

BIODIVERSITY,
CLIMATE &
COMMUNITY
SENSITIVE
URBAN DESIGN &
IMPLEMENTATION

GLEN JUNOR - AUGUST 2020
www.glenjunor.com.au



ABOUT ODONATA

LEADERS IN REGENERATIVE BIODIVERSITY

Odonata is a not-for-profit entity supporting biodiversity impact solutions. Founded in 2017 by Nigel Sharp, we create, support, nurture and empower businesses and entrepreneurs to move towards a more environmentally sustainable world.

Healthy biodiversity, including our soils, is critical to our daily lives and long term survival. Demonstrating the economic benefits of investing in biodiversity, a more sustainable planet where people can thrive will be created, which will greatly benefit humankind. Business is a major tool for positive biodiversity, climate and social impact, and key to inspiring Australians to live a healthy life in harmony with nature.

As a biodiversity and threatened species manager, innovator and advisor, Odonata has the know-how and networks, including the leading global impact investment funds. Our knowledge, trust and reputation have led to strategic collaborations with universities, businesses and NGOs – delivering outstanding results.

Our role at Glen Junor is to advise on biodiversity, climate and community solutions, and critically, to use our expertise in these areas to see their successful implementation within the future community of Glen Junor.

Acknowledgement:

Odonata acknowledge the Traditional Owners of the land on which we live, learn and work. We pay our respects to their Elders past, present and emerging.



***“Designing and delivering neighbourhoods in harmony with our natural systems is essential for vibrant, healthy urban environments and for humanity” - Nigel Sharp
(Odonata Founder & Executive Chair)***

CONTENTS

1.0 Introduction	4
2.0 Biodiversity	6
Understanding Glen Junor's Indigenous History & Existing Habitat & Species	7
Embedding Nature within the Urban Landscape Through Biodiversity Sensitive Urban Design	8
Glen Junor's Biodiversity Ambassador Species	9
Urban Pocket forests at Glen Junor	10
The Benefits of Human-Nature Interaction in Everyday Life	11
Threatened Species Conservation at Glen Junor	11
3.0 Climate	12
Understanding Climate Change at Glen Junor	13
Building a Resilient Climate Proof Community Through Nature Based Solutions	14
Combining WSUD with BSUD	14
4.0 Community	15
Creating a Sustainable Culture within Community	16
Connecting Community Through Landscape	16
Connection to Community Through Shared Community Spaces	17
5.0 Conclusion	18
6.0 Odonata Team Members	20



1.0 INTRODUCTION

INTRODUCTION

Glen Junor is a world class, contemporary, sustainable neighbourhood. It is immersed in nature, and is destined to become an international benchmark for healthy, inclusive and sustainable living. It is a visionary concept for a new, exemplary peri-urban residential community closely connected to Gisborne in the Macedon Ranges. Glen Junor will be a vibrant and inclusive community shaped by a strong connection to and understanding of the region, as well as a commitment to social and environmental sustainability.

This report highlights the key pillars of **Biodiversity, Climate and Community** at Glen Junor. Information from ICON Science's 'BSUD @ Glen Junor' report and the 'Glen Junor Community Vision' has been used, to outline how these elements will be implemented and importantly, embedded, into the core vision of Glen Junor. These documents can be found at www.glenjunor.com.au.

Key to this vision is the proposed 50% Biodiversity and Community Space contribution, where half of the developable area of Glen Junor will be reserved for spaces that both people and nature can enjoy and thrive in. This is a world leading initiative, setting a new benchmark for healthy, sustainable and biodiverse community living. It is critical to acknowledge that biodiversity, climate and community within Glen Junor are not thought of as three separate concepts, but are interrelated. This is key to creating a truly thriving community at Glen Junor, where residents and visitors alike can experience this world class setting of sustainable living.



“The truly integrated approach of embedding biodiversity, climate resilience and community as core features of Glen Junor, will ensure residents discover a real sense of belonging”



The Glen Junor Vision



2.0 BIODIVERSITY

UNDERSTANDING GLEN JUNOR'S INDIGENOUS HISTORY & EXISTING HABITAT & SPECIES

Understanding the ecological context of Glen Junor, is a critical component when developing and implementing the Biodiversity Sensitive Urban Design Strategy for the site. Without this knowledge and understanding, initiatives can be misplaced, fragile ecosystems placed at risk and most critically, the benefits seen from incorporating biodiversity at the forefront of design would be limited. Therefore this places site context at the forefront of Glen Junor's design initiatives

INDIGENOUS HISTORY

The Gisborne area has a rich Indigenous history, with evidence of more than 26,000 years of existence in the region. The connection to Country, the understanding of the land and most critically the care for both flora and fauna demonstrated over thousands of years by these first nations people within the area, are deep-seated factors that must be acknowledged, respected and celebrated, particularly when looking to incorporate biodiversity as a leading theme flowing through the Glen Junor development. The area where Glen Junor lies is Wurundjeri Country, where the Traditional Owners travelled along water ways throughout the area, managing the landscape, highlighting how to best live harmoniously with the existing surroundings, habitat and ecosystems. Acknowledging this history and importantly celebrating it, is a critical component of the BCCSUD strategy. This strategy is aimed to provide a strong connection to the culture and learnings for the present and future generations, that were seen for thousands of years within and around Glen Junor.



