FACULTY OF
EDUCATION

EVALUATION OF THE ROYAL BOTANIC GARDENS VICTORIA **RAISING RARITY** SCHOOLS PROGRAM

AUTHORS:
DR ROSIE WELCH
PROFESSOR ALAN REID
DR RACHEL COUPER
DR LISA HUNTER
DR GILLIAN KIDMAN

MARCH 2025
FINAL REPORT

FOREWORD

This report has been written for the Royal Botanical Gardens Victoria, to document and evaluate the Raising Rarity Schools outreach program. The Raising Rarity program has gained noteworthy momentum and interest since its beginnings in 2019. In the process of its expansion and rich interdisciplinary collaboration this evaluation responds to the need to understand the educational and organisational benefits and challenges. There is a unique plant-forward conservation-based education opportunity documented as well as recommendations for future directions.

The report was commissioned by the Royal Botanical Gardens Victoria and funded by the Ian and Norman Shirley Foundation.

The report covers the community links between the RBGV and schools as well as the benefits and challenges of the program and the ways schools have adopted the program in their unique city to rural settings with curriculum links, teaching and learning approaches.

Methods included: survey, interviews and co-design workshops. Participants were limited to educators and the RBGV organisational staff. School-based artefacts were collected such as photos, student work samples and newsletter items. There wasn't enough scope to include children and youth directly in the evaluation, but this will be essential for future iterations of research.

The findings in this report will be of interest to educators, conservationists, academics and community members curious about plant-forward approaches to conservation education.

SUGGESTED CITATION

Welch, R., Reid, A., Couper, R., lisahunter., and Kidman, G. (2024). "We're going to check on the plants everyday": An evaluation of the Raising Rarity Schools Program. Plants + Places + Pedagogy Faculty of Education Research and Scholarship Group, Faculty of Education, Monash University DOI: 10.26180/28726454

MONASH University

CONTENTS

IMAGES & TABLES

ACKNOWLEDGMENTS

We would like to acknowledge the valuable contributions of program participants, the teachers and RBGV organisational staff as our key collaborators in this review. Thank you for sharing details about your skill and experience with the Raising Rarity schools pilot program.

The team acknowledges the financial and in-kind support received from the Ian and Shirley Norman Foundation via the Royal Botanic Gardens Victoria to support this research evaluation.

The team acknowledges input from educators, students and curriculum writers throughout the workshop design phase. Especially, Bev Laing, Bec Robie, Marc Pruyn, Alex Scott, Catherin Laurens, Anna Roach and Lenore McCullough.

We would like to thank Professor Mark Richardson and Christina Renowden for conversations early in the project design.

ARTWORK

Sketches throughout by Dr Rachel Couper, Monash Art, Design and Architecture

MONASH University

EXECUTIVE SUMMARY

1. The Raising Rarity (RR) schools pilot project contributes to the protection of Victorian flora through meaningful and sustainable conservation projects in schools. The schools outreach component of RR shows clear evidence of the program's ability to foster educational and conservation outcomes through an authentic and hands-on approach to caring and collecting seed and data of plant species that are rare and threatened (nearing extinction) in Victoria.

2. The RR schools outreach program offers direct benefits to participating schools across a range of intra-curricular, cross-curricular and extra-curricular domains. These standard expectations for schools to value an outreach program sit alongside broader, demonstrable educational benefits. These include fostering (a) the development and application of scientific literacy, (b) values and commitments to conservation outcomes, and (c) authentic motivation for teachers and students alike in supporting positive biodiversity outcomes in various communities and bioregions in Victoria.

3. Key features of the schools' outreach program that support these outcomes include:

   (a) 'plant forwardness' by addressing 'plant awareness disparity';

   (b) leveraging RBGV expertise in botanic and conservation domains and strengthening internal RBGV organisational collaboration for conservation;

   (c) valuing care, reciprocity and community in ecosystem restoration;

   (d) potential to harness perspectives and place-based sensitivities in working with rare plant species and their habitats, threats and rejuvenation, this has scope to include traditional owners through school partnerships in the future;

   (e) demonstrating the multiple benefits of localising and professionalising engagement in education for biodiversity conservation in schools, imagination, community and career opportunities;

   (f) offering real-world mentoring opportunities in 'communities of practice' committed to the goals of Raising Rarity;

   (g) creating conditions for scaling up the broader remit for RR in harder-to-reach communities, with other partners and at other sites, e.g. Indigenous nurseries, aged care facilities, community groups or events.

4. While RR faces similar challenges to other conservation-focused schools outreach programs in Victorian schools across the state, the evaluation has shown it has the dual potential to both *dissolve* and *'leap frog'* typical barriers through the program's focus on *mentoring, sustained local participation* in the plant life cycle, *the bioregion hub model of local connections and activities*, and careful consideration of its '*spheres of influence*', particularly in developing the program beyond the pilot phase via its links to local councils, regional botanic gardens and communities including First Nations led collaboration.

5. Analysis of evaluation data (from a survey, interviews, a co-design workshop and documentation) show the RR schools outreach program demonstrates many of the key features of international best practice in education for conservation. Data also show the education team and RBGV leadership have the potential to leverage these qualities further through: (a) developing thoughtfully designed

messaging with key stakeholders, and (b) undertaking program 'tweaks' across Curriculum, Organisational and Community aspects. The evaluation would suggest these are key to sustaining the program and scaling up its contributions to wider work at RBGV that both supports participation in, and addresses the educational dimensions of, the COP15 Kunming-Montreal Global Biodiversity Framework.

PART 1 EVALUATION REPORT

1. Raising Rarity (RR) is a unique outreach program, nationally and internationally. Its primary purpose is to contribute to the protection of Victorian flora through meaningful and sustainable conservation projects. This is achieved through a multi-faceted, community-based outreach program that engages schools, both Primary and Secondary, and the wider community in conserving threatened Victorian plant species.

   The key finding of the evaluation is that the pilot program for schools outreach shows clear evidence of RR's ability to foster conservation and care for different plant species critically threatened in Victoria, through sound processes of collaboration and participation between RBGV and key stakeholders in education, i.e. schools.

2. Key benefits of the Raising Rarity program for schools include:

   a) school and student engagement, enthusiasm and ownership of plant conservation;
   b) development of real-world applied scientific knowledge and skills;
   c) wellbeing, social collaboration and inclusivity;
   d) school culture, community, networks and authentic conservation collaboration;
   e) inspiring future careers;
   f) teacher wellbeing, satisfaction and professional growth.

   While beyond the scope of this evaluation, it is also clear that the schools outreach program offers additional benefits to RBGV. These include: (i) generating audiences for other RR outreach activities through working with regional botanic gardens, local council operations and education counterparts, and (ii) providing sites and opportunities for sales associated with the commercialisation of its rare plant collection across Victoria, be that at garden centres and plant nurseries, regional gardens, in school grounds-based events (e.g. farmers' markets) or related community sites; and (iii) unique and generative internal RBGV collaboration between horticulture, science and education teams that ripples outward into organisational culture and conservation purpose.

3. Features attributable to the uniqueness and design of the program that support key benefits for schools include:

   a) its engaging focus on 'plant forward' - in contrast to a default of 'people forward' - in learning ***with*** rare plants (e.g. the contrast is with those that focus primarily on medicinal, edible, or well-being focused benefits of plants) (see Stagg, Hetherington & Dillon, 2024);
   b) leveraging RBGV expertise to afford interactions between teachers and students with locally-based plant experts in schools and at hubs (see Fox & Cundill, 2018).

   NB in general, this is increasingly rare for members of schools to experience, and is a key point of difference from typical provision in Victoria in conservation, scientific and ecologically-related education;

   c) the visionary possibilities it offers for more hands-on, real-world and problem-solving forms of biocentric and ecocentric learning than typically found in mainstream educational provision about plants. As one participant noted, in contrast to other conservation-focused educational programs, 'you can take a seed/seedling/plant home' (see Méndez-Herranz, & Cabello, 2024);

   Another point of difference with RR is these forms of learning are typically less anthropocentric and more attuned to valuing care, reciprocity and community in socio-ecological systems (see Ajaps & Forh Mbah, 2022).

   This is primarily achieved by students encountering a world of diversity in local plants, imaginatively and scientifically (Sanders, Nyberg & Brkovic, 2024), learning to enjoy a key aspect of their own world simultaneously, that is under double threats: "the extinction of experience" and "moving baseline syndrome" (e.g. acceptance of degraded natural ecosystems to be the normal state of nature, see Vera, 2010).

   RR addresses the "extinction of experience" by increasing participants' interactions with nature and specifically countering what some term 'plant blindness'(Dünser et al., 2024) through the fostering of

'plant awareness'(see Brkovi, Sanders, & Nyberg, 2024) and 'plant fascination' (Daniel, Russo & Burford, 2023). While for the latter, RR directly challenges a new norm of not having rare native plants as regular part of participants' lifeworlds, by helping enrich their lives through active practices of attention, care and restoration of threatened Victorian flora (see Keith et al. 2022; Blue et al. 2023).

To elaborate, we found evidence from surveys, interviews and a co-design workshop that the high quality educational design and realisation of RR has immense potential to transform traditional subject-based, cross-curricular, extra-curricular and whole-school approaches. This is primarily supported by RR through the ways the outreach program deeply engages participants with core principles of systems literacy, authentic and context-based science learning, nature-based education, and education for ecosystem restoration (see Stagg, & Dillon, 2023; Ardoin, Reid & Bowers, 2024).

As above, we note features and expectations for learning are now largely receding from current curriculum priorities and typical classroom experiences, which might be broadly characterised as overwhelmingly 'people forward' (Linderwell, Hargiss & Norland, 2024);

d) a creative and unique combination of ambitious citizen and community science-based approaches to education that are starting to connect Indigenous perspectives and place-based sensitivities in working with rare plants and their habitats, threats and rejuvenation (see Stagg & Dillon, 2024; Ballard, Lindell & Jadallah, 2024; Leonard, 2024);

e) the validation of a bioregional 'hub' model that leverages the RBGV's gardens across the state, that also creates connections with RBGV staff who role model ambitious educational and professional possibilities to students, e.g. careers in horticulture, conservation, and locally relevant biodiversity work more generally (Rae, 2013);

f) the motivation, passion and mentoring that RR untaps between RBGV staff, teachers and students to care for plants and local biodiversity in communities over extended periods of time, characterised by emotional investment and commitment, rather than by way of short term excursions or inclusions more typical of botanic-related education provision (see Renshaw & Tooth, 2017);

g) the opportunities RR affords for community links (broader organisations, networks and businesses), intergenerational learning (with parents, Elders, Friends of the Gardens), and peer-to-peer initiatives with other schools and conservation groups (see Sanders, Ryken & Stewart, 2018).

NB the co-design workshop identified many other partnership possibilities, including Indigenous nurseries, and other sites with gardens that could work for RR, e.g. aged care facilities, community gardens, prisons, VET and nurseries.

4. Challenges facing RR are not unique to the program.

a) **For participating schools**, they include familiar barriers of: (i) securing approval to participate from senior leadership, (ii) releasing staff from other duties to provide sustained support over the long term (e.g. a year) within and beyond the curriculum (e.g. in class, lunchtime and after school recognition), (iii) enhancing teacher knowledge and readiness to champion and support RR from botanical and educational perspectives, (iv) addressing challenges associated with scheduling and timetabling, funding, infrastructure and local partnership maintenance as they arise, (v) reducing student attrition and uneven engagement.

