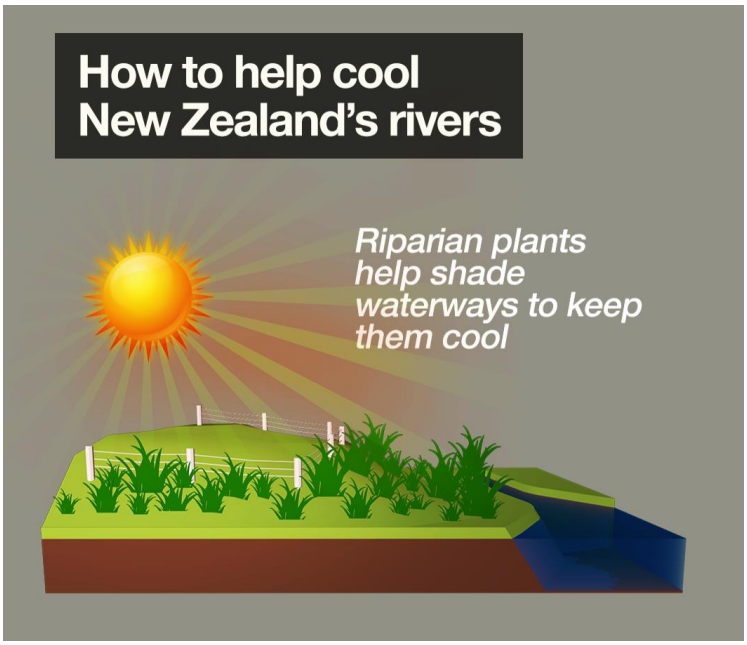
In part one and two of our special investigation into the health of New Zealand's rivers, Newshub examined what exactly is polluting our waterways, and what is being done to try to protect and save them.

In part three we look at what effects climate change could have on the health of our rivers, and analyse if we've already reached the tipping point for overall decline in waterway health.

One of the biggest problems facing our rivers, especially those in areas of New Zealand

facing drought such as the Canterbury plains, or a noticeable rise in temperature such as Waikato and Northland, is keeping the water flow cool.

As we examined in part two of Newshub's report, Kiwi dairy farmers are undertaking a massive planting operation alongside the area of land immediately adjacent to waterways on their farms, known as the riparian area - and one of the many reasons these plants are important is because they help shade the water, keeping them cool.

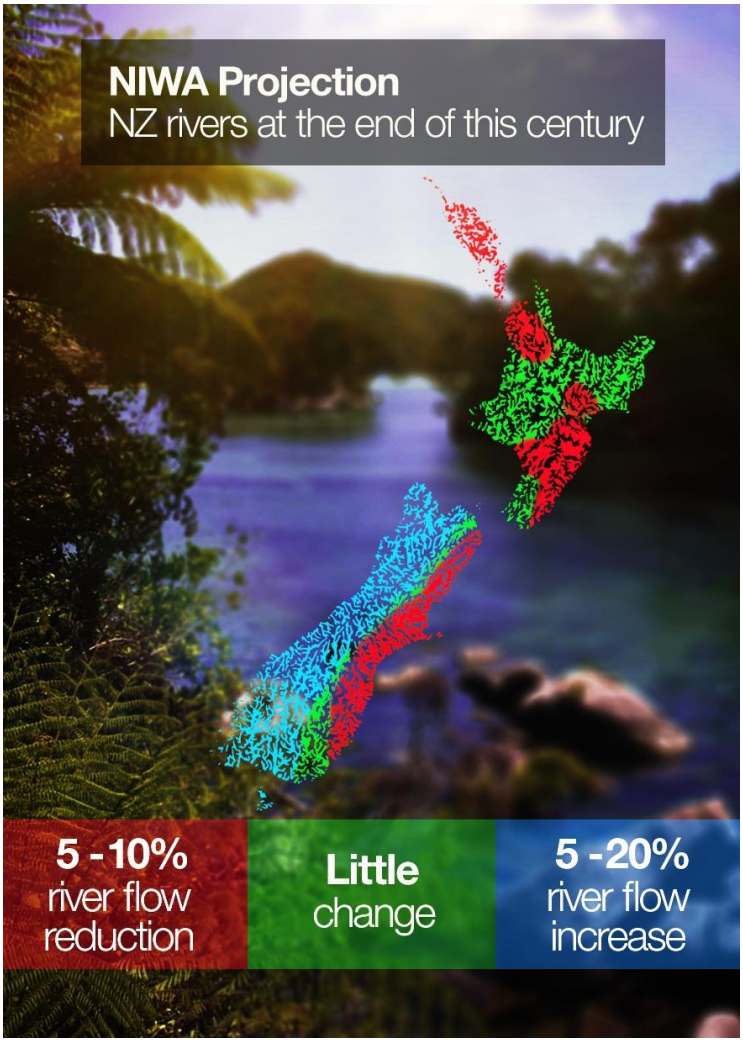


NIWA has worked with the dairy industry on best practice to protect rivers from getting warmer, and chief scientist of freshwater and estuaries Dr John Quinn says riparian planting is a key weapon in fighting to keep our rivers from heating up.

