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Industrial Transformation in response to climate change: NSW ALPINE TOURISM SECTOR

PREPARED FOR:
New South Wales
Office of Environment and Heritage

About the authors

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Citation

Please cite as: Sharpe, S. A., Delaney, C., and Cunningham, R., (2019) Industrial Transformation in response to climate change: NSW Alpine tourism case study, report to the NSW Office of Environment and Heritage Adaptive Communities Node, UTS: Sydney

Acknowledgements

This research was funded by the Office of Environment and Heritage, NSW Government, as part of the Adaptive Communities Node under the Adaptation Research Hub. The authors would like to acknowledge both the financial and collegiate support of the OEH Adaptation team in producing this research.

AdaptNSW

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Climate change adaptation in NSW Alpine tourism sector

Introduction

The purpose of this case study is to investigate business innovation activity in response to impacts associated with a changing climate in the Alpine and Highland regions of New South Wales. Climate change includes temperature changes, changes in the frequency and intensity of weather events such as heat waves, severe storms and rain events and bushfires.

The Alpine tourism sector has a long and well documented history of dealing with climate variability and has developed a host of coping strategies. For the ski resorts this is most evident in their investments in snow making and grooming activities. For these businesses these adaptations represent the focus of activity in the current and near future - as one interviewee said *“as long as nights continue to cool to zero degrees we can make enough snow”*.

The case study highlights the differing ambitions for tourism in the region between on the one hand the ski resorts and associated businesses, and on the other hand the wider business communities of the Alpine region. The tension between two views; that ‘we are a winter town only’, or ‘we want to make the investments and commitments be a 12-month nature-based and adventure tourism place’ highlight contrasting visions for the way forward for the region.

This tension is based on differing business models of the associated businesses, and how these businesses address the issues of diversification and revenue security in the face of climate change and other dynamics in the region. Adaptive capacity is markedly different across the Alpine tourism industry and the region. The impact of this unevenly distributed capacity is further compounding demographic and socio-economic changes that are also playing out unevenly across the industry and region.

Methodology

The case study methodology includes a three-step research design. First, background information, literature and studies were reviewed to provide background and context to the case study. Climate change adaptation within the Alpine tourism sector has been the subject of a number of previous studies (Bicknell and Mcmanus 2006; Morrison and Pickering 2013a, 2013b; Pickering, Castley, and Burt 2010). These studies were reviewed as part of the background analysis, and to see where historical points of comparison could be made with this case study.

The second stage of the research design was interviews (12) with various stakeholders with roles in the Alpine tourism industry including, ski resorts, local businesses, local government, business chambers of commerce, and the NSW National Parks and Wildlife Service.

The interviewees represent a diverse range of stakeholders from the Alpine tourism sector and are similar in coverage to previous studies (Bicknell and McManus 2006; Morrison and Pickering 2013). Interviews were structured around four themes and included 10 open-ended questions to guide discussions. Interviews lasted on average an hour, with the longest being 2 hours 15 minutes. The interview guide is shown in Appendix 1.

The participants were interviewed in person during field work in February 2018, or by telephone in March and April 2018.

Alpine tourism in the NSW highlands

The alpine tourism industry in NSW services approximately 1.65 million visitors per year, with gross expenditure in the industry \$881m in 2014, up from \$867 in 2005 (NIEIR 2012). The winter season employs some 9200 FTE workers, increasing from 8700 FTE in 2005. This employment is seasonal, although significant in the region. Studies into the economic impact of the Alpine tourism industry in Australia highlight that the industry is extremely significant and provides a highly regionalised economic benefit (delivered by the resorts) that would be difficult to replace with another sector (NIEIR 2012).

The NSW Alpine tourism sector is centered around four ski resorts: Thredbo, Perisher, Charlottes Pass and Selwyn, and the Alpine gateway towns of Jindabyne and Cooma, and to a lesser extent Tumut, Berridale, Adaminaby. The resorts are located within the Kosciuszko National Park. Skiers need to access the park to access the resorts. The Kosciuszko National Park attracts more than 2 million visitors annually, the majority in winter, and 70% for accessing the ski resorts.

