Uraidla Sustainability Fair: 15 March 2026

Keynote discussion: Nutrients, Water and Healthy Landscapes

Presented by Prof. Andy Lowe with Tara Ingerson, Wendy Telfer, Ira Thorstensson, Will Hannaford, Astrid Haines, Saskia Latreia

Andy Lowe
But before we start, we've run these panel discussions for a number of years here at Urad la sustainability fair, and unfortunately, last year, one of our panellists died, Joan Gibbs, so we just wanted to recognise Joan's contribution. She was a researcher and lecturer at the University of South Australia, and I don't know if anybody was here. When she did her talk, she gave a very engaging talk with a number of different props. So we're very sad and just recognise and recognise the contribution that Joan gave, both to sustainability environment, but also to the panel talks. Okay, so we're going to talk how nutrients shape our landscapes, from fertilisers in agriculture to the microbiomes of our forests and gardens. But nutrients are really important. But as we know, too much of a good thing can also cause problems. And since the rise of industrial scale, fertilisers, excess nutrients have increasingly impacted our systems. So we have an expert panel here today to discuss the problems with excess nutrients within systems, but also some of those solutions that we can start implementing. Now, before we go to the panel, I just wanted to give you a bit of an overview of nutrients within our systems. We know here in Australia, nutrients are, of course, essential for the growth of plants. They they drive those ecosystems. They're basically the food that goes in to ecosystems. But Australian ecosystems are traditionally quite low in nutrients, particularly nitrogen and phosphorus, and we have a floor, we have a plant community here that's quite adapted to that low nutrient environment. So when nutrients hit and excess nutrients hit, our systems, that pulse of nutrients, of course, gives a fertilisation effect, but it can also give problems, particularly after wildfires. Now, the problem comes with wild scale fertiliser use. You know, fertiliser has been used to help with plant growth for millennia. We used to harvest guano from bat caves and from bird caves. But the problem really came with industrial scale fertiliser preparation. Fertilisers, the first industrial process was patented in 1842 and since that time, we've just seen industrial scales of fertiliser use, and that really helped drive the Green Revolution and the feeding of the earth. So when we talk about nutrients, and we talk about the problems with nutrients within our natural systems, we're also recognising the impact that nutrients have had and the application of nutrients to drive our food systems and build our economies and also our societies. So we need to look at that balance. So how much of a problem are nutrients? Well, if we look at the planetary boundaries, which is an analysis that's been done by the Stockholm resilience centre, and looked at nine planetary boundaries, so how much carbon dioxide are we giving out? How much plastic pollution are we giving out? They've also done an assessment for nitrogen and phosphorus, and by most counts, in most places on Earth, we're actually releasing about 200 to 300% more nutrients into the environment than is sustainable. So we're well out with the planetary boundaries in terms of nutrient runoff, and that includes here in Australia, where we remember that our systems here are particularly sensitive to nutrient levels. So what happens? Well, we get things like massive algal blooms. We get problems with dead zones in rivers and killing of fish. We get oxygen depreciation, we get toxic waters, and we get the loss of biodiversity, and those are driven by nutrient runoff in large pulses that go into our rivers and streams and more broadly, into our ecosystems. A large proportion of those nutrient runoffs come from agricultural systems, but they also come from urban runoff and waste water. So it's not only blaming the farmer for these. These are also in. Issues that we all have responsibility for and can all do something about. So what are the solutions? Well,

we have an expert panel here today. We have Wendy Telfer, who coordinates rebirth the ranges, an alliance of 25 organisations working working to halt the decline of the woodland birds, and she's part of the hills and Fleury landscape board. We have Tara ingerson, an environmental scientist, working with the EPA, the Environmental Protection Authority. She's been working there for over 20 years, and is principal coordinator for environmental reporting and in charge of state of environment reporting for South Australia, we have Ira Thornton, who's well acquainted with the science and on ground impacts of soil nutrients, and particularly with relevance to the sixth Creek catchment, of which they are chairperson, and we have will Hannaford, who's been fortunate to work and live in the Adelaide Hills for much of his life. He's worked in agriculture, viticulture, and he's also part of the hills and Florida landscape board. We have Astrid Haynes, a year 11 students from Heathfield High School, who's a youth ambassador, and also Saskia, latria, a year nine, also from Heathfield High School, and also a youth ambassador. Give them a warm welcome today.

Andy Lowe
Okay, so I take a seat now and get much more comfortable. So first round of questions, I think it's really useful. I've given you a bit of the kind of global context on nutrients and the problem with nutrients. Why don't we break it down a bit for a kind of local environment here? So Wendy, there we go. Wendy, why don't why don't you tell us a bit about what's going on here in the Adelaide Hills and how nutrients contributes to the other environmental problems here. Thanks.

