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Nature, place and the creative class: Three Canadian case studies

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ABSTRACT

In the natural world, the transfer of resources between landscape features such as the corridors and patches that make up the mosaic of ecological niches is increased where those boundaries are more complex. This article explores this as an analogue for the relationship between natural landscapes and human communities and the possible link between those landscapes greater human diversity and innovation. Using Canadian case study research this article explores the potential link between landscape and human creativity. The case studies are all examples of human communities with higher than average populations of the creative class and with noted landscapes that have influenced the nature and direction of development. We explore the possibility that there is a link between landscape and creativity and consider how this may reflect the potential for cultural diversity and thus the sustainable community development.

1. Introduction

The basic link between human and 'natural systems' has been firmly established (Odum, 1997; Pickett and Cadenasso, 2006). But this link is generally concerned with human impacts on ecosystem services, and the benefits of those ecosystem services (Pickett and Cadenasso, 2008; Newman and Jennings, 2008) to human economic services, ignoring their contributions to human cultural and social diversity, innovation, and built organization.

There has been much recent discussion on the subject of urban form and its impacts on environmental and social parameters. Specifically, the way in which urban areas can be restricted and sprawl minimized (Whyte, 1958; Razin, 1998; Kunstler, 1998; Calthorpe et al., 2001), the way in which ecological systems can be maintained and enhanced (McHarg, 1971; Newman and Jennings, 2008), and the way in which urban areas can be made 'liveable' (Appleyard, 1981; Evans and Dawson, 1993; Elliott, 2008), 'walkable' (Burden, 1995; Southworth, 2005) and more 'human scaled' (Calthorpe et al., 2001). Not to mention direct impacts of the presence of natural spaces in urban areas on human well-being and health (Frumkin, 2001; Hill, 2002; Jackson, 2003). These goals have been realized in a variety of techniques, tools and movements in planning and architecture including the design and architecturally focused 'New Urbanism' (Congress for the New Urbanism, 1999) movement and the ecologically sympathetic and city planning orientated 'Smart Growth' (Ingram et al., 2009).

These planning agendas are part of the current development ethos of many municipalities. However, many of these development philosophies and ideas either consider the ecological aspects of urban as either elsewhere (and protected by the denser development) or simply providing services such as water and clean air. Ecosystems provide more than that—critical space for enhanced community vitality (Dale et al., 2010). This notion, that places to live become more attractive if they are integrated with functional ecological features has been demonstrated by, for example, Lee et al. (2008) who established the link between ecological functionality and neighbourhood satisfaction. These types of neighbourhoods are universally preferred: "Urban residents worldwide express a desire for contact with nature and each other, attractive environments, places in which to recreate and play" (Matsuoka and Kaplan, 2008).

There are some places where the links between social and ecological aspects of design are included in planning and decision making, creating towns and communities that have demonstrated resiliency and adaptability in the face of changes in local and global systems (Rogers and Sukolratanametee, 2009). This article examines three Canadian case studies where many of these characteristics are manifested.

It has also been suggested that the success of cities from an urban economic perspective is dependent upon the attraction of the so-called 'creative class' (Florida, 2002). These are individuals that are attracted to and wish to work in cities with characteristics of diversity and tolerance. They work in a variety of industries where creativity and flexibility are valued. They live in places with diverse housing choices and walkability, as well as amenities that they value. This, Florida claims, is consistent with the new urbanism concepts and ideas of density and mixed-use development.

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Exactly what the creative class is ambiguous: "The creative class remains a vague socio-occupational category, most commonly defined as a group of individuals who either possess high levels of education and/or are engaged in creative (scientific, artistic or technological) types of activities" (Petrov, 2007). It is clear that the creative class thrives on diversity of opportunity and ideas (Florida, 2002) and amenities that they value as critical to their general well-being, such as access to green space, access to diverse food sources, and culture and arts, but surely the most important thing would be access to sources of creativity and innovation—the spark of ideas and invention, as this is what makes people creative? People respond to and affect ecological change in ways that can be creative—a 'learning loop' (Pickett et al., 2004). How does one assess these less tangible values? Literature on memes (Dawkins, 1986; Blackmore, 1999) attempts to explore how ideas spread and essentially support this idea of an emergent creative class economy and wider aspects of cultural evolution. Memes are described as 'an element of culture passed on by non-genetic means especially imitation' (Blackmore, 1999, p. 43). It could be said that creativity, the flow of memes, in the socio-economy is analogous to the flow of nutrients and resources in natural systems—in both systems flow is enhanced by diversity and by permeability. As interaction with nature is as vital for community as is social intercourse (Hersperger, 2006); without landscape and cultural diversity, we argue that both ecological and human systems will stagnate and eventually collapse and fail.

