THE EFFECTIVENESS OF LAND USE PLANNING ON THE PRESERVATION OF OPEN SPACE IN FIVE RURAL, HIGH AMENITY COMMUNITIES IN THE ROCKY MOUNTAINS

by

Lisa M. Spadoni

A Thesis
Presented to
The Faculty of Humboldt State University

In Partial Fulfillment
Of the Requirements for the Degree
Masters of Science
In Natural Resources: Natural Resources Planning and Interpretation

December, 2008
ABSTRACT

THE EFFECTIVENESS OF LAND USE PLANNING ON THE PRESERVATION OF OPEN SPACE IN FIVE RURAL, HIGH AMENITY COMMUNITIES IN THE ROCKY MOUNTAINS

Lisa M. Spadoni

Rural communities in the Rocky Mountain West with high amenity values such as open space or access to outdoor recreation experienced a high population influx between 1980 and 2000. As the population continues to grow, new development threatens to degrade the very attributes that originally attracted people. To mitigate the negative impacts of development, many communities implement land use planning policies and regulations. This study examined the effectiveness of land use planning policies and regulations on the preservation of open space as a natural amenity in five rapidly growing Rocky Mountain counties. The five communities consisted of the fastest growing rural counties in Colorado, Idaho, Montana, Utah and Wyoming. I analyzed planning policy documents and regulations and the responses of interview participants to determine which open space protection strategies were most frequently identified and which were viewed as effective in preserving open space. The most common protection strategies were: agricultural or open space zoning, cluster subdivisions with density bonuses, natural resource zones or overlays, creating buffers around wetlands and streams, restricting development on steep slopes, and conservation easements and fee simple purchase. Overall, no single land use planning technique has served to protect open space resources in these counties. However, using a combination of these techniques
could serve other communities as they work to protect open space resources in the face of increasing development pressures.
ACKNOWLEDGEMENTS

This research was supported by USDA-CSREES National Research Initiative Competitive Grant Award Number 2002-35402-11597. My major professor Dr. Michael Smith provided insight and technical expertise through all aspects of this project. Committee member Dr. Yvonne Everett provided invaluable support and guidance on the logistics involved with the project. Dr. Sheila Steinberg as well as my other committee members provided feedback on project formation and timely, insightful reviews of thesis drafts. This project would not have been possible without the help and input from the many participants within the study communities.

I am eternally grateful to my family and friends whose support made it possible for me to complete this project. My thanks and love to my mom, dad, sister, brother-in-law, nieces and nephew: without you, I probably wouldn’t be here to finish this project. Your strength, love and unflagging encouragement throughout my life are the cornerstones of any accomplishment I might achieve. My gratitude to Marvin Natucci who believed strongly in education and whose loving gifts continue to buoy me today. Finally to all of my friends, especially my ‘wild-lifers’ and the ones who had to put up with my constant attempts to write: you all suffered through this process with me and provided support, cheerleading and nagging as needed. Thank you.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>ii</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>STUDY SITES</td>
<td>10</td>
</tr>
<tr>
<td>METHODS</td>
<td>25</td>
</tr>
<tr>
<td>RESULTS</td>
<td>30</td>
</tr>
<tr>
<td>Document Content Analysis</td>
<td>30</td>
</tr>
<tr>
<td>Land Use Planning Techniques and Their Effectiveness in Preserving Open Space</td>
<td>42</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>53</td>
</tr>
<tr>
<td>LITERATURE CITED</td>
<td>60</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Population and population change in study counties, 1980 - 2000</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Study county comparative statistics</td>
<td>23</td>
</tr>
<tr>
<td>3</td>
<td>Planning documents reviewed and interview respondents by county</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>Land use planning tools or techniques and plan evaluation score</td>
<td>32</td>
</tr>
<tr>
<td>5</td>
<td>Land use tools or techniques most frequently identified by interview</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>respondents and the perceived effectiveness of those tools or techniques on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the preservation of open space</td>
<td></td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Map of study counties</td>
<td>11</td>
</tr>
</tbody>
</table>
INTRODUCTION

During the first six decades of the twentieth century, population in rural communities exhibited a pattern of decline as people moved to urban settings in search of economic and employment opportunities (Taeuber 1972). At the end of the 1960s and through the 1970s, however, rural areas experienced an increase in population as people became disillusioned with urban life and joined the back-to-the-land movement (Jacob 1997). The urban to rural population movement has fluctuated in intensity over the last thirty years, but studies have indicated a continued and increasing flow of people into rural areas (Johnson 1998, Long and Natucci 1998). Further, rural communities with high amenity values, such as open space, outdoor recreation opportunities and a pleasant community atmosphere have experienced a continuously high population influx (Nord and Cromartie 1997, Johnson 1998). Counties with amenity based recreation economies continued to be the fastest growing rural counties through the 1990s (Beale 1998).

Some of the highest rates of in-migration to rural areas have occurred in the Rocky Mountain West (Riebsame 1997). Over 60 percent of the counties in this region grew faster than the national average in the 1990s (Beyers and Nelson 2000) and many rural counties gained population faster than urban areas (Theobald 2000). In particular, high amenity rural counties in the Mountain West region experienced the highest rates of population growth of all counties in the region during the first half of the 1990s (Shumway and Davis 1996). The rapid population growth in many high amenity communities has resulted in economic activities usually associated with urban areas and
social relations more typical of rural areas, what some researchers term an ‘exurban’ society (Duane 1999, Maestas et al. 2001).

