

## River Detectives Story of Change

Bridgewater Primary School, North Central CMA region, 2022



River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it.

Since 2016, the program has been available to school and youth groups in five regions across Victoria.

In the North Central CMA region Chris Guinane is a teacher at Bridgewater Primary School, a small school of seven students half an hour west of Bendigo, set within a farming community on the Loddon River where the River Detectives program has been implemented over many years. Recently it has become the focal part of an innovative outdoor classroom program.

When Chris arrived at the school two years ago student numbers were dwindling. Chris and the principal at the time, Julie Ladd, realised there were local children living in close proximity to the school travelling straight past to attend other schools in nearby towns. School staff were keen to understand why.

Chris explains that they canvassed the entire Bridgewater community in 2021 to gauge perceptions and came up with a plan;

*“A common theme was the need for the school to be visible in the community. We needed a way to re-engage with the community and offer a point of difference to schools attracting our local children. Given our location and proximity to the river we thought we could experiment with an outdoor learning model and make that the new ‘DNA’ of our school. Our goal was to create passionate students learning about their own backyard - to create a culture of sustainability and produce students who are environmentally literate so they might become custodians in their future personal or work lives and make valuable contributions to society.”*

With Chris’s outdoor education background, Julie’s drive and the unwavering support of parents who could sense the excitement their kids felt at the prospect of learning outdoors, the outdoor classroom program was born. The school’s involvement in River Detectives provided the foundation and it was up to the staff, students, families and community to shape the program.

Chris outlines how the program has evolved;

*“We started implementing the outdoor classroom late 2021. Every second Wednesday we take all the students, along with a trolley loaded with everything we need, down to the Loddon River. For the first session we do our river science. We visit various positions along the river each fortnight gathering a broad spectrum of data, collecting a waterbug sample and doing a habitat survey. Students analyse the results and discuss what they mean. The students are at a point now where they have done it so often and feel so confident they could run the session themselves. They’re still as excited about it now as the first time they did it which is a delight to see.*







*For the rest of the day we integrate our regular curriculum – literacy and numeracy – into the outdoors. The River Detective program support us with great resources and the Outdoors Victoria’s outdoor learning toolkits provide hands on ideas and resources linked to the Victorian Curriculum. They are adaptable to cater for our ranges of ages, abilities and learning needs.*

*In literacy, students use their writer’s notebooks to complete visual literacy tasks where they record and describe the things they can see, hear, smell, feel around them. In numeracy students work with waterbug data.”*

On alternate Wednesdays learning is completed outdoors on school grounds utilising the great facilities, gardens, chooks and avoiding technology as much as possible.

*“The students lead work in the vegie garden seasonally; planning what will be planted next, calling suppliers, purchasing, planting and weeding. We use this produce in our kitchen to cook on Wednesday afternoons, having lunch together using produce we’ve grown. The kids cook and clean. We also have a waste management system with scraps being shared between the chooks, compost and worm farm.*



*Students identify the native plants on our grounds, care for them and observe what fauna is using them. These experiences form the basis for inquiry projects on flora and fauna around the school. We’ve just started sinking our teeth into learning about pollinators and plan to make a bee hotel. This has been a real eye opener for us all and is changing perspectives about the insects we encounter and creating more respect.”*





Bridgewater relies on the Loddon River for tourism, sport, recreation and farming. Sharing their outdoor learning with the wider community in an important goal of the program;

*“We have a public [Bridgewater Primary School facebook page](#) with nearly 200 followers and regularly post photos and summaries of what we are doing. We also share to the broader Bridgewater on Loddon community facebook page. In future we’d like to share our data with the community to upskill others about what our river is telling us and what the possible threats and opportunities are.*”

*We hope that by sharing our journey it will attract the attention of others, even experts in entomology for example that may wish to collaborate with our school. We figure that the further we can cast our net, the more chance we’ll have of garnering support from people who wish to contribute and deliver incursions / masterclasses or upskill staff so that we can run a program that will produce the best outcome for our students.”*

The outdoor classroom program has been a tremendous success so far with very positive outcomes for all involved. It was a significant drawcard for new principal, Linda Kingsley;

*“The program really brings down those ideas of climate change and global warming to something really tangible for students. Their changing environment is literally on their doorstep and they feel less powerless with these issues. Students can feel overwhelmed by the daily news but our students are thinking more of the good news story and how they can contribute.”*

For Chris, Wednesdays are his favourite day of the week;