"If we get riparian shade around small streams now it's one thing we can do to mitigate some of that impact by reducing the heating that's going to occur.

"But that's just the reality that if we carry on the way we are with climate change we're going to see less water in those areas that will have big impacts in both the agricultural system and on the stream system, it certainly exacerbates the problems we have with purification in both lakes and in rivers."

NIWA has predicted what river flow in New Zealand could look like by the end of this century, using data from current climate change projections.



As you can see, rivers on the east coast of the South Island, Wairarapa, Hawke's Bay, Waikato, Auckland and Northland all face the possibility of having a 5 - 10 percent reduction in river flow by 2090.

Alpine rivers however, especially those in the Southern Alps of the South Island, are projected to have a drastic increase in flow.


A dry river bed in the Southern Alps - these catchments will likely see much more rain due to climate change. (Getty)

On the projection, NIWA says: "In a warmer world New Zealand is exposed to more westerly airflow from the Tasman, and few easterlies. This would bring more precipitation to the Southern Alps in particular, resulting in higher river flows in rivers with alpine sources. This is seen quite vividly as Canterbury's major rivers become wetter on average while their shorter nearby rivers tend to dry. The largest decline, in percentage terms, centres on parts of Hawke's Bay."

NIWA say there is a 20 - 100 percent projection of decreased river flow in some areas of Hawke's Bay and Banks Peninsula in Canterbury.

There are obviously thousands of agriculture businesses in those areas expected to see a reduction in river flow - not just dairy farming, but beef, lamb and a myriad of other land based industries.

Warmer temperatures will kill off vital insect populations

DairyNZ water scientist Dr Tom Stephens told Newshub he believes one of the biggest threats to our waterways is rising temperatures.

"The biggest way of removing oxygen from our waterways is simply by heating them up. And if you raise the water temperature of a waterway on top of removing the oxygen carrying capacity, it actually directly impacts on our high value insect species, the stonefly and the mayfly.

"If a stream rises above 20 degrees, those species will disappear. They undergo

mortality, what we call extinction, and yet those species are critical sources of food for our fish, and they're also critical to grazing algae and keeping that under control."
The larger the waterway - the harder it is to cool

NIWA's Dr John Quinn says that while riparian planting can help protect smaller streams from heating up, the problem becomes more complicated the larger the waterway gets. "So clearly, if you can shade out the stream you reduce the temperature which is one of the things that is making algal blooms grow more quickly, and the light which makes them grow.

"We've done experiments on different scales that show that that really does work, but once streams get bigger - beyond 10 to 15 metres - it becomes more and more challenging to shade, to use shade to control."

Dr Stephens agrees that protecting these larger waterways from the heat of the sun is incredibly important. New Zealand's longest river, the Waikato, is also one our widest, and in certain areas has seen a stark decline in health. He puts this down to insect populations, which are incredibly important to river health.


The Waikato River near Huntly has seen a marked decline in health. (Getty)

"One of the biggest reasons why we don't have the insect diversity we need and we want in our community in the Waikato waterways is that they're too hot.

"Algal growth can be important to insect health, particularly in shallow streams, when we're talking about a deep river or a hydro lake it's slightly different, because the algal growth isn't attached to the bed, it's the free floating stuff, it's what we call

phytoplankton.

"Because you can't shade the lake, or a river that's larger than five metres wide, you just can't get enough shade on it to control for that algae. "

So climate change looks set to have a drastic impact on the health of our waterways, and it would appear science can only do so much to protect them. Discussions need to be happening now about how best to tackle this problem before it spirals beyond control and the rivers on the Canterbury Plains and Hawke's Bay dry up for good.


The Selwyn River in Canterbury has all but stopped flowing. (Newshub)

The Selwyn River in Canterbury looks to have almost dried up already - and a major investigation needs to be done to find out why. If too much water has been taken out of the Selwyn to irrigate agricultural-based industries, which has been suggested, then surely the Government must get involved to stop this from happening to other rivers.

So have we reached a tipping point for overall river decline in New Zealand?

Dr Mike Joy teaches environmental sustainability at Massey University and says the shocking state of the Selwyn River in particular should be a wake-up call for all New Zealanders.

"There's certainly some basket cases like the Selwyn. It's a bad example of just decades of putting the wrong things in the wrong place and now, it's coming home to haunt us.

"If you take the whole country then nearly all of our rivers are in perfect condition where they start off, in a conservation state they're fantastic pristine rivers as good as anywhere in the world, but it's the bottom ends that are the problem."