2. The edge: the built and non-built relationship

The patch/corridor/matrix model (Forman and Godron, 1986) is well suited to translating landscape ecological concepts into planning (Hersperger, 1994). The edges and boundaries between components of the landscape are significant locations of diversity, biological and structural, and affect the flow of nutrients, organisms, other flows between adjacent ecosystems (Forman, 1995). The structure, complexity and character of an edge effects the degree to which flows across the boundary are filtered, carried or absorbed at the edge (Bennett, 1990, 1991; Forman, 1995). For natural processes 'soft' complex edges increase the flow of materials, whereas 'hard' edges such as those typically found built and non-built environments decrease flows—homogeneity (no edges) has no movement or flow at all (Forman, 1995). Complex edges enhance resource flow between adjacent patches and therefore facilitate the diversity in those patches. Complexity increases permeability: permeability increases diversity (Forman, 1995). At the edge of two intersecting ecosystems, for example, a river and the ocean, lie some of the greatest diversity and richest food sources. Conversely, highly disturbed or introduced, that is 'concretized', impermeable boundaries such as typically located between the interface of competing human system processes or human and ecosystem services reduce diversity and resource flow (Forman, 1995).

Where natural features are integrated in the built environment in ways that allow access by the full diversity of the community then these edges are going to contribute more to the cultural, innovative and economic life of the community. Natural corridors, patches and edges that humans cannot (or do not) 'concretize' may contribute more to the creative human class as defined by Florida than the built environment. It is crucial, however, that these natural features remain accessible and do not form barriers between neighbourhoods (Soleckiav and Welch, 1995).

Edges also have an important role to play socially. Cultural edges, characterized by a diversification of social behaviour and knowledge support increased resilience (Turner et al., 2003). Wallace and Wallace (2008) also recognise the importance of complex social systems in building resilience into urban places. They demonstrate that public health and public order are dependent on the dense networks of social ties that are more complex and more resilient in older and more stable neighbourhoods. Furthermore they note that this is partly independent of economic indicators, with stable poorer neighbourhoods still exhibiting the public health and public order seen in stable but more affluent neighbourhoods. Interestingly, however, ecological systems are important in this relationship: "The failure of urban resilience often translates into a failure to manage ecosystems for optimal resilience" (Wallace and Wallace, 2008). To what extent is the converse of this true? Does a failure to manage ecosystems also lead to a failure of urban resilience over the longer term?

In the context of an urban built environment – and applying the analogue to socio-economic systems – the greater the complexity of the non-built environment associated with the built environment, the more permeable the landscape features (between the ecological and the built and between urban land uses and between areas of different socio-economic character), then the greater diversity of information and ideas and memes. Dawkins (1986, 1989) suggests that memes are the building blocks of cultural evolution; in the same way that more complex natural environments lead to greater biodiversity, more complex cultural environments will lead to a greater diversity of surviving memes.

Memes follow the rules of evolution and natural selection (Blackmore, 1999), and will therefore grow, replicate and flourish in a socio-economically diverse built environment that is open and allows for their diffusion. A diversity of memes will support a resilient and adaptable creative socio-economy—such is the essence of Florida's ideas concerning the creative class. Memes spread first by assimilation by an individual and then are transmitted to other individuals through some form of vehicle (Heylighen, 1998). This spread, and survival is dependent on the fitness of the meme to the cultural and social environment into which is launched. A diverse and complex social and cultural landscape will create more opportunities for different memes to spread, and as previously discussed social and cultural diversity is linked to bio- and ecological diversity. The presence of a symbiosis between urban form and ecological space within such places we suspect will support a diversity and diffusion of memes that also encourages a more resilient and adaptable sustainable place incorporating a reconciliation of ecological, social and economic imperatives (Dale, 2001; Robinson and Tinker, 1997).