We note these barriers are typically beyond the remit of any external school partner in a project to address in offering a collaborative program, but the RBGV should be mindful of such factors when developing plans to scale up and consolidate work related to mentoring, participation and hub-type activities through RR. A key success of the program to mitigate these challenges is the flexibility of delivery within different school settings. The co-design research workshop demonstrated that a schools "starter pack" or toolkit would help to alleviate pressures of leadership planning and delivery across diverse school contexts.

A key recommendation from the interviews and co-design in this regard was the value of developing 'communities of practice' to induct new schools, sustain RR networks, and reduce pressure on RBGV staff to troubleshoot. In this, consensus centred on a 'community of practice' initially hosted by RBGV, that could be affiliated to a botanic garden hub (Cranbourne, Shepparton, Sale, etc), and meet online,

as appropriate, to strategize on addressing the aforementioned challenges and develop new educational possibilities. Two interconnected networks would strengthen this approach: one that is bioregion based and the other Victorian state-wide.

NB this finding aligns with strategies arising from an evaluation of Sustainability Victoria's ResourceSmart School program, in relation to embedding and scaling up its conservation-related education program in the state, that have also proven effective in meeting both educational and conservation goals (see Rickinson, Reid & Hall, 2016).

NB the co-design method informed by interview data proved to be a sound approach to understand schools needs in RR planning, design and resourcing.

b) **For RBGV**, the key challenges raised in the analysis were recognition of:

i. the resource intensity of face-to-face work in schools by its seed scientists, horticulturalists, and educators.

This might be offset by consideration of the schools outreach programs links to the commercial arm of RR, and by sponsorship/active involvement by local partners (e.g. Friends of the Gardens, an Ambassador program, linking with Indigenous nurseries).

We also note ways to bridge the challenges for participating schools and RBGV can be identified by mapping out the 'spheres of influence' of each key partner in the program and then identifying overlaps and strategies for moving forward. Analysis of the evaluation data suggests key possibilities for a 'spheres of influence'-based development of RR, including: (a) activating its links with groups like the Friends of the Gardens, (b) a focus on Victoria's bioregions and establishing links with Local Government agencies and Custodians of Country, and (c) media/communication strategies that identify synergies with existing outlets/activities, e.g. Gardening Australia Junior, Nature Stewards, Scouts, etc.

ii. *the need for a clear narrative/identity of the schools outreach arm of the program.* Is it primarily a seed conservation project? If so, how and why are schools positioned as the best place to do this scientific conservation work? Or is it primarily an experiential plant conservation education project? If so, how might the program better focus on the educational outcomes of the initiative in its program scope, depth and sequence. It can be both, of course, but the messaging of how and why needs to be clearly considered and communicated.

iii. *the need for clear messaging about the top priorities for* stakeholders *(funders, public community, local business, seed conservation),* research *(seed conservation, scientists, educators) and* practitioners *(teachers and RBGV staff implementing the program).*

Key ingredients to that messaging should be seen to align with those for international best practice in conservation-related education (Ardoin, Reid & Bowers, 2024), i.e.:

1. Employing a rich repertoire of teaching and learning approaches
2. Fostering participatory approaches
3. Including direct action
4. Focusing on local community settings in both issues identification and resolution
5. Surfacing and discussing personally relevant and meaningful information
6. Collaborating with experts.

Based on the evaluation data, these are likely to prioritise the following in developing messaging for *stakeholders*: 4, 3 and 2; for *researchers*: 6, 4 and 2; and for *practitioners*: 1, 2, 3, 4, 5 and 6. Successfully accomplishing this could further support RBGV in efforts to publicise, share and showcase the value and achievements of RR nationally, regionally and globally, e.g. alignment of their work with supporting participation and the educational dimensions of the COP15 Kunming-Montreal Global Biodiversity Framework (GBF) (Obura, 2023).

PART 2 TECHNICAL REPORT

BACKGROUND

The *Raising Rarity* Schools program unites students, teachers, and botanic gardens scientists, horticulturalists and educators together in a shared conservation program to grow and collect seed of a threatened plant species. This unique program mostly takes place within the grounds of participating schools in the State of Victoria, Australia, inviting students to grow and care for a local threatened species from their bioregion.

Staff of the Royal Botanic Gardens work at the interstices of the organisation and community, supporting students and teachers in learning how to grow and care for the plant species in their school. The Royal Botanic Gardens team guides teachers and students in activities growing, collecting plant data and seed collection, a point of difference being an emphasis on 'plant first' rather than the edible, medicinal or wellbeing 'justifications' frequently associated with other gardening programs in schools.

As both citizen and community scientists, through a sustained year-long project of growing indigenous critically endangered plant species from seedling through to flowering, students are contributing to valuable real time scientific data. The students document the phenology (e.g. the emergence of leaves and flowers) and collect data about the plant growth and health to send to the RBGV's scientists, learning about the wider and deeper political and cultural work required in fostering conservation outcomes and ecosystem restoration (Gann et al. 2019). The project offers a glimpse into how more ecocentric educational activities can flourish in contemporary mainstream schools (Ballard et al. 2024).

GUIDING QUESTIONS

The initial research questions guiding this evaluation were:

1. Within the school and wider community, who is involved in the program (why and how)?
2. In what ways are teachers linking the Raising Rarity program to their existing school-based curriculum (formal curriculum learning areas, activities, assessment, wellbeing, sustainability etc)?
3. What are the educational strengths, weaknesses and opportunities of the program across the different school-settings?
    a. What teaching has occurred and what are the teachers' observations of student learning?
    b. What does the program offer to students, teachers, the school and the wider community?
    c. What resources and innovations would help the program further flourish in educational settings?
    d. What are the gaps, challenges and limitations of the program across the settings?
4. What school-based curriculum resources need to be developed for future development of the program?

These questions are answered throughout the data in the technical report. As we conducted the research, additional data were collected in relation to the organisational aims and delivery of the project. These data have been incorporated to extend upon these initial research questions, to offer further considerations for RBGV about possible steps forward for Raising Rarity.

METHODOLOGY

The research evaluation team gained formal ethics approvals from Monash Human Research Ethics (MHREC) and the Victorian Department of Education (DET) to undertake surveys and interviews with school staff and key members of the RBGV organisation. There was discussion of including young people in the research, however this was deemed beyond the scope of the initial evaluation resources. There was keen interest from all parties to engage young people through participatory research methods in future research. Additional funding will support this work.

The instruments used in this evaluation were a survey with teachers (n=4); interviews with school staff (n=6); interviews with RBGV staff (n=9); a co-design workshop with teachers, RBGV staff, Monash staff, students and curriculum designers (n=14, 4hrs). Finally, artefacts were collected from the participants such as site photos, newsletter items and correspondence or school-based connections such as newspaper articles and student letters related to the project.

The surveys provided an initial scoping connection point with teachers for the evaluation, however the response rate was limited. The interviews, however, lasted for 50-80 minutes each and were rich in descriptive dialogue. All interviews were transcribed and thematically coded and analysed in relation to the research questions. The coding themes were generated by the research team through an iterative process of reading the transcripts and generating codes in relation to the research questions.

Below are two tables of the school and RBGV interview participants.

SCHOOL-BASED PARTICIPANTS

Participant	School Role	Curriculum Links	Notes
Primary Generalist 1 (PGT1)	Gippsland Regional Public Primary School 1 (Rosedale PS - Bec)	Generalist Class - cross-curricular learning as a whole group. Literacy, Physical Education, Science, Math's	Pilot Hub school. Champion teacher, with a background in environmental ecology management.
Primary Generalist 2 (PGT2)	Gippsland Regional Public Primary School 2 (Glengarry PS - Clare)	Initially the whole class participated in the introductory day, then lunch time volunteer group.	Part-Time teacher.
Primary Generalist Classroom Principal (PG3CP)	Gippsland Regional Public Primary School 3(Damian - Loch Sport)	Whole class involvement	Small one class school, classroom Principal, student transience and disengagement.
Primary Science Specialist (PScS)	P-6 Private School Campus of larger inner-city P-12 school (Amanda Melb GS)	Year 6 Science self-elected leadership group	Small group of volunteers as part of the science leadership group. All boys. School horticulturalist help.
Secondary Teacher 1 (ST1)	7-12 Catholic Secondary, peri-urban (Priya - Dandenongs)	Volunteers from years 7-12	Teacher asked to run the program by someone senior, uses land that is a former/disused market garden.
Secondary Teacher 2 (ST2)	P-12 Private School (Alex - PEGS)	Conservation Club	Lead teacher who initiated the existing school conservation club. Reached out to RBGV to support the Raising Rarity program in the school.

Table 1 caption. Overview of the School-based participants Source: research data

RBGV ORGANISATIONAL PARTICIPANTS

Participant	Role	Notes
Learning Facilitator (LF/EdHort)	Raising Rarity School's Outreach Project Officer - Learning Facilitator (Horticulturist and Outdoor Educator)	New project role in 2024 with the expansion to 6 schools supported by funding from the Ian and Shirley Norman Foundation.

Retired Conservationist (RC)	Former Manager Horticulture	Retired, and former leader of the Care for the Rare program.
Education Manager (EdM)	Acting Head of VEAT - Programming and Audience Development	"Education Manager" connecting the schools RR project to the organisation.
Senior Horticulturalist (SnrHortFounder)	Senior Curator Horticulture Cranbourne	Co-founder of the RR program with SSFounder. Works on the commercialisation arm of Raising Rarity.
Project Officer (PO)	Raising Rarity Project Officer, Cranbourne	
Learning Facilitator (LF)	Senior Learning Facilitator	
Seed Scientist (SSFounder)	Research Scientist (Seed Ecology) Melbourne	Co-Founder of the RR program with SnrHortFounder.
Horticultural Leader (HortLeader)	Horticulturalist Team Leader Cranbourne	
Organisational Leader (CEO)	RBG CEO	Interviewed on advice of RC participant.

Table 2 Overview of the RBGV organisational participants Source: research data

The initial round of analysis themes from the interviews were presented to the teacher and RBGV staff participants at the co-design workshop for confirmation and clarification. A few amendments to the data were made based on this workshop discussion, such as the timeline dates of some schools' participation. There were also additional follow-up conversations with teachers and members of the RBGV teams to aid in clarification of details from questions that came up during the analysis and reporting phase. Instances where this correspondence is utilised is noted throughout the report.

The co-design workshop was facilitated by the Monash research team and hosted at the RBGV Cranbourne Gardens. The workshop included a range of codesign activities, most notably the World Cafe method to prompt questions in relation to the three themes of: 1) curriculum; 2) organisational; and 3) community links to RR to date and into the future. There was a range of intersecting expertise across the participants including insider and outsider organisation and schools' knowledge and experience with the program. The question prompts guiding the workshop activities can be found in the appendices.

TIMELINE OF THE RR PROGRAM TO DATE

2019 |

The inception of the Raising Rarity idea - “pure science” to community potential via “greenhouse chats”. Meg Hirst and Russell Lark building on ideas with John Arnott’s Care for the Rare program.

2020 |

COVID pandemic focused attention on core business so little progress on RR

2021 |

End of pandemic and rebuilding of business operations to include innovative projects

2022 |

The first RR pilot school - passionate conservation teacher initiated contact with RBGV scientist to collaborate after reading FAME media about their funding of the Raising Rarity conservation of rare and threatened species project.

2023 |

Raising Rarity Schools outreach program established with two pilot schools: one Regional Primary School and one urban P-12 Grammar School. The focus was on quality over quantity with one species per school.