Wendy Telfer
Andy, yeah, I think you all know and love the Mount Lofty Ranges of which the Adelaide Hills forms part. It is a biodiversity hot spot. So we've got over half of South Australia's plants and over half of the bird species of South Australia in the Mount lofties. But because we mod, we cleared so much habitat so early for agriculture. So it's a highly modified landscape. And we cleared about 85% of South Australia. You know, the vegetation through the Mount lofties. So when you fly into Adelaide, you can always see that spine looks like we've got lots of trees, but it's actually the other side, the Eastern flanks, right up towards the Barossa, down onto the flurio and Lake Alexandrina, areas where we cleared huge amounts of habitat. And so that, you know, is at the paddock scale. It's also really critically along our water courses. And those water courses, you know, the vegetation along water courses is a natural filter, so when like the nutrient sediment. So sediment is sort of all the all the soil, and that carries the nutrient that Andy was talking about, when that washes off our landscapes and through our townships. There's not that filter in our in our water courses anymore that sort of stops the sediment and helps it drop out. So our large scale clearing and loss of native vegetation is a real driver of we haven't got that nature infrastructure anymore in place that really drops the nature, the sediment out and the nutrient out. And so then it's heading into our water courses. And as Andy said, when that nutrient is in our systems, it not only causes, you know, stagnant pools and algal blooms in our water courses, which is having huge impacts on our native fish. So most of our native fish are declining, and a huge number of them are threatened. So the native fish and our aquatic ecosystems are really in crisis, but also, as you all know it, then heads out to sea and is has become a driver of the marine algal bloom. So there's lots of argument about whether the algal bloom is caused by, you know, land based nutrient and by or is it all because of sea sea temperatures? The coastal system and the southern reef is a really low nutrient system. So like Andy talked about, we've got a bio diverse reef system out in our Gulf because it's low nutrient. And so for decades, we've been pumping, draining, running nutrient from our landscapes into that system. And now we've got the perfect storm of marine temperatures rising, causing that bloom. So it's really connected right from the ranges and the hills here, down to the sea. And it's, yeah, we've taken out the nature infrastructure, both in our water courses, but then also in the sea. So we took out our oyster reefs and our sea grasses have really degraded, and they were also natural filters for that nutrient. So it's a really connected system where we've degraded the habitats. And the native vegetation that was doing such a critical job. And so for me, I'm working on a project

re bird the ranges. We've got 78 declining woodland bird species through the hills. So that's three out of five woodland birds are declining, and huge number are threatened with extinction. They desperately need habitat and water courses also provide critical like climate refuge for birds. So so our water courses are critical for stopping nutrient sediment critical for terrestrial biodiversity, like birds and our aquatic ecosystems and that system out to sea,

Andy Lowe
it's a perfect storm, right? So, it's a perfect storm, and I heard something like 50% of our native fish are endangered or threatened. Is that right?

Wendy Telfer
Yeah, it depends which area you're looking at, but certainly the majority are declining. And yeah, the vast majority are threatened. Yeah, we're not very good at, you know, doing the stats and focusing on fish as much as we should. But yeah, fish

Andy Lowe
tend to get forgotten in trouble. They're in trouble, and also don't leave the mic. So you also talked about sediment runoff as well. So we talked a bit about nutrient runoff and sediment runoff. How did those combine together to make the problem worse?

Wendy Telfer
Yeah, so the sediment is, so it's basically the sediments, the carrier for the nutrient, you know, it's it's so by dropping the sediment out, you're often dropping the nutrient out in the system. So Tara can probably talk a lot more technically about it, but that, you know, that's the basis premise. We're trying not to have huge amounts of soil. We want water coming through our water courses and our systems, but we don't want that sediment and nutrient coming

Andy Lowe
with it. So want that filtering. So let's Nice segue to Tara now. So Tara, give it you know, reassure us. What does the what does the state know about the nutrient problem?