*“I spring out of bed on Wednesdays. Rain, hail or shine I know that everything we do on those Wednesdays will be highly engaging, super positive and will make an impact on our students and community. On these days we know the students are ready to learn with no anxiety and it’s a treat to be a part of.”*

Chris and Linda are confident the program enhances learning outcomes for students. Senior students are demonstrating increased vocabulary and fluency in their information writing. Staff are witnessing their students being healthy, happy, active and connected to their local environment;

*“The health of our river and the ecosystem is crucial to the wellbeing and daily lives of the people we care about here. The kids initially saw the program as a bit of fun but increasingly they’re gaining a very clear picture of how things in their local environment are connected. They are understanding the importance of learning and passing that learning on to others. Students really care about what they’re doing, taking pride in the program and the service we’re providing to the community and environment.”*





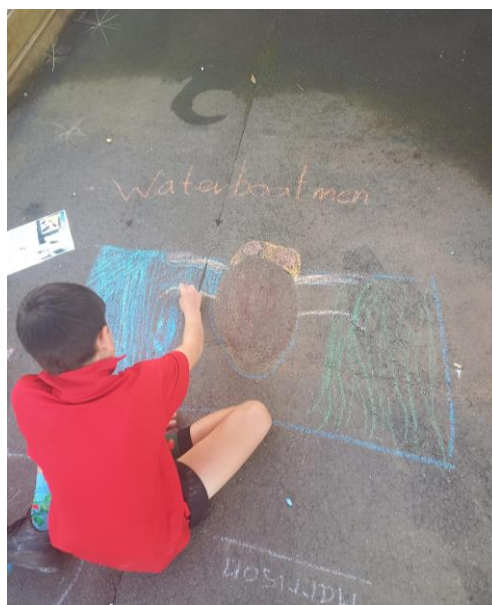
Students play a large role in suggesting ideas for the program and this is reflected in their enthusiasm, effort and learning;

*"I enjoy going down to the river doing learning. We do lots of waterbug testing to see if the water is ok."* (Marley)

*"We're lucky. Not many other schools get to do this. We are outside instead of being inside and we are learning about the environment. You can learn anything outside – even Maths!"* (Isaac)

*"When tourists come along the river path they are interested in what we're doing. We do a little session with them and show them the waterbugs we have collected."* (Rylea)

*"Every school should have an outdoor classroom because it is fun and we learn a lot."* (Emily and Amaya)



Parents are learning a lot as conversations happen around the dinner table and the school is getting wonderful feedback from the wider community we interact with whilst at the river as Chris proudly explains;

*"There was one occasion when a group of tourists stopped as they were walking past and I stepped back to encourage the kids to lead the conversation. The students were really insightful talking about the outdoor classroom. As it turned out the group were all ex-teachers and principals and were blown away by what they saw and heard. They loved seeing the engagement, the passion and how well the kids could articulate the purpose of what they were doing."*

Chris and Linda agree they are excited by the way the program could evolve in future. They are determined to find innovative directions to take the program and undertake deeper investigations. In future they'd like to provide PD to other schools looking to begin their own outdoor learning programs. Schools can struggle to know where to begin but Chris's advice is to jump in and do it.

*"We were lucky to have two principals who have given us the autonomy to have a crack. For other schools who are feeling averse to the risk or thinking of reasons why they shouldn't do it, just give it a go. The rewards will soon be clear in the way students engage so wholeheartedly with a program like this."*

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## River Detectives Story of Change

Deans Marsh Primary School, Corangamite CMA region, 2022



River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it.

Since 2016, the program has been available to schools and youth groups in five regions across Victoria.

In the Corangamite CMA region Russell Taylor-Shaw is the teaching principal at Deans Marsh Primary School, a small rural school of 40 students with three class groups in 2022: Prep/1/2, Grade 3/4 and Grade 5/6. For the last three years, Grade 3/4 have participated in the River Detectives program.

Deans Marsh is a wonderful place with unique nature and wildlife, and the school draws on its environment to support student learning. It has been an active River Detectives school since 2020.