A diverse cultural environment needs to include natural environments that are accessible by the greatest variety, balance and disparity of people (Stirling, 2007)—the existence of natural capital is the basis of cultural capital and interactions between the two forms human capital (Berkes and Folke, 1994). Cultural evolution and the development of economic systems are intrinsically linked to each other and to biodiversity and ecological systems (Hinterberger, 1994). The more difficult to develop, or the more protected ecological features are, the greater their contribution to enhanced human diversity. This diversity is also likely to act as an attractor to the creative class or more diverse human capital. In other words, does an urban form that is permeable to ecological systems, with significant green infrastructure, attract more of the creative class and contribute to greater social and intellectual diversity? Indeed in a sample of American cities, almost 90% of gentrifying districts were near an environmental amenity or significant cultural institutions (Clay, 1979; Ley and Dobson, 2008).

Systems of greater complexity and diversity (whether ecological, social or economic) have greater resiliency and adaptability. This article considers that the ecological needs to be part of the dialogue of creativity in a more fundamental way—both by ensuring there is space for the ecological in the places in which we live and also by considering the ecological as providing critical infrastructure for human social and community systems. Socially, it is the

Table 1
Summary of occupation and education data for the three case studies and the British Columbian average (Statistics Canada, 2007).

	Labour force engaged in arts, culture, recreation or sport (%)	Population with degree or higher (%)
Salt Spring Island	7.2	27
Vancouver	6.5	33
Whistler	4.9	29
BC average	3.5	16

relational capital and relational connectedness in behavioural processes that are vital to changing the long-term social relationships that underlie collaborative schemes (Nkhata et al., 2008). Collaboration, or dialogue (particularly inter and trans-disciplinary) is crucial to the incorporation of sustainable development into policy and practice (Dale, 2001; Folke et al., 2002; Walker et al., 2002; Berkes et al., 2003; Dale, 2005). The ecological also needs to be part of this relational system.

3. Three case studies

In order to explore this notion further, a multiple case study approach is taken (Yin, 2008). The case study method was chosen – the detailed examination of an aspect of a historical episode to develop or test historical explanations that are generalizable to other events – to contribute to theories that can accommodate various degrees of complex causality (George and Bennett, 2004). Similarly, case studies were chosen in which a variable is at an extreme value, that is, the case studies all illustrate diverse dominant landscape features.

Three sustainable development case studies from across Canada, developed by the Canada Research Chair in Sustainable Community Development research program at Royal Roads University (www.crcresearch.org) are used to explore the creative class within the context of nature and place. As well, the three communities are recognised for their positive attitudes to the local ecological landscape. The link between the creative class, natural landscape and community development will be discussed. The extent to which these findings would apply to other contexts outside the cultural context of west coast Canada is moot—the nature of case study research does not allow for generalisation. However, the themes of creativity and the connection between people and nature have been applied in many contexts in both North America and around the world.

These three communities were selected as places where the landscape in each community is generally and widely recognised as being a key part of the character of the place. The three were used to examine the connection between the place and the community living there. In this way, identifying case studies with an extreme value is useful for heuristic purposes of identifying new theoretical variables or new causal relationships. The creative class in Canada is measured using the Talent, Bohemian, Mosaic and Tech-Pole indexes applied in a Canadian context as described by Gertler et al. (2002). In these case studies, the scale used prohibits the use of the more detailed data used by Gertler et al. and so a rougher estimate of creativity is taken by using higher order levels of the National Occupation Classification and population information found in Community profiles derived from the 2006 Canadian Census (Statistics Canada, 2007) (Table 1). A case study comparison was then conducted, the independent variable being a dominant landscape feature in all three cases that cannot be easily modified by the human built environment over the shorter term, and the dependent variables being community diversity, creative class and sustainable community development.

The case studies that have informed this article are three communities in British Columbia, Canada with large, dominant physical landscape features—Salt Spring Island (island landscape), Vancouver (coastal landscape) and Whistler (mountain landscape). All three illustrate examples of the reconciliation of, or the creation of, space for ecological systems within the socio-economic systems, where physical character of the local landscape has directly influenced the response of the community to planning and community development related issues locally. Case studies are explored in terms of the manifestation of the creative class in the community concerned, the nature of the environment in those communities and an exploration of the impact the one has on the other. This investigation can come to no definitive conclusion and these case studies provide no more that an indication of a possible relationship; but they do suggest that the relationship between the environment and the creativity of a community is more important than current literature into the creative class suggests.

