Spatial Vision

SECCCA Enhancing Community Resilience to Climate Change

Vulnerable Populations

Paper 2

Final
8th December 2023

About this document

Company	Spatial Vision
Purpose	Vulnerable Sub-populations
Document File Name	SECCCA Enhancing Community Resilience_Paper 2 Vulnerable Populations_FINAL_8_Dec_23.docx
Project Client	South East Councils Climate Change Alliance (SECCCA)
Date of Issue	8th December 2023
Project Number	SV006177
Version Number	3.0
Document Type	Project Paper
Document Status	FINAL
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Cover photo: Flooding in Dandenong

SECCCA and Spatial Vision respectfully acknowledge the Traditional Owners of the lands on which we work, and pay respect to their Elders, past, present and future. We appreciate and acknowledge the advice and guidance of the Bunurong Land Council in assisting with the consideration of potential climate change impacts on First Nations communities, which for this study began with a focus on the Frankston Local Government Area.

Thanks to the Minderoo Foundation for supporting this project.

Contents

1 Document purpose

This document describes the vulnerable groups within the community, identified by South East Councils Climate Change Alliance (SECCCA) councils, to be of concern in relation to the likely impacts of climate change. The identification of these sub-populations has been undertaken as part of the Enhancing Community Resilience project in partnership with SECCCA and SECCCA member councils.

This document also describes the process by which the groups have been identified.

This document, referenced as Paper 2, should be read in conjunction with the SECCCA-wide outputs that are provided in the form of Microsoft (MS) Excel tables, PDF maps, and spatial data, as well as the additional papers developed as part of this project to gain deeper understandings of the various components of the project:

Paper 1 – *Definitions and Approaches*: Outlines and introduces the key terms and definitions, and the proposed conceptual framework by which community vulnerability and resilience to climate change are to be assessed.

Paper 3 – *Methods and Application*: Outlines the process used to identify and assess the vulnerability of sub-populations in the community to climate change. This report provides a detailed explanation of how inputs into the vulnerability assessment method, such as the role of community assets, can be used as an entry point for the building of community resilience.

Paper 4 – *SECCCA-wide Outputs: Findings and Guidance*: Provides an overview of the outputs prepared and findings drawn from the SECCCA-wide evaluation. This report includes high-level guidance on how the outputs can be used to identify where there are likely to be groups or sub-populations in the community that are more vulnerable to climate-related events.

Paper 5 – *Case Studies*: Presents the findings of four case studies that apply the SECCCA-wide information for four separate geographic areas, where each case study considers a different climate-change-related event.

2 Project background

Climate change is significantly increasing risks such as fires, floods, coastal erosion and heat waves to local communities throughout Australia. Preparing communities for current and future changes to the climate is a critical task and requires protection of life, property and wellbeing. Proactively preparing communities to act prior to, during and after disasters builds community resilience to future impacts and minimises risks and their consequences.

The Enhancing Community Resilience Project will help prepare communities in the SECCCA region for current and future changes to the climate by improving community preparedness through practical actions, tools, and resources. Project participants will be empowered with information and access to new or improved services, enabling them to make individual decisions to prepare for climate change.

Leveraging the outputs of the SECCCA Asset Vulnerability Assessment Project, the project will also assess the vulnerability of the SECCCA region's community to climate change.

Working with SECCCA Council members and climate science experts, the project will identify and visualise the community services, demographics, locations, and communities that are exposed to the impacts of climate change. Councils' community planners are integral in understanding vulnerability across communities, including cohorts such as aged care, disability, those with non-English speaking backgrounds (NESB) and youth.

A further stage of the project will develop, deliver and evaluate interventions to build community resilience to climate risk by working with expert community development practitioners, councils, emergency services, and communities.

The project outcomes and approach will be converted into a practical Toolkit for councils and communities that can be applied in other regions throughout Australia to build community resilience to climate change in these areas. This Toolkit will be developed using a parallel evaluation and collation of lessons learned throughout the project.

For further background information on this project, refer to Paper 1 – *Definitions and Approaches*: Appendix A.

3 Vulnerable sub-populations identification process

A key requirement of the Enhancing Community Resilience project is to identify processes and tools that can be translated and broadly applied to other communities. To identify the focus for climate change resilience-building measures and programs, a starting point is to identify the communities, or the groups within communities, to focus on.

It is well documented that the most vulnerable in the community will be the most impacted by climate change. This is because they often have the greatest sensitivity and least capacity to deal with the anticipated change, and because they are disproportionally situated in areas that are to be most impacted by climate change.

An important first step in this project was to identify the most vulnerable communities and sub-populations in the community to anticipated climate change. This assessment of vulnerability also provided insights into where there is potential to build greater resilience within communities and what factors have been assessed to help build greater resilience.

The process applied in this phase of the Enhancing Community Resilience project was aimed at:

- identifying ten vulnerable sub-populations (in relation to climate change)
- reflecting on whom council staff are most concerned
- aligning with the broader Minderoo purpose and being applied elsewhere in Australia.

4 Vulnerable communities and sub-populations overview

4.1 Climate change and the disproportionate impacts on vulnerable sub-populations

Many studies have identified the unequivocal relationship between climate change and its disproportionate impact on vulnerable and impoverished populations. The recent Intergovernmental Panel on Climate Change (IPCC) 6th Assessment (AR6) report (IPCC, 2014) underscores the exacerbation of development deficits and inequalities in response to climate change hazards. It highlights that these climate change impacts '… disproportionately affect marginalised groups, amplifying inequalities and undermining sustainable development'. Of concern, the report also states that 'under all emissions scenarios, climate change reduces capacities for adaptive responses and limits choices and opportunities for sustainable development.'

Vulnerable populations based on geographic, social and economic marginalisation have fewer options to prepare for, respond to, and recover from climate change and extreme weather events. These groups are likely to struggle with a multitude of impacting factors such as low incomes, poor nutrition, and poor physical and mental health, which all contribute to lowered availability of personal energy or household resources to develop and strengthen personal and community resilience (Department of Home Affairs, 2018).

Due to the changing climate, extreme weather events are likely to exhibit greater magnitude and frequency, occur in new locations and at different times of year, and occur in combination with other extreme events causing compound impacts. These factors cause the vulnerability of the baseline population to increase, and exacerbate the impacts to already-vulnerable people.

The relationship between climate change and vulnerable populations provides the foundation on which this project is built, and is critical to be considered throughout the project lifecycle.

> *'When new and intense events strike, built-in vulnerabilities are exposed and new ones emerge.'*
> – National Resilience Taskforce

4.2 COVID-19 lessons

The recent COVID-19 pandemic and the response on a governmental, community and individual level highlighted key learnings for consideration in planning for climate change and its associated impacts.

These include:

- Similar to COVID-19, those most vulnerable to any economic, health or environmental shocks will be most vulnerable to the impacts of climate change.
- An integrated approach through governmental, institutional and strategic lenses is required in addressing the needs and building resilience of vulnerable populations.
- Communication with these vulnerable groups (e.g. homeless people outside the system who can't be reached, or displaced populations who may lack trust in the authoritative bodies that are there to support them) is critical and can be very difficult.
- Those most impacted are not necessarily those with underlying health issues, but potentially are subject to broader socio-economic challenges.

- People, governments, industry and communities are capable of significant change and response to a disaster.
- It is in the interest of all (particularly the better-resourced, knowledgeable, able-bodied, healthier and wealthier) to assist those less able or in need.

5 Consultation process to identify vulnerable sub-populations

5.1 Overview

Determining the 10 vulnerable population groups of focus for the project was an iterative and structured process through consultation and workshops with the SECCCA member councils. Table 1 outlines the key consultations held to identify and narrow down the final 10 groups.

Project Working Group (PWG) workshops: PWG workshops were held approximately every month to provide an opportunity for presentations on project progress, concepts and methodology, and to receive input and feedback from council representatives.

Table 1. Consultation process with SECCCA councils

Type	Date	Focus	Outcomes/outputs
Workshop (PWG Workshop 1)	May 2022	• Council representatives present initial thoughts on vulnerable communities/individuals and rationale, and climate change/extreme weather events of concern in their Local Government Area (LGA)	• Preliminary understanding of vulnerable populations and climate change events of concern across the SECCCA LGAs • Feedback from PWG on processes, progress and planning
Online survey	May 2022	• Online survey completed by PWG members	• Building on preliminary understanding of vulnerable populations and climate change events of concern across the SECCCA LGAs
Workshop (PWG Workshop 2)	June 2022	• Outline of key concepts, terms and definitions • Council feedback received on definitions • Demonstration of spatially mapped sub-populations across region	• Long shortlist of vulnerable populations identified by SECCCA member councils (Table 2) • Feedback from PWG on processes, progress and planning
One-on-one council discussions	July 2022	• Discussions with each council on their vulnerable groups, what services and work are currently being undertaken in planning for and assisting these groups, and assessing vulnerability • Encouraged PWG members to invite relevant council members along for insight	• Deepened understanding and insight of vulnerable populations specific to each council
Council vulnerable population proformas	July–August 2022	• Requested each council to fill out proformas on their three nominated vulnerable groups • Input requested on description of group, reason for choice and criteria rating	• Nomination and further detail on three chosen vulnerable sub-populations

Type	Date	Focus	Outcomes/outputs
Workshop (PWG Workshop 3)	(late) July 2022	• Summary of one-on-one council discussions • Presentation of spatial representation of nominations across SECCCA region • Councils presented their three nominated vulnerable populations to other councils • Demonstration of sensitivity, capacity and vulnerability scoring concept	• Highlighting of key vulnerable population nominations across SECCCA region • Commencement of refining to 10 vulnerable sub-populations • Feedback from PWG on processes, progress and planning
Vulnerable-group discussions (first six groups)	August 2022	• Vulnerable-population-focused group discussions with council representatives (and invited representatives from non-council organisations) across all nine SECCCA member councils • Initial six groups: Older people; non-English-speaking background (NESB) recently arrived people; NESB established communities; people experiencing homelessness or insecure housing; people requiring a high level of care; single mothers	• Deepened understanding of factors influencing vulnerability for each vulnerable sub-population • Requested participants of each session to fill out an Excel workbook identifying their top five influencing factors, and the services available across their LGA
Workshop (PWG Workshop 4)	September 2022	• Update to councils on vulnerable-group discussions, and discussion on potential final four groups • Walk-through of initial application of vulnerability assessment approach • Discussion on thoughts of bringing it all together to assess community vulnerability to climate change and assist the building of resilience	• Introducing the thoughts of bringing it all together to assess community vulnerability to climate change and assist the building of resilience • Feedback from PWG on processes, progress and planning
Vulnerable-group discussions (final four groups)	October–November 2022	• Vulnerable-population-focused group discussions with council representatives (and invited representatives from non-council organisations) across all nine SECCCA member councils • Final group: First Nations people	• Deepened understanding of factors influencing vulnerability for each vulnerable sub-population • Requested participants of each session to fill out an Excel workbook identifying their top five influencing factors, and the services available across their LGA

5.2 Initial thoughts on vulnerable groups in the community

The initial thoughts and 'long shortlist' of vulnerable sub-populations identified by SECCCA member councils at a workshop in July 2022 are presented in Table 3.