Plains Grassy Woodland



Black-Chinned Honeyeater

EXISTING HABITAT & SPECIES

In the ecological survey, conducted by Practical Ecology (2018), three key ecological vegetation communities were identified on site, all of which are considered endangered. These included Plains Grassy Woodland, Plains Sedgy Woodland and Riparian Woodland. This vegetation, though largely degraded due to the extensive on site grazing history, provides critical habitat to some of Victoria's most endangered species. Understanding these ecosystems is vital to ensuring effective strategies are put in place to preserve, enhance and promote them within the development, as well as ensuring the successful conservation and advancement of the animals that rely upon these habitats. Identifying "Biodiversity

Ambassador Species" is a strategy that not only provides the community with a species they can form an attachment to, putting a face to Glen Junor's biodiversity story, but also helping inform the design of the landscape and built form. Different interventions also allow for the promotion of the ambassador species. Glen Junor's ambassador species is the Black-Chinned Honeyeater. This bird, native to Gisborne, is a distinctive species, that adds vibrancy and colour to it's surrounds. It will also be a symbol of Glen Junor's commitment to promoting biodiversity and conservation within its community.

PROFILE

BEHAVIOUR & PERSONALITY

- Feeds in groups of 12 on nectar, insects & seeds
- Active, gregarious & inquisitive
- Flits from perch to perch, often hanging precariously upside down

LOOK

- Average size, 15cm
- Medium & stocky, short tail
- Black head, golden shoulder, black chin & bright blue above eye

BREEDING & HABITAT

- Co-operative breeding
- Builds a 'woolly', cup-shaped nest. Tending to choose pale colours for nesting material
- Lives in Box & Ironbark Eucalyptus and Bloodwoods, near waterways. Moves seasonally.

"Distinctive, memorable and likeable, the Black-Chinned Honeyeater is a symbol that has the potential to make people think about their actions towards living sustainable lives."

EMBEDDING NATURE WITHIN THE URBAN LANDSCAPE THROUGH BIODIVERSITY SENSITIVE URBAN DESIGN

Biodiversity sensitive urban design (BSUD) is an alternative way of planning and designing new development, looking to incorporate biodiversity into the core fabric of the urban sphere. Historically areas of biodiversity value within a site are seen to hinder development, however with BSUD, biodiversity is viewed as an asset and is enhanced and celebrated on site. Glen Junor provides an opportunity to not only highlight BSUD in practice, but also to deliver a net gain in biodiversity, through higher levels of on-site biodiversity than what existed pre-development. This will ensure the protection of existing vegetation and habitats, as well as the creation of new habitat, further strengthening on site local ecology.

Key to implementing successful BSUD throughout Glen Junor is the proposed Biolinks habitat corridor, flowing throughout the site. These corridors will provide a passage of refuge for local wildlife, providing them with regenerated habitat to be able to seek shelter, as well as forage within. They will also allow for greater species movement throughout the site, connecting fragmented habitat patches, further enabling the promotion of on-site biodiversity.

Creating habitat within the built areas and community open spaces will also be vital to effectively enabling nature to thrive within Glen Junor. Ensuring street planting mimics the layers of nature is a simple step that will provide great biodiversity benefits. In particular, not neglecting the vital shrubs and bushes, which are often not considered in conventional planting schemes, is vital, as these plants provide essential habitat for small native birds, who rely on this vegetation for shelter. Preserving important remnant vegetation on site will also be critical to ensuring a net gain in on site habitat in the building of Glen Junor.

Community gardens and agriculture spaces also have a critical role to play in securing and promoting on-site biodiversity. Flowering plants and grasses are important habitat for pollinator species. These spaces will provide not only a large variety of flowering species, but will also give the community hands on experience of positively influencing habitat restoration, through the actions of gardening and caring for these plants. These spaces will create living 'cues to care' which are important for ongoing biodiversity engagement, further immersing people in their natural surrounds.

Document Biodiversity Values

Native plants & animals, incl threatened.
Landscape context, including geological & hydrological features, spatial arrangement, and connectivity.
Potential threats to biodiversity.



Identify Biodiversity Objectives

Maintain or improve viability of threatened species & ecosystems.
Opportunities for rewilding.



Identify BSUD Actions

Considering 5 principles for BSUD.
Seek solutions that address biodiversity & development objectives.
Address key threats to biodiversity



Assess BSUD

Assess the contribution of BSUD using appropriate metrics: Population viability, occupancy, abundance.
Use tools such as PVA & expert elicitation.



Decide

Determine BSUD that best meets biodiversity & development objectives.
Manage trade-offs between objectives using tools such as: Project Prioritisation Protocol and participatory approaches



Identify Development Objectives

Building & infrastructure requirements.
Population & dwelling targets.
Liveability targets.