3.1. Salt Spring Island

Salt Spring (Fig. 1) is an 180 km^2 island with a population of 10,000 and surrounded by dense urbanization on the lower mainland of British Columbia and the southern end of Vancouver Island. The island has a tourism-based economy that relies on the ecological and recreational resources, as well as magnificent viewscapes of forests, mountains, ocean and farmland. Ninety percent of the island contains sensitive, rare or endangered ecosystems. One particular ecosystem, Burgoyne Bay, harbours historical and cultural values from thousands of years of human activity; although the area has had human impacts (e.g. land clearing for farming, log sorts on land and in the water), it has had relatively little modern development. The Burgoyne valley and bay retains an atmosphere embracing the cultural and spiritual values of local First Nations and the heritage of one of BC's first inter-racial settler communities (Arnett, 2003). Any development or logging on the island is regarded as a serious threat to the island's ecosystems and community's economic base, as well as aesthetic values.

Salt Spring Island has a complex matrix, both in space and culturally in the relationship between the natural landscape and human communities. The mosaic is made of agricultural, forest, low density residential and small village developments. It is both ecologically and culturally distinct from either Vancouver Island or the Lower Mainland of British Columbia to which it is linked by ferry. The insight in to the community used for this case was obtained through semi-structured interviews over three years with 16 community members around the topic of a successful community action against a developer—that story is reported fully as a case study at http://www.crcresearch.orgcase-studies/crc-case-studies/community-action-salt-spring-island. The interviews identify that one of the key drivers of action identified by Island residents was their attachment to the physical beauty of the place and the landscape.

Salt Spring Island is a classic example of a landscape attracting a diversity of population that is very obviously based on creative talent, an example of an ecological and social edge relationship—7.2% of the labour force is occupied in arts, culture, recreation and sport, double the BC average of 3.5% (Statistics Canada, 2007). The workforce is also highly educated (27% with a degree or higher as opposed to a BC average of 16%) (Statistics Canada, 2007).

Artists, musicians, place-independent consultants, retirees, and a variety of alternatively minded people have taken up residence on the island. Well-known artists residing on the island include Randy Bachman, Raffi Cavoukian, and Robert Bateman, to name only a few. In the case study produced for the Canada Research Chair, the community identity with place is manifested in a strong bond with the island landscape and its natural resources. The island has also attracted a population with a diversity of knowledge and skills, considerable social capital and a focus on conservation and

Fig. 1. Salt Spring Island from the top of Mount Maxwell.

preservation that contributed to one of the most successful social action campaigns in Canada.

The nature of the community action was strongly linked to the diversity of both the population on the island, and their access to resources (intellectual as well as financial), and the particular focus within the wider context of protest (concern over water resources, landscape aesthetic, the political implications of private resource exploitation, etc.). The human capital on the island very much reflects what Florida refers to as the creative class, which in this case has not chosen an urban setting, but a unique landscape albeit with easy access to a large urban centre (Vancouver, British Columbia). Although Florida maintains that it is the amenities of a city that attract the creative class, on Salt Spring Island it is the ecological amenities being the key attractor and a certain lifestyle that only islands can provide.

One key factor in success of the campaign against logging on the island was this access to the diversity of artists and musicians, and several artistic tools were used to bring the campaign into the open. Another key factor was that the ecological place characteristics appear to have attracted people with a pre-existing openness to diverse ideas and opinions, allowing the campaign to be proactively fought on multiple fronts owing to this diversity (in the courts, politically, through non-profit organizations, in the media, through business and shareholder meetings and on-the-ground direct action). Openness to others and diversity of ideas are critical to community responses to external, global forces often beyond the capacity of any one community to address (Dale and Sparkes, 2007), and a key factor in a community's ability to implement sustainable development.

The artistic community is present on Salt Spring Island because of the landscape, the creativity is inspired by the landscape, the landscape and the proximity of the natural gives space for the creative class to flourish. The persistence of the natural started being a result of limited water resources and the remoteness of the place, but has since been maintained and protected by the very people that the physical and ecological character of the place has attracted.

