

River Detectives Story Of Change

Minyip Kindergarten and Rupanyup Kindergarten, 2024

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

The program is available to schools and youth groups in five regions across Victoria. Some aspects of the program are suitable for preschool-aged children, with sessions provided to early childhood services when capacity allows.

Christiana Henke is the Early Childhood teacher at two services in the Wimmera CMA region; Rupanyup Kindergarten and Minyip Kindergarten. Both are small services in a grain and livestock farming area. Rupanyup Kindergarten has six children enrolled, aged three, four, and five. Minyip Kindergarten has nine children. Both services are a fundamental part of the small communities of which they belong. They are blessed with nearby reserves and bushland, dams and wetlands. Both programs currently operate from the Minyip building due to the redevelopment of Rupanyup Kinder's playground.

Wimmera CMA River Detectives coordinator Jeanie Clark contacted Christiana in 2024 with an offer of including water experiences in their program. Christiana enjoyed prior experience with the WaterWatch program and knew of the similarities to River Detectives, with possibilities to study living things and access local wetlands for water creatures.



Jeanie suggested waterbug incursions for Term Four, also serving as professional development for Christiana. This topic fitted in with their current learning about nature, in particular insects. The children were very interested in bugs; their number of legs, special features, their habitats and eating habits (with all the gory details of course). They were also learning about the characteristics of different shapes.

Christiana explains, *"The timing for Term Four was very convenient as the children of both services had an intense interest in bugs/insects and this had been a focus of the program at both services for some time. As the wetlands are*

some distance away from the service, it wasn't feasible for us to visit them in person. The River Detectives program provided us with a very accessible and convenient solution."

Jeanie collected water samples from three different in-stream habitats of the Minyip Wetlands and shared them during incursions with the six Rupanyup Kindergarten children on October 18 and with the eight Minyip Kindergarten children on October 22.

Jeanie introduced sessions by showing the children a photo of where she collected the water to familiarise children with the site. She talked about the shapes of the creatures likely to be found to tie this into their recent learning.





Rupanyup Kinder children fishing for waterbugs.

Three trays were set up with water and bug samples from the three different in-stream habitats. The children observed the myriad of life swimming around in the trays then 'fished' for waterbugs using scoops.

Jeanie put the bugs into small petri dishes with lids. Magnifiers were placed on top of the dishes so the children could get a close look at the bugs' bodies. They were challenged to match bugs with the identification photos provided and work out what their names were.

The children were extremely excited and maintained their engagement for an extended period of time.

Each tray varied in water clarity, plant material, and health. Children discovered the channel and deeper water catchment were very active with bugs, but the dam was less active. They learnt that the dam provided less food and camouflage for the bugs to hide from predators.

Christiana received lots of fantastic feedback from children and families.

"Children from both services asked when the water bugs and Jeanie would be back again."

One Rupanyup Kindergarten family regaled how their child recounted all the aspects of waterbugs all weekend and wanted to call grandparents each time they recalled a new detail!

It had a very positive impact on the children, spreading awareness to them and their families of the local environment and the people within their community who are sources of knowledge."

Christiana acknowledges activities such as these develop an awareness of the world and each child's place in it – appreciating all creatures large and small. Children become more aware of their impact on other living things and develop empathy. They begin to realise that although a creature may be very small or hard to see, it is still a creation and requires care and respect.

Christiana enjoyed witnessing the development of interest in the children.

"Children remarked they wanted to see the water bugs in their natural environment. They were also concerned for the bugs' welfare, ensuring they had enough water in viewing dishes to breathe. I assured them Jeanie would return them to their natural environment once the session had concluded. The children closely watched how carefully the bugs were transported."



Rupanyup Kinder children study the features of each bug to identify them.



Minyip Kinder children compare bug shapes.

Educators produced photo pages about the incursions and shared them with the community through the local Community News Sheet and via Yarriambiack Shire Council's website.

Moving forward, Christiana would like to see the services work with the River Detectives program again, ideally over several sessions with an excursion to the Minyip Wetlands with children.

“This was a fantastic starting point to gauge interest and showed the extent of engagement the children achieved.

We are looking into installing a water sensory area to appreciate the habitat and ecosystem that water provides.

We would also like to build upon our current sustainability practices with gardening; composting; limiting water and electricity usage; reducing, reusing and recycling.”

These incursions demonstrated it's never too early to start environmental literacy and, in fact, it's often our youngest citizens who have the greatest capacity to wonder at the way nature works. The future is bright if the respect, curiosity, and care that these children showed stays with them as they grow into tomorrow's environmental champions.



Minyip Kinder children (left) and Rupanyup Kinder children (right) were proud to receive a waterbug lifecycle poster to remember the incursion by and share with their families.