Researchers have argued that the underlying forces of the urban to rural migration have shifted from economic factors to the search for natural amenity factors such as open space, scenery, and outdoor recreation (Dubbink 1984). The Economic Research Service of the U.S. Department of Agriculture has created a natural amenities index based on three classes of physical factors: topography, climate, and water area. Rural communities that scored high on the amenity index grew by as much as 120 percent while those ranked low on the index grew by only one percent (McGranahan 1999). Surveys of new residents in counties with high levels of amenities found that factors such as scenery, environmental quality, the pace of life, outdoor recreation and climate were more important reasons for relocation than job opportunity or cost of living (Rudzitis 1999). Rapid population growth has also been correlated with proximity to wilderness and surveyed residents have cited the access to wilderness as important (Rudzitis and Johansen 1991). Beyers and Nelson (2000) found that migrants to rural communities were attracted to social amenity values such as perceived safety, small town feel, and community involvement as well as to natural amenities.

Population growth trends in the United States and the current population demographics in high amenity communities have indicated that growth trends in rural areas will continue. The number of Americans reaching retirement age will significantly increase in the next decade. A Gallup poll of retirees indicated that a majority of them would like to settle in a small town or rural area (Fetto 1999). In addition, Cromartie
(1995) reported that mountain communities had a relatively young population and this built-in growth momentum in rural communities would likely result in increased populations.

Rural in-migration to high amenity communities has increased the demand for housing and supporting development and has often led to a substantial decrease in open space, scenic vistas, and recreational opportunities, as well as degrading air and water quality (Ringholz 1996). While the semi-urban development and cultural amenities of some cities and towns in high amenity communities have been identified as valued attributes, the natural setting has been regarded as having an equal or greater value (Geoghegan 2002, Tilt et al. 2006). As the population of rural communities continues to grow, new development threatens to degrade the attributes that originally attracted people (Cromartie 1995, Mitsch Bush 2003).

Open space has been identified as an important element in maintaining quality of life in rural communities (Geoghegan 2002, Sharp 2003, Tilt et al. 2006). A survey by McNicol and Draper (1997) of residents of Canmore, Canada, in the northern Rocky Mountains indicated that residents chose to live in Canmore for the accessibility of mountain environments and the associated wilderness values and outdoor recreation opportunities. Canmore’s officials recognized this and emphasized that residents’ needs should be coordinated and integrated in a manner sensitive to the natural environment upon which resident’s quality of life depends. In an interview, Richard Moe, president of the National Trust for Historic Preservation, indicated that people recognize the value of open space, “People are willing to pay for it (open space); they are willing to accept
regulations, because this issue more than any other affects the quality of life in communities today” (Pedersen et al. 1999:page A3). Wilkinson (1991) noted that loss of open space could cause a decrease in community image and reputation and increase public anxiety.

Open space in and around communities is a broad term that encompasses many types of semi-developed or undeveloped land. In various reports, the term open space has been used to indicate ranch, agricultural, and forest land, wetland and stream corridors, and wilderness areas (Johnston and Madison 1997, Elmendorf and Luloff 1999, Geoghegan 2002). Each of these land use types has been shown to provide important ecosystem functions such as contributing to clean air and water and providing wildlife habitat as well as contributing to the quality of life of nearby residents (Hansen et al. 2002). In addition to providing ecosystem functions, agricultural and ranch lands have contributed to the open scenic vistas and attractive rural character of mountain communities (Duerksen and VanHemert 2003). Landscape level benefits of open space have been noted to include conservation of natural habitat and opportunities for recreational and educational experiences (McHarg 1992). Elmendorf and Luloff (1999) reported that open space provided important social and psychological values including tranquility, physical and emotional exploration, and solace.

The period of growth in high amenity rural communities has been marked by the conversion of open space from agriculture and wilderness to exurban development (Riebsame et al. 1996, Hasse and Lathrop 2003). In Colorado, for example, 110,000 hectares of agricultural land were converted to commercial and residential development
every year between 1992 and 1997 (Obermann et al. 2000). The extent of land use change due to population growth in rural areas of the Mountain West has been greater than in urban areas because of the dispersed nature of the exurban development (Sullins et al. 2002). To satisfy the demand for exurban homesites, large farms and other rural tracts have been divided into smaller tracts for single family homes (Nelson and Dueker 1990). In Montana, ranchland and farmland were shown to be more valuable for development than agriculture. Farmers generally could afford to pay only $6,175 per hectare if they wanted to make a profit from farming, but the same property could sell for $9,000 per hectare to developers (Witkowsky and Lawlor 1995).

Rapidly increasing housing and development infrastructure have been shown to cause numerous environmental and social problems as they result in the conversion of open space to a built environment. Conventional land development has displaced sensitive native species, introduced and promoted the spread of nonnative species, degraded water resources, fragmented habitat networks, and diminished the land's cultural and aesthetic value (Radeloff et al. 2005). Habitat destruction and degradation through development have been the leading causes of biodiversity loss (Schemske et al. 1994, Wilcove et al. 1998). Exurban and rural developments have affected biodiversity in areas that were thought of as too remote to attract builders just a few decades ago (Miller and Hobbs 2002).