The other aspect of this case is the island space in which it is situated. An island restricts the ability of human systems to ignore the natural systems; there are definite finite physical limits to development. One of the concerns of the campaign was the protection of the watersheds that provide the island population with their water supply. An island has very clearly defined landscape ecological edges, and these edges intrinsically contribute to the physical character of the place. In the case of Salt Spring Island, the interviews revealed that the beauty of the place was the main attractor for people to locate there, the ecological edge complimenting and contributing to its cultural edge. The next case study is in a physical situation where this finite physical limit is not present, at least to as such a comprehensive way, but its planning has resulted in sustaining the permeability of its dominant landscape features into one of Canada's nationally significant advances in urban sustainable development. The limits come from a desire to protect the physical beauty and are thus culturally rather than physically imposed—yet still dependant on landscape ecological characteristics.

3.2. Vancouver

Vancouver (Fig. 2), described by Coupland (2000) as the City of Glass, is consistently ranked as one of the best cities in the world for quality of life (see for example the Mercer quality of living survey at http://www.mercer.com/qualityoflife). It is located on the west coast of British Columbia, Canada and is the largest city in western Canada with a population of 600,000 for the City in a region of 2.5 million. The City has ocean on one side, mountains on another, and

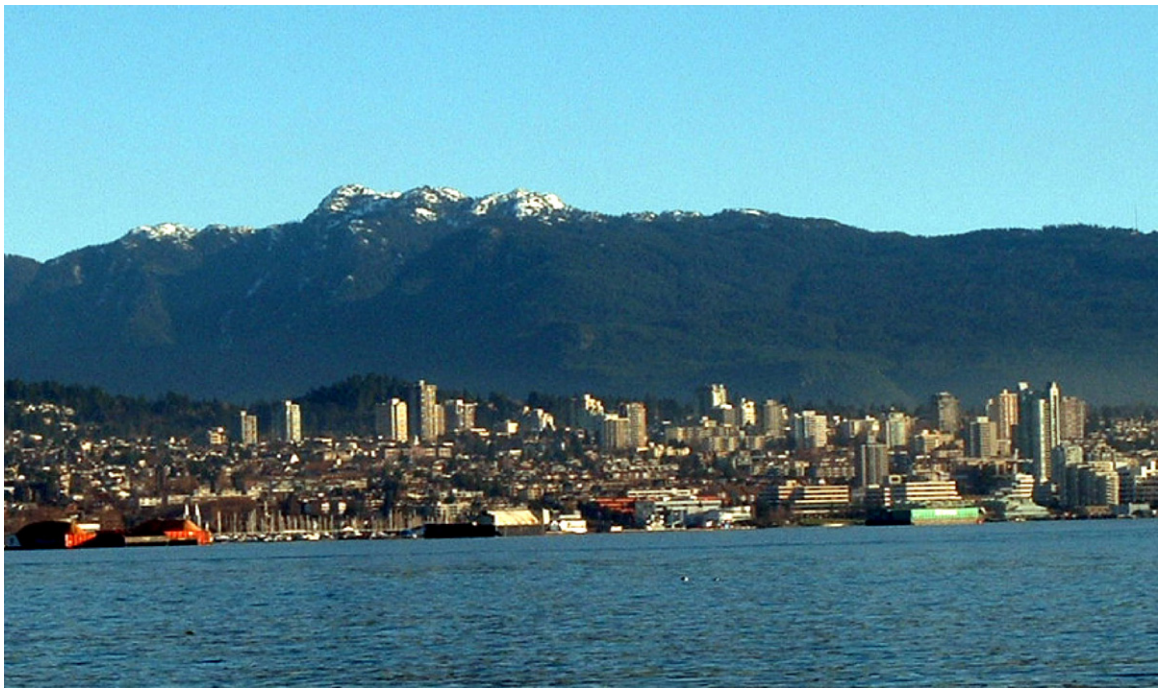

Fig. 2. The Resort Municipality of Whistler from Whistler Mountain.

the Fraser estuary on the third. The Downtown core is on a separate island in an inlet and the city is characterized by its proximity to the ocean and mountains. The City is one of the highest scoring cities Canada with respect to creative class indicators—and the most Bohemian of all major cities (Gertler et al., 2002); 6.5% of the labour force is occupied in arts, culture, recreation and sport, and 33% of the workforce is highly educated (Statistics Canada, 2007).

