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APPLICATION OF RESILIENCY THEORY AND ADAPTIVE CYCLES AS A  
FRAMEWORK FOR EVALUATING CHANGE IN  
AMENITY-TRANSITION COMMUNITIES

by

Scott L. Hoffmann

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Human Dimensions of Ecosystem Science and Management

Approved:

---

Dr. Dale J. Blahna  
Major Professor

---

Dr. John C. Allen  
Committee Member

---

Dr. Steven W. Burr  
Committee Member

---

Dr. Douglass Jackson-Smith  
Committee Member

---

Byron R. Burnham  
Dean of Graduate Studies

UTAH STATE UNIVERSITY  
Logan, Utah

2008

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## ABSTRACT

Application of Resiliency Theory and Adaptive Cycles as a Framework for Evaluating  
Change in Amenity-transition Communities

by

Scott L. Hoffmann, Master of Science

Utah State University, 2008

Major Professor: Dr. Dale J. Blahna  
Department: Environment and Society

In recent decades, many rural, natural resource-dependent communities have experienced ubiquitous and oftentimes substantial economic decline due to downturns in their commodity-oriented industries. In spite of this, communities with access to varying forms of natural capital have experienced an upsurge in activities such as recreation, tourism, second home growth, and retirement in-migration. If managed properly, amenity-oriented development has potential to reverse economic decline by attracting tourists, entrepreneurs, younger and more educated workers, and retirees, and may ultimately generate economic diversification, local growth, and an improved quality of life for residents. While there are literally thousands of potential measures of well-being, this study aimed to identify potential indicators of amenity-transition by examining community social and economic capital. To examine such a complex social and economic transition, these indicators were coupled with indicators from the tourism and amenity-development literature, and linked to concepts from Resiliency Theory from the

ecosystem science literature, in a longitudinal study of amenity transition communities in the Pacific Northwest. Results focus on measures of social organization and economic sustainability in three study communities: McCall, ID; Leavenworth, WA; and Prineville, OR. Key informant interviews and historical documents were used to develop adaptive curves for each community, and to help evaluate the concepts and indicator variables that contribute to community resilience and adaptability. Secondary indicator data serve as a quantitative linkage between Social Capital and Resiliency Theories and the adaptive phases communities may experience throughout this transition. The results identify key historical periods for each community as residents adapt to economic and social change. Using key informant interviews coupled with secondary data provided a clearer picture of how each community has transformed and redefined itself throughout transition.

## ACKNOWLEDGMENTS

Many thanks to my major professor, Dr. Dale J. Blahna, for the creative inspiration, guidance, and encouragement offered throughout this research. His ability to recognize and assess the “big picture” provided much needed insight to fulfilling the specific goals of this project. I would like to recognize and thank my committee members, Dr. John C. Allen, Dr. Steven W. Burr, and Dr. Douglas Jackson-Smith, for their additional guidance in refining the “big picture” into a manageable and valuable piece of research. Dr. Linda Kruger, of the USDA Forest Service, was a driving force behind the project, and I thank her for the many contributions and direction she has offered. Dr. Kruger and the USFS Pacific Northwest Research Station also provided the funding that enabled this study to be conducted.

Additional thanks go to Dr. Annabelle Kirschner, from Washington State University, who provided much-needed instruction and support with data collection from the US Census Bureau.

Last but certainly not least, endless thanks and gratitude go to Julie, who has supported me emotionally (and financially) throughout my graduate studies. My turn will come soon enough.

Scott L. Hoffmann

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# CHAPTER I

## INTRODUCTION

In recent decades, many rural, natural resource-dependent communities have endured a ubiquitous and oftentimes substantial economic decline due to downturns in their commodity-oriented industries. Over this same period, some rural communities with access to varying forms of natural capital have experienced an upsurge in activities such as recreation, tourism, second home growth, and retirement in-migration (Vias 1999; Smutny 2002; Borneman 2003; Johnson and Beale 2002; Blahna et al. 2006). If managed properly, this amenity-oriented development carries potential to reverse economic decay by attracting tourists, entrepreneurs, younger and more educated workers, and retirees, ultimately generating economic diversification, local growth, and an improved quality of life for residents (Reeder and Brown 2005; Johnson and Beale 2002).

With rapid in-migration and expansion in amenity growth, communities are left to cope with unique strains placed on existing forms of capital within the community. This study is built on the hypothesis that by examining community indicators of social and economic capital, deterministic variables of amenity-transition may be revealed. For example, the *Social Capital Typology* posited by Flora et al. (2004) suggests that community *bonding* and *bridging* social capital can predict levels of community action and organization, two characteristics sometimes linked to successful amenity-transition. Other relevant indicators may include those that measure social and economic well-being, civic engagement, autonomy, and economic diversity, among others. These measures of social and economic capital influence how a community is able to react to changes that

occur within its developing infrastructure and deal effectively with its external superstructure.

To gain further understanding of how a community makes a complex social and economic transition from an extractive to an amenity-based economy, this study links the hypothesis above with aspects of Resiliency Theory to form a heuristic device that enables evaluation of a community's resilience and adaptability to amenity-transition. These concepts come from a literature linking social and ecological components, and together they examine the attributes that influence the dynamics inherent in social-ecological systems. Walker et al. (2004) define *resilience* as the capacity for a system experiencing change to “absorb disturbance and reorganize while maintaining its original function, structure, identity, and feedbacks.” They further define *adaptability* as the “capacity of actors within a system to influence and manage resilience” (Walker et al. 2004, 3).

The *Adaptive Cycle* (Gunderson and Holling 2002; Holling 1986; 2001) has been used in the past to assess ecological systems transitioning between stable and unstable states. Its application to social systems has been limited to their relationship to natural resource management, and the social role in improving the resilience and sustainability of ecosystems (Berkes and Folke 1998; Gunderson and Holling 2002). However, it has never before been operationalized to evaluate how *human communities* may cope with changes in capital and resources as they undergo transition.

For the conceptual expansion of this heuristic, community attributes reflecting transition from natural resource dependency to amenity orientation were identified, and three communities from the Pacific Northwest were chosen based on these criteria.

Examples of the criteria used include small population size, rural setting, and strong influence of natural amenities on the local economy. The communities used were McCall, ID, Leavenworth, WA, and Prineville, OR. Key informant interviews were conducted in study communities to gather historical information and to examine residents' perceptions of how each community was able to adapt to the impacts caused by timber decline and ensuing amenity development. This data was used to construct a curve for each community that links historical economic and social cycles to the Adaptive Cycle model. Indicators of community change were identified from the interview data, and were developed using variables collected from the US Census Bureau. These indicators were used to characterize various phases along each community's adaptive curve, and each community was evaluated to test the applicability of quantitative data to the heuristic. For each study community, changes in economic and social structure were documented from the 1960s to current modes of amenity-oriented development. The focus was to gain a coarse-filter understanding of the phases of amenity-transition through which the selected communities have gone, and to conceptually develop the heuristic and analysis in a way that future research can refine and apply it to additional communities. To accomplish this, readily available data were used to document the transition and cycles that the study communities have experienced.

To develop the heuristic, indicators of social and economic capital were coupled with indicators from the tourism and amenity-development literature, and linked to concepts from Resiliency Theory in an attempt to describe this transition. These indicators are representative of dimensions of community development that contribute to the ability to manage transition to amenity-oriented infrastructures. The dimensions

developed here include social structural support and economic viability. Indicators were in some cases stand-alone variables and in others were groups of variables that when combined measure a specific concept. For example, variables measuring state nativity and place of residence five years prior lead to an understanding of migration patterns as an indicator concept. Specific variables were identified and defined more thoroughly based on the review of literature as well as the key informant interviews in each community; a common theme among these is variables believed to affect a community's ability to cope with economic and social change. As variables were identified and indicator concepts developed, they were linked to specific stages on the Adaptive Cycle. In this manner, data describing how an individual community has transitioned from timber dependency to an amenity-oriented economy could be collected. Based on historical data, an Adaptive Curve was then illustrated for each community, and specific periods throughout a community's "timber to amenity" transformation were characterized using the secondary indicators. Trends among these variables and indicators provided an understanding of what was happening to residents and within each community with regard to adaptation to economic and social change. Areas for future research include in-depth examinations of additional communities, the further identification and development of relevant and useful variables and indicators, and the identification of additional secondary data sources to increase the detail and precision of the Adaptive Cycle application to amenity-transition communities.

This study investigates the use of a conceptual heuristic to evaluate communities as they transition from natural resource dependency to amenity-transition. This transition involves social and economic components, and indicators from both were developed into



dimensions of community resilience and adaptability that the model aims to evaluate.

The study ultimately provides a resource for communities to refer to as they experience and attempt to manage such transition. As future variables and indicators are identified and developed, their value should be evaluated with regard to being useful in practice for agencies, community leaders, and residents conducting social assessments and making policy decisions that will influence community change and well-being.

## CHAPTER II

### LITERATURE REVIEW

#### **Natural Resource Dependency and Amenity-Transition**

The review of literature relevant to this study begins by examining past research on natural resource dependency and amenity-transition. Factors that may exist in communities affected by these modes of decline and growth are discussed. Additionally, the role that social capital plays in amenity-transition communities is presented as a potential factor within this type of change. Concepts of ecological resiliency are linked to social systems, and as a framework for this study the ecological concept of adaptive cycles is presented as a heuristic tool to use in evaluating community resiliency and adaptability to economic and social change.

#### *Community Natural Resource Dependency*

A classical model of natural resource dependency, offered by Edward Abbey (1968) in his depiction of 1960s Moab, Utah, epitomizes what rural, “Old West” communities often witnessed: prospectors and miners, relaxing after a physically active and arduous full day’s work in the outdoors, spending ample wages intermingling at the local beer hall, forgetting that the present boom will not last. Not realizing the ethical or political (or economic) implications of uranium exploitation, they are simply enjoying the local economic upsurge that is temporary and sure to change (Abbey 1968). It has become a generalized illustration, but the entrenched consequences resonate throughout communities that have endured, or are enduring, changes in natural resource dependency.

Peluso et al. (1994) present natural resource dependency as being rooted in an *extractive, non-consumptive, or backdrop* derivation. These categories describe the relationships that may exist between communities and the resources upon which their economies and livelihoods may be dependent, and each has a distinctive potential for subsistence. In an extractive dependency, renewable or nonrenewable resources are utilized by a community and introduced into a regional, national, or global market (Peluso et al. 1994). These markets, and the corresponding economic and social implications they impart in affected communities, are by nature and by the capitalist markets that govern them, vulnerable to cyclic waves of supply and demand. The effects of such economic fluctuations lead to the “boom and bust” cycles experienced and repeated in countless communities dependent on minerals, timber, oil, natural gas, and other extracted commodity resources. Non-consumptive dependencies (Peluso et al. 1994) occur in communities that possess natural amenities, perhaps scenic, recreational, or climatic, that attract tourists or recreationists whose expenditures provide the potential for a more diversified economic development and associated outcomes (Reeder and Brown 2005; Johnson and Beale 2002). Finally, backdrop dependencies occur in communities possessing aesthetic surroundings or natural beauty that may attract new residents whose income continues to be earned elsewhere (Peluso et al. 1994). Analogous to these three classes is an economic reliance on a single resource and market, and the resulting consequences that such dependency imparts on economical, social, cultural, and political mechanisms within a community.

The five resource-use regimes discussed by Nord (1994) illuminate the relationship between natural resources and economic capital within such regional,

national, and global economies. These include: 1) *subsistence resource use* by a community, such as local firewood production, in which capital has no role; 2) *commercial exploitation of open access resources*, such as fisheries, with the equipment owned and utilized in the industry being the capital; 3) *small holdings resources*, owned by small groups or families, in which capital enters through the loans received for land purchases; 4) *industrial ownership of resources*, such as a company's petroleum prospecting and drilling, the capital being highly intensive in the external ownership of the resource; and 5) *public ownership of resources*, in which capital comes from federal lease holdings for public ownership of processing facilities and equipment (Nord 1994).

Natural resource dependency occurs in communities that are unable to diversify their economic capital beyond a single commodity industry and resource-use regime. This limited economic diversity leads to vulnerability and sensitivity to shifts in demand, and as a result, the community may be left susceptible to the corresponding expansion and contraction of social and economic mechanisms that affect overall well-being (Krannich and Luloff 1991). The resulting instability may manifest as cyclic unemployment or underemployment, increased out-migration, community conflict, lack of control over the resource, domination by forces external to the community, diseconomies of scale, persistent poverty, and social disruption (Krannich and Luloff 1991; Humphrey et al. 1993; England and Albrecht 1984). The effects of resource dependency can span the economic, social, cultural, and political capacities of a community. It should be noted that while these symptoms have been linked to natural resource dependency, it has also been argued that in many cases the causes of natural resource industry declines and the consequences of dependency have been too

generalized, and should not be assumed to exist in all affected communities (Freudenburg et al. 1998; 1999; Beckley 1998). Also, the effects of dependency may be localized and unique to the circumstances of individual communities and industries (Parkins et al. 2003; Overdest and Green 1993; Beckley 1998).

### *Amenity-Transition Communities*

Amenities have been defined as public goods that offer enjoyment in a particular geographic location (Garber-Yonts 2004). Economic development and population change in rural communities is often tied to existing local amenities and related entrepreneurship opportunities that attract visitors and new residents. These amenities may be environmental qualities, recreational opportunities, or other agreeable settings to which people choose to visit and perhaps relocate. An amenity index, developed by McGranahan (1999), demonstrated that while non-metropolitan counties scoring low on the index grew by an average of only one percent per year from 1970-1996, those counties scoring high in existing local amenities grew by an astounding 120 percent during the same time period. Further, of the counties designated as predominately recreation- or retirement-oriented, most scored in the top 25 percent of the amenity index (McGranahan 1999). Thus, a strong correlation exists between the presence of recreational or environmental amenities in rural counties and ensuing population growth.

In their classification of non-metropolitan recreation counties in the United States, Johnson and Beale (2002) identified 329 counties in 45 states projected to experience rapid future growth in the recreation and tourism sector. The attraction of these areas is founded on the presence of natural capital, such as scenic landscapes, mountains, lakes,

rivers, forests, and deserts. McGranahan (1999) identified environmental factors that serve as place-specific amenities that attract people to various locations. These can be categorized as desired climatic conditions, appealing topographic variations in a landscape, and the presence of surface water as part of a landscape. In addition to recreational visitors and in-migrants, these amenities attract people seeking specific environmental characteristics for retirement migration and for second home construction. Rural communities whose traditional economic infrastructure is rooted in natural resource dependency often possess this natural capital and other amenities that can be utilized for recreational, retirement, or second home growth. It is important to note, however, that while some communities possess the potential for this type of development, other communities may struggle due to a lack of adequate natural capital or the inability to capitalize on opportunities due to “locational disadvantages” (Krannich and Petrzela 2003; Reeder and Brown 2005).

Numerous past studies have identified strong linkages between the influence of amenities on rural population growth and ensuing economic and social change within communities (Garber-Yonts 2004; Reeder and Brown 2005; Ohman 1999; Hunter et al. 2005). As communities experience growth and transition to amenity-oriented economies, characteristics such as quality of life and economic and social well-being can be assessed as a measure of a community’s ability to manage such transformation.

### *Social and Economic Impacts of Amenity Development*

Migration into a community with an amenity-oriented economy inevitably leads to changes in the existing social and economic infrastructure, as new residents introduce

diverse education levels, incomes, regional backgrounds, and ages to the community's traditional configuration (English et al. 2000). Characteristics such as quality of life and social and economic well-being are influenced by population growth in emerging amenity areas. The manner in which this change affects a community has often been debated in research. As Ohman (1999, 2) notes, the processes of change within a community are driven by "a complex combination of environmental, economic, and social factors." The effects of rapid population growth have been assessed in numerous case studies and other empirical research (Hunter et al. 2005; English et al. 2000; Albrecht et al. 2000; Krannich and Luloff 1991; Reeder and Brown 2005). This literature identifies generalized characteristics of change within amenity-oriented communities that include rapid in-migration and growth, changes in per capita income and poverty levels, economic diversification, increase in property values, changes to the traditional family structure, and increase in crime rates. Reeder and Brown (2005) contend that this type of growth is generally positive, though it can vary dramatically from one locale to another, depending on place-specific factors.

English et al. (2000) identify the following changes that communities becoming dependent on recreation or tourism may experience: significant increases in per capita income, greater percent increases in per capita income, housing becoming more expensive, a higher percentage of seasonally vacant housing, increases in the number of housing units, increases in property values, and a generally better educated population. Their research also notes the significance of the introduction of new values regarding the resource base and various options for development, though it has been debated whether this leads to increased conflict within communities. While significant sociodemographic

differences can exist between older and newer residents, actual attitudes regarding development can be quite similar (Smith and Krannich 2000). With the introduction of higher incomes and education levels come novel manners of political organization and ways of dealing with problems (Blahna 1990). At the very least this demands some type of response by longer-term residents to address and adapt to changes that are occurring.

Amenity-oriented communities have been found to have among the highest growth rates of non-metropolitan areas, while also displaying some of the highest levels of income inequality (Ohman 1999). Hunter et al. (2005) conclude that while economic well-being is higher in amenity communities than in other non-metropolitan areas, this benefit is negated by cost of living increases associated with such amenities. As population growth occurs in these areas, instances of economic hardship may be attributed to factors such as increased demand for housing, and an inability of longer-term residents to shift into emerging service-oriented employment (Hunter et al. 2005). Ohman (1999) also acknowledges the significance of the restructuring of social and economic well-being due to shifting levels of employment in new economic sectors. Certain sub-sets of the population may be “passed by” if they are unprepared or unable to capitalize on the nascent economy. Income inequality may be explained in some communities by such a chasm between newer and longer-term residents.

Much of the literature that examines boomtown growth in the West can be applied to certain amenity-developing areas, as these communities experience the same type of “boom” growth in response to the demand for their natural and recreational qualities. England and Albrecht’s (1984) *social disruption hypothesis* provides a generalized synthesis of what can occur as a community experiences “boom” type growth. Initially,



the community benefits from the rapid economic growth associated with the boom.

This fosters a developing infrastructure and leads to increases in services available to the public. Residents adapt to changes occurring within the community's social and economic structure, and over time are able to manage the transition. Quality of life may initially decrease as these adaptive behaviors are acquired, but over time, the community rebounds as it becomes able to minimize the risk of individual exposure to structural change (Smith et al. 2001). As Perdue et al. (1999) emphasize, the underlying mechanism of a community's ability to manage transition is the adaptive proficiency of residents. This refers to the capacity of residents to adjust and adapt to the kinds of social, economic, and cultural changes that may accompany transition from extractive to amenity-based economies. It should be emphasized that literature is complex, and may only apply to very specific local circumstances. The more generalized aspect of its cyclic nature is more relevant to this study.

Thus, the adaptation over time of residents in amenity-transition communities should be the focal point of research attempting to evaluate how a community may best manage social and economic change due to amenity transition. Indicators of adaptability in this study will be both social and economic in nature, and may be assessed by the use of indicators relevant to each concept. Limitations to existing research include the predicament of measuring variables of change at static points in the history of a community. For example, past research examining boomtowns often begins at the start of the "boom," making it difficult to establish a baseline for assessing change (Perdue et al. 1999). A key insight for this study will be the significance of using historical data to identify relevant indicators of resiliency and adaptability that a community has developed

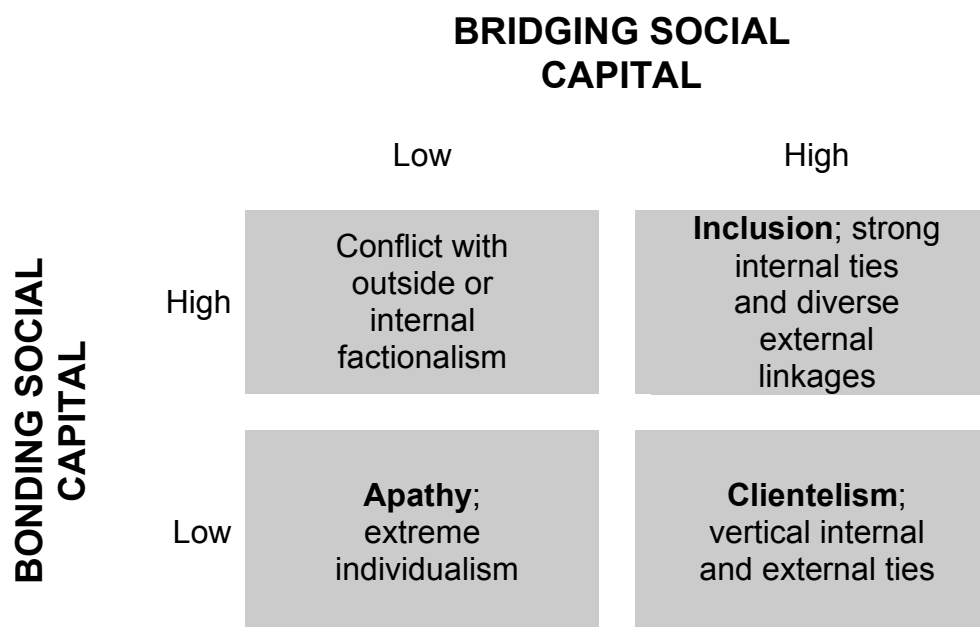
and may possess, both before the onset of change as well as at different stages throughout its transition.

## **Social Capital in Amenity-Transition Communities**

### *Community Social Capital*

Flora et al. (2004) define social capital as the networks, norms of reciprocity, and mutual trust within a community, which strengthens common identity and the sense of residents pursuing a common future and shared well-being. They propose two distinct forms of social capital: *bonding* and *bridging*. Bonding social capital is the network of connections that exist within groups sharing similar backgrounds; bridging social capital consists of the linkages that a group or community shares with outside groups or communities (Flora et al. 2004). Wilson (1997) describes beneficial social capital as high levels of interpersonal trust, lively civic engagement in community affairs, and prominent organizational capacities within a community. It may be thought of anecdotally as the glue that binds a community together.

The *Community Social Capital Typology* (Figure 1) presented by Flora et al. (2004, 63) suggests healthy social capital as a favorable balance between bonding and bridging capital, or the internal linkages within a community and the external ties which communities can share. A central element to this model is the trust that may or may not exist within and between groups and communities. Fukuyama (1995) relates strong networks of trust in such situations as indicative of the productive capacities of communities to build social capital.



**Figure 1.** Community social capital typology (Flora et al. 2004, 63).

This typology is useful in illustrating the adaptive capacity of a community to change. As posited by Flora et al. (2004), the concepts of bonding and bridging social capital can be used as a foundation for examining the potential for adaptive capacity. When social capital of either type is lacking or degraded, it can inhibit adaptive capacity. Without such capital, a community is rendered more vulnerable to change as it lacks resources from which to develop certain adaptive skills. Vulnerability may arise when a dominant group exercises influence within a community, whether an internal group with access to certain resources, or an external group possessing power unavailable to community residents. Communities that have historically been dependent on natural resource extraction may be rooted in this type of power imbalance, as residents become dependent on those entities that control their resource. While social capital in one form or another may be present in a community, it is important that a certain balance between

bonding and bridging social capital be maintained for a community's adaptive capacity to be high. As mentioned previously, the consequences of unproductive social capital and inhibited adaptive capacity may include unemployment or underemployment, out-migration, conflict, lack of control, external domination, diseconomies of scale, persistent poverty, social disruption, and higher crime rates (Krannich and Luloff 1991; Humphrey et al. 1993; England and Albrecht 1984; Flora et al. 2004). These hardships may contribute to what Wilson (1997, 745) regards as the "psychological, spiritual, and economic malaise" that plagues many natural resource-dependent communities.

When social capital within a community is well balanced, other forms of capital are made available to residents from both internal sources and from external ties to other communities and markets (Flora et al. 2004). These may include financial, human, or political capital, among others, and the availability of such capital can empower a community to take hold of its own future. Potential sources of economic growth within a community, such as human capital and technical development, are stimulated by "stable social and economic circumstances" (Adger 2000, 355). On a community level, these circumstances are the elements that collectively result in healthy social capital. Norms of reciprocity are reinforced internally as residents work collectively towards social and economic development and sustainability (Flora et al. 2004). Strong horizontal linkages to other communities can foster information sharing and networking that enhance a community's ability to adapt (Flora et al. 2004). Such development of internal and external social capital directly influences the adaptive capacity of a community to respond and transform to the social and economic changes that manifest during amenity transition.

It becomes relevant here to define what the term community means with regard to this study. The concept of community, as characterized by Wilkinson's *Interactional Theory* (1991), will be used. In this, Wilkinson describes *community* as a physical locale, delineated by the social interactions among a local society that provide common direction and purpose, associative relationships, and a source for collective identity. Using this notion of community focuses on the individual and group relationships that are critical to the formation and maintenance of social capital. To address criticism that social capital is in fact declining (cf. Putnam 1995), as evidenced by reduced participation in clubs, organizations, and public meetings, this definition of community focuses on the transfer of social capital from the individual to group to overall community level. However, social capital may in fact be alive and well, though due to more specialized and broadening interests and organization by society it originates in more individualized and specific networks than previously hypothesized (cf. Florida 2002). Thus, the function of social capital within a community may begin at a more individual or condensed group level, and permeate throughout the community via associative relationships between residents who share broader common interests and goals.

#### *Linking Social Capital to Amenity-Transition*

Population growth in amenity-transition communities may lead to increasingly diverse backgrounds, perceptions, skills, and goals as newcomers mix with longer-term residents. As discussed, these novel methods of organizing and addressing and dealing with problems that newcomers bring into a community may be very different than traditional community mores (Blahna 1990; Smith and Krannich 2000). As these changes

occur, adaptability becomes a function of acceptance, understanding, cooperation, and a collective effort to improve the quality of life for all residents. Flora et al. (2004) relate social capital within a community to measures of the structures and impacts a community experiences when bonding and bridging capital are strong. Such communities are more likely to be able to mobilize resources and address change in a healthy and productive manner; this mechanism is referred to as *Entrepreneurial Social Infrastructure* (Flora et al. 2004). With similar regard to community business development and expanding linkages, Putnam (1995) asserts that social capital promotes networking, shared leads and connections, equipment, and services; joint ventures, more rapid information flow, and more agile transactions. Increasing the resources and capital available to residents in this manner may help infuse a community with alternative methods of economic development beyond traditional resource dependence. Thus, social capital within a community can cultivate an effort among residents towards economic reorganization, through the creation of alternative futures, inclusive networks, and mobilization of resources (Flora et al. 2004).

These processes of change are thought to operate in all non-metropolitan communities transitioning from traditional extractive natural resource economies. The tremendous growth rate of areas possessing recreational and other natural amenities, on average three times faster during the 1990s than in other rural areas (Reeder and Brown 2005), places even greater demands on amenity-transition communities trying to adapt to changing social and economic conditions. This makes the presence of well-balanced social capital an even more salient development variable in these communities. Vias (1999) describes a pattern by which new employment opportunities may be created in

communities that experience population growth driven by desirable local amenities and quality of life characteristics. This economic development is driven by entrepreneurship and multiplier effects of old and new residents (Vias 1999), and may be catalyzed by well-balanced levels of bonding and bridging social capital.

Beyers and Nelson (2000) found that traditional economic activities in resource-dependent communities should not be assumed to be disappearing altogether. As new economic sectors emerge, traditional livelihoods may in fact endure by adapting to new markets and new technologies. Rather than a one-dimensional transformation from “Old West” to “New West,” communities rooted in resource dependency may in fact retain many of their traditional forms of economic productivity, albeit in potentially contracted levels (Beyers and Nelson 2000). The significance of this finding is that entrepreneurship is vital for communities to transition within traditional economic sectors as well as in emerging ones (Beyers and Nelson 2000). The resources that stimulate and enhance such economic vitality are rooted in social capital and are a function of a community’s collective past, present, and desired future.

## **Ecological and Social Resiliency**

### *Resiliency in Ecological Systems*

The ecological application of the resiliency concept was introduced by Holling (1973) as the magnitude of perturbation that an ecosystem can withstand before shifting into a different stable state, while maintaining the regulating processes and overall function of the system. This definition includes both the magnitude of disturbance that can be absorbed before changes in system processes occur (Holling 1973; Gunderson

2000), as well as the time required for a new equilibrium to be attained (Holling 1973; 1986; Ludwig et al. 1997; Gunderson 2000). Holling (1996) describes four general attributes of ecosystem structure and function: 1) change is episodic, as natural capital accumulates slowly until an unpredictable perturbation disrupts the system and causes an abrupt release and reorganization of capital; 2) nonlinear processes function across multiple scales, both large and small, and fast and slow (Holling 1986; 1996); 3) multiple stability domains exist for a particular system, in which stabilizing forces maintain productivity and destabilizing forces maintain diversity and resilience against disturbances; and 4) uncertainty and surprise within ecosystems require flexible and adaptive management in order to maintain resiliency (Walters 1996). These elements create a measure of the robustness and buffering capacity of a system that is resiliency (Berkes and Folke 1998).

