Ep 19 – Wetlands working on Farm

Sarah Thorne: [00:00:00] Catchment Convos with Thriving Southland, your link to Southland catchment groups and their impactful projects. Each episode, we'll dive into grassroot efforts by local farmers and communities that are driving change and sustainability in our region. Listen in for inspiring stories and insight. Real people, real change, the Southland way.

Welcome to Catchment Convos. My name is Sarah Thorne, and I'm your host today. I'm one of the Thriving Southland team and have the wonderful job of working with Southland's catchment groups.

Joining me for today's episode is Justin Kitto, Dairy NZ's environment manager, who has a passion for building wetlands and has worked on many wetland projects with Dairy NZ and the local catchment groups. Together, we'll talk about what wetlands do, how they can help your farm systems and catchment, and look at how wetlands can support your farming business and become a really smart investment for your farm. So let's get into [00:01:00] it.

Welcome to Catchment Convos, Justin. It's lovely to have you on our podcast today. You've been a big supporter of Southland's Catchment Group since they started, and we have been really lucky to have your help with lots of our catchment group projects. Would you like to introduce yourself to our listeners and tell us how you came to work in the wetlands space?

Justin Kitto: My name's Justin Kitto, and I'm the Environment Manager now at DairyNZ. And how I came to be involved in wetlands is DairyNZ was lucky enough under the previous government to get a Jobs for Nature grant, and we had three catchments throughout the country, and one of them just happened to be based in Southland, and the Waimea specifically.

Part of that project was wetlands, so what we wanted to do is we wanted to partner with farmers to build edge-of-field interventions, wetlands bioreactors, because we knew that they were good mitigation. But farmers can sometimes struggle around what to [00:02:00] do and where to put them, so we just wanted to get some on-the-ground experience to figure out how we can make it work, how we can make it work cheaply, and how effective and how beneficial they're actually gonna be.

Sarah Thorne: That's fantastic, Justin. So before we get into the cool project you've been involved with, can you tell our listeners what a wetland is and why they are important?

Justin Kitto: So wetlands are right there in the definition. They are land that is wet, and because they are land that is wet they have a lot of different plant communities, a lot of different bird communities, a lot of different fish communities, insect communities, because there's parts of it that are dry land and there's parts of it that are submerged under water.

So they're able to host a wider range of species. And because of that, they're some of the most biodiverse ecosystems we have in Southland, in New Zealand, on the planet. And because of that biodiversity, that's why they're really important. But because of how they function and where they sit within the landscape, they are amazing at intercepting water [00:03:00] and transforming the water quality into something that's better. So they're very good, as an example for denitrification. And because of their composition and where they're located, they're very good at absorbing water, so they're very good at buffering flows, in particular flood flows, and also releasing water slowly during dry periods, so they buffer those minimum flows as well.

Because of just how great they are communities and societies throughout New Zealand, throughout the planet, are now starting to look at wetlands more and more as a tool to improve water quality, to manage droughts, to manage flood flows. So they're increasingly prevalent across our landscape.

Sarah Thorne: That's a fantastic explanation. And I know this is one a lot of people think about is there any preference in looking after a natural wetland versus making one on your farm?

Justin Kitto: Yeah. I think there is a preference to protecting what we've got, 'cause [00:04:00] it's much cheaper to not drain something, to put a fence around it and leave it. It's much more expensive to recreate something after we've removed it or destroyed it, because there's this weed burden, and you need to burn diesel and plant plants and maintain all the weed species that have invaded in it that make plant survival hard.

So I think the first thing we need to do is protect what we've got, and unfortunately there was an article in the news yesterday demonstrating that we're continuing to lose wetlands, which is unfortunate given, you know, the benefits that they do have. So I think the first thing to do is just stop draining them. That'll be the perfect start. And then it's sort of protecting the remnants

and protecting the bits that are degraded but not quite gone yet, because there's a seed source there. They still function like a wetland, and if we just retreated from them a little bit they could return to what they were.

So I think the first port there is just protect what we've got. That's the cheapest option. And [00:05:00] then the second option is if you're interested in wanting to put something back, it's just looking at what you've got available. So what is the land contour you're working with?

