# Transcript

# A conversation with the Commonwealth Environmental Water Holder (CEWH)

(Webinar)

**March 8, 2022 – lunchtime session**

**Siwan Lovett:** Well, good afternoon everyone. It’s an absolute pleasure to have you joining us on this International Women’s Day, to have a conversation with the Commonwealth Environmental Water Holder and guests, around the topic of droughts and flooding rains. My name is Siwan Lovett and I work at the Australian River Restoration Centre, and it’s my pleasure to be facilitating and guiding the conversation this afternoon. So joining me here today is Hilton Taylor, he’s the Commonwealth Environmental Water Holder. Dr Skye Wassens from Charles Sturt University. Skye works with us on monitoring evaluation and research program on a range of other research projects. And we have Jason Wilson who’s a locally engaged officer with the Commonwealth Environmental Water Office. So all of us will have a little bit of a chat at the beginning and then we’ll throw open to question and answer. We are really keen to hear from you. So at the bottom of your screen, you’ll see a chat bubble and if you click on that then your question or comment will go in the far right hand side of your screen and there we can read what you’re wanting to know about and also see your comments as can everybody else in the webinar. So let’s get started and I’d like to welcome Jason Wilson to do the Acknowledgement of Country for us. So Pat, if you could start sharing the slides please. Thanks very much. Take it away Jason. You just unmute yourself.

**Jason Wilson:** Thank you, Siwan. I’d like to start by saying we acknowledge that the Commonwealth Environmental Water Australia’s traditional owners and pay our respect to the nations of the Murray-Darling basin, and their past, present and emerging. I’ve got a welcome here in my native language up here, the Yuwaalaraay people. And when I refer to Yuwwalaraay, I mean all Aboriginal and Islander people. So yaama ganu, hello everyone. Giir Yuwwalaraay nhalay maran nugwalayy winangaylanha. I acknowledge the Yuwwalaraay people who are the traditional custodians of the land we meet on. Girirr wayammaa winangaylanha nigyani maran, and pay respects to the elders, both past and present. Nindaayluu yilaadha winangaylanha ngiyani, and future extend the respect to all others here today. Yilaalu yalagiyu dhugay Murri Yuwaalaraay dhaymarr nhalay. This always was and will be Yuwaalaraay land: long ago, now and always.