This case study is based mainly on documentary evidence relating to planning decisions that have informed the development of the City. This story has been widely reported and is in the public domain see for example Punter (2003), MacDonald (2008) and Berelowitz (2005). The City of Vancouver is an example of where the cultural influence of the landscape surrounding the community has been enhanced by the creation of permeability between the built- and non-built in the urban design. The importance of the natural landscape to Vancouver's identity, liveability and indeed creativity has long been recognised in the planning process of the City (Punter, 2003): physical public access to both ocean side and mountain, but also in deliberate planning of views in the Downtown to ensure that these features are viewable from throughout the city. Vancouver is often held up in the global context as an example of one of the world's most sustainable and liveable cities. This development is in large part influenced by the physical limits to growth of the environment (mountains and water), and the importance the community gives to these features culturally and emotionally.

If the premise of this article is correct, then is it the close proximity to two significant landscape features that has, and continues to influence and inform the ideas behind its sustainable development. Does the maintenance and enhancement of the City's interaction with this edge make Vancouver both attractive for the creative class and a very liveable city?

In Vancouver in the 1970s, there was a forward thinking municipal council in place; just at the time that many comparable cities in North America were building freeways to facilitate car transportation, Vancouver resisted. The reasons given for this are, in part, the presence of dominant landscape features contributing to the sense of place (MacDonald, 2008). Indeed MacDonald suggests this link has been embedded in the culture of the place since the 1920s with the City's original general plan. This cultural linkage between landscape and community stimulating creativity to protect these assets and memes about urban development that, in the 1970s, ran counter to the dominant paradigms of the time and had been proposed for Vancouver since 1959 (Punter, 2003, p. 18). This foresight set a precedent for subsequent walkability and liveability and planning controls to enhance the physical beauty and accessibility to the landscape for the residents of the City. By the 1990s it was assumed that planning would include access to and protection of the waterfront aesthetic quality and amenity (MacDonald, 2008).

This further led to thinking that predisposed the decision makers of the City to implement more sustainable solutions to challenges. However, neighbouring communities have a similar context but do not display the same planning perspectives–is this because of a lack of the same identity with the mountain and ocean? The proximity to mountain and ocean reduces as one travels east through other parts of metro Vancouver so maybe it is this that has reduced focus on sustainability. This reduced focus could either be through the lack of presence or the lack of attraction in the physical environment for the diverse creativity of the main City. In addition, direct access and permeability changes as a function of distance from the physical amenities. Indeed education and occupations in arts, culture, recreation and sport reduce in adjacent communities—in Burnaby 10 km from Vancouver highly educated people make up 26% of the adult population and those in arts and culture occupations 3.3%, in Surrey 30 km from Vancouver 16% and 2%, respectively (Statistics Canada, 2007). Of course to what extent this is due to the attractor of the landscape, or the simple impact of higher property prices forcing lower earners away from the city, and which comes first is hard to prove—but Florida (2005) would suggest that the creative class comes before the property price rises.

Over time the City has gone from a provincial backwater with an economy heavily reliant on natural resources to an international city with a diverse economy. Is this simply enlightened municipal decision-making or are the place and the landscape features dominating it part of the story? Of course the presence of key individuals such as Larry Beasley and Mike Harcourt could be entirely random happenchance. It is almost impossible to discount this, but if the

Fig. 3. The north shore mountains from the City of Vancouver.

thesis of this article is correct then the unique nature of these landscapes would increase the chances of the presence of those with sufficient creative spark and agency to effect sustainable change? Indeed the planning history presented by MacDonald (2008) and Punter (2003) and the theories of Florida (2002, 2005) suggest that the link would be expected.

3.3. *Whistler*

Whistler (Fig. 3) is a resort municipality located in the Coast Mountains of British Columbia, 40 km inland from the Pacific Ocean, and 120 km from Vancouver. Whistler is primarily a ski resort, but also caters for mountain bikers and hikers in the summer, as well as more casual visitors. The town has 10,000 permanent residents, 11,000 second home owners and a combined visitor/resident population of 45,000 at peak times of the year (Resort Municipality of Whistler, 2010). Whistler is again a different place—one in which the physical landscape is the raison d'être of the town in its current form as a resort municipality. 4.9% of the population are employed in art, culture, recreation and sport; 29% have are educated to degree level or higher (Statistics Canada, 2007). Although in this case the occupations are more than typically skewed to recreation and sport—and as such may not be as representative of bohemian occupations as in the other case studies.