The Australian Alps National Parks (including national park areas in NSW and Victoria) are recognised on the Australia National Heritage list as an Environmental Landscape (Commonwealth Department of Environment, 2018). The plant communities of the Alps are diverse, and in many cases rare. Kosciuszko National Park has 380 alpine and subalpine species, including plants that rely on late lying snow for seed distribution (Costin et al. 2000).

Rare and threatened animal species are dependent on specific plant communities found in the alpine areas including the Mountain Pygmy possum (dependent on plum pine communities in periglacial boulder fields, and Alpine water skink and Alpine tree frog (both dependent on Alpine wetland areas). The rare flora and fauna of the Alpine region underscores the important ecological contribution of the area, as well as the economic, through the Alpine tourism sector.

Jindabyne is the main gateway town to the Alpine region, and the township has grown rapidly in the past decade as retail centre and accommodation source. The main employing industries for residents are tourism and recreation services.

A brief summary of the characteristics of the four main ski resorts in the NSW Alpine region is provided in the following section.

Thredbo

Thredbo is the oldest ski resort in the area. It is located 37km from Jindabyne on the southern slopes of Thredbo Valley. The village was started in the 1950s and operates year-round for winter and summer activities including skiing, snowboarding, bushwalking, golf, tennis, trout fishing and high-altitude training. There are also a number of music festivals during the summer months.

Thredbo has a skiable area of 480 hectares, of which a quarter has snowmaking capabilities. Thredbo has the largest snowmaking facilities of the NSW resorts. The allowable bed capacity is 4820.

Perisher

The existing resort was formed in 1995 from the merger of Perisher/ Smiggens and Blue Cow/ Guthega resorts. Perisher is the largest resort in the area, both in terms of skiable areas, number of lifts and maximum allowable beds.

The establishment of the ski tube in the late 1980s made a significant difference to access, and hence viability for Perisher. The ski tube enabled extended and all-weather access to Perisher, reduced the need for car-parking at Perisher. It also allowed for the establishment of the ski tube accessible Blue Cow resort. Perisher has snowmaking facilities, although in comparison to other resorts with snow making (Thredbo and Selwyn) snowmaking is a small proportion of the total skiable area at 4%.

Charlotte Pass

Charlotte Pass is a small resort and is only accessible over snow during the season. As of the 2012 NIEIR report Charlotte Pass did not have snowmaking facilities, but a recently announced 110-year masterplan will see the installation of automated snowmaking in three areas of the resort (Charlotte Pass Snow Resort, 2019).

Selwyn

The Selwyn resort takes in the northern section of the Kosciuszko National Park. Also, a small resort. Selwyn does not have any overnight visitor accommodation, only staff accommodation. The resort is made possible by extensive snow making activities with over 80% of the skiable area using snow making equipment.

Table 1: Summary characteristics of NSW Alpine resorts

Resort	Number of lifts	Skiable area (Hectares)	Snowmaking area (Hectares)	Maximum beds
Thredbo	14	480	120	4820
Perisher	47	1245	53	4952
Charlotte Pass	4	50	0	611
Selwyn	12	45	36	50 (staff only)

Source: NIEIR (2012)

Geographical context

The Alpine region is contained within the Snowy Monaro Regional Council. The council was formed on 12 May 2016 through a merger of the Bombala, Cooma-Monaro and Snowy River Shires.

The Regional Council comprises an area of 15,162 square kilometres (5,854 sq mi) and occupies the higher slopes of the eastern side of the Great Dividing Range between the Australian Capital Territory to the north and the state boundary with Victoria to the south. The population of the region at 2016 census was 20,218.



Figure 1: Map of the Snowy Monaro Regional Council area

Source: Snowy Monaro Regional Council website

Analysis of previous studies

There have been numerous previous studies over the past two decades that have investigated the current and forecast impacts of climate change on the alpine tourism industry, and the perceptions and strategies of decision makers in preparing and adapting to these changes. This section provides a short overview of these studies as way of background to the current case study.