**Hilton Taylor:** Thanks, Jason. Look, first of all, I really like to thank you Jason for providing that Acknowledgement of Country. That’s quite a special thing. The other thing I’d like to do is just thank everyone for giving up their time today and coming in and spending time having a conversation with the Commonwealth Environmental Water Holder and friends. And it’ll be great for people to put their questions in, share their thoughts and it’s really about a conversation. We’ve got a short presentation and then a conversation after that. Just before we move on to the slides about the water part, I would like to mention the background of this slide that we’ve got up here and just a little bit about the Commonwealth Environmental Water Office and Holder. Engagement with First Nations People right across the Murray-Darling basin is really important to us. We take it seriously. Jason is a fantastic asset within the organisation and we have other Aboriginal people working with us who really keep us grounded in thinking about what we’re doing. We acknowledge the traditional owners of the land right across the Murray-Darling basin where we were. And we also acknowledge that that land has never been ceded. So when we go to that land, we’re actually working on land with the Aboriginal people. Now, this background here that we’ve got is a painting that was done by one of our staff, Rebecca is a proud Wiradjuri lady. And the bones of this painting, well, the majority of the painting was done by Rebecca but there’s a whole lot of everybody who works in the Commonwealth Environmental Water Office have got their mark on this painting. We actually filled it in as part of a work planning day and then it’s stayed the office for a long time here where people just came and added their little bits and pieces, so we've each got our mark on this painting. It’s really quite significant that hangs proudly in our office. It’s a beautiful piece of work and it sits alongside another piece that Rebecca had done earlier in the office and it’s just a really good reminder for us that we’re working with and for and together with Aboriginal people right across the Murray-Darling basin. I love looking at this piece of art. That’s probably why I talk too much about it. It’s a really stunning piece. Can we move on to the next slide please, Pat? So we don’t have to cast your mind back too far to how dry it was and casting your mind forward to how wet it is now. One thing I would like to do is send our thoughts and wishes to people who are impacted by the floods that are going on, particularly on the east coast, and right up until this morning, there’s still further flooding occurring along parts of the coast. I have friends and family in northern New South Wales and South East Queensland that have been impacted or know people who have been impacted and it’s been quite overwhelming. But in the basin, the flows across most of the basin, I understand more we’ve got some pretty tough times out of it but across most of the basin, it’s been rejuvenating and it’s been fantastic. And you look at these two photos of the same site on the Narran River up in northern part of the basin, that’s just close to the border around Queensland and New South Wales, and you look at that and you think, “My goodness, it’s hard to imagine it’s the same site,” and there’s so much of the basin that has transformed from absolute desperate drought-stricken conditions to looking incredible. It’s a boom-and-a-half-bust system and it’s really important that we think about it as such, but it’s also really important to think about, “Well, what do we do as the Commonwealth Environmental Water Office and Holder in dry conditions and in wet conditions?” and that’s why we want to have a bit of a conversation about today. So in the height of the drought, our function really was to use little bits of water that we had on our entitlements, really strategically to keep refuges alive in the rivers. There were times when they were just drying up pools. There was hardly anywhere for fish and birds and frogs to hang out and we were able to get water in certain parts of the basin to these really critical refuges, and then as the better season coming along, there was still a population left in those refuges to start to expand, to spawn, to float down the stream, to birds to come and start to breed from. So there was actually some core breeding herd, if you like in an agricultural sense, that we’re able to keep alive and that was a really critical part of our work. Then you’re winding the clock forward to where we are now with a great season and it’s just amazing to see the water and the connectivity. These rivers are connecting from right up in Queensland up around Warwick and Dalby and places on the Darling Downs right through down to western New South Wales along the Barwon River down beyond Bourke to Menindee and right through to the Murray River and out to the mouth of the Coorong, it’s thousands of kilometres of river channels and seeing that connectivity is fantastic, and our waters, even in this wet season, play some important roles. And I think one of the things to think about is if you imagine all the big dams that are on the heads on the major rivers across the Murray-Darling basin, you can start down at Victoria with Eildon on the Goulburn, and then you’ve got Dartmouth and Hume and Burrinjuck and Blowering and Wyangala and you just keep on going up Burrendong and you keep going up into Glenlyon right up in Queensland. All of these dams went from near empty to full. To fill those dams up, it took something like 10,000 gigalitres of water. If you think about that, that’s about 20 Sydney harbours worth of water that’s been held up in these dams. It’s an awful lot of water that hasn’t passed down these rivers naturally, plus there’s been water extracted appropriately for irrigation and economics and community values, all sorts of things. So it’s all a very modified system. So that I think underscores the importance of having this balance and having some of our water available on the backs of these flows to keep natural systems going at the start. So if you can imagine a river system that’s got a big dam on top of it, the water starts to flow in a natural flow or a natural season like this and birds start nesting and it’s looking great. And then the rain stops, naturally without dams, that water would’ve just kept on coming and the birds would’ve got through their breeding cycle and everyone would’ve been happy. But now, if it stops raining and the dams aren’t quite full or they’re just full, the water that’s coming in is captured and the flow can taper off really quickly and that’s where our environmental water become so critical in wet years. We can keep some flows going into the bird breeding sites, into those big rookeries, in natural wetlands, and that’s a really important part of finishing off the breeding cycle. You don’t want those birds to be stranded on dry, now wetlands and they abandon the nest, pigs or foxes or cats or something like getting there, or start inundating if the water dries out around the nest. So having this water continue to flow having environmental water available to do that is a really critical thing. If you think about it, we’ve got birds ranging from Narran Lakes up in the north which Jason will talk about a bit more later through the Macquarie Marshes wetland down into the big wetlands in the bottom end of the Lachlan River crossing the Murrumbidgee where Skye will talk about a bit later down into Barma-Millewa forest and all the way down into the Coorong. And we’re seeing fish spawning along the length of these rivers and are growing up in nursery habitats like Menindee Lakes and being transferred down the Great Darling Anabranch. And we can move on to the next slide. I think it’s really important to think about how important these rivers are in these western systems. If you look at the bottom right hand slide there, that’s the bottom end of the Menindee Lake, Lake Cawndilla where it runs out into a canal that connects from Lake Cawndilla down into the Great Darling Anabranch which makes it way hundreds of kilometres down through that country to join the Murray. Environmental Water, at the beginning of this season, was used to underwrite to make sure there was enough water to make that connection all the way through, and you look at that water in that landscape and you can see what oasis it is, how important it is to that landscape. It’s a pretty dry landscape even in a good season like this. So having that water flowing through there for months and really rejuvenating the wetlands adjacent to the Darling Anabranch once it gets down into the proper anabranch and having that all come back to life in that dry landscape is a critical part of what we’re doing in these better seasons. And you can see the Juvenile Golden perch and Murray cod there, they’re breeding in places like the Menindee Lakes and we’ve got connectivity up and down the rivers, so they’re moving. Some of the perch went thousands of kilometres in their life so it’s really important to keep these systems really ticking when the good seasons are here so they’ve got the resilience to hang in through the drought years. I might leave it at that and just throw to Skye to talk a little bit more. Skye is from the university and doing independent monitoring on our behalf, and just really tease out a bit more about what we’re seeing the impacts of the environmental water and I’ll hand that to you, Skye. I’m sure you can talk about it far better than I can.