For more information about River Detectives:

Email riverdetectives@nccma.vic.gov.au or visit www.riverdetectives.net.au



River Detectives Story of belonging

Jeparit Primary School, 2023

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

The program is available to schools and youth groups in five regions across Victoria.

Craig Donahoo is the Principal of Jeparit Primary School, a small rural school on the Wimmera River in the state's west that has been involved in the River Detectives program since 2017. Students monitor their adopted site on the Wimmera River nearby. The river terminates six kilometres north of the town at Lake Hindmarsh and this year a fantastic opportunity arose to connect with this ancient lake.

Lake Hindmarsh has been dry since 2013, but in December 2022 received water after three years of La Nina conditions. In 2023, as water receded from the lake bed, distinct vegetation zones became obvious and this was identified as an ideal investigation to complement the school's term four theme of Belongings.



Lake Hindmarsh, the first of a series of terminal lakes.

In October, 15 Prep to Year Six students travelled by bus to the lake. Students worked in groups of three to identify plants in thirteen 10-metre transects along Picnic Point Track from the lake edge to the lunettes.



Senior students measure the 200m transect over the big lunette sandhill with a trundle wheel.

Principal Craig Donahoo explains, *“Leading up to the field work, we instructed students on plant identification using phone apps and introduced them to the concept of using transects to describe changes that occur in landscapes. In the field, River Detectives Coordinator Jeanie had pre-prepared booklets with 20 photos of plants to be found. Using the visual aids, students were able to identify a range of species in the field and to draw and photograph ones which were not in the booklets.”*

Parks Victoria officer Jeremy Downes attended the excursion and helped students identify plants as well as facilitating the removal of three bags of cape weed, ice plant, and gazania with permission from Barengi Gadjin Land Council.

“Students were given agency to remove weeds. Students reported they enjoyed removing weeds as they felt they were doing something positive for the environment.”

As a natural example of Belongings, the very visible zonation of plants was discussed: from reeds to herbs and grasses; from wattles to gums and pines. Students came to understand that each plant family belonged to different parts of the lake environment according to their habitat needs.



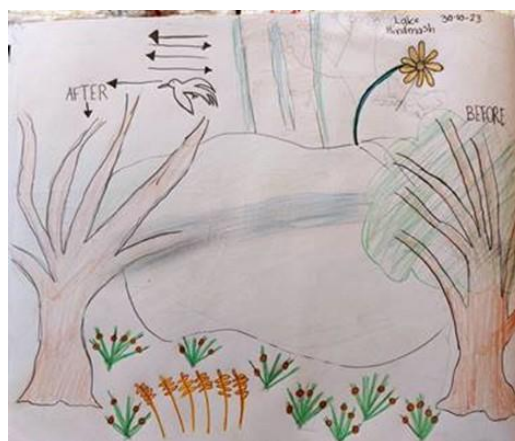
Students hear from Jeanie, Jeremy, and Sue on site at the lake.

Students were able to show their understanding of each layer of native vegetation, weeds, changes over time around the lake, and the animals that call it home (right).

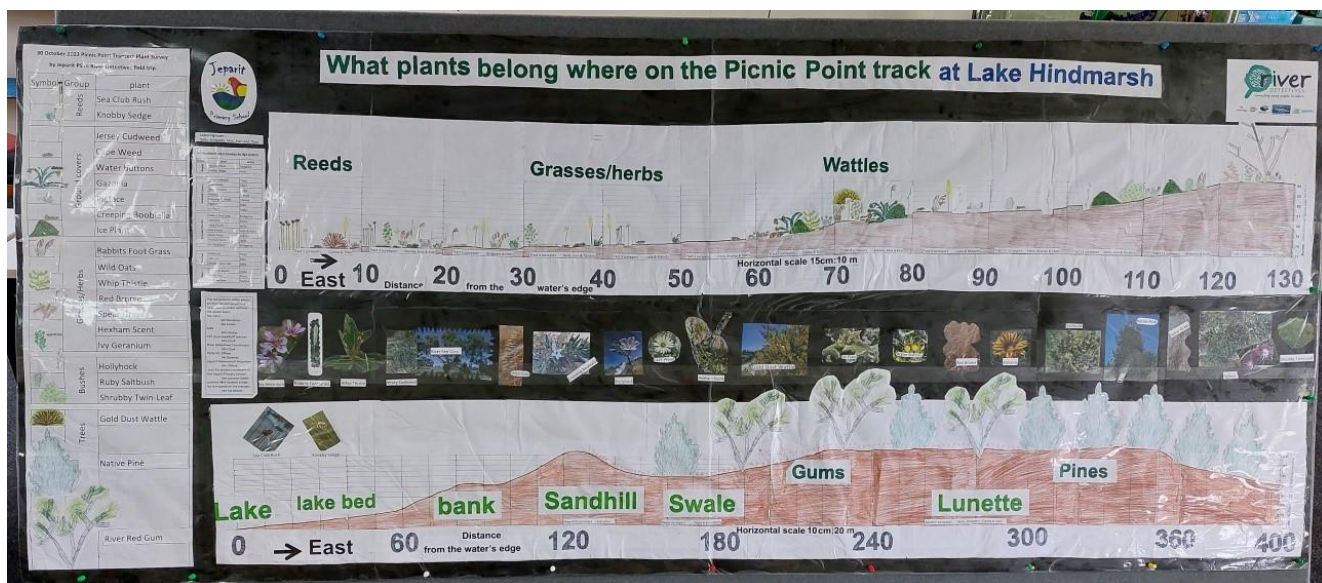
Over the following six weeks, students continued their learning, transforming their field trip experiences and their observations into an incredibly detailed two-metre poster. They made scaled plant diagrams and used their transect survey data to place species in the correct section of the poster.