Tara Ingerson
Okay, thank you. So the Environment Protection Authority, or the EPA, as we're known as, as an environmental regulator, our legislation is principally pollution based, which includes sediments and nutrients and a whole lot of other things there. So we do have legislation in place called the Environment Protection water quality policy, or water quality policy, which prescribes a whole lot of requirements that we all need to adhere to, whether it's just you or me or whether it's big industries to actually meet. So these, this policy helps to, I guess, minimise or prevent harm from happening to our waters, and this includes both marine waters and also inland waters. And our inland waters include streams rivers, but it also includes stormwater as well. So you know, those drains are in our streets and everything like that actually forms part of the policy as well. We also licence activities as well that have a higher risk of harm to our waters, and that it can include things like piggeries, wastewater treatment plants, wineries and all that sort of stuff. So there, they need to adhere to a whole heap of requirements as well, and licencing and conditions and other stuff to demonstrate that they're doing all the best they can to actually minimise and reduce pollutants to waterways. So the EPA also runs a monitoring programme. They're called aquatic ecosystem condition reporting, or acres, as they're more fondly known as so we have a scientific team that go out and we monitor waters throughout the entire state. So it ranges from up to Flinders Ranges Limestone Coast, hills and fleuriot, Kangaroo Island, all over the place. So this monitoring takes place most places about every five years. It's a cycle. In some areas, it's a bit more frequently. So hills and fleuriot, they do get up here a bit more frequently. Frequently it's closer, which makes it easier. And they monitor a whole suite of different parameters. So this can include invertebrates, like little bugs that you find in waters.

And these bugs differ depending on how polluted that waterway is. They monitor nutrients sediments as well. They also take into account, they look at turbidity, also the flow of water through that system, and a whole heap of other parameters, which they all then package together to then work out what the condition of that stream is now throughout South Australia, most of the streams are rated from good to poor. So there's no excellent streams out there. Most streams have actually got some level of human activity in impact to it from all the things that we've all that we'll be talking about, so And surprisingly, well, not so surprisingly, I should say the ones are in poorer condition are usually found in urban and agricultural environments. So there's that link between the monitoring that we see and the results that we see in the activities that actually take place in that area. So the monitoring also then looks at what pressures are principally related to that. Area, and also what responses are happening by a range of different stakeholders, and this can include the landscape boards, councils, community groups and all that, that sort of stuff. So we actually engage with these stakeholders to work out exactly what's being done and also what can be done now state of the environment report actually goes into more detail and actually tries to identify some opportunities as well that people can actually do to help minimise those pollutants.

Andy Lowe
So Tara, with with all of the policies and the monitoring underway, are our waterways getting better or

Tara Ingerson
worse? No, they're not getting better.

Andy Lowe
What's the key problem? Most probably, if I can push you,

Tara Ingerson
probably lack of improvement in land management is, is, is probably the thing that's that's preventing those waters from becoming better. I mean, some are just stable. They're just choofing along. But, yeah, and there are some areas that are actually getting worse, but, but certainly just the lack of manageable improvement.

Andy Lowe
So we'll come on to some of the potential solutions in a minute. Will let's go to you next, give us a bit of a an understanding. So Tama talked a little bit about, well, the the level, but potentially increasing level of nutrients running into waterway will tell us about landscape level issues. What's, what's going on in the landscape to increase nutrients?

Will Hannaford
Thanks, Andy for I guess a lot of us, we come from urban areas or Peri urban areas. But like Wendy said, there's, there's a lot of country in the Mount Lofty Ranges that that is semi agricultural, agricultural. And the there's, there's a lot of lot of people out there who have taken on board really looking after their creeks, but there's also a lot of other people who haven't done that. And it is a for a lot of people, is down the priority list because it costs a lot of money, and it's, it's quite a bit of effort. But, you know, for the main, main part, there's, there's two main drivers in those agricultural regions, and probably more talking about the grazing areas, and that's probably the majority of the agricultural regions in in the hills there's, there's two things that really add to the issue of nutrients and nutrients getting down creeks. I've got a got a little couple little props here that you might recognise. Thank you. I made this yesterday in the kitchen. I actually got it out of the paddock. So, you know, that's a that's a good looking cow pat. And there, for those people who know a bit about cows, they they're great when they're in the paddock, because your dung beetles, hopefully got dung beetles, and they get stuck into them and they're incorporated back into the soil. That's prop

one, and that's prop two. And I know what you're thinking, No, I didn't do that, but cows, cow, sheep, you know, there's, there's a lot of volume of both the poo and the wee that goes out of at those animals each day. And if those animals are allowed to just wander through creeks, and those creeks aren't fenced off, then this stuff has a big impact, not only for that, that creek there, but that we, we're fortunate that we've got that the hills form a big catchment area for the water for Adelaide. You know that we've got the big reservoirs. So if, if that's just another reason to keep the we and the poo out of those creeks. The third prop I've got, Andy, I think mentioned before, you might not be able to see that, but that that's Muriate of potash. So that's, that's a really effective potash fertiliser, and that is but that forms part of a one of the, probably the most widely used fertilisers, and it's called hay booster. And it goes, normally, goes out in spring. And when I've run cows on, when I ran cows on my place, I used to use that to increase the productivity of of hay production. But I've had first hand experience with this? Well, I've put it out, and then I've got a heap of rain and potassium fertilisers are very soluble. Like nitrogen fertilisers, they're very soluble. So this stuff can quite easily end up back in your water course or your dam. So hence, you know, we want those the. Those areas, the dams and the Craig's fenced off. We want lots of plants, native plants, in those areas, to act as buffet buffers, to incorporate, to slow down and stop those nutrients going into the creeks. Thanks.