It could take generations for our rivers to recover

Dr Kevin Simon teaches freshwater ecology at Auckland University. He believes we've not reached the tipping point yet, but we are very close.

"Could it be saved? Sure. It certainly could be made better. It will take a long time and a very large amount of effort.

"So I think that one of the big questions is how much effort are we going to require to repair some of these systems to make them better and how long should we be thinking about in terms of timeframe for recovery.

"It could be very well in order of talking about decades or generations."

Is 'polluter pays' part of the answer?

Dr Joy shares Dr Simon's views but is perhaps less optimistic of a positive outcome for our rivers.

"The majority of our rivers are in decline, they're getting worse, they're not even stable.
"They're all of the rivers that are in pastoral catchment, nearly all of them are getting worse and so there's no sign, we're doing nothing that's going to reduce it unless we get some kind of a handle on reducing intensification and we have to do something about polluter pays.

"So until we do that, until we actually start making some change and not just talking about it then we're just going to have continuing decline of our water quality.
"We have to face up to the fact that we've made a mess and actually do something about it."

Dr Stephens paints a far more positive picture.

"I wouldn't say that the rivers are getting worse as such. If you look at the latest trend reporting by NIWA and the Waikato Regional Council, indicators for sediment are improving, indicators for phosphorus are improving, indicators for algae in our hydro lakes are improving.

"There isn't a hydro lake where the algal growth is worsening, not in the last 10 to 20 years."

> Tomorrow, in part four of Newshub's special investigation into the health of New Zealand's waterways, we'll examine the blame game and finger-pointing that has ramped up over the decline of our river health - and ask whether it is time for all parties, organisations and industries to have a frank and urgent discussion about how they can best work together to save them.

PART 4: The blame game over NZ river health

03/03/2017

By Tony Wright

http://www.newshub.co.nz/home/new-zealand/2017/03/special-report-the-blame-game-over-nz-river-health.html

VIDEO – WEBLINK

You would've had to have been living under a high-country rock to miss the nasty war of words between environmental groups like Greenpeace and the dairy industry of late. Greenpeace won the latest battle in January when the Advertising Standards Authority (ASA) ruled one of its TV ads was not misleading or untruthful when it stated: "precious drinking water supplies are being polluted by industrial dairy farming and massive irrigation schemes".

The Ad That Dairy NZ Doesn't Want You to See

UPDATE 2: The Advertising Standards Authority has thrown out DairyNZ's complaint and ruled that the ad is truthful and not misleading
http://www.newshub.co.nz/home/new-zealand/2017/01/greenpeace-trumps-dairy-industry-with-river-pollution-ad-ruling.html

UPDATE 1: DAIRYNZ has laid a complaint about this ad - they don't want NZers to see it.

DairyNZ is NOT happy about this ad we've been running on TV - They're threatening to make a complaint to the Advertising Standards Authority. But we reckon it's bang on so we'll keep running it.

http://greenpeace.nz/stop-big-irrigation

Industrial dairying is failing. It’s failing people who want to swim in clean rivers, it's failing our tourism industry, it’s failing our climate and it’s failing farmers. The industrial dairying model requires vast amounts of water and chemical fertiliser to grow more grass to feed ever-growing herds of cows. All to produce more and more tonnes of low-value milk powder to ship offshore. This degrades our land, pollutes our rivers, increases our climate emissions and puts farmers into debt. And it’s about to get a whole lot worse. Right now, two huge, costly new irrigation schemes are planned. Ruataniwha in the North Island and Central Plains Water in Canterbury.

Posted by Greenpeace New Zealand on Tuesday, November 15, 2016

The DairyNZ complaint was one of 12 the ASA received about the ad, and all 12 were rejected - that's a massive win for Greenpeace over the dairy industry.

As Newshub reported in parts one and two of our special investigation into New Zealand's river health, the dairy industry has acknowledged the role it plays in pollution, and its farmers have spent a billion dollars trying to protect waterways from further contamination.

There are other factors to consider when it comes to river pollution.

The beef, lamb and venison industries are not regulated to protect

waterways.

Other land and river-based industries such as milling are key polluters.

Invasive species of fish and plants are still a major problem.

Climate change is having a major detrimental effect as our waterways heat up.

While it would be easy for Newshub to square up the protagonists in a 'we said, they said' debate, the true facts of the matter are that all New Zealanders are responsible for the health of our waterways, even the great majority of us who live in urban areas. We all live here, we all eat the food that is grown here, and we all go to the toilet here - it's that simple.

We are all responsible for water pollution

Freshwater ecologist Dr Kevin Simon from Auckland University told Newshub all Kiwis have a part to play.

"We spend lots of time of assigning blame and not enough time solving problems, so we need to focus more on how can we do these things better?