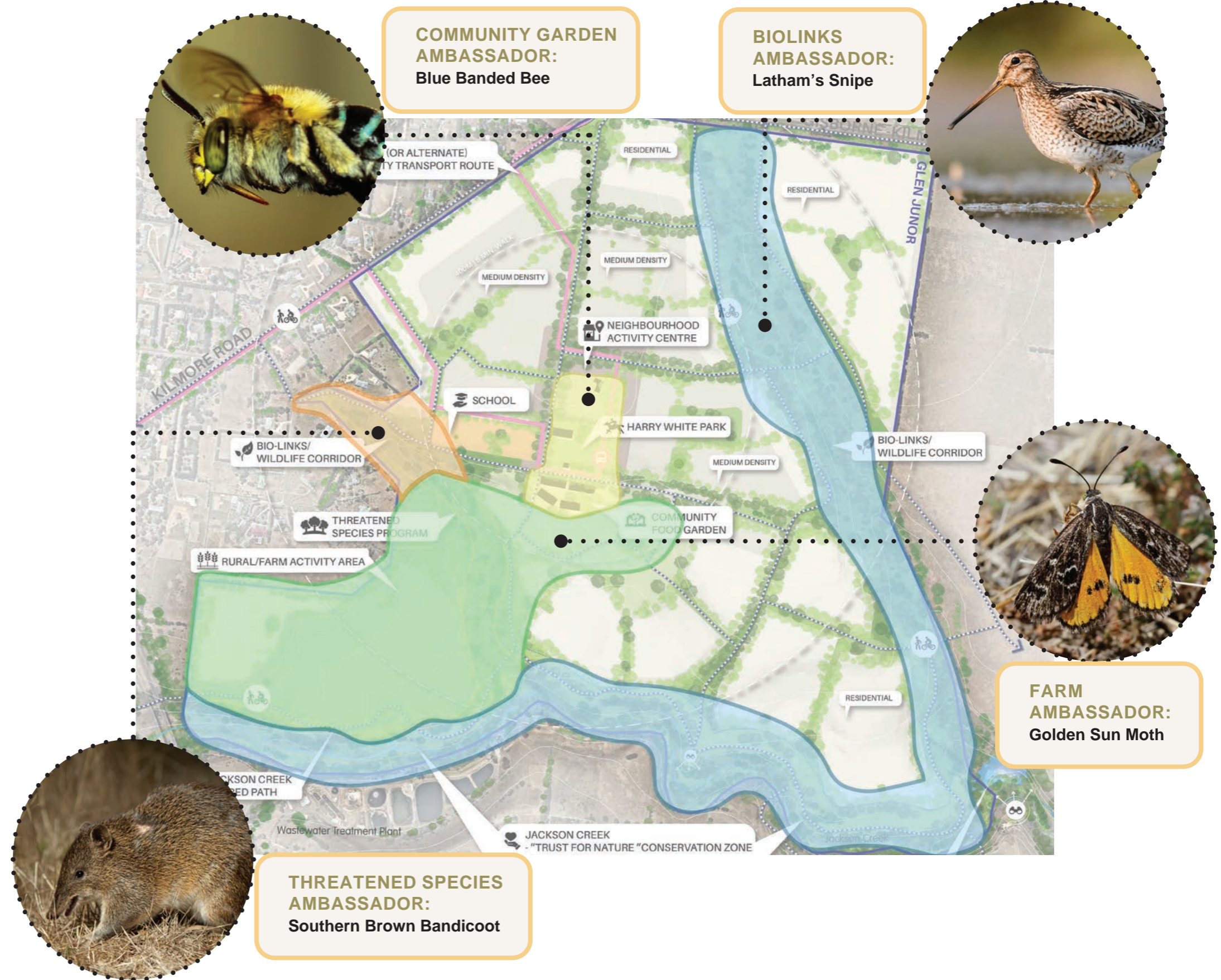
Biodiversity Sensitive Urban Design Principles (Garrard et al. 2018)



GLEN JUNOR'S BIODIVERSITY AMBASSADOR SPECIES

Ambassador species at Glen Junor are an important element of the biodiversity strategy. These animals serve a variety of purposes. From a design perspective each creature requires its own habitat. When designing the landscape and Biolinks throughout the site, the creation of habitat for these species is an imperative design principle. Species such as the Blue-Banded Bee and the endangered Golden Sun Moth, are particularly critical ambassadors. As pollinators they play a critical role in the ongoing fostering of biodiversity, and as such it is imperative that they have ample habitat to flourish on site. These animals help inform the landscape, with planting and connections all forming a critical role in the existence of them on site. Any disruption to this vegetation or poor land management and planting, could result in the future of these species being jeopardised.

Species such as the Black-chinned Honeyeater and the Latham's Snipe are also critical to BSUD at Glen Junor. Not only do they form valuable members of the natural ecosystems that will exist through BSUD establishment, they will also provide a sense of life and wonder to the landscape of Glen Junor, acting as notable heroes of BSUD. This is of critical importance, as it will provide the community tangible evidence of successful BSUD implementation, with the continual presence of these species on site. In turn this will help build awareness within the community, of the importance of biodiversity, helping to further promote a community that is living sustainably within a natural setting. Each landscape area will be intrinsically linked with a species that is likely to exist in it, further strengthening the connection of land and community.