The concept of multiple stability domains for a system is an important component to understanding resiliency. The following example expounds upon this idea.

Two alternative stable states may exist with regard to freshwater lakes. In clear water and turbid water environments, interaction between nutrients, vegetation, and sunlight maintain stable yet very different ecological states. The lakes may, over time, transition between clear and turbid water conditions due to the trophic effects of organism populations in each. The disturbances that prompt such transition do not act in the opposite direction; rather, they have unpredictable and uncertain effects over time. (Sheffer 2000)



Similar episodes of multiple stability domains and ecological transition have been documented in tropical rain forests (Trenbath et al. 2004), desert grasslands (Foley et al. 2003), and tundra environments (Higgins et al. 2002).

Walker et al. (2004, 2) develop the notion of resiliency that will be recognized by this study: “the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain the same function, structure, identity, and feedbacks.” The use of the resiliency concept for the present context, that is, application to social communities, focuses on *evolving* function, structure, identity, and feedbacks in a community, rather than a return to some previous state. Four additional elements of resiliency are identified by the authors: 1) latitude, the threshold of change beyond which a system is unable to recover; 2) resistance, the “ease or difficulty” of introducing change to the system; 3) precariousness, the closeness of the system to the threshold of change; and 4) “panarchy,” the cross-scale influence that nested systems from above and below have on the system. The ability of residents to manage these changes is a key element. Thus, the concept of resiliency provides a method of evaluation and management for not only ecological systems, but also for social systems in which variability, uncertainty, and surprise is also a constant.

### *Linking Ecological and Social Resiliency*

In the same manner that ecosystems develop responsive mechanisms to uncertainty and unpredictable change, social groups must also be able to respond and adapt to perturbations that disrupt the processes that control and maintain their structure. The concept of resiliency is particularly applicable to groups or communities that depend

on ecosystems and natural capital for their economic livelihood (Adger 2000), creating a direct link between the functioning and well-being of ecosystems and social communities. In his presentation of human-nature interactions, Glaser (2006) evaluates ideological mind maps, concepts that depict the relationship of the social dimension to the environment. Though they differ by degrees of ecocentricity and anthropocentricity, what becomes evident in the comparison is the validity of each model in terms of the continuous linkage between nature and society (Glaser 2006). Humanity influences ecological processes at all scales (Olsson et al. 2004) and in turn creates social-ecological systems that develop coping mechanisms and adaptive strategies to manage uncertainty (Berkes and Jolly 2001).

The linkage between social and ecological systems is elucidated further by Berkes and Folke (1998) as a compilation of ideas from two different sets of literature: common-property research that emphasizes the importance of institutions that regulate social, political, and economic organization for the well-being of a social group and its associated ecosystem; and ecological economics that links the natural capital sustained by an ecosystem with the economic institutions that govern its use by society. The formal and informal institutions that maintain ecological, economic, and social systems can themselves cultivate resilience (Adger 2000) to manage uncertainty and maintain well-being.

In the social sense, resiliency may be associated with an impact on livelihood (Adger 2000) that may result from a disturbance. For example, the negative impact that declines in the timber industry have had on livelihood in communities dependent on logging has been well documented (Carroll 1995; Reed 2003). This aspect of resiliency

becomes a function of economic, demographic, and institutional variables interacting and affecting a community across temporal and spatial scales (Adger 2000). Research by Harris et al. (1998) developed a resiliency index for Pacific Northwest communities experiencing economic hardship due to decline in their respective natural resource-based economies. The index was indicative of a community's ability to cope with and manage a changing economy, through evaluation of economic factors and social impacts on livelihood and well-being. It was hypothesized communities scoring higher on the index had greater resiliency to change, and results indicate these communities were in fact adapting more productively. The research concluded the communities more likely to adapt were more populous, had higher levels of economic diversity, had more active leadership, were less dependent on neighboring communities, and had stronger linkages to places of political and economic influence (Harris et al. 1998). Additionally, residents of well-adapted communities possessed the "capabilities and motivation to plan, organize, and act" (Harris et al. 1998, 15), which is suggestive of the potential value of the social capital component of this study. An expansion on this research to be gained by the current study is the proposed longitudinal nature of evaluating resiliency and adaptability, as communities change over time.

*The Resilient Communities Project* is another example of the application of the concepts of resiliency to actual community transition. The study is a three-year project seeking to evaluate response to economic change, as well as the effects on social cohesion that declining global markets for natural resources have on communities there (MacKendrick and Parkins 2004). A primary benefit of the project is its synthesis approach, which focuses not on community patterns of stability, but rather on the

functioning of ecological, social, and economic systems as they relate to quality of life within communities (MacKendrick and Parkins 2004). “Locally relevant indicators” enable a localized assessment of individual communities and examine how a community takes an active approach to managing social and economic change (MacKendrick and Parkins 2004). This approach is particularly relevant to this study, as a central theme will be to evaluate how individual communities may be situated along a cycle of adaptability to amenity-transition. Once again, this research has not attained the longitudinal results that the current proposed study would achieve.

These types of research have direct relevance to the objectives of this study. Adaptation to the impacts that stem from large-scale economic and social change is related to available local resources and the dynamics within a community over time. The notion that a community might cultivate resiliency, or various coping mechanisms, to deal with changes in economic structure or social cohesion is especially apparent in communities that have experienced the cyclic patterns associated with timber decline and amenity-development.

### **Adaptability of Systems and the Adaptive Cycle**

#### *System Adaptability and Panarchies*

Glaser (2006) provides a synopsis of the subsystems that influence the viability of an overall system: 1) *human systems* composed of individual development, social systems, and system of government; 2) *support systems* with economic and infrastructure and superstructure systems; and 3) *natural systems* derived from the environment and resource systems. Holling (2001, 391) attributes the complexity of such systems to the

presence of small sets of controlling factors that impart self-organization, or the formation of adaptive systems, which when faced with change may achieve multiple outcomes based on “accidents of history.” The interaction of these “critical, self-organized variables” (Holling 2001, 391) establishes a framework upon which change may occur as social and economic processes within a human system transition from one state to another. For a transitioning system, opportunities hinge on uncertainty, and the “emergence of novelty” that impart adaptive properties as change occurs (Gunderson and Holling 2002, 10; Holling 1994).

The interactions of such variables across multiple temporal and spatial scales, their relationship to adaptability, and the evolution of adaptive systems are best articulated by Gunderson and Holling (2002) in their concept of *panarchy*. In a panarchy, complex natural and human systems are composed of hierarchical levels and processes. These hierarchies lie at different orders of magnitude: for example, in a natural system, processes may occur at the levels of individual, community, species, landscape, ecosystem, biome, and at the global scale of ecological interaction; in a social system, processes may occur at the individual, group, community, government, societal, cultural, and again global levels of social interaction (Gunderson and Holling 2002), among others. The insight offered by this model is the notion of overall system *nestedness*, or the interaction and influence that one hierarchical level may have on another, across scales of time and space (Gunderson and Holling 2002). This occurs not only across hierarchies within single systems, but at scales that span natural and social systems themselves. Nestedness across such scales creates the notion of the social-ecological system, in which processes may occur across levels of individual stakeholders, communities, natural

resource management agencies, governments, natural resource management and use philosophies, and regional, national, and global markets. Panarchy describes the structure by which processes that govern natural, human, and social-ecological systems are linked via “adaptive cycles of growth, accumulation, restructuring, and renewal” (Holling 2001, 392). As systems evolve due to disturbance, uncertainty, and change, adaptive cycles occur at each hierarchical level of system nestedness, across scales of both time and space (Gunderson and Holling 2002).

### *The Adaptive Cycle*

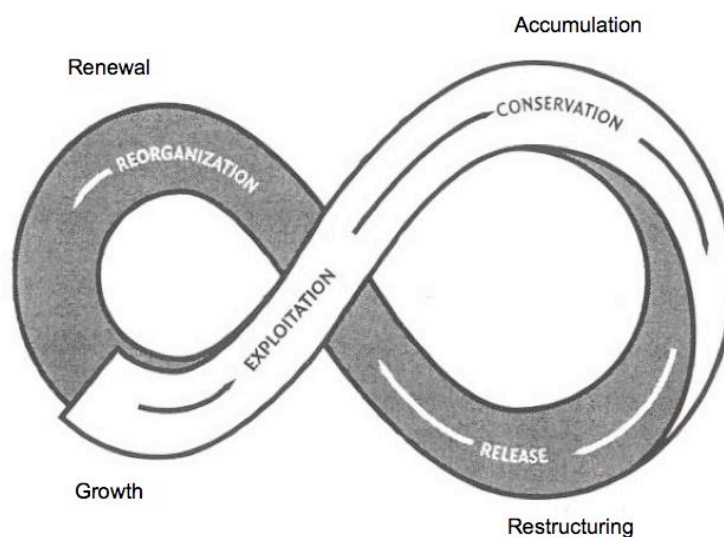
The *Adaptive Cycle* model (Gunderson and Holling 2002; Holling 1986; 2001) has traditionally been practically applied to assess transformation as ecological systems migrate between stable and unstable states. The model is characterized by four dynamic *adaptive-renewal* stages through which all systems are posited to cycle: *exploitation*, *conservation*, *release*, and *reorganization* (Berkes and Folke 1998; Gunderson & Holling 2002; Holling 2001; 1986; Blahna et al. 2006). These correlate with the previously mentioned concepts of growth, accumulation, restructuring, and renewal (Gunderson and Holling 2002). Table 1 provides definitions for each phase of the model, and Figure 2 illustrates how the phases in the Adaptive Cycle model are hypothesized to flow from one to another.

The application of the model to social systems has been examined primarily vis-à-vis their pertinence to improved natural resource management, and the potential social role in improving the resiliency and sustainability of ecosystems (Berkes and Folke 1998; Holling and Gunderson 2001). This study aims to explore and gain a better understanding

of how indicators may be used to evaluate how *communities* can cope with changes in their capital and resource infrastructure as they undergo amenity-transition. The Adaptive Cycle provides a framework upon which to develop this type of heuristic.

**Table 1.** Stages of the Adaptive Cycle (Gunderson and Holling 2002; Holling 2001; 1986)

<i>Exploitation/ Growth</i>	The structural aspects, productivity levels, relationships, and traditional forms of capital that exist within a system
<i>Conservation/ Accumulation</i>	Productive efficiencies, resources, and forms of capital that emerge and evolve as a system prepares for disturbance and transition
<i>Release/ Restructuring</i>	Transition and change that occurs due to disturbance brought on by increasing connectedness, rigidity and vulnerability within a system; ability to cope, or adapt, relies on possessed resources and capital
<i>Reorganization/ Renewal</i>	Adaptive and innovative properties that allow a system to reformulate, or reorganize, capital during transition to build adaptive capacity, hence increasing resilience and against future stressors and disturbances



**Figure 2.** The Adaptive Cycle (Adapted from Gunderson and Holling 2002; Holling 2001).

*Application of the Adaptive Cycle Model  
to Amenity-Transition Communities*

An amenity-transition community is by nature a social-ecological system, and is thus dominated by human actions (Walker et al. 2004). The capacity for residents to influence resiliency is a function of the community's social component and results in the overall adaptability of the system to cope with transition (Walker et al. 2004). In his systems perspective, Glaser (2006) attributes the functioning of each system level to the different forms of capital that the system has accumulated. In a social system, this is analogous to the description by Flora et al. (2004) of how varying levels of bonding and bridging social capital can influence other forms of capital. Taken together, this relationship forms the basis for the argument that resiliency and adaptability are a function of certain elements of social, economic, political, and cultural capital present in an amenity-transition community.

Again, Figure 2 demonstrates how the cycle is hypothesized to flow from one stage to another. A critical element to this flow is that under given circumstances systems may spend variable time in any given phase. Also significant is the ability of a system to jump from one phase to another, across spatial and temporal scales, depending on the specific disturbance or change. For example, Community A, a rural amenity-oriented community with a more diversified economic base and closer proximity to a metropolitan area, may be able to reorganize and reformulate its capital at a more rapid pace than Community B, an isolated and somewhat autonomous community with minimal connections to external capital and resources. The pattern that would reflect characteristics for Community A on the Adaptive Cycle curve would be a shorter time



spent in the reorganization phase, while Community B would experience a much longer, perhaps indefinitely protracted, time spent in the same phase. In a related fashion, once reorganization has progressed to a recaptured utilization of its existing capital and resources, Community A may enjoy a long and productive exploitative phase, realizing the benefits of sustained economic and social development. A further benefit may be increased resiliency and adaptability, lessening the impact of future disturbances and change. Community B, on the other hand, may suffer from the constraints placed on its own reformulation of capital and resources by isolation and limited external ties. Thus, if the community is able to realize some benefit from the reorganization of existing internal capital, it may still be left more vulnerable to future disturbances and change. If and when these do occur, the community's inhibited resiliency and adaptability may cause a rapid leap from a weakened exploitative phase directly into another phase of release, and the ensuing capital and resource collapse. To reiterate the underlying principles of this concept, the actual effects of resiliency and adaptability in a community are a function of numerous cross-scale interactions and processes (Gunderson and Holling 2002). The one-dimensional examples provided are meant only to reinforce the mechanisms inherent to the Adaptive Cycle.

*Indicators of Resiliency and Adaptability  
in Amenity-Transition Communities*

This study will link indicators from the social capital literature to community resiliency and adaptability. It is understood that a quantitative assessment of social capital within a community is a controversial endeavor at best; however, it is hypothesized that there is some merit in using such an evaluation as a preliminary step in at least

determining where a community is positioned with regard to amenity-transition.

Moxley and Proctor (1995) offer their interpretation of social capital as “community solidarity,” or patterns of institutional and social organization within a community that tends to merge or bond community members. Examining manifestations of social organization and support may reveal such patterns within a community undergoing amenity-transition. It is these patterns of organization that affect community resiliency and adaptability to change, and the evaluation of such relationships over time can enable a longitudinal glimpse of how a community has already responded to change as it has occurred. This is a desirable method of assessment for amenity-transition communities in particular, due to the rapid and cyclic nature of the mechanisms of transformation that can occur within the communities. For the coarse-filter purpose of this study, the indicators used will be readily accessible, though future research and applications of the heuristic should demand a more in-depth identification and development of relevant indicators.

Examples of variables and indicators were mentioned previously in the Resilient Communities Project, which uses community resilience as an intervening variable linking concepts from social capital, such as social psychology and social organization, with community economic well-being and adaptive capacity for change (MacKendrick and Parkins 2004). The variables and indicators reflect social and economic well-being, as well as the diversity that a community cultivates as it develops various patterns of institutional and social organization. Examples include: migration history, religious institutions, financial institutions, access to healthcare, community integration events, and communication services (MacKendrick and Parkins 2004). Additional variables can be

found in a study conducted by The Sonoran Institute that tracked economic and social change in Moab (Grand County), Utah. These variables changed dramatically in correlation with the growth and decline cycles experienced by the community. They include: economic base diversity, employment rate, employment rate seasonality, poverty level, personal income, property values, and average earnings per job (The Sonoran Institute 2004). Numerous other studies have focused on many of the same variables in describing resource dependency and amenity-related growth (Albrecht et al. 2000; English et al. 2000; Harris et al. 1998; Johnson and Beale 2002; McGranahan 1999; Vias 1999).

Potential indicators discussed in this study are believed to characterize the types of capital that may be present in amenity transition communities. Available community capital is believed to provide the resources a community needs for prosperous amenity transition; social capital in particular is hypothesized to be strengthened by the presence of the other forms of capital. Conversely, when certain types of capital are deficient or degraded, a community may experience compromised economic and social development (Flora et al. 2004). Table 2 discusses the forms of capital that are available to a community as a whole, and that are believed to influence resiliency and adaptability in an amenity-transition community.

**Table 2.** Potential forms of capital within a community (taken from Flora et al. 2004)

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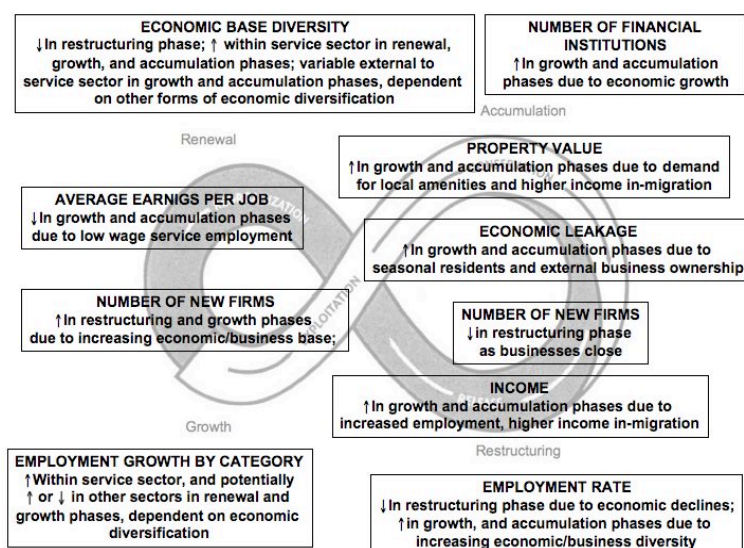
Natural	Resources generated by the landscape that may be consumed or extracted for profit
Cultural	Local knowledge; the values, symbols, customs, and sense of history within a community
Social	Networks, norms of reciprocity, mutual trust within a community; strengthens sense of common identity and a shared future
Human	Skills, abilities, potential, health, and leadership qualities among individuals in a community
Financial	Money within a community used for investment rather than consumption
Built	Community infrastructure: businesses, schools, community centers, ecological habitat; can bolster other forms of capital

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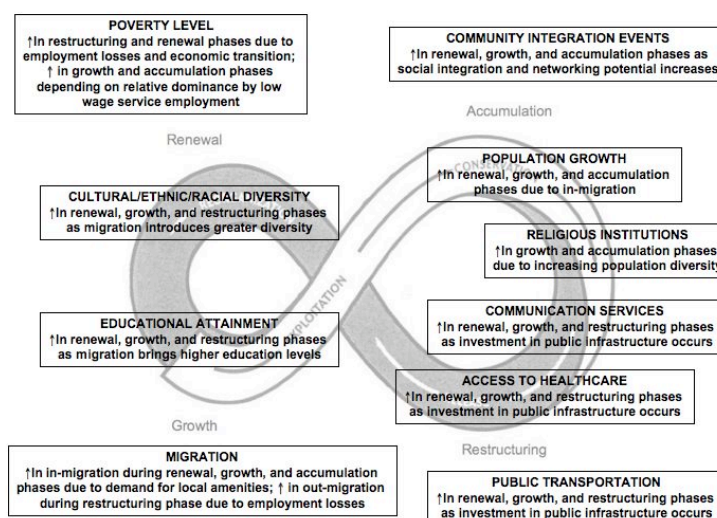
Using Table 2 as a reference for developing indicator concepts, information gathered in key informant interviews was used to identify seemingly important indicators of amenity-related economic growth and social change. These were documented for each of the three study communities. Indicator concepts were linked with various phases from the Adaptive Cycle model to serve as an evaluative tool to measure aspects of community resiliency and adaptability to change. Two generalized constructs were developed to examine this: the *economic viability* of a community, and *social support* available to residents in a community. As mentioned above, these economic and social indicators are hypothesized to correlate in different ways with particular phases of the Adaptive Cycle model (see Figures 3 and 4 below). The relationships in Figures 3 and 4 are purely hypothetical and are meant to provide an illustration, and it should be noted that different variables might manifest in different communities in numerous ways. In the constructs, increasing or decreasing arrows represent the hypothesized direction of relationship between an indicator and its corresponding phase of the Adaptive Cycle. It should also be

noted that not all indicators listed in Figures 3 and 4 were explored for the three study communities. The constructs serve as a theoretical framework for matching specific indicators with phases along the Adaptive Cycle model, and there are potentially many more additional indicators that could be used to examine community adaptability.

The developed heuristic can thus serve as an evaluative tool to examine changes in resiliency and adaptability over time in an amenity-transition community, as it relates to the presence of economic and social capital. The indicators chosen to model the study communities are by no means exhaustive, as the constructs below portray; there in fact could be hundreds of appropriate indicators to measure in this research. Rather, to develop a coarse-filter and exploratory heuristic, the indicators were meant to offer a glimpse into the specific circumstances a particular community may be facing during amenity-transition. The limitations of the heuristic are inherent in the assumption that a more calculated quantitative and qualitative methodology is required to further the research.



**Figure 3.** Economic viability construct for various community adaptive phases.



**Figure 4.** Social support construct for various community adaptive phases.

The above indicators represent shifting levels of economic and social capital within a community. Quantitative measurement of various indicators is meant to provide a piece of an overall puzzle of community resiliency and adaptability. In both constructs, the phases of the cycle are characterized by the increasing or decreasing trends in specific indicators over time. For example, the exploitative phase in an amenity-transition community may correspond to: increasing population; increasing economic base as new businesses are established; decreasing poverty rates as income rises and new income sources are generated; and community infrastructure development as healthcare options expand, ties are formed with other communities, and cultural diversification and overall community integration increase. The conservation phase of the cycle may be characterized by increasing rigidities among the indicators, or a tapering off of certain types of capital accumulation within a community. A release and reorganization phase could thus follow, depending on circumstances unique to individual communities. As

discussed earlier, the cycle is meant to be a visual representation of different phases of amenity transition and related economic and social development.

At any point along the cycle, disturbance could retard or accelerate the pace at which a community moves through any given phase; a significant disturbance could drive a community into a different phase altogether. Examples of disturbance might include natural disasters, shifts in market demand for certain amenities, changes in governments regulations or incentives, social crises, or other unforeseen community issues. These disturbances and changes may occur on smaller or larger scales, reflecting the nestedness that occurs among scales, from global, to national, to regional, local, and individual levels. The selected variables are again limited, and only begin to elaborate on potential changes within a community; however, a quantitative analysis such as this may provide a baseline that can then be used to develop future research hypotheses. Rather than an empirical test of specific hypotheses, the current study is intended to provide an historical analysis of what the study communities have experienced, and to examine whether secondary indicators such as those selected provide a valid means of linking components of social capital to the resiliency and adaptability of amenity-transition communities, while using the Adaptive Cycle as a heuristic tool. This coarse-filter examination of the three study communities is meant to exhibit the inherent value and necessity of conducting more in-depth analyses with the Adaptive Cycle using additional indicators and methods.

To more thoroughly examine measures of adaptability in amenity-transition communities, and to explore how communities can position themselves to manage these types of change, this study seeks to develop a heuristic that can be used by community

leaders, residents, and other decision-makers to better understand where they stand and what they can do to gain more control over their futures. Scrutinizing historical trajectories and trends over time can improve understanding of the factors that have manifested change in these communities. Applying this to the Adaptive Cycle concept enhances the longitudinal focus necessary to provide context to community change. The ensuing identification and measurement of locally relevant indicators of economic and social capital provides an exclusive assessment of transition, illuminates phases of change a community has passed through, and enables a community with a framework by which to guide future development. The methods for such a heuristic must be flexible to accommodate various types and sizes of amenity-transition communities. This study seeks to build such a framework for the development of future research that would evaluate an expanded sample of these types of communities.



## CHAPTER III

### METHODS

The methodology for this study included two types of data collection for the three study communities: 1) archival records and community historical data collected via semi-structured key informant interviews conducted in each of the communities, and 2) secondary indicator data, collected from the United States Census Bureau. A preliminary analysis was conducted to identify potential study communities and their likely stage fluctuations along the adaptive cycle. Communities were selected based on historical evidence of multiple cycles of economic transition. Qualitative data was garnered from a small set of key informant interviews in each community, and was used to solidify the historical records and help verify the concepts and indicator variables that are hypothesized to contribute to community resilience and adaptability. These data also helped identify individual community historical patterns and shifts from extractive to amenity-based economies and match these with stages along the adaptive cycle model. Secondary data served as a quantitative linkage between Social Capital and Resiliency Theories and the adaptive cycle and was used to model and evaluate concepts from each. Finally, dynamics within study communities were compared and contrasted based on their documented stages along the adaptive cycle model. More detailed descriptions of the community selection criteria and data collection are provided in the following sections.

### **Community Selection Criteria**

Rural, historically timber-dependent, amenity-transition communities in the Pacific Northwest are the focus of this study. Individual test communities for this study were identified based on seven criteria: 1) location in the Pacific Northwest; 2) rural, or non-metropolitan, status, using a standard of 10,000 residents for maximum population at the community level; 3) an Amenity Index score of at least four out of seven, which represents a considerable tendency towards amenity development; 4) an Urban Influence Code of seven, eight, or nine, representing counties not adjacent to even “small” urban areas, and which are thus assumed to have relatively little urban influence; 5) historical patterns of timber dependency dating back to the early part of the 20<sup>th</sup> century; 6) eventual transition to amenity-orientation, as evidenced by a preliminary historical archival analysis; and 7) multiple cycle iterations of economic growth and decline. This seventh criterion was difficult to assess prior to data collection, thus multiple iterations of growth and decline may have occurred at varying levels and within varying segments of individual communities. Initially, a number of communities in the Pacific Northwest region were evaluated based on these criteria. Based on recommendations from rural sociologists, preliminary historical archival analyses using data provided by Chambers of Commerce and state historical societies, desirable population sizes, amenity rankings, and urban influence measures, three communities in three different states were selected for this research. Further discussion of the selection criteria is provided in the following section, with subsequent briefs for each of the three study communities.

McGranahan’s Amenity Index (1999) was used for classification of amenity-orientation and urban influence. In this study, the relationship between regional natural

amenities, rural population growth, and corresponding employment patterns was examined. McGranahan (1999) showed that over the past 25 years, population growth has occurred more rapidly in counties scoring higher on the Amenity Index; in addition, employment growth has tended to be larger in counties at the higher end of the scale (McGranahan 1999). McGranahan's (1999) Index examines the correlation between existing local natural amenities. These factors include certain characteristics presumed to be reflective of desirable local environmental qualities; the factors considered included: warm winters, average levels of winter sun, temperate summers, summer humidity levels, low winter-summer temperature gap, and water area. These variables were interrelated, though not redundant. In other words, certain combinations of characteristics can be unique to a particular county, but may not manifest in the same way in a different county. Thus, most counties may have some positive and some negative aspects associated with their local amenities (McGranahan 1999). Table 3 presents the significance of these scores. For this study, counties scoring a four or higher were chosen. This desired score represents a score above the mean of all counties examined by McGranahan (1999).

**Table 3.** Natural Amenity Index scores (from McGranahan 1999)

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<u>Natural amenity rank</u>	<u>Standard deviations from the mean</u>
1	Over -2 (LOW)
2	-1 to -2
3	0 to -1
4	0 to 1
5	1 to 2
6	2 to 3
7	Over 3 (HIGH)

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To link the presence of local natural amenities with rural population change, for the purpose of the Adaptive Cycle heuristic, McGranahan's (1999) overview of patterns of *settlement* within a county was also used. This measurement indicates how "rural" a county is. The metric referenced by McGranahan (1999) for this was the Urban Influence Code developed by Ghelfi and Parker (1997), which evaluates a county based on its proximity to an urban area as well as the size of its largest settlement (McGranahan 1999). The explanations for these county scores can be found in Table 4.

**Table 4.** Urban Influence Code for non-metropolitan counties (from McGranahan 1999)

<u>Code #</u>	<u>Measured urban influence</u>
3	Adjacent to a large metro area with a city of 10,000 or more
4	Adjacent to a large metro area without a city of at least 10,000
5	Adjacent to a small metro area with a city of 10,000 or more
6	Adjacent to a small metro area without a city of at least 10,000
7	Not adjacent to a metro area and with a city of 10,000 or more
8	Not adjacent to a metro area and with a city of 2,500 to 9,999
9	Not adjacent to a metro area and with no city over 2500

Though at times cyclic, rural population has generally decreased in counties most distant from urban centers, while generally increasing in more urban proximate counties (McGranahan 1999). In McGranahan's study (1999), all of the amenity measures he considered were related to population growth in non-metropolitan counties when other factors were controlled. The current study aims to examine amenity-related population growth in areas that, as measured by their Urban Influence Code, are somewhat isolated rural communities (code 7 or above).