5.3 Vulnerable group nominations

The nominations of vulnerable sub-populations in the community from each SECCCA member council, which were supported with additional details presented in a standard proforma in July and August 2022, are presented below. The standard proforma requested LGAs to self-assess and provide a rationale for their choice of vulnerable communities. This assisted the prioritisation process by the project team (in consultation with the Project Control Group). The details in the proforma included:

1. Event type of concern	Fire/Flood/Heat/Coastal
2. Priority – Severity of event	H/M/L/U
3. Other LGAs impacted	Yes/No (if Yes, likely total number)
4. Community type	Geographic/Demographic/Functional/Disperse Non-functional
5. Available representatives to assist	Groups/Individuals (and names)
6. Representatives' level of knowledge	H/M/L/U
7. Key assets identified based on services provided	Yes/No (if Yes, name and service provided)
8. Available data	H/M/L/U

*Ratings key: H – High; M – Moderate; L – Low; U – Unknown

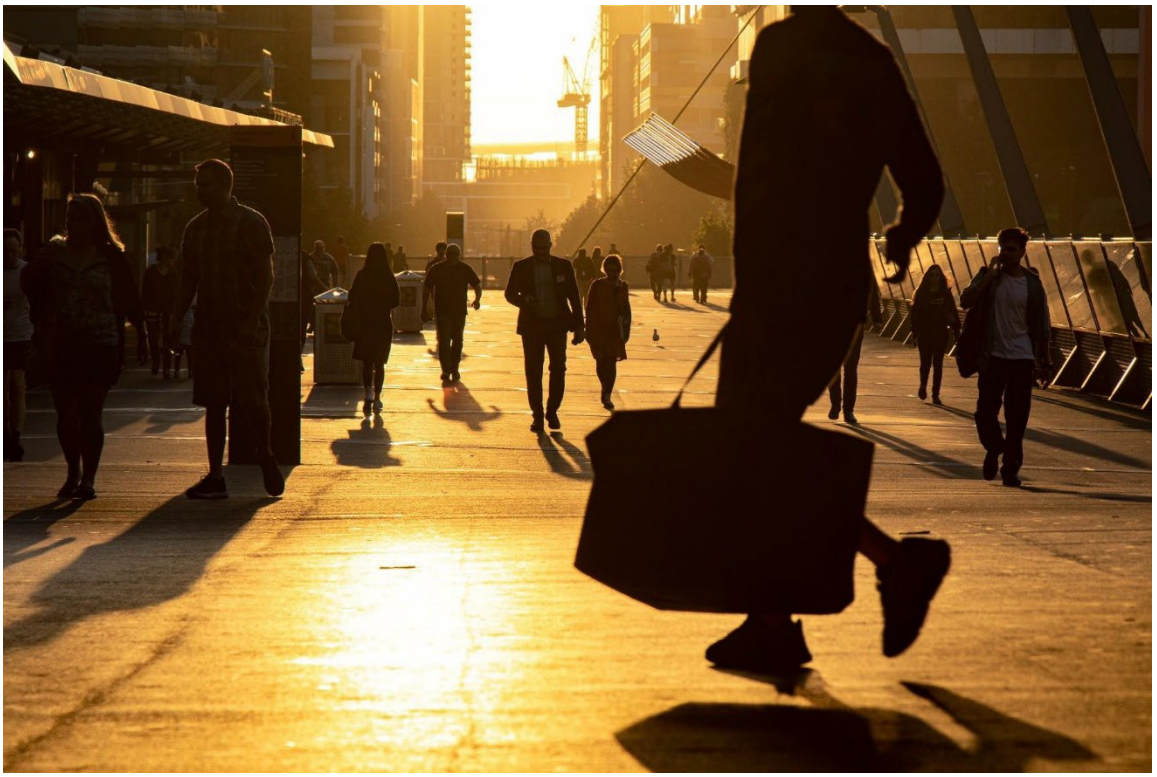

Table 2: Vulnerable groups identified by SECCCA member councils

Group	Vulnerable group	Port Phillip	Bayside	Kingston	Frankston	Greater Dandenong	Mornington Peninsula	Casey	Cardinia	Bass Coast
1	Elderly	✓	✓	✓				✓		✓
2	Needs for assistance/disabilities		✓	✓	✓		✓	✓		✓
3	Homeless/Insecure housing (e.g. caravan parks)		✓	✓	✓	✓	✓			
4	Public housing	✓								✓
5	NESB a. Recent arrivals b. Established communities c. Non-integrated (self-separated) d. Migrants seeking asylum	✓			✓	✓		✓	✓	
6	Women/Single mothers			✓	✓	✓			✓	
7	Low socio-economic status a. Low income/poor economic resources b. Low socio-economic rating c. Poor education opportunities	✓			✓		✓	✓		✓

Group	Vulnerable group	Port Phillip	Bayside	Kingston	Frankston	Greater Dandenong	Mornington Peninsula	Casey	Cardinia	Bass Coast
8	Marginal communities/Geographic communities			✓				✓		
9	Farming communities								✓	
10	Rural fringes a. Youth – aged 15 to 19									✓
	b. Mental health									
11	First Nations			✓	✓					
12	Emerging communities								✓	
13	People working outside (exposure)	✓					✓		✓	✓
14	LGBTQIA+									
15	Renters						✓			✓
16	Ideologically disaffected									
17	Lone people		✓		✓					

Table 3. Summary of council nominations for vulnerable populations

Vulnerable group	Port Phillip	Bayside	Kingston	Frankston	Greater Dandenong	Mornington Peninsula	Casey	Cardinia	Bass Coast
CALD – NESB a. Established communities b. Non-integrated (self-separated)	- poor access to information - poor literacy			**Nomination #3** - language barrier - poor support networks	- long-term migrant		**Nomination #1** -long-term migrant - NESB particularly		
CALD – NESB a. Recent arrivals b. Migrants seeking asylum	**Nomination #2**			**Nomination #3** - language barrier - poor support networks	**Nomination #1** -newly arrived or those seeking asylum		**Nomination #1** -newly arrived - NESB particularly	- newly arrived families - poor housing	

Vulnerable group	Port Phillip	Bayside	Kingston	Frankston	Greater Dandenong	Mornington Peninsula	Casey	Cardinia	Bass Coast
Older people a. >55, >65, >85 b. Lives alone c. Requires assistance d. Low income/Low socio-economic	**Nomination #1**	**Nomination #1** - especially living alone	**Nomination #1**				**Nomination #2** - limited incomes - >55	**Nomination #1** - >65 - needs assistance - disabilities	**Nomination #1**
High level of care a. All ages b. Medical or mental health conditions		**Nomination #2** - mental health - disabilities	**Nomination** #2 - particularly in relation to heat	**Nomination #5** - needs assistance		**Nomination #1** - or chronic illness			**Nomination #2**
Homeless/Insecure Housing a. Rough sleepers b. Caravan parks or other insecure housing	**Nomination #3** - insecure housing	**Nomination #3** - homeless or at risk of being homeless	**Nomination #3**		**Nomination #2** - including people with insecure housing, or no fixed address	- >30 per cent income on housing			
Single parent/Single mothers a. Dependants <5			- by association, those with children <5 years old	**Nomination #4** - single parents - lone people	**Nomination #3** - mums and families - mums keeping children warm/cool			- single mother households	
Geographic communities a. Marginal communities b. Farming communities c. Emerging estates			**Nomination #4** Residents who live south of Mordialloc Creek			**Nomination #3** - working out-doors (ag) - tradespeople	**Nomination #3** - coastal communities and villages	**Nomination #2** - farming communities	
First Nations			- particularly >65 years old	**Nomination #2** - large population - disadvantaged					

Vulnerable group	Port Phillip	Bayside	Kingston	Frankston	Greater Dandenong	Mornington Peninsula	Casey	Cardinia	Bass Coast
Low income a. Renters/Economic stress b. Income at 30 per cent threshold	**Nomination #3** - can't move houses			**Nomination #1** - very low income		**Nomination #2** - >30 per cent income on housing		**Nomination #3** - economic disadvantage - social disadvantage	**Nomination #3**
Youth (aged 15–24) a. Rural fringes focused b. Urban focus too? c. Mental health and isolation							**Nomination #4** - youth 12 to 25		- concerned with youth, and their mental health
Low socio-economic status a. Low income/Poor economic resources b. Low socio-economic rating c. Poor education opportunities	- specifically, renters, and those experiencing rental stress - can't afford housing insurance (i.e. flood)			- very low income		- specifically: households paying more than 30 per cent of their combined income on rent/mortgage	- particularly those caring for young people - low SES families	**Nomination #3** - economic disadvantage - social disadvantage	- specifically: low income households, renters, social housing - have 6000 people on low income
People working outside (exposure)						**Nomination #3** - tradespeople		- seasonal pickers	- seasonal pickers
Farming communities								**Nomination #2** - farming communities	
Emerging estates								- new estates	
Public housing	- social housing (towers) '- non-integrated'								Social housing
Lone people									
LGBTQIA+									
Ideologically disaffected									

6 Dedicated sub-population sessions

Once a nominated sub-population in the community was identified for inclusion in the top 10 listing, a dedicated session was arranged and held with the councils who had nominated that group. Councils were encouraged to invite others in the council, or stakeholders outside the council, with an interest or sound knowledge in the particular sub-population.

All councils were invited to these sessions focused on the one nominated sub-population.

These sessions were aimed at deepening the understanding of the key factors that can assist in better defining the likely vulnerability of this group to climate change impacts. At these sessions, the project team shared progress and aimed to have the participants share their experiences and thoughts on where the team should focus and where participants could assist in the next steps.

The project team was particularly keen to understand what work councils, or stakeholders outside councils, may already be doing to assess the vulnerability of groups to climate change.

These sessions focused on the following four topics:

- the relative importance of factors that can impact vulnerability
- 'mapping' services or reach of facilities that may influence vulnerability
- what has not been covered
- any thoughts or concerns about what we may be missing.

1. Relative importance of factors that can impact vulnerability

A list of factors that the project team had compiled that may impact vulnerability was presented. Factors were a combination of:

- 'sensitivity' factors – those we can or can't readily change, in that they are regarded as intrinsic to individuals (i.e. age, health condition)
- 'capacity' factors – those we can change, particularly services or facilities that councils or others may have in place or have planned.

Councils were asked to consider the most important factors impacting vulnerability to climate change – and what climate change event(s) they have in mind.

Councils were asked to identify:

- their top three factors and rank them as high, medium, or low
- another three high, three medium, and three low factors.

2. 'Mapping' services or reach of facilities that may influence vulnerability

The project identified some services and facilities offered by councils that affect the vulnerability of communities in advance.

A key issue was to map the reach of these services and facilities that influence the vulnerability of groups.

One approach proposed to councils was that they use a list of suburbs in an LGA and do *at least one* of the following:

- rate the presence or absence of services
- provide a rating (H, M, L) of the services provided.

The project team also reviewed council asset data provided in the Asset Vulnerability Assessment

(AVA) project, particularly building data, and recognised that this provided a good starting point to consider the facilities offered by councils to different vulnerable groups. Key facilities managed at the state government level were also obtained.

An initial list of such facilities with a potential matching to the likely vulnerable groups they serve was presented at the sessions.

The question of whether it is meaningful to use travel distance to some facilities, such as libraries, was discussed.

3. What has not been covered

It was noted that some key considerations were not adequately covered, such as:

- policies and plans
- other groups/bodies involved
- boundary issues – inter-agency dependencies
- actions undertaken and success of
- community concerns

These issues are addressed in the use of geographic case studies that consider climate change impact scenarios on a geographic area.

These dedicated sub-population sessions involved outlining the overall framework and approach the team proposed to assess vulnerability. These sessions aimed to fill out additional detail on this process and the project team's current thinking on the best way forward, noting the team's view that the process was as important as the outcome.

The team were also aware that there was a need to further refine the factors considered in relation to different types of climate events.

4. Any thoughts, or concerns, about what we may be missing

The project team were aware that some factors were difficult to quantify. For example, the team noted that most discussion on the vulnerability of groups or sub-populations in the community to climate change identifies the importance of 'social connection'. Although Paper 1 notes that this is difficult to quantify, we proposed in this methodology to identify proxy factors instead. For example, for older people, it was suggested that those who also care for children might indicate these older people were 'more connected'. Similarly, suburbs with active groups may be considered to have more social connections.

Follow up steps

In the follow-up to these sessions, LGAs and other stakeholders were asked to reflect on a list of the most important factors (which the project team had prepared based on the discussions held with councils) that they understood can impact the vulnerability of the particular sub-population to the identified climate changes.

The project team also circulated a list of suburbs (or alternate geography) and asked that participants reflect on the presence or quality of the services or capacities they viewed as important in influencing the vulnerability of groups to the identified changes in climate.