The Commonwealth Scientific Industrial Research organization (CSIRO) has reported on climate change in the Alpine areas for the past two decades. From the most recent report (CSIRO 2015) the likely impacts of climate change in the Alpine region include substantial decreases in snowfall and increase in melt and thus reduced snow cover. In each of these cases, trends are considered large compared to natural variability, especially under a high emissions scenario. The CSIRO research as far back as 2003 has found declining snow depths in the alpine region between the 1950s and 2001 (Hennessy et al. 2008).

The NSW Government climate projections for the South East Tablelands include temperatures continuing to warm in the near future (2020–2039) and far future (2060–2079), compared to recent years (1990–2009), on average about 0.6°C in the near future, increasing to about 2°C in the far future. There will be more hot days and fewer cold nights and again the degree of warming projected for the region is large compared to natural variability in temperature (NSW Office of Environment and Heritage 2014).

Previous studies show there has been an evolution in the attitudes of Alpine tourism stakeholders in their perceptions of climate change; progressing from some to all participants acknowledging the reality of climate change in the alpine environment (Bicknell and McManus 2006; Morrison and Pickering 2012; Morrison and Pickering 2013). However, across all the studies there is diversity in the views about the consequences of these impacts for the region, with many stakeholders commenting that technological options including improved snow

making and grooming, is minimizing any impacts, and that ski resorts now have better control of their (snow) environment, than at any time in the past.

Across all the studies, there was a common conclusion that the threat of climate change impacts, rather than the actual impacts have the potential for more negative consequences for the ski industry, especially if this resulted in a downgrading of the value of capital investment into the sector (Morrison and Pickering 2013).

Bickwell and McManus (2006) highlight a number of adaptations already evident in the Alpine regions including a shift to all-season tourism, snowmaking and grooming technology, investment in research and the establishment of an 'advocacy network'. In the fifteen years since their research these have remained the primary adaptations.

In all season tourism there has been an evolution in understanding of the market offering – early investments in pools and tennis courts misunderstood summer tourists demand for nature-based activities such as walking, hiking and cycling.

The main limitation to investment in summer-based tourism is the ability to recovery a return on investment (Morrison and Pickering 2013), as visitor-spend during the summer months is much less than the winter months.

Snowmaking has been the dominant, and largely autonomous adaptation of the past two decades. In 2006 snowmaking was seen as an 'insurance policy' against a bad season, whereas now it is seen as necessary and something that all ski resorts, even smaller ones, have invested in. The previous studies highlight potential limits to this adaptive response; biophysical limits to snowmaking in warmer temperatures, and social and economic limits with the water and electricity usage associated with snowmaking (Morrison and Pickering 2013). These limits seem to be at an abstract level, with no associated decision-making about what these limits mean in terms of operations, now or in the near future.

Other limitations to adaptation include lack of knowledge in relation to the impacts, but also for response measures. The need for research (local and contextualized) and opportunities for collaboration were also raised across two of the major studies (Bicknell and McManus 2006; Morrison and Pickering 2013). This was done with the realization that the knowledge of what to do did not currently exist within the community in a way that would see the Alpine tourism sector able to develop and implement strategies for adaptation.

An interesting finding of Bicknell and McManus (2006) was that Alpine communities' emphasize their resilience rather than their vulnerabilities. This is tied back to the perception of the threat of climate change impacts being more serious than the actual impacts. It is also further compounded by the variety of adaptation responses and limited resources available to different parts of the sector to make these adaptations. Large ski resorts and small businesses in service centres may not agree on the same strategy to move forward, let alone coming together to create an advocacy force that would lobby for specific outcomes and investments from government.

Thematic analysis from the interviews

Perceptions of climate change impacts

Across the stakeholders interviewed there was general consensus about the reality of climate change, but as with previous studies there was difference in how this translated to impacts that stakeholders report occurring now, and impacts that are reported, for instance from the CSIRO. This meant that for many stakeholders, whilst they had noticed changes, when

comparing year on year they found it hard to attribute these to a trend, and felt they were reporting more anecdotal evidence rather than systematic impacts.

“People are aware of the predicted impacts but the experience of the last few years have been good”.

“I have noticed that autumn and spring are getting longer, last (ski) season was the best in ages, but it was a late starter, winter is getting later, the best times are now in August and September”.