2024 |

Funding from the Ian and Shirley Norman Foundation supported a temporary position for a RBGV Horticulturalist Educator as Learning Facilitator and a small-scale program evaluation by Monash University.

Schools program further established with six ‘pilot’ schools undertaking the Raising Rarity program and the trial of a bioregional hub model. Schools included:

1. **Regional Primary School Hub** with one leader school and two other small regional public Primary Schools
2. Urban P-12 Grammar School
3. Urban fringe Catholic Secondary College
4. Urban Grammar Primary School.

FINDINGS - SCHOOL SETTING

CURRICULUM LINKS, AND TEACHING AND LEARNING APPROACHES ACROSS SIX DIFFERENT SCHOOL SETTINGS

We investigated six different school settings that are integrating Raising Rarity into their teaching and learning programs within their school context in a variety of ways. In this section we unpack how each of the teachers in these schools are connecting the program to their teaching and learning programs, bioregion and community. The findings presented in this section respond to research questions two and three:
Q2) In what ways are teachers linking the Raising Rarity program to their existing school-based curriculum (formal curriculum learning areas, activities, assessment, wellbeing, sustainability etc)?
Q 3) What are the strengths, weaknesses and opportunities of the program across the different school-settings?
(a) What teaching has occurred and what are the teachers' observations of student learning?

Each of the six schools are described below, beginning with the three regional primary public schools that trialed a regional hub model in 2024.

Three regional primary public schools: Piloting a bioregion "hub" model

The **Raising Rarity** program was implemented in a pilot hub model across three regional public primary schools to experiment with the possibility of extending this to other bioregions in Victoria. This model featured one experienced lead school and teacher, who supported two other schools in their first year of the program. Each school demonstrated unique adaptations, informed by their specific contexts and resources, while operating independently and contributing to the success of the hub. Recurring themes across these schools was the importance of a hands-on learning approach, novel compared to other educational programs within the school. "Hands-on looking through a lens at plants, seeing what they're made of... it was perfect for the kids, very hands-on." (PG1, interview 1).

Lead School: A Holistic Approach to Conservation Education

The lead school, participating in its second year, integrated **Raising Rarity** into a Year 5–6 generalist class, embedding it within a term-long biodiversity unit. The lead teacher, with a professional background in aquatic science and natural resource management, brought expertise and passion to the program. "I created a biodiversity unit... educating students about biodiversity, the environment, and understanding threatened species," the teacher explained. This cross-curricular approach included:

- **Science**: Topics on biodiversity, ecosystems, and threatened species.
- **Maths**: Practical applications such as pH level testing, data collection, and measurement.
- **Literacy**: Writing and reading projects tied to conservation, including reflective letters to the Royal Botanic Gardens Victoria (RBGV).
- **Wellbeing and PE**: Gardening activities served as stress-relief tools, particularly for students needing breaks. "We use that time [gardening] as part of our PE block... if someone's having a moment, we'll go and just see how the plants are going."

The teacher's innovative pedagogy emphasized authentic learning connections, such as the "Jenga effect" analogy to explain ecosystem interdependence, which resonated with students. Older students actively mentored younger peers in another hub school and enhanced whole-school awareness and participation within their own school. "Our students took SML leaders to regional campus of the school and taught them how to do everything... such an opportunity for student-to-student teaching,".

With such a strong cross-curricular integration of Raising Rarity into the classroom programming, it is not surprising that there was a strong emotional investment of students in the program. Students show disappointment after plant damage (e.g., cockatoos). Excitement about plant care and monitoring.' "They were quite forlorn... 'That was my plant that's gone.'"... "[*Samantha*] is always out in the garden making sure the nets are down properly." (PG1, interview 1)

Second School: A Specialist STEM Approach

The second school, new to the program, implemented **Raising Rarity** through a part-time specialist STEM teacher. Initially involving two full classes during the discovery phase, the teacher made the decision to transition within the program delivery to a small, focused special interest group to ensure higher-quality data collection and monitoring. This group enabled hands-on learning, with students rotating roles in plant care and observation: "We had about four kids

allocated to each plot, and they took turns… one kid will water the plants each week, one will do the soil testing, one will do the moisture testing, and one will just do a little bit of analysis of the plants."

Student-led problem-solving was a notable feature, as the teacher encouraged autonomy in addressing challenges. For example, students resolved an issue when a plant became entangled in mesh: "The kids were like, 'Ms. PG2, it's like one of the plants, it's poked its head through the mesh and it's stuck! What are we going to do?'"

The teacher identified the program's potential for broader curriculum integration, blending conservation activities with maths, science, and literacy. However, challenges included limited school leadership and resource support. The teacher described the program as "an informal little passion project," highlighting its flexibility and the capacity for student-driven learning in the absence of formalised structures. There were challenges with participating in the seed handover celebratory discovery day at the regional botanical gardens due to competing school activities. This was a challenge for the teacher, as she flagged the challenges of the project being prioritised in the calendar of events by school leadership.

Third School: Hands-On Engagement in a Small Multi-Age Class

The third school, a small regional primary with only nine students across multiple year levels, approached **Raising Rarity** through highly personalised and hands-on activities. The Principal, who also served as the classroom teacher, emphasized engagement for students who struggled with traditional classroom learning. "We're continually looking for opportunities for our students who aren't perhaps as good in the classroom... this really offered a great solution."

Older students (Years 5–6) mentored younger peers in maintaining garden plots, fostering collaboration and responsibility. "The 5-6s have had a plot themselves and then they have a few little kids that help them maintain it," the teacher explained. Practical tasks, such as building garden beds and constructing protective netting to safeguard plants from rabbits, enhanced problem-solving skills and student ownership of the program.

While scientific processes were part of the program, they were not explicitly extended beyond required data collection. The Principal-teacher highlighted the flexibility of curriculum integration, stating, "Because I'm the boss and the teacher, I get to set the curriculum. So, this is part of our work." The program blended seamlessly into the school schedule, balancing hands-on activities with formal learning.

Across the three schools, the **Raising Rarity** program demonstrated flexibility and adaptability, catering to each school's context:

- **The lead school** integrated the program into a well-rounded biodiversity unit, fostering cross-curricular links and whole-school engagement.
- **The second school** focused on a special interest group, prioritizing hands-on scientific skills and student-led problem-solving.
- **The third school** emphasized practical, multi-age activities to engage students, particularly those less suited to traditional classroom learning.

These variations highlight the program's ability to accommodate different teaching styles, school resources, and student needs while promoting conservation education and hands-on learning. The hub model effectively supported recruitment of new schools, collaboration and knowledge-sharing, laying the groundwork for broader implementation and success.

P-6 Urban Grammar School with Primary Specialist Science Teacher

In its first year of participation, the Urban Primary P-6 Grammar School successfully integrated the Raising Rarity program into its existing Year 6 Leadership Service framework. This structured program enables all Year 6 students to choose a leadership area to pursue, fostering responsibility and engagement. The specialist Primary Science teacher coordinated the Year 6 Science Leadership group, which consisted of six students who actively participated in the Raising Rarity project. With the support of the Science teacher and the school's horticulturist, these students engaged deeply in hands-on science activities and took on specific roles that reinforced their scientific learning and leadership skills.

Students were given meaningful responsibilities within the program, promoting active involvement and skill development. As described by the Science teacher, "I have a Science Service team… they rotate jobs. One takes the water temperature moisture reading, one takes the pH reading, one records what the weather's been in the last week... and one person's actually done the inputting into the Microsoft Forms." These delegated roles emphasized the application of scientific techniques in real-world contexts, helping students connect classroom learning to practical conservation tasks.

The program provided an enriching continuity of learning by building on prior knowledge from formal science curriculum classes. The teacher noted that the hands-on activities were a standout feature, offering students tangible experiences that reinforced scientific concepts: "They had learned about pH with me, and they understood what acids and alkalis

were and how you can test it. So we make the pH indicator out of the red cabbage leaves. And I loved that they could recall what we did last year when we learned about pH." This foundational knowledge was further deepened as students took ownership of planting and caring for seedlings, creating a strong personal connection to their plants and reinforcing their understanding of plant science and ecology.

Through their leadership roles, the students extended their learning by researching the species they were working with and sharing their knowledge with the wider school community. As the teacher remarked, "The boys actually did the research and found out a little bit more about Everlasting plants. They know a lot more than I do… I've also gotten the kids to explain to the rest of the school what we're doing so that when they walk past these plots with the signs, they know what they're about." This peer-to-peer education fostered a sense of pride and accountability, further embedding the students' leadership and conservation skills.

The program's integration was highly structured, leveraging the school's science specialism to focus on real-world applications of scientific concepts. While the link between conservation and science was not explicitly emphasized, the teacher viewed the program as an opportunity to "give the experiments we do a bit more relevance in real-life situations." This approach highlights the program's adaptability in supporting different educational priorities and contexts.

Secondary Suburban Catholic College 7-12 Volunteer Group

The peri-urban Catholic secondary school implemented the Raising Rarity program with a group of Year 7–12 volunteer students, emphasising inclusivity and leadership across all age groups. The program was structured to encourage peer mentoring and collaboration, breaking away from traditional hierarchical roles. As the coordinating teacher explained, "I encourage that with the kids that are in the group as well, but I don't limit that to the seniors leading the juniors." This approach fostered leadership opportunities for students at all levels, creating an inclusive and supportive environment.

The program adopted a flexible delivery model to accommodate the varied schedules and commitments of the volunteer students. Attendance fluctuated throughout the year, with students participating as their availability allowed. This adaptability was key to maintaining engagement, as the teacher noted: "It's just a casual; when they turn up, I have the meters." This informal structure allowed the program to integrate seamlessly into the students' busy schedules while maintaining its focus on hands-on learning and conservation.

A unique aspect of the program's implementation at this school, compared to other schools in the evaluation, was its initiation. The teacher who ran the program was invited to do so by another staff member, rather than volunteering based on personal interest. While this teacher demonstrated a commitment to providing opportunities for students, their level of personal investment in the program was less pronounced compared to other schools where teachers were more intrinsically motivated. Despite this, the program effectively engaged students and supported skill development.

The teacher highlighted several practical skills students gained through the program, such as using scientific tools and techniques. Students learned data collection using pH meters and magnifiers, providing them with valuable scientific experience: "Kids are learning skills in data collection using equipment." Additionally, the combination of hands-on tasks and scientific observation enhanced students' learning. One activity involved sketching observations made through microscopes, further blending creativity with scientific inquiry: "The kids did some sketching from the microscope as well."

This Catholic secondary school demonstrated how the Raising Rarity program can be adapted to fit a flexible, volunteer-based model. By fostering peer mentoring and offering opportunities for students across age groups to engage in conservation activities, the school provided a meaningful platform for students to develop leadership, scientific, and observational skills. This case highlights the potential for the program to succeed even when led by a teacher whose personal connection to the project is secondary to their commitment to creating student opportunities.

Urban P-12 Grammar School Conservation Club

The P-12 Grammar School showcased a well-established commitment to conservation education, entering its third year of the **Raising Rarity** program. The lead teacher, who initiated the program by reaching out to the Royal Botanic Gardens Victoria (RBGV), brought extensive experience and dedication to conservation education, having founded a school conservation club 15 years ago. Reflecting on his long-standing commitment, the teacher shared: "I started a conservation club about 15 years ago at the school... trying to establish as many links as I could." His proactive approach fostered a culture of environmental stewardship within the school.