**Skye Wassens:** Thanks, Hilton, and hello everyone. It’s really nice to have the opportunity to talk about the Murrumbidgee. And I wanna talk through a sequence of the last four years that we’ve experienced in Murrumbidgee. This image at the top shows the lower Murrumbidgee, so that includes Nari-Nari country in the west, Nari-Nari country through the Gayini and down towards Wiradjuri country in the east of this area. It’s incredibly complex and important inland wetland system. That supports a really high diversity of habitats. And most of the systems at the end of major rivers that Hilton touched on is a highly regulated system because we have a really important and economically really vital irrigation system downstream that is quite reliable and so water in the Murrumbidgee, so we’re managing these systems, now using predominantly environmental water to sustain the biodiversity. Going through the last few years in January 2019, it was dry to moderate year of water availability. When we have those years, we’re very much focused on these frequently inundated aquatic meadows. So these are areas that have historically been inundated really annually. They’re so wet that river red gums can’t establish so they’re quite an open system. And one of the big challenges we face with these types of communities is if they’re allowed to dry up for a couple of years, they’ve become encroached with river red gum and once that happens, they’re very difficult to maintain. There are really fascinating communities and highly diverse in terms of their plans and also the animals they support. As we went into January 2020, that was an incredibly hot, incredibly dry year which we all experienced. In those type of years, the watering has to narrow down on what we call is critical refuges to keep at all cost, habitats, they’re often large permanent lagoons and permanent creeks across the floodplain, really important for our native fish, particularly the Golden perch and our turtles, and also things like southern bell frogs, so they can refuge and hold out there for a short period. Maintaining those refuges is really important because if we lose those refuges and we lose those species, then when we do start to get an increased in water availability, we’ve got nothing there to recolonise. So as we went into January 2021, we had a more moderate to high water availability. So in those types of years, we’re able to hit the critical refuges, the aquatic meadows and was able to inundate larger areas of river red gum floodplain which require inundated service over three to four years. Some of the critical lignum habitats and particularly in those years we were thinking about water bird breeding and creating a habitat for water birds, maintaining lignum in good conditions so it could all support those large breeding colonies that establish in those systems. And now in January 2022, it’s obviously very wet and you can see the large area of inundation that’s occurring through the floodplain, some of that is natural flow as they’ve been releasing water to create air space from the dams, a little bit of tributary in-flows, and that’s inundated much of the river red gum forest along the river, and we’re now using Commonwealth Environmental Water in two key ways, partly to manage water quality and reduce the risk of hypoxic blackwater in the main river channels by managing the recession, and also to support those very large water bird breeding colonies that have established, and Hilton touched on this as well, the importance of maintaining the duration of inundated, maintaining foraging habitat for juvenile birds and for the adults so we can raise healthy chicks. And University of New South Wales team is part of the Flow-MER program and very close and monitors the success of those water bird breeding events and how successful we are in producing fledglings and recruiting. I’ll probably shift on to the next slide. So the next challenge with these managed systems is we have hundreds and thousands of species of plants and animals that have really quite niche water requirements, and so there’s a balancing act of ensuring that these species have everything they need to survive throughout their life cycle. Some species like southern bell frog, their life expectancy is just a few years so it’s really critical if we have a breeding event for something like bell frog that we’re producing juveniles. We’re creating an environment that supports the juvenile through to a suitable breeding age and creates opportunities for them to breed. So there’s not a lot of value in having a breeding event but not following that up with appropriate conditions over winter or the next year or we can start building on those successes. Also as we’re getting to these wetter years, we’re able to get these complimentary outcomes, so when we have Bitterns, which is a cute little fluffy bird in the middle of the picture. We’re also supporting bell frog breeding. We support Bittern breeding ‘cause Bitterns like eating bell frogs. As we get more water in the system, we’re able to support very large water bird colonies, large pelican colonies, support connectivity between the floodplain and river which is important for things like Golden perch. So the activities that we undertake in these very dry years are really fundamental to the types of success we’re getting in these wet years. And it’s really important that year on year we keep building on those successes and very carefully manage the water in those dry years so we can maximise our outcomes in the wet years. From here, I think I’ll pass on to Jason Wilson who’s going to talk about Dharriwaa and the Narran Lakes and we’ll talk about some of the water bird breeding outcomes there. Thank you.