Timber dependency was documented through community historical and archival data analyses and economic data collected by the US Census Bureau. The preliminary historical archival analysis was used to determine the time period in which timber dependency originated for each community. A unique characteristic of the study communities is their movement through multiple Adaptive Cycles, as their social structures have responded to the changes brought about by economic transition. An ideal example of such a community can be illustrated by examining the case of Moab, Utah, whose traditional economy and social structure was rooted first in agriculture, and then in mining. Beginning in the 1950s, Moab experienced a significant boom in the extraction of uranium, only to see it dramatically decline by the mid-1960s. Possessing unique and profound natural amenities, the presence of two National Parks, and stimulated by a national surge in the popularity of mountain biking, Moab boomed once again in the mid-1980s as tourists began flocking to the area. It has since become a quintessential example of a resource-dependent community that has transitioned to an amenity economy. Moab's movement through multiple Adaptive Cycles makes the community particularly relevant to this research, though due to its location as well as its focus in a large number of previous studies, it is included only as an example of the type of community desired for this study.

### **Study Communities**

#### *McCall, ID*

The first community selected for the study is McCall, in Valley County, Idaho. The location of McCall on the Payette Lake made it a major port in the timber and

mining industries in the early part of the 20<sup>th</sup> century; for some time the Brown Tie and Lumber Company was the largest employer in the area. During its early history McCall was known for its rough reputation, characterized by its “whorehouses, dancing clubs, and gambling establishments” (McCall Chamber of Commerce 2003). McCall experienced a relatively early transitional shift to amenity-orientation, as in 1924 a group of residents organized a “Winter Carnival” to provide some form of activity during the harsh winter months. The Carnival has endured to modern times and remains a cornerstone for McCall’s many tourism attractions. A town sometimes referred to as “Ski Town, USA,” McCall is experiencing rapid growth due not only to skiing, but to year-round outdoor recreation as well. Amenities such as the Payette Lake, the Payette National Forest, Brundage Mountain Resort, Tamarack Ski Area, the Manchester Ice and Event Centre, and nearby Treasure Valley have generated unprecedented population growth, rising property values, and other forms of economic development (The Otak Team Report 2005) (historical information compiled from the Valley County Chamber of Commerce 2003). McCall’s population in 2000 was 2,084 (27.2% of county population), and Valley County’s 2000 population was 7,651 (US Census Bureau 2000); the county’s natural amenity ranking is five and its urban influence measure is nine (McGranahan 1999).

### *Leavenworth, WA*

The second community evaluated was Leavenworth, in Chelan County, Washington. At the beginning of the 20<sup>th</sup> century, the Great Northern Railway Company constructed tracks through Leavenworth, leading to increased opportunities for economic

development. For about 30 years the local sawmill and town as a whole prospered amid a flourishing lumber industry. However, this prosperity came to an abrupt end around the 1930s as the railway was rerouted, the sawmill soon after was closed, and Leavenworth was forced to suffer through difficult economic times. In the 1960s, leaders in the community decided to try to revive Leavenworth's economy by modeling the town after a Bavarian alpine village, in an attempt to attract tourism and much needed revenue. The plan was an enormous success, and since this period the town has grown considerably into an amenity-oriented community. In addition to boasting year-round recreation potential, including the Alpine Lakes Wilderness, Leavenworth hosts one of the most attended Oktoberfest celebrations outside of Munich, Germany. With its compliment of seasonal festivals and agritourism ventures, Leavenworth stands to continue to capitalize on amenity growth and development. More than a million visitors come to Leavenworth annually (historical information compiled from the Leavenworth Chamber of Commerce 2005). Leavenworth's population in 2000 was 2,074 (3.1% of county population), and Chelan County's 2000 population was 66,616 (US Census Bureau 2000); the county's natural amenity ranking is four, and its urban influence measure is seven (McGranahan 1999). The relatively small proportion of Leavenworth's population to the total county population should be noted; the nature of Leavenworth's development as a theme tourism attraction is a unique feature of the community that makes it relevant to this study. County level indicators are expected to provide adequate evidence of an historical transition from timber dependency to amenity-orientation. Issues concerning population ratios of the city to the overall county will be addressed throughout the data analysis.

*Prineville, OR*

The third and final community examined was Prineville, in Crook County, Oregon. In 1916, residents of Prineville voted for an extension track to be built from their town to the Oregon Trunk Railway, which in 1911 had bypassed Prineville during its construction. The railway did not provide much benefit for the community until the mid-to-late 1930s, when the timber industry exploded, driven by the nearby Ochoco National Forest as well as a number of private holdings. During World War II, Prineville's economy robustly expanded from traditional ranching to a booming timber economy. This continued until the 1950s, when a slow and steady decline characterized all of Central Oregon's logging industry. By the 1960s the revenue from timber extraction was being used for destinational recreation development in and around Prineville, and several lumbermen had begun investing in recreational resorts and businesses. While the timber industry is still active in Prineville, with the presence of the Ochoco Lumber Company as well as a number of secondary wood products firms, recreation and tourism has grown to be a major component of Prineville's current economy. The Ochoco National Forest, numerous golf courses, bike trails, and fishing opportunities, Prineville Reservoir State Park, and proximity to the world-renowned Smith Rock climbing area provide diverse recreational opportunities for visitors. Prineville carries the unofficial nickname of "Rockhound Capital of the United States," a reference to the unique geologic sites surrounding the community that attract numerous visitors (historical information compiled from the Oregon Historical Society 2002). Prineville's population in 2000 was 7,356 (38.3% of county population), and Crook County's 2000 population was 19,192 (US Census Bureau 2000). Crook County's natural amenity ranking is six, and its urban



influence measure is eight (McGranahan 1999). Table 5 provides a summary for each of the three chosen study communities; important to note is the small size, relatively high amenity index rankings, and relative “ruralness” of the three selected communities.

**Table 5.** Summary criteria for McCall, ID, Leavenworth, WA, and Prineville, OR

	Location	US Census 2000 Population	Amenity Index Score	Urban Influence Code	Earliest period of timber economy	Multiple cycles of growth/ decline?
<b>McCall</b>	Valley County, ID	2084	5	9	Early 20 <sup>th</sup> Century	Yes
<b>Leavenworth</b>	Chelan County, WA	2074	4	7	Early 20 <sup>th</sup> Century	Yes
<b>Prineville</b>	Crook County, OR	7356	6	8	Early 20 <sup>th</sup> Century	Yes

In 2007, Headwaters Economics published socioeconomic profiles of rural communities, including the three study communities, which document their development as amenity-oriented destinations. Highlights of this research are presented in Table 6. These highlights are based on data collected from the US Census Bureau and the Bureau of Labor Statistics, and compare the chosen study communities to the data distributions of all counties in the United States (Headwaters Economics 2007).

In general, Table 6 illustrates certain dynamics within the study communities that may be indicative of many amenity-transition communities: rapid population and employment growth, and less affordable cost of housing for residents. Other characteristics may exist as well, depending on local attributes of a community’s transition.

**Table 6.** Headwaters Economics socioeconomic profile of study communities compared to U.S. averages (2007)

	<b>Valley County, ID</b>	<b>Chelan County, WA</b>	<b>Crook County, OR</b>
Population growth (1970-2004)	Fast	Somewhat fast	Fast
Employment growth (1970-2004)	Fast	Somewhat fast	Somewhat fast
Personal income growth (1970-2004)	Somewhat fast	Somewhat fast	Somewhat fast
Median age (2000)	Old	Roughly average	Somewhat old
Per capita income (2004)	Somewhat high	Somewhat high	Somewhat low
Average earnings per job (2004)	Somewhat low	Somewhat high	Roughly average
Education rate (2000)	High	Somewhat high	Roughly average
Employment specialization (2000)	Somewhat diverse	Somewhat diverse	Somewhat specialized
Housing affordability ((2000)	Less affordable	Less affordable	Somewhat less affordable
Unemployment rate (2005)	Somewhat low	Somewhat high	Somewhat high

These characteristics agree with the findings of English et al. (2000) mentioned earlier. One variable in particular raises an issue discussed by Reeder and Brown (2005); the three selected communities for this study show different levels of average earnings per job: low, average, and high. As mentioned earlier, in their study of amenity-related development, the authors note growth of this type as generally positive, though can vary dramatically from one location to another depending on the place-specific factors available to a community. Amid growing service-oriented economies, the three study communities exhibit different levels of earnings per job. This may be attributed to locational factors or diverse modes of growth within the communities, thus potentially

influencing the direction of the relationship between indicators and phases mentioned in the *Economic Viability* and *Social Support* constructs in Figures 2 and 3.

### **Verification of the Adaptive Cycle Heuristic**

While the historical data provided initial insights to amenity transition and community economic and social change, further information was needed to better estimate change relative to the Adaptive Cycle. To examine the economic and social constructs and variables in a qualitative manner, five semi-structured key informant interviews were conducted in each of the three study communities. The objective of the interviews was to gather qualitative information from community leaders, professionals, and residents, who possess firsthand knowledge and who were able to provide key insights into specific periods of transition in the community's history and throughout its economic and social development. The qualitative component of this research sought to gain a better understanding of the general patterns of economic and social change experienced each study community, and served as a pathway to expound upon the relationship and relevancy of county level secondary indicators to community level experiences.

### **Interview Instrument**

The interview instrument was designed to provide a historical context for each community, and to further identify the specific economic and social patterns of transition that each community has undergone. A specific outcome was to identify the time periods in which each community experienced consumptive (extractive), non-consumptive, and/or backdrop modes of dependency and development, as well as identify the specific

phases of transition each community has undergone. The complete interview instrument can be found in Appendix A.

### **Sample**

A non-representative, convenience sample of the key informant interviews was selected by using a referral sampling method. To improve upon the sole use of county level secondary indicator data, and to gain a more focused analysis of individual communities, participants were selected at the community, not the county, level. Thus, in each community, key and easily identifiable residents were contacted and asked to provide names of potential respondents who would satisfy the requirements of this study. In each community, initial contacts were members of city governments or the private business sector who were found via community websites. Recommended respondents were then assessed based on their length of residence and position within the community. To represent the longitudinal focus of this research, residents with a length of residence of at least 25 years were interviewed, with two exceptions in McCall in order to include respondents from the city government and the local Forest Service office, both of which were believed to be valuable for addressing historical cycles of timber dependence and amenity-transition within each community. These exceptions were representative of an overall and unexpected difficulty of finding residents in each community who had resided there for 25 years or more. This limited the potential number of respondents but remained a primary focus for providing longitudinal data. The identified potential respondents comprise a judgmental sample based on the following: 1) professional status or position in the community; 2) civic leadership, activity, responsibility, and duty; and 3)

membership in community organizations and/or associations. The focus was to gather historical data from residents who had experienced firsthand different aspects of the cycles of change that the community had gone through since timber dependency, and thus respondents were assessed based on possessing the broadest scope of each of the three characteristics above. These characteristics for respondents as a group are summarized in Table 7 below. Due to the small populations in each community and the distinct possibility of respondents being identifiable by their professions, affiliations, and other activities, the summary provided is as generalized as possible. Six respondents were interviewed in McCall, five in Leavenworth, and five in Prineville, for a total sample (n) of 16 interviews.

**Table 7.** Summary of respondent characteristics for the three study communities

<u>Desired characteristics</u>	<u>Example characteristics among respondents</u>
Professional status and position within the community	Private business owners and entrepreneurs, US Forest Service employees, US Bureau of Land Management employees, engineers, financial institution employees
Civic leadership, activity, responsibility, and duties	Serving Mayors, former Mayors, City Council Members, City Managers, County Commissioners, Chamber of Commerce Board of Directors, other city employees
Membership in community organizations and/or associations	Local historical societies, various local school organizations

### **Meeting Schedule**

Local sampling was conducted in each study community beginning in April 2007. The McCall interviews were conducted between April 9 and April 13, the Leavenworth interviews between April 23 and April 27, and the Prineville interviews between April 30

and May 2. Specific locations for the interviews were decided upon based on convenience for the respondent.

### **Data Analysis**

A qualitative analysis was conducted to establish historical periods within each study community that relate to trends seen within the collected secondary data, and ultimately the different stages of transition along the Adaptive Cycle. This analysis also sought to illustrate how qualitative and quantitative data can be coupled to evaluate communities using the Adaptive Cycle heuristic. Emerging interview themes were hypothetically linked with particular phases along the Adaptive Cycle and with indicators developed in the Economic Viability and Social Support constructs. These themes relate to periods of growth, accumulation, restructuring, and renewal in the communities, and are believed to be salient to extractive and amenity-oriented development. The themes were then compared to historical records and archives to help shape and construct a curve to represent each community's Adaptive Cycle. Data were used to identify the growth and decline of each community's extractive, timber-based economy, and the onset, timing, and effects of amenity-oriented growth and development.

### **Modeling Adaptive Curves for Each Study Community**

A conceptual Adaptive Curve was constructed for each study community, illustrating the historical patterns of change as detailed by the key informant interviews. Coupled with the clusters of variables formed via statistical analysis of the secondary indicator data, particular phases along the Adaptive Curve were characterized. Further, categorizations of variables salient to specific historical periods and modes of change

with regard to each study community were examined. These Adaptive Curves can be found in the Results chapters, with explanations for each community following.

For reference, the initial Adaptive Curve model presented in Figure 2 is set as a backdrop to the developed Adaptive Curves for each community. The phases of adaptation are labeled in the four corners of the figures: Growth, Accumulation, Renewal, and Restructuring. The study communities are hypothesized to move through their respective Adaptive Curves between historical points designated as significant to each community. The lines and arrows in each figure illustrate movement between these points, and the relative magnitude of the changes in each community between certain points is represented by line thickness. Hence, the thicker the line the more significant the impacts were. The length of the curve between two points is meant to represent the relative amount of time each community has spent in a particular phase. It is stressed that a downward trend to a particular phase along the curve does not carry a negative connotation. For instance, a community passing through a restructuring phase may experience both positive and negative impacts as residents adapt. Similarly, as a community migrates from periods of growth and accumulation to the renewal phase, it is not necessarily experiencing negative changes in economic or social well-being. This section of the curve should be interpreted as a period of disturbance or change, which initiates some kind of response by the community, and which may have detrimental or beneficial consequences.

Certain categorizations of variables provided by cluster analysis were used to further expound which of these impacts may be related, though it should be noted that this analysis qualitatively examines initial relationships between natural resource industry

declines, amenity-oriented change and development, and service-based economic structures. For the scope of this study, it is a tool to be used with the intent of developing future research hypotheses, and does not attempt to test, explain, or confirm existing hypotheses. In addition, it does not recognize the significance of time sequence as the variables change from decade to decade. Only the most useful and relevant clusters will be identified and discussed.

One caveat that should be mentioned is the unit of measurement chosen for the quantitative portion of the study. While key informant interviews were conducted at the community level, and survey questions were community-oriented, secondary indicator data were collected at the county level. This was done based on the following reasoning: 1) historically, each community shares with the overall county a strong “timber to amenity” orientation, and the assumption is made that county level data trends are indicative of trends experienced at community levels; 2) the use of secondary data was meant to reinforce the inherent value of supplementing a qualitative methodology with quantitative data analysis, as a means to effectively evaluate social and economic transitions using the current model; and 3) at this conceptual stage the US Census Bureau was determined to be the most useful and available data source. Hence, the potential exists in the quantitative analysis for the fallacy of making assumptions for a unit of analysis different than the unit analyzed. This was unavoidable due to the temporal and financial constraints on the research, and due to the exploratory nature of the study it was determined to be an accepted risk. The issue will be considered in the Results and Discussion sections and will exist as a priority for future research.



## **Secondary Data Collection**

For the quantitative phase of the research, secondary data were collected at the county level from the United States Census Bureau. Census variables that were measured can be found in the Economic Viability and the Social Support constructs (Figures 2 and 3) discussed in the Literature Review. For a longitudinal assessment of transition from periods of resource dependency to current modes of amenity-transition, data were collected back to 1960, a period in which the timber industry was still having significant impacts on the local economies of all three study communities. Data was collected up to the most recent Census in 2000. The purpose of this data was to track economic and social indicators for each community's transition from the nascent times of timber extraction (and in some cases agricultural roots and influence), through the decline of the logging industry and the onset of recreation and tourism, to the ongoing amenity-related growth being experienced in each community.

One limitation of using Census data as the primary source for secondary indicators in this study is the lack of availability of data after the year 2000. The study communities have all experienced additional and at times rapid change since the last Census was conducted. In addition, Census variables prior to 1960, and perhaps even 1980, lack the specificity required to conduct such an analysis. This constrained the choice of indicators for this longitudinal study, and future work could benefit greatly by implementing additional data sources. Also, shorter periods of rapid transition in the study communities may not be captured in the ten-year intervals between Census surveys. Again, additional data sources could be utilized in a more focused future study to examine more recent changes in each community.

The secondary indicators chosen for the research are listed in Table 8. They represent social and economic concepts that link amenity-oriented development and growth trends with selected variables of community change, resilience, and adaptability. In general, based on qualitative data gathered, they are locally relevant to the study communities selected, and thus trends within the data could vary by community depending on various factors such as type of amenity growth. The list is by no means exhaustive; there may be literally hundreds of possible variables that would explicate patterns of change seen in amenity-transition communities, and even more that relate to resilience and the adaptive capacity of communities. The scope of this research was to develop an exploratory heuristic that could incorporate readily available data sources and variables. Because of this exploratory nature, as well as funding constraints, the secondary data collection was limited US Census databases, which do relate fundamentally to the developed social and economic constructs. As mentioned earlier, this constrained the choice of variables, but did allow for an initial and exploratory assessment of the Adaptive Cycle heuristic.

To summarize Table 8 and relate the chosen variables back to the social and economic constructs in Figure 3 and Figure 4, the variables can be categorized as follows: variables 1-3 examine population change; variable 4 examines racial diversity; variables 5-7 examine mobility and patterns of migration; variables 8-10 measure educational attainment; variables 11-13 measure unemployment rates; variables 14-15 examine poverty levels; variables 16-20 evaluate occupational group employment; variable 21 measures median family income; and finally, variables 22-23 assess housing affordability.

**Table 8.** Indicator variable key

Category	Variable code	Variable description	Associated Construct*
Population change	Pop	Population	Soc support
	PopPerCh	Pop % change in last 10 years	Soc support
	PerPop25	% Pop above 25 years age	Soc support
Racial Diversity	NonWhite	% Persons of nonwhite race	Soc support
Mobility and migration patterns	StateNative	% Pop born in state of residence	Soc support
	DiffCounty	% Pop living in different county 5 yrs prior	Soc support
	DiffState	% Pop living in different state 5 yrs prior	Soc support
Educational attainment	EighYrsSchool	% Pop with 8 yrs or less education	Soc support
	HighSchool	% Pop with high school degree	Soc support
	FourYrsCollege	% Pop with 4 yrs or more of college	Soc support
Unemployment rates	MUnemp	% Male population unemployed	Econ viability
	FUnemp	% Female population unemployed	Econ viability
	TotUnemp	% Total population unemployed	Econ viability
Poverty levels	FamPov	% Families below poverty level	Soc/Econ
	PersPov	% Persons below poverty level	Soc/Econ
	AgForFis	% Ag, Forestry, Fisheries	Econ viability
Occupational group employment (% persons employed)	DurGoods	% Durable Goods Manufacturing	Econ viability
	ConstrEmp	% Construction	Econ viability
	ServEmp	% Service Worker	Econ viability
	CreatClassEmp	% Creative Class**	Econ viability
Income	MdFamInc	Median family income	Econ viability
Housing affordability	MdHomeVal	Median home value	Econ viability
	MdGrossRent	Median gross rent	Econ viability

\*Refer to Economic Viability and Social Support constructs in Figures 3 and 4

\*\*Creative class occupational group (McGranahan & Wojan 2007) measured as persons employed in professional/management/administrator Census categories

The creative class occupational group indicator is drawn initially from urban development research by Florida (2002), which posits that an emerging core of workers characterized by increased knowledge, intellectualism, and creativity can be an economic growth driving force in urban areas. McGranahan and Wojan (2007) have more recently adapted Florida's *creative class* concept and applied it to rural areas as they develop into more complex economies. They redefine the creative class as workers with the ability to

migrate, a phenomenon influenced by the presence of rural outdoor amenities. Their work assumes that local planning strategies can attract such workers, increasing the creative and intellectual base of a community. Key to their model is the presence of local services, appealing landscapes, natural amenities and associated growth in surrounding areas that would attract these types of workers, the presence of which enhances economic growth opportunities within rural communities. For this research, the concept will be included as an initial step in evaluating whether the study communities are in fact attracting these types of workers; the creative class variable is defined as those employed in professional, technical, managerial, and administrative occupational groups. This is an innovative approach to evaluating rural economic development, and thus the inclusion of a “Creative Class” variable would be a worthy addition to the *Economic Viability* construct. It should be noted that a more thorough examination of the concept, by way of a more detailed analysis of occupations believed to contribute to the creative class, would surely be required before conclusions could be drawn beyond its general applicability to the Adaptive Cycle model.

Where necessary, data recorded in dollar units were adjusted for inflation using the average Consumer Price Index. The inflation calculator used can be found at <http://data.bls.gov/cgi-bin/cpicalc.pl>.

### **Secondary Data Analysis**

Cluster analysis is useful for examining relationships among variables in an exploratory manner (Romesburg 1984), and was believed to be appropriate for the goals of this research. However, results from cluster analysis using the chosen US Census

variables generally did not yield any useable relationships among indicators for the three study communities. Often, no apparent relationship existed between developed indicator clusters and hypothetical phases of transition along a community's established adaptive curve. The failure of the current analysis may be related to the limitations and constraints stemming from the use of US Census variables, as mentioned earlier. Also possible is that simply too few indicators were examined, which ultimately is also related to both the nature of the US Census database as well as funding and time constraints placed on this study. The developed methods for this research may prove useful in future work with additional indicators, as the coupling of qualitative and quantitative data for examining amenity transition is still believed to be an important and valuable approach. Thus, individual indicators whose change over time corresponds to trends apparent in each study community's adaptive curve will be used to supplement qualitative results for this study. Detailed methods and results from the cluster analysis component of the research may be found in Appendix B.

## CHAPTER IV

### RESULTS FOR MCCALL, IDAHO

The Results chapters are organized in order of study community: Chapter IV for McCall, Chapter V for Leavenworth, and finally, Chapter VI for Prineville. In each chapter, key insights are presented from the qualitative interviews and archival data, which detail historical periods, modes of change and growth, and adaptive characteristics of residents affected by the transition. As mentioned earlier, individual indicators collected from the US Census Bureau are used to illustrate relevant trends in each community's adaptive curve.

#### **Results from Key Informant Interviews**

##### *McCall's Past*

McCall experienced a period of timber dependency that existed during the 1950s and 1960s. From the 1970s to the 1990s, McCall was home to an active, albeit steadily diminishing timber industry that centered on logging from the surrounding Payette National Forest. Sawmills operated in McCall as well as many surrounding communities within Valley County. Wages from the mills were high relative to other industries, and mill workers were able to support entire families with the earnings garnered from timber employment. The community had an overall "resource-based feel" that resulted not only from economic dependence on the timber industry, but also the presence of a more robust agriculture and ranching industry than the county has today.

Even during McCall's timber heyday, second home growth and outdoor recreation contributed to the community's economy. Attractions included the annual

Winter Carnival and the town's location on the shores of Payette Lake. Brundage Ski Resort was opened by a local family in the early 1960s, and has since steadily grown in size and importance with regard to the town's economy and identity. Boise residents would routinely venture to McCall on weekends for relief from urban crowding and lifestyle; many owned second homes within the community. During these times, visitors to McCall were primarily from within the state of Idaho. In the mid 1980s, timeshares began bringing in significant numbers of people, and by the early 1990s it became evident that McCall was attracting the attention of more and more out-of-state second homers, retirees, tourists, and outdoor recreationists. Also in the early 1990s, the state of Idaho began an earnest advertising campaign to promote recreation and tourism within the state, contributing to McCall's reputation as a small town second home and recreational destination.

Occurring simultaneously with this influx of second homebuilders, retirees, and tourists was the steady decline of timber production in the county. Between the 1960s and the late 1990s, and specifically in the years 1976, 1983, 1999, and 2001, mills gradually closed within Valley County. Despite this decline, and representative of the entrenched natural resource culture, many local residents still considered McCall a "timber town" long after its decline. Today, respondents could identify just one remaining Valley County mill, in New Meadows. This sawmill primarily produces secondary forest products and some lumber and saw boards, and respondents explained that the mill itself has become less significant over time.

Respondents were objective as to why the timber industry in Valley County experienced such decline. Simply stated, the logging companies had harvested the

“biggest and the best” trees. As the available trees decreased in average trunk diameter, lumber value also significantly decreased, and the mills reached a threshold upon which the industry itself was no longer economically viable. “Economics had finally caught up” with the industry.

McCall’s existing amenity-based attributes and growth resulted in individual impacts from the waning timber industry more than community impact as a whole, as overall McCall had already begun its transition toward amenity-orientation. A segment of the population was forced to move away to seek logging work elsewhere, though for some the amenity-related growth proved enough to make up for economic losses. The presence of unique recreational opportunities may have contributed to many residents being able to remain in the community in spite of the timber decline. Culturally, residents have migrated away from a timber identity and have, in varying degrees, adjusted to the notion of McCall as an amenity destination.

### *McCall’s Present*

McCall has at times experienced rapid change related to amenity-related growth and development. It is a community “changing in look” as it evolves into a tourist destination, and many residents believe that it is losing the “small town feel” that once characterized it. Its current growth is dominated by the construction of second homes and by seasonal influxes of destination tourists seeking the many amenities that McCall offers. These visitors have increasingly driven the economy of the community, and have transformed McCall into a regional resource center for other communities within the county.



McCall's transformation has come with numerous consequences to residents, both economic and social in nature. For the residents who remained in the community, available employment became more and more of the service-oriented variety, which proved much lower paying than timber work had been. By one account, "the nature of the beast had changed;" service workers replaced timber workers, and the economy of McCall shifted from logging-based to increasingly service-oriented. The exact timing of this transition is difficult to pinpoint because McCall had always been a desired destination for Boise residents. However, by the early 1990s land value had started to increase rapidly as more and more out-of-state visitors began to "discover" McCall. Construction of second homes became paramount to other activities, and as a result many ex-timber workers were also able to find employment in excavation, hauling, construction, contracting, and other related industries. This trend has continued to the present.

It is important to note that amid an overall upward curve to McCall's amenity-related development, this type of growth is cyclic in nature and the community has experienced both peaks and troughs over time. Real estate has been a driver for the local economy, and can be affected in various ways by national markets and by supply and demand. Local property taxes have increased significantly over time, which has been a double-edged sword for residents. On the one hand, increased tax revenue could be a valuable resource for keeping the community infrastructure on pace with strains associated with accelerated growth. Conversely, many residents themselves struggle with being able to afford their own property taxes. "Increased property values are not realized

until you sell; in the meantime, you pay higher taxes.” In the words of one, “the millionaires are increasingly being driven out of town by the billionaires.”

Many respondents mentioned the concept of social cohesion. Some noted that community closeness and familiarity with other residents had decreased over time as more new residents arrived. It was feared that the community is losing its sense of history, as more long-term residents move away because of increased economic demands placed on them. Perceived diminishing of quality of life, as well as changing attitudes within the community, was identified as a possible reason some older residents are leaving. An additional factor mentioned by all respondents was the lack of local “social hubs,” where people can congregate, for example a movie theatre, bowling alley or “other local-type places; McCall misses out in many ways” because of this. “Local diners are going out of business; the smaller places are disappearing.” “People are not getting enough non-recreation stuff to do while they are here.” Contributing to this sentiment of reduced community cohesion is the socioeconomic issue of youth leaving the community because of a lack of employment opportunities. “People do not send their kids to college to be service workers.” This results in increased out-migration of younger residents.

Another explanation for migration away from town was the notion of residents, whether older or more recent, “building their nest egg (by investing in real estate), then moving to another smaller, maybe more rural, community.” “People ride the wave up, sell their property, then leave the community.” Other respondents expressed that one of McCall’s attributes was its ability to retain a “small town feel” in spite of the high dollar development that it has undergone. McCall’s physical expansion is limited by the surrounding state and national forest lands, which one respondent noted would prevent

the town from sprawling in the way that other rapidly growing communities may experience. The limited number of plots of land within McCall is viewed as a factor that can also restrict and control future growth, as well as drive real estate prices upward.

