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Defining Sustainability in the Greater Yellowstone Ecosystem

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Abstract

Because of the normative and subjective nature of the terms sustainability and sustainable development, solutions tend to be applicable for specific regions but not the whole of society. Thus, it is imperative understand better how community stakeholders and decision makers define the concept of sustainability. Not only will greater understanding of such definitions add to our understanding of nature-society relations, but also in certain contexts, this understanding may help to promote realistic and effective decision-making at local levels. The objective of this study was to determine how amenity-driven gateway communities surrounding Yellowstone and Grand Teton National parks define, conceptualize, and perceive sustainability, and if those perceptions varied between time in residence, community of origin, or role within the community. Thirty-five key informant interviews were conducted with decision makers within the Greater Yellowstone Ecosystem to meet the study objectives. Throughout study communities, definitions of sustainability focused on the environment, the economy, and multi-generational thinking, and it is believed that these similarities can be the starting point for communication and collaboration among gateway communities, the long-term sustainability of their individual communities, and the collective resource upon which they all depend, the Greater Yellowstone Ecosystem.

Keywords: sustainability, sustainable development, community perception, Greater Yellowstone Ecosystem, national parks

1. Introduction

1.1 The Trouble with Defining Sustainability

One of the fundamental issues regarding the applications of the concept of sustainability is the lack of a universal definition for the concept, largely because of the numerous objectives, contexts, goals, and scales of perspective that surround it (Kates, 2010; Parris & Kates, 2003; Vos, 2007). To be sure, there are many proposed definitions oriented around themes of human or environmental well-being and a long-term perspective, going back at least to the 'Brundtland Report' (WCED, 1987). Harrington (2016, 1) recently suggested one of these: sustainability is "the capacity to maintain or improve the state and availability of desirable materials or conditions over the long term," with the intent of providing a broad and flexible definition while reflecting the most basic meanings of sustainability. Of course, the flexibility of such a definition also provides for many different specific adaptations (the particular conditions or materials of focus, the period under consideration [see NRC, 1999; Kates et al., 2001]), thus leading to differences in applications and, at times, communication problems.

In order to tailor efforts to improve sustainability to particular contexts, including accommodation of the complexities of connections among places, it is imperative to understand how community stakeholders and decision makers conceptualize, perceive, and define the concept of sustainability (Robinson, 2004; Rudzitis, 1999; Volker, 1997). Greater understanding of such conceptualizations will add to our understanding of nature-society relations and may help to promote realistic and effective decision-making at multiple scales (Bergstrom & Harrington, 2012; Parris & Kates, 2003). This is of critical importance because the concept of sustainability is predicated upon the idea that environmental, economic, and societal goals should be integrated into the decision-making process (Dernback & Mintz, 2011) in order to bequeath an "undiminished world to future generations" (Raskin et al., 2010).

A region where multi-scalar decision-making has resulted in on-going conflict in recent decades is the Greater Yellowstone Ecosystem (GYE), encompassing lands adjacent to Yellowstone and Grand Teton national parks

(Figure 1) (Robbins, 2006; Turner, 2008; Yochim, 2009). As the centerpiece of the GYE, the policies implemented by the National Park Service in relation to Yellowstone and Grand Teton national parks; local, state, and federal agencies in relation to adjoining public lands; and actions of tourists and residents in the gateway communities of the region, have considerable influence over the long-term sustainability of local communities and the natural environment. Gateway communities, those settlements that serve as access points to public lands, benefit economically and socially from increased tourism and recreational activities through increased spending, as well as through quality of life amenities that draw businesses and workers (Headwaters, 2016). However, tourists, recreationists, and amenity migrants may also be detrimental to the community and the natural environment through stresses related to population growth, economic change, and environmental degradation. This can be particularly harmful in gateway communities where decision makers place local economic initiatives and community growth above environmental protection (Baron et al., 2000).