The teacher emphasized the importance of providing students with hands-on, practical experiences to deepen their engagement and connection to conservation. Activities such as tree planting, frog pond monitoring, and bat trapping

have been staples of the conservation club. As he explained, “The whole idea is... to try and get as many practical things out there that our kids can get involved in, and they love it.” The **Raising Rarity** program seamlessly integrated into this framework, offering students an opportunity to expand their conservation activities into plant science and biodiversity preservation.

A key strength of the program at this school was the alignment between the conservation club and the students’ intrinsic motivation. The club comprised self-selected students with a genuine interest in conservation, ensuring high levels of engagement and commitment. This alignment made it easy for the teacher to incorporate **Raising Rarity** into the school’s broader programming and curriculum. With financial support from the school for conservation activities, the program benefitted from adequate resources.

The teacher demonstrated a sophisticated understanding of the program’s relevance to larger ecological and governance frameworks. By linking the program to international treaties and environmental science curricula, such as the Ramsar Convention, the program offered students a meaningful, real-world context for their studies. He noted, “You can link that stuff into the curriculum and say, well, we're a part of that... Ramsar and all sorts of things like that.” This approach provided students with a broader understanding of global conservation efforts, fostering a sense of connection and responsibility to larger environmental challenges.

Additionally, the teacher highlighted how the program and conservation club experiences serve as pathways for students to envision their future roles in environmental science and related fields. The hands-on opportunities not only enhanced their immediate learning but also inspired them to consider post-secondary and career pathways in conservation and environmental stewardship.

At this foundational partner P-12 Grammar School, the **Raising Rarity** program leveraged an existing conservation culture, motivated students, and a forward-thinking teacher. The connection with the RBGV was a fulfilling highlight of his educational work. This case demonstrates the program's potential to thrive in schools with established environmental initiatives, where it can contribute to both curriculum enrichment and real-world conservation engagement.

COMMUNITY LINKS

The *Raising Rarity* (RR) program demonstrated a remarkable ability to foster meaningful community relationships, expanding from within individual schools to collaborations between schools, and outward to broader networks, organizations, and businesses. Teachers and students were active participants in this network, and in the interviews often contributed future-oriented ideas for enhancing community connections of the program into the future.

Community Outcomes

The RR program achieved diverse community outcomes, including:

- Individual Learning and Peer Mentoring: Students gained valuable knowledge while engaging in collaborative, peer-supported learning experiences.
- Inter-School Connections: Schools collaborated through shared conservation projects, strengthening ties between educational institutions. As one teacher reflected, “We ended up meeting with the people from [School X] down the road when we did frog ponds” (ST2, Interview).
- Partnerships with External Organizations: The program’s collaborations with the Royal Botanic Gardens Victoria (RBGV) and local businesses enriched educational opportunities through shared resources and expertise. For example, “Local 1 Bunnings and Local 2 Bunnings provided the garden beds, and a local soil supplier donated the soil,” and “We want to do an official recognition for the businesses that supported us” (PGT1, Interview).
- Local Business Support: Partnerships with businesses such as Bunnings supplied garden beds and soil, making the program economically viable: “Bunnings donated soil, garden beds, and some weed bedding” (PGT2, Interview). Parents and other community members also contributed: “Parents assist with watering plants during school holidays” (PGT1, Interview) and “Parents volunteered to look after the garden” (ST1, Interview).

Strengthening Classroom Learning through Expert Partnerships

The foundational partnership with RBGV brought real-world expertise into the classroom. Teachers expressed the value of this collaboration:

- “The link between the school and the botanists and horticulturalists of the Botanic Gardens was incredibly important” (ST2, Interview).
- “Having the experts from the Botanic Gardens come out has been important” (PGP, Interview).
- “They provided resources like pH meters and replacement plants” (PGT1, Interview).

The program also offered students hands-on learning opportunities. One teacher shared their enthusiasm for the activities: “The exploratory day was just amazing... hands-on learning about pollination and flowers” (PGT1, Interview).

Another highlighted the excitement of hosting a scientist for fieldwork: "[Seed Scientist] is coming out to do some fieldwork nearby and is going to chat with the kids about her career!" (PGT2, Interview).

Leveraging Existing School Ecosystems

The program was flexible in the ways it was integrated into existing school infrastructures. For instance:

- A school's hospitality and kitchen garden program provided the infrastructure to create scientific garden plots: "We do have a restaurant at our school... the gardens are used for food classes as well" (ST1, Interview).
- Ground staff and administrators actively supported the program: "Our ground staff have done a lot of the heavy lifting. They've actually established their apple crate boxes and filled those, and they look after the plants during the holidays" (PScS, Interview).
- Schools leveraged their communication channels to promote the program: "I dropped information to our Publications Manager who wrote an article and got a student to write an article about the whole Raising Rarity program" (PScS, Interview).

Fostering Inter-School Collaboration

RR connected schools as part of a broader educational network, encouraging shared learning and collaboration:

- "We went to [regional hub school] for our initial introduction to Raising Rarity" (PGP, Interview).
- "The kids from [lead hub school] gave a prepared speech about what the program was for them and how they implemented it" (PGT2, Interview).
- Teachers envisioned expanding these connections: "It would be great to develop stronger connections between schools and botanical gardens... a hub model would help facilitate this" (PGT1, Interview). Another suggested, "Maybe for next year... having a WebEx where we all join in and see each other" (PGP, Interview). A Year 6 student reflection to the project officer was that as they left Primary for High School, they wanted the program to follow them to the High School setting. This student was so enthusiastic about RR that they wanted to help instigate it in their new HS setting. The possibilities for this to happen are high, given the school is located in the regional Gippsland area where the program is networking well already. Ideas about expanding Community Partnerships

Ideas about further expansion of the program extended to local community groups, retiree networks, and conservation organisations to support student learning and achieve broader conservation goals. Teachers highlighted these collaborations:

- "The biggest group outside of education is actually community groups... retiree groups as a group who are keen on gardening" (ST2, Interview).
- "How great to be able to grow the plant, hand over the seed, get seedlings back, and do some plantings with the community" (PGT1, Interview).

Indigenous Knowledge Integration

Some schools explored connections with Indigenous communities, recognising opportunities to incorporate Indigenous knowledge into biodiversity and conservation efforts.

Teachers shared their aspirations:

- "We haven't yet connected with the local Indigenous community, but there's potential there... It would be amazing to connect those communities with the school for planting days or monitoring days" (PGT1, Interview).
- "Sale Botanic Gardens has a strong connection, but our school hasn't really got a lot of connections yet" (PGT2, Interview).

Since collecting this data, connections were established. Continuing to develop the pilot hub model could help to facilitate inter-school learning across age levels as well as the connection with First Nation's community. Connections were already established at the end of 2024, with the schools and the RGBV collaborating with a Youth Worker from a local High School who conducted the Smoking Ceremony at the end of year seed handover ceremony.

During the program's celebration day, these connections were strengthened through a regional smoking ceremony and seed-gifting event. Although not all schools could attend in person, they contributed to the event (Correspondence with RBGV Project Outreach Officer).

The Role of Resource-Based Partnerships

Resource partnerships with organizations like RBGV and local businesses supported the program's success. These collaborations provided financial and material support while enhancing educational outcomes. There were also wider spheres of networks that influenced visibility and connection to the project. One teacher noted, "The program came through a STEM leader, possibly linked to Museums Victoria" (ST1, Interview).

The *Raising Rarity* program successfully fostered connections among students, schools, and broader communities. By integrating expert partnerships, leveraging existing school resources, and building community networks, the program enriched educational experiences and promoted environmental stewardship. Its emphasis on collaboration and resource-sharing highlights its transformative potential for conservation education, laying a foundation for sustained community engagement and future growth.

BENEFITS

The key benefits of the Raising Rarity program for schools, included: 1) School and student engagement, enthusiasm and ownership of plant conservation; 2) Development of real-world applied scientific knowledge and skills; 3) Wellbeing, social collaboration and inclusivity; 4) Building greater awareness in the school and wider community about plant conservation contributing to school culture, community, networks and authentic conservation collaboration. This included emerging connection and collaboration led by First Nation's groups in local regions; 5) Inspiring future careers; 6) Teacher wellbeing, satisfaction and professional growth. This section responds to research questions 2 and 3 (a) and (b).

1. School and student engagement, enthusiasm and ownership of plant conservation

There was a sense of achievement and pride in participating in conservation efforts. "We value being able to contribute to these special projects." (ST1, Interview)

Students were really connected to the conservation within the school and being involved, one teacher described how "The students have embraced it so much... they're passionate about the plants and what they represent." (PST1, interview) or that "they're always on the lookout now for billy buttons in the local environment." (PST1, interview). Through deeper learning, this teacher described how "The students see the importance of protecting threatened species like the billy buttons." and "It's part of a larger mission to connect schools to conservation in a hands-on way." (PST1, interview). After two years of the program in the lead hub primary school, this led to broader conservation goals and the desire to scale the model: "We'd love to expand this to include planting days in the community." (PST1, interview)

The engagement in caring for a plant was described by another teacher as increasing awareness of regional and global conservation initiatives: "The kids know that they're part of something bigger than their school." (PG2, Interview)

At the **urban Primary School**, the teacher described student ownership and connection to the plants: "They've named each one of the plots after their initials. One of the plots is called the MEMA plot... That's given them ownership of that plant." (PScS, interview 1) and how when, "Some of them have flowered now, so they're very, very proud of—'theirs is the tallest plant' or 'the most flowering plant.'" (PScS, interview 1)

As part of the student involvement in the project they developed a sense of responsibility and enthusiasm for the science, as one teacher described it: "The kids are like, 'Have you got more [seed] bags? We need to bag them up!'" (PG2, Interview). The involvement has also sparked independent inquiry and a deeper interest in conservation. "Some kids have done their own research on other endangered plants." (PG2, Interview). The responsibility and enthusiasm for the project was described by another teacher where students at his school are normally disengaged, as: "The fact that we don't have to force them out there... they're keen to do it!" (PG3CP, interview 1)

2. Development of real-world applied scientific knowledge and skills

"They're learning real-life skills like data collection, observation, and problem-solving." (PST1, interview)

"Students engage in leadership and teamwork through collaborative activities like monitoring and planting." (PST1, interview)

"It ties into science, math, literacy, and wellbeing—so rich in learning opportunities." (PST1, interview)

Peer collaboration reinforces learning and builds confidence. "Kids from [lead hub PS] showed our kids how to do soil testing and what to look for in the plants." (PG2, Interview)

Engaging with detailed knowledge enhances students' confidence and sense of expertise. "Some kids are very good at remembering the Latin name, Craspedia." (PG3CP, interview 1)

"It's just those life skills that come into everything that we do. Again, it's giving them a real-life scenario where they're actually needing to be organized." (PScS, interview 1)

Students contribute meaningfully to conservation efforts. "It's a real hands-on thing they can do rather than just stopping rubbish going into waterways." (PG3CP, interview 1)

1. Well-Being, social collaboration and inclusivity

Participation offers a supportive space for students struggling socially or academically, fostering inclusion and belonging. "One of the first things they often do is take some of our neurodiverse kids... and point them in the direction of the conservation group."(ST2, interview 1)

"It's a calming space for wellbeing... students use it to de-stress." (PST1, interview)

Collaborative tasks foster teamwork and improve social dynamics among students. "Working together to build the beds and shovel the soil broke down some of those barriers." (PG3CP, interview 1)

2. School culture, community, networks and authentic conservation collaboration

"It's now embedded into our school culture." (PST1, interview)

"Our mural celebrates local biodiversity with billy buttons, bees, and blue-tongue lizards." (PST1, interview)

"The whole school knows not to touch the plants or pick the flowers." (PST1, interview)

The program integrates seamlessly with existing nature-focused activities. "It fits well with what we do in our Bug Blitz program." (PG3CP, interview 1)

School wide interest, "When the kids go past, they have to go past the plants to get to my room. And I've heard quite a few comment on, 'Oh, look, it's flowered' or 'I wonder which one...'" (PScS, interview 1)

- Programs like Raising Rarity enhance the school's image and create opportunities for external recognition. "The fact that we're a pilot school... we're actually part of something here." (ST2, interview 1)
- Benefits extend to both individual student development and broader community engagement. "It's a great community project. The kids are learning skills, and the school is involved in a project that helps the community." (ST1, Interview)

3. Inspiring Future Careers

Participation influenced career aspirations in plant sciences and ecology. "One student decided earlier in the year that he wanted to be a plant biologist after those experiences." (ST1, Interview)

Raising Rarity and related programs inspire students to pursue environmental careers. "We've had two or three other students go on and get involved in wildlife management through the course out at Latrobe Uni." (ST2, interview 1)

Exposure to professionals broadens students' career aspirations: "Having [name], an actual scientist, chat to them was pretty cool for the kids." (PG2, Interview)

There were connections to tertiary and higher education students who worked with the RBGV staff and expression of potential to extend this with trainees in partnership with nurseries. On some school visits, a botany/ecology/sciences student joined the education officer. Secondary students were comfortable to chat to the volunteer and ask questions about her studies and uni life. This exposure with young scientists could also provide real life insight and inspiration in new career pathways.