Hansen et al. (2002) showed that rapid rural development and a conversion of open space in the greater Yellowstone ecosystem reduced the viability of song bird populations and rare mammalian species. In addition to reducing habitat area,
development can fragment habitat. Theobald et al. (1997) found that a highly fragmented landscape is less likely to have large, intact habitat units which can cause species isolation or inhibit movement between habitat areas. Fragmentation has been shown to reduce the probability of recolonization in the event that a species disappears from a given patch of habitat. Maestas et al. (2001) studied biodiversity across three land use categories: public protected areas, private cattle ranches, and exurban developments. They found that the occurrence and density of wildlife species were more similar between ranches and protected areas than in exurban developments, and that sensitive native species were found more frequently on ranch and protected lands. Diversity of native plant species was highest on ranch land because of its productive valley location.

Even though the proportion of private land in rapidly growing Rocky Mountain counties may be as little as three percent, Knight (1994) found that private lands contain a disproportionate amount of high quality wildlife habitat. Therefore, the protection of private open space in rural communities is vital to the health and diversity of native species. The great challenge to the future health of high amenity rural communities will be to foster growth that is both socially beneficial and environmentally benign. The most environmentally benign development has been that which leaves untouched the greatest amount of land, especially land adjacent to preserved wilderness areas (Cromartie 1995).

Land use planning has been seen as an effective means for dealing with growth and development in an effort to preserve natural amenities (Elmendorf and Luloff 1999). Common land use planning tools have included general management plans, zoning ordinances, cluster housing requirements, and transfer of development rights. Land use
planning and regulation were initially used to protect the health, safety and quality of life in urban centers (Platt 1996), but in more recent years rural communities, especially those with high amenity values and rapid growth, began to use more complex planning tools (Duerksen and VanHemert 2003). The scope of land use planning has expanded to include any geographical area where residents wish to guide the impacts of growth and development and includes approaches that have been called “new urbanism,” “sustainable development” and most recently, “smart growth” (Daniels 1999, Berke and Conroy 2000, Ye et al. 2005). In recent years, open space preservation in the form of protected agricultural and ranch lands, wildlife habitat, wetland areas and trails has become an integral part of smart growth programs (Daniels and Lapping 2005).

Federal and state mandates to protect open space and biodiversity have been largely ineffective, leading to the implementation of local land use planning regulations in rural areas as a means to protect valuable natural resources (Beatley 2000). As rural communities have faced increasing populations, land use planning has been used in an attempt to manage growth and preserve open lands (Elmendorf and Luloff 1999, Duerksen and VanHemert 2003). According to Sharp (2003) there has often been resistance to the implementation of land use planning techniques in rural Rocky Mountain areas. However, as fears increase over the loss of amenities, including open space, residents have decided that action is needed and have turned to land use tools and techniques.

A number of studies have been conducted to examine how smart growth planning policies and open space preservation tools were being implemented in urban and rural
areas and to evaluate the effectiveness of those planning techniques. Beyers and Nelson (2000) studied rural communities in the Rocky Mountain West and concluded that these areas were not well equipped to deal with the rapid changes impacting their communities. One possible reason for the difficulty in applying effective land use planning policies has been that local rural planning agencies tend to be understaffed and overwhelmed by development pressures. In a study examining land cover in a rural watershed in Michigan, Erikson (1995) concluded that local land use plans were mostly ineffective in protecting forestlands. Analysis of land use planning policies including open space protection strategies such as cluster subdivision provisions with density bonuses, open space zoning, and environmental, agricultural, and scenic overlays showed the prevalence of open space and agricultural protections was low in rural counties in Wisconsin, Florida, and Illinois (Tallen and Knapp 2003, Brody et al. 2006, Edwards and Haines 2007). Those communities with abundant natural and recreation-related amenities had the highest levels of protection (Edwards and Haines 2007). Despite these studies, land use planning techniques have been one of the most commonly recommended tools for protecting rural community character and open space (Arendt 1999, Daniels 2000a, Duerksen and VanHemert 2003).

The goals of this study were to examine the effectiveness of land use planning tools and techniques on the preservation of open space as a key quality of life determinant in five rapidly growing communities in the Rocky Mountains. I looked first at the planning documents used in each community to determine what policies, regulations or other tools were used with the intention of preserving open space. I then
examined interview data from knowledgeable community members to determine their opinions on the effectiveness of land use planning techniques used to protect open space and natural resource amenities within their rapidly growing communities.
STUDY SITES

Field research and data collection were conducted in the following five non-metropolitan counties in the central and northern Rocky Mountain States: Blaine County, Idaho; Gallatin County, Montana; Summit County, Colorado; Summit County, Utah; and Teton County, Wyoming (Figure 1). These counties all experienced substantial population growth between 1980 and 2000 (Table 1). Counties were selected by using U.S. Census data to determine which non-metropolitan county with high amenity values in each of the five central and northern Rocky Mountain States had experienced the most population growth from 1980 to 2000. In addition, the communities were selected by analyzing an amenity index developed by the United States Department of Agriculture (McGranahan 1999). The final selected counties combined the highest rate of population growth and the highest scores on the amenity index. Non-metropolitan counties that experienced significant population growth due to non-amenity factors such as the construction of an industrial or prison facility were excluded.