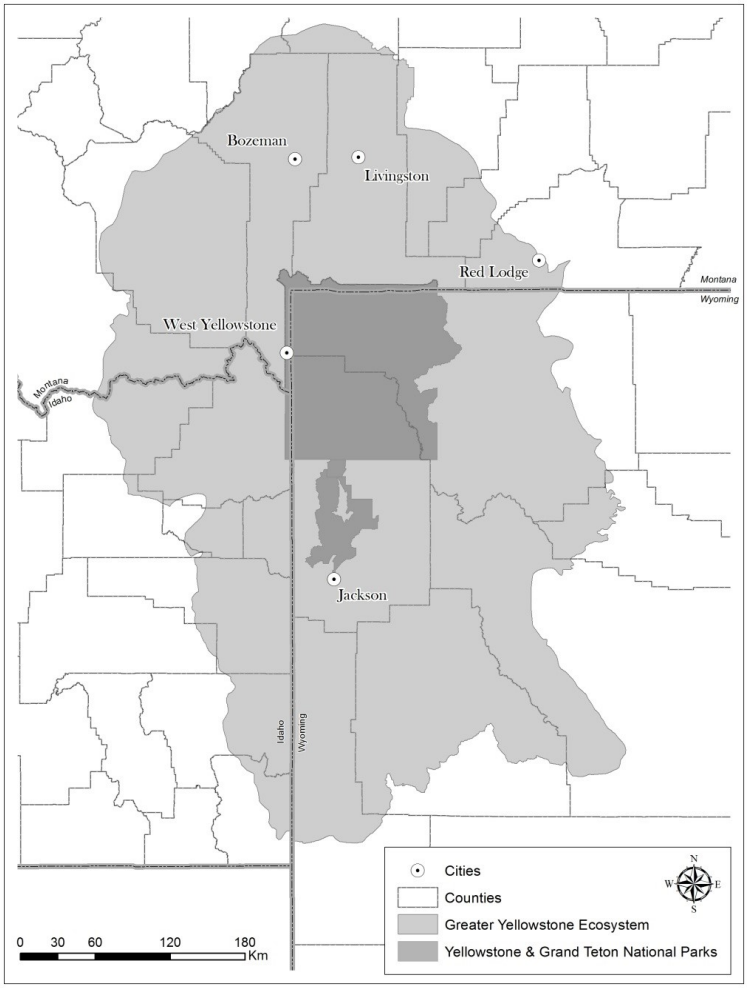

Figure 1. The Greater Yellowstone Ecosystem Study Area

The objective of this study was to determine how three amenity-driven gateway communities surrounding Yellowstone and Grand Teton national parks define and perceive the concept of sustainability. Specifically, we wanted to determine 1) how decision-makers and stakeholders define, perceive, and conceptualize the concept of sustainability; and 2) whether definitions differ based on a) time of residence within the GYE, b) community of origin, or c) role within the community (Haberl et al., 2006; Kemp & Marten, 2007; Leiserowitz et al., 2006; Parris & Kates, 2003; Vos, 2007; Wilbanks & Kates, 1999). This research adds to the scholarly discourse on the conceptualization of sustainability, local thinking, and decision-making, and can be used to inform decision makers and stakeholders of amenity-driven communities.

1.2 Sustainability and Perceptions

Because of the normative and subjective nature of the terms sustainability and sustainable development (Christen & Schmidt, 2012; Kates, 2000; Scholz et al., 2006), and the need to have working definitions that may be applied in specific situations when actions are being taken, stakeholders and decision makers have found it necessary to develop individual definitions of the terms, which has in many instances caused further confusion about the concept (Redclift, 2005). Varying definitions stem from the numerous objectives (environmental, economic, social), contexts, goals (equilibrium, growth, reduction), and scales (spatial and temporal) employed by groups in relation to the concept (Parris & Kates, 2003, Vos, 2007). However, flexible definitions, or the 'fuzzy concept' nature of sustainability, may be advantageous in certain instances as they allow for locally adapted solutions based on local concerns (Harrington, 2016; Robinson, 2004). In addition, Kemp and Martens (2007) suggest that the normative nature of sustainability conceptualizations prohibits concise definition because solutions tend to be applicable for specific regions, but not the whole of society. Solutions also tend to be long-term, and may have unintended associated risks that are unknown in advance, as well as involving trade-offs. Thus, definitions of, and solutions for sustainability are based on individual and collective perceptions, attitudes, beliefs and values that differ based on local context.

Perceptions are culturally influenced and based on the complex combination of past individual experiences (Segall et al., 1968). Perceptions allow humans to organize and interpret information about the world around them; they contribute to our aesthetic sense and provide critical survival tools (Pomerantz, 2006). Although environmental perceptions and attitudes have been of interest to scholars and policymakers for decades, formal assessment of public perceptions and attitudes of environmental issues did not begin until the 1970s (Bord et al., 1998). For scientists, the benefit of these assessments is that they provide the ability to determine public response to environmental initiatives: responses have the ability to exacerbate or reduce environmental impacts. For policymakers, public assessment provides the opportunity to determine the policies or initiatives that hold public support (Adelle & Whitana, 2008; Bord et al., 1998).