Increased fire hazard in the summer months, and how this could impact the flora of the alpine regions, as well as the potential for summer tourism activities in the mountains such as walking and cycling were also noted by a few stakeholders.

“...bush fire risk has increased, and is something we need to think more about if we are having hikers up in the mountains”.

“...The main hazard that has increased is fire in the summer...snow gums are very sensitive to how they respond to fire, Alpine Ash too...it takes 20-50 years to recover from a fire like the one we had in 2003, if we get multiple burns in that time the trees cannot recover”.

Even without climate change impacts disrupting winter tourism, a number of stakeholders commented that they felt that climate change was not being adequately considered or covered in plans for the future of the region.

“Climate change will have local consequences – these consequences are not being taken into consideration in planning for our region”.

Further, there was a recognition from half (6) of the stakeholders that responding to climate change would require a strategic and planned approach, and that time and resources would also be required to manage this process.

“We need to future proof the town, we need to be able to accommodate growth and climate variability...we may still have the ability to generate more income as a tourist destination despite climate change but we need to start planning for that to happen”.

Seasonal impact on the Alpine region

The distinct seasonality of the Alpine region already creates issues for infrastructure and service provision. During the winter time the population of Jindabyne can swell to two and three times the summer population levels. This creates challenges in servicing this new population with schools, medical and health services and accommodation.

“The seasonality of Jindabyne creates problems, the population swells in winter, and we need the infrastructure to cope with that, but then that is only needed for 2-3 months a year”.

Jindabyne bears the brunt of this seasonality. Changes to accommodation for staff employed by the resorts have meant that resort staff usually have to find their own accommodation (and usually in Jindabyne) and travel into the National Park and resorts for work.

“Resorts have made changes, it used to be that they would accommodate their staff up at the resort, but that is not the case anymore, they can rent

those rooms to skiers, so now staff have to live down in Jindabyne, so accommodation in winter is a big issue”

The constraints on accommodation in winter have led to new building activity in the township, but again this is only aimed at fulfilling winter demand.

“...people are building, but just to cater for winter tourism, mostly absent landlords, they will use it (the accommodation) for a few weeks when they come down to ski, and then rent it out for short stays the rest of the time...”

Adaptation response: investment in snow making/ grooming

The most ubiquitous, and autonomous adaptation evident in the Alpine region is the investment in snow making technology and snow grooming equipment. As noted earlier all the resorts have snow making and grooming equipment.

“What we fear now is a wet season, rather than a hot season, even the smaller resorts are putting in snow making”

“We are ready for a bad season now, the technology like snowmaking and snow grooming is really flattening out the season, a bad season 30-40 years ago, was worse than a bad season now”.

The limits to this adaptation response highlighted in the previous studies, including biophysical limits, and social and economic limits were not discussed by stakeholders as current concerns. One stakeholder admitted it would become a concern in the future, especially with water availability. Another stakeholder highlighted the opposite; that the region has adequate access to water and electricity to support continued snowmaking activities.

Adaptation response: Diversification into all-season tourism

One of the most prominent adaptation mentioned in the previous studies of the Alpine region is the shift from winter tourism to all-season tourism. This has been an identified adaptation and strategic desire for the Alpine community for much of the last two decades. The strategy for all-season tourism is based around nature exploration, and activities such as mountain bike riding and bush walking.

“we are working on summer activation, walking trials – high-end multi day ones like they have in Tasmania”

“Things are changing to 12-month tourism, Thredbo is doing lots of planning for mountain bike trails, the Caltex petrol station is making as much in summer as in winter”

Stakeholders highlighted a number of limitations to the all-season tourism model; firstly, for some businesses including the ski resorts, the major employers and drivers of economic activity in the region, summer tourism is not as attractive as winter tourism.

“Much of the retail activity here is for skiers and hikers, hikers don’t spend as much as skiers”

“Summer tourists spend significantly less per day than skiers, \$100 per day versus \$600-\$700 per day, the numbers are different too, we might have 700 mountain bikers, but 7,000 skiers, volume and yield are very different...”

The ability to make a return on investments specifically targeted for summer tourism is a major limitation on the strategy for all season tourism.