*"We do a lot of environment stuff on site at school, but the proximity of the Deans Marsh Creek is just a good opportunity for us [to get the kids out into the community]. We pride ourselves on being a community school – and so, we love the walk down there as well because people see us with our buckets and our nets and it's good. We walk along the main street of the town and we only have to cross two roads and we're there. It's not a long walk but there's not a lot of town around us!"*

Deans Marsh Primary School adopts responsibility for testing the water quality of Deans Creek, a tributary of the Barwon River, a significant river in the Corangamite CMA region – and they've learned a lot about where the water comes from and where it goes:

*"So the water starts up in the Otways, and Deans Marsh Creek is really where it starts and then eventually it ends up in the Barwon River. So the kids find that interesting as well. All that water is flying down those hills – they all know that area well and then it's coming to us in this creek.*

*"We've looked at the River Detectives videos on rivers and things and that's been good for the kids to access a bit more information because they do [get a better understanding of the whole concept of catchment, not just a creek on its own].*

*"We're an inquiry learning school, so we encourage students to have wonderings about topics; and they do have wonderings about nature and about the*





environment and about their local area, and so this is a good program – and it’s a year-round program. We do our other inquiry topics just for a term, but this one runs throughout the whole year.

*“We try and get down there once a month to do testing and see it in all its different stages. We’re heading down next week, and there’s a little dam on the way there and the landowners told us it’s full of tadpoles [following recent, sustained rainfalls], so we’ll be doing a bit of a detour.”*

The school enjoys visits by River Detectives coordinators from the Corangamite CMA. This year Deirdre Murphy held a macroinvertebrate incursion where students learnt about aquatic waterbugs and collected further data.



*“[When Deirdre] showed us the water bugs and brought a sample in and there was a little pygmy perch fish and the kids, were like: ‘OK, we’re gonna go down there again, ‘cause we haven’t found a pygmy perch!’ So, yeah, they’re pretty determined.”*



The school fosters extensive community partnerships and demonstrates a substantial commitment to environmental education, including an annual trip to the Bambra wetlands to investigate a larger local ecosystem and conduct revegetation at Bambra.



They've developed the school wetlands into a small wildlife reserve involving a partnership with Landcare and local families.



Parents and community members have shared their knowledge of native flora and fauna, working with the school to create a nature walk linking the school wetland with the playground.





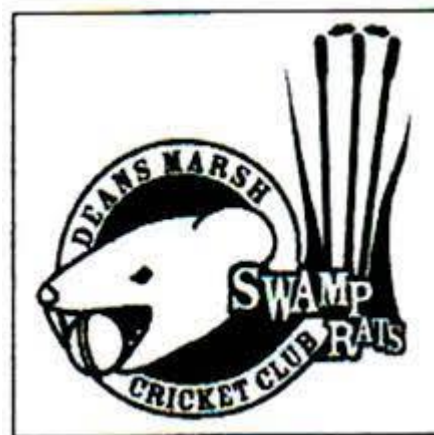
The school is also involved in recycling programs, is a Resource Smart School and is part of the Schools Water Efficiency Program.

Through a water meter installed on their main tank, students and staff monitor water consumption to assist the school to become as water efficient as possible.

And let's not forget about the local cricket club connection:

*"Our Grade 5/6s last year were studying the rakali, which is a local species, like a swamp rat. And that's what the local cricket team is named after, the Rakali: the Deans Marsh Swamp Rats.*

*"So they're the swamp residents; and we've got a big artwork here of a rakali, so that's always in the back of the mind as well: will we see a rakali? The way the Grade 5/6s described it to these guys [Grade 3/4], they think it's about a metre long. So it's like some kind of mythical beast. So yeah, I think they're probably looking for something that's maybe a bit bigger than what it is!"*



Russell explains the impact the River Detectives program has had on the school and students:

*"River Detectives is one of those things that students will list as a personal highlight in the yearbook, where students talk about their gratitude and their highlights from the year and put all their photos on their page.*

*"But it's more than that; there's the invisible aspects too: the pride in their town and in their environment and in themselves.*

*"They're in little teams named after water bugs. So we've got our water boatman team for instance, and each time the team will have a different testing regime. They might be testing the pH one week or the electrical conductivity and that water boatman team gets quite close and they've designed themselves some little logos and things and they've got a folder of their notes. So we've really embraced it as a school program and added our own flair to it.*

*"So there are a lot of invisible things, like that team building and that pride, and that sense of achievement in doing something good for the community. When we all sit down and enter the data at the end, they can all hear it and can all see the fish change colour (on the screen) based on the quality of the water. So there's quite a bit of learning in there as well – the testing, the main four tests – but we also try and get some samples to look at and do the habitat check as well."*

For Russell, the River Detectives program has provided a flexible, engaging, outdoor learning experience:

*"River Detectives is a really good out-of-classroom experience for the kids. If COVID taught us anything, it's that we're not always going to be in our classrooms. Things don't always go to plan. So it's good that we can show that some great learning can happen outside of the classrooms as well. Pulling on the gumboots and heading down to the Deans Marsh Creek with the kids and the school therapy dog and all our buckets and things is a great adventure – last time we got caught in the heaviest rain I've ever experienced. And you know, it's all just part of the adventure. And the kids – the kids really love it."*

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## River Detectives Story of Change

Stawell Primary School '502', Wimmera CMA region, 2022



River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it.