In order to achieve a sustainability transition, changes in values, attitudes, and behaviors are needed. However, two barriers toward sustainable behavior exist. First, at the individual level, a lack of time, money, and knowledge often result in the inability to translate attitudes and values into action, as well as values that conflict with the general meaning(s) of sustainability. Second, structural barriers such as laws, regulations, and societal norms limit action (Leiserowitz et al., 2006). Additionally, the disempowerment of local communities through a lack of public participation in the decision making process is seen as a barrier (Macnaghten & Jacobs, 1997). For example, in a study of Lancashire, England, Macnaghten et al., (1995) found that, while many residents identified positively with the values and priorities of sustainability, there was concern that local and national governments acted as barriers toward sustainability, operating in their own self-interest and marginalizing locals. As the authors suggested, "people are continually concerned about their relationship with actors and institutions such as those of government, and...their expression of hope or despair, willingness to act or not, trust or mistrust, are inseparable from this continuing negotiations of such relationships. (page 19)"

Individual and structural barriers are particularly evident in communities that are reliant on tourism and recreation-based economies, as the relationships among tourism, local communities, and the environment are complex and highly dynamic. Compounding this complexity is the fact that in tourism and recreation-driven communities the various perceptions of stakeholders are often at odds with one another (Imran et al., 2014), thus complicating sustainability discourses. To address these concerns, a growing body of research has focused on the concept of sustainable tourism, or "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (UNWTO, 2005, page 11).

Communities who use or plan to use tourism to diversify their economies must be cognizant of the potential impacts of tourism, as well as the ways in which stakeholders and decision makers within the community perceive these impacts. In eastern North Carolina, Byrd et al., (2009) found a disconnect between residents' and government officials' perceptions of tourism, with government officials not being aware of community experiences and perceptions of the industry, particularly those perceptions focused on issues such as environmental impacts, quality of life, crime, and taxation. Communities may also find that there are differences in perceptions related to the prioritization of sustainability dimensions (economic, environment, and society). For communities adjacent to the Central Karakoram National Park in Pakistan, Imran et al., (2014) found that several factors influence perceptions, including contextual factors (resource rights, governance, benefits, and incentives) and personal capability factors (awareness and information). Specifically, stakeholders were concerned with the negative impacts of tourism, but were equally interested in benefiting economically from the profits of the

protected areas. These factors bespeak the coupled and complex nature of stakeholder perceptions in the region by showing that while stakeholders were committed to sustainability, they were only interested if they also benefitted economically.

It is also possible to compare individual stakeholder groups to determine how sustainability dimensions are experienced and prioritized. Using four case studies in rural Germany, Lange et al., (2015) studied the perceptions of representatives from the agriculture, forestry, water management, and planning sectors. The authors' found that societal dimensions of sustainability were underrepresented in the perceptions of all these stakeholder groups, that economic dimensions were prioritized by most (especially land managers), and that environmental dimensions were often contextualized in regard to resource availability as opposed to biological diversity. In addition, stakeholders were cognizant of the multigenerational aspects of sustainability, with differences in temporal horizons aligning with the resource under management. For example, water resource managers and agriculturalists were concerned with changes that would occur in the time span of decades, while forest managers thought in terms of centuries. Thus, perceptions were driven more by the importance of the sustainability dimension to the stakeholder than by the regional context of which the dimension resided. In this context, multi-generational thinking refers to the recognition that actions and decisions have long-term implications for future generations.

Multi-generational thinking also reflects the hierarchical and embedded reality of nature-society couplings in that the rates, magnitude, and spatial extent of human impacts on the environment, as well as the uncertain nature of time lags and legacy effects of such couplings, have the potential to hinder future generations (Liu et al., 2007a: Liu et al., 2007b). While the concept of multi-generational thinking has been present in definitions of the concept of sustainability since the Brundtland Report (WCED, 1987, noted by NRC, 1999), is included in conceptual models of sustainability such as Meadows' Pyramid (Meadows, 1998), and has been a basis for the valuation of ecosystem services (Costanza et al., 1991), very little research has focused on societal conceptualizations of this idea, and should be an area for future study.

Finally, perceptions of sustainability may be influenced by time in residence of decision makers, their distance to the protected area or tourism activity, and their occupation. Puhakka and Sarkii (2009) found that perceptions of tourism development adjacent to Oulanka National Park in Finland related to four tourism-driven discourses. First, the integration of nature-based tourism and conservation efforts were important to community development. Second, the local use of natural resources should be prioritized over nature-based tourism. Third, nature-base tourism played a minor role in regional economic development while, fourth, other stakeholders accepted tourism development as it related to the national park. In a follow up study, Puhakka and Cottrell (2013) found that these discourses were related to a number of factors, including time in residence, distance from the national park, and occupation. For example, those who prioritized the integration of nature-based tourism and the economy had often lived in the region over 20 years, lived further than 10 km from the park, and were employed in the tourism industry. Those who focused on the rights of local residents and who had less acceptance of nature-based tourism had lived in the region the longest (over 40 years), lived closer to the park, and were dependent on more traditional livelihoods. These findings suggested that those who lived the longest in the region, and who were closest in proximity to the park were the most critical of tourism, while recently arrived residents and those employed by the tourism industry were more likely to respond favorably to the industry.