Fourteen key community members were interviewed regarding their role and motivation in the community engagement process to develop Whistlers' comprehensive sustainability plan (Whistler 2020). The impact and significance on the community engagement process is reported in Smith (2007) and presented as a case study on http://crcresearch.royalroads.ca/case-studies/crc-case-studies/community-engagement-whistler2020). The comprehensive sustainability plan has been lauded as being a state of the art example of growth and sustainable community development. The main purpose of its planning process is to protect and enhance the physical environment, which is the foundation of the economy and culture of the town. Again, interviews confirmed that the nature and physical beauty of the landscape was a key motivation in volunteer involvement in the process. This also demonstrates a link between the creativity manifested in the novel approach to community engagement and the sustainability plan and the landscape which stimulated the process.

The character of the landscape correlates with the presence of a diverse group of people and the community having a free flow of ideas—even if often only on a temporary basis. For example, a chance meeting on the ski slopes between local decision makers and Natural Step practitioners led to the development of Whistler 2020, the document and policy upon which Whistler's reputation for sustainable development is built (Battison, pers. comm., November 27, 2008). One can easily argue that the landscape character and the space it subsequently provides for interaction between people is therefore an essential part of the story. In this case, the mountains so dominate the landscape and set hard limits on the community's ability to grow in space because it is impossible to do so, thus, landscape edges directly contributes to the economic diversity and ultimately an attractor for greater social diversity than normally found in smaller communities (Dale and Onyx, 2005). In this case study, the ecological edges and the cultural edges are inextricably linked (Turner et al., 2003), and act as an attractor for a greater diversity of human capital attracted to the lifestyle living here allows.

Whistler on the one hand seems a simpler story than the other two cases. The integrated planning initiatives came out of a desire to protect the landscape that was the foundation of the economy. However, is it possible that the mountain landscape attracted people with a predisposition for sustainable development that resulted in an integrated planning approach? As one participant in the planning process stated "people come here because of the environment and it's a spiritual place in terms of the mountain environment,

recreation and lifestyle". It is neither the landscape nor the people but the dynamic relationship between the ecological and cultural edges that result in moves towards sustainability, over the longer term.

4. Discussion

It is, of course, almost impossible to really determine cause and effect in these relationships, the location of these three communities in attractive landscape may be coincidental, and there are other communities in such landscapes that do not attract the creative class in the same way. There are clearly many parameters that influence the creative class–and the adoption and creation of sustainable memes. However, in all these cases action and sustainability was stimulated by the strong, deep and personal relationship and identification the community members felt towards the landscape in which their community was embedded.

Having (semi-)natural landscape features that cannot be built on, or are protected by policy initiatives, increases the patch diversity of an area, increases the complexity of the mosaic and provides functional systems of all types throughout the community. This increase in diversity increases the permeability of the system—enhancing the ecological functionality in the urban area or community. It also enhances access to (semi-)natural ecological systems by the social and economic systems. It is these that are most often considered important in planning decisions within the urban area. The ecological functionality of the diverse landscape provides an attractor to the creative class, and that in and of itself, provides a unique amenity.

Using language from the social capital literature, these phenomena can be likened to the 'bonding' of the landscape and environment to the social structures within the local environment (Newman and Dale, 2005a,b). In effect the landscape is part of the community, and recognising this builds the strength of that community. The influence of the landscape increases with repeated and ongoing personal contact. The creation of strong bonding social capital between people with their landscapes will influence the relationship between them. Clearly, strong bonding social capital around critical edges in the three case studies has contributed to greater sustainable development planning and policy implementation. The importance of diversity and tolerance in social systems has been noted in both the literature of the creative class (Florida, 2002) and in the social capital literature (Dale and Onyx, 2005; Newman and Dale, 2005a,b). Ecological systems are also enhanced by biodiversity and ecological resilience, by connectivity and complexity (Walker, 2008). It stands to reason that when both the landscape and the social systems sustain diversity and resilience, and these two systems are operating in concert rather than in opposition the whole system is exponentially more diverse and resilient. This would presumably make the whole system more sustainable as the components are reconciled.