Blaine County is located in South Central Idaho, on the eastern side of the Sawtooth Mountains. The Wood River Valley, with the cities of Ketchum, Haley, Bellevue, and Sun Valley, lies in the center of the county surrounded by the Sawtooth and Challis National Forests to the north and sagebrush and lava dry-lands managed by the Bureau of Land Management (BLM) to the south. In total, more than 81 percent of the 6,850 square kilometer county is public lands. The Big Wood River runs through the
Figure 1. Map of study counties
Table 1. Population and population change in study counties, 1980 – 2000*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Blaine County, ID</td>
<td>9,841</td>
<td>13,552</td>
<td>18,991</td>
<td>40%</td>
<td>92%</td>
</tr>
<tr>
<td>Gallatin County, MT</td>
<td>42,865</td>
<td>50,463</td>
<td>67,831</td>
<td>34%</td>
<td>58%</td>
</tr>
<tr>
<td>Summit County, CO</td>
<td>8,848</td>
<td>12,881</td>
<td>23,584</td>
<td>83%</td>
<td>166%</td>
</tr>
<tr>
<td>Summit County, UT</td>
<td>8,714</td>
<td>15,518</td>
<td>29,736</td>
<td>92%</td>
<td>241%</td>
</tr>
<tr>
<td>Teton County, WY</td>
<td>9,355</td>
<td>11,172</td>
<td>18,251</td>
<td>63%</td>
<td>95%</td>
</tr>
</tbody>
</table>

*Source: United States Census Bureau 2000
heart of the Wood River Valley. The variation in topography and geology creates a natural environment that varies from high alpine to mountain desert.

Prior to European influence, the area was populated by the Shoshone tribe. The first European population consisted of miners who moved into the area in the early 1860s. The first permanent European settlers, however, were farmers who arrived in 1879. Mining brought the first population boom to the area, but a parallel economic force starting in the 1880s was the raising and shipping of sheep. In the early 1900s, Ketchum was one of the largest sheep shipping centers in the United States. Despite the agricultural success of the region, by the 1910s, the mining industry and the Blaine County population were in decline. Fewer than 3,800 people remained by 1930.

In 1936, the construction of Sun Valley Resort, the first destination ski resort in the United States, brought a new influx of residents to the county. It also brought Hollywood celebrities and fame to this rural county. For the next 35 years, the population of Blaine County fluctuated between 5,200 and 5,800 residents. Renowned for many years as a winter recreation destination, in 1970 a year-round recreation market was created with the opening of Elkhorn Resort. Summer, once a slow time of year, became popular for kayaking, river rafting, hiking, golf, fishing, and more. The population of Blaine County increased rapidly with this new economic prosperity.

Between 1980 and 2000, the population of Blaine County increased by 92 percent. In the same time period, the number of jobs in retail trade doubled and service industry jobs increased from 16 to 27 percent. Concurrently, the number of jobs in the farming industry decreased by 32 percent. Between 1992 and 1997, the total amount of
land in farms decreased by 19 percent. As of 1997, farms constituted 12 percent of land in the county (United States Department of Agriculture 1997). The number of full time farms, average farm size, and market value of farm products also decreased during the 1990s. All signs pointed to an economic shift in Blaine County from traditional extraction industry to an economy based on tourism and real estate sales. However, the agricultural heritage is a powerful cultural force in the county, is still the economic livelihood for many landowners, and contributes indirectly to the tourist economy by providing a rural atmosphere and by protecting open space.

Gallatin County is located on the headwaters of the Missouri River in southern Montana at the northwest corner of Yellowstone National Park. The county covers 6,739 square kilometers of mountain lands varying in topography and climate from temperate river valleys to snow-capped peaks and open ranch lands. Nearly half of all the land in Gallatin County is under public ownership in the form of Gallatin National Forest, Yellowstone National Park, BLM, and state lands. The climate of the county reflects four true seasons with time of year and elevation affecting temperature and precipitation.

Gallatin County was inhabited by the Crow, Blackfeet and Gros Ventre tribes prior to European influence. The first European visitors to Gallatin County were fur trappers in search of beaver pelts in the late 1700s. When gold was discovered in the 1860s, a more permanent population became established. Many miners who followed the Bozeman Trail in search of gold returned to Gallatin Valley to take up farming and ranching. In 1864, these settlers established the town of Bozeman, the county seat.
Unlike many other mountain communities, Gallatin County did not suffer as severely from the boom and bust cycles of a mining economy. Because of the strong base in agriculture, both ranching and farming, the population of Gallatin County has grown steadily over the last century. As Bozeman and the county in general have become more popular for those seeking outdoor recreation and a small town atmosphere, the rate of population growth has also steadily increased. Between 1980 and 2000, the population grew 58 percent.

Gallatin County is now home to two world-class resorts, Bridger Bowl Ski and Snow, and Big Sky Ski and Summer Resort. Bridger Bowl opened in the late 1950s and Big Sky first opened for skiing in 1973. Both resorts continue to expand their ski terrain and summer recreation possibilities. In addition to these resorts, the city of Bozeman is well known for its outdoor recreation opportunities including fly fishing, hunting, hiking, camping, and boating, and close proximity to Yellowstone National Park.