“You can’t save winter with summer. If you think climate change is going to take away winter, summer tourism will never be enough to keep the rest of the economy sustainable. The yield is simply not there...summer won’t save the Alpine tourism industry”

The difference in yield and volume expectation between the summer and winter tourist cannot successfully be bridged by the current range of businesses operating in the Alpine region at the moment. As one stakeholder noted:

“There is little incentive for current businesses to invest/ renovate at the moment, they think it is always going to snow, I am always going to be able to charge this amount during the ski season and that is where I make my profit, what is the incentive to put more investment into upgraded facilities to attract visitors all year?”

For Perisher ski resort, their diversification strategy is global, rather than all-season. Perisher resort is owned by *Vail Resorts*, an international ski resort and accommodation multi-national company. Perisher offers an opportunity to market global ski opportunities to Australian skiers, and in the event of a bad season in Australia, Perisher has the option to offer discounts for skiing in other destinations, and therefore not risking customer disappointment.

“(Perisher’s)... diversification strategies are global rather than local. It’s offering the same product in different countries. Previously ski resorts focus on day tickets, now they focused on cheap season passes. The passes in Perisher also offer a pass in another country...”

The business models of the two major ski resorts – Thredbo and Perisher also shape their attitudes to summer tourism. Thredbo has a head lease for the whole resort, they can masterplan the whole resort. There are also multiple owners of accommodation, food and beverage services in Thredbo. Perisher has a strip lease arrangement, where they lease the part of land with infrastructure (lifts etc). Perisher also controls all the accommodation, food and beverage services on their site.

The ski resorts themselves have different operating conditions to those of the businesses in the town. The ski resorts are defined as tourism precinct, and therefore have different trading conditions (later and longer trading) which can also impact when penalty rates are triggered.

“...Ski fields are classified as a tourism precinct, this means that businesses there don’t have to pay penalty rates, but Jindabyne is not classified in the area...”

The success of snow making and snow grooming have translated into good seasons in the past few years, and some stakeholders highlighted this as the reason for some parts of the industry being less interested in investing in the all-season tourism model.

“Resorts strategies are different, winter tourism is not declining, it is booming, so they have less interest to think about summer”

Other stakeholders expressed doubts in the unique offering that the Alpine region could deliver to the summer tourist, in comparison with other established summer tourism sites (e.g. the beach), and the amount of time and investment it would take to build the reputation required to become internationally competitive.

“In winter we have a unique offering in the Australian market – snow, in summer time we are not unique”

“Mountain biking is starting to grow – but it took a long time to take off”

“The culture of walking in the mountains has been in Europe for hundreds of years. In Australia, we don’t have a strong culture of walking in the mountains in summer, we head to the beach”.

A number of stakeholders also discussed that some of the smaller businesses in the Alpine region lack some resources and capabilities in order to transition to all-season tourism. The trout fishing industry was highlighted by half of the stakeholders, as an industry that should be thriving with the move to all-season tourism, but instead had declined. The perceived reason for this decline is summarised by one stakeholder:

“In the move to summer business, ...the benefits not shared across all industries, for instance the trout fishing industry, it was estimated to be \$50-\$70m in 2001, now would be a quarter of that....lots of reasons trout is an introduced species so there is some conflict with native fishers, licensing changes, also local industry not that savvy – they need to have websites, information for fishers etc, but they don’t upgrade.”

Managing transitions

As previously noted, half the stakeholders interviewed, recognised that climate change impacts would require a transition, and this transition, in order to be successful would have to be planned, managed and resourced. At a basic level, this was reflected in some comments about needing stronger strategic planning from local government, and the challenges that local government amalgamations have presented in achieving this.

“we need proper planning for growth”

“we have a three-pace shire after all the councils were amalgamated, Jindabyne is growing fast, Cooma-Monaro is staying the same, and Bombala with an older demographic is shrinking – but they (Council) have to have parity on expenditure between the three”.