STOP

7 Additional considerations

7.1 Vulnerable group intersections and compounding

A common theme highlighted throughout the project was the compounding impact of multiple vulnerabilities. It was noted that vulnerable people were likely to be classified as vulnerable across a number of different factors, which increases their overall vulnerability and impacts their ability to respond to, and be resilient against, climate change and extreme weather events. For example, an older person may be more vulnerable to climate change hazards if they are living alone, have low mobility or have low technological literacy.

Figure 1 demonstrates the applicability of compounding factors on the different vulnerable sub-populations that increase these sub-populations' vulnerability to climate change hazards. The input of Council was sought to understand the factors driving vulnerability and the reasons behind their effect.

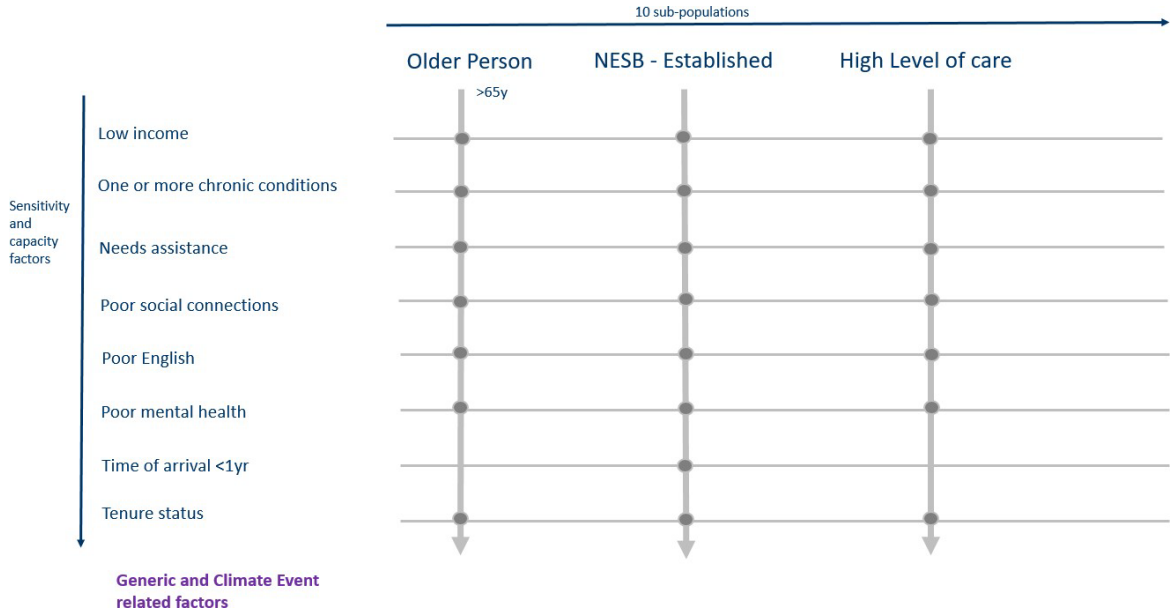

Figure 1. Compounding factors on vulnerable sub-populations that increase vulnerability

7.2 Sensitivity and capacity considerations

The factors most influential to each sub-population, with the input and guidance from councils, were incorporated into the vulnerability framework as sensitivity and capacity factors.

Although there are a multitude of factors that may influence the vulnerability of a person within a sub-population, it was important to define the most significant factors as part of the process in understanding what is driving the question of who is more vulnerable and why.

Refer to Paper 3 – *Methods and Application* for further details on the input and application of the sensitivity and capacity factors for each vulnerable population vulnerability framework.

7.3 Compounding impacts of climate change

Alongside the chronic and longer-term impacts of climate change (such as increased average temperature) is the increased frequency, intensity and compounding of extreme weather events.

The IPCC 6AR (IPCC, 2014) reports that extreme weather events are increasing in frequency and intensity, and compound events may be more probable and/or severe in the future. Compound events are defined by the IPCC 6AR as 'the combination of multiple drivers and/or hazards that contributes to societal or environmental risk', and include the 'combination of two or more – not necessarily extreme – weather or climate events that occur: i) at the same time; ii) in close succession; or iii) concurrently in different regions.'

The effects of such compound events impact communities more intensely than when these events occur in isolation, challenging adaptation and risk management capacity. This causes already vulnerable populations to be further disproportionately impacted. A relevant example of this is the ongoing and recurring flooding of Echuca township in northern Victoria in late 2022.

'I think we need to be very careful about only tackling this on a geographic basis. A strong characteristic of homelessness is that many people are in hidden locations. We need to devise methodology so they are not excluded.'
– Rosalyn Franklin from Homelessness/Insecure Housing Session

7.4 Spatial data considerations

The availability of spatial data has been a key consideration in developing an approach to assess the vulnerability of sub-populations to climate change. However, it is important to consider vulnerability and the components of resilience without the bias of only addressing factors for which data are easily accessible. For example, although the homeless population are highly vulnerable, it is inherently difficult to characterise this sub-group spatially. While granular spatial data regarding homelessness are difficult to source, it does not mean that homelessness should be excluded from vulnerability analysis.

Another consideration is whether population demographics are represented as either a density or absolute value. Although it is insightful to understand the distribution of a vulnerable demographic across a region as a percentage of the population, it is also important not to disregard pockets of vulnerable populations that have lower density. The level of impact to these people and their lives is the same as those who live in areas with higher-density vulnerable populations.

7.5 Known unknowns

A number of factors were highlighted in discussions that were identified as unknown areas, or 'known unknowns' (due to a range of issues such as lack of data or lack of understanding) that impact a full assessment. It is important to recognise these factors exist and consider their limitations on vulnerability and resilience. Some key 'known unknowns' are:

- Some vulnerable sub-populations don't have a representative to engage with. As such, they may be a difficult population to access and have input to fully recognise the influencing factors of vulnerability.
- The influence of legislative action and transformative and adaptable policymaking is critical in the building of resilience, without which inequalities and poverty will worsen in the face of climate change (UN World Economic and Social Survey, 2016). Leadership changes (at the local, state and

federal governmental level) and attitudes towards climate change may threaten the development of long-term action and decision making. The influence of this is unknown. It is important to consider the building of climate change resilience in the context of the current and future political climate.

- The uncertainty of climate change modelling and forecasts limits the ability to extensively understand the exact nature and timing of extreme weather events, limiting the capacity to anticipate events into the future.
- Social connectiveness (or disconnectiveness) is inherently illusive and difficult to adequately represent and incorporate within a quantitative analysis. Metrics such as access to the internet, digital literacy and levels of volunteerism can be incorporated as proxies, but it is critical to recognise the impact that connection or disconnection can have on an individual during extreme weather events.

8 Selected sub-populations

8.1 Older people

Sixteen per cent of the Australian population is aged 65 and over. This is expected to reach 21 to 23 per cent by 2066, with one-third of the older population in the 75 to 84 age bracket (AIHW, 2013). People aged 65 and older are inherently vulnerable to the impacts of climate change due to their increased likelihood of having chronic or underlying medical conditions, as well as having reduced mobility and a greater reliance on life-supporting equipment and medication (Cissé et al. 2022, page 13). Many climate change and extreme weather events are associated with an increase in mortality and morbidity, particularly in the very old (Wilson et al. 2011). The elderly may also be less likely to seek assistance or medical support when required.

All nine SECCCA member councils identified older people as a vulnerable sub-population within their LGA, and six nominated it as one of their three chosen vulnerable populations as part of the proforma process. However, it was noted by all councils that it was the compounding of this factor with other vulnerabilities that caused concern for this sub-population. For example, older people with medical conditions or low mobility, or those with no access to the internet or with low digital literacy.

Discussions throughout the project regarding those of most concern in this sub-population included the following comments:

- Those who live alone:
  - may or may not be accessing services (how and if they do are unknown)
  - may choose not to access services despite their availability
  - show increased social isolation
  - have an unknown level of family/friend/social networks
  - highlight the importance of providing in-house services.
- Those with chronic health conditions, low mobility or the need for assistance:
  - will be more vulnerable in acute climate hazards that require time-sensitive relocation.
- Those with low or no English proficiency:
  - have more difficulty in finding and accessing services and information.
- Those without internet access and those with low or no computer digital literacy:
  - rely heavily on non-digital forms of receiving information and services (a key concern for this sub-population)
  - frequently were not receiving services or information during the COVID-19 pandemic lockdowns and the 2022 floods in Lismore.
- Those in a low-income household:
  - are unwilling to turn on heating/air-conditioning in extreme temperatures due to concerns around heightened service bills.
- Those who are asset rich but income poor:
  - show lowered capacity to prepare themselves and their houses for climate change hazards
  - rely on external providers to prepare their property for climate change impacts, leading to preparations being delayed or simply not happening.
- Concerning quality of housing, renters had limited ability to change physical aspects of their houses.

- People who are looking at palliative care or assisted care, but who are in their home, will be extremely vulnerable in climate events (and this can be at any age).
- Many older people are carers themselves.
- Age brackets can range – e.g. >55, >65 and >85.

Appendix B provides an example for older people of the draft list of factors impacting this group, drafted from key points identified through consultation.

> '*The challenge we had with this population group (older people) was looking at it from a mitigation perspective. Whilst the Mornington Peninsula Shire has a large older people population we actually have a population (of older people) that have appropriate means (financial, social connection, etc.) to mitigate the health risks. Therefore, we looked at the actual risk factors pertaining to older people that we would need to focus on. For example, those on low income or experiencing housing stress or those with medical or health issues which are identified as separate vulnerable priorities.*' – AJ, Mornington Peninsula Shire

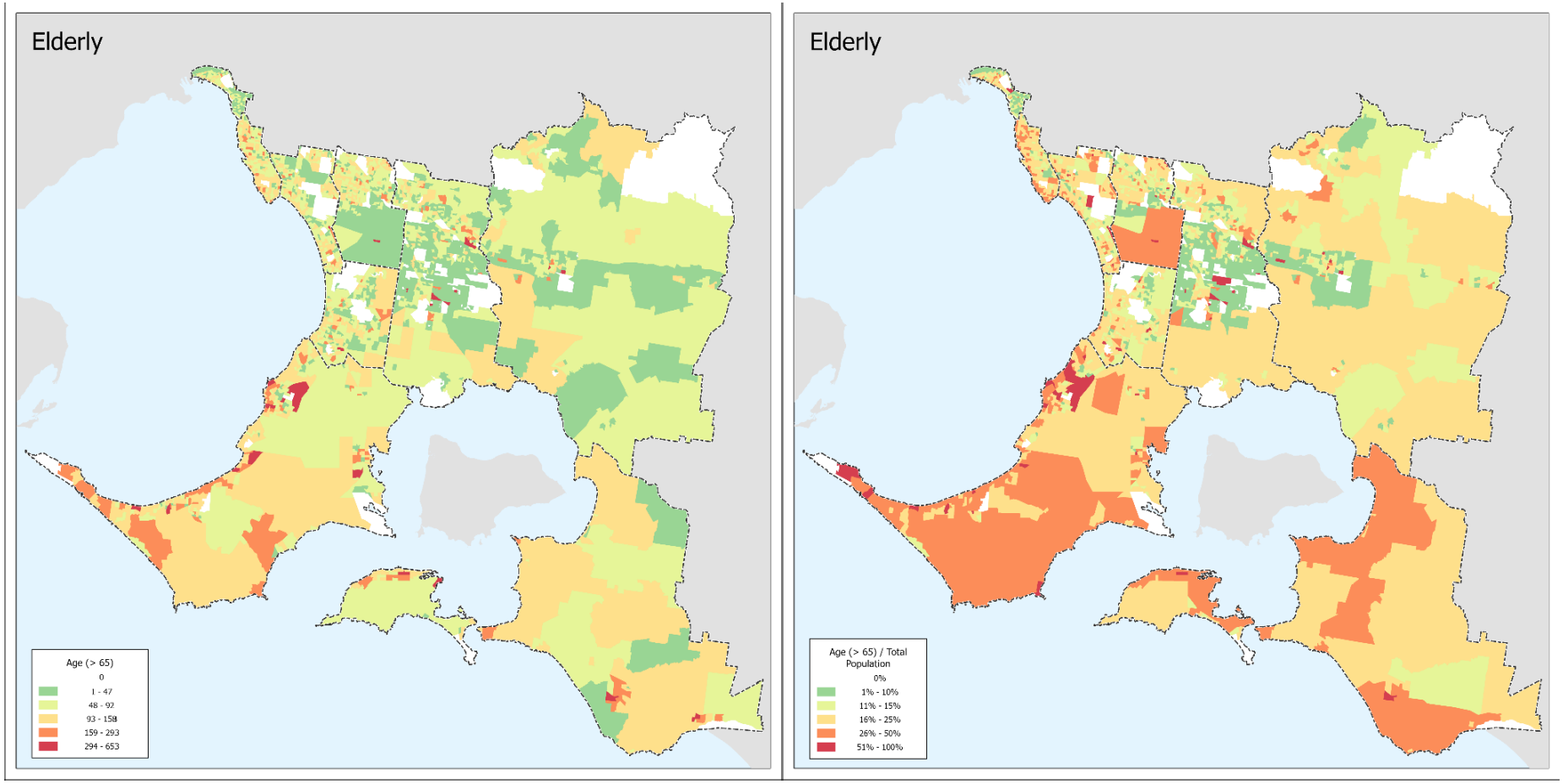

Figure 2. Population of older people across the SECCCA region, by population (left) and density (right).