Although the market for recreational tourism is expanding in Gallatin County, the agricultural sector still holds a prominent economic position. Over 45 percent of the county is considered farmland, an increase from 1992 of nine percent, and the market value of farm products has increased slightly from 1992. However, the number of full time farms decreased by 12 percent between 1992 and 1997, and the percentage of the population employed by agriculture, forestry, fisheries and mining decreased from seven to four percent during the 1990s (United States Department of Agriculture 1997). It could be argued that the agricultural industry in Gallatin County, rather than declining, is becoming centralized in larger agricultural corporations. Along with these changes in the
agricultural sector have come increases in the service sector from 39 percent to 52 percent of all employed persons. The entertainment and recreation service sector alone increased by 12 percent. This shows that while agriculture still contributes significantly to the economy, the economic influence of tourism is on the rise. At the same time, the rate of subdivision of agricultural parcels into home sites has accelerated greatly in the past two decades.

Summit County, Colorado is located in the heart of the Colorado Rockies. The county encompasses 1,575 square kilometers of rugged mountain terrain and fertile valleys. The climate is governed by an alpine setting. More than 81 percent of Summit County is public land comprised of the White River National Forest, BLM property, and a State Wildlife Area. The Blue River, Snake River, and Ten-Mile Creek all feed Summit County’s two large reservoirs, Lake Dillon and Green Mountain.

The area was populated by the Cheyenne tribe prior to European settlement. The influx of European settlers began in 1859 when gold and silver were discovered in the surrounding hills. The town of Breckenridge was established within the northern portion of the county, known as the Upper Blue Basin, in 1860 as a mining town and a short time later was established as the county seat. Like many other communities, Summit County and the town of Breckenridge suffered the boom and bust cycles of a mining economy. Many miners turned to farming and ranching especially in the southern portion of the county known as the Lower Blue Basin. Mining declined through the first half of the 1900s and by the 1950s, the population of Summit County had decreased to just over 1,000 residents and Breckenridge had shrunk to less than 300 individuals.
In 1961, a Kansas lumber company opened the Breckenridge Ski Area and a new boom era began. Transportation improvements contributed to the revitalization of Breckenridge and Summit County. The Eisenhower Tunnel on Interstate 70 was completed in 1973, considerably reducing the driving time from Denver to Breckenridge. In the 1980s, additional summer and winter recreational activities increased in popularity. As skiing, other recreation, and tourism in general grew, so did the resident population. Between 1980 and 2000, the population of Summit County increased by 166 percent.

Approximately one hour west of Denver, Summit County residents enjoy both the mountain wilderness and the convenience of nearby metropolitan services. Summit County is now home to four world-class ski resorts, Arapahoe Basin, Breckenridge Ski Area, Copper Mountain, and Keystone Resort which offer year-round recreational opportunities. The Dillon and Green Mountain Reservoirs offer opportunities for boating, fishing, and motorized water sports.

As the tourist economy has grown, the reliance on a traditional, natural resource based economy has declined. The agricultural industry which is almost evenly split between livestock and crop production has declined. In 1997, eight percent of the county was considered farmland, a decrease of 10 percent from 1992. While the percentage of the population working in agriculture has remained a constant two percent over the last 10 years, the number of jobs in entertainment and recreational services has increased from five percent to over 30 percent of the workforce (United States Department of Agriculture 1997). This shift from a traditional resource economy to an economy largely
based on tourism and services has become a common trend in high amenity communities of the Rocky Mountains.

Summit County, Utah, was formed in 1854 from Green River and Great Salt Lake Counties. The County extends over 4,846 square kilometers and is located in the northeastern portion of Utah. The Uintah Mountains dominate the eastern portion of the county which also encompasses a large portion of the Wasatch-Cache National Forest. The western section is a high valley of the Wasatch Mountains and is largely in private ownership. Overall, 45 percent of the county is owned by federal and state agencies.

The Ute, Shoshone, Goshute, and Paiute tribes inhabited the area prior to European settlement. The first permanent European settlers arrived in the late 1840s to mine coal in the western portion of the county and to begin ranching in the eastern portion. During the 1860s, coal mining became the chief economic industry of Summit County. Mining continued in the western part of the county until the 1950s and then steadily declined. Towns in the western part of the county struggled economically for several decades until the area’s rugged terrain and high annual snowfall led to its rebirth as a winter recreation center. Summit County currently encompasses six incorporated towns including the largest, Park City.

As winter recreation became popular in the late 1970s and 1980s, Summit County experienced explosive population growth. Between 1980 and 2000, the population grew by 241 percent. In large part, this population growth was due to the creation and expansion of the Deer Valley ski area and Park West resort, both located in Park City. Noted for its clean air and scenic vistas in addition to its resort atmosphere, western
Summit County has also become a bedroom community to Salt Lake City with commuters willing to travel 55 kilometers or more for the benefits of living in a small, high amenity community.

The economy of western Summit County has shifted largely to the travel and tourism industry. Selected to host the winter 2002 Olympics, Summit County expanded the recreation opportunities within Park City with the construction of a new winter sports park and expansion of the existing ski areas as well as the creation of new facilities for concerts, conferences, and other public venues. Along with the publicity generated by the winter Olympics, these new facilities are expected to increase Summit County and Park City’s reputation as an international resort destination.