URBAN POCKET FORESTS AT GLEN JUNOR

Urban pocket forests are a concept growing in popularity around the world, delivering high levels of biodiversity in areas no larger than a tennis court. These 'mini' forests are designed using the principles outlined by Professor Akira Miyawaki. The idea is that forests are grown in a way that looks to replicate the natural ecosystem processes they would be involved in if they were to be grown in the wild. This replication, along with the selection of endemic and native species, provides resilience, through imitating the natural competition plants face in natural circumstances. This results in multilayered growth, boosting the variety in plant species, as well as enabling higher levels of biodiversity.

Critically to Glen Junor, this method has been proven to be highly successful in urban environments, providing ecosystem benefits to the communities in which they are located. Replicating ecosystems, such as the Riparian Woodland that exists along Jackson's Creek, can provide the community not only with a link to this biodiversity corridor, in close proximity to homes, but will also provide habitat for many species that exist within this habitat. These forests provide a unique opportunity, to promote biodiversity within the surrounds of the built environment, further limiting any separating factors people may have from nature, and in turn strengthening the community's bond with biodiversity.



The Beginnings of a Pocket Forest in the Netherlands

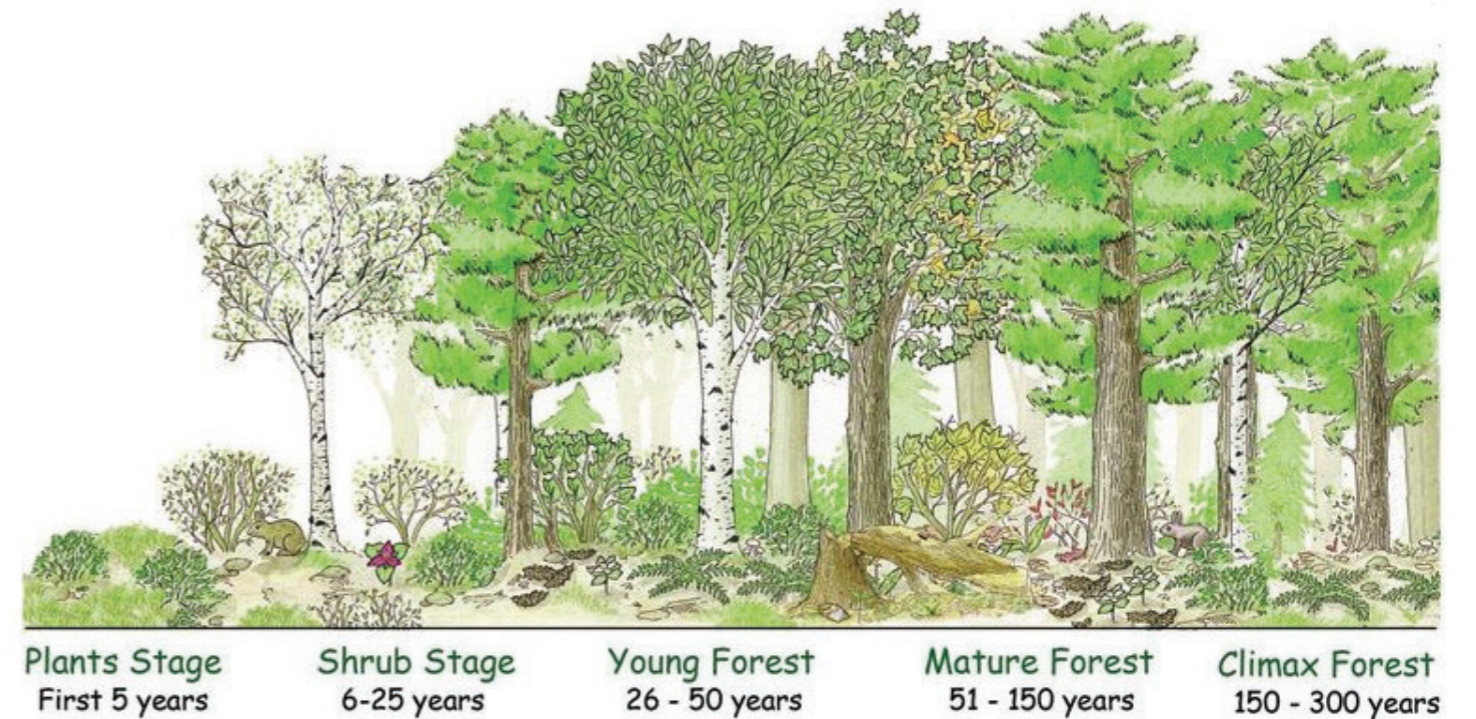


Miyawaki Method being used in France

THE MIYAWAKI METHOD:

- Established in the 1970's, the Miyawaki method replicates natural forest processes, by densely planting seedlings under varying levels of shade.
- Young trees which must compete for sunlight and are eventually transported to their location on site, where they continue to grow.
- Studies on these forests have shown them to deliver 30 x more density, grow 10 x faster & provide up to 100 x more biodiversity than conventional planting methods.
- While extensively trialled in Europe and Asia, pocket forests are not commonplace in Australia, however have been shown to grow highly effectively even in lower rainfall conditions.