**Jason Wilson:**Thanks, Skye. I’m gonna move through my slides from the pictures on my slides from the left to right, and I wanna start with Narran Lakes. The word ‘Dharriwaa’, it means the Narran Lakes system it means a meeting place. So when the water comes, the birds come, the frogs come, the fishes come and the people come, and there’s been thousands of years of ceremony out there and we facilitated, as Yuwaalaraay people, those nations that border us from Kamilaroi, to the Muruwari, to the Gunggari, as far as the Wiradjuri coming up and the Weilwan people that are in Ngiyampaa background, so the Ngemba people. So that’s what Narran means and the nature reserve was bought around 35 years ago and about 32 years ago, and the joint management committee that sits over there and assists in the operation of Narran with the planning management has been going for ten years, and I’m one of those members. I’m the chair, the current chair, the co-chair with Ted Fields Junior. So we’ve got about eight people from different towns, Lightning Ridge, Walgett, Collarenebri, Brewarrina and Goodooga that sit on there, so they all surround Narran and the communities that families, all subscribed or have come from. So we always look for opportunities to be engaged and I’ll talk about that a little bit later. Narran Lake has been dry to wet. It has been incredibly dry. You see in those photographs earlier and there’s one in the middle there at the top, that’s Back Lake gauge and I’ve been going there for about 40 – oh geez, I was there as a six-year old. I always used to camp there with my elders at that Back Lake gauge and in the water but just out of the water. I’ve seen Narran and every flood is very different. This 2022 event has been quite different, there’s been a surge of water that I’ve never seen before in my life. But coming back to that very dry 2019 period and beyond 2020, we had the opportunity in the Commonwealth Environmental Water Office to have a grant that we call an events-based mechanism, and we wanted to make sure that that lignum that you see in those pictures both in the middle from the top to the bottom in very good condition. We wanted to make sure that events-based mechanism was going to prime the complex, the Narran Lakes for a large bird breeding event. And 2022, tick, tick, tick, the birds came. So I’ll get in to some of those wonderful birds that are out there at the moment. We’ve got two large rookeries going on, one in the centre, in the best spot and that’s predominantly straw-necked ibis, and we call those straw-necked ibis in our language out there, murrgumurrgu, on that one. And the second one, that’s around the 5,000 to 7,000 in that rookery, and then further down in the southern arm, on Narran Lake Nature Reserve, we also have a mix of straw-necked ibis, Glossy ibis and White ibis. We also have, in there, spoonbills, egrets and a lot of cormorant. And there’s a little less ducks this time around and Hilton touched on it. There’s been a massive amount of water right across the Murray-Darling basin breeding events. And I learnt something new the other day from Liz, one of our northern team managers and it’s the first time in 20 years that Narran and Macquarie Marshes and the wider wetlands all have large bird breeding events occurring at the same time. Ducks are probably pretty spoilt. They’re out there doing their thing in other spots. So I just wanna go into some of the two-way plans and how they work with a lot of the plans that we do out there. So having prepared a successful and delivered the successful events-based mechanisms back in 2020, we did prepare one for the 2022 event. This water that had surged into the lake again and the tail end of it was dropping off. So we went through all of the trimmings to try and get that grant going again. The best thing about it, we were quite successful in getting it ready, but we didn’t need to go with it. There’s some beautiful rain that happened just in the corner of the Condamine-Balonne system around Warwick and right after Dalby, and there is some incredible water coming down. I think something like 43,000 a day just above St George. I think I got a message from Greg Ringwood, one of our workers up there in the north and I always try to look at anything above St George, ten percent that will go down that Narran system. So good water coming in and that’s only the start of this water, so it’s going to increase. Hopefully, that sees the events-based mechanism there, but it shows the water management plans that underpin our science and the work that we do works. Lastly, I wanna touch on from our engagement activities, we provide detailed updates to a multitude of different groups of community people like the shires, the broader community, the Aboriginal community that work in the schools being fantastic, and these updates are two-pages and they’re usually filled with some wonderful pictures like these, and our audience really enjoy them to the point where we get quotes from them, but we also use some of the Aboriginal language in some of our updates so that’s been pretty cool to see a picture down the bottom there. There’s Hilton and I at there at Narran pretending that I’m not lost and Hilton is agreeing with me. It’s really good to have people from head office from Canberra come out and visualise our water and our effort on the ground. Some of our staff, particularly Mike Peat, has been out there to Narran in very dry condition. So it’s only in the last year and the bit that was ticked the box for him that is ever since he started he has never since Narran with water, and not only water, we’ve got him some birds to breed too, so it’s hard work that he’s put in with the northern team. It’s been fantastic to get that as a reward. We worked with the Lower Balonne working group. One of the opportunities that we do like to have is with the science work that’s happening on Narran. When we started doing some short-term intervention monitoring, we had a chance to bring some of the Narran Lake joint management committee members out there to be a part of the bird and the vegetation surveys. So that’s another one of those ticks in the box for us in regards to that involvement of our engagement activities. And I think, lastly, being involved in open days. The last five years she’s always been very engaged in being out there, being visual and meeting the general public, shaking hands pressing flesh and talking about our attributes that we put into the Narran Lakes system. So that’s been a wonderful relationship with the Narran joint management committee, and recently, some really good effort with the Dharriwaa elders group where they just secured an Aboriginal rangers program. So I’ve been liaising with them on behalf of the department to do more in the Dharriwaa elders group and get some more involvement out on the ground for everyone. I’d like to thank you for having to talk about Narran. It has been dry. Now, let’s celebrate the flooding rain and what that brings. Thank you.

**Siwan Lovett:** Thanks so much, Jason. That’s wonderful and I love hearing your language. I can do Dharriwaa, but I’m not sure about the ibis, so I’m not even gonna try that one. So we’ll just go to the last slide here and this is just to show you the smiling faces of the local engagement officers that are based throughout the basin. And so feel free to contact these people if they’re close in your area and you want to know more about the work that’s going on in your region. Thanks, Pat. I’ve got some questions which is fantastic. So the first one I want to start with is one from Katrina Willis who’s just asking a question, whether there are any areas in the basin that haven’t shown recovery after the two wet consecutive years. Hilton, would you like to have a go at that one?