Andy Lowe
Well, we'll talk about the solutions a bit more in a bit more detail in a minute, Ira, let's go on to you work at in sixth Creek. You work in kind of restoration, a community based organisation. What are some of the other problems that you're seeing from nutrients and those dynamics within the systems that you manage?

Ira Thorstensson
Yeah, well, I kind of feel like I've been given the short end of the stick here a little bit. You know, I'm here to represent sixth Creek and talk about the creek lines, and everyone else on this panel has already kind of covered it.

Andy Lowe
Give us something new. Yeah, exactly.

Ira Thorstensson
Let's do something new. Shall we? I think two people now have used this phrase nutrient pulsing, and I think that's a really interesting one in the landscape. So we have these systems where we get these you know, the nutrient is not level in the landscape all the time. Throughout time, you get these pulses of increased nutrients when certain activities or certain times of the years happen, and so the two that sort of spring to mind we might stick on the creek line stuff to begin with, to start is our deciduous trees. When they drop their leaves into creeks all at once, it creates this incredible pulse of nutrients, usually not immediately, but once the water warms up enough that those leaves start to break down really quickly, and that, just in the way we've talked about previously, with fertiliser runoff or sediment getting into the systems, the sort of biological leaf matter and other biological material does exactly the same thing. And I guess the other interesting pulse, that nutrient pulse, that we haven't talked about yet is, I think that fire in the landscape is a really interesting process that changes how nutrients works in the landscape. And obviously we're all we're all very afraid of bush fires living up here in the hills, right? And so we should be both for our own health. But post bush fire, we get these massive pulses and nutrients, which can either be quite positive within the ecology of our region or really detrimental. And one of the things we're seeing with these large fires at the moment is that basically, they're wiping out so much of the vegetation that the soil ends up washing down into our creek lines, like has been discussed before, whereas historically, when fires were much smaller On the landscape and much more human managed by various Aboriginal groups, you actually still had enough of the soil structure and the remaining vegetation, especially grasses and other

sort of herbaceous, low growing plants, that that nutrient didn't escape the system in the same way. So I think that's a really interesting management consideration we need to take with us going into the future too, that not only do we need to focus on nutrients, on a land holder level, in terms of what we're adding to the system, but also that if we don't manage our landscapes, to be thinking about these big pulse events such as bushfires, then we've got some issues going on. Great.

Andy Lowe
You did find something new to say? So thanks, Ira. I think, look, I've learned a lot from the panel today, some things about nutrients I didn't know, which is really interesting. So, and we've kind of laid out a kind of doom and gloom scenario, the real problem with those nutrients. So I'm going to ask you to give us a bit of hope. Now, lift up our spirits and tell us kind of what. What can we do about these systems? So we might start with you, Wendy,

Wendy Telfer
a huge amount of this is about putting back habitat at scale. So whether it's for those aquatic fish, the declining birds, whether it's for stopping sediment and nutrient getting, you know, through water courses, causing algal blooms there or in the ocean, if we can put back that natural nature infrastructure to do its job where we're going to have it's a huge step. So no matter what scale you live and work at, whether it's, you know, a backyard as a hobby farm, a block, you know, or a large productive farm, it's about trying to find those opportunities to put back native vegetation. Yeah, trees and understory that. Can help with that filtration system, and

Andy Lowe
particularly in and around creeks, including dry creeks. So if you've got any kind of dry creek or creek through the property, just being able to establish vegetation around that that acts as the filter for the system. So everybody could do that with that property,

Wendy Telfer
yeah, and some of it is restoring what's there, as Ira talked about it, is trying to manage those weeds and put back native system species that don't drop those leaves. So it's about kind of the integrity of improving the condition of what you've got, as well as putting it back at scale.

Andy Lowe
Yep. So Tara, So Wendy talked a little bit about natural systems. What? What about urban systems? What can we do in those places?