In recent months, the NSW Government launched a strategic planning process for the development of the Alpine region, so this may result in more strategic investment in assets and infrastructure for the region. Although the level and quality of local stakeholder participation in the formation of these strategies will likely be decisive in their success. A number of stakeholders echoed the following quote:

“...the top down approach not working, we need a collaborative approach”

Stakeholders were clear that in order to transition to all-season tourism model, and ensure the region is less dependent on winter tourism into the future, will require changes and investments at the individual firm and business community level, but also investments in enhancing the connectivity – both physical and digital, of the Alpine region.

“If people come to visit and have accommodation booked and there is no snow, they will be looking around for other things to do, we need to have some other options”.

“It would be good if we could make the area less dependent on seasonal tourism, and more connected to the outside world both through transport but also digitally”

“ I hear about other towns that have transitioned – I ask questions – how do we have better relationships with national parks, how do we deal with the people who move from Canberra and make the most of the opportunity, and climate change, what is the tipping point for us, what do we do next...”

Stakeholders highlighted that the business community in the Alpine tourism sector is tightly networked, but at the same time can be disconnected from businesses in other sectors within the region. This disconnect is in terms of businesses’ ambitions for growth, attitudes to entrepreneurial opportunities, and a willingness to innovate and change.

“Ski communities are a tight knit group, especially the permanent community, we place a lot of importance on long standing relationships”

“There are some budding entrepreneurs in Jindabyne, activities funded by online businesses or remote work, so they relocate here for lifestyle reasons and run their business from here”.

“There is a lot of distinctions between businesses, some are connected, flexible, able to think laterally, others are less inclined to look for growth...”

Relationship with National Parks

National Parks and Wildlife Service (NPWS) is a major stakeholder in the region. Every stakeholder interviewed discussed the importance of National Parks to the region, and their role as a critical decision maker, and highly influential in contributing to the success of the all-seasons tourism model.

All stakeholders also discussed their perceptions of the relationship between the business community and National Parks, with most businesses perceiving they did not have a good relationship with National Parks: describing their relationships as “one-way”, “problematic”, “challenging” and “difficult”. Stakeholders felt they had no ongoing forum or channel of communication to National Parks through which to form an ongoing relationship.

“We have no engagement with National Parks, no neighbours program for meeting and discussing issues in an ongoing way for example issues like brumbies, or weed management...”

In some instances, there was a misunderstanding with stakeholders about the role of NPWS, as well as some understanding of the challenge that NPWS face in balancing their conservation objective in the parks with assisting with activating more tourism.

Discussion

The purpose of this case study is to investigate the innovation and business strategy making activity in the NSW Alpine tourism sector in response to climate change. The sector is already highly experienced with dealing with climate variability in a year on year basis. The case study interviews highlighted consensus on the reality of climate change, but diversity in the

perceived impacts of climate change. There is clear evidence of the declining trend in snow levels in the Alpine region since the 1950s, however the success of what has been the primary (and largely autonomous) adaptation of snow making has minimised the impacts of these declining snow levels.

Prominence of snowmaking and grooming

Snow making and grooming technology was once seen as an insurance policy for the bigger resorts, but now is common across all resorts. The success of snow making has led many stakeholders to comment that they are now better prepared for a 'bad' season than they were one to two decades ago. The success of snow making and related grooming activity has in many ways meant less motivation in pursuing other adaptation responses.

There are limits to snow making as an adaptation response; biophysical limits, as well as social and economic limits associated with the resource intensity of snow making. In the previous studies of adaptation in the Alpine regions these limits were more discussed, than we found in this series of stakeholder interviews. In some cases, stakeholders rejected the existence of limits to snow making.

All-season tourism

The other adaptation response discussed by stakeholders in interviews, and indeed over successive studies, is the shift from winter only tourism to all-season tourism. The move to all-season tourism is supported by government at all levels, National Parks and businesses in the services centres dependent on tourism (Jindabyne, Cooma etc).

The shift to all-season tourism requires additional investment in new facilities and provision of new services. What is less clear is how an adequate level of return on investment can be achieved from these investments. The interviews highlighted the significant difference in yield and volume of winter versus summer tourists. In the Alpine regions all the facilities are built for winter tourism and adapted where they can be for summer as well. This does not necessarily lead to the creation of an optimal summer tourism product.