**Hilton Taylor:** Yeah. Thanks, Katrina. It’s a really good question and it’s good not only in a year like this, but in every year. The basin is about a million square kilometres. It’s thousands of kilometres diagonally from up near Warwick across to Goolwa in South Australia. And within a season and between seasons, it can vary enormously and you can have absolute drought in one part of the basin and literally flooding rains in another part. So in the last couple of years, the area that’s probably not had the benefit of some of the other areas is the lower Murray floodplains, in particular, there’s been fantastic flows go down along the Murray and there’s been breeding within the Murray channel itself. But if you think about how long these rivers are and how the water, what they call attenuates, it just flattens out, it takes so long, this country is so flat. And I was up in the middle of New South Wales, thousands of kilometres from the mouth of Murray, had a drive through the country, something up there, it was 150 metres above sea level or something, and I was thinking, “It’s 2,000 more kilometres by river to the sea from there and it’s only got 150 metres of fall,” so this water just spreads out so much. So the water doesn’t actually get out onto those floodplains down in the lower parts of the system very often. And this has been one of those years where there’s been fantastic flows down the river but there are parts of that floodplain that are parched, they’re still dry. And some of our South Australian colleagues have mentioned they’ve been a bit concerned, “Where’s all this water going?” It just takes so long to get there. It flattens out so much and Murray is a big river down in that part of landscape. It takes a lot of water to get it up and over those banks and onto the floodplains. So really by and large, the system is in great shape but there are areas that are looking spectacular yet.

**Siwan Lovett:** And following on from that, Hilton, I guess it’s the role of science in underpinning some of the decisions that you make. Skye, how is the work that you’re doing informing the work of the Commonwealth Environmental Water Office? Have you got a few examples of where it’s coming together that we can manage the water even better?

**Skye Wassens:** I guess the way our monitoring programs work is we’re providing evidence around a range of species and a range of responses to support adaptive management and that’s both within seasons and between seasons, so that might include identifying critical refuges which they see dependent on them, understanding the type of flood conditions that would trigger the breeding responses. So we built our knowledge on how we trigger large breeding events with things like southern bell frogs, identifying the critical thresholds of inundation that we need for a water bird breeding and how we can manage those events best, so a really key role in the data we generate is in supporting us to manage the decisions. And each time we deal with a bird breeding event, we get a little better. We become more aware of particular risks around various things, and we get better at managing those and keep incrementally building our success and that’s really important, particularly with things like endangered species where we don’t actually get many changes at getting it right. So having really robust data to get it right each time can really help support the recovery of those endangered species.

**Siwan Lovett:** And that links that whole idea of adaptively managing to what season we’re dealing with, and we’ve got a question here with someone saying, “Look, we’ve got to accept that it’s gonna be drought and it’s gonna be flood.” So Hilton, how can water for the environment actually help us cope with this climate variability, knowing that it will get dry again? How can we mitigate those impacts?

**Hilton Taylor:** So there’s a temporal overlay over this. In the shorter term, I mean in three to five year cycles and things, we can really manage our water accounts to try and boost resilience in populations in better years, so that they’re better able to cope with dryer periods and if they become more frequent or longer, hopefully with increased resilience as they go into those situations, they can persist and hang on longer. And as I mentioned at the beginning of the conversation, we can also get water to critical sites across the basin. Not everywhere. We don’t have the water and we don’t have the infrastructure to always get water everywhere, but if we can get water to critical refuges across the basin, then the populations can hang on there. We can keep topping those up while we have water and that enables them to be able to hang in until the good seasons come again. ‘Cause the broader longer-term around climate change and government policies at a much higher level that needs to be addressed as well, I think, and they go into, “What do we do to mitigate the impacts of climate change? What do we do to reduce the carbon emissions and climate change?” those things are broader policy levels that we, as an entitlement holder or water user, don’t really – we have our scientific input to it and people can see the results of what’s happening in the river that we’re collecting and people like Skye are working with us to collect all this information and that will inform those policy discussions. But a short-to-medium term, we can actually manage water to buy time, build resilience and do those things while the bigger policy questions are being answered. There are serious policy questions because if you’re putting the water into the rivers for environmental outcomes and keeping the rivers alive, that’s gonna come from somewhere, the pie is only a certain size and the socioeconomic issues associated with that but there’s also socioeconomic issues with having rivers collapsed if you continue to expect the same amount of water and into a dryer climate. That doesn’t mean they’re a good place either. So these are really big vexed issues that society will have to deal with.

**Siwan Lovett:** And we’ve got a comment here about the endangered catfish, are there any plans to simulate low flows for that particular species? I might throw this one to you Skye because we do have a number of endangered and threatened species in the basin. How do we make decisions about which ones get the flows and at what time?

**Skye Wassens:** The question of high flows, particularly in spring and summer, is a really important one. So the challenge we face, as water managers, is in rivers like the Murrumbidgee. They’re running irrigation flows at that time of year. There’s also a peak time for the irrigation. So we don’t actually deliver a lot of the environmental water in that October-November period and that’s partly because we’re quite aware of that constant high-flow cold water becomes a challenge for some of our native fish species and it is a little bit of a balancing act when we’re working in these low-regulated rivers. So if there’s invalid transfers or if there’s transfers of water happening in the system, it’s very hard to create a low flow condition at the right time. One thing we’ve done in the Murrumbidgee where there is a lot of consumptive water moved around is focused on some of our off river habitats, places like Yanga National Park which is supporting X amount of Golden perch populations where we can manage flows quite effectively, Yanga creek system, the Edward/Kolety-Wakool system is having quite a bit of success with some of the catfish because they’re able to manage the flows, those low flow conditions a little better. So it is a challenge when we’re working in a working river that’s delivering a whole lot of water for other purposes.