8.2 People who require a high level of care

People requiring a high level of care are highly vulnerable to climate change and extreme weather events. This is due to their often impaired ability to take protective action, their social disadvantage from being socially isolated, and the fact that they are often excluded from adaptation planning (Cissé et al. 2022). The United Nations passed a resolution about human rights and climate change, recognising that '… persons with disabilities are among the most adversely affected in an emergency, sustaining disproportionately higher rates of morbidity and mortality, and at the same time being among those least able to have access to emergency support' (Gazendam, 2019).

The sub-population includes, but is not limited to, people with disabilities, those with medical conditions, those with low mobility, those who require in-home services for daily activities, those who are reliant on life-support machines, and people with medical conditions that affect their ability to regulate body temperature.

Five councils specifically nominated this sub-population in their proformas. However, most other councils had this vulnerable population incorporated into other sub-groups, such as older people.

Discussions throughout this project regarding this sub-population included points on the following:

- Extreme weather events complicate management of medical conditions during and after such events. For example, power outages highly impact those who need refrigerators for medication, or who rely on life-supporting electrical equipment.
- Consider stability of medical condition at that point in time – someone will need more support if their medical condition is unstable.
- Concern for those who:
    - rely on in-home services in extreme weather events, where access to person is not possible, is disrupted, or is delayed
    - need to travel to access services.
- Some people may not take up services or support available to them due to a multitude of reasons (e.g. lack of trust in service providers, service may not be financially viable, stoic).
- Vulnerability increases for those who have lower functional capacity (e.g. those who are unable to drive, unable to undertake their daily tasks, and who identify as legally blind).
- Some people may not identify as 'needing care'.
- Vulnerability increases for those who experience a language barrier, particularly for those who originate from countries with low trust in authorities, or who do not expect government or non-government authorities to provide services or support systems.
- Smoke from bushfires is a higher exposure hazard for this group, as are heat waves.
- Access to and ability to use smartphones and technology are important factors, particularly for older people who require assistance.
- They generally will have a reduced ability to work, and their carer's reduced ability to work as well, and may be more likely to be living on a low income or on government payments. This may influence their housing situation to be unsuitable for the impacts of climate change.
- This population has potential to be more socially isolated and disconnected from the community, and those who live alone.

> '*How people experience disability is affected by environmental factors – including community attitudes and the opportunities, services and assistance they can access – as well as by personal factors.*'
> – Mornington Peninsula

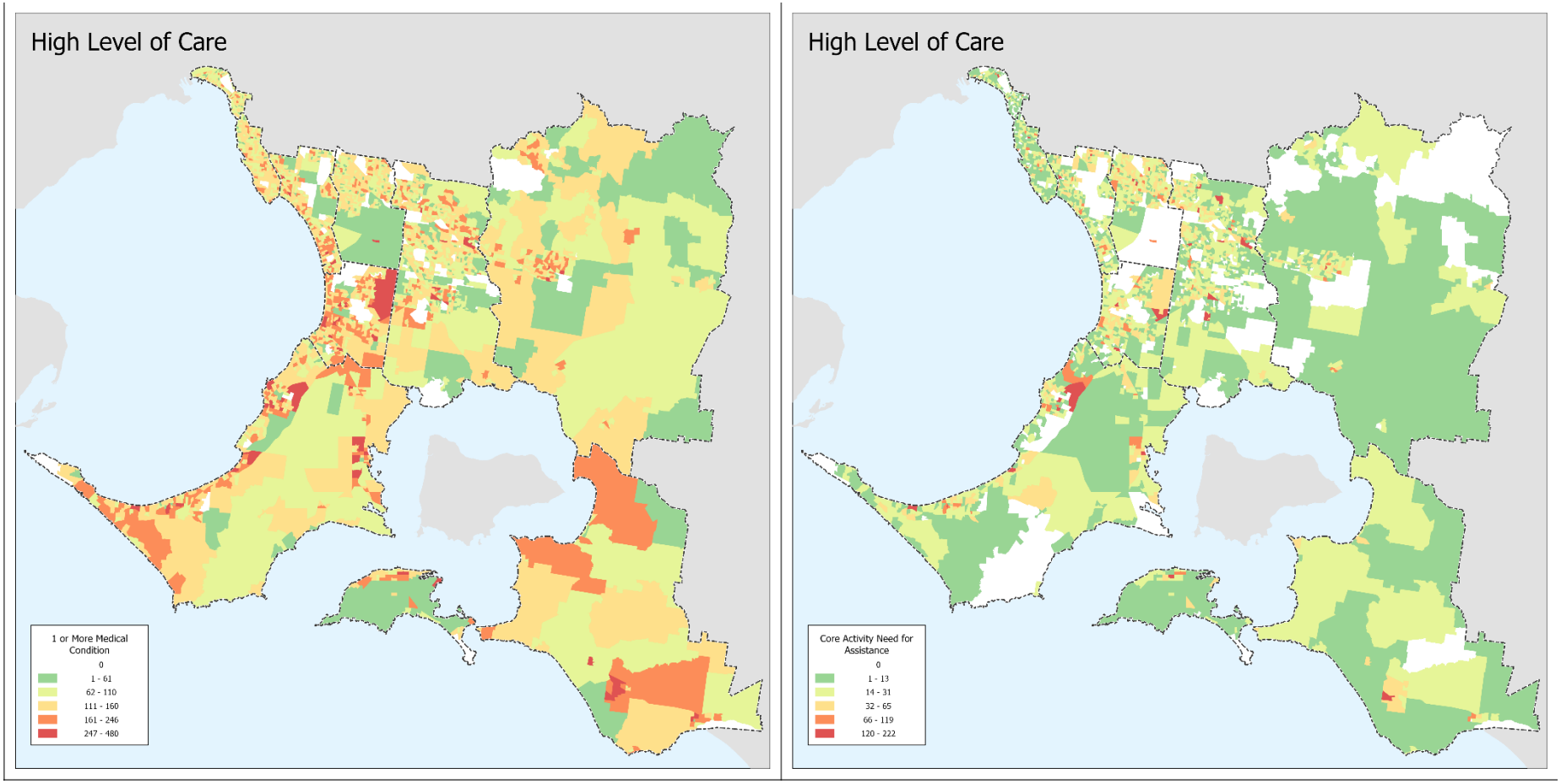

Figure 3. Population of those with a high level of care across the SECCCA region, showing those with one or more medical conditions (left) and whose core activity requires assistance (right).

8.3 Non-English-speaking background – recent arrivals

People with no or low English language literacy who have arrived in Australia recently (in the past 1 to 5 years) are a known vulnerable population across the SECCCA region. This sub-population includes migrants, refugees, people on temporary visas and international students. A combination of factors contributes to this sub-population's increased vulnerability, particularly their lowered ability to access and understand critical information related to climate change or an extreme weather event. Additionally, they may be more vulnerable due to limited experience with the Australian climate and its weather extremes.

Discussions throughout the project regarding this sub-population included the following observations:

- Levels of trust are low. Recent arrivals may not take up services available to them provided by council, and would more likely take up services provided from within their own community.
    - Throughout the COVID-19 pandemic these groups would get information provided from within their home countries rather than from Australian and local authorities.
    - They show less reliance on local sources of information, making this sub-population vulnerable through lack of preparedness in an extreme weather event.
    - It is important to build trust within these communities and welcome them to services such as the police, State Emergency Service (SES) and their local council through engagement events such as 'welcome to community' festivals and English classes.
- Those on temporary visas and international students are not eligible for government support like permanent residents and citizens are – this group can fall through the cracks with no financial support.
- They may have little to no English language proficiency.
- Location of services is very important.
    - Lots of services are based in Dandenong, despite this sub-population having generally been pushed out towards Casey and Cardinia. These people still need to travel back to Dandenong to access these services.
- Services are struggling to keep up with demand (long wait-lists).
- Council is central to the settlement process for new arrivals
    - Council partners with other organisations when planning events (e.g. AIMS, DHHS, Local Employment Organisations, Educational Organisations offering AMPEP).
- There is unfamiliarity with local weather and climate conditions, although there's more relatability when compared with events in their own country (e.g. extreme temperatures). This leads to a lack of understanding of what to do in these climate events.
- It is important to understand the trauma that refugees may have experienced.
- There is a risk of social isolation and lack of support networks.
- They are potentially a highly disengaged population within the wider community.
- Casey: Afghan and Hazara communities in particular.

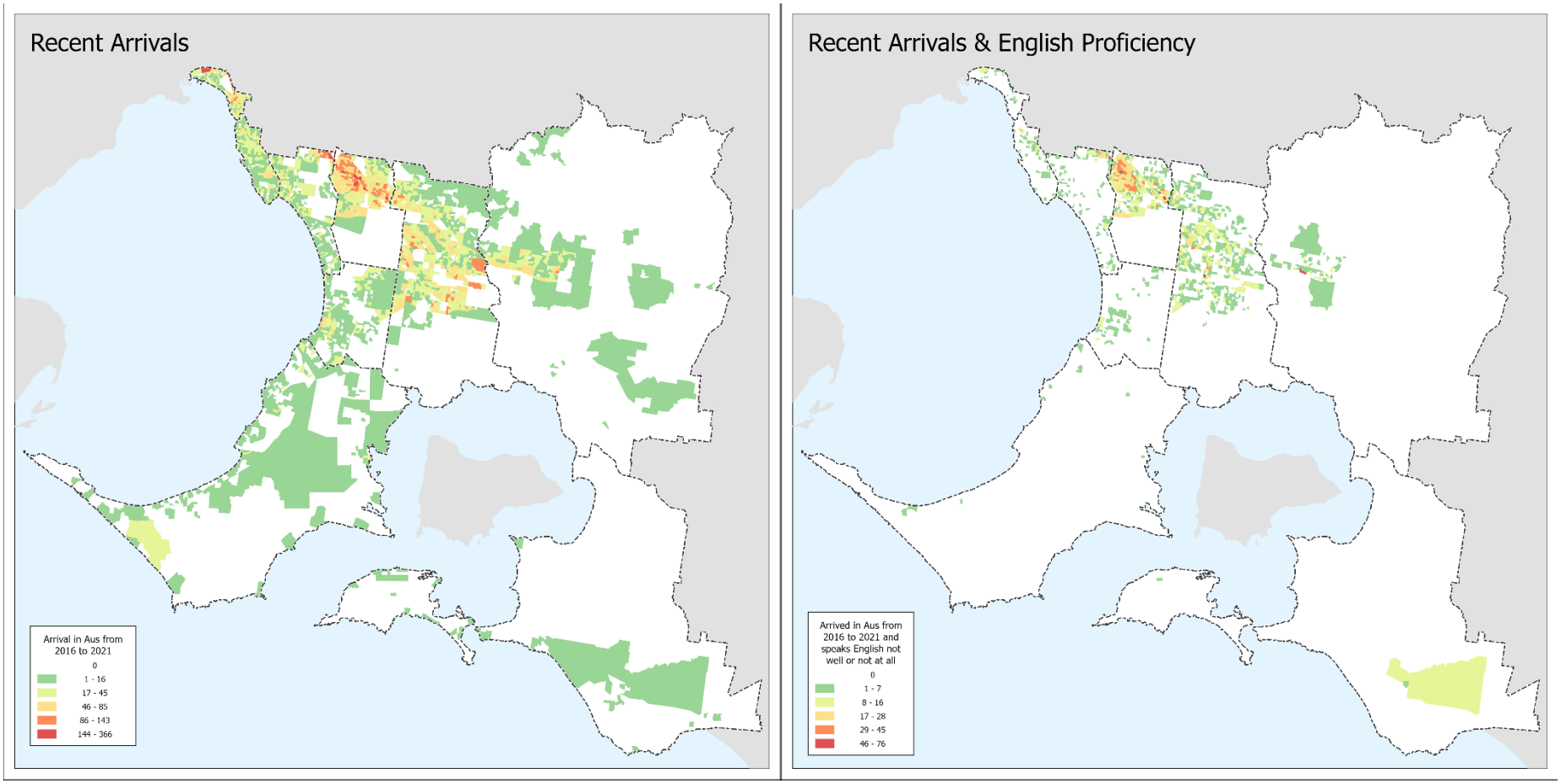

Figure 4. Population of those classified as NESB – recent arrivals across the SECCCA region, showing those who arrived between 2016 and 2021 (left) and those who also have poor English proficiency (right).