We can restore what we've lost using the resources that's still there, and then we can construct something. And constructing something is expensive 'cause you've gotta burn a lot of diesel, plant a lot of plants. But while that is expensive, the benefit is you can put it in a very strategic location to have the optimal benefit. So while it might be expensive, the benefits may stack up.

Sarah Thorne: You've touched on some great examples there, Justin, and I know you've been involved in, many wetland projects. Can you tell us about some of these projects that you've worked on and why you think they're important to the landowners or the groups involved?

Justin Kitto: Yeah so touching on the why it's important for the landowners first. Um in my experience, the farmers have been involved because they know it's the right thing to [00:06:00] do by their community, by their industry. So that, I think that's the first motivator, and they may never in a million years have thought of a wetland as a legitimate mitigation option utilizing something that was on their property. But they are part of a community. It's their community. It's their livelihood. It's their history. It's their future. So they wanna do something right. So that's the first part of the equation.

Most of my experience has been in the Balfour, which is a subcomponent of the Waimea. And there we had a nitrogen challenge we wanted to manage and we didn't really have an idea of what we were going to do. We just knew we had to do something, and we went out there and spoke to a whole bunch of farmers that were in hotspot locations and had known areas on their farm where the rest of the catchment's water was ending up.

Then we looked at the landscape and we thought, "Okay, what can we do here?" And for some of those farmers, it was just [00:07:00] restore and plant up what was there. For other farmers, we were able to work with the contour and build weirs that had fish passage to hold back water, get shallow water, and do a whole bunch of planting.

And then went all the way through to a highly engineered, constructed wetland because we had a really motivated farmer that wanted to do something, but we had no contour to work with, so we had to create the contour to hold the water back to create the conditions for the plants. And unfortunately, that did cost a lot, but it has made a beautiful asset on that farm and that catchment that will over time, as it matures, as it gets established, will mitigate the environmental footprint that's accumulating in the catchment.

I think that's one of the key learnings I've got right there is when you work with the landscape, it's relatively cheap to do something. But if you want to force something in the [00:08:00] landscape and constrain it so it doesn't impact on farming the costs do increase.

So it's about finding the right thing for the right part of the landscape. And if you work with the landscape, things get a lot cheaper.

Sarah Thorne: Now especially with these bigger projects, people start looking into it and they start learning about the rules and stuff, and they can get quite nervous. What are the key things that the farmers actually need to be aware of? And when should they stop and get some advice?

Justin Kitto: I think before you start getting advice is helpful. And the advice doesn't have to be from the regulator. The advice can be from another farmer or another organization that's not the regulator that has done this work before, just to get some ideas, just to see what other people have done, just to know what you're getting yourself in for.

But I think the thing which really trips people up is a perception that you need to get out there and burn diesel and play with your big Tonka trucks [00:09:00] and build something like a mega engineering project, like a mega structure. You don't need to do that because I've been on farms where the farmer has invited me onto the farm and their starting point was a dam or a pond or a big thing where they were gonna burn a lot of diesel.

And driving around the farm we can see perfect locations that are boggy already, that are wet already, that the farmer knows are not that productive, are a bit ugly. When the weather turns to custard, the animals always end up there and make a mess. They don't want them there. They've already got some remnant wetland plants there, and they are the perfect locations to build something or restore something or create something more cheaply because that's where a wetland actually wants to be.

The starting point for me is, yeah, just look at what you've got on your farm. Is there a bit on the farm that you're not particularly happy with, doesn't grow a lot of [00:10:00] grass? Is it a bit boggy, bit weedy? And where I say weeds, it could be weeds like gorse, but it could be the traditional native wetland plants that are considered to be weeds 'cause it impacts on- pasture production. So those native weeds, you know, they're perfect places to start with, and it could be an excellent place to dip your toe and make the farm look more beautiful and benefit the environment at the same time.

Sarah Thorne: That's exactly what we found with the Mid Oreti Marshalling the Best project when we did the site visits and drove around.

Justin Kitto: Yes, exactly. And I think the important thing there is you don't have to have, you know, meters of water built up behind a structure. Just land that even if the water is just sitting slightly below the surface or just above the surface and it squelches under your feet when you walk through it, that's the perfect wetland right there.