Since 2016, the program has been available to school and youth groups in five regions across Victoria.

In the Wimmera CMA region Toni Stewart is a teacher at Stawell Primary School '502', a forward-looking historically significant school, with an Eco Ninja program, into which slots River Detectives.

Teacher Toni Stewart reports on their involvement;

*"Stawell Primary School has been a part of River Detectives for approximately 5 years. With an 'Eco Ninja' program at the school, River Detectives fits really well with the 'Water Ninjas' part of that. At present we have our Eco Ninjas program run weekly, so try do River Detectives fortnightly/monthly. But, there have been lots of interruptions to the school year which then causes interruptions to the River Detective Program.*

*We became involved as it was an authentic way to learn about sustainability and be 'Citizen Scientists'. We use River Detectives as part of sustainability, but it is also part of science when we are looking at ecosystems and habitats. We also hoped it would encourage students to respect and care for our waterways and appreciate how important it is to care for them and our environment."*

Stawell Primary School is located in the centre of the town of Stawell. With an enrolment of 280 students, it draws on both the town and surrounding rural districts and is a 20 minute drive from the Gariwerd / Grampians National Park. Within the town there is a lake, on the edge is a creek wetland and in the National Park there are further creeks and lakes.

River Detectives has evolved and followed teacher, Toni Stewart, with her year levels from grade 5/6 to grade 4. She also began under Landcare Officer / RD facilitator Bronwyn Bant, who encouraged and supported them.



In March 2020, with additional Landcare funding to cover bus travel, Toni and her class were able to travel to the Stoney Creek waterway (WI\_Sto005\_RD) in Budja Budja / Halls Gap. Bron came and demonstrated the monitoring and helped with the class. The water results, indicating excellent rainwater for the tests conducted, were put on the River Detectives website. On the walk to and from Venus Baths, the class also did a Citizen Scientist lookout for birds and animals.





Without continued funding, Toni had to look closer in Stawell for suitable walkable-distance water places from the school. Now with her Grade 4 class of 26 students, they walk to the lake at Cato Park (site WI\_LCT450\_RD) for monitoring.



When possible, Toni brings additional samples to school from Federation Park/Stinky Creek wetland (site WI\_SFD500\_RD) on the edge of town for the students to test. (These town sites have also turned out to be of rainwater salinity levels, but murkier and with higher levels of nutrients.)

After Bronwyn left, Jeanie Clark became Toni's Wimmera CMA's River Detectives support. Despite times of covid lockdown, Toni was able to keep some monitoring going of these local sites. Jeanie also secured additional equipment from the Wimmera CMA's former Waterwatch program to enable Toni to have more students actively involved in each monitoring. By supplementing the River Detective kit's one turbidity tube with three Waterwatch tubes, Toni's Grade 4 students have been able to test turbidity in four groups and compare their readings - a reliability check before being reported to the River Detectives database.

Toni reflects on these experiences;

*"Our River Detectives outings were quite full on and very busy. Now that we have more equipment it is easier as more students can take part. Having a River Detectives facilitator with us would make this even easier. Students take turns doing the various testing and recording results. They love doing waterbugs especially on site (photo right at Federation Park). When entering the data on the River Detectives website, we click on the 'fish' which tells us how healthy our results are so the students know what their readings mean."*

Toni explains the impact of the River Detectives program on students;

*"I think the biggest change for our school is students getting the opportunity to do something for the community and for the environment that has a real purpose. They enjoy using 'real' scientific equipment when doing the tests on pH, salinity, temperature, turbidity and soluble phosphate. Thus, students are becoming more aware of looking after their environment. They bring samples of water to school from their own dams for testing."*







*“We are presently trying to create a frog bog at school. This came about because of our involvement in River Detectives. Our school tried to do a frog bog a couple of years ago, but covid got in the way. We decided to extend it this year after talking about bugs and ecosystems when discussing River Detectives’ readings. To do this, students have to have a real understanding of what type of habitat we need to provide and have come up with lots of ideas of what they can contribute.”*

For Toni, the River Detectives programs brings rewards and presents challenges;