The western portion of Summit County has experienced rapid development as a bedroom community to Salt Lake City and an economic transition to a service-based economy. Throughout the county, jobs based in agriculture and other natural resources declined in the 1990s, while jobs in the service sector increased sharply. Between 1990 and 2000, the number of jobs in entertainment and recreation services increased by over 12 percent. The eastern section of the county, however, has remained largely agricultural. Over 49 percent of the total land within the county is farmland. Livestock production is the dominate industry, contributing 94 percent of the market value of farm products (United States Department of Agriculture 1997). Although the amount of land in agriculture and the average market value per farm increased from 1992 to 1997, concern remains that the development occurring in western Summit County will spill
over the mountains and begin to erode this culturally and economically important pastoral lifestyle.

Teton County is located in the northwest corner of Wyoming, bounded by the state of Idaho to the west and Yellowstone National Park to the north. Teton County contains portions of Yellowstone National Park, the Targhee National Forest, the Bridger-Teton National Forest, and all of Grand Teton National Park. Federal and State owned land accounts for more than 97 percent of the county land area. Teton County encompasses just over 10,360 square kilometer of picturesque valleys and rugged mountains. The most widely known features of Teton County are the Teton Mountains, named the Grand, Middle and South Teton. This cluster of peaks draws millions of people with its scenic views and recreational opportunities. The Teton Mountains form the western edge of Jackson Hole, a broad valley rimmed on all sides by mountain ranges.

The Jackson Hole valley is approximately 128 kilometers long and 24 kilometers wide and encompasses national forest, Grand Teton National Park, and the National Elk Refuge. Jackson Hole also contains most of Teton County’s private lands. Prior to European settlement, the area was inhabited by the Crow and Shoshone tribes. The valley was named for fur trapper Davey Jackson in the early 1800s and Jackson Hole was a relatively unsettled crossroads for mountain men until the first permanent European residents arrived in 1883. The valley was settled mainly by ranching families. As the beef industry expanded, the large elk herd that roamed the valley began competing with cattle for hay supplies. In 1910, the federal government bought 9,840 hectares north of
the town of Jackson to keep the elk herd from starving in the winter and to help preserve the ranching lifestyle in Jackson Hole. This area is now known as the National Elk Refuge and supports over 7,000 elk during the winter.

Tourism began early in Jackson Hole as ranchers supplemented their income by dude ranching. The valley became known for big game hunting and ranchers often took guests and offered guide services. Jackson Hole became a vacation destination for fishermen, horseback riders and hunters, and tourism began to replace cattle ranching as the county economic base. Additional tourism was facilitated when the Teton Mountains were designated as a national monument in 1929 and additional land was added in 1950 to create Grand Teton National Park. In 1967, Teton County joined the ranks of destination ski and summer resorts with the opening of Jackson Hole Mountain Resort.

Teton County is now known internationally as a tourist destination, attracting outdoor enthusiasts in both the summer and winter. The resident population increased by 95 percent between 1980 and 2000. In 1997, ranching and farming accounted for less than one percent of the economic make-up of the county, while jobs in the entertainment and recreation services sector increased from three percent to 24 percent of total county jobs in a five year period. Between 1992 and 1997, the area of land in farms dropped by 16 percent (United States Department of Agriculture 1997). While this number has declined, ranches and farms still comprise a large percentage of the privately owned lands throughout the county, and the rural ranching character of Teton County and the Town of Jackson is seen as vitally important. Residents and tourists value working ranch lands for
their contribution to the “Old West” character of the county and for the scenic views, open space, and wildlife habitat that ranches provide.

General comparison data for each study community are contained in Table 2. Historically, Blaine County, Idaho, Summit County, Utah, and Summit County, Colorado were settled as mining communities and suffered from boom and bust economic and population cycles. Gallatin County, Montana was settled both by miners and farmers, whereas Teton County, Wyoming was settled by ranching families. This agricultural history largely spared these later two counties from a widely fluctuating economic and population base through most of the past century. Although all counties turned to farming and ranching as mining declined, the influence of agriculture declined in Teton County, Blaine County, and Summit County, Colorado. The amount of land in agriculture increased in Gallatin County and Summit County, Utah, but both of these counties also experienced the increase in recreation and service based industries as well as accelerated rates of rural land subdivision.

Three other categories of differences were evident between these counties: amount of public land, proximity to a large city, and the overall rate of growth. Teton County has the most public land at 97 percent. Summit County, Colorado and Blaine County have a similar amount of public land at about 80 percent, and Gallatin County and Summit County, Utah have the least public land at 50 percent and 45 percent respectively. In terms of proximity to a large city, Summit County, Utah and Summit County, Colorado are close enough to the capitols of their respective states (both large metropolitan areas of more than a million people) to make a daily commute to urban
<table>
<thead>
<tr>
<th>Comparative statistic</th>
<th>Blaine County, Idaho</th>
<th>Gallatin County, Montana</th>
<th>Study county</th>
<th>Summit County, Colorado</th>
<th>Summit County, Utah</th>
<th>Teton County, Wyoming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area (square kilometers)</td>
<td>6,850</td>
<td>6,739</td>
<td>1,575</td>
<td>4,846</td>
<td>10,360</td>
<td></td>
</tr>
<tr>
<td>County area in public lands (percentage)</td>
<td>81</td>
<td>48</td>
<td>81</td>
<td>45</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>County area in private lands (percentage)</td>
<td>19</td>
<td>52</td>
<td>19</td>
<td>55</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Private land in agriculture (percentage)</td>
<td>12</td>
<td>45</td>
<td>8</td>
<td>49</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Average precipitation (centimeters)</td>
<td>38</td>
<td>86</td>
<td>41</td>
<td>41</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>Average high temperature range winter to summer (degrees C)</td>
<td>-5 to 26</td>
<td>0 to 24</td>
<td>-2 to 23</td>
<td>2 to 30</td>
<td>2 to 26</td>
<td></td>
</tr>
<tr>
<td>Increase in service sector jobs 1990 -1997 (percentage)</td>
<td>11</td>
<td>12</td>
<td>25</td>
<td>12</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