The yield and volume issues also mean the ski resorts, in varying degrees are less interested in summer tourism, than winter. Winter is still the priority. The resorts themselves have differing diversification strategies. In the case of Perisher, owned by multi-national resort company Vale, their diversification strategy is global, allowing Australian skiers to access skiing at other global destinations (at resorts they own). This diversification is demonstrated in their marketing activities to their Australian customers, and in the way they structure ticket prices – less emphasis on day ticket sales, more into season passes, and global season passes.

There are limits to all-season tourism as well; a number of stakeholders raised the increased summer fire risk that the region is now starting to face. Increasing fire risk during the summer months, necessitating management of numbers of hikers and mountain bikers in the National Parks, could impact the long-term viability of these activities. This, combined with the sensitive fire nature of much of the Alpine region's flora, including slow recovery periods from bush fires (20-50 years) means the summer amenity of the region could be severely damaged by repeat burns in a short period of time.

Resourcing transitions

The majority of stakeholders interviewed acknowledged that at some point transitioning the Alpine economy away from winter only tourism would be necessary, and that transition would take time, planning and resources. In the towns that are dependent on the ski industry, there is a need for the large ski resorts and businesses to take the lead in this transition. However,

for reasons mentioned before these businesses are not necessarily investing or pursuing this strategy.

Individual small firms in these townships lack the resources both financial and human to make the transition alone. There are also limits in the capacity of local government to manage the transition. A regional strategy making process is under way with the NSW Government through the Department of Planning, and it is envisaged that this kind of strategic input, and additional resources from both State and Commonwealth levels of government will be required to achieve a transition that leaves the Alpine regions stronger, and less dependent on winter only tourism in a changing climate.

Networks and collaboration

The Alpine tourism business community is strongly networked, but there are less connections to business communities across the region in other sectors. The all-season tourism model, or even just a more diversified economic base will require greater participation and collaboration across all the prominent economic sectors in the region – primarily agriculture. For example, a food trail could be another addition to the all-season tourism offering, and would require a closer integration of the agricultural sector, as well as developing and promoting a ‘snowy mountains’ produce brand. Strategies that could be mutually supporting in the development of both tourism and value-added agricultural industries in the region.

Finally, the Alpine ski tourism sector is not a homogenous sector and there are differing views and strategies on appropriate responses and visions for the future. The impact of this could be the continuance of an ‘advocacy gap’. A concept initially identified by Morrison and Pickering (2013) to describe the Alpine region’s preference for emphasising resilience rather than vulnerability, and therefore not developing the leadership or capacity to ‘advocate’ for additional resources. However, this case study highlights not so much an attitude of emphasising resilience leading to the ‘advocacy gap’, but rather the challenge of differing visions for the future of the Alpine region, making it difficult to united behind and advocate for a single vision.

References

- Bicknell, Sharon, and Phil Mcmanus. 2006. "The Canary in the Coalmine: Australian Ski Resorts and Their Response to Climate Change." *Geographical Research*. <https://doi.org/10.1111/j.1745-5871.2006.00409.x>.
- Charlotte Pass Snow Resort Pty Ltd (2019) 10-year Masterplan, www.charlottepass.com.au/10-year-masterplan.html, accessed 11 June 2019.
- Costin, A.B., M. Gray, C.J. Totterdell, and D.J. Wimbush. 2000. *Kosciuszko Alpine Flora*. Melbourne: Commonwealth Scientific and Industrial Research Organisation.
- Hennessy, K.L., P.H. Whetton, K. Walsh, I.N. Smith, J.M. Bathols, M. Hutchinson, and J. Sharples. 2008. "Climate Change Effectson Snow Conditions in Mainland Australia and Adaptation at Ski Resorts Tjrough Snow Making." *Climate Research* 35: 255–70.
- Morrison, Clare, and Catherine Pickering. 2013a. "Limits to Climate Change Adaptation: Case Study of the Australian Alps." *Geographical Research*. <https://doi.org/10.1111/j.1745-5871.2012.00758.x>.
- Morrison, Clare, and Catherine M. Pickering. 2013b. "Perceptions of Climate Change Impacts, Adaptation and Limits to Adaption in the Australian Alps: The Ski-Tourism Industry and Key Stakeholders." *Journal of Sustainable Tourism*. <https://doi.org/10.1080/09669582.2012.681789>.
- NIEIR. 2012. "The Economic Significance of the Australian Alpine Resorts." Victoria State Government. <http://www.arcc.vic.gov.au/documents/aesfullreporttext.pdf>.
- NSW Office of Environment and Heritage. 2014. "South East and Tablelands Climate Change Snapshot." Sydney. <https://climatechange.environment.nsw.gov.au/Climate-projections-for-NSW/Climate-projections-for-your-region/South-East-and-Tablelands-Climate-Change-Downloads>.
- Pickering, Catherine Marina, J. Guy Castley, and Michelle Burt. 2010. "Skiing Less Often in a Warmer World: Attitudes of Tourists to Climate Change in an Australian Ski Resort." *Geographical Research*. <https://doi.org/10.1111/j.1745-5871.2009.00614.x>.