Forest Succession Image: Forestrypedia



THE BENEFITS OF HUMAN-NATURE INTERACTION IN EVERYDAY LIFE

Connecting people with nature on a day to day basis results in several positive outcomes, that can be transformational for the people who have these experiences and the ecosystems in which they interact with. As detailed in the 'Biodiversity Sensitive Urban Design @ Glen Junor Report' written by Bekessey et al. 2018 "Children living in streets with trees will have lower incidence of asthma (Lovasi et al. 2008) and allergies (Hanski et al. 2012) and those with nature in their schoolyards will have improved cognitive development (Dadvand et al. 2015) and lower incidence of ADHD (Faber Taylor & Kuo 2011). Adults are less likely to die from heart disease, diabetes and cancer (Kuo et al. 2015)." Not only this there is resounding evidence supporting the positive mental health benefits associated with interaction with 'everyday nature', which addresses a critical failure in our current town designs, as highlighted by the recent Covid-19 pandemic.

The value of incorporating nature into Glen Junor's design is not just limited to health benefits. Ecosystem benefits, that are the result of well functioning ecosystems, are also set to benefit the Glen Junor community. These benefits range from pollution reduction, water purification to carbon sequestration and climate change mitigation. Biodiversity at the heart of Glen Junor will result in a more resilient and future proof community, further strengthening ties both within the community of Glen Junor and to the surrounding greater Gisborne area.



BSUD (Bekessey et al. 2018)



Southern Brown Bandicoot

Feral Proof Fence at Mt. Rothwell



THREATENED SPECIES CONSERVATION AT GLEN JUNOR

A key feature of the Glen Junor landscape is a feral proof area, in which a population of Southern Brown Bandicoots will be established. Australian leaders in threatened species recovery, Odonata, will provide a world first example showcasing how development can actually promote and regenerate populations of endangered species. This program will further strengthen Glen Junor's commitment to biodiversity, as well as provide an insight into the peril that faces our country's endangered species, in particularly our iconic marsupials. The Southern Brown Bandicoot has an important role to play in the ecosystems in which it inhabits. Acting as ecosystem engineers, these creatures dig small holes in foraging through the soil, aerating it at the same time. This is critical to soil health and plays a vital role in the health of the vegetation that relies on this activity. A prime example of the intricate relationships that exist within an ecosystem, a process that aims to be recreated at Glen Junor.



3.0 CLIMATE

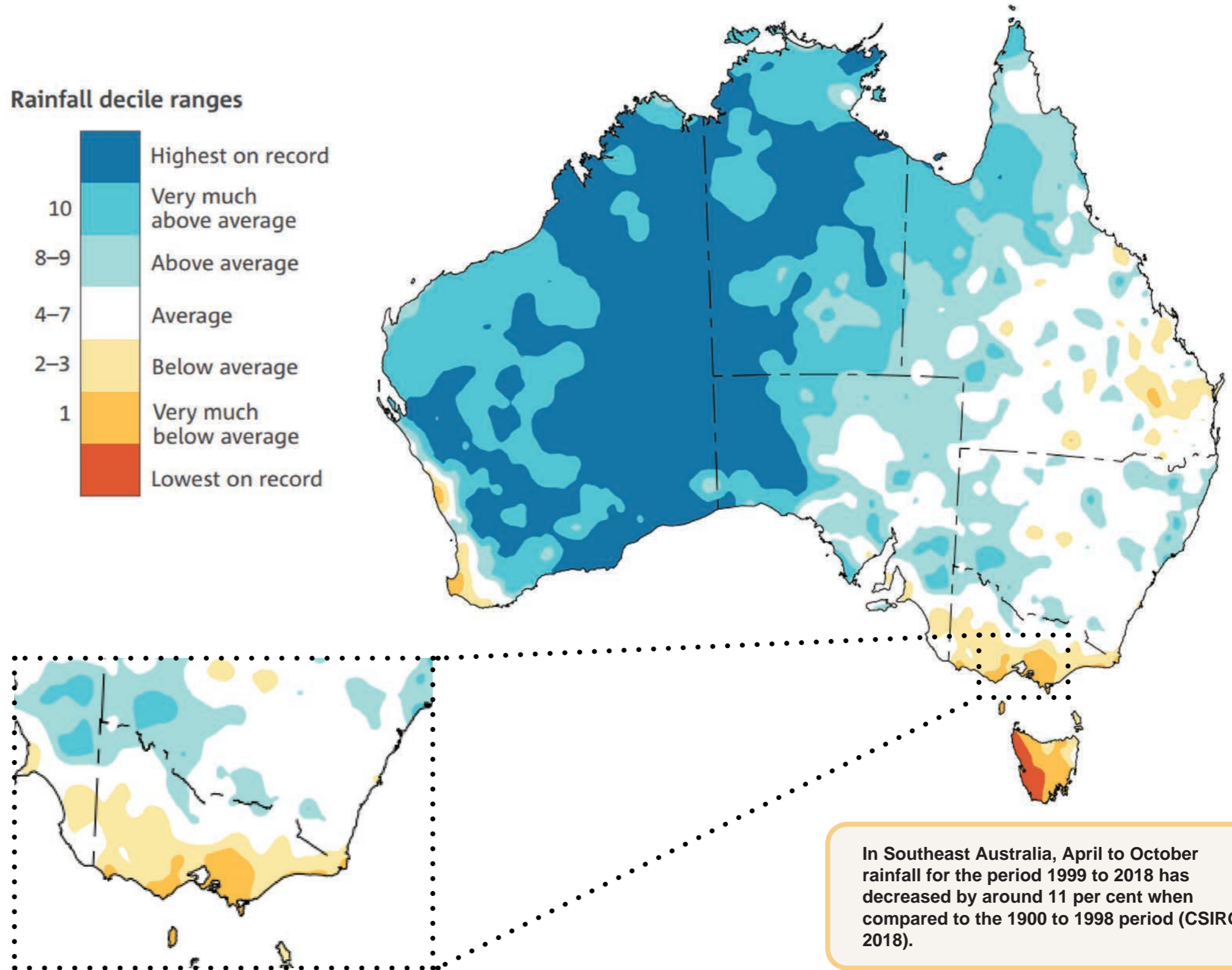
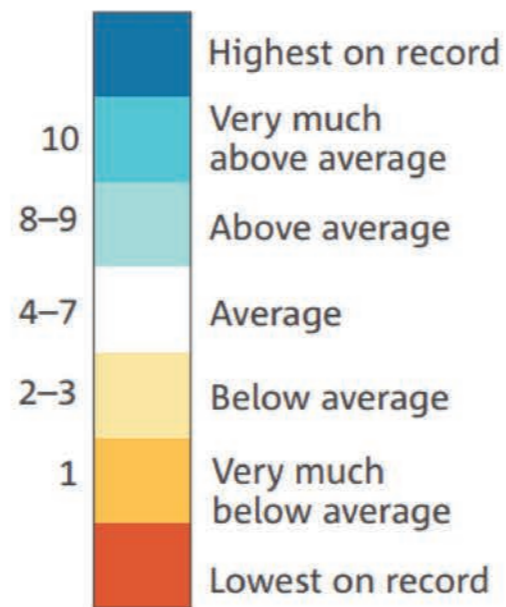
UNDERSTANDING CLIMATE CHANGE AT GLEN JUNOR