8.4 Non-English-speaking background – established communities

Established communities from a non-English-speaking background were identified as another vulnerable group, but with different factors impacting their overall level of vulnerability.

Discussions throughout the project regarding this sub-population included the following observations:

- They may have strong social connections within cultural groups and across a broader region, but may not have a local connection within their own neighbourhood.
- Despite being in Australia for long periods of time, many still do not speak English proficiently.
- Their limited English proficiency lowers their ability to receive and understand information.
- Commonly see elderly women (European immigrants from the 1950s and 1960s), that live alone that have previously relied on their husbands, that do not speak any, or very little, English. These women can be easily isolated and very stoic (don't request or accept support when needed).
- They do not have the English proficiency to understand what services may be available to them, so they are not receiving the support they're entitled to, thereby increasing their vulnerability.
- Social connections and networks (religious groups, family, friends) are critical for this group to receive information and support.
- Communicating risks is critical to this group – it's important to have information provided in a number of different languages to ensure people have access to the information.

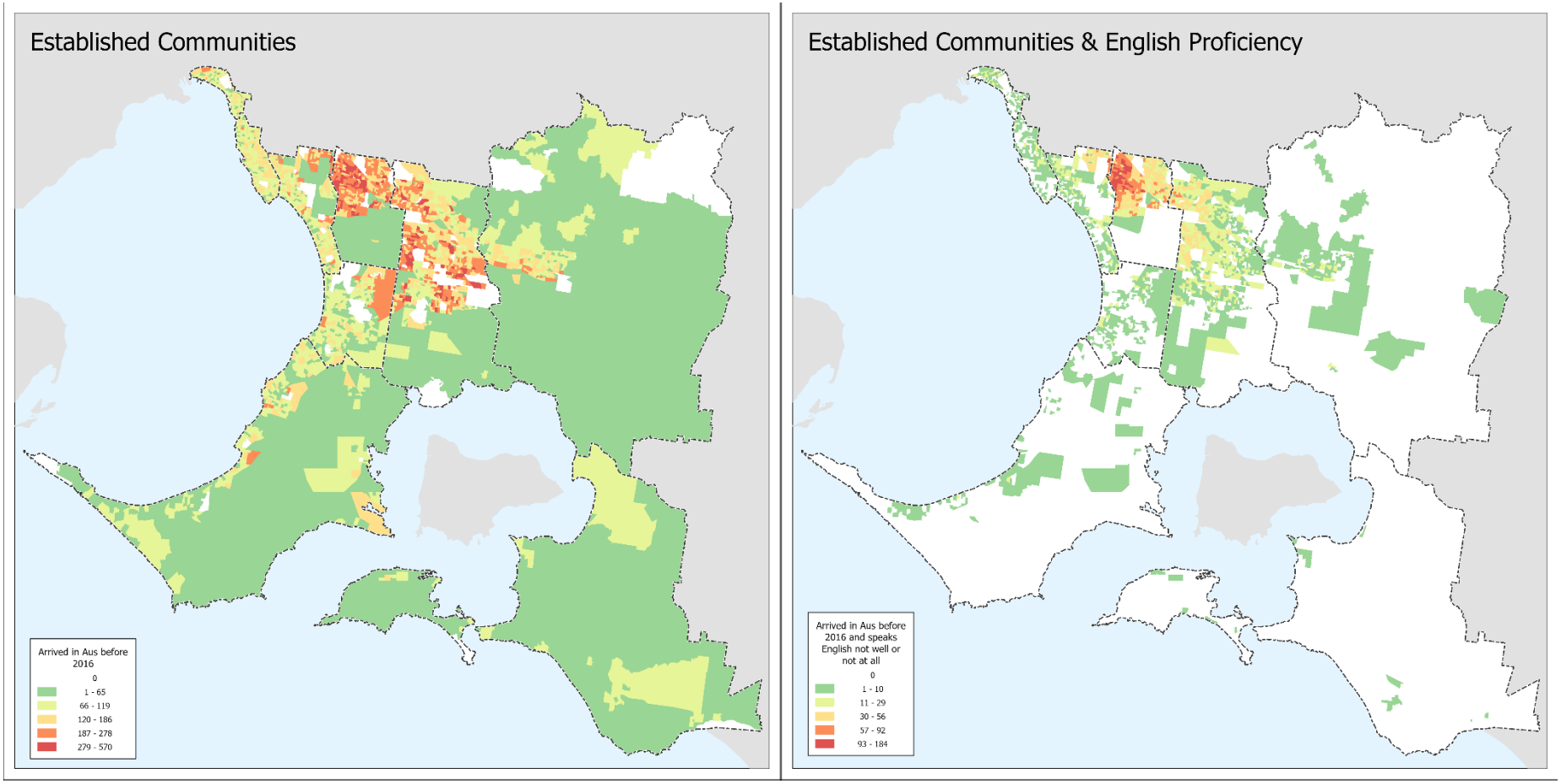

Figure 5. Population of those classified as NESB – established across the SECCCA region, showing those who arrived prior to 2016 (left) and those who also have poor English proficiency (right).

8.5 Those experiencing homelessness or insecure housing

People experiencing homelessness or insecure housing are some of the most exposed to climate change and extreme weather, and have fewer resources than those with secure shelter to prepare for, respond to, and recover from these events.

Furthermore, the inability to accurately map where homeless people are located reduces the ability to account for their safety post-event, as well as to ensure services are provided in the right areas. The homeless are in a unique state of vulnerability as their direct exposure to climate extremes such as heat, cold, and rainfall is higher than those with shelter. Additionally, a climate event may become the tipping point for those living in insecure housing to become homeless. The stigma and bias towards this sub-population may also contribute to these people not seeking refuge in available longer-term accommodation.

Discussions throughout the project regarding this sub-population included the following observations:

- Sub-population includes people living rough on the streets, those 'couch surfing' or living temporarily with family or friends, and those living in caravan parks.
- Those in insecure housing are likely to be living in low quality (e.g. inadequate insulation) housing and are:
    - less likely to afford energy bills associated with heating and cooling
    - less likely to be able to afford food and necessities in climate events
    - less able to change their circumstances or improve their housing situation
    - more reliant on social services.
- They may not have the resources to recover or restore their pre-climate-event circumstances, therefore becoming increasingly reliant on social services and loss of independence.
- Those who have major health, financial, social and mental health concerns show increased vulnerability.
- The risk of family violence may be cause of risk of homelessness or insecure housing.
- Vulnerability is increased during heat for a number of reasons, including:
    - heat stress from extended periods of time outdoors
    - living in a poorly insulated housing situation
    - falling asleep and lying for extended periods of time in the sun, sometimes with multiple layers of clothing on
    - sleeping in cars
    - severe sunburn and blistered feet from walking on hot bitumen or tarmac
    - being bitten extensively by mosquitoes and other insects
    - being mistaken for sleeping peacefully when they are in a situation of severe heat stress or ill health.
- Potential for social isolation is increased.
- They are more likely to be reliant on public transport/walking/cycling for transportation.
- Rental prices are increasing due to a lack of properties up for rent.

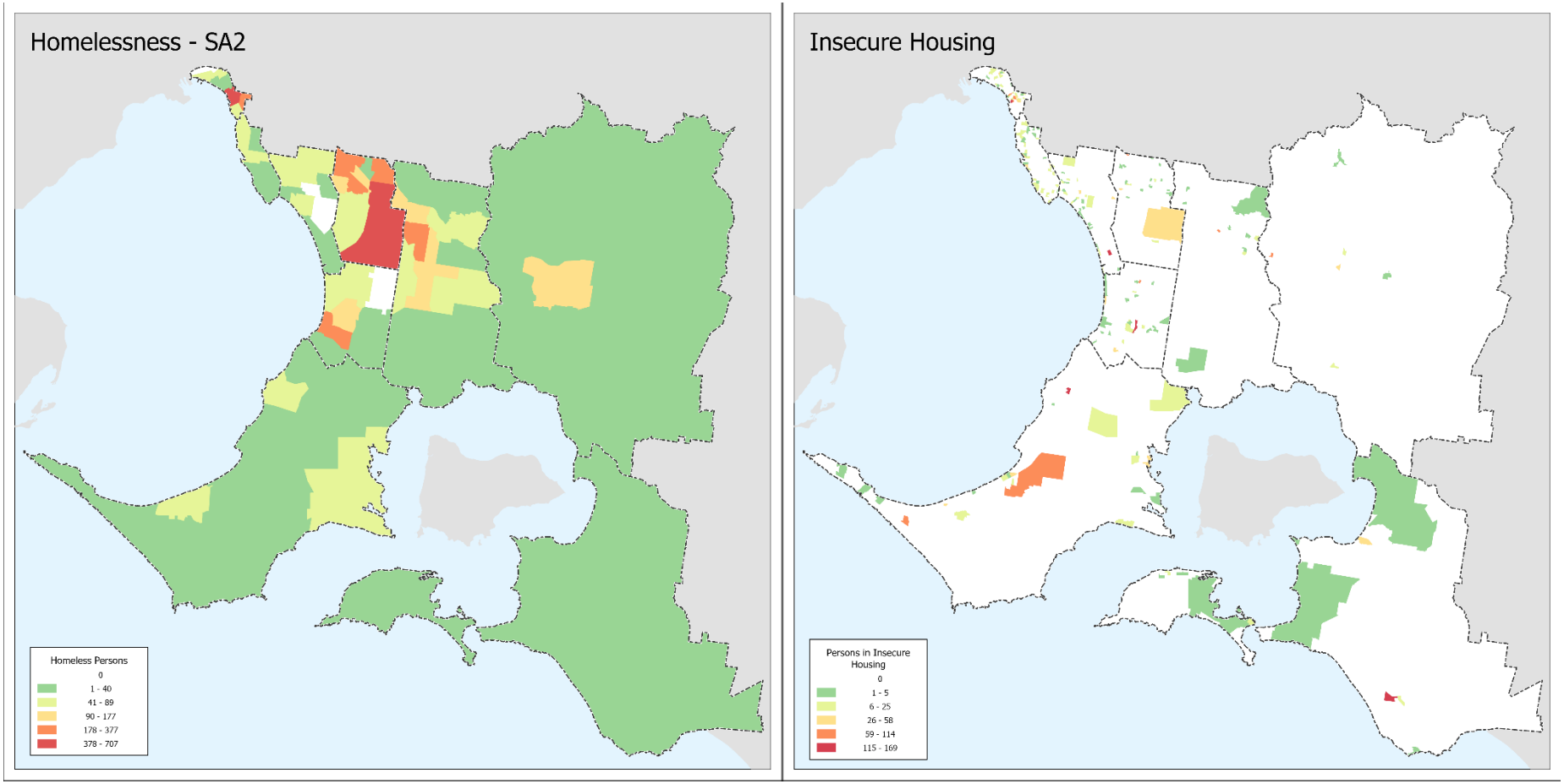

Figure 6. Population of those classified as experiencing homelessness or insecure housing across the SECCCA region, showing those identified as homeless at the SA2 level (left) and those who have insecure housing at the SA1 level (right).