1.3 The Greater Yellowstone Ecosystem and Study Communities

The Greater Yellowstone Ecosystem (GYE) has experienced tremendous growth in recent decades, largely as a result of amenity migration. Between 1970 and 2010 the population of the region increased by over 90 percent, with some counties, such as Teton County, Wyoming, increasing over 250 percent (Bergstrom & Harrington, 2013; Hansen et. al., 2002). Demographic changes have often driven escalating land values and real estate demand, particularly in riparian corridors and those areas immediately adjacent to public lands (Gosnell et al., 2006; Hansen et. al., 1998). Meanwhile, visitation rates to Yellowstone and Grand Teton national parks continue to rapidly increase (Figure 2), with an increase of 42 percent since 2010 alone (NPS, 2017). The approximately 7.6 million annual visitors to national parks in the GYE also have a large economic impact, creating nearly 18,000 jobs and $1.4 billion in total economic activity within the gateway region - defined as "all counties contained within or intersecting a 60-mile radius around each park boundary" (Thomas & Koontz, 2016). Thus, tourism and recreation-related activities are some of the primary drivers of local economies in gateway communities such as West Yellowstone and Red Lodge, Montana, and Jackson, Wyoming (Rasker et al., 2006). Although tourism in the GYE may be economically advantageous, the millions of tourists who visit the region each year also have a direct impact on the natural environment and the communities they have come to enjoy, including increased costs associated with providing public services, environmental degradation associated with recreational activities, and the introduction of nonnative species (Johnson et al., 2003).

The gateway communities of West Yellowstone, Red Lodge, and Jackson were chosen as study communities because they not only exhibit unique socio-economic characteristics, but also differ significantly in their interactions with the natural environment based on their dependence on it for economic sustainability. The community of West Yellowstone is situated along the western border of Yellowstone National Park (YNP), and is confined by its position between YNP and the Beaverhead, Targhee-Caribou, and Gallatin national forests. As such, the 1,279 residents of the community, and as a result, its economy, are almost entirely dependent upon tourism and recreation visitors to these public lands (Bergstrom & Harrington, 2013). West Yellowstone also has the lowest median income of the three study communities ($34,018), and a moderately high proportion of the population below the poverty level (15.1 percent). Situated along the shores of Rock Creek, Red Lodge is surrounded by the Absaroka, Beartooth, and Pryor Mountain Ranges. Although Red Lodge is not immediately adjacent to Yellowstone National Park, its economy is still highly dependent upon activities inside the park because of the Beartooth Highway (U.S. Highway 212) that connects the community to the northeast entrance of the park. However, unlike West Yellowstone, the community of 2,236 retains some links to its traditional agricultural and natural resource extraction roots. Red Lodge also has the lowest median home value ($225,000) and the highest proportion below the poverty rate (20.6 percent). Finally, Jackson, a community of 9,967, is located at the southern end of Grand Teton National Park. While the economy of Jackson is heavily dependent upon tourism and recreation activities, its year-round population is also large enough to sustain financial and professional services, allowing for a stand-alone economy (Bergstrom, 2012). Jackson is the wealthiest community in the study, with a median income of $67,117 and a median home value of $558,500, while its proportion of the population below the poverty level is the lowest at 11.1 percent.