4. Teacher wellbeing, satisfaction and professional growth

- Teachers benefit personally and professionally from collaboration with experts and new knowledge "The Raising Rarity program... enhances my knowledge of the work being done in the botanic gardens."(ST2, interview 1)
- "It sparks my interest and my passion, and I think that gives a new freshness to what I do." (PScS, interview 1)

CHALLENGES

The challenges that participating teachers/schools felt were at times due to their particular context but at other times some challenges were shared across sites, from initial administration approval and support, the resources teachers already had or needed to seek out from other staff, knowledge sources, or for material resources such as garden supplies. The conflicts of time constraints and securing the needed human or material resources seemed to be dependent upon the level and nature of participation and competing interests also affecting the sustainability of current practices and/or further upscaling or extension of engagement.

Approval and Administrative Hurdles

- Administrative processes slowed down program implementation: "Our school has gone through a change in leadership, and they like everything to sit in a calendar before anything gets approved." (PG2, Interview)

Staffing Limitations

- Challenges in securing additional support for the project: "We're a bit low staffed, so trying to get someone to come out and get engaged has been hard." (PG2, Interview)
- Small school size limits the capacity for additional projects or activities: "There's only a few of us here... this sort of stuff really does take a dedicated person." (PG3, Interview)
- "If we were to do Raising Rarity, it would be great for me to sort of start at the beginning of next year and then whoever takes over from me for the second half of the year to carry it on instead of starting something new." (PScT, Interview)
- Teacher Readiness and Knowledge
- Lack of expertise: "Not many teachers are aware of threatened species... there's a fear factor with outdoor teaching." (PGT1 Interview); "One teacher didn't even want to teach biodiversity because she didn't understand it." (PGT1 Interview)
- Dependence on passionate leaders: "Programs succeed when there's a passionate teacher championing them." (PGT1 Interview)

Time Constraints

- Limited time affects the depth of student engagement during sessions: "Lunchtime is not a full hour at our school; it's really just over half an hour." (ST1, interview)
- "I see these kids twice a week for an hour each, so trying to find the time and fit it in has been hard." (PG2, Interview)
- "The biggest issue within all schools is time... having Principals who are willing to have kids miss classes." (ST2 interview).
- Balancing time for conservation activities with academic schedules is a key challenge: "Our school has other events on and only approves a certain number of things." (PG2, Interview)
- "I'm supposed to organize a time for the RBGV Learning Facilitator to visit one last time... and we don't seem to be able to find a time and date that everyone is here on site." (PScT, Interview)
- Overloaded curriculum: "The curriculum is so jam-packed, it's hard to fit this in." (PGT1 Interview); "We had to dedicate PE time to make it work." (PGT1 Interview)

- Limited time for broader outreach, administrative and teaching responsibilities limiting capacity for external networking: "Unless it's on my list of things to do, I forget to." (PG3, Interview)
- "Our school is super busy. There's always kids out with sports or music or camps." (PScT, Interview)

Resource Challenges

- Funding limitations: "Getting grants is hard... and even when you get one, it doesn't always do what you need." (PGT1 Interview)
- Resource demands: "Without ongoing support from the botanic gardens, it would be hard to sustain." (PGT1 Interview)
- Environmental factors necessitate additional work to build infrastructure to protect plants. "The rabbits got in and ate it all... so we need the beds." (PG3, Interview)
- External support is crucial but must align with school schedules to avoid overwhelm: "Schools get busy and overloaded... having regular visits or contact kept us moving." (PG3, Interview)

Community/network gaps

- Limited connections with Indigenous communities: "it's hard to find the right contacts… "It would be great to involve local Indigenous knowledge in planting and monitoring." (PGT1 Interview)
- Identifies barriers to broader community participation: "We struggle with getting parent involvement in just things in general." (PG2, Interview)
- Securing further connections are for some a potential rather than a reality: "Other schools I know use parents who are really interested or really talented... There are resources out there that could be harnessed." (PScT, Interview)

Miscommunication Issues

- Highlights the need for clear communication between groups involved in the project. "The VCAL kids came in and were told to weed everything, and they pulled all our daisies up." (ST1, interview); "The informal email network is fine for now, but a structured community of practice could improve things." (PGT1 Interview)

Student Attrition

- High-achieving students often leave, impacting program continuity. "We tend to lose students to select entry schools like Nossal." (ST1, interview)
- Uneven engagement: "Some students are less engaged—mostly the ones who aren't into gardening." (PGT1 Interview)

Competing Interests

- "Clashing with other lunchtime activities like Dungeons and Dragons or craft workshops." (ST1, interview)
- Scheduling conflicts limit participation in external activities

Sustainability of Initiatives:

- "My fear... is that once the teacher who's running it moves on, it just falls away." (ST2 interview).
- Unpredictability of plant growth: "Three plants died in that one, and that was really interesting because the kids were like, 'Oh, that didn't work. Isn't that supposed to work?'" (PScT, Interview)
- Programs depend heavily on passionate teachers and risk discontinuation without institutional support: "It's been left to me because I'm passionate about it... but what happens when I'm gone?" (PGT1 Interview)
- Need for timeline or roadmap: "If there was a timeline handbook of, in the first month, we expect this to happen... to have a roadmap of what we hope to achieve." (PScT, Interview)
- Scaling up to expand Raising Rarity while maintaining its quality and depth poses logistical challenges: "You'd need to increase the staffing of the botanic gardens tenfold... to roll that out across the state." (ST2 interview).

FINDINGS - RBGV ORGANISATIONAL SETTING

This section of the technical report is organised into key quotes from the interviews with organisational staff. These quotes extend beyond the scope of the initial evaluation report, however are likely to be useful within the RBGV organisation for planning consideration in relation to internal benefits of the program and resourcing. This data could also be further analysed in future research outputs between the Monash evaluation team and the RBGV.

RBGV Organisational Management

"I think Raising Rarity is probably the strongest example of internal collaboration from teams right across the organisation." (CEO, RBGV, interview 1)

Structuring the program for sustainability

"We are working with a consultant to develop a business plan, which will set out more clarity in our next steps and what we can resource to achieve." (CEO, RBGV, interview 1)

"We've made it a bit more streamlined how effective is it being, and we are keeping the essence of what was so successful in getting the kids so engaged." (CEO, RBGV, interview 1)

"The scaling up does need to be achievable and structured so that's really the process we're going through at the moment." (CEO, RBGV, interview 1)

RBGV Education Team

"At the moment, we have the schools that have been involved, seeing the project as an engagement project. That's nice to have, and a nice affiliation with the Gardens, and really authentic. Lots of value in that." (Education Manager, RBGV, interview 1)

"We set up, depending on the school, at least two research beds… schools could be testing moisture levels across different beds to see the impact on flowering and growth of different species."(Education Manager, RBGV, interview 1)

Student-Centred Learning:

"I've loved the idea that with plants, you can literally get your hands dirty… students can engage directly with a threatened species."(Education Manager, RBGV, interview 1).

"Tash went to visit one of the schools… she just sat down in the middle of the classroom with eight kids around her, talking about how to enter data into the online system." (Education Manager, RBGV, interview 1).

"Relationships have been vital to the success of this project. Tash has built strong relationships with the teachers and students, and even knows individual students by name." (Education Manager, RBGV, interview 1).

"Raising Rarity is a hot topic, and everyone wants a slice at the moment. It's very helpful to get traction on every level... It's something unique to our organisation that schools can't easily replicate themselves." (Education team, RGBGV, interview 1).

On linking plant science to education: "I'm more having an approach where I interview the department heads like horticulture, ask them what they're doing, and then take that specialized knowledge to schools so the kids can experience it. It's about harnessing what's here that can't be found anywhere else." (Education team, RGBGV, interview 1).

On balancing flexibility and structure in the program: "It's flexible in terms of choosing plants specific to an area, or scaling tasks up or down for different age groups. But it's not flexible when it comes to starting and finishing the program. You have to align it with the school year to ensure engagement." (Education team, RGBGV, interview 1).

On sustainability and scaling challenges: "Our real bottleneck will always be the plant material. At this stage, we don't really have enough rare plants to go further than what we're doing, but it's possible to scale electronically with good materials and a strong platform." (Education team, RGBGV, interview 1).

On the Program's Interdisciplinary Nature: "Ben said, 'Oh, what about this project?' I kind of went yes, please. That is like I kind of describe it as my perfect Venn diagram of horticulture and education, and science and botany, all sort of coming together perfectly." (Schools outreach officer, RGBGV, interview 1).

On Inspiring Students and the Importance of Plants: "We try to garner some ideas about what kids think about what rare and threatened is. They can always pull up an animal, but they can never name a plant... I think that's the crux of the program: to raise awareness and inspire the next generation of scientists and conservation horticulturalists to think about plants more so in the forefront." (Schools outreach officer, RGBGV, interview 1).

On Hands-On Learning and Engagement: "The Species Discovery Day is a really good hands-on way of introducing them to the plant. They get to use microscopes, magnifying glasses, and actually work in the garden, dividing plants, potting them up, and taking them back to school. It's a really engaging, practical experience." (Schools outreach officer, RGBGV, interview 1).

On Building Relationships with Schools: "That rapport with seeing the same person and touching base about the same program really improves their experience. The kids knew my name the third time I visited, and they were more trusting and confident, which made the interactions so much richer." (Schools outreach officer, RGBGV, interview 1).

On the Impact of Raising Rarity: "I hope we are inspiring kids to think about the environment differently—to give them agency over some of it. I think it's empowering for them to have a genuine opportunity to do something meaningful for the environment." (Schools outreach officer, RGBGV, interview 1).

On the Program's Authenticity: "What's key about this program is that students get to work alongside real scientists and horticulturalists. It's not tokenistic. They see the actual science, and that authenticity is what makes it so valuable." (Schools outreach officer, RGBGV, interview 1).

Expanding the Program: "More plants in more places. That's kind of one of our catch cries. Schools could contribute significantly by planting local species suited for their environment. The program can make a real difference by raising awareness and care through kids." (Schools outreach officer, RGBGV, interview 1).