8.6 Single mothers

Women are disproportionately affected by climate change compared with men due to social, economic and cultural factors (Osman-Elasha, 2012). Coupled with the financial disadvantage of supporting dependent(s) on a single income, single mothers have been identified as a key vulnerable population across the SECCCA region. In Australia, 37 per cent of single mothers with dependent children are living below the poverty line, which is the highest rate of poverty compared with any other family type within Australia (Davidson et al. 2020).

> 'For single parents in relation to climate change, it's their capacity to care for their children, have an income, access childcare and its out-of-pocket costs – if a mum does not have anyone to look after her children, and no access to child care, and *has a* low income job, they stay on Centrelink – they end up staying at home and getting isolated. Then the children get isolated.'
>
> Source: Council Feedback

Discussions throughout the project regarding this sub-population included the following observations:

- Children are impacted by default.
- Likelihood of being under financial stress is increased due to reduced household earning capacity (likelihood increases with more dependent children).
- Single mothers are more likely to be living in lower-rental housing and poor housing conditions.
- Single mothers may be priced out in the rental market, meaning they have to move further away from their services, social connections and places of employment.
- Single mothers are potentially victims of domestic violence.
- Single mothers from NESB backgrounds show increased vulnerability.
    - Lack of understanding about the climate can lead to babies being too cold or too hot for the weather.
    - Lots of single mothers in this sub-population are extremely isolated, living in share houses, or on temporary visas.
    - Those living on expired visas will not reach out for support or help when required due to fear of being 'caught', and hence are hidden and don't want to be seen.
- Single mothers experiencing homelessness or insecure housing (e.g. couch surfing with friends or family) show increased vulnerability.
- Issues arise where mothers require care; when there is no one to look after the children, the mother will not get the care she needs.
- Difficulties affording food and necessities may be exacerbated by more frequent flooding, heat, and water scarcity, impacting crops, supply chains and food prices.
- Climate change may not be a high priority.
- Mothers will generally prioritise their children's needs over their own. For example, they may be the last to eat, increasing their vulnerability.
- Older children may be looking after younger children, or a parent with physical or mental disabilities.
- Potential for mental health issues (e.g. stress, depression) is increased.
- Social connection (e.g. friends, family, religious or community groups) is key in reducing vulnerabilities; this group can be very isolated and difficult to engage with as they may be barely scraping by, and may not have the time to volunteer, or give feedback to council.

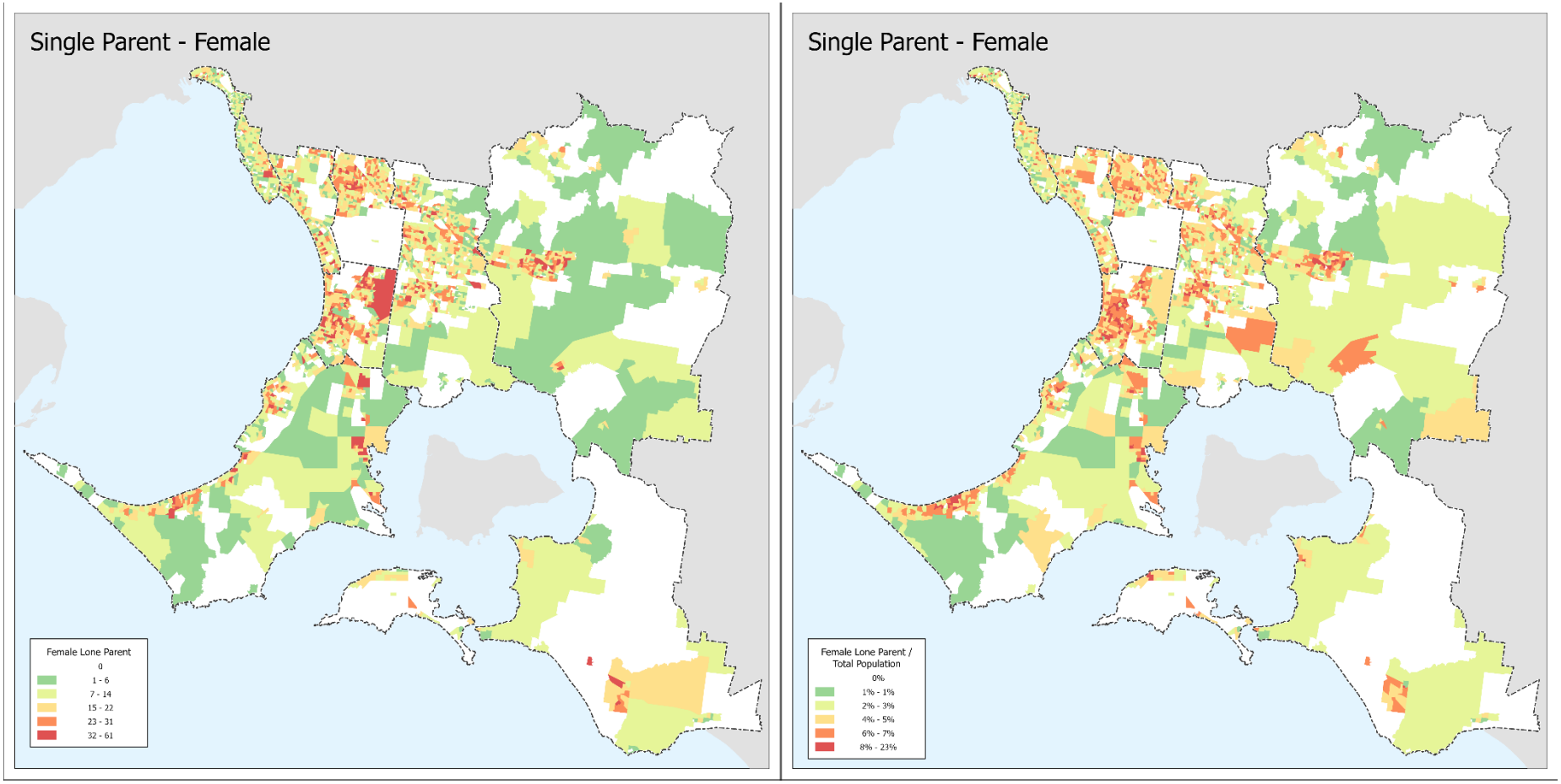

Figure 7. Population of single mothers across the SECCCA region, by population (left) and density (right).

8.7 Low income

People on low income have a reduced ability to prepare for, respond to and recover from climate change and extreme weather events due to having fewer assets and less access to funding, technologies and political influence (Douville et al. 2021). The United Nations' Economic and Social Council report highlights the vulnerability poor communities experience regarding climate change impacts, and argues that '… in the absence of transformative policies which coherently address the economic, social and environmental dimensions of development, building climate resilience will remain elusive and poverty and inequalities will worsen'. The report also notes that 'families living in poverty systematically occupy the least desirable land – and the land most susceptible to damage from climate hazards', and highlights that 'Climate change has the potential to worsen their situation and thereby worsen pre-existent inequalities' (United Nations, 2016).

Low-income people are disproportionately impacted by extreme climate and weather events compared with wealthier people, regardless of their level of preparedness, as they have fewer means to respond (Department of Home Affairs, 2018).

This vulnerable sub-population cuts across all cohorts of the broader community, and captures those who would otherwise fail to be recognised.

Five councils specifically noted *low income* (or a variant of this, such as *low socio-economic status* or *those experiencing mortgage/rental stress*) as one of their vulnerable population nominations. It was consistently mentioned as a key factor of increased vulnerability across all other sub-populations.

Discussions throughout the project regarding this sub-population included the following observations:

- People's capacity to change their situation in extreme events relies on how much disposable income they have.
- Increased vulnerability where 30 per cent or more of income is spent on mortgage or rent
- Lived experience and education around climate change and extreme weather events both lower vulnerability.
- Social connectedness is an important factor – those who live alone but have a strong community connection would fare better.
- Access to a phone and internet is important.
- Low-income people can be difficult to engage with, as they may be angry, frustrated and upset by their situation and the potential or perceived lack of support (e.g. long wait lists to access a service that may be necessary immediately).
- 'Low income' can be indicated by receipt of Centrelink payments.
- Overcrowding in housing is an important factor.
- A person's low-income situation may be short-term (e.g. temporarily unemployed) or permanent (e.g. person with a permanent disability on disability payments)
- Services are available, noting that:
    - many are run by churches
    - wait-lists are long for many of them
    - small-scale services are important (e.g. those providing no-interest packages for essential, good-quality personal applications).

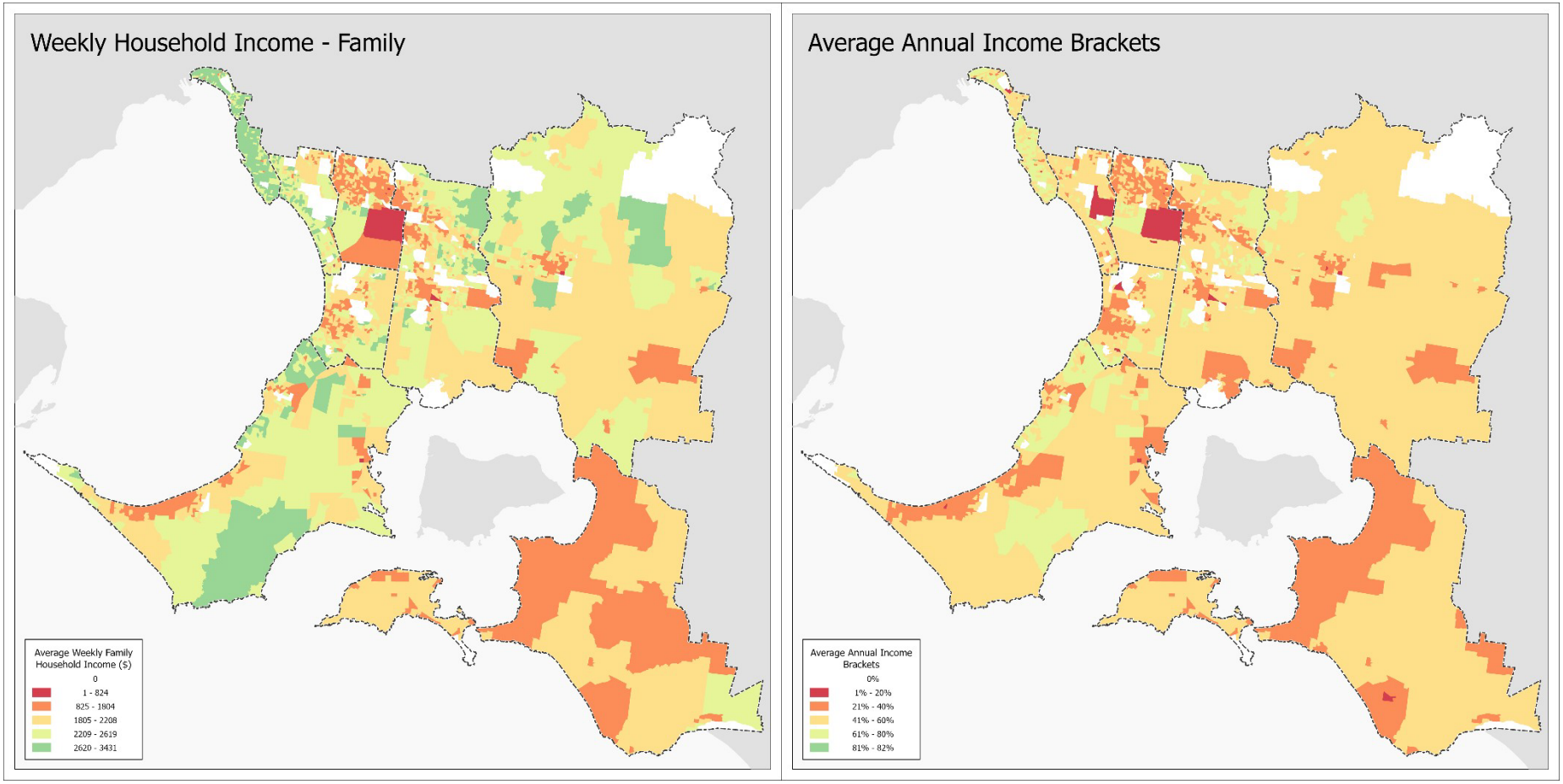

Figure 8. Population classified by average household income at the SA1 level across the SECCCA region, showing average weekly household income (left) and average annual income brackets (right).