Climate change poses an ever present threat, when shaping new communities. In order to limit this threat, it is critical to plan and implement strategies, that will result in the community being both adaptive to and mitigate changes in our climate. With this in mind, Glen Junor will be built as a climate resilient community, not only with the aim of influencing environmentally responsible residents, but with the aim of ensuring adaptability and resilience exists at the core of this community.

Climate trends and estimates reveal that Melbourne's temperatures are likely to rise over the coming years. According to the CSIRO it is predicted that Southern Australia will experience further increases in sea and air temperatures, with more hot days, as well as marine heatwaves, and fewer cool extremes. We are likely to witness decreases in rainfall across southern Australia with more time in drought, but an increase in intense heavy rainfall throughout Australia. This means less rain overall, however when it is expected to rain, there will be heavier downpours. This scenario poses particularly difficulties when building a climate resilient community.

Common urban problems such as urban heat island effects, localised flooding and drought are likely to impact the community of Glen Junor into the future. With temperatures rising in South-Eastern Australia, the risk this poses to both people, especially the elderly and vulnerable, and our natural environment is significant. Creative solutions are available in order to mitigate this risk, to ensure that both people and nature can flourish on site. Water management will be absolutely key to success, in particularly the capturing and storage of the more frequent high rainfall events and preventing runoff and nutrient loss throughout the landscape. By implementing innovative adaptive and mitigating measures into the fabric of Glen Junor, the foundation for a climate sensitive community ready for the future, will be established.

Rainfall decile ranges



Map Source: Bureau of Meteorology

BUILDING A RESILIENT CLIMATE PROOF COMMUNITY THROUGH NATURE BASED SOLUTIONS

Water is key to life. With climate trends dictating that this precious resource will become scarce, the strategic management of water, Through 'Water Sensitive Urban Design (WSUD)', at Glen Junor will be critical to ensuring the success and vibrancy of both the landscape and the community that will exist there. There is growing research to support using 'Nature Based Solutions' as an effective ideology when looking to build resilience within an urban setting. While conventional water capture methods will be explored, using tanks and rainwater harvesting measures, there is an opportunity to employ nature based solutions in order to effectively manage water at Glen Junor.

As outlined by WWF, 'Nature Based Solutions' harness the power of nature to reduce greenhouse gas emissions and also help us adapt to the impacts of climate change. They are win-win solutions that involve protecting, restoring and sustainably managing ecosystems to address society's challenges and promote human well-being. Asking the question 'what would nature do?' is an approach taken to help us better design and manage our natural resources, while also helping us better understand the natural processes that are occurring around us in an everyday nature setting like Glen Junor.