Tara Ingerson
Thank you, Andy. So as I mentioned before, storm water is part of our inland waters, so storm water doesn't go into wastewater treatment plants or anything like that. They end up in creeks and they end up in the marine environment. So that's something, I guess, from our perspective, we can have a lot of not control over, but we can actually do stuff that actually helps prevent nutrients getting into our storm water system, which then eventually gets into Craigs and rivers. So councils, local councils, are actually responsible for managing stormwater. They each do their own thing with with with stormwater. Stormwater in urban environments, you've got the drains going down the roads, you know, things like washing cars, you like, Don't wash cars in the street and let that, all that that car wash end up in the storm water system that'll end up in the Craig, also sweet leaves from your gut, the the roadside, and put that in your green bin. Improve your green space. So when it does rain, the rain actually seeps into into the soils, rather than then goes down the road. Try and minimise concrete as well in your backyards. But also, don't use fake grass either, because that also increases runoff as well. So these are the sorts of things that we can do in our space. You can also speak to local councils. There's a lot of local councils that are doing

some really good stuff. They're putting in rain gardens, which help filter water before it then goes down the storm water drain. I was actually riding through Charles Sturt Council the other day, and they've got an amazing wetland system which captures water and then is recharged into groundwater and then reused to water their their gardens. You can put rainwater tanks to help also capture water. But if you go onto your council website, they might have some information there that can also help you. And there's also a website water sensitive SA, and that's another website I'll link to, Andy, I don't think I put that one in there. And that also has some some opportunities there, and some some ideas to actually help that. So I mean, people think, I think, you know what help am I going to do as an individual? But if we all collectively do it together, it will help.

Andy Lowe
So I've been taking quite a few notes on practical advice, and what we'll do at the end is we'll put up the notes on the website for the U raidler sustainability fair. I think we also got a recording of this discussion so you can relive the moment as well with us. And we've got a number of websites and links that we'll put up at the end as well, so those should be up in the next few days also. So, yeah, Will, let's, let's carry on with the good advice. So what can we do? Get get our cows out of the creeks. Is that that's your number one message,

Will Hannaford
is it? Yeah, lots of us have got cows. I'm thinking, and not, who's got cows? Oh, who's

Andy Lowe
whose neighbours have got no no. Got no no okay,

Will Hannaford
well, so I think probably the best thing that you know, if you're concerned about the environment and and nature in creeks and your local area and the Adelaide Hills, the best thing you can do is probably talk to anyone you know that does you probably, you may have family or friends and really be an advocate for trying to persuade them to find, even find out more information. We the landscapes, hills and Furio. We're a government agency. We've got some great information. We've got a watercourse guide, five steps watercourse guide, and it's really, really easy to read. So if you know anyone who has livestock and they haven't fenced off their creeks or dams, I think that's probably the best thing you can do. I mean, if you are super keen, I had someone come up and talk to me today. A and said that they were willing to write to their minister, the their local member. I mean, that's, that's, that's something else you can do. But at the moment, there's no legislative policy in place to stop people grazing their creeks. So, yeah, talk, talk, talk, talk, talk.

Andy Lowe
Thanks, Will. And so that five steps water course guide that that's really around fencing, getting livestock out of creeks. It's really aimed at land managers with livestock, is it?

Will Hannaford
Yeah, that's correct, and it's got some great re veg information in it. And we've also got the same five step guide for re vegetation. That's an excellent resource as well. And that's not just for water courses, it's for any sort of re vegetation. So come and see us. We're in. We've got a stall just behind here, if you're interested in any of that sort

Andy Lowe
of give me the bullet points now, five, five key steps.

Will Hannaford
What should I do? Well in terms of water courses. Yeah, okay. The first thing is to really the obvious. Think about fencing. The second one is to think about re vegging with native,

indigenous species. They're your local species. We can provide help with all that. Most of the water courses are the weedy parts of the landscape, so we've actually got a really fun weed quiz come along, and we've got some, some pretty good prizes to give for the for the ones that get the questions right. So that's 123, number four is the the one that Wendy mentioned, and that's the sedimentation and erosion. But I mean, some, some, you know, there's been a lot of erosion in a lot of creeks, and we can give advice about that as well. And the fifth one is thinking about the native species. And Wendy did mention fish permanent pools. Permanent pools are really, really important looking after permanent pools. They're just the and they can be really small, but they're that the refuges of galaxiads, the small, little native fish. We've still got them in the Mount Lofty Ranges, and there's some other species. So if you know there's a permanent pool that you go and go past or visit or know someone, they're super important to look after. All.

Andy Lowe
Right, fantastic. So I've taken notes. We'll put those up at the end, and there's obviously some further information as well. Ira, what else? What else can we do?