From the human aspect of Belongings, WaterWatch volunteer Sue Afford from a neighboring farming family shared memories of the lake as a place for recreation during her lifetime. Jeremy also spoke about the lake as his workplace.

Students drew pictures to reflect on their sense of belonging to Lake Hindmarsh.



The visual cross-section of Lake Hindmarsh vegetation is a great example of student inquiry at a place of importance in the local environment, and of the way River Detectives can integrate with many curriculum areas. Field work and class work can go hand in hand.



The poster will be on display in the window of the local supermarket over the summer holidays.

Craig reflects on the impact of this activity and the River Detectives program,

"I was really pleased to see the high level of enthusiasm and engagement of all students during this activity."



Students were able to:

- increase their plant identification skills
- understand the relationship between site geomorphology and species locations
- gain knowledge of why scientists use transects to describe changes that occur in landscape
- complete a table to describe species in a section of the transect
- use scale to represent species in a transect
- feel satisfaction and purpose when removing weeds
- gain knowledge of the Lake's past social and commercial history

"It was great to see students learning in real life situations. I think we need to do more of this."

A copy of the booklet featuring plants of Lake Hindmarsh that Jeanie prepared was given to each family of the school.

Jeanie reflects,

"None of us had realised how much variety there was in the plants at this part of the lake, much further around from the main tourist site. The weeds there were also a surprise. We hope our transect poster will not only reinforce what we found out about native and weed plants but also be able to be used to inform others."

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Sea club rush
(water's edge).



Jersey cudweed
(dry lake bed)



Ivy geranium
(lake edge)



Cypress pine
(lunette sandhill)

Photos by Jeanie Clark (cc, 2023)

River Detectives Story of Change

Stawell Primary School, 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

Jeparit Primary School, 2021

In the Wimmera CMA region, Heidi Lees is a teacher at Jeparit Primary School, a small school community of 17 students where all students from Foundation to Grade 6 participate in the River Detectives program. The Wimmera River flows through the farming area of Jeparit before terminating at Lake Hindmarsh just north of town. Lake Hindmarsh is Victoria's largest freshwater lake and the first of a series of terminal lakes. The river is an important feature of the town and a common point of reference for students who come from a variety of backgrounds.

The school has a long-standing association with the Wimmera River. They began monitoring the waterway in 1996 as part of the Waterwatch program and have maintained a connection with the river over the years thanks to support from their regional coordinator and freelance environmental educator Jeanie Clark and by liaising closely with the local Jeparit Waterwatch group.

When Heidi joined the staff in 2018 she strengthened their association by joining the revamped River Detectives program.

"I saw the training advertised and thought it was a great opportunity considering the Wimmera River flows through our school's 'backyard'. Our school had just started a kayaking program in 2018 and I felt that the two programs would complement each other. The students learn about the river they are paddling on, know how to look after it and appreciate the river more. It is my philosophy that students learn best through hands-on learning. Therefore, students collect real data for graphing rather than pretend data."

Heidi outlines that River Detectives is the core program that engages Jeparit PS students in sustainability education.

"Things have been disrupted due to Covid, but we have always tried to complete our monthly water quality monitoring. Before Covid students ventured down to the river during geography or science to collect the sample, we completed the testing back at school. Data was then uploaded onto the website. We also took part in macroinvertebrate sampling in March and October. Jeanie collected bugs from the river and brought them into school for our students to experience. This activity adds a different dimension. Students become aware of what lives in the river, what should live in it, the role waterbugs play in the food chain and learn to appreciate the importance of keeping the river healthy."



"With support from Jeanie we have learnt about the effects of flood, drought, and humans on the Wimmera River over time, especially their impact on salinity levels and turbidity. We notice that salinity levels are generally quite high. We learn about the fauna that visit our site through observations of tracks, scats, nests and other clues. We know which fauna have visited our site."