Slowing and filtering runoff from the site using bioswales and raingardens integrated into streetscapes, and landscaped zones is a strategy that will be critical to managing stormwater on site. By using swales that have been planted with native vegetation, rainfall runoff will be captured from the pavements and the landscape, to ensure it is properly filtered, soaking the land and providing hydration to the soil. This method of infiltration allows for passive irrigation to occur, ensuring that water is effectively absorbed in the landscape, significantly reducing the risk of flooding posed by significant downpour events. These strategies will also contribute significantly to urban cooling, reducing the amount of hard stand infrastructure, by promoting green infrastructure.



COMBINING WSUD WITH BSUD

Effective and efficient usage of water resources is critical to implementing Glen Junor's BSUD strategy. Therefore it is important to recognise the critical role that water has to play in securing a rich and vibrant landscape. Water infiltration elements, such as bioswales and raingardens not only serve as important stormwater management systems, they are also biodiversity assets, with planting mimicking the grassy understory that exists naturally on the site's identified three key EVC's. This theme of hydrology promoting biodiversity can also be seen in the Biolinks strategy, with this critical biodiversity corridor following the hydrology route of Jackson's Creek, rebuilding and restoring the riparian habitat that exists along the waterway.



4.0 COMMUNITY

CREATING A SUSTAINABLE CULTURE WITHIN COMMUNITY

Creating a sustainable culture within the community of Glen Junor is critical to ensuring the implementation and success of the BSUD strategy. Outlined in the 'Glen Junor Community Vision' are five key focus areas, which are integral to implementing the overall community vision. The key focus areas are 'Lifestyle and health,' 'Inclusiveness, safety and social connectivity,' 'Opportunities for young people,' 'Creating a home for everyone' and 'Supporting better business models.' By promoting these key areas within the community, a sense of pride and custodianship can be fostered at Glen Junor, where people are connected with one another and also with the landscape they live within. This connection to the land will help provide enhanced biodiversity outcomes for Glen Junor, making it a prime example of community led sustainable practice.

Delivering these community outcomes is vital, when gauging the success of Glen Junor. Therefore it is important to have effective strategies in place to ensure the community benefits right from the inception of Glen Junor. Key strategies to promote a community led sustainable culture include:

- Collaborative design of community spaces
- Regular community consultation and inclusiveness throughout the design and building phases of Glen Junor
- Promotion of community gardens/farm as a key feature of the landscape
- Early delivery of community facilities
- Designing a soundly configured urban pattern that promotes interaction among residents at Glen Junor

CONNECTING COMMUNITY THROUGH LANDSCAPE

The landscape design at Glen Junor has an important role to play, when looking to promote community connection. Creating spaces for people to interact, as well as developing shared spaces that require community care, helps build both relationships between people within the community, but also fosters relationships between people and nature. This is a core element of the sustainable culture envisaged at Glen Junor, care for one another, as well as care for the surroundings vital components when building a sense of place as well. With the landscape offering unique settings for both people and nature, the community at Glen Junor has the opportunity to form bonds with the site's ambassador species, understanding their origins and what it takes to create and maintain critical species habitat on site. This is aimed to further boost a sense of custodianship felt within the Glen Junor landscape, knitting the community closer together through care and a communal sense of purpose.



A Vision of the Community Gardens at Glen Junor
Image: CJ Arms

CONNECTION TO COMMUNITY THROUGH SHARED COMMUNITY SPACES

Shared community spaces in many ways will be the heart and soul of Glen Junor. Designed to bring people together in a natural setting, these spaces will provide opportunities for the community to interact, providing collaborative activity nodes that are highly sought after in the landscape. These spaces will encourage the community to live a healthy and active lifestyle and will cater for all ages and interests, so as to be inclusive of the whole community. Biodiversity is a critical design element throughout each of these spaces, creating exciting and attractive place, keeping people engaged with their surrounds and providing a point of interest to

Proposed shared community spaces will comprise:

- Community gardens at the heart of Glen Junor
- A community farm, which will promote sustainable agriculture
- The Biolinks corridor, a key feature of Glen Junor's BSUD
- Threatened species enclosure, a key conservation story, built into the fabric of Glen Junor
- Creative urban design, in particularly promoting the entry boulevard, resulting in public interactions along engaging streetscapes
- Various parks and play spaces knitted throughout the urban form