* Sources: United States Department of Agriculture 1997 and United States Census Bureau 2000
employment feasible. The other three counties are all more than 160 kilometers from their capitol or any other large city. Finally, in terms of population growth, all the counties experienced rapid population increases between 1980 and 2000. Summit County, Utah grew most rapidly at 241 percent, followed by Summit County, Colorado at 166 percent. Teton County and Blaine County grew at similar rates of 95 and 92 percent respectively. Of the five study counties, Gallatin grew the least rapidly at 52 percent.

Despite these differences, all five counties have much in common. First and most obviously, they are all located geographically in the central and northern Rocky Mountain West. They have topography ranging from mountain peaks to alpine valleys and meadows, and they have a similar climate in terms of temperature and rainfall. The one exception is Gallatin County, which is slightly warmer and has more than twice as much rainfall as any of the other counties. This may help account for the greater continuing emphasis on agriculture. All of the counties contain meandering streams and rivers and are dotted with lakes. All contain one or more major destination ski resorts. Additionally, all study counties have more social and cultural amenities than are normally found in a rural area largely due to the high levels of tourism found in these areas. These natural, recreational, social and cultural amenities have attracted thousands of residents and tourists to these counties.
METHODS

Land use planning documents for each of the five counties were collected in 2002 and examined to determine the type of policies, regulations and other tools used by the local jurisdictions to preserve open space. Documents collected included comprehensive or master plans, zoning codes and subdivision ordinances (Table 3). I used content analysis to examine each of the documents.

Content analysis is a social research methodology used for analyzing the content of large volumes of data, including documents, in a systematic fashion (Stemler 2001). Singleton and Straits (1999) described content analysis as consisting of four major steps: (1) defining the content categories, (2) defining a unit of analysis, (3) establishing a system of enumeration and (4) relating categories to each other or other data.

To evaluate the planning documents, I developed a content analysis protocol and plan evaluation form. The content categories were defined as the land use planning policies, techniques or tools often used with the intent to preserve open space. The units of analysis included the stated goals and regulations within planning documents for each community. Each document was analyzed to determine which policies were included and the specificity of each one. I chose the policies, techniques and tools by examining smart growth implementation policies (Smart Growth Network 2002) and by reviewing policies and regulations discussed in open space preservation literature (Duerksen and VanHemert 2003, Tallen and Knapp 2003, Brody et al. 2006). Similar to the plan evaluations done by Brody (2003) and Edwards and Haines (2007), I evaluated
Table 3. Planning documents reviewed and interview respondents by county

<table>
<thead>
<tr>
<th>Study county</th>
<th>Number of interview respondents</th>
<th>Planning documents reviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blaine County, ID</td>
<td>14</td>
<td>Blaine County Code Title 8: Comprehensive Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blaine County Code Title 9: Zoning Regulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blaine County Code Title 10: Subdivision Regulations</td>
</tr>
<tr>
<td>Gallatin County, MT</td>
<td>15</td>
<td>Gallatin County Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zoning District Regulations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>County Subdivision Regulations</td>
</tr>
<tr>
<td>Summit County, CO</td>
<td>20</td>
<td>Summit County Comprehensive Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summit County Development Code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summit County Ten Mile Master Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summit County Lower Blue Master Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Snake River Master Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Joint Upper Blue Master Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summit County Open Space Protection Plan</td>
</tr>
<tr>
<td>Summit County, UT</td>
<td>15</td>
<td>Synderville Basin General Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eastern Summit County General Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Snyderville Basin Development Code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Eastern Summit County Development Code</td>
</tr>
<tr>
<td>Teton County, WY</td>
<td>13</td>
<td>Jackson/Teton County Comprehensive Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teton County Land Development Regulations</td>
</tr>
</tbody>
</table>
each policy as being either action-oriented and specific, or general and non-action oriented. Policies were rated as action-oriented if the language used required an action such as *shall adopt* or were included as regulations in the zoning or subdivisions codes. Policies were rated as non-action oriented if the plan language suggested a course of action such as *encourage preservation* and no corresponding requirements were included in the zoning or subdivision codes. Policies were assigned a score of zero (0) if they were not present in the planning documents, a score of one (1) if they were present but not action-oriented, and a score of two (2) if they were present and action-oriented. Each policy received a score from zero to two based on its presence, absence and specificity for each study community. I summed the scores for each indicator and compared the scores to determine which indicators were most frequently and actively used in open space preservation.