If an increase in the development of memes is the manifestation of the creative class and memes follow the rules of evolution and natural selection (Blackmore, 1999), then they will grow, replicate and flourish in a socio-economically diverse built environment. A diversity of memes will support a resilient, adaptable and creative socio-economy—such is the essence of Florida's ideas concerning the creative class. Memes spread first by assimilation by an individual and then are transmitted to others through connection with other individuals. This spread, and survival is dependent on the fitness of the meme to the cultural and social environment into which is launched. A diverse and complex social and cultural landscape will create more opportunities for different memes to spread, and as previously discussed social and cultural diversity is linked to bio- and ecological diversity. The presence of a symbiosis between urban form and ecological space within such places we suspect will support a diversity and diffusion of memes that also encourages a more resilient and adaptable sustainable place. It is also possible that a diverse and natural landscape, which is impermeable to human 'development' either physically because of its dominant landscape features or through deliberate planning, may also, lead to greater sustainable community development.

5. Conclusion

These case studies indicate that, at least in these places, there is a relationship between unique landscape features, specifically ecological edges, and community creativity that appears mutually reinforcing. Locating at ecological edges, if their permeability is sustained, increases access to a wider range of resources, both biologically, socially and we argue, culturally. To confirm this more studies need to be done. Is a relationship between ecological functionality and creativity observed generally?

Historically, people situated along rivers, and lakes, for greater access to natural resources. In the case of Canada's First Nations, a study by Wilson Duff, the Curator of Anthropology at the Royal British Columbia Museum, in 1964 (unpublished) found that 100% of communities in British Columbia lived along the edge of a waterway or shoreline, and we argue our modern urban form continues to follow this same pattern of access to resources. These case studies suggest that ecological edges can also play a critical role in contributing to cultural diversity. There unique amenity value serving as an attractor to the creative class: this leading to a greater diversity of human capital, free flow of memes, and hence to human innovation. This diversity and the resultant innovation that comes with it is key for sustainable community development, community vitality (Dale et al., 2010) and ultimately the success of human communities. The challenge is to identify which comes first, do creative people get drawn to landscapes with greater diversity, or in communities with a high number of creative people are natural and diverse landscapes more likely to get protected? There could also be an economic driver, attractive places becoming more desirable and therefore more expensive to live in leading to a more affluent (and therefore more highly educated) population.

Sustainability is a reconciliation of the three imperatives–therefore the human environment or landscape has to be a complex matrix that allows space for all three of these imperatives to flourish. These case studies suggest that where this complexity exists and the socio-economic is reconciled to the ecological, sustainable development is enhanced by creating a virtuous cycle of feedback for sustainable development. It is therefore the complexity of the system and the reconciliation in space of the social, economic and ecological that provides spaces that enhance, or attract the creative class. The importance of the ecological/place dimension is missing from the creative class literature—even in fact suggesting it operates against the creative class by tying them down and encouraging reduced mobility (individuals trading off a sense of place against career opportunity). Clearly, further research is needed to explore the relationship between ecological and cultural edges and the influence they have on human communities—their creativity, their diversity and the impact this has on the places they inhabit. Scale effects need to be explored—does the effect of landscape effect the distribution of the creative class within the context of a region, or does it act as an attractor to a region, creative class distribution is typically described at very coarse regional scales?

Questions arise as to the ability to deliberatively plan for this reconciliation. What are the characteristics of place that are required to attract the 'creatives'—can this in itself be actively created? We have argued that ecological edges and cultural edges are key to sus-

tainable community development, as both results in more diverse places. Rather than being regarded as simply an accident of natural or social geography, perhaps edges could be purposively created and maintained (Turner et al., 2003), or restored by communities in their attempts to promote greater sustainable community development. For example, the city of Boulder, Colorado has adopted a European model that is somewhat a homologue of Salt Spring Island. To ensure an edge, the city has actually bought up all the surrounding land to ensure a surrounding 'natural' environment. Different modes of ecological protection and integration into the community may have different effects on the attraction of a creative class.

Clearly, the Whistler and Salt Spring Island cases are not large scale urban communities, however, their unique physical attributes have acted as an attractor for diverse 'creatives'. But, it is also not just a question of the scale or dominance of a landscape feature, but rather, optimizing on the unique space of the natural edges to attract people, enhancing their opportunities for connecting and sharing ideas, leading to opportunities for greater dialogue and collaboration; for dialogue is the most effective way for communities to collectively formulate shared values (Etzionni, 2000) and is essential to the realization of sustainable community development.

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