Ira Thorstensson
I mean, once again, they've sort of taken my sixth grade talking points,

Andy Lowe
haven't they? I suspect you've got something in reserve, though, I've got

Ira Thorstensson
some stuff in reserve Absolutely. So no, I'll absolutely back everything that's been said. You know, sixth Creek as a catchment focused organisation, we do exactly what will has just talked about, and try to really provide support for landholders along the sixth Creek to do the sorts of management activities, particularly focused on fencing and weed removal, I think to expand a little bit on what's been said, I think for those of us who don't have Creek lines on our properties, that doesn't change the fact that native vegetation is incredibly, incredibly important. And I think what often gets overlooked in the sort of conversation is that it's the native vegetation supports soil structure, and it's that really good soil structure, which means that when rain hits the, you know, hits the land, it soaks into the ground, instead of just washing off the top and washing sediments and nutrients with it. So within that context, we talked about the fact that a lot of land has been cleared. But I actually think it's really important to note that a lot of the land that's been cleared in the sort of more northern parts of the Lofty Ranges and and in the more southern parts here in Eureka, it certainly was very forested. But in a lot of these other parts of Adelaide Hills, we were actually looking at fairly grassy, open ecosystems, and it's those native perennial grasses with their sort of deep, fibrous root systems that are really responsible for being able to create the sort of soil structure that allows nutrients to be retained in The system. So I think I back everything that's been said, but I'd also highlight that native grasses in particular are something that are worth investing time and effort into understanding more about and being able to manage effectively.

Andy Lowe
Yeah, well, thanks so much. I mean, really, really practical advice from the panel members, but I think before we get too comfortable, we've got a couple of youth ambassadors that are set to set some hopefully quite difficult questions to the panel members, and we'll just open up the panel discussion. So if you as audience members have questions that you'd like answering. Get ready to ask those now, but we'll go to the panel questions the panel. Have no idea what these guys are going to ask. Like to keep it a little fresh here. So Astrid, or Saskia, you going first? Yeah. So Saskia, let's go, yeah.

Saskia Latreia

Thanks. The algae bloom has created community devastation, killed 1000s of marine life, and severe served as a warning to the many ways that climate crisis will begin to influence biodiversity. What do you believe needs to change now, plus the future to preserve natural disasters like this happening again?

Andy Lowe
Thank you. And so a good question there about the algal bloom. It's obviously the topic of the moment, and probably a number of people have opinions on the algal bloom. There's also been quite a bit of, I would say, misinformation out there about the algal bloom, and it's probably fair to say that there's still scientific debate on exactly what's caused it and exactly what the best solutions would be. Maybe I'll go to Wendy then Tara to answer the question, what's a kind of no regret strategy to stop algal blooms in the future?

Wendy Telfer
So to the climate crisis, absolutely. I guess it's every one of us doing our bit with reducing emissions that's still a critical piece that we can control and change. You know that the marine temperature is obviously the big driver of Bay algal bloom, but layering on that is that putting back nature infrastructure at scale, and that's both within the marine environment. So our sea grasses have been really impacted by nutrient and sediment that really comes out to sea and then causes those sea grasses to die off. So huge amount of effort in putting back those natural filter systems, same with our oyster reefs, they're incredible filters of nutrient and sediment, something like they one one oyster can filter a bathtub every day. I think, yeah, so it's an incredible job in filtering. And so it is, putting it back at scale in our marine systems. But then, as I said, up through our waterways and being having that filtration system right throughout Awesome.

Tara Ingerson
Thank you. I mean, I guess another thing is that connection from to land to water, marine environment as well, and helping minimise the amount of nutrients that go into the marine environment from our land and and, and part of that is, is is looking at how we actually do that, and that's also from our creeks and rivers as well. I should have just mentioned it's not only stormwater that goes into it's it's our creeks and rivers. River Torrens goes in. So there's a lot of work looking at improving those systems to try and reduce sediments and nutrients going in. Of course, you know a lot more can be done to actually help reduce that as well. So a lot of it is reducing the amount of nutrients actually going into that marine environment that then may help sustain the bloom as well. And again, we're still doing a lot of monitoring to find out exactly what has caused this and what is sustaining it as well. So there's sort of two components to it. So yeah,

Andy Lowe
but I guess it is a, you know, helping stop climate change and helping to reduce nutrients that flow into our rivers and ultimately into the seas, are two no regret strategies, because of the other benefits that those would both derive. I think with the algal bloom, it's really shown a spotlight on our environment here within the state. Obviously, we had the funding that came out the summer plan, and about $10 million of that was focused around restoration of oyster reefs, shellfish reefs, but also with sea grass meadow restoration. Now $10 million sounds like quite a lot. It's not bad. It's a good start. But a number of those programmes are actually community based programmes where communities are helping support the establishment of 25 reefs around the state, and we used to have hundreds of kilometres of oyster reefs around the state. So being able to re establish 10 or 20% or even 30% of what used to be there will make a massive difference. So these types of investments do make a difference, but they also raise awareness of what else can be done that can help future investment. Thank you. Okay, Astrid, we might go for the second question, please. Thank you.