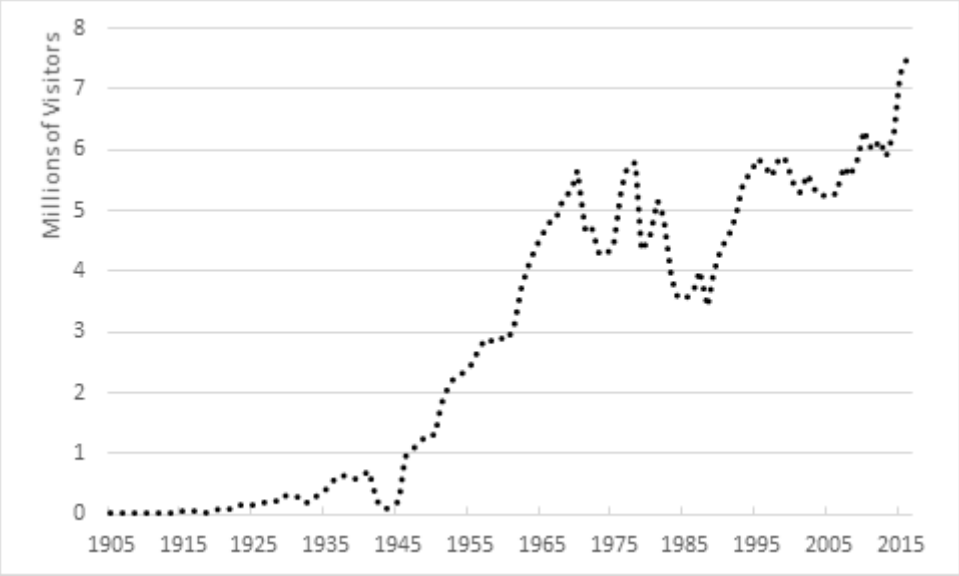

Figure 2. National Park Visitation Rates in the Greater Yellowstone Ecosystem (NPS Stats 2017)

2. Method

This study utilized the key informant technique because it allows for the improved understanding of community members who may have specialized knowledge of the subject under examination, in this case the concept of sustainability, due to their position in society (Marshall, 1996; Rubin & Babbie, 2009). Grounded theory guided data analysis as it is an inductive and systematic method that suggests that theory discovery and formulation occur through data comparison (Glaser & Strauss, 2009). Grounded theory provides not only explanation and description, but also potentially some level of predictability of the phenomenon under examination. Further, grounded theory may be applied to help suggest how respondents react to changes over time and space, the potential consequences of their response(s) to that change, and the broader socio-economic conditions that may affect change (Corbin & Strauss, 1990).

The material presented here is based on questions focused on how informants defined the concept of sustainability, and how their definitions relate to community priorities and goals. Respondents were asked the same questions in approximately the same sequence, however, questions could be added, removed, or changed depending on responses. This allowed for the maximum breadth of coverage of primary topics and themes and allowed

collection of additional insights from key informants. Theoretical saturation, the point in which no additional information, concepts, or themes emerged, was achieved differently for each of the study communities based on the content of each individual interview.

A purposive sampling approach, where interview subject selection was based on the expected likelihood of a good level of knowledge of the research topics, was implemented. A list of potential key informants was developed by identifying local government officials, local and regional non-governmental organizations and institutions, and local business owners. Key informants were contacted in April of 2010 via email to explain the project and inquire about availability for May-August 2010 interviews, yielding 20 willing participants. In-person key informant interviews occurred in June 2010. In addition to scheduled interviews, nine spontaneous interviews (snowball interviews) were conducted based on input from key informants. Two interviews conducted with representatives of regional non-government organizations in Bozeman, Montana, took place in June and early August. Three additional interviews occurred via email in August, September, and November, for a total of 32 interviews (Table 2).

Qualitative interview data were collected using digital tape recorders, transcribed into Microsoft Word documents, and the content was systematically analyzed utilizing *Atlas.ti* software (version 5.0.66). For this study, coding consisted of reading each interview transcript and determining which predefined code(s) related to sustainability were most applicable to the ideas presented by the key informant. Additional themes that arose were identified and added to the coding process, allowing for more precise categorization and the facilitation of inferences of meaning. Coding themes included broadly defined topics based on the three traditional dimensions of sustainability (economic, environmental, societal), as well as the concept of multi-generational thinking that references the long-term time horizons understood in sustainability discourses (Barry, 1997, Broome, 2008).

Table 1. Key informant interview characteristics

Location	Business Owner	City Official	NGO	Average Time in Residence	Total
West Yellowstone	6	2	2	34	10
Red Lodge	2	4	4	19	10
Jackson	0	7	2	16	9
Regional NGO	0	0	3	18	3
Total	8	13	11	22	32

3. Results

During interviews, key informants were asked if they had a working definition of what constituted sustainability or sustainable development, and if they saw a difference between the two concepts. Of the original 32 key informant interviews, 24 responses (or 75 percent of all responses) were recorded for this question. Definitions differed based on the key informant's community, his or her role within the community, and their time in residence in the community.

When considering all study communities collectively, 11 out of 24 respondents (46 percent) focused their definition of sustainability on environmental dimensions. Definitions focused on economic dimensions were present in ten out 24 responses (42 percent), while societal dimensions were discussed by six out of 24 respondents (25 percent). Finally, nine out 24 respondents (38 percent) focused their definitions of sustainability on multi-generational thinking, as well as on one of the three categories of sustainability concerns.