Economic diversification in McCall has been limited by a number of factors. The nature of high priced second home development attracts already wealthy people who do not have to worry about income; many are retirees, or “older people with money,” or “trust fund babies.” It was noted that many of these residents do not want continued growth because they are content with the community as it is. Tourists who do not own residences in McCall are limited by the noticeable lack of hotels in the town. (There is currently an 80-room hotel development being planned that will alleviate this somewhat.) In the past ten years, the local business infrastructure has become almost entirely service oriented, creating difficulties for many owners. In spite of increased wages in the service sector, staffing a business can be a challenge due to competition with (primarily) the construction industry, which is able to offer workers much higher wages. As one local business owner explained, “Running a business is a lifestyle that is not for everyone...I still work six days a week...it is what you have to do.” As one respondent perceived it, “McCall’s economy is not diversified at all.” “It is solely reliant on tourism and second homes,” and on the associated real estate, service sector, and construction industries.

Identified by all respondents, the most detrimental effect of McCall’s escalating real estate prices and strong service-oriented economy is the lack of affordable housing for working residents. The impact realized by this ranges from long-term residents who own valuable land, but move away because they can not afford their property taxes, to workers who can not afford to live within the city. Many of these workers are forced to

commute long distances to work in McCall, from other communities with lower housing costs but fewer employment opportunities. In worst-case scenarios, there have been instances of workers found squatting in local Forest Service campgrounds, sometimes even in winter, only to be removed from the sites and the campgrounds closed. As an example of the sometimes-exorbitant real estate value in McCall, property on the Payette Lake shore is currently going for approximately \$20-30,000 per linear foot.

Some respondents believe the construction of the newly built Tamarack Ski Resort on state lands outside of McCall will exacerbate many of the growth pains being realized. Opened in 2004, the exclusive resort offers high-end recreation and real estate that attracts second homebuilders on a scale beyond which McCall has experienced thus far. An example given was the recent arrival by helicopter of tennis celebrities Andre Agassi and Steffi Graf, who intend to purchase and develop property at the resort. Different expectations among the respondents exist regarding Tamarack. Some anticipate that the presence of the resort will accelerate even more the growth pattern and rising housing costs affecting McCall, while others believe the development is far enough away from McCall to minimize any future impact.

Efforts by the city and by private business owners to alleviate McCall's struggle with lack of affordable housing are evidence of a community being proactive in solving challenging issues. The city government commissioned a "housing needs assessment," and from this initiated a community-housing program with hopes of "managing future growth and housing problems." Aimed at city employees, the program went from recognizing the problem and beginning initial planning to actual "units in the ground"

within three years. Developers are also required to allocate a certain percentage of the total development cost of their project to building affordable housing for workers. The city “has tried to stay out in front of the problem.” One local business owner has even purchased property specifically for workers to rent while employed.

Finally, social services were mentioned as “at risk,” as demands on the water supply, sewer system, public health care, and other social amenities are experienced. One potential benefit of the tourist industry is its ability to “bring in lots of money to the community, so we have lots of things we wouldn’t otherwise have.” These kinds of revenues are viewed as essential for the city’s capacity to maintain its infrastructure. Another sign of progressive community planning is an “Urban Renewal Plan,” currently being developed by the City Council, which will seek to develop new business and address infrastructure needs, such as sidewalks and utilities, and hopefully “make [McCall] more friendly.” The city is also proactive in submitting proposals and being awarded grants for future development needs.

The enduring presence of tourism and outdoor recreation within McCall’s once-dominant timber economy may be linked with the community’s capacity to adapt to its current situation. The ability to adapt to a changing economic and social infrastructure has proven different for different types of residents, but at the community’s core remains the access to the outdoors for which “older residents remain and newer residents [migrate] in.” As one respondent stated, “[people here] weather the storm, stay through that economic trough, because they love it.” McCall has always attracted visitors, which according to one respondent, allowed many older residents to “adapt o.k. . . because we never fell flat on our face” (after the decline of timber revenues). McCall remains a

“reluctant resort,” because many residents are unsure of where future development will take the community and of how residents will continue to cope with the constraints of a service-oriented economy.

Adaptation has been easier for residents with higher incomes or access to other financial resources. Businesses geared toward the tourist industry have “always been present” in McCall, and for these owners transition may even have provided more opportunities. Respondents thought that since “we will always have visitors, it is important that we continue to enhance these industries.” Adaptive capacity for many proved to be the ability to “find that tourist niche and fill it.” The construction industry that supported the booming second home development occurring in McCall was also an important way for many once-timber workers to maintain income and remain in the community.

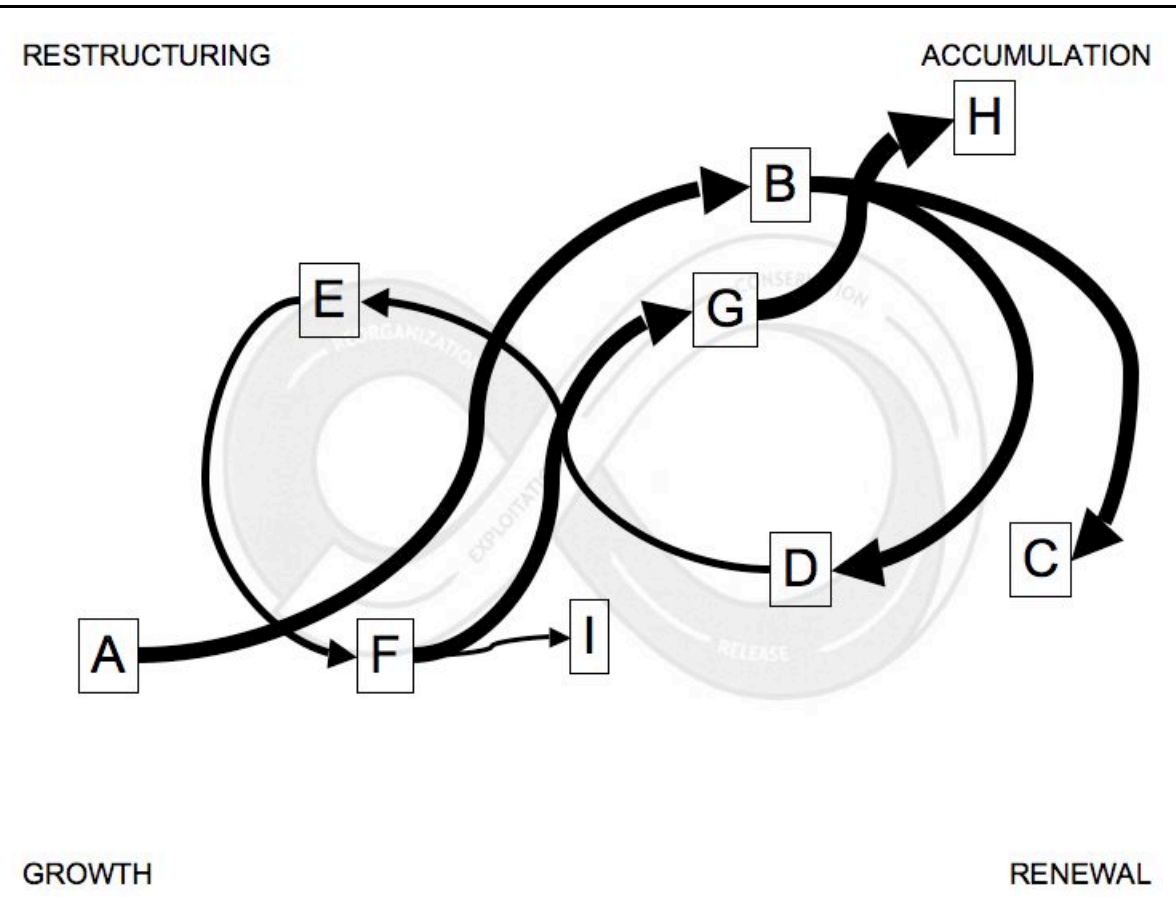
Characteristics that respondents felt enable adaptation included personality and behavioral traits as well as perceptions or outlooks that “more adaptable” residents may possess. For one, “many people come here from areas where similar things occurred; they may be more tolerant [of change] or may be more freaked out...we have both.” Adapting to change was also seen as a matter of perspective: “People from Boise still see McCall as a small town; Boise is growing so fast people see McCall as underdeveloped, slow paced...it is all relative to what you are used to.” “People who have been here are more established...you can not ignore the change, but you live with it the best you can; if [people] do not like it, they leave.” In a related manner, “[people] just have to deal with change and hang in there.” Insight into how newer residents adapt to the continued changing community structure was given by a respondent, who noted, “People who come

here do so because of the change...they would not have come here before the change.”

Additional attributes that enable adaptation are “patience, acceptance, and tolerance of change.”

### Construction of Adaptive Curve for McCall

Using data from the key informant interviews and archival sources, an Adaptive Curve was constructed for McCall; this is presented in Figure 5. An explanation for each phase on the curve is provided.



**Figure 5.** Adaptive Curve illustrating McCall’s transition from timber dependency to a tourism and service-based economy.

McCall's period of timber dependency, from the 1950s to the 1960s, is represented in Figure 5 by the curve from A→B. During this period, the local timber industry was the largest employer in the community, and while the economy was dependent, it was nonetheless robust. Due primarily to declines in timber supply, from the 1960s through the 1990s McCall experienced a sharp decline in timber production, which impacted the social and economic structure of the community. The threshold at which this began to occur is represented by point B; this represents the accumulation phase on McCall's Adaptive Curve characterized by the decreasing economic viability of the timber industry as supply began to diminish. Respondents noted various reasons for the turning point in this timber-related growth, among them a reduction in the number of highly valuable large-diameter trees in the surrounding forests.

B→C and B→D on the curve represent McCall's first renewal phase. The overall decline of timber (B→C) is shown as a terminus along the curve, and represents the segment of the population that felt the most devastating impacts. These residents were left with no means to support themselves and their families, and unable to adapt to a changing economy, eventually moved away from McCall in search of work elsewhere. The curve from B→D represents residents who were able to remain in the community, by adapting to economic changes, and shifting capital and community resources.

D→E and E→F illustrate the restructuring of various forms of capital within the community as efforts were made to rebuild the economy. As mentioned by respondents, the presence of a nascent second home and tourism economy may have helped many residents adapt during this time. Second home growth and tourism from primarily the Boise area could have enabled certain residents to capitalize on a newfound economic



base once the timber industry had begun its decline. This already existing influx of tourists and part-time residents could have sustained this base until the economy began to grow again. The F→I trajectory represents the remnant contributions of the timber industry, which to the present have been relatively insignificant to the local economy.

Point F in Figure 5 represents the beginning of an important period in McCall's history. As mentioned by one respondent in the interviews, the state of Idaho began a pronounced advertising campaign in the early 1990s to attract out-of-state tourism. With this increased exposure, natural amenities began to play a more prominent role in the community's future, and the economic base started to become increasingly service and amenity-oriented. Hence, F→G→H represents a rapidly, though at times cyclic, expanding service-based economic structure. This growth is driven by second home development as well as by outdoor recreation and tourism. There has been limited economic diversification in McCall beyond the service industry, construction employment, and real estate. G→H represents the acceleration of this growth that McCall has experienced in the past few years, primarily since the opening of the Tamarack Ski Resort. It should be noted that this most recent accelerated growth is not apparent in the secondary data analysis, as variables could be measured only back to the 2000 Census.

Respondents questioned whether McCall was close to another economic leveling off, or even decline, which would perhaps signify the community either 1) approaching another release phase, or 2) entering a protracted accumulation characterized by economic stagnation. This has yet to be realized, however, as the housing market remains robust, and tourists continue to visit the community and surrounding areas. Of particular relevance is the recent construction of the Tamarack Ski Resort, which has continued to

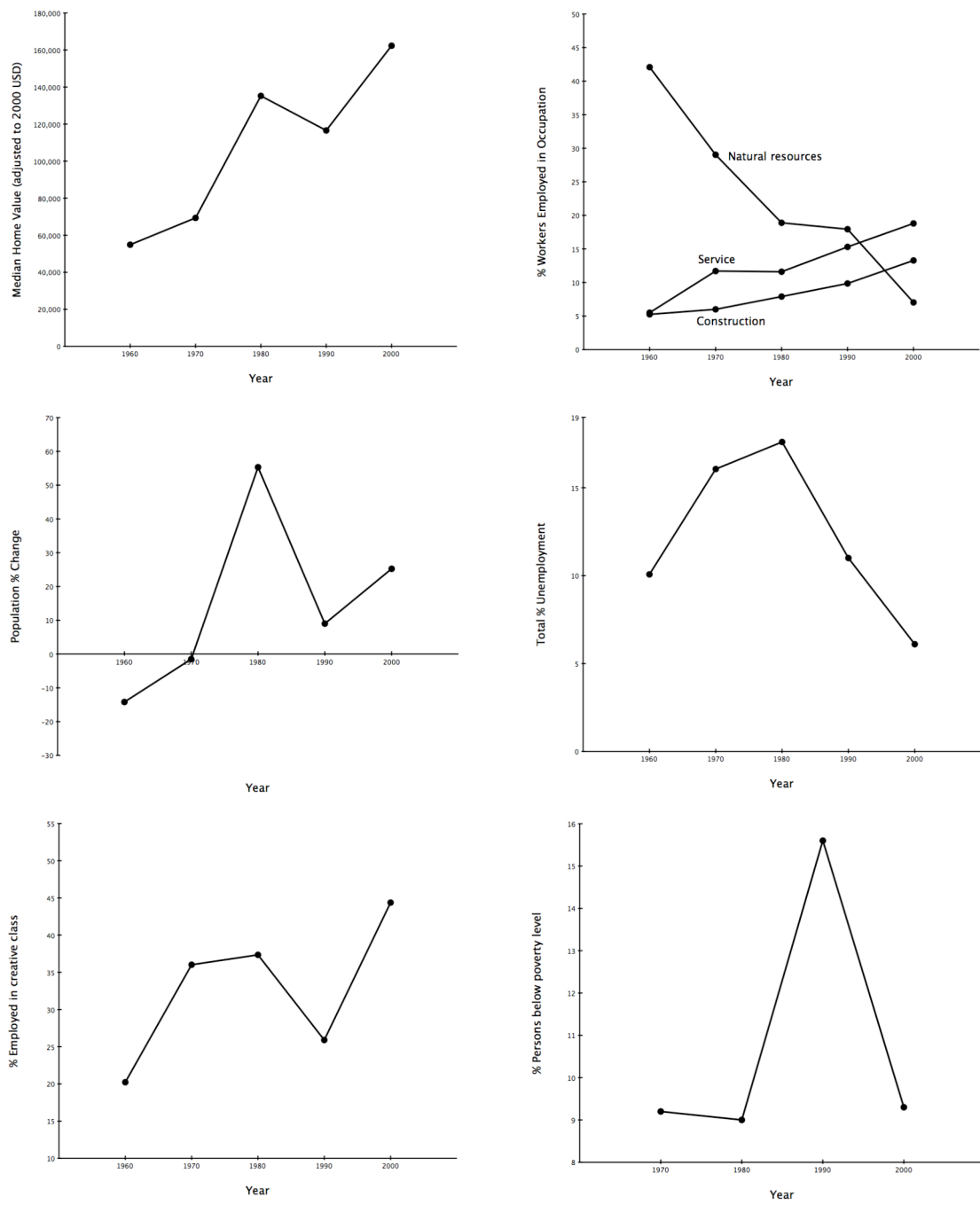
drive the housing market forward. This latest iteration of rapid growth had respondents questioning whether sustainability was possible. The limitations of the use of Census data include the inability to examine Valley County post-2000, years in which this most recent surge in growth has occurred. Continued analysis of economic and social indicators is necessary to provide insight on this potential next phase of accumulation and possible renewal.

### **Relevant Indicators to McCall's Amenity-transition**

As mentioned previously, the cluster analysis of potential indicators of transition failed to identify usable classifications of chosen indicators relevant to amenity-transition in the three study communities. In spite of this, certain individual indicators do seem to correspond with trends of change identified by key-informants, and thus with various phases along each community's Adaptive Curve. Each of these individual indicators for Valley County is presented in Figure 6.

Again, the indicators shown in Figure 6 correspond with historical transition in McCall, as disclosed in the key informant data and as represented by McCall's adaptive curve. Median home value has increased over the study period, particularly between 1990 and 2000 as tourism initiatives by the state of Idaho was accompanied by an increase in second home construction. This has occurred amid a sustained growth phase that some respondents believed might be approaching another accumulation phase. Natural resource employment sharply decreased as McCall experienced a timber-dominated renewal phase; service and construction employment have steadily increased, again representative of McCall's most recent growth phase. Population growth in McCall has fluctuated with

the initial timber-related growth (1970-1980) and ensuing renewal (1980-1990) phase, bolstered by the more recent 1990-2000 amenity-related growth phase. Since 1980, unemployment rates have decreased, employment perhaps supported by the growing service and construction industries. From 1980-1990, as the timber industry experienced sharp declines, these industries appear to have compensated somewhat for related employment losses. Employment in the creative class decreased with the timber decline, but rebounded sharply from 1990-2000 as amenity-related growth in McCall occurred. Finally, poverty rates have dramatically increased and decreased with the timber decline and with amenity-related growth, respectively.



**Figure 6.** Relevant indicators to amenity-transition experienced in Valley County.

## CHAPTER V

### RESULTS FOR LEAVENWORTH, WASHINGTON

As in Chapter IV, key insights are presented from the qualitative interviews and archival data, which detail historical periods, modes of change and growth, and adaptive characteristics of residents affected by the transition. Again, individual indicators collected from the US Census Bureau are used to illustrate relevant trends in each community's adaptive curve.

#### **Results from Key Informant Interviews**

##### *Leavenworth's Past*

Leavenworth experienced an earlier peak in its timber economy than McCall. By the 1950s signs of an industry in decline were evident to community residents. Diminishing supply, as well as increasing environmental pressures and regulations being placed on forest managers and the logging companies, had led to the closing of local sawmills and the onset of rapid economic and social change to the community. This began occurring as early as the 1930s, in spite of the timber industry remaining an important local employer into the late 1950s and early 1960s. By the early 1960s, however, the community had lost between one-third and one-half of its total population, mostly timber workers who were forced to leave Leavenworth in search of logging work in other regions of the Pacific Northwest. Many were uneducated and unable to transition to other types of employment, and had to move away to search for work with which they were familiar. "Most who depended on it [timber] moved away."

During many respondents' lifetimes, "there was never a lot of money in the town." Major employers included the local mills, the Forest Service, and the local school. Fruit orchards thrived in the county, and in some regards continue to contribute to the local economy today, despite recent declines. "Mill work was seasonal," due to harsh Cascade winters, and "we had a train that came in to haul fruit and lumber out."

"From the 1950s to the 1960s, Leavenworth was a dying town." Approximately "50% of the buildings downtown were boarded-up, and there was no business sector left." Unemployment went from "approximately 5-8% to upwards of 35%" due to the closing of local mills. Leavenworth was "becoming a ghost town." The closing of the mills "did affect [quality of life] in some respects, though it depends on your interpretation of quality of life. We didn't know any different, and had nothing to compare it to. We didn't consider it being deprived at the time, because everyone was in the same boat." Another respondent explained, "Quality of life for those remaining did not change much."

In 1962, the Chamber of Commerce was awarded a grant in the amount of \$10,000 to assist with future community development. A professor and a group of students from the University of Washington were hired as consultants to assess the direction that citizens of Leavenworth should pursue in revitalizing the community. This group recommended, because of the natural surroundings of the Cascade Mountains, the community should model itself as a Bavarian village with the hopes of becoming a tourism-based destination. Five prominent residents agreed to invest in the plan, and traveled to the Bavarian region of Germany to research how to embark on the project. They returned to Leavenworth with pictures and other information that convinced

residents that such an initiative was achievable, and in 1964, the Bavarian theme officially began. At the time there was still one mill in operation, as well as many local Forest Service employees.

### *Leavenworth's Present*

By 1970 Leavenworth's theme as a Bavarian village had "exploded." The change to a tourism destination was the community's response to "needing to decide on a direction to go; other [development] options might have been uncontrolled, unplanned, and 'hodgepodge.' Other regional towns have ended up like this." Today, tourism is estimated to account for "85% or so of the total income" within the community.

Leavenworth has become "completely dependent" on tourism; "Before, people relied completely on timber; now, they rely completely on tourism." People come from as far away as Germany to experience the renowned "Bavarian village." Many of these visitors are said to arrive with doubts regarding the community's ability to accurately portray its Bavarian theme, though leave quite impressed at its authenticity.

To accomplish this, the city instituted a Design Review Board that is charged with enforcing strict regulations regarding the architecture and motif that local businesses must maintain. An example of this body's influence occurred when corporate giants McDonald's and Starbucks sought to open establishments within the town. The companies attempted to violate the Bavarian theme by using traditional building facades and signage with their respective logos, but were told, "If they wanted to come to Leavenworth, they would have to follow our rules." Both have since opened local

establishments, but gave in to the Design Review Board and abided by the required Bavarian building design, as well as the absence of a logo on their signage.

In addition to the Bavarian theme, access to outdoor recreation accounts for a portion of the local tourism revenue as well, though on a much smaller scale. The mountains surrounding Leavenworth offer stunning scenery, whitewater paddling, skiing, and “at least 100 local lakes” that attract many people from the Seattle and Tacoma urban areas. Overall, “If you can’t find something to do in Leavenworth, you’ve lost your mind.”

Tourism is credited with revitalizing the community, and providing employment and income at a level that would not have otherwise been accomplished. Not only is it viewed as “an honor that people would want to come and see our town,” tourism is believed to be a “clean industry” that has made “the quality of life much better for residents” of Leavenworth. “It is healthy for the community.” “A dollar spent on tourism stays in the community; it will repeat itself.” These dollars provide Leavenworth with increased tax revenue, “more dollars to work with,” which can be spent on community improvements, such as “ball fields, better parks, etc.” “Business owners really only see positives,” according to one respondent; “So many of us can make a living.” Another respondent noted, “I always wanted to come back to Leavenworth, but would not have been able to without the growth of tourism.” The local unemployment rate was believed by some to be near zero; “You can always find a job doing something.” Although local “wages are not high, tips, etc. can make a decent living,” perhaps due to the sheer volume of visitors to Leavenworth. In addition to local benefits, the influx of visitors to Chelan



County are believed to benefit surrounding communities as well, and many are turning to their own form of tourism, such as wineries and other outdoor-oriented attractions.

Economic growth, however, has not come without consequences. Because of the uniqueness of its Bavarian theme, and the sheer enormity of the number of people who may visit on a given weekend (1.7 million tourists per year, and as many as 40,000 people in a day, “packed shoulder to shoulder”), “some local residents feel that tourism is put ahead of their own best interests.” There can be the hassles of “bad traffic and congestion,” “parking issues,” waiting in “long lines at businesses,” and “some noise” associated with the influx of people. Also, “open space is disappearing” as more and more development occurs. The local orchard and fruit industry is in decline, as much of this land is being sold to developers. Finally, a comparison was made between past times when “kids had a theatre, roller rink, things to do; today, kids don’t have that.”

Similar to McCall, “by far the biggest drawback is affordable housing.” Second home construction is driving land values rapidly upward, and the ensuing “increase in cost of housing for residents is the number one problem” facing Leavenworth. “The cost of buying a home is out of sight. You can’t do it in town.” Accompanying the rising property values is also the issue of rising property taxes for residents who may not have the resources to keep up with the pace of appreciation.

Leavenworth’s leaders have been proactive in identifying this issue and taking initial steps to alleviate some of the pressures placed on residents. An initiative was undertaken that led to the state of Washington reducing property taxes for homeowners falling beneath a certain income level. The city is also pursuing the construction of affordable housing for lower income level residents. Finally, even in cases where local

workers are unable to afford rent or a mortgage in the city limits, a countywide public transportation system exists that allows people in neighboring towns to access Leavenworth early in the morning and late into the evening.

Another sign Leavenworth's community leaders are taking initiative to manage development is "an eleven block revitalization plan that is in the works," which will involve infrastructure development that "aims to be maintenance-free for thirty years." "The local hospital will also be upgraded to double its capacity." Local business owners have also taken leadership roles in Leavenworth's development, "putting up their own money to beautify the community."

It is felt residents of Leavenworth who have remained have adapted well to the economic and social change related to amenity development. From the beginning, the transformation to a tourism destination was a "grass roots effort at development." The Bavarian theme provides a "bond for residents" and provides "community cohesion." "People who don't like it move, and people who come here and like it will stay and contribute." One respondent noted, "There is a need to maintain the community every day rather than letting it maintain itself." The Bavarian theme is truly a group effort, and it requires residents to believe in and support the idea to sustain the community. The importance of residents being accepting of Leavenworth as a tourism destination is what makes the community successful. One respondent explained, "Residents are friendly and open to visitors. They show extreme politeness and respect for folks, and make them feel welcome. It makes a difference." The community realizes that its lifeblood lies with the tourism industry, and they've bought into the idea of supporting it.

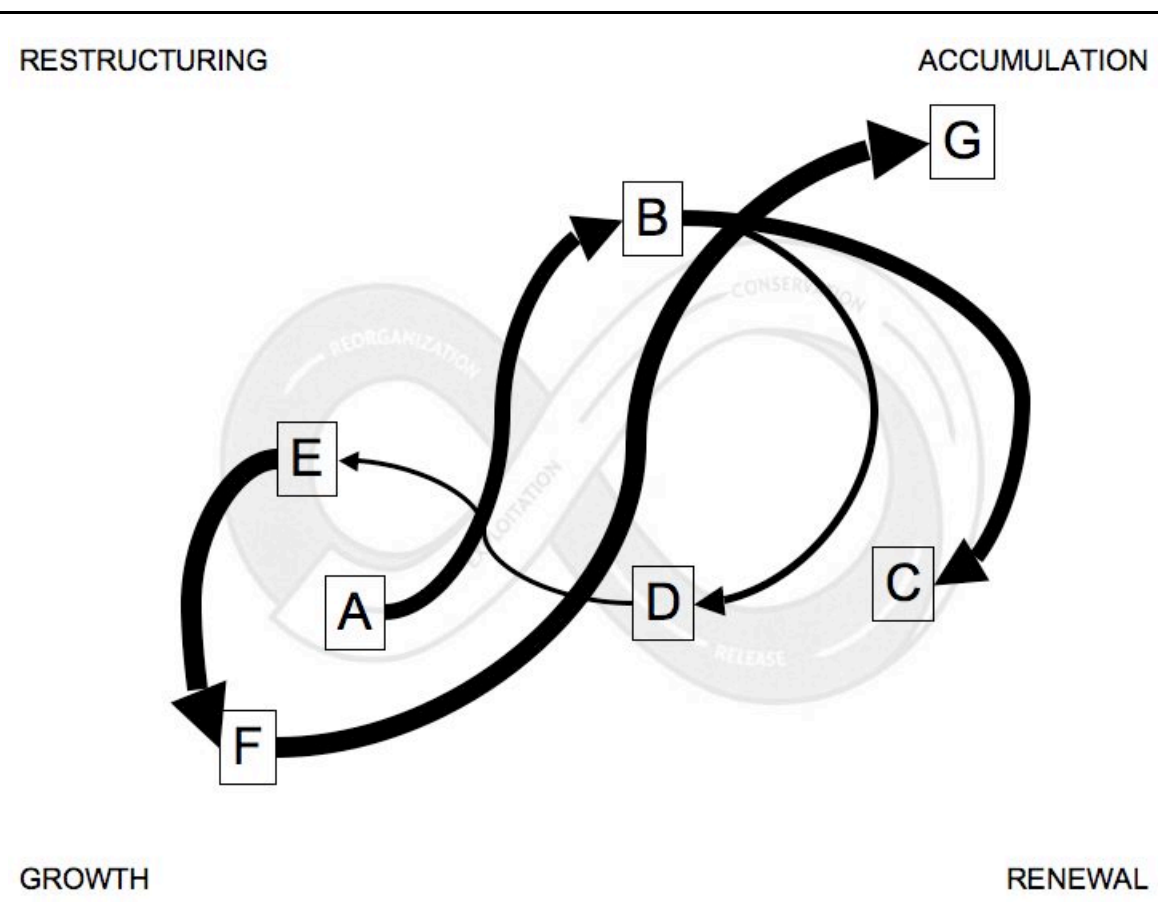
Related to the idea of a community effort is the “perception of having control over tourists.” “We provide the draw, people come because they are invited, and then they go.” “We invite people here.”