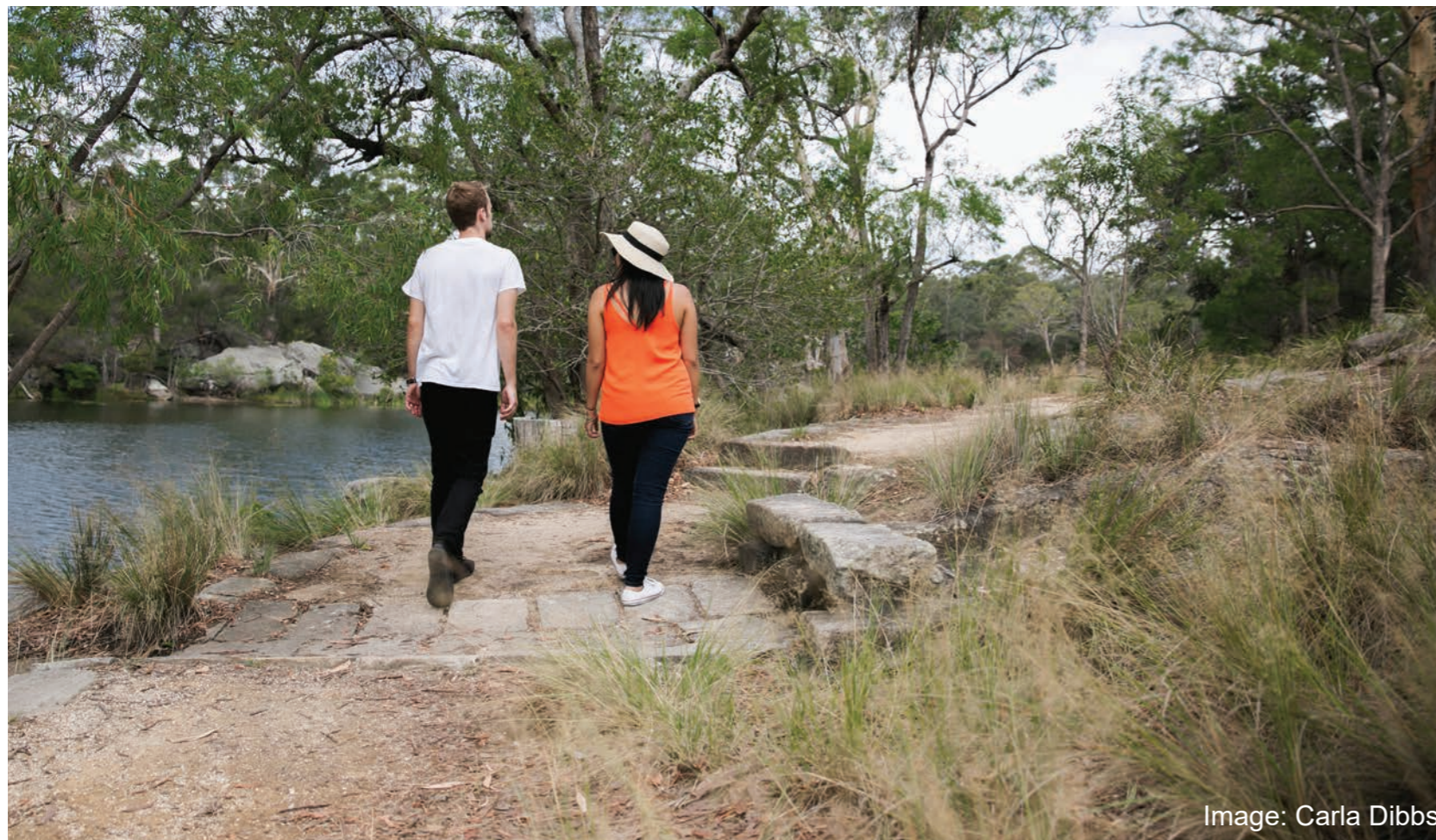


Image: Carla Dibbs

ACTIVITY HOTSPOTS DOUBLING AS INCOME EARNERS

Providing residents with employment opportunities will help support a vibrant and resilient local economy at Glen Junor. Local produce cafes, the creation of a business incubator and coworking hub through the establishment of mixed use areas, well connected by the landscape and urban design, will promote an innovative culture throughout the Glen Junor Community. Glen Junor will foster social enterprise, promoting the local learnings of sustainably and community connectedness, through the establishment of well run, thoughtful businesses. Place creation is critical, to providing the opportunity for these businesses to become innovative, ensuring that they are integral to the community, as well as helping to support the non-profit elements of Glen Junor.



Image: Fleetwood



5.0 CONCLUSION

CONCLUSION

The key pillars of Biodiversity, Climate and Community are the essence of Glen Junor's design. It is destined to become a world class example of regenerative development. Key to this, is understanding that these three elements are all intricately connected, with each playing an important role in the creation of this new community. The implementation of Glen Junor's BSUD strategy, through creative and thoughtful design interventions, will provide the foundation of this community, promoting nature within the urban setting, creating ideal places for both people and animals to thrive. Elements of this strategy will also help build resilience throughout Glen Junor, helping to mitigate the likely impacts of climate change, fostering an adaptable community, ready for any challenges the future may hold. The final pillar of community is the fabric that stitches the settlement together, with spaces created for people to interact with one another and with their natural surrounds. Most importantly this will create a deep sense of belonging amongst the community of Glen Junor, making it an enchanting and inspiring destination for all who are immersed in it.



ODONATA TEAM MEMBERS



SAM MARWOOD
CEO

Established environment and agriculture focused social enterprises with over a decade of experience in environment policy.



NIGEL SHARP
EXECUTIVE CHAIR

Experienced biodiversity impact investor in Australia with extensive experience in regenerative biodiversity business solutions.



ANNETTE RYPALSKI
DIRECTOR OF BIODIVERSITY

Recovery program coordinator for some of Victoria's most threatened species and 15 years experience as Mt Rothwell General Manager.



EAMON WALMSLEY
BUSINESS OPERATIONS MANAGER

Business professional with over a decade of experience implementing operational procedures, marketing strategy, and concept delivery across Australia.



ODONATA  A

Email:
hello@odonata.org.au

Website:
www.odonata.org.au/