*“I really enjoy the excursion when we can actually visit the sites rather than when I just bringing samples to school. It’s great to get students outdoors and surveying the surrounds and doing the testing so we can fill in the data.”*

*COVID has definitely impacted our participation. COVID was very difficult and pretty much stopped us. It was nearly two years of not being able to get River Detectives testing done. It still affects us as our daily structure can fly out the window when staff are away ill and we need to change our plans. With a crowded curriculum and last minute changes due to teaching shortages, I haven’t had the opportunities to test as I often as I would like which means I often feel a bit ‘rusty’ when using the equipment.*

Toni also comments on the financial cost of involvement in going to further afield sites;

*“We are limited to sites we can walk to, parent support when they can transport us or the occasional funding opportunity to cover a bus trip, so if funding was found for schools to travel, that would be even better.”*

Toni is thinking to the future and what River Detectives might look like at Stawell Primary School;

*“In our Grade 3/4 model at Stawell PS, River Detectives fits in well with our Water Eco Ninjas. So I see it going from strength to strength. We are planning to inform our community about our results, with Facebook posts and end of term assembly presentations.*

*It would be great to try and find some funding to assist with transporting students to locations. Since the earliest funding from Landcare for travel and the current funding from the Wimmera CMA for equipment, I haven’t used or found other funding to work in with River Detectives but would be open any opportunities.*

*I am currently organising some transport to get us to our further site at Federation Park so that we can spend a morning there. We plan to have Jeanie on-site for her to model and assist with the class testing as part of the waterbug professional development training.”*



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## River Detectives Story of Change

Mitta Mitta Primary School, North East CMA region, 2022



River Detectives is a cross-curricular, citizen-science program connecting teachers and young people with their local waterway. Through water quality testing, macroinvertebrate sampling, and habitat surveys students learn about the importance of catchment health and their role in caring for it.

Since 2016, the program has been available to schools and youth groups in five regions across Victoria.

In the North East CMA region Michael McBrien is the teaching principal at Mitta Mitta Primary School, a small rural school of one Prep-Grade 6 class situated 81km south east of Wodonga, set amongst the hills downstream of Dartmouth Dam. The school dates back to the 1860's, serving the farming communities of Dartmouth and Mitta Mitta near Mt Bogong.

The school has been an active participant in the River Detectives program since 2017;

*"We are always on the lookout for citizen science activities to engage students in real study that extends beyond the school. Our school 'horse paddock' backs onto the Mitta Mitta River so it seemed like a good fit. Through our local Landcare Group we had been involved in several land based projects so River Detectives enabled the inclusion of the aquatic environment."*

Mitta Mitta Primary School has a long association with their local Landcare Group, planting native shrubs to attract birds, revegetating river banks and breeding dung beetles as part of an ongoing trial. Along with cluster school partners they participate in a sustainability unit each year maintaining vegie gardens and learning about composting.

The River Detectives program has become a regular fixture in the term schedule and the environmental monitoring they conduct is a normal part of the students' learning;

*"Two times per term we head down to our local waterways to take water samples, do water quality tests and sample macroinvertebrates. We do it as a whole school activity with older students helping the new students with sampling and identification. The peer teaching allows them to take pride in their developing expertise."*

*We test at two sites, one on the Mitta Mitta River after it exits Dartmouth Dam and the other on Snowy Creek, a natural flow river. It's interesting to see the differences in diversity and seasonal change between the two sites."*



Testing water quality at the Mitta Mitta River site behind the school



*On cluster days, when we join small schools in our area, our students talk to their peers from neighbouring schools about our River Detectives monitoring and at least two other schools are now joining in the program.”*

The program has given teachers and students a far greater awareness of the aquatic environment and the creatures that call it home. They understand the relationship between land use, water use and the connections between the two different ecosystems.



The school’s second site on the Snowy Creek at a public reserve in town

The program has instigated opportunities for further inquiry;

*“We have been involved in the Great Australian Platypus Search eDNA project, using water samples to identify waterways with platypus populations. We continue to look for opportunities to be involved in citizen science projects such as the Backyard Bird Count and the Great Plastic Hunt.”*



Michael explains the impact the River Detectives program has had on the school and students;

*“It has certainly increased awareness and appreciation of the local waterways and our role in caring for them. Students are proud of their knowledge of aquatic invertebrates and enjoy identifying them and discussing them with family and other schools that visit.*

*The program aligns with our Landcare involvement and helps us value the local environment.”*

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