“Volunteerism has always been the backbone of a small community, because people work together for a common cause.” Throughout Leavenworth’s development, “residents were always encouraged to participate in local events,” and be actively involved in their community. “What really made the life project for Leavenworth work was volunteer work and cooperation.” Historically, volunteerism has been a critical force enabling residents to adapt. One respondent attributed this to “basic human nature, helping your neighbor.” Others thought a sense of a common history may contribute to it; “People who have moved here since the change think that this is the way the community has always been.” Newer residents “have no concept of how it was before the change.” “They have not been faced with the same economic decline as older residents had faced.” “New people don’t see the volunteerism as being a much needed aspect as it was when change was being initiated.” “These people may want things done, but want to pay someone to do it, or be paid to do it.”

Leavenworth’s proximity to a large urban area (a roughly two to two-and-a-half hour drive) was mentioned as one benefit to adaptation. “We’re within a tank of gas of Seattle, just a short drive away.” It is believed that having such a large population base so close to the town will sustain its tourism industry and always provide visitors to the area.

### Construction of Adaptive Curve for Leavenworth

Using data from the key informant interviews and archival sources, an Adaptive Curve was constructed for Leavenworth; this is presented in Figure 7. An explanation for each phase on the curve is provided.



**Figure 7.** Adaptive Curve illustrating Leavenworth's transition from timber dependency to a tourism and service-based economy.

Leavenworth's economic dependency on timber occurred earlier than in McCall, through the 1940s and early 1950s, and is depicted in Figure 7 by A→B on its Adaptive Curve. At point B, in the midst of an accumulation phase characterized by diminishing timber supply, increasing environmental concerns, and more stringent management

regulations, the community began to experience a marked timber decline. This occurred during the 1950-1960 decade. B→C and B→D represent this decline, which was accompanied by high unemployment rates and out-migration. Again, the B→C trajectory represents the residents who were hardest hit by these impacts, and forced to leave the community in search of work elsewhere, and B→D represents those residents who were able to remain in the community. The greater magnitude of B→C represents the especially large segment of the population that was forced to leave the community.

D→E and E→F represent the economic and social restructuring that the community of Leavenworth pursued to revive a depressed economy; at point E a distinct change is seen in the magnitude of the restructuring curve. The decline of the timber industry in Leavenworth resulted in a significant loss in population and rapidly increasing unemployment rates, along with the closing of numerous downtown businesses. As noted in the key informant interview results, and evident by the thickness of the curve from D→E, Leavenworth was struggling with restructuring and “becoming a ghost town.” Point E on the curve corresponds to the Chamber of Commerce’s receipt of the grant in 1962, and the ensuing decision by a group of community residents to embark on the project that would transform the town into a Bavarian-styled village. In contrast to McCall and Prineville, this stands as an identifiable and remarkable organizational period characterized by a determined effort by members of the community to take control of its future economic and social well-being. The significance of this grass roots effort is noted by the change in curve thickness from D→E to E→F, as well as by the relatively short distance spent in the E→F restructuring phase. By the mid to late 1970s the tourism

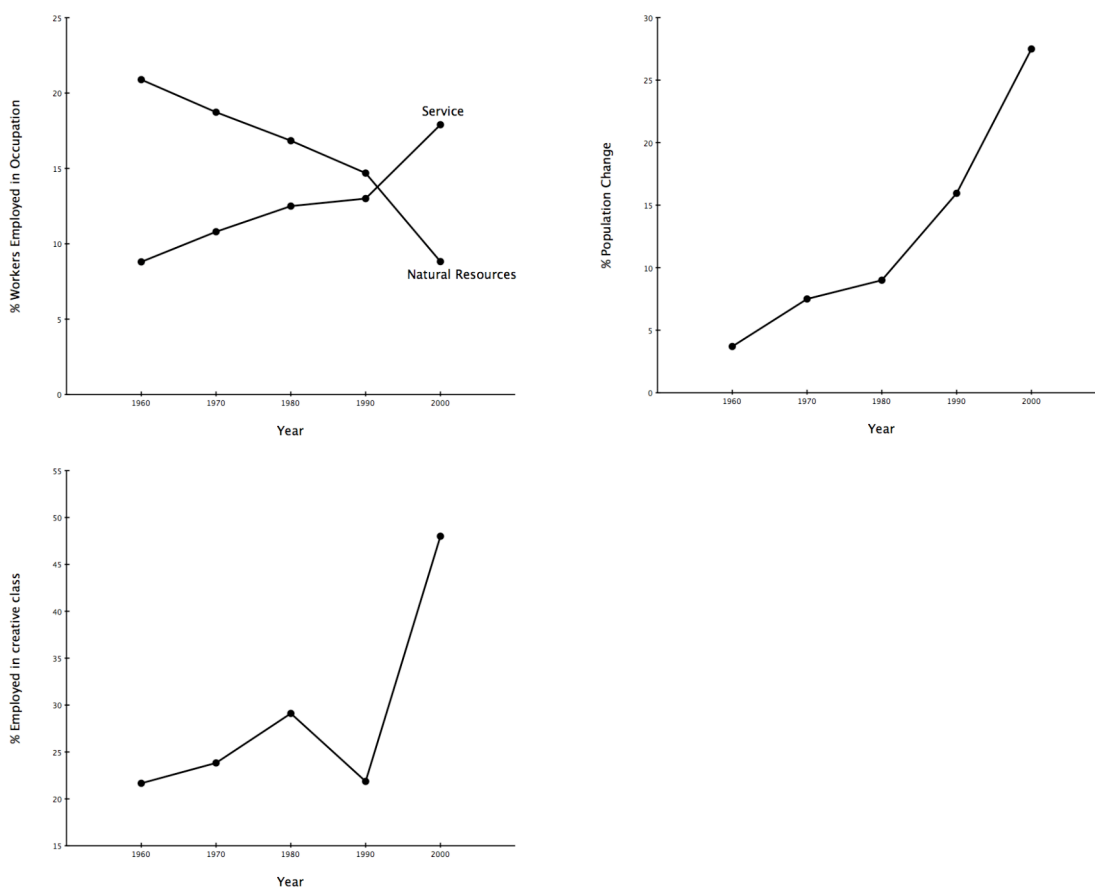
economy in Leavenworth had boomed, and the community had entered a growth phase based almost entirely on theme-related tourism.

F→G in Figure 7 represents the extensive and sustained growth that Leavenworth has experienced from around 1970 to the present. The community has become entirely dependent on the tourism generated by its Bavarian theme, and all other economic inputs are minor in comparison. This is portrayed by the single F→G trajectory following the restructuring phase. This portion of the curve is characterized by many of the same economic impacts that afflict McCall's residents, principally among these the rapidly increasing lack of affordable housing for service workers. Respondents believe, however, that this type of growth is sustainable in the sense that unemployment will remain low, and businesses will thrive due to the uniqueness of the theme and the resultant constant influx of tourists into the community. While service employment remains the primary source of income for many, entrepreneurship seems to stand out as by far the most salient adaptive characteristic in the community.

Leavenworth continues to grow as a theme-based tourism destination. Residents believe the Bavarian theme makes the community a unique destination, and will be sustainable into the future. Future accumulation phases may prove devastating to an economy completely reliant on such growth; the service economy seems to dominate, and unlike McCall, second home growth and related industries such as construction have yet to infuse significant economic benefits to the community. This may be changing, however, and continued analysis beyond 2000 will enable residents and community leaders to assess recent growth and plan for future change.

### Relevant Indicators to Leavenworth's Amenity-transition

As with Valley County, each of the individual indicators relevant to amenity-transition in Chelan County is presented in Figure 8.



**Figure 8.** Relevant indicators to amenity-transition experienced in Chelan County.

The indicators shown in Figure 8 correspond with historical transition in Leavenworth, as disclosed in the key informant data and as represented by Leavenworth's adaptive curve. As natural resource employment has continued to decline in Chelan County, service employment driven by amenity-related growth throughout the county has increased, particularly from 1990-2000. Population growth has been dramatic

in the county, representative of the sustained growth phase that Leavenworth has experienced since the 1960s. Creative class employment increased sharply from 1990-2000 as population continued to boom. As mentioned earlier, the relative size of Leavenworth compared to the overall population of Chelan County creates difficulties in interpreting indicators using a county level unit of measurement.



## CHAPTER VI

### RESULTS FOR PRINEVILLE, OREGON

As in Chapter V, key insights are presented from the qualitative interviews and archival data, which detail historical periods, modes of change and growth, and adaptive characteristics of residents affected by the transition. Again, individual indicators collected from the US Census Bureau are used to illustrate relevant trends in each community's adaptive curve.

#### **Results from Key Informant Interviews**

##### *Prineville's Past*

The 1940s through the 1970s were “the days of timber superiority” in Prineville. This economic period saw “five major mills operating,” with “generations of families working in the sawmills.” Both logging and secondary timber product manufacturing were important components of the industry. “Everybody in town was involved, and there was very little unemployment.” Many of the mills owned their own timberlands, which kept the cost of timber supply relatively low. The local railroad, used for transporting timber, generated enough revenue for Prineville that residents were not required to pay city taxes. It was explained that an entire family could be supported by one timber-related job. Local businesses also thrived because of the economic vitality provided by the timber industry. There were “lots of businesses downtown, and many more people [than today] came downtown.” The general lifestyle was “much slower paced,” and residents “knew everybody else in town.”

When local mills began closing in 1981, a “trickle-down effect started, first with those directly employed and eventually affecting everybody.” Sawmill closures continued until around the year 2000, and with the closing of each mill between 150-200 jobs were lost, in addition to the associated gyppo loggers that worked independently of the logging companies. Throughout the 1990s, “more and more mills closed; the last one to close was one of the youngest mills, Crown Pacific, from around the late 1970s.”

The reasons for the timber industry decline in Prineville, and central Oregon as a whole, are complex in nature. First was the issue of simply over-extracting the resource; “Everyone knew for years we were cutting too much timber, but no one wanted to step up and address the issue.” Coupled with this was an increasingly compelling environmental movement that generated “much conflict between the enviros and the timber industry.” Environmentalists at the time were focused on the cessation of logging in the Pacific Northwest, and one of the principal issues of the time was the spotted owl controversy. “The spotted owl was a tool, and icon, that everyone pointed their finger at.” In reality, it was a combination of these two symptoms that contributed to the industry’s decline. “Most would say we couldn’t keep going like we were going; the environmental community was kind of like the brakes for us.” Timber supplies had been dwindling; “Once mills had depleted their supply, they were dependent on the Forest Service [for supply].” With the environmental movement came more and more regulations and increasing costs to the Forest Service and to mills. “The Northwest Forest Plan legislation in the early 90s changed Forest Service sales. It was downhill from this point. Mills not well managed, mainly family-run operations went under first.” The industry “eventually

became economically unfeasible.” “Once the industry was gone, it wasn’t going to come back.”

The timber decline in Prineville caused “lots of fallout.” While “no mass exodus” occurred, “many people did leave” in search of logging work elsewhere. “Limited skill sets hurt people,” as many workers were not formally educated. The availability of well-paying local timber jobs may have “been a detriment to education, because students knew they could get good jobs right out of high school.” “When dependency on mills began to decline, many were left with only ‘timber skills.’” Workers were thus faced with either “retraining or movement.” The losses were a “significant impact,” as there was “no more revenue sharing for the community from forestlands.” Even still, “lots of the downfall wasn’t even apparent at the time.” Since the mill closures, “people have gone their own way, and you lose track of people.”

The timber industry in Prineville still exists, though “is struggling.” “The wood products industry is still here, but is far from thriving.” An example of the decline in timber output is the number of logs able to be transported on a single truck: “Trucks used to haul two to ten logs per load, but now may have up to 80 per load because of the smaller diameters [available].” The train no longer hauls timber, and is currently being used as a tourist dinner train. Daily logging trucks used to be the norm, but now few are seen. There is “some small manufacturing work” being done with “dry kills,” but this provides for “maybe 20 employees, when it used to be 150-200.” “With all the regulation costs, [it is difficult] to do anything timber related. It’s more about economics.” Another respondent described “a lot of secondary manufacturing” still present; windows, doors, remanufacturing, but no operating lumber mill.”

Declines in local agriculture have also been realized as “homes are being built on prime Ag lands. Land is being taken out of production.” Despite this, there is “still a lot of Ag. It used to be grain, alfalfa, and livestock for subsistence. Then it was potatoes, then mint, then sugar beets, the garlic.” Local agriculture has transitioned with market cycles.

The Les Schwab Tire Company opened its first location in Prineville in 1952. Since then, “it has been a backbone” to the community, and has remained perhaps the county’s largest employer. The company helped to alleviate many of the economic and social issues created by the timber decline, and “has continued to grow while other businesses have been shrinking.” The company plans to soon move its Prineville headquarters to Bend, however, and with this “300-400 local jobs will be transferred.” One respondent explained, “[We are] not sure how this will impact; it’ll probably impact in a big way two or three businesses as secondary fallout. How do we replace this?” Because “most” of the current employees at the headquarters already live outside of Prineville, other respondents were unsure of the magnitude the move will have on the community.

### *Prineville’s Present*

The “biggest change” that Prineville sees today “is that logging and timber are no longer the number one tax base.” One respondent cited a “\$3-4,000,000 per year loss in timber revenue,” and believes the city will “have to raise taxes, etc.” to compensate for this loss. The community has “changed from timber related industries to a lot of smaller industries, mostly construction and service related.” “We are definitely in a transition

period.” The town “is becoming a backyard to Bend and Redmond,” two rapidly growing tourism and outdoor recreation destinations in an adjacent county. Since the timber decline, Prineville has experienced “years of slow growth, and more recently, rapid growth due to an increasing housing industry.” “The biggest growth industry in Prineville is housing construction due to high housing costs in Bend and Redmond.” “Most of these people [coming into Prineville] commute to Bend and Redmond.” “Construction has taken off; businesses have closed, and many people who live here work elsewhere.” “The transition is from blue collar to white collar.” “The last five years,” in particular, “have seen rapid growth that is out-pacing the city’s ability to provide services.” “We’re behind the curve of supplying needed amenities, water, sewer, etc., for such a rapidly growing population. It’s been an instantaneous boom cycle.” Financing necessary upgrades in community infrastructure are perceived as difficult, “due to lost revenues from the timber industry; how are we going to make this up?” Prineville’s proximity to the Bend area causes “worry that the town is becoming a bedroom community.” “The town is seeing more and more of a service economy” because of this, although the overall number of services may in fact be decreasing. One respondent explained, Prineville “has not become diversified,” the service economy offering only “low wage jobs” that “can’t support a family.” Another respondent stated, “[Prineville is] definitely more diversified, but it’s still very small in nature; nothing like the timber industry. We don’t have a very diversified work pool; it’s mostly service oriented.” “There is much less [local] shopping, bars, gas stations, etc. You never had to go to Redmond to shop, but now you do.” The opening of a Wal-Mart store in Redmond was blamed for many of the losses suffered by local businesses. Also mentioned was the

loss of the local movie theatre, as well as the “need for a convention center, or something similar to that downtown.”

At varying levels, respondents believe that tourism and outdoor recreation is becoming a driving force behind Prineville’s recent growth. Tourism “has been much more important since the timber industry decline. It has been able to fill the gap some.” One respondent thought that outdoor recreation and tourism are “a huge part of the economy.” While the community “doesn’t have the massive attraction like in Bend, people will start coming because of congestion in the Deschutes [National Forest],” in other words as crowds overflow the capacities of the Bend attractions. “Bend is the prime attractor, and people get there and can’t afford it. Prineville is good for cheaper access to recreation.” “It hasn’t been huge, not that it couldn’t be in the future. There is big potential for tourism and outdoor recreation.” As such, “Crook County is the second fastest growing county in the state, behind Deschutes.”

While Prineville’s “cost of living has stayed pretty normal,” as compared to Bend and Redmond, “affordable housing is becoming a problem, especially in the last five years.” “Real estate has increased times four in the last 15 years.” “The cost of buying a home is way over-inflated.” “It has to be someone from outside the area to afford; local wages don’t support buying housing.” These low wages that are offered by the service-oriented economy also worry respondents. “High paying forest jobs back then are now minimum wage to start.” “People will say, ‘we have more jobs now,’ but if you compare the money coming back into the community, there’s no comparison.” “People have a lot of excessive debt; they are right on the edge of losing a lot.”

Destination resorts have their sights set on Prineville as well. The Iron Horse Resort community will bring 2400 new homes. “Many long-term residents are not happy to see this moving in, though the flip side is money being brought in.” “The destination resorts will help the tax base. People aren’t keen on these, but they won’t hurt the economy.” The majority of new residents are believed to be retirees, and “not much second homebuilders, though new developments are coming.” There are “a lot of seasonal” residents. “Lots of these are California people, though just as many come from Seattle and Tacoma.” Contributing to the increasing service-orientation, “once these people arrive, they want the same amenities they left behind.”

Recreational activities that “many people have moved in for” are focused on the Ochoco National Forest as well as the nearby Ochoco Reservoir. Hunting, “which is very big,” waterskiing, wakeboarding, jet skiing, camping, and fishing are popular warm weather activities. Winter activities include snowmobiling and Nordic skiing. Cycling events have brought attention to the community, and the surrounding forests offer “excellent bird watching” opportunities. The region also has “excellent weather,” that includes relatively mild winters and sunny summers.

With the increase in tourism and “more and more recreation,” cultural activities in the community are becoming more common as well. The city hosts a “very popular summer concert series in a local park,” local growers have organized a farmers’ market, which “never before existed,” and the Parks and Recreation Division of the city government has successfully partnered with the local Historical Society to provide many more opportunities for residents. An example is the free local museum that highlights the

history of the Prineville area. One respondent noted, “More amenities will come with an increase in population.”

In spite of this increase in local activities and community diversity, respondents feel that the “social aspects” associated with their transition “has been difficult.” “You used to see the same people at work, and shared a brotherhood of being in the timber industry.” “You lose contact with other friends and coworkers.” People have gone their own way since the mills closed, and you lose track of people.” “We have lost the closeness in the community; the timber industry culture was lost. This may be a factor of [increasing] population size.” Prineville is “losing its small-town feel.” “You don’t know people in the grocery store” anymore, explained one. “Things have become less connected as a town; it has become more drive-through tourist-oriented.” People are “losing familiarity with other people due to the numbers.” “You used to know everybody; we’ve lost the sense of a small community; we’re becoming a bedroom community for others.” “We have lost the cohesiveness of the community, losing the inner core, sense of community.” “It will take some revamping to get the sense of community back.” “We used to be special because we were different than Bend and Redmond; now we are becoming Bend and Redmond.”

Characteristics of Prineville’s residents that have enabled them to adapt to transition begin with the attitude of “I’m not going to move no matter what.” “People here are of a pretty independent sort, and many are able to take advantage of new opportunities.” This entrepreneurial spirit has led many to ask, “With all these changes, where is my niche?” It may be a function of “stubbornness, or of not wanting to adapt, but having to adapt.” “Many have started businesses they would not have otherwise



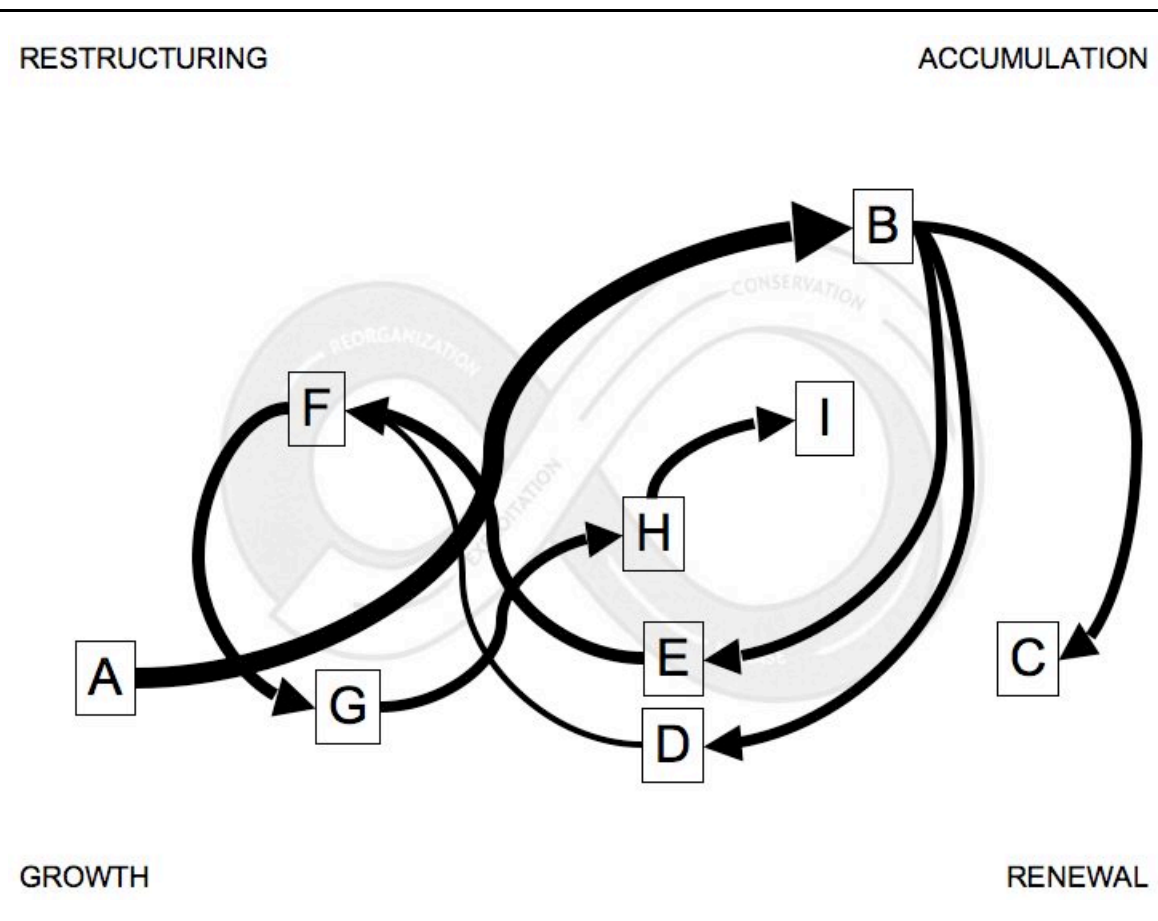
started, and taken risks they wouldn't have previously taken." Two examples of this were given. "One farmer was cut off from irrigation water because of a dam. He decided he'd make money somehow from the feds, so he built the current BLM building [on his land] and now is getting a federal lease." Potted Butte Greenhouse Ranch, owned by a "100 year farm and ranching family, has started a very successful greenhouse business that augments their cattle business." One respondent noted a "wide spectrum of backgrounds" that helps with adaptation, referring to diversity among current residents. Many residents have a "why not profit if I can attitude, and are selling land, farms, etc." "Some long term residents have shifted focus, and some ranchers, farmers, etc. also have." "Longer term residents have money now because of the real estate increase and are reinvesting in the town."

Other responses regarding adaptive characteristics include, "creating more jobs," "educating people on benefits and circumstances," and "people need to feel like they're part of the process." One respondent noted the presence of the community college as an opportunity to gain better employment. The high incidence of residents commuting was mentioned as an adaptive characteristic, as well as evidence of the lack of economic diversification in the community.

The questions regarding adaptability also generated ideas of attributes that may inhibit the ability of residents to adapt to change. "The good old boy system has gotten in the way in the past; the mentality that enviros caused the timber to decline, and if we get rid of them the timber will come back." "If something new comes along, some people think that they're admitting defeat if they accept the change." "Many don't have any connection to how this community developed, as a strong, independent community."

### Construction of Adaptive Curve for Prineville

Using data from the key informant interviews and archival sources, an Adaptive Curve was constructed for Prineville; this is presented in Figure 9. An explanation for each phase on the curve is provided.



**Figure 9.** Adaptive Curve illustrating Prineville's transition from timber dependency to a predominately service-based economy with tourism potential.

Prineville's relatively long period of timber dominance dates back to the 1940s, and involved both logging and secondary forest product manufacturing as drivers to the local economy. A→B in Figure 9 represents this period. Decline in timber production was more recent than in McCall or Leavenworth, beginning around the early to mid-

1980s and continuing until very recently. Respondents explained that dwindling supply, as well as opposition by environmentalists, increasingly rigid environmental regulations, and political repercussions from the Northwest Forest Plan all contributed to this period of accumulation and diminishing capital. B→C, B→D, and B→E in Figure 9 represent this, with B→C again symbolizing the dramatic impact to those workers and families who were unable to remain in Prineville amid the timber decline. B→E represents widespread sawmill closures and B→D represents timber-related employment decline in the forest products manufacturing industry. Amid the mill closures, forest products manufacturing remained as one of the county's largest employers, leaving Prineville as a community still possessing somewhat of a timber identity. This industry has been in continued decline since the mill closures began, but has remained marginally viable.

Restructuring in Prineville during the timber decline was enhanced by the presence of three industries: the forest products manufacturing plants, the Les Schwab Tire Company, which began operating in Prineville in the mid-1980s, and an emerging outdoor recreation and amenity-related industry. These enabled many in the community to adapt once logging employment began its decline, and have provided robustness to the local economy over the past two decades. D→F represents the forest products manufacturing industry that survives yet continues to diminish in significance. The Les Schwab Tire Company, which respondents mentioned as a “backbone” to the community for many years, has enabled adaptation and access to financial resources for many residents during Prineville's restructuring. Amenity-related growth has enhanced this

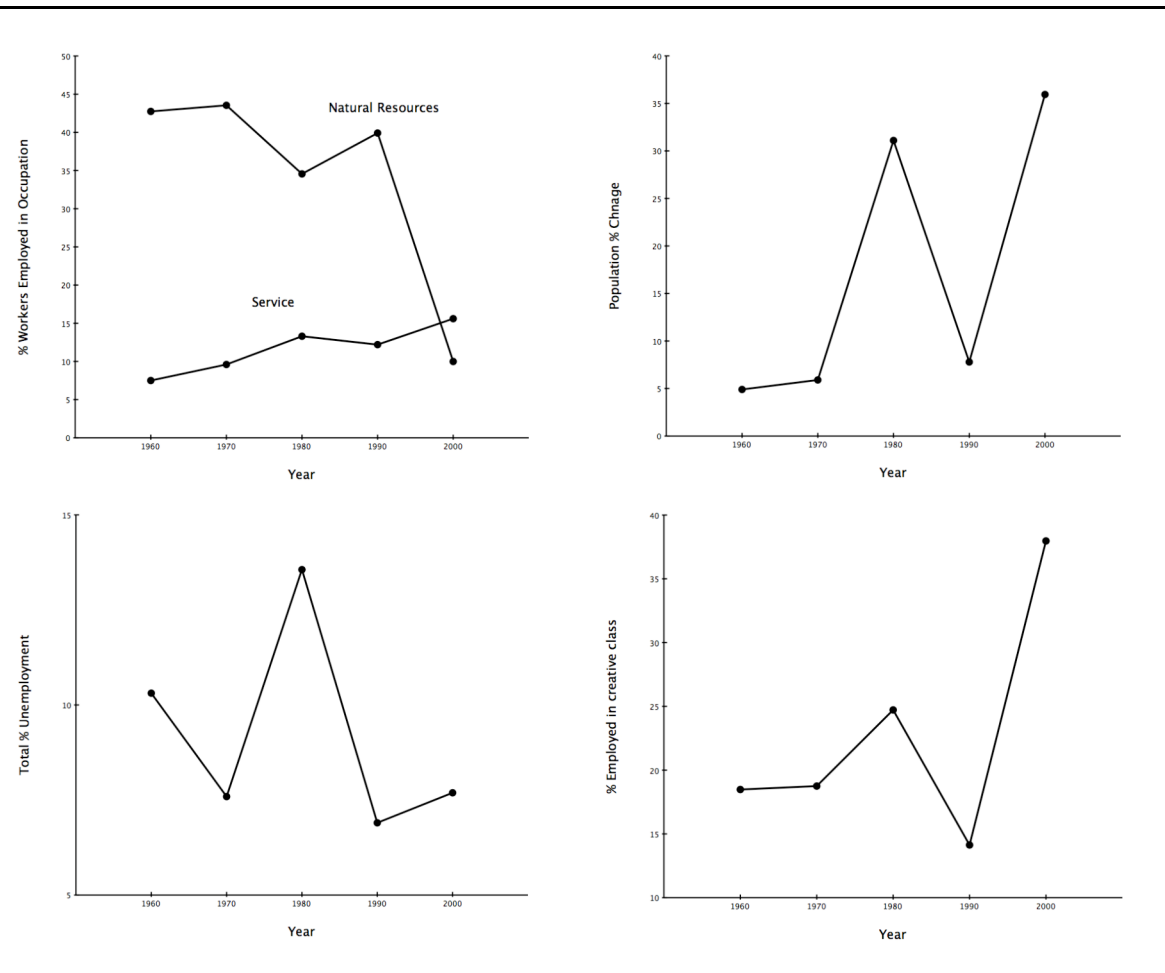
restructuring for some residents; E→F represents the coupling of these industries, and F→G represents the sum restructuring effects of the three industries.