RBGV Science and Horticulture Teams

Program origins and philosophy:

"The mantra started it was, the plant first, then people later. So we always looked at the position of the plant and its distribution - again, it had to be a listed taxa." (Seed scientist, RBGV, interview 1).

"Raising Rarity was a combination of, one, some background that came from a PhD and two, a driving force from a personality that just was unstoppable, and that is [name of co-founder]." (Seed scientist, RBGV, interview 1).

"This program is about differentiation, not just in terms of going out but also integration coming back in. It's trying to develop a lifelong commitment to engaging with this, not just individually, but within communities." (Seed scientist, RBGV, interview 1).

"I think the beauty with the Raising Rarity is there's enough research behind it that we know what they're growing—yeah, there is death, plants die, and that happened at [Primary School 1]… but you know that happens. But the most important bit I found was that engagement with 'this is my local flora.'" (Seed scientist, RBGV, interview 1).

"We always put the plants first, and this is why it's been such an amazing program because I didn't really consider the kids to be honest. I love that they get the data and all that… but then I realized, we needed to flip it and consider what the kids need." (Seed scientist, RBGV, interview 1).

"For scalability, we need to work out a system that bypasses all the other responsibilities of day-to-day teachers… It's not fair on them to bear the brunt of extra tasks like photocopying data sheets." (Seed scientist, RBGV, interview 1)

"There's so much joy in this work—seeing what the kids do, how they interact, and how they start seeing the world differently. It's a real wake-up call for me, particularly at the primary school level." (Seed scientist, RBGV, interview 1)

"The idea of hubs is really powerful. You could have local hubs across bioregions in Victoria, where schools grow their local species, creating a network that connects students, communities, and conservation efforts." (Seed scientist, RBGV, interview 1)

"If we embedded this into the curriculum, especially at the primary level, it could be transformative—not as an add-on, but as a core way of teaching science, geography, and citizenship." (Seed scientist, RBGV, interview 1)

"We're not just growing plants; we're growing connections—to local ecosystems, to each other, and to the future of our environment." (Seed scientist, RBGV, interview 1)

"It was really organic... [horticulturist] came to me and said, 'oh, my god, you have to talk to Millie.' And we met at the front of the nursery, and I said, 'this is what we want to do—make these plants available for people.'"

Growth Through Collaboration: "It started as a passion project and a couple of people who really wanted to do something. We didn't necessarily start with a business plan—it's grown pretty organically over time."

"As far as Raising Rarity... it's blown up quite a lot and there's a lot of relationship building and outreach work that we do, not only with schools, but regional botanic gardens." (Horticulturist, RBGV, interview 1)

On Conservation Philosophy: "I think what it does for me is allows me to connect to people in a different way, you know, not full science all the time." (Horticulturist, RBGV, interview 1)

"I think the gardens have a history of being a bit elitist... I'm more interested in people being able to do that for themselves." (Horticulturist, RBGV, interview 1)

On Local Hubs:

"We're running a model in Sale where we're trying to turn their botanic gardens into a conservation hub, involving traditional owners and providing material for schools and local projects." (Horticulturist, RBGV, interview 1)

"Kids are not just raising money or doing something tokenistic. This seed is actually going back into the Victorian Conservation Seed Bank—it's genuine conservation." (Horticulturist, RBGV, interview 1)

Student Engagement:

"Some kids just want to learn how to grow plants; others nerd out on the data. It's cool that it caters for different kids." (Horticulturist, RBGV, interview 1)

"By the end of the program, the kids generally love these plants—they're their babies. They want to keep them alive and feed them." (Horticulturist, RBGV, interview 1)

On Failure as a Learning Opportunity:
"Things are going to die, and that's part of the scientific process. Understanding why and working through it is cool—it's part of the journey." (Horticulturist, RBGV, interview 1)

"I'm more interested in consolidating regions where multiple schools are growing the same species, rather than spreading out too thin." (Horticulturist, RBGV, interview 1)

Future Models:
"I'd like to see a mentor approach where older kids who've been through the program teach younger ones—it becomes self-perpetuating." (Horticulturist, RBGV, interview 1)

On Community Knowledge:

"We've underestimated the value of community. Some of these people have been walking the bush for 40 years—they know more than we do." (Horticulturist, RBGV, interview 1)

"I'm big on not making things too heavy. Climate change is real, but I frame it in a way that empowers kids to take action rather than overwhelming them." (Horticulturist, RBGV, interview 1)

"We've got something that the Zoo would absolutely love, and that's the capacity to take something home with you. You can't take a rhino home from the Zoo...but you can take a threatened species home, nurture it, and act for biodiversity outcomes." (Retired lead horticulturalist, RGBGV, interview 1)

"Raising Rarity looks like it's the blueprint model for engagement...it's about engaging a school community in the conservation of a local species. That's what zoos can't do." (Retired lead horticulturalist, RGBGV, interview 1)

"It started as a pure science project...about the traits of alpine wildflowers that might make them good for gardens. But it has evolved into schools outreach, home gardeners outreach, botanic garden outreach, and local government outreach." (Retired lead horticulturalist, RGBGV, interview 1)

"You look at the group and you go, one, two, three, four, five kids here that could be change agents into the future. It's beautiful—you can see the potential in front of your eyes." (Retired lead horticulturalist, RGBGV, interview 1)

The challenges of sustainability and resource heavy

"The current model is resource-heavy. It's unsustainable. For Raising Rarity to grow, it needs to be resourced properly and become self-sustaining." (Retired lead horticulturalist, RGBGV, interview 1)

"How do you democratize it? That's one of the challenges. It can't just be a niche program that only certain schools get to do—it has to be accessible and equitable." (Retired lead horticulturalist, RGBGV, interview 1)

"The power of the program is the face-to-face interaction with a plant scientist and horticulturist. The chemistry that happens between people is invaluable." (Retired lead horticulturalist, RGBGV, interview 1)

Grassroots and community approach

"Raising Rarity didn't happen because of the organization—it happened because of two people, Millie and Ray. It was passion-driven, grassroots. That's both its strength and a risk for sustainability." (Retired lead horticulturalist, RGBGV, interview 1)

"Regional botanic gardens and Friends groups could play a much bigger role in supporting and expanding this program. It's an untapped resource with huge potential." (Retired lead horticulturalist, RGBGV, interview 1)

"The Friends groups are a lovely conduit into the community. They have heaps of time, heaps of knowledge, and they're an intergenerational link—an untapped resource for scaling this program." (Retired lead horticulturalist, RGBGV, interview 1)

On education and the long-term impact:

"The beauty of the project is that kids don't just learn—they experience it. They learn to nurture, to measure, to care for a living plant. That connection is powerful and potentially life-changing." (Retired lead horticulturalist, RGBGV, interview 1)

"Even with challenges, it's clear this program could have a lasting impact. You're not just planting a seed in the ground; you're planting a seed in these kids' minds that could grow into something extraordinary." (Retired lead horticulturalist, RGBGV, interview 1)

"There was one particular student in year 7 who just took it on board, was so engaged, and even led the group at times. That was the moment I realized this program could really change the direction of someone's life." (Horticulturist Matt, RGBGV, interview 1)

"The best thing about the project is that we actually release the reins and say, 'Now it's up to you.' It gives students a sense of responsibility and control, which makes them feel valued." (Horticulturist Matt, RGBGV, interview 1)

“This program is unique because it doesn’t end when you leave the garden. It’s ongoing, and students take responsibility for monitoring and caring for the plants.” (Horticulturist Matt, RGBGV, interview 1)

“It’s a tangible way for students to contribute to conservation, rather than just learning about the issues.” (Horticulturist Matt, RGBGV, interview 1)

“The plants aren’t just abstract learning tools; they’re local species, and the idea of ‘helping it come back’ resonates with students.” (Horticulturist Matt, RGBGV, interview 1)

“The seasonal nature of Victorian plants is a challenge—most seed during summer holidays when engagement is low.” (Horticulturist Matt, RGBGV, interview 1)

“Scaling the program could involve introducing more challenging species for older students, giving them a deeper sense of achievement and learning.” (Horticulturist Matt, RGBGV, interview 1)

“The opportunity to plant in local reserves or parks would be a great way to expand the community connection and give students a visible reminder of their contribution.” (Horticulturist Matt, RGBGV, interview 1)

“This program is unique within our organisation. It’s one of the few times we’ve seen strong collaboration across departments, with horticulture and education working closely together.” (Horticulturist Matt, RGBGV, interview 1)

“It’s inspiring to see how other departments work. After one discovery day, I told Tash, ‘I’m exhausted, but I’m so impressed you do this every day.’” (Horticulturist Matt, RGBGV, interview 1)

“The program could have a traffic light system—starting with easy plants and progressing to more challenging ones over time, so students grow with the project.” (Horticulturist Matt, RGBGV, interview 1)

“For me, the ideal future is where the schools program becomes self-sufficient, and my role is advisory because it’s grown so much.” (Horticulturist Matt, RGBGV, interview 1)

OUTCOMES FROM THE CO-DESIGN CURRICULUM WORKSHOP

The preliminary findings from the interviews were presented to a selection of teachers and RBGV staff at a co-design workshop for consideration and discussion. A key stage of the workshop employed the World Café methodology, which is a flexible and effective approach for facilitating large group dialogues. The format is designed to create a welcoming environment conducive to open, relaxed discussions. The process of a World Cafe workshop typically takes place at small round tables with four to five participants, fostering a café-like atmosphere. The host introduces the World Café process, sets the context, and ensures participants feel comfortable. Conversations are structured in multiple rounds, with participants moving between tables to share ideas and insights. Each round begins with a question aligned to the event’s purpose, and insights are shared in a final "harvest" phase, often captured visually.

The RR World Cafe was structured around three tables: Curriculum, Organisational and Community Links. The findings from each table’s discussions are grouped below.

1. Curriculum

The curriculum’s role in Raising Rarity is multifaceted and participants emphasised the adaptability, inclusivity, and collaboration to maximize its impact across schools. Participants highlighted the challenges of aligning the program's plant cycle with the school calendar, suggesting that starting at the beginning of the year and integrating it into the curriculum or co-curricular activities could offer greater flexibility. Unlike traditional excursions to zoos, this program provides practical, hands-on experiences that align seamlessly with the Australian Geography curriculum and STEM education, appealing to diverse student abilities. It fosters inclusivity by engaging students from special education programs in outdoor, experiential learning while offering extension opportunities for high-achieving students. Teachers noted that the program's low-threshold entry mitigates behavioural issues, making it accessible and transformative for all learners.

A club-based model was proposed to sustain student-led initiatives through mentoring, with secondary students supporting primary counterparts, thereby ensuring continuity and building leadership skills. For younger students, the program could start with basic activities like plant care in Year 2 and progress to more advanced projects in Years 4-6. The program offers opportunities to explore scientific concepts such as soil composition, taxonomy, propagation techniques, and experimental setups like varying soil conditions or mulch types. Participants also emphasized leveraging community spaces like shopping centres or public events for displays and presentations to raise awareness and expand outreach.

To enhance program structure, a tiered model could guide participation. For instance, a STEM pre-visit unit might teach foundational science techniques, followed by Royal Botanic Gardens workshops, ongoing voluntary monitoring, and experiments like growing species under different conditions. The cycle would culminate in a celebratory seed harvest handover event, where students experience the tangible impact of their efforts, fostering a sense of achievement. A “pass-the-baton” model for knowledge transfer, where older students mentor younger peers, would ensure program

sustainability and deepen engagement. Advanced tiers could challenge schools to restore entire ecosystems or take on new species, creating opportunities for value-adding projects outside traditional school settings. Presentations, such as mini-symposia, interschool competitions, or public expos, would further enhance communication skills and highlight the program's broader significance.