Sarah Thorne: Looking five to 10 years ahead, how do you see wetlands fitting into farm systems and catchment thinking in places like [00:11:00] Southland?

Justin Kitto: Yeah. I think it is going to be fundamental to the conversation around how Southland manages its environment moving forward. Um and you can see that with the regional forum recommendation where there was a desire to restore a certain amount of wetlands. That's very aspirational.

But you know, Southland's gonna have some flood management and drought management issues moving into the future. The traditional flood infrastructure might not be able to provide the same level of protection that it used to under climate change projections. So having wetlands out there, having more wetlands than what we do now to soak up that water and act like a sponge during those peak rainfall events will help manage flood risk. It can help manage drought risk. But also to mitigate environmental footprint as that limit setting conversation matures, wetlands are going to be an important tool in the [00:12:00] toolbox. Yes, they can mitigate nitrogen, but they're gonna go in the parts of the landscape which are critical source areas which are difficult to manage. They're prone to losing contaminant. They're hotspots for contaminant. So by retreating from those parts of the farm, which is effectively marginal land, it's not that productive, you're not growing that much grass off it. By retreating from those parts of the farm, just that action in itself will reduce contaminant loss.

But by putting wetlands there, you're creating a biodiversity asset, you're improving biodiversity, you're creating sponges in the landscape to reduce peak flow flood risk. You're transforming the contaminant that's leaving your farm to something that's more benign. So, um, I think wetlands will be a fundamental feature of Southland's farmscape moving forward.

Like I said, it's another mitigation in the toolbox that adds multiple benefits, and that's where that whole [00:13:00] stacked nitrogen thinking's starting to come in.

Sarah Thorne: You got some great points there, Justin. And I think when people think about wetlands, they often think about them at the bottom of the catchment, when the truth is we need them throughout the whole catchment.

Justin Kitto: Absolutely. And we need them pepper-pocketed throughout the whole catchment. I think that's one of the perceptions that scare farmers is I'm concerned that farmers think they need to retire their entire farm back into wetland. No, we don't need to do that. We don't need one 1,000 hectare wetland. We need 1,000 1 hectare wetlands spread throughout all of that marginal land that is on quite a few farms. And the farmers that have done it, you know, they haven't gone bankrupt. Their whole farming business hasn't collapsed by putting a half hectare wetland on their farm in a marginal part of the farm that they knew was if anything, it was costing them money. It certainly wasn't making them money.

Sarah Thorne: So if someone's sitting, listening to this podcast and thinking, "Well, that sounds good, [00:14:00] but you know, well, kind of it feels a bit big," or, "I'm not sure what to do next", what's a really simple first step they could take this year?

Justin Kitto: This year. Go out onto your farm after it's rained and see where the water's pooling, where it's congregating. Where do you have that wet, boggy patch that's poorly drained? Just identify it and then fence it off. Just put a temporary fence around it this year or next year. Can you live without that bit of the farm? Does it break the feed budget? Does it break the bank? Can you live without it?

And then the other thing I've been doing with recently, which I think is awesome, is take a photo of it of that bit of the farm that you're contemplating, put it into AI, into whatever AI tool you use, and ask it to project what it could look like in 10 or 20 years' time. [00:15:00] Because that could provide you with a very inspiring picture of what it could look like. It won't look anything

like it, but it'll give you an idea of what it could look like, and that could be your aha moment of like, this is gonna be a cool asset for my farm. 'Cause I've been doing it recently with some of the potential wetlands we've been working on, and wetlands that we have completed. All what you can see is the green plant guards. You get AI to generate what a picture could look like, and it looks like a forest after, like, 20 or 30 years. It's absolutely amazing, and it is surprisingly realistic about what it could look like. It's absolutely amazing.

So do that, and then before you know it, you'll be buying 200 plants.

And then the other bit of advice is, you know you can't eat an elephant in one big bite, so it's lots of little bites that get you there. So just start with a permanent fence and 100 plants, or a small number of plants. Just figure it out. Experiment. Figure out what plants survive there and what plants you can maintain, [00:16:00] and then you just build from there.