G→H represents a recent growing service industry that supports Prineville's bedroom, recreation, and tourism economies, which have seemingly supplanted timber and the soon-to-close Les Schwab as dominant influences in the local economy. More recently, as represented in Figure 9 by H→I, accelerated growth in the community has occurred, due to the community's proximity to Bend and Redmond, and to the more affordable housing and cost of living Prineville offers. This, along with the increase in destination resorts and second homes, has led to an increasing cost of housing within Prineville. This renewed period of growth began around the early 1990s, and has been accelerating to the present as Prineville has become increasingly amenity-oriented. As the community continues along this trajectory, growth looks to be further driven by not only the proximity factor, but by its own amenity potential, such as outdoor recreation opportunities and a relatively mild climate.

Prineville's recent growth may be linked closely with the rapid growth that neighboring Deschutes County has experienced. Cost of living remains relatively low in Prineville, and many who cannot afford to live in Bend have begun to migrate to Prineville. Local amenities also drive this growth as Prineville begins a "discovery" phase characterized by numerous destination resorts being planned. The community is very much in the early stages of its most recent growth phase, with much potential to develop beyond its once timber-dominated economic and social landscape.

### Relevant Indicators to Prineville’s Amenity-transition

As with Valley and Chelan Counties, each of the individual indicators relevant to amenity-transition in Crook County is presented in Figure 10.



**Figure 10.** Relevant indicators to amenity-transition experienced in Crook County.

The indicators shown in Figure 10 correspond with historical transition in Prineville, as disclosed in the key informant data and as represented by Prineville’s adaptive curve. The timber-dominated renewal phase experienced by Prineville in the 1990s was accompanied by continuous but relatively minor growth in service employment. Population growth has been cyclic, and increased during Prineville’s

renewal phase as sawmills closed during the 1990s. As Bend, OR experienced dramatic growth of its own, it is possible that Prineville was experiencing spillover-related growth even while timber decline was significantly impacting the community. Unemployment rates in Prineville seem to directly correspond with timber-related growth during the 1980s and decline or renewal during the 1990s. Finally, as seen in McCall and Leavenworth, employment in the creative class rose sharply from 19990-2000.

## CHAPTER VII

### DISCUSSION

Each study community lies at a different stage along their respective adaptive curve, and each possesses a unique history and trajectory of transition and adaptation. Each is a fine example of a different type of amenity development: McCall's growth is driven by second home development and to a lesser extent access to outdoor recreation; growth in Leavenworth is driven almost solely by theme tourism, and to a much lesser degree outdoor recreation; Prineville finds itself in an early stage of amenity growth, driven significantly by amenity-related growth in adjacent Deschutes County. It also possesses not only its own amenities and access to outdoor recreation, which have much potential to sustain future growth, but also provides still relatively affordable housing as a bedroom community to Bend.

By comparing the historical changes experienced in these three communities, and by examining various locally-relevant indicators of amenity-transition, community residents and decision makers may be better informed as they seek to sustain future growth while also recognizing detrimental consequences that can accompany amenity-related growth. The adaptive curves developed for each study community represent an historical transition from timber-dependency to amenity-oriented growth. The individual indicators presented correspond with some of these historical changes over time, as experienced by the key-informants selected for this study. The indicators may be used to characterize various phases of each community's adaptive curve, though it should be noted that the list of potential indicators is by no means comprehensive; rather, they

should be used as a guideline for identifying and examining further locally relevant indicators of amenity-transition. These historical trends and phase relationships of relevant indicators are discussed below.

### **Amenity-transition in McCall**

McCall has been dealing with growth issues for many decades, and in various ways residents are still uncertain what kind of development they want their futures to entail. An influx of new residents is seen in part as a benefit, yet also as a drawback, as the community's sense of history is diluted with second homebuilders seeking urban escapes. The primary issue facing McCall seems to be finding a balance between sustaining an amenity-based economy and providing social services and housing for its working residents. The community is experienced, however, in dealing with change, and has gone through multiple iterations of adaptive cycles as it has transitioned through new modes and scales of growth. McCall's adaptive curve may in the near future involve another restructuring phase, as problems with affordable housing continue to intensify. The growth phase the community is now in is rapid and hinges on the housing market; new modes of growth would seem to influence how the community will transition in the future.

Rapidly increasing home value in Valley County (see Figure 6) and resulting lack of affordable housing for residents was identified as the primary difficulty in managing future growth. Lack of affordable housing due to rising home values, as illustrated in Figure 3, is believed to characterize the growth and accumulation phases of McCall's adaptive curve. The escalation of this problem may be indicative of an intensifying



accumulation phase, perhaps to be followed by a downturn in the housing market as a release phase is reached. Respondents in the qualitative data identified this as a potential future problem.

The issue of how to deal with increasing home value may be exacerbated by increases seen in the service sector in particular, which in McCall tends to generate lesser incomes. To some degree, construction employment may also fail to provide enough for residents to afford the cost of living in McCall, though at the same time respondents mentioned construction employment as a sort of buffer as natural resource employment has continued to decline (for each indicator, see Figure 6). Increasing rates of employment in these sectors within the county, as noted in Figure 6, create additional work opportunities for residents, resulting in decreasing unemployment rates. As noted in Figure 3, these trends are expected during the growth phases of amenity-transition.

Finally, population growth in Valley County and in McCall has been highly variable, and as seen in Figure 6, increased rapidly in the county in all decades except for 1980-1990. Respondents noted this decade as the time period when most mill closures occurred, perhaps explaining the drop in population growth during this time frame. This would also imply that the timber industry had attracted many workers during the preceding decades, and that efforts made by the state and community in the early 1990s was successful in attracting new residents to McCall and reversing this trend. Figure 4 identifies this trend as representative of a renewal phase in McCall during this time.

A key insight to evaluating the trajectory of amenity-transition that each study community has experienced is identifying vulnerabilities that exist because of social and economic change, and relating them to sources of future resilience and opportunities to

cultivate adaptive capacity that each community can use to address future transition.

For McCall, these relationships are summarized in Table 9. The relevant indicators presented were identified by respondents in McCall and are believed to be salient to the community's adaptive curve; they are both social and economic in nature. Sources of resilience, potential sources of resiliency, and opportunities to build adaptive capacity derive from respondents' perspectives, actual policies implemented in the community, and from interpretations made after a review of data and the community's adaptive curve. The concepts of sources of resiliency and of opportunities for cultivating adaptive capacity are related to similar social-ecological work done by Chapin et al. (2006).

**Table 9.** Implications for community resilience and adaptive capacity in McCall, ID

<b>Relevant indicator</b>	<b>Sources of vulnerability</b>	<b>Potential sources of community resiliency</b>	<b>Opportunities to build adaptive capacity</b>
Loss of social cohesion, familiarity; social disruption Rapid population growth	Decrease in community networks and diminished social support  Unrestricted development and land use change	Increased diversity with regard to social structure and workforce; increased community linkages within existing networks New forms of community investment; increased human and financial capital	Increased opportunity for networking/learning across groups; enhanced social stability via diversification Increased access to external networks and capital; new investment opportunities; diversification of social structure
Limited economic diversification	Fewer available jobs, emphasis on service-oriented employment	Stable existing employment opportunities amid strong tourism economy; diverse and multi-seasonal recreational opportunities and natural capital	Training/education focused on entrepreneurship opportunities; incentives to retain young educated workers; diversification of growing construction economy
Strains on community infrastructure	Limited access to health care, education, reduced public well-being	Property tax allocation to public sector; federal, state, and other grants	Structured tax codes to draw from future development; already-implemented <i>Urban Renewal Plan</i> ; community planning in the present to address rapid future growth
Service-oriented employment	Low wage, low skill labor	Growing and stable service employment amid strong year-round tourism economy	Multiple skill sets of residents able to work multiple jobs; opportunities for employment diversification; new niches formed for entrepreneurs; provision by county/city of training and education programs
Increasing property values	Lack of affordable housing; constraints on future growth due to surrounding national forest	Growth of personal and collective community wealth in real estate assets; increased tax revenue for community services	Government mandated allocation of development funds to affordable housing; size limitations to new developments; further tax exemptions for lower incomes; subsidized employer-provided housing
Unemployment rate	Potential market instability of tourism economy	Year-round employment characteristic of local tourism industry	Investment opportunities for future employment growth created by current rapid economic growth

### **Amenity-transition in Leavenworth**

Leavenworth's leaders decided long ago in a grass roots effort that the community would take full control of its economic and social well-being. Tourism development has been an ongoing experiment in the community, and residents have adapted first by accepting this mode of growth as their community's future, and second by changing their own interests and lifestyles to fit with the theme. It is an effort that instills economic and social cohesion among residents, while simultaneously exposing community well-being to the consequences of complete economic dependence. Personal investment of residents in the Bavarian theme, and the sense of cohesion and bonding the theme imparts at a community level seems an important and perhaps fundamental characteristic of economic dependency in Leavenworth. Leavenworth's transformation has resulted in a community as invested in tourism as it once was in the timber industry that came before. It has become a culture for the community, creating an adaptive curve exhibiting uninterrupted growth as the community continues to attract tourists. The sustainability of such dependency seems the question for Leavenworth to address for its future.

The decision in this study to use indicators measured at the county level may have resulted in the reduced ability to make interpretations about Leavenworth. Leavenworth's population in 2000 relative to that of the county as a whole, 3.1%, is small compared to McCall and Prineville, which in 2000 comprised 27.2% and 38.3% of overall county population, respectively. As mentioned earlier, the nature of Leavenworth's transition from timber-dependency to complete economic reliance on their tourism industry make the community an intriguing addition to this research. While the application of secondary indicators overall fails to capture many of the community dynamics related these

changes, an overall trajectory of change for both Leavenworth and for Chelan County, characterized by rapid population growth amid a declining timber industry and a growing service economy, can be documented by the indicators in Figure 8. These indicators represent the prolonged and to this point sustained growth phase that residents of Leavenworth have experienced.

The relationships between existing vulnerabilities, sources of future resilience, and opportunities to build adaptive capacity for Leavenworth are summarized in Table 10. Again, the relevant indicators presented were identified by respondents in Leavenworth and are believed to be salient to the community's adaptive curve. Sources of resilience, potential sources of resiliency, and opportunities to build adaptive capacity derive from respondents' perspectives, actual policies implemented in the community, and from interpretations made after a review of data and the community's adaptive curve.

**Table 10.** Implications for community resilience and adaptive capacity in Leavenworth, WA

<b>Relevant indicator</b>	<b>Sources of vulnerability</b>	<b>Potential sources of community resiliency</b>	<b>Opportunities to build adaptive capacity</b>
Strong community cohesion and identity	Rigid identity with Bavarian theme may inhibit diversification	Bonding social capital strengthened; strong sense of community and shared well-being	Potential for diversification, stability, and enhanced well-being via joint investment in shared futures
Strains on social and community infrastructure	Large-scale tourism brings large crowds; disruption of social and community structure	Urban proximity results in larger crowds, yet generates stable and perhaps sustainable tourism economy	City revitalization plan ensures planning for future; potential for increased local investment; revenue reinvested into maintaining community infrastructure
Rapid population growth	Strains due to available land area constraints	New forms of community investment; increased human and financial capital	Increased access to external networks and capital, particularly urban-based; new investment opportunities; diversification of social structure
Service-oriented employment	Low wage, low skill labor; undiversified workforce	Growing and stable service employment amid robust tourism economy; many jobs available; Bavarian theme within service industry further bolsters community identity	Entrepreneurship opportunities strengthened due to ever-increasing influx of tourists; potential diversification due to outdoor recreation potential
Increasing property values	Lack of affordable housing; constraints on future growth due to surrounding landscape	Growth of personal and collective community wealth in real estate assets; increased tax revenue for community services	Government mandated allocation of development funds to affordable housing; size limitations to new developments; further tax exemptions for lower incomes; subsidized employer-provided housing; ongoing community reinvestment in theme

### **Amenity-transition in Prineville**

Prineville's period of post-timber restructuring and renewed growth has been more short-lived than that of McCall and Leavenworth, as the timber industry decline

occurred more recently and amenity-related growth is a newer phenomenon to residents. Independent of this timber decline, growth in the community has more recently been due to a “bedroom/commuter” effect as people attracted to the amenities in Deschutes County and the Bend area have begun moving into Prineville. Most seek the amenities of Bend but cannot afford the rapidly escalating cost of living there. Prineville is becoming a bedroom community due to lower cost of housing, proximity to the Bend area, and the presence its own local amenities, many of which still fall “under the radar,” so to speak. This element of being relatively “undiscovered” was noted by key-informants as preventing Prineville from booming in the way Bend has. By their own right, however, natural amenities have the potential to transform Prineville into a stand-alone destination. This is beginning to be realized as seasonal tourists increase in numbers and housing developments in the community are increasingly pursued. Prineville’s relatively early position in its restructuring and growth phase enables decisions made in the near future to have dramatic impacts on what trajectory the community will follow. It should be noted that there is much to learn from examining the experiences of McCall and Leavenworth, as detailed in this study.

Individual indicators that seem to represent Crook County’s more recent transition to amenity-orientation are illustrated in Figure 10. Prineville’s timber industry was still growing in the 1980s, long after Leavenworth’s timber decline and during the height of McCall’s. During this time, unemployment levels decreased, likely due to increasing opportunities for timber-related work. As seen in Figure 10, amid a somewhat slowly growing service economy, natural resource industries within Crook County declined drastically throughout the 1990s. In spite of this downturn, population growth spiked

upwards, reaching 27.49% growth in the 1990 decade. Key-informants indicated that the loss of timber jobs led to many in Prineville being forced to move away from the community, although population growth in spite of this was noteworthy, and largely driven by the Bend “spillover,” or bedroom community effect.

The relationships between existing vulnerabilities, sources of future resilience, and opportunities to build adaptive capacity for Prineville are summarized in Table 11. Again, the relevant indicators presented were identified by respondents in Prineville and are believed to be salient to the community’s adaptive curve. Sources of resilience, potential sources of resiliency, and opportunities to build adaptive capacity derive from respondents’ perspectives, actual policies implemented in the community, and from interpretations made after a review of data and the community’s adaptive curve.



**Table 11.** Implications for community resilience and adaptive capacity in Prineville, OR

<b>Relevant indicator</b>	<b>Sources of vulnerability</b>	<b>Potential sources of community resiliency</b>	<b>Opportunities to build adaptive capacity</b>
Loss of community identity and culture	Timber industry decline recent and still creating direct impacts	Presence of natural amenities	Ability to retain some degree of natural resource character in surrounding wilderness attributes
Loss of community cohesiveness, sense of community	Rapid influx of new residents, diminished community networks	Local resistance to becoming a bedroom community; sense of common and shared futures	Increased opportunity for networking/learning across groups; enhanced social stability via diversification
Rapid population growth	Unrestricted development and land use change; large numbers of commuters reduce local connectedness	New forms of community investment; increased human and financial capital	Increased access to external networks and capital; new investment opportunities; diversification of social structure
Strains on community infrastructure	Strains on public services and infrastructure	Increasing tax base and revenue	Effective community planning to address problems associated to rapid growth
Service-oriented employment	Low wage, low skill labor; loss of locally-owned businesses; loss of Les Schwab company	Growing construction industry and presence of natural amenities	Local investment in construction of new homes/developments to meet increasing demand; opportunities for natural resource-related entrepreneurship
Increasing property values	Increasing lack of affordable housing	Property values have experienced rapid increased relatively recently; increased tax revenue for reinvestment in community services	Potential exists to manage growth and development before it reaches an uncontrollable point; effective governance and leadership required

### **Vulnerabilities, Sources of Resilience, and Opportunities for Adaptive Capacity**

Tables 9, 10, and 11 constitute the primary objective of this study. They are by no means exhaustive. Rather, they are intended to provide a heuristic that community leaders might turn to as they address community issues associated with amenity-transition.

Understanding historical trajectories of change enable communities to gain an understanding of how and perhaps why change has occurred. Assessing known

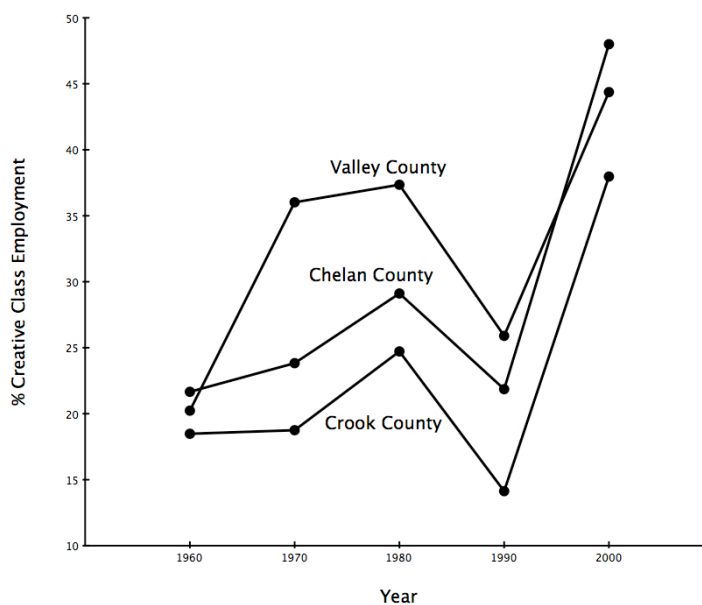
vulnerabilities in social and economic factors that influence transition can lead to an understanding and evaluation of community resiliency, which in turn can be managed to enhance adaptive capacity within a community. Such adaptive management creates feedback loops by which community leaders can identify ways in which transition has been successfully managed, or in contrast, ways in which failures have been experienced. Further, communities can learn from examining the experiences of other communities that share similar histories and/or trajectories. It is believed that coupling qualitative and quantitative data in the way the current study attempts to do enhances this process of feedback and learning. The longitudinal nature of the research adds the additional component of evaluating temporal change. This provides a baseline for matching policy and decision-making timeframes with the rates of changes experienced in each community.

### **Selected Indicators and the Potential Influence of the Creative Class**

The indicators selected for this research were in some cases relatively consistent in illustrating natural resource decline and amenity-transition in the study communities. The indicators that seem to correspond with each community's adaptive curve are discussed in Tables 9, 10, and 11 above. However, others did not match with expected trends and failed in terms of utility, thus demonstrating that a more focused quantitative study is necessary to begin to appreciate how such indicators may be beneficial to understanding amenity-transition. One indicator revealing a definitive pattern in the three study communities is employment in the creative class. Given the theoretical influence

this group of workers may impart in a rural community, a brief discussion thus seems necessary.

The creative class as described by McGranahan and Wojan (2007) is a completely different category, or group, of workers who have the ability to migrate to new areas. Very often, this migration is amenity-driven as these professionals move to rural areas with attributes such as access to outdoor recreation, desirable scenery, and attractive climates. The creative class is thus a novel resource for communities transitioning as a result of these amenities, and could serve as a driver for future economic growth. The implications the creative class could bring to an amenity-transition community become even more fascinating when the data for Valley, Chelan, and Crook Counties are examined. Trends in creative class employment in the counties for each study community are presented in Figure 11.



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**Figure 11.** Creative class employment trends in the three study communities.

In each county, creative class employment declined from 1980-1990, which in McCall and Prineville was a decade of significant timber decline. Management level employment associated with the timber industry could account for this decline, as these types of positions were included in the current measure for the creative class indicator. In Leavenworth, timber decline was a distant memory by this period, however it must be remembered that Chelan County as a whole could have still been experiencing effects from timber industry losses. From 1990-2000, in all three communities, employment in the creative class showed dramatic increases to levels never before higher. As implied by the research of McGranahan and Wojan (2007), in these amenity-driven economies the creative class offers each study community a new set of resources to utilize, as well as a potential mode of economic diversification and economic development for the future as more of these workers migrate in. The creative class indicator offers intriguing insights for community planning as well as a needed focal area for future research and development as an indicator of transition.

### **What Is the Value of the Adaptive Cycle Heuristic for a Community?**

The adaptive curve heuristic is intended to provide a broad scale perspective of transition, a big-picture, so to speak, from which the context influencing transition may be evaluated. As the heuristic is developed for a community, key points in the community's history can be identified, and resulting factors that have potential to play a role in each community's future can be assessed. The model is incomplete in that adaptive curves for communities rely on knowledge of locational attributes and amenities that must be accounted for as individual communities are evaluated. The examples given

would surely be enhanced by additional data focused specifically on such locational variables. Again, the objective of this research was to build, conceptually, a model that could be applied to these unique social-ecological systems.

This study provides numerous opportunities for future research objectives to be developed. One striking feature of the Adaptive Model is its methodological flexibility; that is, for an adaptive curve to be truly complete, many different methods would be utilized depending on unique locational features of the community in question. The study would benefit from more key informant interviews, as well as the development and collection of more specific secondary indicator variables that focus on these locational attributes and not on more generalized amenity development characteristics, as Census data offers. One particular need for the three communities examined is the collection of secondary data since the last Census year in 2000. Each community has since seen dramatic changes, and to provide a complete adaptive curve for each, meticulous attention needs to be paid to transformations within these last seven years. Additional constructs would also provide a more complete view of the cycles operating within individual communities; for example, the model would be further enhanced by an environmental or ecological construct that would examine biophysical impacts and consequences of decisions made within the community. Examples of this could be studies on recreational impacts on the landscape and on wildlife, and water quality and availability issues as population growth and development in natural settings occurs.

While a community's adaptive curve is a model unique to that particular community, it should be stressed the ability to compare the curves of two communities may be of utmost benefit to community leaders and residents in their decision-making

capabilities. For example, decision-making in Prineville may be better informed by reviewing the adaptive curves and characteristics of phase transitions for McCall and Leavenworth, as well as for other communities that have undergone similar transformations. The three communities in this study share similar histories in terms of timber dependency, but have veered onto very different trajectories of post-timber development which have further occurred at varying temporal scales. A key question is what explains these different trajectories in each community. The adaptive curves and initial quantitative study presented here begins to examine this question. A case could be made for each of these towns to represent a different typology of a community attempting to recover from timber dependency by pursuing amenity-oriented development and growth. McCall is becoming a cyclic second home destination and outdoor recreation-oriented destination. Leavenworth is a classic example of focused theme tourism. Prineville is a community still experiencing direct impact from timber losses as well as a changing social identity, and is simultaneously being shaped by bedroom/commuter-related effects and outdoor recreation-oriented growth. At different scales and magnitudes, the three communities share problems, such as lack of affordable housing. The ability of a community typology model, and an ensuing comparative analysis among community types, to inform leaders and residents about the potential impacts and consequences of their decisions would thus be a valuable addition to this research.

Additional statistical analyses are also a critical need for future work. Cluster analysis, as used here, is only a very exploratory application to the model, and fails to capture the significance of the time sequences involved with changing variables within each community's adaptive curve. One method to expand on this idea may be a principal

components analysis to examine how temporal changes in each community affect development and growth. A discriminate analysis covering a large number of counties would capture similarities and differences among county types, and would lend a measure of validity to developed adaptive curves. These tools could provide more quantitative rewards in characterizing transition in the study communities. Performing a social network analysis within a community would enhance the hypothesis that measures of social capital play a significant role in how local decisions are made, and how residents perceive themselves as a community.

Certain psychological characteristics dominated responses regarding the perceived manner in which adaptation has occurred in each study community. Responses that attribute adaptive capacity to being “a matter of perspective,” or degrees of “tolerance,” “acceptance,” “patience,” “stubbornness,” “risk taking,” “sense of history,” “community cohesion,” and “perception of control,” lead to the assertion that individual and community psychological research is a critical aspect to adaptability, and should perhaps be a significant component of future work examining adaptability in these types of communities.

Finally, it should again be noted that individual curves for various processes within a community influence the trajectory of the overall adaptive curve. For example, the cyclic housing market in McCall could be tracked over time, and peaks and troughs along the curve could be identified and evaluated. In theory, these minor curves provide nestedness among all community processes, and influence the overall curve at various points across multiple temporal and spatial scales.

## CHAPTER VIII

## CONCLUSION

The Adaptive Curve Model serves as a method that could be used by communities experiencing similar types of transition as the three study communities. By examining phases of economic and social growth and development, accumulation of resources and capital within a community, disturbance and various modes of response that communities utilize, and finally, the restructuring and reorganization of internal and external resources, a transitioning community can be evaluated for its scale and breadth of resiliency and adaptive characteristics in response to change. Communities such as McCall, Leavenworth, and Prineville are transforming in very different ways, yet an overall trajectory of amenity-development can be characterized in each community so that comparisons may be made and lessons be learned. It should be noted that such social and economic change is pervasive in much of the United States, and understanding local transition through the broad context in which the adaptive curve heuristic provides may be generalizable across many types of transition.

As a heuristic, the model's value lies in its own adaptability to changing research objectives and varying typologies and modes of development related to a community's existing local amenities. Using methodologies and statistical techniques unique to these locational factors impart the ability to community leaders and residents to assess their historical growth trajectories, explore their existing capacity for adaptation, and make informed decisions regarding their futures.



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APPENDICES



# Evaluating Resilience and Adaptability in Amenity-Transition Communities

## Key Informant Interview Instrument

### Contents

Section I	Your Community's Present and Past
Section II	A Brief History of Your Community
Section III	Information About You
Section IV	Conclusion

*This study is a Masters Thesis to be completed for the Department of Environment and Society at Utah State University. Its purpose is to evaluate how rural communities in the region adapt to economic and social change. We plan to develop a model to help communities evaluate the pros and cons of moving from natural resource to amenity-based economies. The study will ultimately provide a toolbox for communities to use as they experience and attempt to manage such transition*

*All responses to the following questions will be kept completely confidential. The study has been approved by Utah State University's Institutional Review Board (IRB), which provides guidelines for all the university's research conducted with human subjects.*

*Thank you for your participation.*

**Section I: Your Community's Present and Past**

**Q1** If I was a newcomer to \_\_\_\_\_, how would you describe it to me?

**What was \_\_\_\_\_ like 40 or 50 years ago?**

**What was \_\_\_\_\_ like 10 or 15 years ago?**

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## Section II: A Brief History of Your Community

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**Q1** In general, how has the economic base of \_\_\_\_\_ changed through the years?

In what ways has \_\_\_\_\_ been dependent on natural resources at any point in its history?

Do you think \_\_\_\_\_ is dependent on natural resources now?

If yes, about when did this period (what years) of resource-dependency begin?

**Q2**      **What were the reasons for these changes (cause for resource decline)?**

**PROBE: (i.e. When/why did the local sawmills begin to close?)**

**How did the *magnitude* of this change affect the community? (What did the magnitude of change really *mean*?)**

**How did it affect your family?**

**Q3** **Has this resource industry disappeared altogether?**

**PROBE: If it still alive is it in further decline?**

**PROBE: Has it in any way rebounded?**

**What does the resource industry look like now?**

**Q4** In general, how did the decline in this resource industry affect the quality of life in \_\_\_\_\_?

**PROBE** for changes in employment, perceived poverty, and other aspects of standard of living or well-being.

**PROBE** for economic, social, and environmental factors that may have changed.

**Q5** Since this decline, what has happened to the economic infrastructure in \_\_\_\_\_?

**PROBE for examples of economic diversification since resource decline, and the development of a post-resource economic base.**

**Q6 Over the years, how well has \_\_\_\_\_ been able to adapt to the economic and social changes brought about by this decline?**

**How well have you been able to adapt?**

**Q7 Over the years, what characteristics of \_\_\_\_\_ have helped the community to adapt to economic and social changes?**

**Q8** Have natural amenities played a major role in \_\_\_\_\_ since the resource industry began its decline? (beautiful scenery, natural environment, etc. **LINK TO PREVIOUS EXAMPLES AND PERSONALIZED LOCAL AMENITIES**)

**PROBE:** Has outdoor recreation and tourism played a role in this change?

**PROBE:** What other kinds of amenities attract people to come to \_\_\_\_\_?

**PROBE** for specific modes or patterns of growth: e.g. second home growth, retirees, returning residents, etc.



**Q9** Would you consider \_\_\_\_\_ to be dependent on outdoor recreation and/or tourism?

If no, would you consider \_\_\_\_\_ to have ever been dependent on tourism?