2. Organisation

The World Cafe generated a range of positive discussions regarding the potential of RR for the RBGV. A key finding was the importance of keeping plants at the heart of the project and focusing on getting the plant species delisted from the Federally and State endangered plant species list. Discussions surrounding the organisational perspective considered the capacity for RR to:

- Contribute significantly to a seed bank of Federally and State listed endangered plant species (and potentially have them delisted) through gathering the seeds,
- Through the data collection, foster and grow the phenological knowledge of the life cycle of endangered plants, increasing our understanding of when plants might flower, produce seeds etc. in particular areas,
- Educate students and the public about the endangered species specific to their area,
- Teach students (and potentially the wider community) the skills and techniques to plant, grow and harvest the seeds from endangered species specific to their area,
- Create a positive action that students and the public can 'do' in the face of climate change and the impact it is having on our environment,
- Generate income, through an initiative structured in a similar manner to the Food For Everyone Project that is a collaboration between an artist and renowned chef. It could be that a similar model but with renowned or local artist or student/ class artwork collaborates with scientists and horticulturalists or local expert on a species. This would take RR beyond schools

The organisational discussions also considered the challenges of data collection by students and schools, and the quality scientific information required for the programme. Through these discussions, it was established that some data is better than no data, at the very least. The collection of data with schools is very much a dynamic part of the project and a work in progress to understand what works best in the different school settings as time dedicated to this science communication task requires field measurements followed by filling in either an electronic template or hard copy. Some schools are finding it difficult to get the final communication of the data back to us challenging so having some user experience expertise to help to design this process to minimise effort and time for teacher and schools would be beneficial.

This touches on the broader discussion regarding the role of Botanic Gardens as a public institution in general: is the primary purpose of botanic gardens to be conservators (leading the fight against extinction and primarily undertaking the work themselves) or an educational institution (teaching the public how to fight extinction, therefore guiding others as to how to undertake the work)? Embedded in this conundrum is the challenge as to whether it is better to be an institution that does exceptional scientific research and work that is largely 'unseen' by the public or a much more public facing institution that does good work that engages more with the wider community. These considerations essentially relate to impact, and through the co-design discussions it was agreed that there is significant potential for RR to increase its impact, particularly when it is conceived of as more than a side project. The Zoos Victoria 'Fighting Extinction Schools Program' is a powerful example where this has been a successful shift towards impact.

3. Community

The World Cafe activity discussions about community provided a range of suggestions about how Raising Rarity has been linked to community so far and ideas for further potential in the future. The discussion centred around existing organisations, departments and businesses that can connect to the schools project for different purposes including:

- Resourcing materials for the garden beds (e.g. local nurseries and Bunnings)
- Providing expert plant knowledge - i.e. who in the community knows about plants?
- Funding potential - to upscale and sustain the program
- Celebrating the program with story-sharing, visibility and media
- Connecting to existing networks, resources and conservation efforts
- Recruiting new teachers and schools to be involved in the program and share ideas.

The range of different types of community groups were categorised into the following clusters:

- Ecologists Environmental Management
- School networks, leadership CEO DET
- Environmental education organisations
- Quiet Community Members and potential volunteers and the retired demographic
- Philanthropic (business, nurseries, retail, developers, consultants, mining)
- Local gov, state national / politicians departments.

- Health wellbeing care gardens
- Indigenous groups (KESO, hands on Marrung 2016-2026)
- Tertiary, vocational
- Land - prisons, community gardens, community groups, aged care.

SPHERES OF INFLUENCE ON THE PROGRAM - RISKS AND OPPORTUNITIES

While RR faces similar challenges to other conservation-focused schools outreach programs in Victoria schools across the state, the evaluation has shown it has the dual potential to both *dissolve* and *'leap frog'* typical barriers through the program's focus on *mentoring, sustained local participation* in the plant life cycle, *the bioregion hub model of local connections and activities*, and careful consideration of its '*spheres of influence*', particularly in developing the program beyond the pilot phase via its links to local gardens and communities. We have mapped out a table of 'spheres of influence' for each key partner in the program. This is useful to identify overlaps and strategies for moving forward. Analysis of the evaluation data suggests key possibilities for a 'spheres of influence'-based development of RR, including: (a) activating its links with groups like the Friends of the Gardens, (b) a focus on Victoria's bioregions and establishing links with Custodians of Country, and (c) media/communication strategies that identify synergies with existing outlets/activities, e.g. Gardening Australia Junior, Nature Stewards, Scouts, etc. In some schools, the RBGV sphere of influence to schools was noted for its role as an esteemed institution. The reputation provided gravitas for leverage of school leadership to run the program. This was especially the case for the Private schools who participated in the evaluation.

School sphere of influence			**RBGV sphere of influence**	**Both School & RBGV**	**Less certain elements**	**Ongoing possibilities**
Requires a dedicated person/s (enthusiastic, passionate champion… or delegated person)	Diverse learners	Emotional connection, responsibility and care	Expertise from the RBGV, partnership, institutional kudos	Indigenous community and organisational relationships	Community and local business involvement	Friends of the gardens
Fits within small to large school structure	Primary or Secondary school contexts	Student knowledge and skills (e.g. Latin names, plant cycle, conservation practices, removing aphids,)	Synergy across divisions, horticulturalists, scientists and educators working together	Regular and sustained engagement throughout the year.	The extent of conservation efforts (data, education and awareness, …)	(Bio)regional Tertiary and TAFE employment pathway information/ inspiration links
Outdoor learning, nature based approaches	Multiage or select group	Scientific skills (e.g. equipment and data collection)	"Personal touch"/ collaboration with RBGV staff, program integrity	Community of practice, network	Impact on student careers (post-secondary pathways, volunteering)	Collaborators and partners? E.g. DET, Schools Principals,
Student interest group, volunteers, whole class activity, whole school activity	Student ownership? Intrinsic motivation	Curriculum integration, science, leadership, STEM, literacy, wellbeing,	Ongoing communication and collaboration with schools and external partnerships (e.g. climate change alliance of botanic gardens, Plants management Australia)	Long term implementation , Scaling up the project?	Parents involvement/ awareness (monitoring plants in holidays, community planting days, expertise)	Other models (e.g. citizen science, SAKGF, Nature Stewards)?

Hands on learning	Biodiversity awareness	Time and staffing = scope within school	Local government and commercialisation aspects	Data collection quality	Planting initiatives beyond the species seed cycle (in the school or community)	Media, Strategy (e.g. Gardening Aus Jnr.)
Infrastructure (existing garden beds, donations)	Dedication of school grounds to the project and protection of the space	School grounds staff/horticulturalists involved	Potential links to donors/Local Council for supply of equipment or materials	Longevity (staffing and executive support for project)		

Table 3. Spheres of influence of RR Schools Program

DISCUSSION AND CONSIDERATIONS

CONCLUSION

The evaluation of the Raising Rarity (RR) Schools Conservation Program reveals a transformative and multi-faceted educational initiative that effectively integrates biodiversity conservation, hands-on science, communication and horticultural education combined with community engagement. The program's unique focus on plant conservation, specifically the cultivation and care of at-risk species local to a school's bioregion, distinguishes it as a leading model for place-based, ecocentric education in schools.

Key Findings

1. **Integration of Expertise**
   The program thrives on the collaboration between seed ecologists, horticulturalists, and educators, effectively bridging pedagogy and conservation science. As one RBGV seed ecologist noted, "There's something about working with the kids... there's so much joy in it. They keep it real for sure." This partnership fosters a shared sense of purpose and responsibility for biodiversity preservation.
2. **Empowering Participatory Learning**
   By involving students in activities such as planting and monitoring endangered species, the program cultivates ecological literacy, scientific skills, and stewardship. One teacher observed that students take pride in their work, saying, "Now you drink extra water, my plant," while another noted, "Students were given control… [and] took responsibility for planting, monitoring, and tracking progress." Such hands-on experiences deepen engagement and counter phenomena like "nature deficit disorder" and "plant blindness."
3. **Community and School Partnerships**
   RR strengthens links between schools, local and school communities, and the Royal Botanic Gardens Victoria (RBGV). Teachers highlighted the value of this relationship, with one remarking, "The link to the Botanic Gardens… provides a bit of gravitas. Schools value and want to showcase this on their social media." These partnerships also create inclusive opportunities, such as conservation groups supporting neurodiverse students, offering them "a really positive outlet at school."
4. **Scalable and Sustainable Design**
   The program's bioregional approach, involving local hubs, offers a scalable model that leverages local expertise and ecosystems. Schools' engagement with the plant life cycle ensures sustained conservation actions. One secondary teacher described it as "a really practical way that our students can get involved in conservation… It's more beneficial than just doing a sausage sizzle and donating money."
5. **Cultural and Emotional Resonance**
   The program fosters empathy, care, and emotional connections with nature. Students' active participation inspires pride and ownership, with some noting, "We've named our plots, and seeing them grow makes us proud." The integration of Indigenous approaches further enriches the program by embedding cultural and ecological knowledge.
6. **Curriculum Integration and Student Impact**
   RR aligns with STEM (with a focus on numeracy and science communication), literacy, and wellbeing frameworks, while offering students a lens into scientific careers. One teacher remarked, "This project gave our students the opportunity to see what they could do after high school. They loved connecting with real scientists and felt part of something bigger."

Challenges and Opportunities

While the program demonstrates immense potential, several areas for development were identified:

- **Resource Intensity**: Scaling up will require additional funding, staffing, and resources, particularly for creating starter packs, bioregion clusters, and tiered involvement models.
- **Communication and Messaging**: Tailored messaging strategies for diverse stakeholders—including schools, funders, and the broader community—are critical for long-term recognition and support.
- **Spheres of Influence**: Mapping and activating partnerships with community groups, Local Government Area Councils, government departments, sustainability education networks, local businesses, and media outlets can expand the program's reach and impact.
- **Indigenous Engagement**: Strengthening relationships with First Nations communities can ensure culturally responsive and richer conservation practices.

Recommendations

1. **Develop a Scalable Model**: Implement a hub-based structure to distribute expertise across bioregions and engage local stakeholders and regional gardens.

2. **Enhance Educational Resources**: Create a Raising Rarity Starter Pack to support teachers with curriculum integration, tiered participation options, and clear conservation milestones. This starter pack could also be a proposition for school leaders unsure about the details of the program, or how it will fit into their existing context.
3. **Promote Recognition and Sustainability**: Introduce awards, badges, and a tiered involvement system to incentivise participation while building a network of ambassador schools. There are opportunities for program commercialisation, school option packs and branding of the program.
4. **Strengthen Media Strategy**: Utilise digital storytelling, podcasts, and community-driven narratives to amplify the program's reach and appeal. This could be newly established, or connect to existing initiatives within the RBGV such as Sonica Botanica.
5. **Foster Research and Development**: Pursue collaborative research opportunities to document, translate and refine the program and secure funding for long-term sustainability.

FINAL REFLECTIONS

The Raising Rarity program exemplifies how education can address urgent environmental challenges by embedding conservation into the daily lives of students and communities. It combines the joy of hands-on learning with the rigor of scientific inquiry, empowering students to actively contribute to climate action. As one participant eloquently put it, "You can take a seedling home. That simple act makes it real." By scaling its reach and refining its model, Raising Rarity holds the potential to become a cornerstone of conservation education across Victoria and beyond.