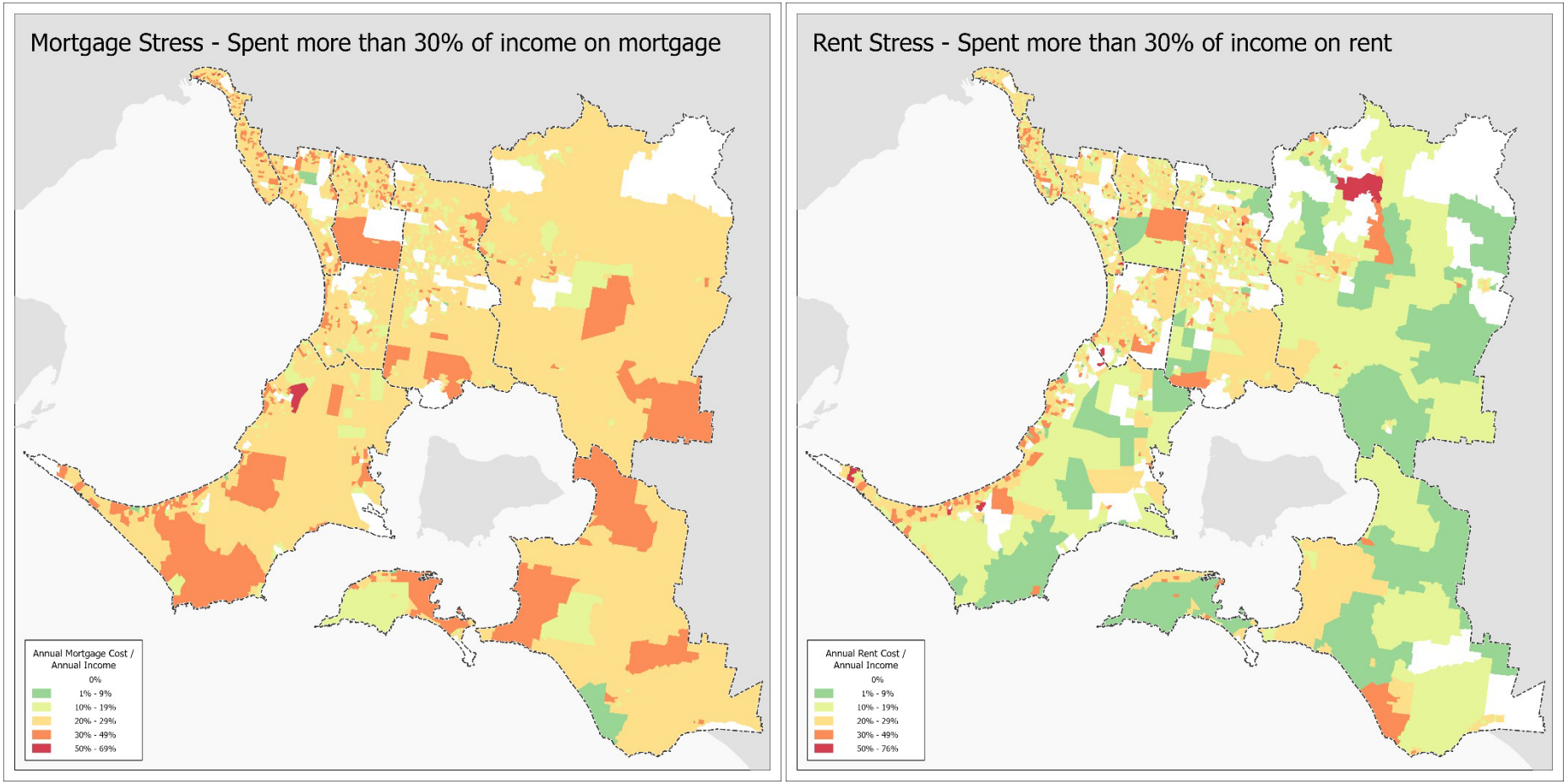

Figure 9. Population classified by mortgage and rent stress at the SA1 level across the SECCCA region, showing annual mortgage cost per income (left) and annual rent cost per income (right).

8.8 Young people

The impact of current carbon emissions on the future climate places youth firmly at the forefront of the climate crisis. This is already playing out with serious consequences on their mental health and wellbeing and a marked increase in climate stress. The increased vulnerability of this sub-population can be attributed to their lowered physiological defence systems, their reliance on adults, their more direct interaction with their environment, and the accumulation of risks over their lifetimes (Sanso et al. 2019).

'There's a real level of powerlessness that's being felt [by this group], and they're also feeling an increase in their level of responsibility for the future … they're seeing themselves as needing to act because nobody else is. It's a unique place that young people fit in this discussion because there's this uncertainty and frustration around the lack of action being taken by others, but then there's this responsibility that they're going to have to carry this forward.'

Source: Council Feedback

Discussions throughout the project regarding this sub-population included the following observations:

- Youth are particularly susceptible to suffering from mental health issues such as stress and anxiety related to climate change.
    - Climate stress and anxiety are not necessarily measured, but are having an impact on younger people.
    - Youth are using social media platforms, such as TikTok, which make it difficult to get detailed information.
- Youth can potentially be carers for other people – for example, a parent with a disability or mental health issues, younger siblings, etc.
- Threshold ages for service cut-off vary between services and within councils.
- The younger cohort of this group can vary in their vulnerability to the older cohort.
    - School-aged youth can be easier to engage with (i.e. at school) rather than the older youth (>18) who are more transient and can be difficult to engage with.
- There are differences in vulnerability when considering youth in rural compared with urban settings.
    - Youth in rural settings have less access to reliable transportation, which is more impactful in the event of an emergency (access to emergency centres).

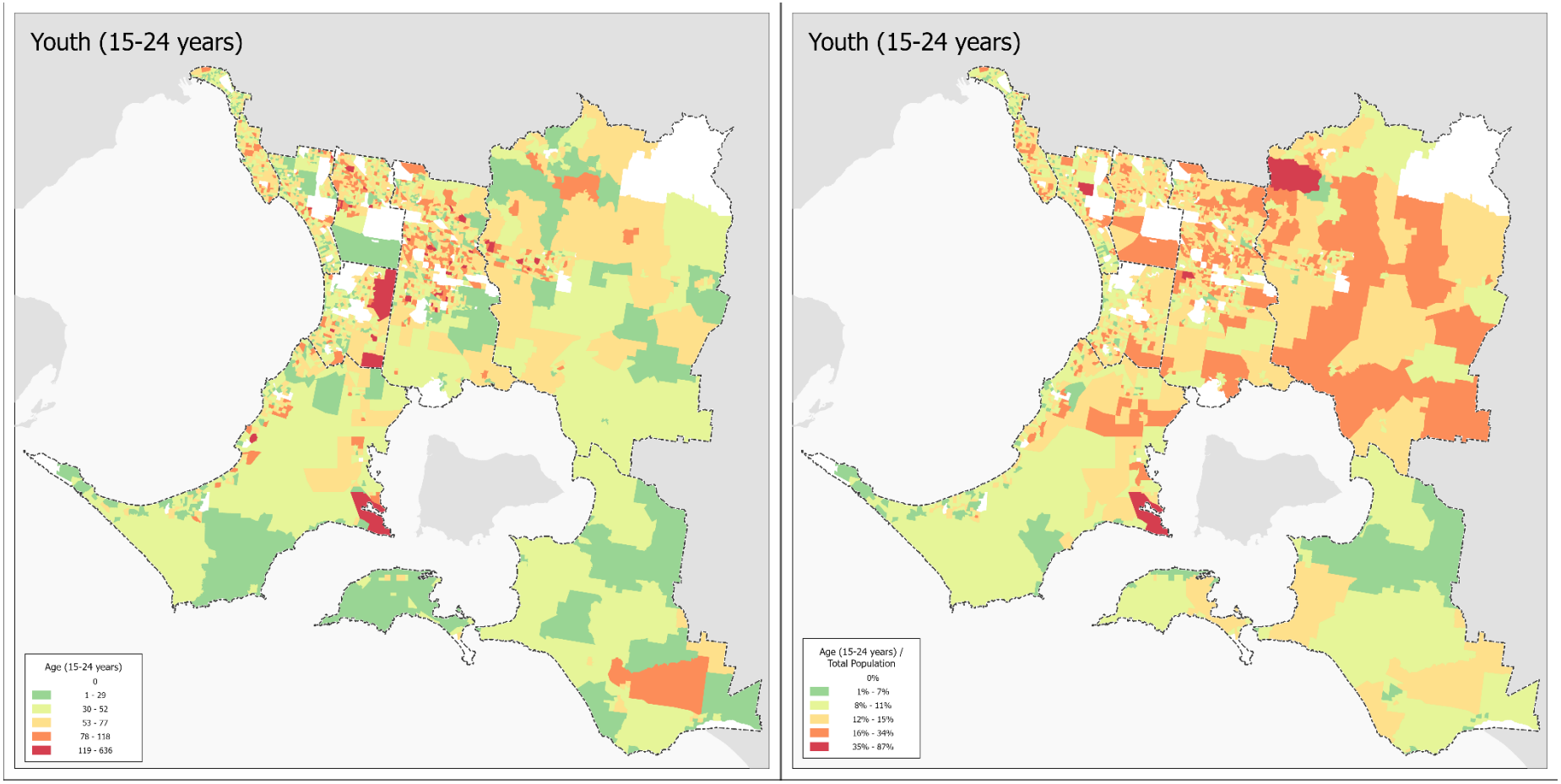

Figure 10. Population of youth aged between 15 and 24 years across the SECCCA region, showing the population (left) and density (right).

8.9 First Nations people

Based on discussions with council staff working with First Nations communities and the Bunurong Land Council (BLC), the approach taken in considering the potential impacts of climate change on this sub-population has been to identify First Nations people in addition to older members of this group and those needing assistance. It was suggested that these two additional parameters would assist in focusing on areas of greatest concern in assessing the vulnerability of First Nations communities. Discussions with the BLC followed the proposal to investigate First Nations people by Frankston City Council. Following that assessment, the approach was also applied to other council areas.

A view of the distribution of First Nations Peoples across SECCCA is presented in the following two maps. The map on the left shows the total number of First Nations people based on SA1s, and the map on the right shows the number aged 55 years and over.