**PROBE:** If people stopped coming to \_\_\_\_\_ to visit, what would happen to the community?

**PROBE** for *specific* locational recreation types and the effects of potential decline in them (e.g. “What would happen to \_\_\_\_\_ if skiing were to decline because of drought?” or, “what would happen to \_\_\_\_\_ if a fire devastated the surrounding forests?”)



**Q10** What are some positive and negative aspects of tourism growth in \_\_\_\_\_? (ASK FOR STORIES, EXAMPLES, CASE STUDIES)

**Impacts on community?**

**Impacts on individual people?**

**Q11** In the event of a future economic downturn, how do you think your community will be able to adapt?

**PROBE** by referring back to specific locational amenities and the potential decline in any one of them.

**Q12** What characteristics of \_\_\_\_\_ will help the community adapt to future economic and social change?

**PROBE** for specific factors that respondent feels are vital for adaptation.

**PROBE:** What are some characteristics that \_\_\_\_\_ lacks that could

**benefit economic and social adaptation and transition?**

### **Section III: Information About You**

**Q1      Where were you born?**

**Q2      How long have you lived in \_\_\_\_\_?**

**Q3      What are your formal and/or informal job duties in \_\_\_\_\_?**

**PROBE for past job affiliations, volunteer organizations, commissions, elected office, other civic activity:**

### **Section IV: Conclusion**

**Q1      What do you think your community will look like in ten years?**

**What do you want your community to look like?**

APPENDIX B: CLUSTER ANALYSIS OF SECONDARY INDICATOR  
VARIABLES

**Cluster Analysis of Secondary Data for McCall**

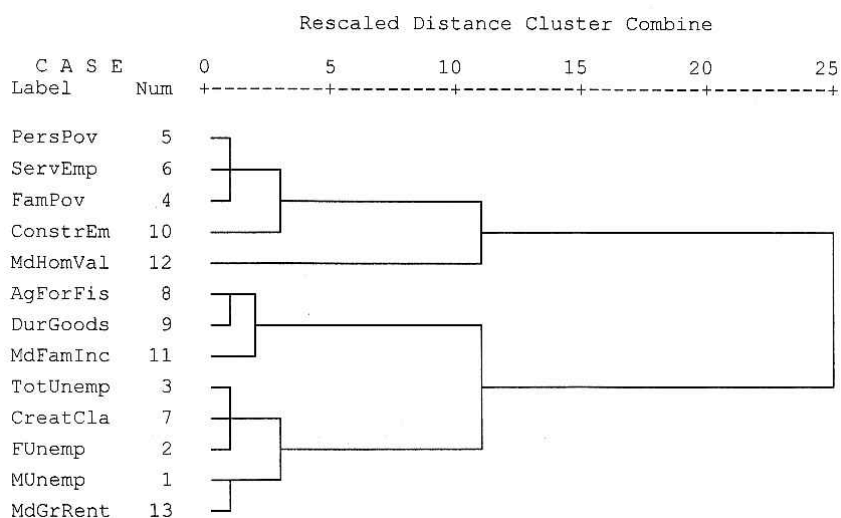
Agglomeration schedules and dendrograms from the cluster analysis of secondary indicator variables are presented in Figures B1-B4. Clusters are formed by examining trends among the squared Euclidean dissimilarity coefficients, as presented in the agglomeration schedules. Agglomeration was ceased and a cluster solution determined at the step in which a large increase in coefficients was seen (Norusis 1993). For each dendrogram this coefficient increase is noted. Due to the exploratory nature of the indicators used for this research, this general standard for cluster solution determination was performed as per Norusis (1993).

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Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	5	6	.000	0	0	2
2	4	5	.022	0	1	8
3	3	7	.028	0	0	5
4	8	9	.072	0	0	7
5	2	3	.106	0	3	9
6	1	13	.138	0	0	9
7	8	11	.326	4	0	11
8	4	10	.650	2	0	10
9	1	2	.652	6	5	11
10	4	12	2.759	8	0	12
11	1	8	2.800	9	7	12
12	1	4	6.700	11	10	0

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**Figure B1.** Agglomeration Schedule for *Economic Construct*, Valley County, ID.



**Figure B2.** Dendrogram for Economic Construct, Valley County, ID.

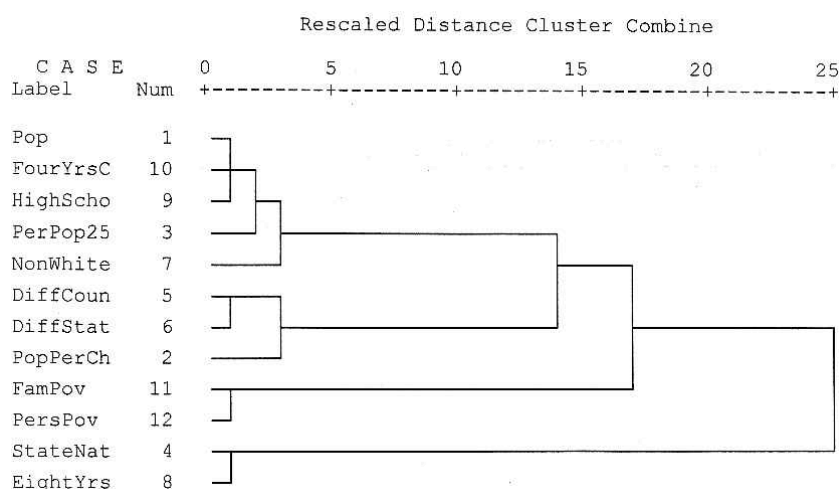
A four-cluster solution in Figure B2 was determined by the large increase in Squared Euclidean dissimilarity coefficient after step nine in the agglomeration schedule (Figure B1). Table B1 lists the individual variables in the four-cluster solution formed by the cluster analysis for Valley County's *Economic Construct*. The clusters are named in a manner that represents the indicator concepts that are linked to amenity-transition.

**Table B1.** Four-cluster solution for Economic Construct, Valley County, ID

<u>Indicator Cluster</u>	<u>Variables contained in cluster</u>
Poverty, service, and construction employment	% Personal poverty; % persons employed in service occupations; % family poverty; % persons employed in construction occupations
Home value	Median home value
Natural resource and manufacturing employment, family income	% Persons employed in agriculture, forestry, and fishery occupations; % persons employed in durable goods manufacturing occupations; median family income
Unemployment, creative class employment, gross rent	% Total unemployed persons; % persons employed in creative class occupations; % females unemployed; % males unemployed; median gross rent

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	1	10	.175	0	0	4
2	11	12	.243	0	0	10
3	5	6	.251	0	0	8
4	1	9	.295	1	0	6
5	4	8	.517	0	0	11
6	1	3	.561	4	0	7
7	1	7	.956	6	0	9
8	2	5	1.002	0	3	9
9	1	2	5.355	7	8	10
10	1	11	6.352	9	2	11
11	1	4	9.531	10	5	0

**Figure B3.** Agglomeration Schedule for Social Construct, Valley County, ID.



**Figure B4.** Dendrogram for Social Construct, Valley County, ID.

For Figure B4, a four-cluster solution was determined by the large increase in Squared Euclidean dissimilarity coefficient after step eight in the agglomeration schedule (Figure B3). Table B2 presents the four-cluster solution for the *Social Construct*.

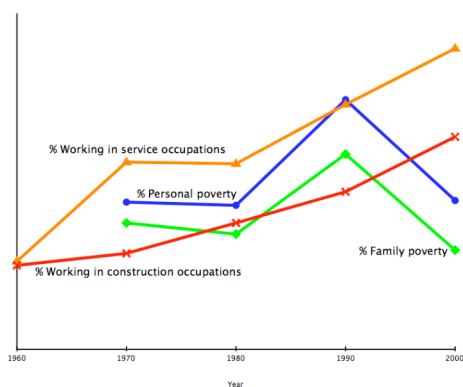


**Table B2.** Four-cluster solution for Social Construct, Valley County, ID

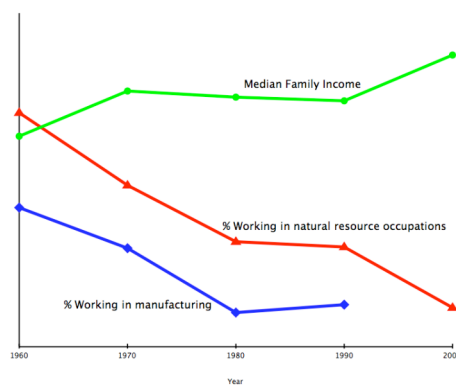
<u>Indicator Cluster</u>	<u>Variables contained in cluster</u>
Population, educational attainment, age of population, racial diversity	Population; % persons with 4 or more years of college; % persons with high school degree; % population 25 years or older; % nonwhite persons
Migration, population growth	% Persons living in different county 5 years prior; % persons living in different state 5 years prior; population % change in last 10 years
Poverty	% Family poverty; % personal poverty
Migration, educational attainment	% Persons who are state natives; % persons with 8 years or less of education

### *Time Series Graphs for Economic and Social Clusters*

To examine the nature of association between clustered indicators over time, Figures B5 and B6 present line graphs that illustrate how variables within each cluster have changed during the time period 1960-2000. Because cluster analysis reveals relationships between variables with regard to how they similarly change over time, only clusters containing multiple variables will be linked to the Adaptive Cycle and discussed. Individual variables may serve as stand alone indicators of amenity-transition, and their value to this study lie primarily in generating ideas for future research.



Cluster 1: Poverty, service, and construction employment

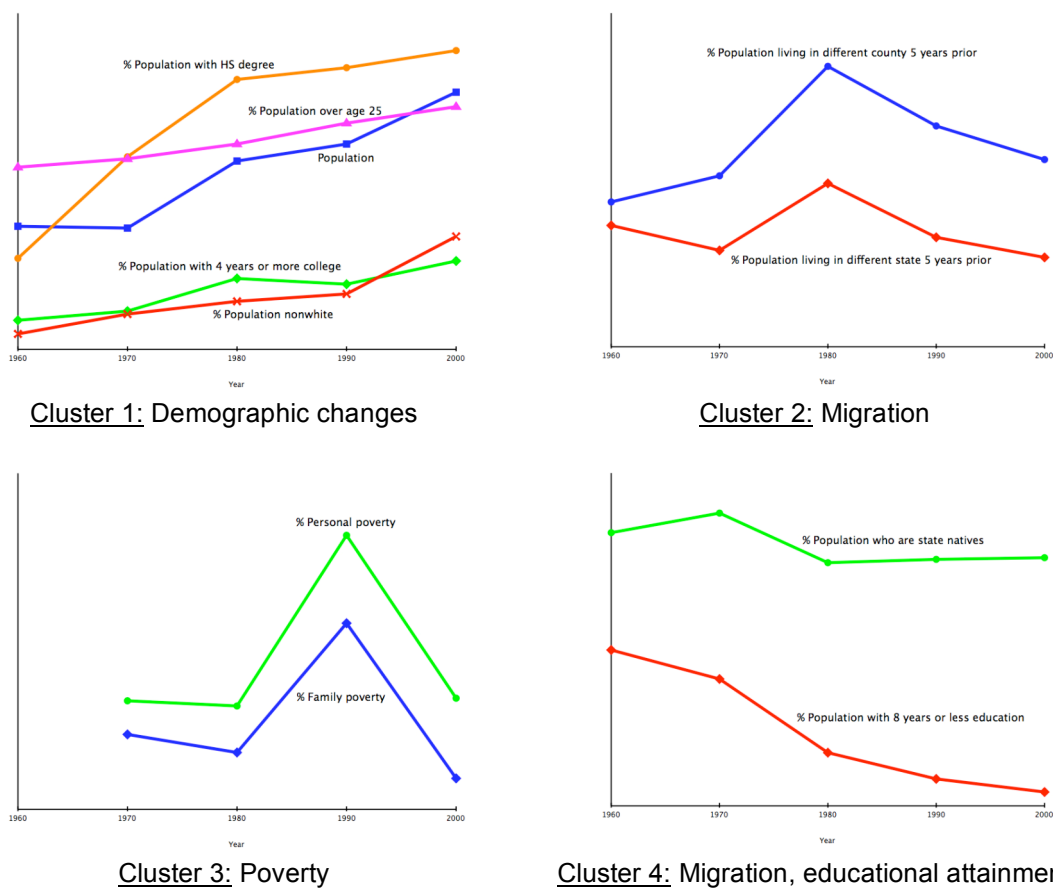


Cluster 3: Natural resource and manufacturing employment, median family income



Cluster 4: Unemployment, creative class employment, median gross rent

**Figure B5.** Trends in Valley County economic indicator clusters from 1960-2000.



**Figure B6.** Trends in Valley County social indicator clusters from 1960-2000.

A summary of the clusters relating to McCall's first renewal phase and ensuing restructuring phase is presented in Table B3.

**Table B3.** Potential cluster relationships to Valley County/McCall's initial renewal and restructuring phases: 1960-1990 timber decline and amenity-related growth

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<u>Associated figure and cluster #</u>	<u>Discussion of relationship</u>
Figure B5 Cluster 1	Service and construction industries always present and growing; from 1980-1990 dramatic increase in poverty levels
Figure B5 Cluster 3	Declining natural resource and manufacturing industries; manufacturing believed linked to timber products; median family income declines somewhat from 1970-1990
Figure B5 Cluster 4	Increasing unemployment until 1980, then decreasing unemployment after 1980; creative class employment grew before 1970, then decreased from 1980-1990; median gross rent remained stable
Figure B6 Cluster 1	Educational attainment and racial diversity increased
Figure B6 Cluster 2	Migration from outside Valley County and from outside Idaho increased from 1970-1980;
Figure B6 Cluster 3	Poverty levels rose dramatically from 1980-1990
Figure B6 Cluster 4	Percentage of population composed of state natives decreased somewhat from 1970-1980; increasing educational attainment

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A summary of the clusters relating to McCall's most recent growth phase is presented in Table B4.

**Table B4.** Potential cluster relationships to Valley County/McCall's most recent growth phase: 1990-2000 amenity-related growth in tourism and second home development

<u>Associated figure and cluster #</u>	<u>Discussion of relationship</u>
Figure B5 Cluster 1	Continued growth in service and construction employment after 1990; dramatic decrease in poverty levels
Figure B5 Cluster 3	Median family income increases after 1990; continued sharp decline of local natural resource employment
Figure B5 Cluster 4	Dramatic increase in number of creative class workers after 1990; unemployment rates continue to decrease as service and construction employment remains robust; median gross rent increases after 1990, after a slight decrease from 1980-1990
Figure B6 Cluster 1	Continued increases in educational attainment and racial diversity
Figure B6 Cluster 2	Migration after 1990 less driven by out-of-state growth
Figure B6 Cluster 3	Poverty levels decreased just as dramatically after 1990 as they increased after 1980
Figure B6 Cluster 4	Percent of population from Idaho remains relatively constant; educational attainment continues to increase

*Potential Linkages of Clusters to McCall's Adaptive Curve*

Cluster analysis is a useful technique to be used in exploratory research to identify and refine future research questions and to develop hypotheses (Romesburg 1984). These attributes reflect the objectives of the current research, and thus cluster analysis was utilized to examine apparent linkages between the historical, transitional adaptive curves for each study community and the quantitative indicators that were chosen to potentially elucidate particular phases along the curves. It is implicit that this quantitative model has not currently been optimized for examining temporal trends and modes of transition for the communities. However, it does serve as a valuable first step in understanding the multitude of factors that can contribute to a community's adaptive cycle, and how certain of these factors may correlate with one another. The following sections will identify

clusters that seem to be correlated with and relevant to McCall's adaptive cycle, and will discuss how these linkages relate to particular phases characterized by the qualitative data.

#### *Poverty, Service and Construction Employment*

Cluster 1 in Figure B5 illustrates two important trends that residents of McCall have experienced. The at-times rapid amenity-oriented growth has led to increases in service employment as well as construction employment. As mentioned by respondents, service growth has always played a role in McCall's economy, as residents filled niches to meet the demands for various services of incoming tourists and second homebuilders. Growth in the construction industry is related to the growing demand for these second homes. Both sectors experienced even more dramatic growth beginning in early 1990. Amid this growth came times of cyclic poverty, with poverty levels increasing amid the timber declines from 1980-1990 and then decreasing with the influx of higher income second home development from 1990 onward. This decrease in poverty after 1990 came in spite of a growing service economy that is often associated with lower wages.

#### *Natural Resource and Manufacturing Employment, Family Income*

The most dramatic trend seen in Cluster 3 in Figure B5 is the sharp and continuous decline in natural resource-related extractive employment within Valley County. Durable goods manufacturing employment was described in the qualitative data to be primarily forest product manufacturing, and thus can be linked intrinsically to the declining timber industry. The US Census Bureau changed the way this variable was defined after the 1990 Census, and thus data for 2000 was not recorded. Median family

income decreased slightly over two decades of timber decline, and then began to increase in 1990, possibly due to the rapidly growing influx of second homebuilders with the higher incomes necessary to purchase properties with rapidly escalating values. One question for future research that this trend seems to raise is how overall poverty and income levels increased after 1990 when the economic base was primarily driven by lower wage service employment. Possible explanations include the skewing of this data by the much higher income levels of second homebuilders, and the incidence of workers working multiple jobs within the service industry to compensate for low wage employment.

*Unemployment, Creative Class Employment, Gross Rent*

Cluster 4 in Figure B5 displays how unemployment trends in Valley County fluctuated amid a declining timber and growing service industry. It is assumed that second homebuilders are not represented by unemployment rates, and therefore these data can be linked directly to the local dominance of the timber and service industries. Unemployment can be seen to have increased from 1960-1980 as the timber industry was in its early stages of decline. After 1980, initial timber losses were perhaps buffered by increased employment in a growing service sector, as overall unemployment decreased between 1980 and 2000. An increase in median gross rent after 1990, in particular, is representative of cost of living increases as property values rose due to second home demand. Creative class employment fluctuated in a cyclic manner over the study years, decreasing amid timber declines and then rebounding strongly after 1990 as immigration

into the county became characterized more and more by higher income occupations that are indicative of the creative class as it is measured in this study.

### *Migration*

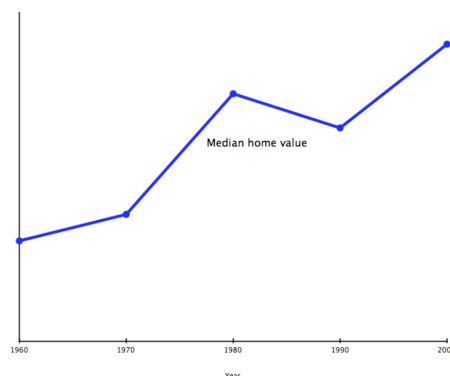
Cluster 2 in Figure B6 illustrates how population growth from 1970-1980 seemed driven by people moving in from different counties and different states. From 1980-2000 these rates decrease relative to overall population growth. The number of people migrating from different counties seems like a sensible correlation, as respondents noted that much of the tourism and second home economy prior to 1990 was due to Boise residents and others from within the state. Based on qualitative data, it would be expected that these rates after 1980 would remain relatively high; one explanation for this might stem from discrepancy in the unit of data analysis. That is, the number of out-of-county and out-of-state people moving into McCall after 1980 potentially become masked by those who moved out of McCall due to rising cost of housing, yet remained within Valley County. Trends in these categories after 2000 seem most relevant to McCall's transition, as since this time the county has experienced its most robust growth, and should be considered as a topic for future research.

### *Affordable Housing*

The qualitative data identified lack of affordable housing in McCall as the number one constraint to residents living and working there, as well as a primary concern for the future. The median home value indicator used for this study did not cluster with any other indicator, indicating that changes in home value over the study period were unlike any of the other trends seen within the data. As previously mentioned, individual variables may



serve as stand-alone indicators of amenity-transition, and given McCall's issues with lack of affordable housing changes in median home value seem particularly relevant to McCall's transition. Figure B7 displays the change in median home value in Valley County from 1960-2000.



**Figure B7.** Valley County median home value from 1960-2000.

These data seem to correlate well with what respondents discussed in the interviews. The median home value indicator did not cluster with other variables because of its steep overall growth curve, with a potential timber decline-related decrease from 1980-1990 just prior to the early 1990s-housing boom described by respondents. This trend is indicative of rapidly escalating property values and is representative of the problems that residents have with rising housing costs.

### **Cluster Analysis of Secondary Data for Leavenworth**

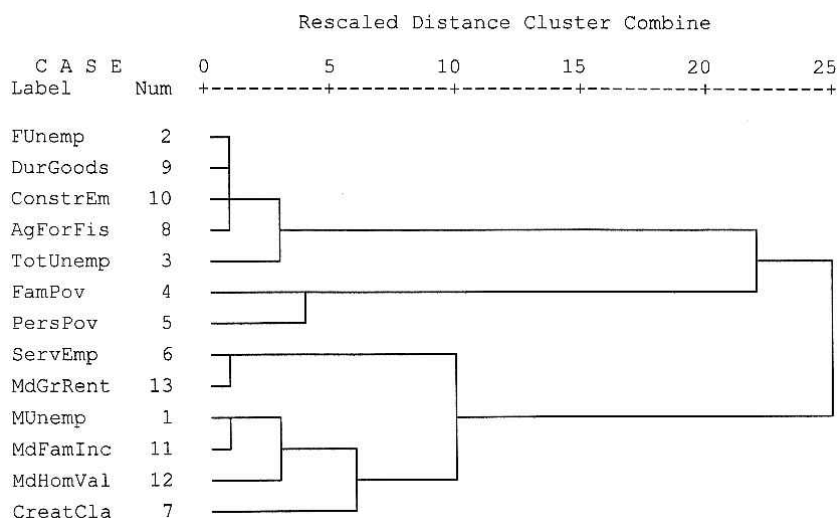
Agglomeration schedules and dendrograms from the cluster analysis of secondary indicator variables are presented in Figures B8-B11. Each dendrogram contains a vertical line denoting the cluster solution chosen to represent the data and create classifications for each construct. This is accomplished by examining trends among the squared

Euclidean dissimilarity coefficients presented in the agglomeration schedules.

Agglomeration was ceased and a cluster solution determined at the step in which a large increase in coefficients was seen (Norusis 1993). For each dendrogram this coefficient increase is noted. Again, due to the exploratory nature of the indicators used for this research, this general standard for cluster solution determination was performed as per Norusis (1993).

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	2	9	.001	0	0	2
2	2	10	.005	1	0	3
3	2	8	.027	2	0	6
4	6	13	.194	0	0	10
5	1	11	.235	0	0	7
6	2	3	.498	3	0	11
7	1	12	.601	5	0	9
8	4	5	.894	0	0	11
9	1	7	1.307	7	0	10
10	1	6	2.338	9	4	12
11	2	4	4.966	6	8	12
12	1	2	5.910	10	11	0

**Figure B8.** Agglomeration Schedule for Economic Construct, Chelan County, WA.



**Figure B9.** Dendrogram for Economic Construct, Chelan County, WA.

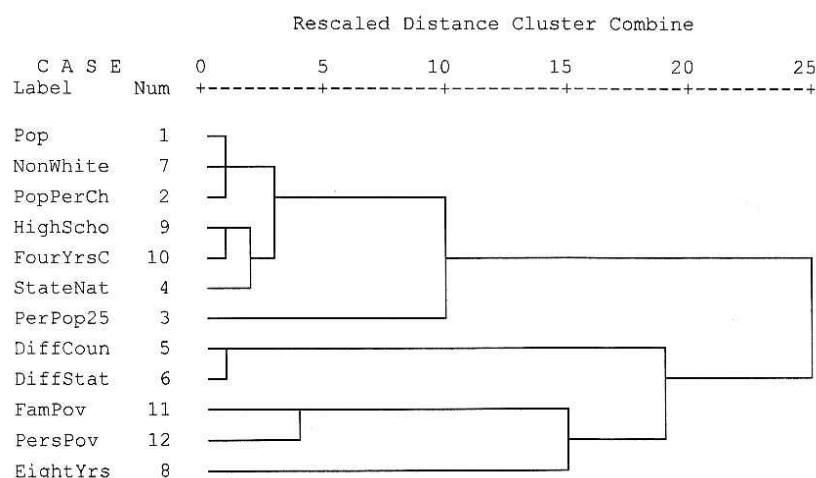
A five-cluster solution in Figure B9 was determined by the large increase in Squared Euclidean dissimilarity coefficient after step eight in the agglomeration schedule (Figure B8). Table B5 lists the individual variables in the five-cluster solution formed by the cluster analysis for Chelan County's *Economic Construct*. The clusters are named in a manner that represents the indicator concepts that are linked to amenity-transition.

**Table B5.** Five-cluster solution for Economic Construct, Chelan County, WA

<u>Indicator Cluster</u>	<u>Variables contained in cluster</u>
Unemployment, manufacturing, construction, natural resource employment	% Females unemployed; % persons employed in durable goods manufacturing occupations; % persons employed in construction occupations; % persons employed in agriculture, forestry, fishery occupations; % total unemployed persons
Poverty	% Family poverty; % personal poverty
Service employment, gross rent	% Persons employed in service occupations; median gross rent
Unemployment, family income, home value	% Males unemployed; median family income; median home value
Creative class employment	% Persons employed in creative class occupations

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	1	7	.003	0	0	2
2	1	2	.012	1	0	6
3	5	6	.032	0	0	10
4	9	10	.173	0	0	5
5	4	9	.339	0	4	6
6	1	4	.687	2	5	8
7	11	12	1.203	0	0	9
8	1	3	3.287	6	0	11
9	8	11	4.918	0	7	10
10	5	8	6.185	3	9	11
11	1	5	8.318	8	10	0

**Figure B10.** Agglomeration Schedule for Social Construct, Chelan County, WA.



**Figure B11.** Dendrogram for Social Construct, Chelan County, WA.

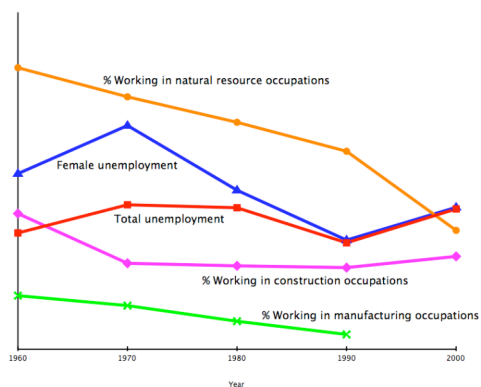
For Figure B11, a five-cluster solution was determined by the large increase in Squared Euclidean dissimilarity coefficient after step seven in the agglomeration schedule (Figure B10). Table B6 presents the five-cluster solution for the *Social Construct*.

**Table B6.** Five-cluster solution for Social Construct, Chelan County, WA

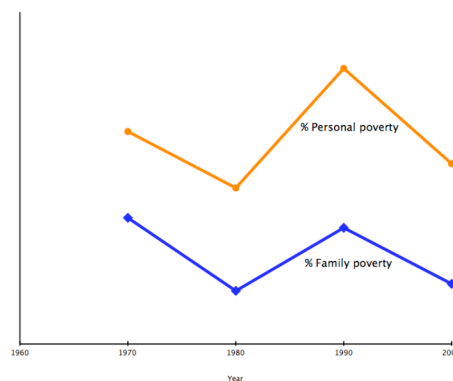
<u>Indicator Cluster</u>	<u>Variables contained in cluster</u>
Population, racial diversity, population growth, educational attainment, migration	Population; % nonwhite persons; population % change in last 10 years; % persons with high school degree; % persons with 4 years or more of college; % persons who are state natives
Age of population	% Population 25 years or older
Migration	% Persons living in different county 5 years prior; % persons living in different state 5 years prior
Poverty	% Family poverty; % personal poverty
Educational attainment	% Persons with 8 years or less of education

*Time Series Graphs for Economic and Social Clusters*

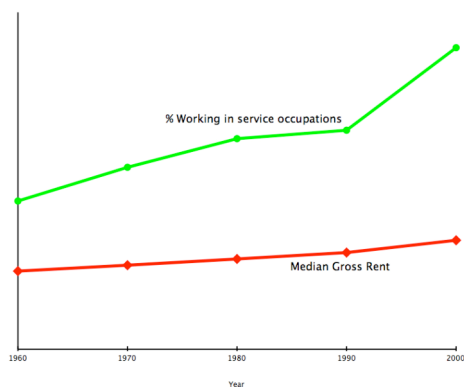
To again examine the nature of association between clustered indicators over time, Figures B12 and B13 present line graphs that illustrate how variables within each cluster have changed during the time period 1960-2000.