Astrid Haines
Yeah, thank you. So um, what everyday actions can we take as young people and the community to reduce the amount of harmful nutrients we produce, and how can we take care of our local local waterways better?

Andy Lowe
So what can young people do? I go to Ira and will.

Ira Thorstensson
Yeah, well, you could join the sixth grade catchment group if you want No, but seriously I say that. But seriously you could join No, but seriously you we desperately need more people. We are actually going on a bit of a recruitment drive today. So if there is anybody who's interested in in joining, please do contact us at our store. But whilst I say, you know, said that slightly tongue in cheek, specifically for my group, I do think that, whilst there are genuine barriers for young people getting involved in community groups, I think that's something that a lot of environmental community groups are starting to become. They want that to change. And so for young people, joining a community group, even when it's feels really tough, because you're not used to the, you know, feeling of dealing with people who are several decades older than you, I think, is a fantastic way to feel that you're genuinely contributing to something, you know, we've, I think all of us, obviously, I'm only, what, a decade older than you two, so I think we grew up with probably pretty similar messaging about a lot of the sort of small scale things, you know, the recycling and the, you know, don't take, you know, don't have showers that are too long. And I think that messaging can be pretty demoralising, because it means that you're acting as an individual to try to change things, whereas when you manage to get out into the community, even when that is complicated and difficult and you have to deal with, you know, all sorts of different personalities, that gives you a much better ability to both make positive change and feel that positive change influencing you positively. So that would be what my that would be my little plug. Great.

Andy Lowe
Thanks. And older people are people too, aren't they will. What else?

Will Hannaford
Well, there's, there's something that probably everyone can do. We are now starting to get, we get inquiries from land holders, small land holders, medium sized land holders, all the time, just about advice, land management advice. And we're starting to notice that we're getting more. It's starting small, but we're getting more and more people actually ringing us up and saying, Look, I've just bought this property. It's a livestock property, but I actually want to return it to nature. So that's, that's really, that's great, because it's contributing towards building nature in, in the Mount Lofty Ranges, but in terms of everyone else who doesn't own land, you know, you've got choices three times a day in terms of what industry you're supporting, in terms of the food that you're putting in your mouth. And this might be a bit controversial to some, maybe not to others, but I guess choosing to not or eat less beef or lamb, mean, your your contribution, I guess, is very small. But if more and more people do that, the demand for, you know, people wanting to run livestock is, is going to decrease crease over time. So that's that's something that we can all think about.

Andy Lowe
Yep, and got another comment from Tara, and then we'll go back to Hira.

Tara Ingerson
Also, another opportunity, too, if youth don't want to deal with us oldies, there are, there is a youth environment council or a youth environment group as well. And again, we can give Andy the link to that. So, you know, they run youth group like groups like to encourage youth

to actually be involved. And I know that the Murray lands, Riverlands landscape board, if you're up in that in their region, also run a youth group. And we heard some amazing stories about what these kids were were doing to not only, I guess, help support improvement of waterways, but also educate some of us oldies that probably don't really know exactly what to do as well. So, you know, I think, from our perspective, or from my perspective, you know, youth does they, they are the ones that are going to encourage us to do better. And you know, it's that's the environment that we're leaving them. So, you know, a lot of the mud are really keen to be involved. So that's why to get involved.

Andy Lowe
People do get set in their ways. They do things how they used to. And that kind of youth voice keeps society honest, I think,

Ira Thorstensson
and I think that actually ties in perfectly with what I was going to wrap up with, which is, I think that even you know, as as young people, when we feel that we don't have the social power to do something on ground at the moment, I actually think doing the sort of psychological work of making sure that you go out and find the things that are working in the world, and finding the. Good news stories is really important, because our media landscape loves to push really negative stories about the environment. And yes, absolutely, there are massive issues that is undeniable, but there are also really good things happening, and I think being able to hold on to those good things and sort of really build that understanding that there are processes, there is science that is able to support the right kind of work happening. That psychological step is, I think, the first step to being able to jump into doing something positive later

Andy Lowe
and connecting with those community groups that you talked about gives you that that feedback as well. Okay, we're going to go to the audience and I'm going to come down with a partially roving mic. So are you going to have to come up and join me at the front of the audience? So if you just give your name and your question, please?