3.1 Definitions by Community of Origin

Key informant responses differed based upon their community of origin, suggesting that while all communities within the GYE are connected through their use of common pool resources, the individual economic, environmental, and societal context of each community is fundamentally important to understanding sustainability. In West Yellowstone, three of the six informants defined sustainability in terms of economic dimensions, two defined in terms of economic dimensions, and only one defined sustainability in terms of societal dimensions. One of the largest sustainability-related concerns in the community was the ongoing litigation between environmental groups and the National Park Service (NPS) involving winter access to Yellowstone National Park. Nearly all business owners interviewed suggested that reduced snowmobile access had a negative impact on not only the

local economy, but also on the community as a whole, thus impeding a transition toward sustainability. A business owner reflected on the changes winter access has had on sustaining the community when he stated that, "you know this town is not sustaining anything, it's dying. It's becoming or has become a one season community."

The importance of the community's dependence on the National Park and the two million visitors that pass through the town each year cannot be overstated. Most key informants in West Yellowstone when asked to define sustainability spoke at length about their dependence on tourism and the National Park, believing that in order to sustain the community over the long-term the natural environment must be protected. This recognition was expressed by a business owner when he admitted, "we all impact the park...and use Yellowstone as a huge resource." These sentiments were echoed by another business owner who stated, "We can't keep abusing the hell out of everything we have." For this business owner sustainability meant developing their business, "in an economically sustainable fashion" and "give[ing] a bit more back to the environment". There were also others who felt that "there has to be economic sustainability first of all", with recognition, however, that "there is more than just economics involved".

In Red Lodge, five of nine respondents defined sustainability in terms of environment dimensions, while five respondents also defined it in terms of multi-generational dimensions. In addition, economic and societal dimensions were each emphasized by three respondents. As in West Yellowstone, definitions of sustainability focused on the environment and multi-generational thinking can be seen as a reflection of the community's reliance on the natural environment for its economic vitality. As one business owner stated, sustainability is "creating a community or a workplace…that is able to work with the environment."

Although the community is located only 60 miles from the largest city in the region, Billings, Montana, for much of the year the community is highly isolated because of the closure of the Beartooth Highway during the winter months. The importance of the Beartooth Highway was illustrated by a May 19, 2011, rockslide that closed the highway for the remainder of the season. Nearly all key informants indicated that this was one of the first instances when the community realized its economic dependence on the highway as tourism decreased sharply in the aftermath of the slides. The effect of decreased tourism on the local economy was also felt in the summer of 2008, when wildfires filled the town with smoke for much of the tourist season. The importance of the environment in this context was repeated throughout interviews in the community, with nearly all key informants noting that without a pristine natural environment with which to draw tourists, the town could not be sustainable. Respondents in the community also felt strongly that it is their duty as a gateway to the world's first national park to not only be advocates for the environment but, more importantly, educators to the hundreds of thousands who travel through the community each year. Reflecting on the importance of education in transitioning toward sustainability, one business owner reasoned, "It is our obligation and we have to do it...educate them why this is such an important biome not just for us as residents, but for them, even though they may live on the east coast."

However, there also were concerns over development and growth and its relation to sustainability. While the community as a whole had seen some success in limiting growth, especially in city boundaries due to planning and zoning initiatives, there were concerns that a lack of zoning at the county level would result in large-scale development. As one business owner stated, "sustainability would be guiding growth so that you preserve the value of the area." A second added, "You can have growth, but you have to do it in a fashion that will maintain the integrity and the character of the place." Each of these informants directly addressed the importance of maintaining the environmental quality of the region to ensure the longevity of the community, with the recognition that economics are directly connected to tourism, and in order to achieve sustainability it is essential that tourist visitation rates remain steady. As on informant noted, "Sustainability is the ability to maintain your quality of life".

Lastly, in Jackson, four of six respondents defined sustainability in terms of inter- or multi-generational dimensions, while two of the six defined in terms of environmental dimensions. Two respondents did not define sustainability, but instead acknowledged the Brundtland Report and its definition focused on meeting present needs without compromising future generations. This lack of a definition and tie to the Brundtland report was a result of the community going through revisions to its comprehensive plan and the inability of elected officials to agree upon a definition. As one informant noted regarding a formal definition from the city, "I'd say it's far from decided and very much up in the air."

From land trusts to the mayor himself, all key informants in Jackson considered the environment to be their prized possession, and something that was worth not only fighting for, but also something that was intregal to long-term sustainability. As a city official questioned, "How do we take what exists and be far more efficient and effective in impacting our environment far less?" An NGO representative noted that "we feel that a truly sustainable community for one of these gateway communities means that you're paying attention to our natural and scenic

resources, and you're making sure that you're not depleting those or overly impacting them with people, etc." This environmental ethic extends to amenity migrants, as well as to long-term residents. A local NGO stated, sutainability is "more about a livable community that for generations to come has the things that…make Jackson unique."