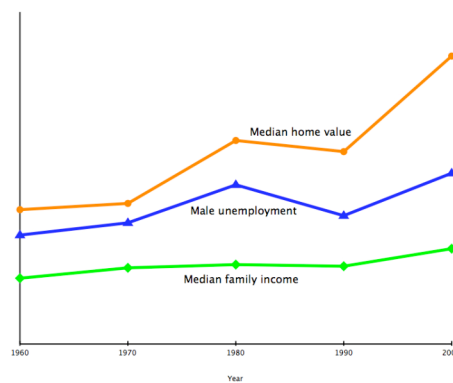
Cluster 1: Unemployment, manufacturing, construction, natural resource employment



Cluster 2: Poverty

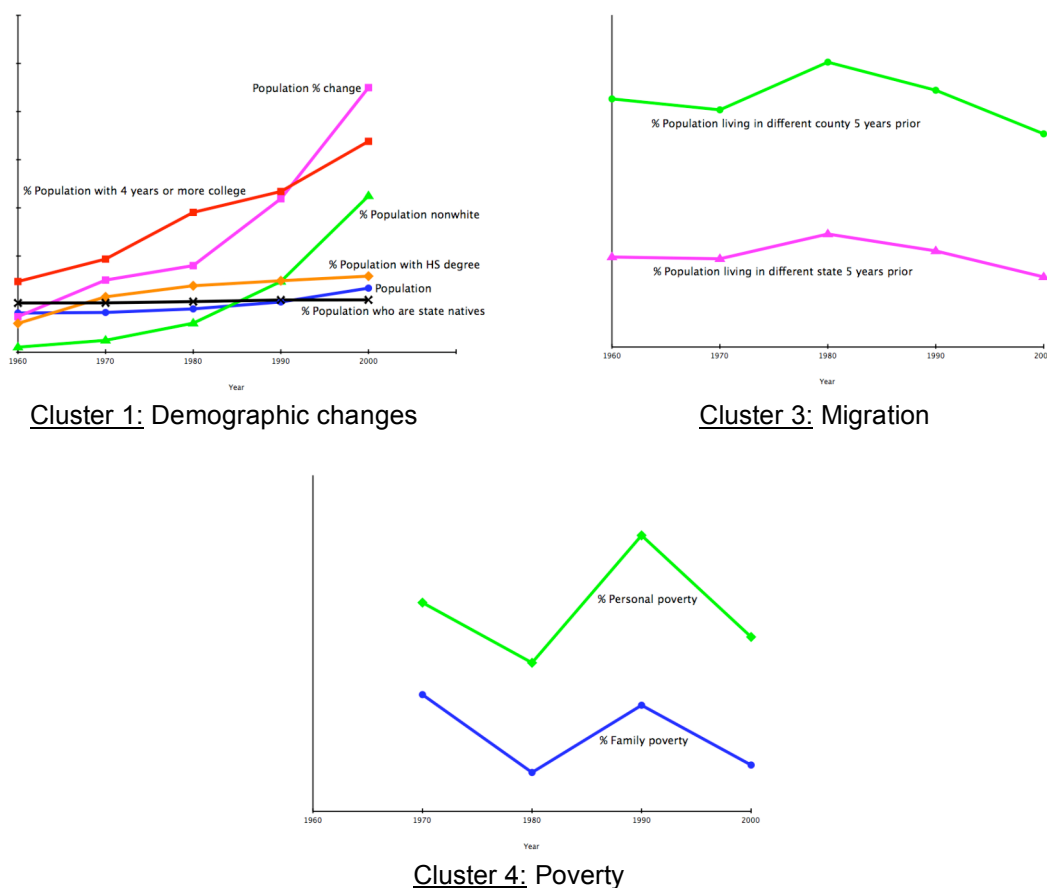


Cluster 3: Service employment, median gross rent



Cluster 4: Median family income, median home value

**Figure B12.** Trends in Chelan County economic indicator clusters from 1960-2000.



**Figure B13.** Trends in Chelan County social indicator clusters from 1960-2000.

A summary of the clusters relating to Leavenworth’s first renewal phase and ensuing restructuring phase is presented in Table B7.

**Table B7.** Potential cluster relationships to Chelan County/ Leavenworth’s initial renewal and restructuring phases: 1960-mid 1970s timber decline and onset of tourism growth

<u>Associated figure and cluster #</u>	<u>Discussion of relationship</u>
Figure B12 Cluster 1	Declining natural resource and manufacturing employment; unemployment rates increased from 1960-1970 as community faced timber declines; female unemployment rebounded after 1970; construction employment also seemed to rebound in the 1970s
Figure B12 Cluster 2	Decreasing poverty after 1970
Figure B12 Cluster 3	Growing service economy; steadily increasing median gross rent
Figure B12 Cluster 4	Median home value increased, sharply after 1970; male unemployment increased during early years of rapid tourism growth; median family income remained relatively stable
Figure B13 Cluster 1	Increase in educational attainment from 1960 onward; modest population growth and increase in racial diversity; sharper increase in the number of residents with 4 years or more of college; number of state natives decreased slightly from 1960-1970s
Figure B13 Cluster 3	From 1970-1980, number of residents from different counties and states increased
Figure B13 Cluster 4	Sharp decrease in poverty levels after 1970

A summary of the clusters relating to Leavenworth’s most recent growth phase is presented in Table B8.

**Table B8.** Potential cluster relationships to Chelan County/Leavenworth's most recent growth phase: 1970-2000 theme and amenity-related growth in tourism

<u>Associated figure and cluster #</u>	<u>Discussion of relationship</u>
Figure B12 Cluster 1	Continued steady decline in natural resource and manufacturing employment; industry began a sharper decline after 1990; decline in female unemployment until 1990, then increase from 1990-2000; relatively stable construction employment which began to increase slightly after 1990
Figure B12 Cluster 2	Poverty decreased throughout the 1970s, sharply increased throughout the 1980s, then decreased again after 1990
Figure B12 Cluster 3	Service employment increased from 1970-1990, and began to spike from 1990-2000; median gross rent increased steadily from 1970, and more so after 1990
Figure B12 Cluster 4	Median home value began more of an increase after 1970, declined somewhat from 1980-1990, and experienced a more abrupt increase from 1990-2000; median family income showed a similar trend, finally increasing from 1990-2000; male unemployment remained cyclic through these years as well
Figure B13 Cluster 1	Rapid population growth after 1980, with related increases in educational attainment and racial diversity; the number of residents born instate declined after 1990
Figure B13 Cluster 3	From 1970-1980, increasing residents coming from other counties and states; after 1980, these migrants declined
Figure B13 Cluster 4	Poverty decreased throughout the 1970s, sharply increased throughout the 1980s, then decreased again after 1990

*Potential Linkages of Clusters to Leavenworth's Adaptive Curve*

The following section will identify clusters that seem to be correlated with and relevant to Leavenworth's adaptive cycle, and will discuss how these linkages relate to particular phases characterized by the qualitative data. For Leavenworth in particular, it should be noted that a county level unit of analysis has the distinct possibility of masking community level trends due to the discrepancy in size between Leavenworth and Chelan County. The 2000 population for Leavenworth was 2036, while the 2000 population for Chelan County was 66,616. This gives Leavenworth 3.1% of the total county population,



as compared to 28.4% for McCall in Valley County and 38.6% for Prineville in Crook County. While McCall and Prineville can be argued to be representative of countywide trends, the same cannot be said about Leavenworth; given the methodology, this would seemingly raise the issue of Leavenworth being a suitable choice for this research. The selection of Leavenworth as a study community was determined based on the initial historical analysis, as well as the community selection criteria, of which Leavenworth fulfilled all requirements. Given the extraordinarily unique nature of Leavenworth's development from a timber dependent community into an amenity-oriented and completely tourism dependent location, the inclusion of Leavenworth was determined to align well with the type of community the research sought to examine. The quantitative component of this evaluation is certainly not the most optimal model for any of the study communities, and this holds most true for Leavenworth. However, Chelan County itself is experiencing strong "timber to amenity-orientation" modes of change, and thus in a fundamental way Leavenworth is representative of this. The application of county level secondary indicators for Leavenworth represents this generalized mode of change, and only linkages that manifest in the qualitative data will be discussed.

#### *Unemployment, Manufacturing, Construction, and Natural Resource Employment*

Cluster 1 in Figure B12 documents the countywide decline in natural resource extractive occupations over the study period. It should be noted that in Leavenworth, the timber industry had begun to decline as early as the 1940s, and by the 1950s was essentially a defunct industry. Manufacturing in Chelan County was strongly forest products oriented, as in Valley County, and these occupations suffered through the same

trend. Construction in the county remained relatively stable from 1970-1990, increasing more from 1990-2000. Leavenworth's tourism industry was booming by the early 1970s, and construction employment associated with this boom would have been expected to be strong during these developmental years; the county level unit of measure perhaps masks this indicator during this time period. Construction employment has increased since 1990 in Leavenworth due to the rising demand for second homes in the community, though many of these homes are being built outside of the city limits because commercial and residential development within the city has reached capacity (respondent correspondence 2007). Finally, female unemployment decreased dramatically after 1970, continued to decrease until 1990. Since 1990 unemployment rates have risen within the county as it has become more and more service-oriented.

### *Poverty*

As in Valley County, poverty in Chelan County has been cyclic throughout the study period, as displayed in Cluster 2 in Figure B12, and Cluster 4 in Figure B13. Linkages may exist between these patterns, the decline of timber, and the onset of a service-based economy, and should be more thoroughly examined in future studies.

### *Service Employment, Gross Rent*

Cluster 3 in Figure B12 illustrates how in Chelan County, as in Leavenworth, service employment has increased significantly throughout the study period. In Leavenworth, this began in 1964 when the community embarked on its Bavarian theme, and it has developed into an economic dependency. For Chelan County, service-

orientation has occurred more rapidly since 1990. Median Gross Rent has increased in the same manner, representative of the problem of lack of affordable housing within Leavenworth. As this increase cannot be described as dramatic at the county level, using median gross rent as an indicator may be less useful at this unit of analysis.

#### *Unemployment, Median Family Income, Median Home Value*

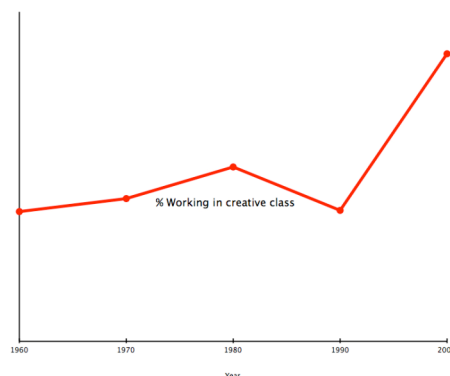
Male unemployment continued to increase in Chelan County from 1970-1980, while female unemployment rates were declining, as seen in Cluster 4 in Figure B12. This is perhaps indicative of continued timber losses and increasing service employment, if gender relationships exist. Median home value has increased in the county in all decades except for 1980-1990. A more dramatic increase can be seen from 1990-2000, which is supported by the qualitative data as being particularly significant to Leavenworth affordable housing problem. Median family income has seen more growth since 1990, and is perhaps related to the higher cost of housing during this same period.

#### *Migration*

The 1970-1980 decade saw increased percentage of residents who had lived in different counties and states five years prior, as illustrated in Cluster 3 in Figure B13. This would imply that this type of person drove migration from around 1965-1975, though this pattern has tapered downward since the 1980 Census.

*Creative Class Employment*

The creative class employment indicator did not cluster with other indicators for Chelan County, though its potential importance should be noted. The line plot for this indicator is presented in Figure B14.



**Figure B14.** Chelan County creative class employment from 1960-2000.

After declines from 1980-1990, a dramatic increase can be seen in creative class employment from 1990-2000. Given the potential for these occupations to contribute to economic development within a region (McGranahan and Wojan 2007), this increase may be a significant indicator to examine in future studies for the county. Similar to county level trends, the qualitative data also confirmed that the same dramatic increase in these types of workers was occurring in Leavenworth in the past decade or so. When economic diversification is mentioned as a constraint to future well-being, as it was by Leavenworth respondents, the creative class becomes an important element to development. The indicator's significance for the three study communities will be addressed in the Discussion chapter.

### Cluster Analysis of Secondary Data for Prineville

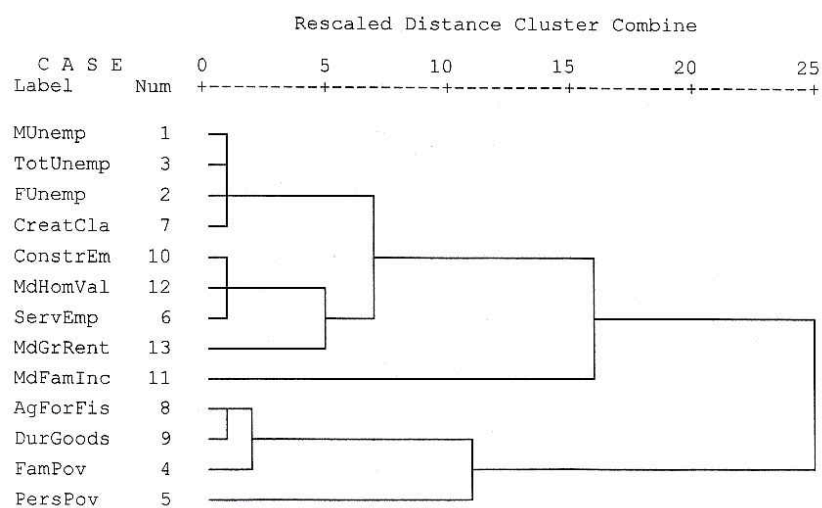
Agglomeration schedules and dendrograms from the cluster analysis of secondary indicator variables are presented in Figures B15-B18. Each dendrogram contains a vertical line denoting the cluster solution chosen to represent the data and create classifications for each construct. This is accomplished by examining trends among the squared Euclidean dissimilarity coefficients presented in the agglomeration schedules. Agglomeration was ceased and a cluster solution determined at the step in which a large increase in coefficients was seen (Norusis 1993). For each dendrogram this coefficient increase is noted. Again, due to the exploratory nature of the indicators used for this research, this general standard for cluster solution determination was performed as per Norusis (1993).

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Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	1	3	.014	0	0	2
2	1	2	.054	1	0	6
3	10	12	.083	0	0	5
4	8	9	.087	0	0	7
5	6	10	.217	0	3	8
6	1	7	.248	2	0	9
7	4	8	.424	0	4	10
8	6	13	1.084	5	0	9
9	1	6	1.738	6	8	11
10	4	5	2.850	7	0	12
11	1	11	4.029	9	0	12
12	1	4	6.599	11	10	0

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**Figure B15.** Agglomeration Schedule for Economic Construct, Crook County, OR.



**Figure B16.** Dendrogram for Economic Construct, Crook County, OR.

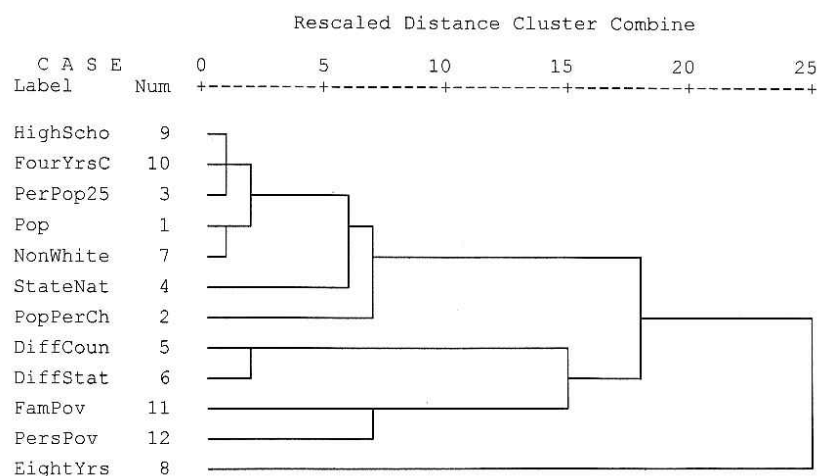
A six-cluster solution in Figure B16 was determined by the large increase in Squared Euclidean dissimilarity coefficient after step seven in the agglomeration schedule (Figure B15). Table B9 lists the individual variables in the six-cluster solution formed by the cluster analysis for Crook County's *Economic Construct*. The clusters are named in a manner that represents the indicator concepts that are linked to amenity-transition.

**Table B9.** Six-cluster solution for Economic Construct, Crook County, OR

<u>Indicator Cluster</u>	<u>Variables contained in cluster</u>
Unemployment, creative class employment	% Males unemployed; % total unemployed persons; % females unemployed; % persons employed in creative class occupations
Construction and service employment, home value	% Persons employed in construction occupations; median home value; % persons employed in service occupations
Gross rent	Median gross rent
Family income	Median family income
Natural resource and manufacturing employment, poverty	% Persons employed in agriculture, forestry, fishery occupations; % persons employed durable goods manufacturing occupations; % family poverty
Poverty	% Personal poverty

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	9	10	.021	0	0	3
2	1	7	.144	0	0	4
3	3	9	.350	0	1	4
4	1	3	.609	2	3	6
5	5	6	.697	0	0	9
6	1	4	2.071	4	0	8
7	11	12	2.528	0	0	9
8	1	2	2.633	6	0	10
9	5	11	5.442	5	7	10
10	1	5	6.768	8	9	11
11	1	8	9.402	10	0	0

**Figure B17.** Agglomeration Schedule for Social Construct, Crook County, OR



**Figure B18.** Dendrogram for Social Construct, Crook County, OR.

For Figure B18, a seven-cluster solution was determined by the large increase in Squared Euclidean dissimilarity coefficient after step five in the agglomeration schedule (Figure B17). Table B10 presents the seven-cluster solution for the *Social Construct*.

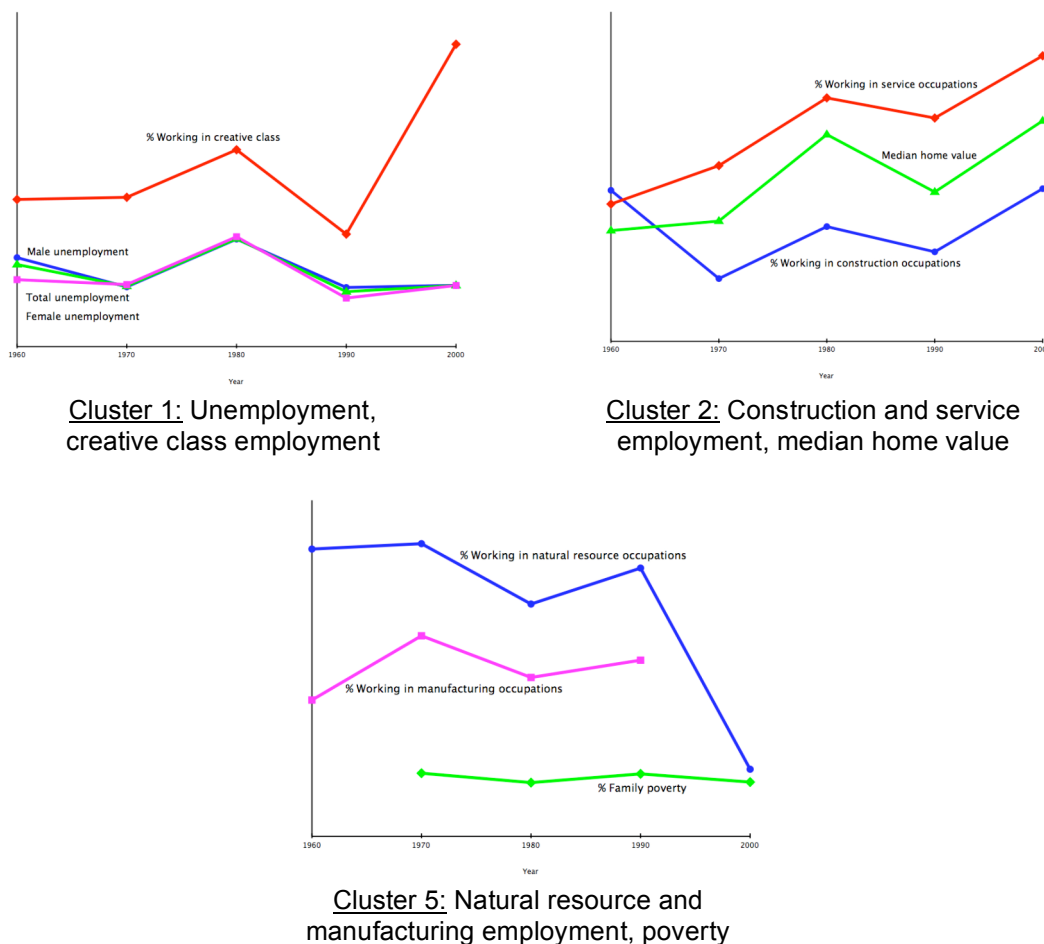
**Table B10.** Seven-cluster solution for Social Construct, Crook County, OR

<u>Indicator Cluster</u>	<u>Variables contained in cluster</u>
Educational attainment, age of population, population, racial diversity	% Persons with high school degree; % persons with 4 years or more of college; % population 25 years or older; population; % nonwhite persons
Migration	% Persons who are state natives
Population growth	Population % change in last 10 years
Migration	% Persons living in different county 5 years prior; % persons living in different state 5 years prior
Poverty	% Family poverty
Poverty	% Personal poverty
Educational attainment	% Persons with 8 years or less of education

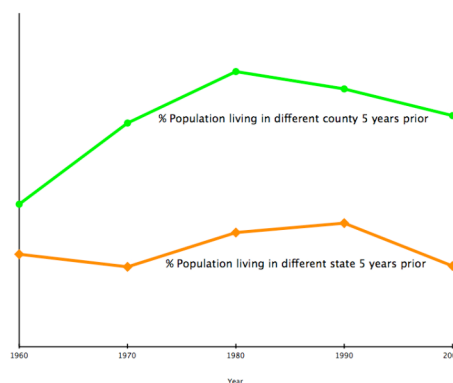


*Time Series Graphs for Economic and Social Clusters*

To again examine the nature of association between clustered indicators over time, Figures B19 and B20 present line graphs that illustrate how variables within each cluster have changed during the time period 1960-2000.



**Figure B19.** Trends in Crook County economic indicator clusters from 1960-2000.



Cluster 1: Demographic changes

Cluster 4: Migration

**Figure B20.** Trends in Crook County social indicator clusters from 1960-2000.

A summary of the clusters relating to Prineville's first renewal phase and ensuing restructuring phase is presented in Table B11.

**Table B11.** Potential cluster relationships to Crook County/Prineville's initial renewal and restructuring phases: 1980-1990s timber decline and growing service-orientation

<u>Associated figure and cluster #</u>	<u>Discussion of relationship</u>
Figure B19 Cluster 1	Modest increase in creative class employment from 1960-1970, then more rapid increase from 1970-1980, decreased sharply after 1980; unemployment rates decreased from 1960-1970, increased from 1970-1980, then decreased again in the 1980s
Figure B19 Cluster 2	Increase in service employment from 1960-1980, then a slight decline after 1980; median home value increased, particularly from 1970-1980, then dropped after 1980; construction employment experienced losses, rebounded from 1970-1980, then declined again after 1980
Figure B19 Cluster 5	Natural resource employment was steady from 1960-1970, began to decline in 1970, and rebounded from 1980-1990; manufacturing employment grew more dramatically from 1960-1970, then experienced the cyclic change from 1970-1990; family poverty levels increased after 1980
Figure B20 Cluster 1	As population grew steadily from 1960-1990, educational attainment and racial diversity likewise increased
Figure B20 Cluster 4	Somewhat cyclic number of residents from out-of-county as well as out-of-state

A summary of the clusters relating to Prineville's most recent growth phase is presented in Table B12.

**Table B12.** Potential cluster relationships to Crook County/Prineville's most recent growth phase: 1990-2000 service and amenity-related growth

<u>Associated figure and cluster #</u>	<u>Discussion of relationship</u>
Figure B19 Cluster 1	Dramatic rise in creative class employment; slight increase in unemployment
Figure B19 Cluster 2	Sharp rise in service and construction employment, median home value
Figure B19 Cluster 5	After 1990 natural resource employment decreased rapidly; family poverty levels decreased slightly
Figure B20 Cluster 1	Population growth rapid after 1990; educational attainment continued to increase; racial diversity increased
Figure B20 Cluster 4	Number of residents from out-of-county and out-of-state decreases from 1990-2000

### *Potential Linkages of Clusters to Prineville's Adaptive Curve*

The following section will identify clusters that seem to be correlated with and relevant to Prineville's adaptive cycle, and will discuss how these linkages relate to particular phases characterized by the qualitative data.

#### *Unemployment and Creative Class Employment*

Cluster 1 in Figure B19 display how increases in unemployment correspond with declines in the timber industry from 1980-1990; the rebound from 1990-2000 may correlate with the growing service industry during this period. Creative class employment also decreased during timber decline, potentially as management level positions within the industry were lost. This class of employment witnessed a dramatic increase from

1990-2000, an interesting and perhaps amenity-related phenomenon that parallels that seen in both of the other study communities.

#### *Construction and Service Employment and Median Home Value*

Service employment has been increasing in Crook County throughout the study period, as seen in Cluster 2 in Figure B19, with the exception of the 1980-1990 decade in which timber decline began. This same trend occurs within construction employment, as well as the median home value indicator.

#### *Natural Resource and Manufacturing Employment and Poverty*

The overall decline of the natural resource extractive employment is illustrated in Cluster 5 in Figure B19. Interestingly, employment in this occupational group, as well as in durable goods manufacturing, actually increased from 1980-1990. Again, manufacturing within Crook County, as in the other study counties, was primarily forest products related, and thus linked closely to the timber industry. Amid this apparent growth, this 1980-1990 decade the saw decreases in creative class, service, and construction employment, median home value, and an increase in family poverty level. Respondents from Prineville noted that after private mills began losing their timber supply and closing in the early 1980s, the Forest Service was able to fill demand somewhat through their own timber sales. It is possible that during this decade there were unique dynamics within Crook County that caused the trends in this cluster. By 1990, however, timber sales had become increasingly difficult for the Forest Service, to the point of virtual collapse of the logging industry. This dramatic decline is well

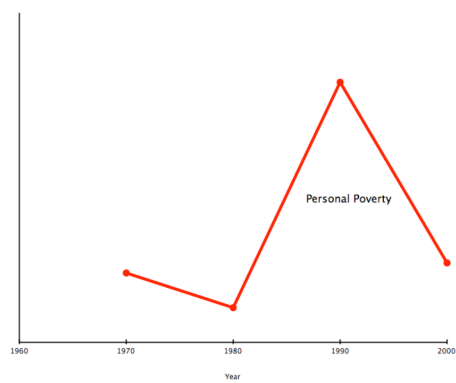
documented by the natural resource employment indicator from 1990-2000. As this decline occurred, family poverty levels within the county increased as well.

### *Migration*

Migration into Crook County from the mid-1960s to the mid-1970s appears to have been driven more from persons from outside the county; with a robust timber economy at the time, these could have been workers entering the county for timber employment. Migration seems to have been driven most strongly by persons from outside the state from the mid-1970s to the mid-1980s, in perhaps a related trend. Prineville's recent growth boom has occurred after 2000, and this is not reflected in the Census data. This growth was described as being driven by people moving to Prineville from Deschutes County, particularly Bend, and the migration indicator could thus serve as an important focus for evaluating how Prineville has transitioned from 2000 to the present.

### *Personal Poverty*

The personal poverty indicator failed to cluster with any other set of indicators due to the unique character of its change over the time of the study period. As can be seen in Figure B21 below, however, its cyclic nature warrants attention as a potential stand-alone indicator of timber decline and amenity-transition. From 1980-1990 personal poverty rose dramatically in Crook County, as the timber decline was well underway. In 1990-2000, as timber continued to decline, but as an amenity and service-oriented economy was growing robustly, personal poverty rates declined almost as dramatically.



**Figure B21.** Crook County personal poverty level from 1960-2000.