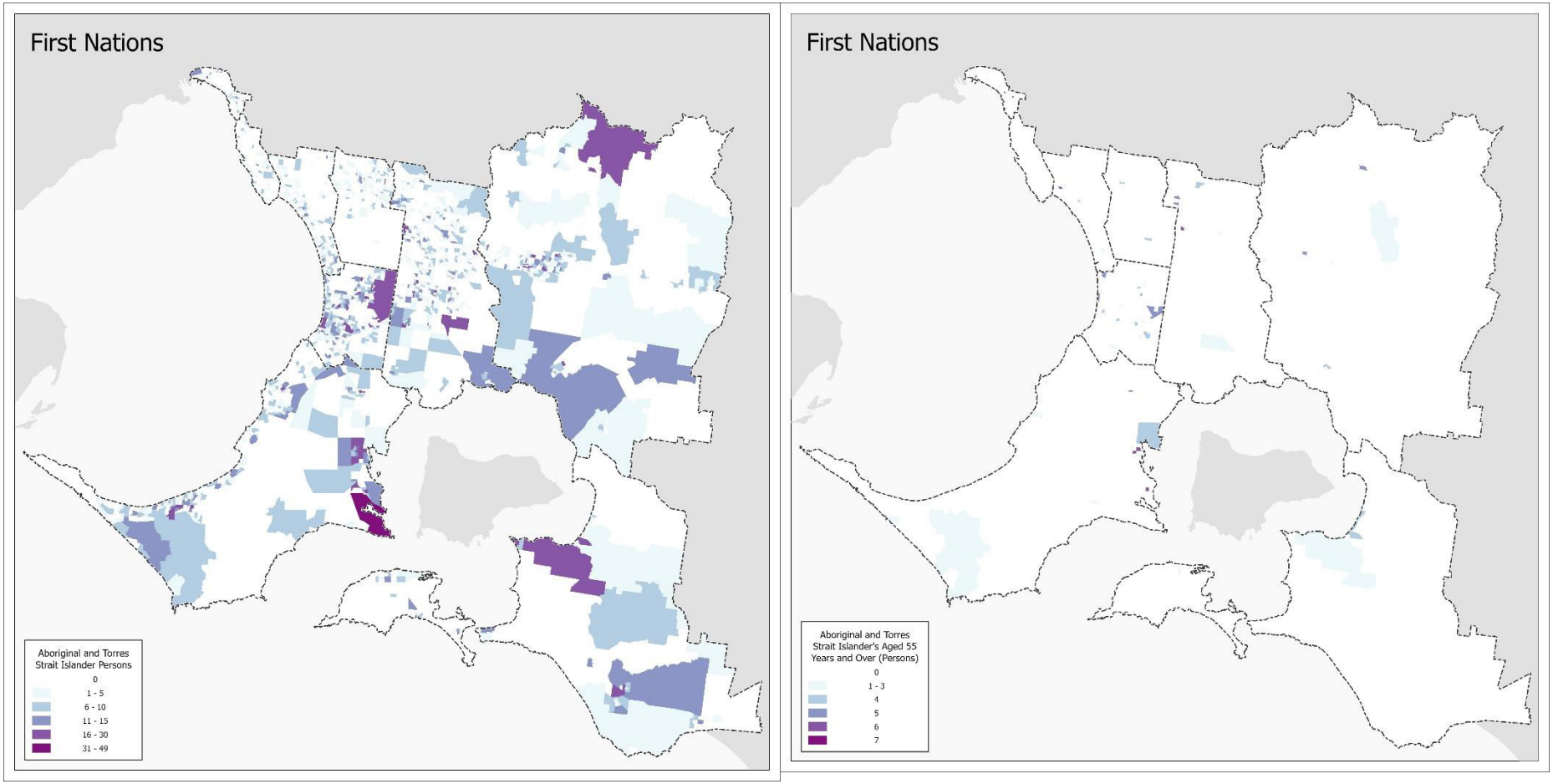

Figure 11. Population of First Nations people across the SECCCA region, showing the population (left) and those aged 55 years and over (right).

9 Other vulnerable groups considered

Additional vulnerable groups in the broader community that were identified in discussions with councils are presented in this section.

9.1 Those with no access to the internet or with low digital literacy

Access to the internet and digital literacy were key considerations noted by council participants as being a highly important factor for resilience.

Discussions throughout the project regarding those of most concern in this sub-population included the following comments:

- Digital literacy is needed to access and understand information.
- Those with internet access may not necessarily have adequate digital literacy.
- Some people still need a lot of support to be connected to the internet.
- Some people can't afford to be connected to the internet.
- Digital literacy is needed to ensure differentiation between authoritative and non-authoritative information.
- Many news outlets are digital, so those relying on physical newspapers are at a disadvantage in receiving information.
- Those who have no access to the internet or have low digital literacy are more likely to be socially isolated.
- Some people still need a lot of support to be connected, and some can't afford to be connected.
- Assuming that everyone has access to the internet and has high digital literacy is false.
- A resilient community is connected.

9.2 People living alone

People living alone may experience social and physical isolation that in turn increase their vulnerability. This characteristic was highlighted as a key contributing factor of vulnerability to a number of sub-populations, such as older people and people requiring care, where living alone and being isolated in the event of a climate crisis could have devastating consequences.

However, it was decided that this sub-population would not make up one of the 10 final vulnerable groups as it was noted that many people who live alone are well connected to their communities and via social media. They may also have the financial means to be living alone by choice. Therefore, they are not inherently vulnerable. It was decided instead that this factor would be considered within each of the 10 vulnerable populations.

9.3 Agricultural and farming communities

Agricultural and farming communities are particularly sensitive to climate change and extreme weather events. Their higher exposure to changing climate and weather, and the potential for smaller-scale farmers to have the resources to invest in adaptation options, can result in lower crop yield or entire crops being wiped out, and deterioration of the productivity and viability of the land (United Nations, 2016).

Key points identified by council staff in relation to this group include the following:

- Agricultural regions are generally the 'food bowl' of larger cities. Therefore, when these areas are impacted by climate events, the repercussions are felt by a far-reaching area.
    - This directly impacts food prices, particularly vegetable prices, meaning more people are unable to afford these foods and will therefore default to less nutritious foods.
- Some councils – for example, Cardinia Shire – are working with organisations to support farmers.
- Agricultural farming communities are highly vulnerable to climate change and extreme weather events, as their livelihood and source of income are directly impacted.

9.4 Food security and access

Food security and access have been, and will continue to be, a concerning factor on top of the climate crisis. With the changing climate and the increase in frequency and intensity of extreme weather events, access and availability of food, particularly for those already vulnerable, will become an increasingly critical topic.

Key points identified by council staff in relation to this group include the following:

- There's been an increased reliance on food services and food relief, particularly during the COVID-19 pandemic lockdowns.
    - Despite lockdowns and restrictions ending, and a decrease in unemployment, demand for these services has not eased; rather, demand continues to rise.
    - Food delivered by these services is lacking in fresh items, such as fruits and vegetables.
- Continued increases in inflation and food prices mean more people who have never accessed these services are now relying on them for food.
- People are needing to buy cheap and, therefore, generally less nutritious food, which in turn reduces overall health, making them more susceptible to the health impacts of climate change.
- Generally, it's the women/mothers in the household who will eat last, or not eat, to ensure the family are fed.
- There is a strong link to income – those who were just getting by are now tipped over the edge and need these services.

10 Areas of interest/geographic communities – use of scenarios

For the vulnerability assessment approach to be scalable and nationally applicable, it needs to introduce a geographic area (or 'area of interest') component, and allow the vulnerable groups within that area to be assessed in relation to different climate events or change of concern. The approach applies the vulnerability assessment framework to the area of interest and considers factors in addition to the specific vulnerable sub-populations within the geographical region. This assessment process provides further insights that will assist in the identification of potential opportunities to build greater community resilience to climate change.

This area-of-interest approach is more comprehensive and nuanced in assessing the vulnerability of a community to specific climate change event types. It achieves this by considering additional capacity factors (such as access roads or power outage history), and broader community characteristics (such as past experience, or volunteer levels across the broader community) in the assessment of community vulnerability.

Four areas of interest were selected, each of which focused on a different climate event or change of concern. These four areas were selected based on an assessment of nominations provided by councils, and prioritised based on scorings against key selection criteria, including the severity of the event, whether other LGAs are impacted, the community type(s) impacted, the availability of council representatives to assist the assessment, and the availability of data.

The four geographic communities, or areas of interest, focused on are:

1. *Flooding at South Mordialloc Creek*

The area south of Mordialloc Creek was nominated by Kingston Council due to its proneness to inundation. The council highlighted the vulnerable populations within this area as older people and those with a disability, due to their higher risk of isolation in flooding events, inability to receive people into their homes when relying on others for personal care, use of medication, and receiving home nursing or provided meals.

People experiencing homelessness were also identified as a key vulnerable population. Inundation – caused by overland flooding, flash flooding, tidal flooding and storm surges – is a significant issue for the community in the area due to its low-lying nature and reliance on a significant number of stormwater pumping stations as part of the drainage network.

2. *Bushfire event at Cockatoo and Gembrook*

Bushfires are a key hazard for the Cockatoo and Gembrook regions, based on historical events, their proximity to remnant bushland and vegetation, and the high fire fuel load in these areas. Furthermore, this region is characterised by a wide range of demographic groups within its community, particularly those with low socio-economic status.

3. *Coastal community at Rosebud*

Mornington Peninsula Shire nominated the coastal area extending from Safety Beach to Capel Sound due to the significant social vulnerabilities within the community, including poverty, homelessness, young people, people with a disability, older people and those with low income. This area is particularly vulnerable to coastal processes, such as inundation caused by tidal flooding and storm surges.

4. Heat waves in growth areas/new estates of Cranbourne East/Clyde North

The growth regions and new estate regions in Cranbourne East and Clyde North were nominated by City of Casey due to the high population growth projections for these areas, and their high urban heat ratings in heat waves expected in the near to mid future.

The lack of canopy cover and little open space for shelter and refuge during heat wave events cause increased vulnerability for the community, particularly as these areas generally support a high population of people from non-English-speaking backgrounds, as well as young families with very young children.

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Appendix A – Acronyms

AR6	6th Assessment Report
AVA	Asset Vulnerability Assessment
IPCC	Intergovernmental Panel on Climate Change
LGA	local government area
MS	Microsoft
NESB	Non-English-speaking background
PWG	Project Working Group
SA1	Australian Bureau of Statistics Statistical Area Level 1
SECCCA	South East Councils Climate Change Alliance

Appendix B – Draft list of factors impacting vulnerability of older people

The table below is the draft list of factors impacting vulnerability for older people, collated through consultation with the councils. Each factor was categorised into a sector and identified as to whether it related to sensitivity or capacity. A list such as below was determined for each sub-population.

Sector	Component	Sensitivity	Capacity
Age	Aged 65 and over	x	
Age	Aged 55 to 65 (and over)	x	
Ecological	Heat island index and vulnerability	x	
Ecological	Urban canopy and veg density		x
Economic	House insurance?	x	
Economic	Housing occupancy (e.g. Renting, owning)		x
Economic	Income stress or amount	x	
Economic	Low household income	x	
Economic	Rent and mortgage stress	x	
Economic	SEIFA Index of Economic Resources	x	
Health	Are in need of assistance for self-care activities	x	
Health	Long-term health condition (includes disability)	x	
Health	Any medical condition(s)	x	
Health	Mental health condition Medically diagnosed	x	
Health	Mental health condition Subjective wellbeing	x	
Institutional and Services	Climate strategies		x
Institutional and Services	Council bus services		x
Institutional and Services	Flood strategies		x
Institutional and Services	Meals on Wheels		x
N/A	Indigenous population	x	
Physical	Aged care facilities or residential care services		x
Physical	Building density		x
Physical	Dwelling/housing structure (caravan, house, etc.)		x
Physical	Housing condition and/or type and/or age		x
Physical	Population density		x
Physical	Proximity to medical services (hospitals, doctors, medical centres)		x
Physical	Proximity to open space		x
Physical	Proximity to other services (community halls, council services)		x
Physical	Proximity to public transport		x
Social	Education level		x
Social	Employed		x
Social	NESB English proficiency		x

Sector	Component	Sensitivity	Capacity
Social	CALD Established populations	x	
Social	Excluded populations		x
Social	Has a car (one, two or more)		x
Social	Level of social capital		x
Social	Level of trust		x
Social	Level of volunteering/social participation		x
Social	Live alone (over 65)		x
Social	Marginalised, stigmatised		x
Social	CALD Recent arrival	x	
Social	SEIFA Index of Relative Social Advantage or Disadvantage		x
Social	Social connections Internet access		x
Social	Social networks Levels of inclusion		x
Social	Unpaid assistance		x
Social	Unpaid childcare		x

Spatial Vision