The preponderance of responses related to multi-generational thinking in Jackson is also a reflection of a community ideal based on long-held values of respect and protection of the natural environment. A city official noted that sustainability is "being able to basically live within your means so that you are not compromising the ability of future generations to also have a good quality of life and be able to do the things you are able to do." This idea is furthered with another official suggesting, "I think sustainability, in my mind, is doing what we can to keep this place at least as good as we found it, and hopefully make it better."

3.2 Definitions by Role in the Community

Key informant responses also differed based on the interviewee's role within the community (i.e., business owners, city officials, non-government organizations). As one might expect, business owners primarily defined sustainability in terms of economics (four of five respondents). However, they also included the environment (three respondents) and society (two respondents). The emphasis on issues related to economics by business owners results from their dependence upon the recreation and tourism industry. As one business owner in Red Lodge suggested, "my definition for sustainability I guess would be first and foremost economic…How do we sustain tourism." It was proposed that tourism could be sustained keeping "the things that bring the tourists here as pristine as possible."

There were also concerns from business owners that the recent level of growth in the region could not be sustained over the long term, and that continued high levels of growth might have negative implications for both local communities and the natural environment. Speaking on this concern, a business owner said, "Can the level growth, can the infrastructure that is being built, is it sustainable in terms of your ability to fund what your growth level is. And then what are the environmental impacts for that." Business owners were also cognizant of the fact that their livelihoods were directly tied to the natural environment, and that there was a need for multi-generational thinking. As a business owner from West Yellowstone expressed it,

> My definition of sustainability is one that … we have the obligation as leaders and stewards of this community to look at the long-term implications of the decisions that we make today.

City officials also defined sustainability in terms of multi-generational thinking. In Jackson, the preponderance of responses related to multi-generational thinking (three of four respondents) was likely a product of the planning process, and the language and sentiments expressed through their ongoing revision of the city comprehensive plan. For example, a town planner defined sustainability as "recognizing…that decisions made today have long term impacts and that we want to give this place to our grandchildren in at least as good as shape or better than we received it." City officials also recognized the importance of self-sufficiency in the face of a tourism-based economy, with an official from West Yellowstone stating, "In the purist sense [sustainability] means you can shut your gates and live…I guess, when I think of sustainability I think in large part of self-sufficiency."

Representatives of non-governmental organizations defined sustainability in terms of the environment (seven of eleven respondents), thinking multi-generationally (five respondents), and economics (five respondents percent). As all NGOs were environmentally oriented, a focus on the environment is natural. Because land trusts focus on long-term planning, the inclusion of multi-generational thinking was also to be expected. As one land trust respondent confirmed, "So I think we tend to think about sustainability differently than most people because we are thinking about things in very long time scales." Sustainability was then based on "long-term management, self-sufficiency" that lasted "through all types of economic, environmental, and cultural changes".

Finally, non-government organizations were also cognizant of the connection between the natural environment and the local economy, with one stating, "I don't think that there is a person [in the GYE] who doesn't appreciate where we are…how we interact with our surrounding environment. It sustains our economics and in return, the economics has to sustain the golden goose." Thus, sustainability was "making sure that people can make a living on the land…that leaves room for wildlife and wild creates, and that is long-term in its view".

3.3 Definitions by Time in Residence in Communnity

Lastly, the time in residence for decision-makers also influenced how they defined the concept of sustainability. For those who had lived in the GYE for less than 10 years, definitions focused on multi-generational thinking or quality of life concerns (ten out of 16 respondents). Most of the respondents who fell into this category had

recently moved to the region for reasons of environmental or social amenities. Because newcomers are amenity-driven in many cases, it is likely that they would want to maintain the qualities that initially brought them to the region, leading them to think multi-generationally. Some respondents, however, expressed concerns that amenity migrants in some instances may arrive with preconceived expectations of the region that may prove difficult to fulfill and result in a disconnect between long-time residents and newcomers. For example, one NGO official, in reference to newly arrived amenity migrants, said

> I think there is still a very romantic concept of what it means to live in the West and what it means to live especially in the GYE…People who are newcomers don't understand some of the cultural identity here including things like…the way that neighbors work together, the way that we conserve resources, the way that land managers understand a landscape.

Those who had lived in the region between 10 and 20 years defined sustainability in terms of economics (seven of 16), the environment (three respondents), and multi-generational thinking (six respondents). Expressions of these residents began to shift away from quality of life themes, and instead began to focus more on the longevity of their residence. This was seen in their focus on economics and quality of life. Most mid-term residents, primarily business owners, recognized their relation to and dependence on the environment, but felt that without viable economic opportunities they could not continue to live in the region.