**Siwan Lovett:** And talking about moving around, one of the greatest creatures that moves around is carp. Jason, how is your community and area faring with carp at the moment? What are you noticing? Obviously our population is exploding in responses to the flow. How are you managing that in your community?

**Jason Wilson:** I think all fish population are exploding at the moment, they had a real good chance to reclaim some of the waters, and the banks, and the rivers and the billabongs and the creeks, you name it. At the moment, the crayfish are going off up here at the moment but we’re at a dam just outside of Narran, and you could see the birds absolutely smashing the fish trying to get fed but also the ones that they couldn’t swallow was some of the carp and they were tossing them at the banks so they’re doing their bit too.

**Siwan Lovett:** That’s great to know. I didn’t know you were employing them as well.

**Jason Wilson:** The environmental services of our birds are just going nuts at the moment. I mean that’s a really broad question too. There are carp plans at that federal level and I don’t know, I might just throw it to Hilton on that but from a local perspective, we don’t like catching carp. We do toss them up the bank but we do like catching perch and they’re really having a good chance to bounce back from the flows that are occurring now. But Hilton might have a better perspective on the broader carp program.

**Hilton Taylor:** Thanks, Jason. Carp are a major issue. There’s just no denying or hiding from that but it had a big impact on the river systems but they are part of the food chain, pelicans and other fish, and things do actually really thrive on the carp as well. One of the things we can do with environmental water is manage water into wetlands and different places at different times, and having carp streams and things on that we can get water in there, we can get recovery of aquatic systems without carp, and if there are ephemeral systems, we can dry them down if there’s only tiny little carp going to the aquatic system, gets going again, starts to thrive and if the carps start to build up, we can dry those down and actually trap a lot of carp in there and get that wetland system working again. The other thing we can do is create flows at a time of the year that actually favour native species, and sure you might bring some carp with them, but you’re also giving them native fish the best chance you can for them to get a leg up and remain in the system and remain competitive in the system. Little carp are great cod food, some of those things. The broader work around the carp herpes virus and things like that, that there’s a lot of science to go yet before that will become a widespread panacea silver bullet aim for a carp. There’s issues about some biological control in all areas, there’s issues with the species might get into or not, we’re not fairly sure about that. There’s issues about the amount of biomass that might die as a consequence of those issues about the efficacy, the effectiveness isn’t actually gonna work, “What’s gonna happen with all the dead fish? Could you deoxygenate the water if fish broke down on mass where they died and then kill all the other fish that can’t breathe?” so there’s a lot of science still to go before that’s a reality. I mean, for the foreseeable future, carp are part of the landscape. And just very quickly if I can, Siwan, talking about the catfish before, we’ve been working with fisheries in the FRDC Institute and we’ve actually translocated some catfish out of certain areas and have them really go in quite well in parts of the Ovens system. We’ve also, as Skye mentioned, I think in the Edward-Wakool system, some of our designs flow through there off the Murray main channel are starting to see some catfish recovery in those places and it’s great to see, and that’s working with these flows at the right time of the year and working with the fish ecologist and if you can get some of these population established, larvae can drift into other parts and help repopulate as well but they are a tricky species to manage.

**Siwan Lovett:** They are the ultimate survivor, but I take some solace in thinking that I know our native fish are doing well now and the more we rehabilitate areas, the better the environment for our native fish. And on that actually, we’ve got a question here and I might throw it to you, Skye. A question about more revegetating in the rivers, more river water, is that actually going to create more precipitation ‘cause we’re reducing evaporative loss? Do you know much about climate science?

**Skye Wassens:** I can say, I guess, is the – particularly to recover native communities along the river channels and around the wetlands, that has a whole range of benefits for native species. They’re really critical habitats or refuge for reptiles, in particular, who utilise timber and a lot of our bird species. So I think there’s a whole range of benefits in terms of creating those terrestrial refuges for wildlife in those systems in terms of influencing large scale rainfall that that would be a climatologist question. So sorry to cop out of that one.

**Siwan Lovett:** That’s fine. And as you say, we do know that when we revegetate, those areas become microclimates and can reduce temperature quite dramatically which is why they’re such important refuge. Hilton, a question to you now and this one is in relation to some of the floodplain restoration projects in Victoria. Just a question around those areas that don’t get infrastructure projects. Are there risks associated with that and will ecological equivalents actually or flow targets be achieved in those areas that don’t have that infrastructure?