"I think all of New Zealand needs to step back and take ownership of this, it's not just farmers, it's not just the dairy industry, it's all of us that own this problem, and we're all going to need to step up together to try and figure out ways to do things better to fix these systems.

"It's going to take all of us to make some hard choices to do that."

Some of those hard choices will need to be made by people who live in New Zealand's cities.

City dwellers are major polluters

Just think of the almost 1.5 million people crammed into the relatively small area of the Auckland isthmus and the pollution that causes.


Urban areas are major polluters of New Zealand's water. (Getty)

NIWA's chief scientist of freshwater and estuaries Dr John Quinn told Newshub city living has a massive impact on water quality, and we should all be more aware of it.

"It is very much a 'we're all in this together' issue, but in one sector, the urban-rural split in this is not actually very helpful for people blaming each other.

"There's a lot of things that could be done better inside cities. We could be a lot better at reducing the amount of contaminant that comes off our roofs and off the impervious areas that we have."

Dr Quinn says that city carparks and roads create major pollution, as most do not have barriers, and rain water simply runs off them into the environment along with the contaminants.

Is the dairy industry receiving the credit it deserves?

Dr Quinn also believes the dairy industry has made great strides in recognising and rectifying the pollution it causes, even in the face of increasing intensification.

"I think the dairy farming community needs to receive some credit for the effort that it's put in over the last 15 years, and if we look at the results from those dairy practice catchments we looked at, we have seen improvements in water clarity amongst all of those, [and] reductions in E. coli in a number of them.

"Farmers have done a good job of getting livestock out of streams and improving effluent and nutrient management," he says.

"Giving some people credit for the effort they've put in is a much better way of getting

everyone to move forward than just slagging people in a rather uninformed way."
Farmers are at ground zero in the battle for New Zealand's river health
Dr Simon says Kiwis should appreciate what farmers are trying to achieve by reducing pollution in waterways, which has gone largely unchecked since farming began in the 1800s.

"Part of the issue is that the farmers have to bear the brunt but we've got to help them. We've got to help provide them with solutions that are economically feasible and will work. Farmers don't want to pollute, they want to make a living just like the rest of us."


The dairy farm has quickly become the epicentre of the battle over river health. (Getty)

And Dr Simon believes New Zealand's environmental issues are symptomatic of a global problem.

"We're faced with a growing human population; we're eating in a different way, so more people [are] on a western diet, and the challenge of producing food to support that while minimising the effects on the environment.

"It's going to require changes to us as individuals and how we eat and what we demand, changes in how we do agriculture, and some technology mixed in with that.
"It's a tough one."

A short history lesson on farming

New Zealand was the last major land mass in the world to be discovered, and Pākehā cleared 75 percent of its native forests and wetlands to create pastoral farms in the 1800s. New Zealand was essentially founded by Pākehā to create a massive farm to feed Britain.

We now export our meat, wool and dairy products all around the world - and the

agricultural, forestry and fishing industries are big players in the New Zealand economy. Much is made about the number of livestock animals we have in New Zealand to sustain the farming industries - so do we have too many?

As you can see, the number of dry stock animals such as sheep and beef cattle have decreased, while the number of dairy cattle has remained stable at 6.5 million.

Dr Mike Joy teaches environmental sustainability at Massey University and says there needs to be an ideological shift in the way agriculture in New Zealand is run.

"It's not dairy farming per se, it's just the intensity of what we do it in because we subsidise it through allowing pollution, and we add so much to it by bringing in millions of tonnes of palm kernel and subsidising it with fossil-based nitrogen fertiliser and increase the stocking rates.

"Because we've probably trebled the stocking rate by bringing in all this other stuff in, we've created it."

The dairy industry says its farmers are learning fast

DairyNZ water scientist Dr Tom Stephens grew up in the United Kingdom and spent years in the US state of Florida studying that region's problems with water quality. He believes that although the challenges facing New Zealand's waterways are unique because of its high levels of deforestation, they can be overcome.

"Every dairy farmer I visit now has their head above water, they have sat going 'alright, what is my footprint? How is that impacting on water quality, and if it is, what can I do about it?'"

Dairy farmer Brian Gallagher's family has farmed in Patumahoe near Auckland for generations - he's seen massive changes in the way the industry has evolved to help protect the environment.

"There's been huge differences over the last 50 to 100 years and even in the 25 that I've been here, massive differences around animal management, nutrition, but I would honestly say the biggest one would be land management and effluent management."

So it appears that dairy farmers are incredibly cognisant of the issues facing the waterways that run through their properties - and that the much needed change to protect them is indeed occurring.

The real questions though, are these: Is the change, both in attitude and application, happening fast enough - and is it happening with the right amount of intensity? We may only find out the answers to these questions in 10 to 20 years.