Sarah Thorne: That's so cool, Justin. I've never thought about doing that, and I guess that gives you your why, don't it? You can print it up and stick it in your office or on your fridge. So there's a lot of support out there, I think, once you've taken that step of thinking, "Will this work for me? Does it work for my farm?"

Justin Kitto: Absolutely. Yep there's heaps of support out there, heaps of guidance, heaps of photos that can give you inspiration and don't be afraid to track down a farmer that's already done it. And they've got lots of lessons learned and they'll speed up the process for you by telling you all the things that they got wrong and they figured out along the way.

Sarah Thorne: Oh, that's a great point. So wetlands are often talked about in environmental terms, but they're also a really smart business decision too. Can you talk a bit about how they can stack up as a great business decision for the farm, not just like a compliance or a feel-good project?

Justin Kitto: It's a tough one because I can't think of any dollars and cents analysis where people have considered a wetland versus a [00:17:00] barn, or a wetland versus halving your stocking rate or anything like that.

But what I can think of is we did some farm systems analysis in Southland a while ago to help prepare us to think about the limit setting conversations that were happening in Southland. And one of the things we always find when we're trying to mitigate environmental footprint on dairy farms is it's often taking out fertilizer, taking out feed, taking out cow numbers, things like that.

And by taking stuff out of the farm system it makes it more challenging to farm. So we thought, what if we think about this differently? Why don't we not make farming harder? So optimize fertilizer use, optimize feed use, keep stocking rates similar, but reduce the size of the farm and repurpose that land, that marginal land, like I said before, that marginal land that's boggy, that's wet, that's losing a disproportionate amount of [00:18:00] contaminant, that is critical source areas, that is flood plain, that is too steep. Repurpose that to riparian margins and wetlands and forests and focus on that. And that process there, thinking of it differently, reducing the total hectares farmed, cost of it was very similar compared to the traditional farm systems mitigations that we apply. But you got many more tangible benefits around wetlands, biodiversity, carbon credits, improving in-stream health, things like that. You then have the tangible benefits of building all those sponges on your farm to mitigate flood risk.

Now, what's that going to do in the longer term if we're putting wetlands everywhere and we're mitigating flood risk? What does that have for insurance costs? What does that have rating basis when we don't have to build these massive stop banks everywhere to protect communities and things like that? And, you know, how would the economics change, for [00:19:00] example, if insurance companies start funding wetland restoration to minimize their liabilities? And all the nature-based credits and all of that sort of stuff.

So does a wetland stack up? Don't know. We don't have the analysis. I want to see the analysis done, and we might be able to do it in the next couple of years. But I think there's a different way of looking at this, where when you start bringing in different ways of thinking and different cost benefit analysis, I think it will start stacking up in the future.

And the other thing to add to that is, is to improve water quality in Southland, yes, we do need to reduce the amount of sediment, the amount of phosphorus, the amount of nitrogen leaving our farms and our factories and our cities. But the things that actually matter, the fish and their food that live in the creeks, they need other things other than that. So they need habitat. They need riparian vegetation. Thinking about that riparian planting and those wetlands is also beneficial as well, so that's why retreating from the [00:20:00] farm a little bit particularly those marginal areas which have a disproportionate negative impact will be of benefit.

Sarah Thorne: So you have seen wetland projects at all stages of development. What have been your biggest learnings, and do you have any funny mistakes or unexpected results that you're happy to share with us?

Justin Kitto: Unexpe- oh, yeah. How much time do you have? Yeah. I think the first learning I've got is don't default to burning diesel and playing with your Tonka trucks. That should be the option of last resort. Like I said earlier, I'm just gonna reinforce this 'cause I think it's the key lesson. Look at the wet, boggy parts of the farm already and prioritize those. Fence them off, plant them out.

I think one of the biggest learnings I've got is the earthworks relative to the planting and maintaining water flow. One of the first mistakes we made when we were building the wetlands is we used pipes, 150 mil culvert pipe through the weirs to [00:21:00] control water level, and they were glued in place. So that meant they filled up before we got the plants in. So very simple learning, don't glue the pipes in place to begin with to get those plants established. It might take you two or three years once the earthworks are completed to get those plants established and above the water level before you can finally complete the wetland in terms of getting the right water level behind it.