**Hilton Taylor:** That’s a big question. Where I’d like to start with that is there’s a lot on the floodplain that’s getting no water now as a consequence of river regulation. Our rivers are fundamentally changed. Now we talked before about those huge dams that are up on the top of the river systems. And as a consequence of those dams, the really big floods still get through and inundate big slates of the floodplain naturally. And in really dry years, really, really dry years, the river just keeps running most of the time and not much floodplain gets inundated and that would’ve happen naturally as well in those really dry years. It’s the other majority of years in between where the floodplain really misses out different levels of the floodplain where there would’ve been these small peaks. In the Barma-Millewa forest for example, in the mid Murray upstream from Echuca. Probably almost every year, there will be water up over bank and out onto the floodplain. I think even right through the millennium drought, it was only one year where the modelled natural flows, the water that would’ve flowed without the dams, it was only one year in that whole period where it wouldn’t have got out to the floodplain for the last 25 years. So if you think about that, that’s the part of the system that’s really missing out as middle level flows. So the floodplain is missing those now. What we’re doing with the SDL project, is actually getting water to some parts of the floodplain where the infrastructure and the landscape coincide to be able to get that water. So it’s an improvement on what’s happening. It’s not a case of more areas missing out, it’s a case of more areas getting it than what are currently getting. So it’s a step in the right direction. I think it’s a way to think about it. It’s an improvement. It doesn’t help those areas that were already missing out necessarily, and I think there’s a lot of science to go on, a lot of practice to go on to see how these SDL projects right along the length of the river can be used, can maybe use in concept. Do they have to be used sequentially in different years for different parts of the river to give it a go? In some years, there might be enough environmental water to use most? Other years, we might have to choose winners and really look out for certain refuges. So that’s all part of the science that’s still evolving, I think, and I’m happy to have a follow-up if I’ve missed the point for the question.

**Siwan Lovett:** No, I think you’ve answered it. I’m just curious to know if you can just explain SDL for those that don’t know what that acronym means. It’s actually a really important one. So what does SDL mean?

**Hilton Taylor:** So SDL stands for sustainable diversion limit. So what happened is when there was an agreement about how much water should be recovered for the environment, it was an agreement reached and it’s informed by science but it’s also informed by socioeconomic and political balancing of science. So once upon a time, the rivers and floodplains got 100% of the water. Now, they get a percentage of the water that’s not extracted for other important economic and social uses. And getting that balance is a really tricky thing to do. So there was a number decided 2,750 gigalitres on average per year was what they thought the environment should get back or was agreed. A lot of people agreed with that exact number. That was still the negotiated outcome. But then they worked out that you can get equivalent volumes of water through these sustainable diversion limit projects. So we get an equivalent environmental outcome. So with less water but using infrastructure and directing water on the certain parts of the floodplain, you can get an environmental equivalent, so now you can get water to an area that would’ve otherwise taken a higher flow to get that water there. So these SDL projects, as they refer to, are projects that use infrastructure to get water onto the floodplain that would’ve otherwise require more water to get it there. And that’s then taken off the 2,750 average number, and there’s an agreed suite of projects where people are aiming to get 605 gigalitres of environmental equivalents they’re getting by putting these infrastructures on the floodplain or changing operating rules or things like that, they can get an environmental outcome without having to recover more water as held entitlements to be delivered at a particular time. It’s a complicated thing. It’s a netting off, if you like, with getting the environmental outcome.

**Siwan Lovett:** That was a really useful explanation because I sometimes get confused because we do have the acronyms, but also understanding what that sustainable diversion limit actually meant. Speaking of just talking more generally an engaging community, Jason, I’m wondering if you can reflect on – have you seen any difference or a lift in local support with environmental water and an understanding of what it is we’re trying to do in the basin in your community and also in talking to your colleagues who are local engagement officers?

**Jason Wilson:** Look, there’s been an incredible lift in our community. I think since the LEOs have been out there, physically working on the ground and linking up with the likes of the floodplains association or irrigated groups, generally the board, the community and school, our schools are fantastic. The kids just supped up this information like a biscuit. It’s fantastic. I’ve seen the increase of people’s perception of what the river has done up here in the north, particularly through that massively dry period where we had a chance to take water from a couple of dam up here and we had flows that went down the Barwon-Darling, that topped up fish population and maintain them, and some of them, those flows went right down as far as Menindee Lake in very dry condition and the community, no doubt, has appreciated that. And off the back of that, I think it really shown the light on how we’ve been working as an environmental water office in our catchments or in different parts of the Murray-Darling basin. We’ve had a couple of events like that and the communities have really warmed to what we’re doing.

**Siwan Lovett:** And do you think in talking to your colleagues that people are understanding more about water for the environment and what it’s trying to do? Because I know that in long times past people thought environmental water was a special type of bottled water. Do you think we moved on from that now? We’ve been better at explaining what it is we’re trying to do?

**Jason Wilson:** Yeah, definitely. I think with our updates. I’m a bit biased up in the north here, we really love –

<Over talk>

**Siwan Lovett:** You're allowed to be.

**Jason Wilson:** Also, I remember the people saying, “Why don’t you dye the water to say you can tell which one is the environmental water, which one is irrigation?” I said, “No, it doesn’t work like that.” It’s been wonderful to be able to have that narrative with the community whether it’s in different groups but they have that opportunity to explain how that process works. And we’re all working together particularly on river operations, not so much piggyback off each other but use the opportunity of weather systems and getting – also in amongst our LEO group. We have a LEO week every quarter, we go down to Canberra, and some of the comments, we have a bit of an in-camera session, I think it happened about five o’clock every afternoon till about nine to ten o’clock that evening, but we talked about how we can do our job better and how we deliver a lot of stuff but we also articulate that in amongst our delivery teams. And our senior exec, squarely over, Hilton facilitates the meeting with us every month and he understands how things are moving on the ground so that’s really good to get that level of localism into the beast that is the commonwealth government. And I think to have that flow up and down, community appreciates that because we take direct information from the horse’s head or the mouth and we put it out there on the ground to people, then they feel like there’s transparency. I think that’s what our water is starting to deliver, not only in the river but more so in the conversations of the portfolio.