BUSINESS INNOVATION IN RESPONSE TO CLIMATE CHANGE: INFORMATION SHEET

This research project, *Business innovation in response to climate change* is being conducted by the Institute for Sustainable Futures at the University of Technology Sydney as part of the research program for the Adaptive Communities Node. The Node is part of The NSW Office of Environment and Heritage funded NSW Climate Change Adaptation Research Hub.

The purpose of the research is to investigate business innovative activity in response impacts associated with a changing climate. This includes temperature changes, changes in the frequency and intensity of weather events such as heat waves, severe storms and rain events and bushfires. The research investigating knowledge sources, and the enablers and barriers to innovative activity in these circumstances. Innovative activities can include: changes in business practices and operations, development of new products and services, development of new knowledge and information sources, and establishment of new partnerships and collaborations. These changes can be of both a short or long-term nature, and at the individual business level, or industry and sector level.

The research team is conducting a number of interviews with key stakeholders on this issue, and you have been identified as one of these stakeholders. Your contribution to this research will involve participating in an interview. The interview will take approximately 45 minutes and will be based on a set of interview questions that you can receive a few days before the interview.

The results from all the interviews will be analysed and included in a research report for this project. All material collected during the interview will be kept confidential and research data gathered from this project will be published in a form that does not identify you in any way. All research participants are acknowledged with thanks in the appendices of the research report. You are free to decline this acknowledgement and also withdraw your participation from this research project at any time without giving a reason.

If you have any concerns or questions about the research you can contact **Dr Samantha Sharpe** at the Institute for Sustainable Futures, UTS on **0425 333 759** or samantha.sharpe@uts.edu.au.

Research ethics for projects conducted at University of Technology Sydney The University of Technology Sydney, Human Research Ethics Committee, has given in principle approval to research studies undertaken by the Institute for Sustainable Futures. If you have any complaints or reservations about any aspect of your participation in this research you may contact the ISF Ethics Coordinator, Dr Keren Winterford (02 9514 4972) or the ISF Deputy Director, Professor Cynthia Mitchell (02 9514 4953). You may also contact the UTS Ethics Committee through the Research Ethics Officer (02 9514 9615). Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Appendix B

These questions are used to guide discussions; some questions may be more relevant to particular stakeholders.

1. Could you please tell me about your organisation and your role within the organisation?
2. Could you please tell me about whether and how your business activities have changed over the past decade? Changes in customer, changes in turnover by season?
3. Climate change scenarios are forecasting a number of changes in the Alpine region including temperature variability, rainfall variability, and the increased risk of bush fires? Have you seen existing evidence of these impacts? Have these changes affected your business operations and viability? Will these in the future?
4. How do you think visitors to the area are noticing, responding to these current and future changes?
5. How do you relate to local business community in Jindabyne? Is it closely connected? Is being part of the business community a key activity in ensuring the viability of your business?
6. An adaptation strategy is to move to year-round tourism strategies – how is your business considering this?
7. What other adaptation strategies are available?
8. What do you think the role government needs to play in economic development in the region – local, state and federal?
9. Any further question or comments?

Thank you for your time.