I think wetland plants they're remarkably hardy, and it's amazing how well some of them have actually done in the water. Don't get me wrong, they don't want to be drowned, but they don't mind sitting in a little bit of water.

What else has surprised me? I think how quickly the natural environment responds. In one of the wetlands we've got, or a couple of them that we've got, in less than a year we've had lizards. We've seen evidence of lizards living in them. The amount of bird [00:22:00] life that's found them. Both introduced bird life, but also native bird life that sort of invaded the area and is interacting with them a lot more.

The seed source that's popped up by itself. Those were the things that did really surprise me, just how quickly these things responded and how quickly things invaded. One of the wetlands a frog turned up. The farmer hasn't heard a frog in about 20 years, and within a year there was a frog there. So that did surprise me.

What other learnings? That the wetland water level does fluctuate, so having some sort of mechanism in place where the water levels can fluctuate through different times of the year is important.

The other key learning is you do lose more sediment off your farm than what you think. So make sure if you do have a wetland that's picking up overland flow that you have a sediment trap or a deeper pond at the top to try and trap and [00:23:00] retain that sediment. The evidence is consistently clear, that

residence time is an important feature. So by having some baffles or something to interrupt the flow and distribute the flow through the wetland is critical.

And when all the scientists have examined wetlands that have low denitrifying abilities versus high denitrifying abilities, it's to do with the amount of plants living in the wetland and the distribution of water through that wetland. Instead of just blowing in one end and out the other end, you do need to mix the water, deflect the water, divert the water, and having that plant life is fundamental to a wetland that's going to remove nitrogen.

Sarah Thorne: That's a lot of good points there, Justin. I'd forgotten, but when you said about the fences, Curvy fences are fine, aren't they? You can follow that wet line and maximize what you've got for your grazing, and also maximize your wetland space too. So don't be scared of curvy fences. [00:24:00]

Justin Kitto: Exactly. Yeah. And again, that's just following the contour and working with the landscape, not against it.

Sarah Thorne: Well, we're almost at the end of our podcast today, but before we wrap up, is there anything else you'd like to share with our listeners on the topic of wetlands?

Justin Kitto: I think the hardest step is deciding that you're going to do something, and what that first step is actually going to be. So I just want to reinforce the fact that go out on your farm after it's been raining, take a mental note of those boggy parts that are always been a bit difficult to manage or where drainage may be failing, and rushes or carex or flaxes are starting to dominate again. They are the perfect cheap parts to work with. And just start easy. Just like I said before, put a temporary fence around it. Can you imagine not having that part of the farm available to grow grass and feed an animal on? And if it's not gonna break the bank, if it's not gonna break the feed budget, go for it.

But if you do put a temporary fence [00:25:00] around with it and it does feel a bit uncomfortable for you, that's fine. You don't have to go through with it. There's no law that says you have to. Just do what feels right for you and your farm and where you are on your farming journey as well.

But yeah don't be scared, and there's lots of opportunities around there, and lots of little 3,000 square meter opportunities, 2,000 square meter opportunities, and parts of a farm, that you're probably not farming that hard anyway.

Sarah Thorne: Oh, thank you so much, Justin for joining us today and sharing your wonderful wetland knowledge and expertise. We are genuinely really lucky that you work for Dairy NZ, and I know our local catchment groups really value your time, effort, and appreciate all that you do. Thank you so much for coming on our podcast today. It's been amazing.

Justin Kitto: Thank you, and thank you for having me. What farmers do as well with Thriving Southland is absolutely awesome, and it's a pleasure to help you where I can.

Sarah Thorne: And that's a wrap for [00:26:00] another episode of Catchment Convos, brought to you by Thriving Southland. A big thanks to our guests for being part of the conversation on today's episode, and to you guys for tuning in. We appreciate your support. Don't forget to like, subscribe, and follow us wherever you get your podcasts from so you can stay up to date with all the latest episodes as they're released.

For more information on this episode, check out the show notes or head to the Thriving Southland website where you can also learn more about the awesome work happening across the catchment groups here in Southland. And if you've got a project or an idea you want to share, don't be shy, reach out. So until next time, keep up the good work out there on the land, and as always, stay connected and keep driving those changes for a thriving Southland.