Reflecting on her River Detectives highlight, Heidi spoke passionately about a project they have been able to achieve throughout 2020 and 2021 despite the challenges of Covid-19 and remote learning, testament to the program's flexibility and potential;

“In 2020 during remote learning, students were learning about erosion in science and mentioned that they’d noticed erosion on the river banks when conducting monthly testing. Students wrote letters to GWM Water, Land care, Jeanie, and local farmers to ask if they could interview them about what we could do to improve the river and prevent erosion. We met on WebEx, and students learnt that revegetation could help to minimise erosion. We then successfully applied for a Junior Land care Grant to tackle the problem.”



Between lockdowns we invited ecologist Mirinda Thorpe to visit. She walked along the river with students, identified native plants growing on the banks and discussed the benefits of revegetation. Then, in November we visited Dalki Garinga, the Wail native nursery, where nursery manager Paul Lehmann taught us how to propagate plants indigenous to the area.

Next, we enjoyed a visit from Barengi Gadjin traditional owners. They helped us to observe culturally significant sites. The students saw middens and learnt about what traditional daily life would have been like along the river. They taught students about their culture, traditional tools and environment.

Parks Victoria supported us to identify suitable revegetation sites protected from people/cars providing plants with the best chance of success.

In May 2021, students planted out the plants they had propagated at the nursery in November with the support of representatives from Barengi Gadjin, Parks Victoria, Paul Lehmann, Hindmarsh Landcare and the Jeparit Town Committee.

To educate the broader community and raise awareness we put up a display in the main street to explain the project.”

Grant money was allocated to funding the ecologist’s visit, the nursery excursion, and to purchase plants. But, as is so often the case when good people come together on inspiring projects, organisations and individuals were so supportive of the project that many donated their time and materials.



Heidi explains the next goal of the project;

“We aim to use leftover funds to install bollards to protect future revegetation sites in areas frequented regularly by people for recreation, as vehicles in these areas would be likely to damage existing vegetation and new plantings. We also plan to install signage at the revegetation site outlining the project activities and goals, acknowledging project partners, promoting local user groups, sharing thoughts about why the river holds value for them and why we need to look after it. We hope the sign will communicate how local groups



are working together and share that for people to use boats on the river, it needs to have water and to have fish in the river, the water needs to be healthy.

An annual fishing competition is held at Easter and we have dreams of supplying information to participants when they register to let them know about our project and encourage them to look after the plantings.”

The fishing competition is an important event for Jeparit. People come from near and far to participate, fishing and camping along the river. Heidi feels it's very important for all in the community to support events such as this because they bring people to the area, and it's great for socialising and for health and wellbeing.

“There is a real need for us all to work together so that people can still fish, still boat, and protect the river from erosion. If we have a common understanding that all of these activities are great and we work together, we will continue to enjoy the benefits of the river for many years to come.”

Jeparit PS was proud to have received a Highly Commended mention for the Woolworths Junior Landcare Team Award at the 2021 Victorian Landcare Awards for its innovative and collaborative project.

Covid-19 has heightened awareness of supporting students' learning of key concepts. Heidi values the opportunity to implement River Detectives content through literacy and numeracy activities so teachers can satisfy the demands of core curriculum areas whilst engaging students in the River Detectives program.

“Students have learnt science and geography concepts like understanding erosion and revegetation. They collect field data when we visit the site. Water quality testing gives them confidence with scientific processes. In Maths we use the data we collect for graphing. Recounts of their experiences visiting the nursery, propagating and learning from the ecologist and traditional owners were written by students and published in the school newsletter.”

The River Detectives program provides hands-on learning and encourages students to be more observant.

“Students love to be out in the environment and nature and as we walk to our test site, the students notice things – flora and fauna – and then they ask questions about what they're seeing and why it might be occurring. Sometimes they google or sometimes they contact Jeanie for more information. It's precious learning out in the environment instead of learning from a textbook. Students spend time at the river with family during holidays, weekends and after school; now they have an understanding of what's under their feet, the reason for looking after it and how we can do that.”

One of Heidi's greatest joys has been witnessing how some students who struggle with the academic challenges of reading and writing in the classroom “come alive” outdoors by the river.

“During our excursion with Mirinda, one student asked so many questions and was so enthusiastic about participating. I realised this activity was something this child could excel in, go on with in life and be successful.”

Heidi values the support of her regional River Detectives coordinator.

“Jeanie trains teachers up and then we roll out the program with our school. Jeanie is so knowledgeable and inspires the teachers she trains. We rely on her so much. Her role as coordinator is so valuable to support schools undertaking the program. Continued funding is essential to enable her to continue this role. She takes away my stress and we love to see her out in schools doing hands-on activities with students and staff.”

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