MONASH University

REFERENCES

Ajaps, S., & Forh Mbah, M. (2022). Towards a critical pedagogy of place for environmental conservation. *Environmental Education Research*, 28(4), 508–523. https://doi.org/10.1080/13504622.2022.2050889

Ardoin, N.M., Reid, A., & Bowers, A. (2024). What works in environmental education: Findings from eeWORKS. Report presented at NAAEE Annual Conference, Pittsburgh, 6 November.

Ballard, H. L., Lindell, A. J., & Jadallah, C. C. (2024). Environmental education outcomes of community and citizen science: a systematic review of empirical research. *Environmental Education Research*, 30(6), 1007-1040. https://doi.org/10.1080/13504622.2024.2348702

Blue, S., Hargiss, C. L. M., Norland, J., Dekeyser, E. S., & Comeau, P. (2023). Plant blindness represents the loss of generational knowledge and cultural identity. *Natural Sciences Education*, 52, e20106. https://doi.org/10.1002/nse2.20106

Brkovic, I., Sanders, D., & Nyberg, E. (2024). Investigating plant awareness: Methodologies, challenges and possibilities. *Plants, People, Planet*, 1–9. https://doi.org/10.1002/ppp3.10604

Daniel, J., Russo, A. & Burford, B. (2023). How might we utilise the concept of botanic gardens' in urban contexts to challenge plant blindness?. *Biodiversity Conservation*, 32, 2345–2364. https://doi.org/10.1007/s10531-023-02607-w

Dünser, B., Möller, A., Fondriest, V., Boeckle, M., Lampert, P., & Pany, P. (2024). Attitudes towards plants – exploring the role of plants' ecosystem services. *Journal of Biological Education*, 1–15. https://doi.org/10.1080/00219266.2024.2308293

Fox, H., & Cundill, G. (2018). Towards increased community-engaged ecological restoration: A review of current practice and future directions. *Ecological Restoration*, 36(3), 208–218. https://doi.org/10.3368/er.36.3.208

Hirst, M. J., Arnott, J., & Larke, R. A. (2022). Raising Rarity: creating meaningful and sustainable conservation outcomes through community-based outreach. *Sibbaldia: The International Journal of Botanic Garden Horticulture*, (22). https://doi.org/10.24823/Sibbaldia.2022.2000

Keith, R. J., Given, L. M., Martin, J. M., & Hochuli, D. F. (2022). Urban children and adolescents' perspectives on the importance of nature. *Environmental Education Research*, 28(10), 1547–1563. https://doi.org/10.1080/13504622.2022.2080810

Leonard, K. (2024). Decolonizing botanical gardens. *Qualitative Research Journal*, 24(5), 536-554. https://doi.org/10.1108/QRJ-04-2024-0086

Linderwell, S., Hargiss, C. L. M., & Norland, J. (2024). Do demographic factors impact plant knowledge and plant awareness disparity? *Natural Sciences Education*, 53, e20146. https://doi.org/10.1002/nse2.20146

Méndez-Herranz, M., & Cabello, V. (2024). Learning biodiversity care in everyday life: teacher education in contrasting biocultural contexts. *Environmental Education Research*, 1-20. https://doi.org/10.1080/13504622.2024.2370998

Obura, D. (2023). The Kunming-Montreal Global Biodiversity Framework: Business as usual or a turning point? *One Earth*, 6(2), 77-80. https://doi.org/https://doi.org/10.1016/j.oneear.2023.01.013

Rae, D. (2013). Botanic Garden Horticulturists: A Threatened Species?. Sibbaldia: *The International Journal of Botanic Garden Horticulture*, 11, 5-14. https://doi.org/10.24823/Sibbaldia.2013.47

Renshaw, P., & Tooth, R. (Eds.). (2017). Diverse pedagogies of place: Educating students in and for local and global environments. Routledge: London.

Rickinson, M., Hall, M., & Reid, A. D. (2016). Sustainable schools programmes: what influence on schools and how do we know? *Environmental Education Research*, 22(3), 360 - 389. https://doi.org/10.1080/13504622.2015.1077505

Sanders, D. L., Ryken, A. E., & Stewart, K. (2018). Navigating nature, culture and education in contemporary botanic gardens. *Environmental Education Research*, 24(8), 1077-1084. https://doi.org/10.1080/13504622.2018.1477122

Sanders, D., Nyberg, E., & Brkovic, I. (2024). Putting plants in the picture. *Environmental Education Research*, 1–10. https://doi.org/10.1080/13504622.2024.2391094

Stagg, B. C., & Dillon, J. (2023). Plants, education and sustainability: rethinking the teaching of botany in school science. *Journal of Biological Education*, 57(5), 941–943. https://doi.org/10.1080/00219266.2023.2264617

Stagg, B. C., & Dillon, J. (2024). Plants and the Kunming-Montreal global biodiversity framework: educational approaches to support pro-conservation behaviours. *Journal of Biological Education*, 1–19. https://doi.org/10.1080/00219266.2024.2332728

Stagg, B. C., Hetherington, L., & Dillon, J. (2024). Towards a model of plant awareness in education: a literature review and framework proposal. *International Journal of Science Education*, 1–21. https://doi.org/10.1080/09500693.2024.2342575

Yemini, M., Engel, L., & Ben Simon, A. (2023). Place-based education–a systematic review of literature. *Educational Review*, 1-21. https://doi.org/10.1080/00131911.2023.2177260

Vera, F. (2010). The shifting baseline syndrome in restoration ecology. In Restoration and history (pp. 116-128). Ed. Marcus Hall. New York: Routledge.

APPENDICES

Co-design workshop Overview

1. Present initial themes from the Monash Raising Rarity evaluation
2. Generate ideas for how the Raising Rarity schools program can be (re)configured into the future
3. Mapping recommendations of pathways for the educational quality and sustainability of Raising Rarity

Table Prompts

Curriculum | How can Raising Rarity be (re)configured in schools in the future?

1. What are the different "thresholds" or "tiers" of involvement/ scope that schools could have with the Raising Rarity project and what would it take to be involved at each level?
2. What are the different thresholds of learning (knowledge, values and skills) that teachers and students can achieve with the raising rarity program? (conservation, care, health, STEM).
3. How can the program be inclusive for all types of learners?

Organisational | What would make Raising Rarity core business for the RBGV by 2030?

RBGV CEO - "it's not just more botanical knowledge (the herbarium team), there is a widespread shift to conservation as part of botanical gardens into the future"

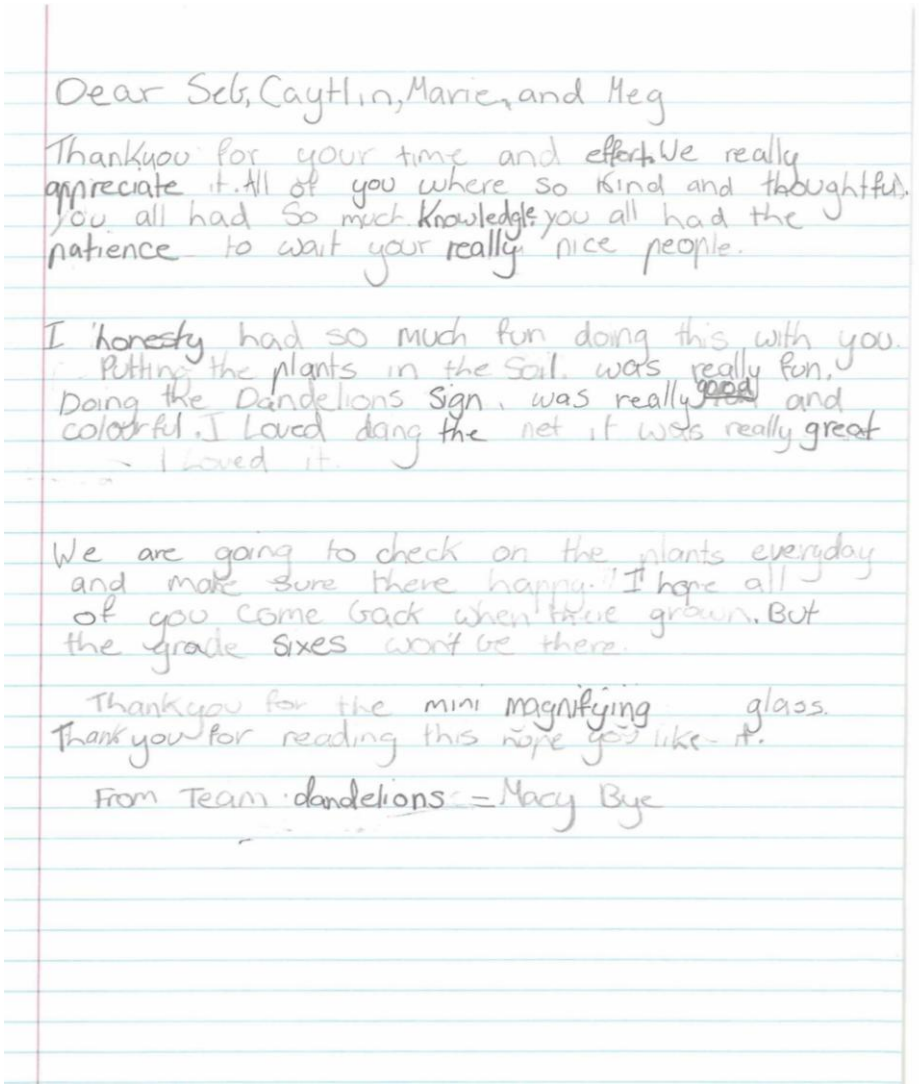
1. What contribution to science and conservation can the RR schools' program (really) contribute?
2. Challenge: "it's resource heavy": i.e. scientists, horticulturists, educators visiting schools
    a. How to make the project sustainable for the RBGV team?
    b. What are the benefits internally to the RBGV to have this inter-department collaboration?

Community | What are all the possible community spheres of influence Raising Rarity can leverage?

1. Map all the possible connections for the RR program in the community.
    a. What role can schools play in these?
2. What does community conservation success look like for Raising Rarity in the future?
3. What does success look like from the perspective of the schools, parents, and community members involved? How can we ensure their voices are central in defining success?

Image 1: Co-design Workshop, October 2024, Cranbourne Royal Botanic Gardens

Image 2. Billy Buttons mural at Lead Regional Hub School



Dear Seb, Caytlin, Marie, and Meg

Thankyou for your time and effort. We really appreciate it. All of you where so kind and thoughtful. You all had so much knowledge you all had the patience to wait your really nice people.

I honesty had so much fun doing this with you. Putting the plants in the soil was really fun, Doing the Dandelions sign was really ~~good~~ and colourful. I Loved doing the net it was really great I loved it.

We are going to check on the plants everyday and make sure there happy. I hope all of you come back when they've grown. But the grade sixes won't be there.

Thankyou for the mini magnifying glass. Thank you for reading this hope you like it.

From Team dandelions = Macy Bye

Image 3. Sample letter to the RBGV team from Gippsland lead school in 2023

GLOSSARY

Example glossary term insert definition of term

MONASH University

Further information

Monash University
Wellington Road
Clayton, Victoria 3800
Australia

T: +61 3 9905 2801
E: rosie.welch@monash.edu

monash.edu.au

Monash University
Wellington Road
Clayton, Victoria 3800
Australia

T: +61 3 9905 2801
E: rosie.welch@monash.edu

monash.edu.au

CRICOS provider: Monash University 00008C