**Siwan Lovett:** Thanks very much, Jason. And Hilton, we’ve got a follow on question from Jackie about possible perverse outcomes from some of the work. Would you like to reflect on that?

**Hilton Taylor:** Thanks, Siwan. I think it’s a really important question. It’s something we really need to be wise to and deal with. There are few things that I’d like to just point out there. One is we’ve had long term intervention monitoring now for about ten years where we’ve been measuring the impacts of the application of environmental water. And also The Living Murray Program has had monitoring going on for long periods of time through their program as well and some of the SDL projects, if you think about things that were done under The Living Murray Program, down on the Chowilla Floodplain down in South Australia not far over the border from New South Wales and Victoria, there’s infrastructure that’s been put on the floodplain there that uses the difference in water level by one of the locks on the Murray there. Diverts water out of the lock or the whirlpool above the lock and out onto the floodplain and then re-joins the river down below and by using that elevation of the water that’s been held up there, we can get water onto parts of the floodplain that we otherwise couldn’t get water to without a really big flow, and that’s one of the examples of those environmental equivalents or environmental outcomes that you get with less water by using infrastructure. That’s been operated for a number of years now and those parts of the floodplain where we can get water there using that sort of infrastructure, are in much better shape than other parts of the floodplain that are dry. So I think there’s that, there’s the monitoring and there’s this ongoing monitoring and we don’t get it right every time everywhere we go and we have to be really upfront about that. And we’re at critical times of breeding fish and we’ve had flows right, we’ve had everything right, just the fish didn’t get the email or something, but then we’ve done the science and we’ve followed up on it and we’ve worked out the temperature and other things come into play not just the flows, and this is evolving science and it is genuinely interactive science and that science influences the next year’s planning of water delivery. And I think that look, that close loop, the work that people like Skye and all the other scientist, literally teams of hundreds scientist working across the basin, supporting the work we do and they give us some very blunt feedback at times and we need to incorporate that into our plans, and I think that’s a really important thing. And the other thing about where we can get water to on the floodplain, we have opportunities to work with irrigation corporations. The original engineers that set some of that stuff up were bloody maestros, they really were. They built gravity fed irrigation networks right across some of the floodplains in the Murrumbidgee and in the Edward-Wakool system, and they run on the highest ground across the floodplain. We’re working with those irrigation corps, upgrading their infrastructure, investing locally and creating local jobs and getting more out of those irrigation infrastructure into, ephemeral creeks, into black box, and red gum communities across high parts of the floodplain by using that infrastructure. It’s a great outcome for the environment. It was putting water on money and stuff back into those local communities as well. So it’s an evolving science and these relationships will be really critical as we move forward.

**Siwan Lovett:** Thanks, Hilton and as we come to an end, I want to link back to the community because the communities in the basin are so essential to our work and we want to engage and feel part of and celebrate the successes of water for the environment, and one of the innovative approaches that’s been taken recently is to actually share a soundscape of Nap Nap Swamp which is an area that Skye can talk more about, but I’ve listened to it myself and it starts off very quietly and then you get a very big chorus of a whole range of animals. So Skye, can you say a bit more there about how you’re engaging community in ecology through sound?

**Skye Wassens:** So this is a collaboration we did with Michael Whitelaw from Australian National University, and what we’ve done is we’ve taken up audio recording data which we’ve been collecting over a number of years and with visualise setting into spectrogram, so you can actually see and hear the sounds of that transition from a dry wetland where you’re getting lots of woodland birds. It’s very quiet at night –

<Over talk>

**Siwan Lovett:** Hello? Skye’s internet connection is not helping us there. Skye I’ll have to leave you there and I can let people know though that the Nap Nap Swamp –

**Skye Wassens:** Then transitioning across to –

**Siwan Lovett:** Thanks Skye. So we’ve put the link there in the chat so that you can –

<Over talk>

**Siwan Lovett:** So you can actually go and look at that. And the other thing is I did actually talk to Skye in a podcast and we can put that link there too so you can actually hear Skye without the internet breaking up for her. It’s amazing it lasted that well so it’s fantastic. So as we come to a close, I’d like to say a big thank you to our guests, Hilton, Skye, and Jason, for a really interesting conversation. And we would love to hear from you and we have actually put a link to a survey into the chat. It will only take you a couple of minutes but it means a great deal to us if you could just fill that out. We’d love to know if you’d like more conversations, what you’d like those conversations to be about, and any other ways that we can connect with you and share more interesting work and stories and experiences relating to water for environment. So thank you very, very much and I hope you have a lovely afternoon. Bye for now.

-END OF TRANSCRIPT-