[Audience question]
Yes, my name is Bron and I've sort of got two interlinking questions, if I'm allowed, I think Tara, if I've got your name right, mentioned the causes of what the nutrient loads are for entering our waterways, and what I'm wondering, because will mentioned, it's not legislated yet, whether the water quality strategies and policies, how bad are our creeks and waterways going to have to get before it becomes legislated in terms of poor to good, and when will it be legislated? And then my other question is that you've got nutrients as your key topic, organic nutrients, I assume, and that what I'm wondering is that I've tried to look in some of these policies and strategies, and can't find any mention of micro plastics and nano plastics. And that really worries me, because I don't know that the water treatment can actually filter it, and we don't, obviously have the filtering processes, but it probably comes from the source, which is the main problem of industry. Thank you.

Andy Lowe
Thanks very much, Bron so a couple of clear questions there. We'll take the first one, I think, which is around. So when, when are we going to legislate to reduce, to improve water quality?

Tara Ingerson
Now that is a really good question, and it's a challenging one, I guess, from from that, that policy perspective, in terms of, like legislating, the stuff that will was saying in terms of, you know, you have to put, like, fences or stop, stop from entering waterways. I mean that that is something that we have certainly not legislated, but certainly encouraged and pushed with,

with a lot of the work that we do with with land holders, when we do that, that that that environmental monitoring that we do, and it's a lot of it is, I think, also trying to encourage and trying to get people to recognise those that that risk as well, and that change in generation, I think will also help as well. I remember when we did a lot of the the engagement with the state of the environment report, we heard a story from one of the landscape boards that they were trying to actually encourage this farmer to actually fence their Craig off to stop it. And he just nut, nut, nut. But as soon as his his, his granddaughter said, Poppa, you should actually stop that. Boom, it was done. So it's it's also trying to work out mechanisms to actually do it, but it is an important point in terms of, how do we do policy to actually encourage that. That is certainly something that, you know, we are discussing at the EPA in terms of how we can actually put that on there, because it is, it'd be a huge requirement on a lot of land holders if all of a sudden we just put that in.

Andy Lowe
And one of the problems is that nutrients just doesn't come from one source Exactly. So you can't legislate a single action to remove that. And I guess, will I guess with the landscape boards as well? You guys work through influence to explain how to improve property and presumably land value as well if you improve lots of property condition, and that's a much more powerful influencer in the end, the carrot rather than the stick. Is that right? Well, or do you need both? Do we

Will Hannaford
need both? Yeah, well, I've I'm more of a stick person, sorry. I guess I deal with the coalface, and I think it would be nice to have a little stick or a medium sized stick as well.

Andy Lowe
Okay, let's have both. Okay, any one more question? Yeah, yeah, oh, I just wanted

Wendy Telfer
to chip in that compliance is really important, and so we do have some regulatory power. So councils and EPA, you know when. So we are getting a lot of runoff from our development zones, out of Nan out of Mount Barker, um. And so community are the eyes and ears we need you if you can. If you ever see nutrient plumes in our water courses, please do tell you you know alert people so that that compliance can happen. Try to get, you know, a quick reaction as a community to those sorts

Andy Lowe
of so and if you see it, you can contact your council or your local landscape board, yeah, landscape board, for sure, EPA or the EPA. So several routes there. Now the other question, Brom was about microplastics, so I think let's do that as a topic for next year, because I think microplastics and PFAs, so those kind of permanent pollutants in our systems. What threat do they represent, and what can we do about them? It's a big question, so I'm not going to put it to the panel here, but I think let's take it up next year, if that's okay. And one more question to finish this off. Anybody else want to ask a question? If not going once, twice, good. Okay. So now we've got a lot of information come through. We will put it up on the website. Afterwards, you can listen to the recording of the conversation as well. If there's particular information that you liked, I'll put a summary of some of those key points, of what you can do in various points, and there'll be websites and also the hills and Florida landscape Board have a stall here, and you can learn more from will about cow poo and we and other things under the yellow tree. How appropriate. And 1pm and revegetation. So what to do about creeks and re vegetate those so 1pm will is going to talk under the yellow tree. Ira. You also have a sixth Creek stall here, and you're looking at invertebrate monitoring as well. So if anybody is interested in invertebrate monitoring and how to count those books and streams, you've got a pilot that's being rolled out, and you're going to show

some of the infrastructure for that, something like that. Okay, good, fantastic. I'd like you to join me in thanking Wendy, Tara will Ira Astrid and Saskia for a fascinating conversation.

Andy Lowe
You this bang on the hour, there we go. Thank you very much.