Finally, those who had lived in the GYE for longer than 20 years defined sustainability in terms of the multi-generational thinking and well-being (nine out of 21 respondents), the environment (seven out of 21 respondents), followed by economics (5 respondents). Thus, long-term residents recognized the relationship between the environment, the local economy, and their quality of life. By maintaining the natural environment, long-term residents were, in fact, sustaining their way of life, as well as their descendants' opportunities with respect to the environment.

4. Discussion and Conclusion

One of the fundamental concerns regarding the vision of sustainability today are the varying definitions and emphases as the result of the differing objectives, contexts, goals, and scales employed. Conceptualizations of widely used but broad terms like 'sustainability' and 'sustainable development' are directly influenced by individual and collective perceptions. To facilitate decisions focused on multi-dimensional sustainability-oriented objectives, it is critical to have a clear understanding of the various conceptualizations of sustainability. By providing decision-makers with a better understanding of the breadth of conceptualizations and concerns will help accelerate trends that favor a transition toward sustainability and curtail those that impede it.

Throughout the study communities, definitions of sustainability were focused primarily on the environment, the economy, and multi-generational thinking. In addition, definitions varied based on key informants' time in residence, their community or origin, and their role within the community. Similarities of concerns can be the starting point for communication and collaboration among gateway communities and the long-term sustainability of their individual communities and the collective resource upon which they all depend, the Greater Yellowstone Ecosystem.

In West Yellowstone, definitions focused primarily on the economy and the environment, while in Red Lodge and Jackson definitions focused on the environment and multi-generational thinking. For West Yellowstone, and to a lesser extent both Jackson and Red Lodge, definitions focused on the environment and the economy reflect the tourism and recreation-based economies of the community, as well as their dependence on the natural environment (especially Yellowstone and Grand Teton national parks). Specifically, most informants were cognizant of the fact that economic vitality in the community was predicated upon a healthy and vibrant natural environment. However, as Macnaghten (1995) and Byrd et al. (2009) also found, concerns exist in the GYE that not only is there disconnect between stakeholders and decisions makers, but also that the policies of land management agencies have direct, and sometimes, detrimental, impacts on community sustainability.

In the communities of Jackson and Red Lodge, definitions of the concept of sustainability were heavily focused on inter- or multi-generational thinking. Because both communities had recently completed comprehensive plans, this may have focused attention on long-term planning. This may also suggest that during inter-planning periods, definitions and priorities may shift to other dimensions of sustainability, particularly economic dimensions, due to the regional dependence on tourism and recreation activities. While it is unwarranted to suggest that the community of West Yellowstone is not concerned with future generations, their continued focus on the economy and extra-local influences has created an environment where it is not a vocalized priority. Similar to what Lange et

al. (2015) found in northern Germany, shorter term concerns are more critical to residents' thinking at the present time, despite the fact that long-term planning will ensure a more successful transition toward sustainability.

Further, as Puhakka et al. (2009, 2014) discovered in gateway communities adjacent to Oulanka National Park in Finland, time in residence plays a critical role in understanding how stakeholders define sustainability. Those who have lived in the GYE for less than 10 years focus on multi-generational thinking because of their desire to maintain the quality of life and environmental and societal amenities that first drew them to the region. For respondents who had lived in the region between 10 and 20 years, definitions tied to economic and environmental dimensions of sustainability relate to the recognition of their dependence on the natural environment for quality of life and economic vitality. The recognition of the embedded nature of the local economy in the environment is important because it provides incentives to long-term residents to sustain natural, societal, and economic systems over the long-term. Lastly, those residents who have lived in the GYE for more than 20 years continue to recognize the embedded nature of local economies in the natural environment (see Harrington 2016), but define sustainability in terms of environmental dimensions out of their desire to sustain the uniqueness of Greater Yellowstone for future generations.

Similar to what Imran et al. (2014) found, stakeholders and decision makers within the GYE are cognizant of not only their relations to the natural environment, but more importantly that their livelihoods are directly connected to the health and viability of that environment. Further, their conceptualizations of the concept of sustainability and their behaviors and actions that are the result of that conceptualization suggest that decision-makers are striving towards a sustainability transition as best they can given a local context that includes myriad of extra-local forces and an amenity-driven, and tourism-based economy. As one city official succinctly noted, "I think fundamentally people understand that...our ecology is our economy."

Ultimately, further education, discussion, and action regarding an adaptive pathway toward sustainability is needed if communities hope to meet objectives that facilitate their sustainability visions. The Greater Yellowstone Ecosystem is held together through the complex dependencies and interactions between physical and biological systems and communities in the GYE play a critical role in the perpetuation of those interactions. If each community in the region is willing and able to recognize its role and the role of others in the ecosystem, a definition for sustainability that is mutually beneficial to all systems is possible and will ensure that future generations will receive the same, if not a better, Greater Yellowstone Ecosystem than exists today.

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