Interviews were also conducted in 2002 with a total of 77 individuals throughout the five study counties (IRB #01-89). Interview respondents were selected in each county through a combination of purposive and snowballing sampling techniques (Singleton and Straits 1999). Respondents were initially chosen purposively by examining secondary data sources for people who were well informed on the research topic based on their work or community experience. The snowball technique was used to identify additional respondents based on knowledge gained from the initial interviews and from exploring the community, resulting in the total number of respondents for each county shown in Table 3. Respondents held community positions such as, but not limited to, community planners, planning commissioners, zoning board members, elected
officials, local environmental group representatives, journalists, attorneys, and
developers. Prior to conducting the interviews, respondents were informed of the
purpose of the study and guaranteed a level of anonymity.

Interviews were semi-structured and I asked how the communities were
attempting to preserve quality-of-life factors such as open space and how effective land
use planning tools and techniques were in responding to a loss of open space from rapid
population growth. Interviews ranged in length from 30 minutes to four hours, and were
recorded with a digital voice recorder. After files were downloaded to a notebook
computer, they were transcribed verbatim into Microsoft Word files and then imported
into the QSR NVivo qualitative analysis program.

QSR NVivo was used to perform content analysis on interview responses to open-
ended questions such as, “What is the general framework of land use planning?” and
“Overall, do the policies in place protect/preserve community quality-of-life in relation to
natural resources protection and open space?” The content categories consisted of land
use planning policies, techniques or tools often used with the intent to preserve open
space which emerged from coding the interview responses (Singleton and Straits 1999).
The frequency of discussion of those tools and techniques across the interviews was
calculated as a percentage of total number of interviews. Responses were further coded
into four categories regarding the effectiveness of the tools and techniques. The
categories included (1) very effective, (2) somewhat effective, (3) not very affective, and
(4) effectiveness not assessed. Responses were included under ‘very effective’ if they
included language such as: do a lot of good, drastically reduce development, very
instrumental, and other general or specific statements regarding the positive nature of the tool or technique. The category of ‘somewhat effective’ included responses such as: cannot protect everything, lacks enforcement, has helped some, and other statements that reflect both a positive and negative relating to the tool or technique. Responses were included in the category of ‘not very effective’ when they included language such as: doesn’t work, has failed, or doesn’t prevent development, and responses were included in ‘effectiveness not assessed’ when the respondent discussed a particular land use tool or technique used in open space preservation but did not assess its effectiveness.
RESULTS

Document Content Analysis

The types and number of land use documents collected differed for each community. Blaine County, Teton County, and Gallatin County each had a comprehensive plan that was the governing document for the entire county. Blaine and Teton Counties also had one zoning and subdivision code for the entire county. Gallatin County was unique among the study communities as they were the only one without county-wide zoning. There were 16 separate zoning districts within Gallatin County, each with its own zoning regulations. However, the vast majority of the county lacked zoning. Summit County, Colorado had a county-wide master plan, but had four sub-area plans that provided additional detailed goals and policies for specific sub-basins of the county. In this case, the entire county was controlled by a unified land use and development code. Summit County, Utah was divided into the Snyderville Basin Planning District and the East Summit County Planning District. Each district had a separate master plan and development regulations.

The most frequently present and specifically implemented open space preservation tools and techniques within the planning documents of the study communities were: (1) agricultural, ranch or open space zoning, (2) cluster subdivisions or planned unit developments, generally paired with density bonuses, (3) natural resource zones or overlay districts, (4) requiring buffers around wetlands, lakes and streams, (5) restricting development on steep slopes, (6) conservation easements and fee simple...
purchase, and (7) creating a trail network. Other commonly used land use tools included, inter-jurisdictional preservation partnerships, large minimum lot size, transfer of development rights programs and requiring open space dedication. The tools used with the least frequency and specificity included educational programs, partnering with non-governmental organizations to acquire land and preferential tax treatments (Table 4).

Agricultural, ranch or open space zoning districts often set large minimum lot sizes and restrict the types of development allowed within a district (Smart Growth Network 2002). These tools were identified as mechanisms to preserve open space in all of the planning policy documents and were implemented through the zoning codes of each county.

Summit County, Utah established agricultural and ranching zoning districts with 40 acre, 100 acre and 120 acre minimum lot sizes and restricted uses to agriculture, ranching, open space and single family homes. Blaine County and Summit County, Colorado utilized agricultural zoning areas of 20 and(or) 40 acre minimum lot size. Uses in these zones were restricted to agriculture, open space recreation, wildlife and single family homes. Similarly, Teton County authorities established a rural district classification with a minimum lot area of 35 acres and uses restricted to agriculture, ranching, and single family homes. Gallatin County established agricultural, forestry, rural residential and wildlife zoning districts in eight of the 16 zoned districts within the county. Minimum lot sizes in the various districts ranged from 40 to 160 acres and uses were restricted to agriculture, ranching, timber production, open space and single family homes.

Cluster subdivision provisions were generally paired with a density bonus incentive found specifically in the zoning or subdivision code of the study communities.
Table 4. Land use planning tools or techniques and plan evaluation score

<table>
<thead>
<tr>
<th>Land use planning tool or technique</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural/ranch/open space zoning</td>
<td>10</td>
</tr>
<tr>
<td>Cluster subdivision</td>
<td>10</td>
</tr>
<tr>
<td>Density bonuses</td>
<td>9</td>
</tr>
<tr>
<td>Natural resource zones/overlay districts</td>
<td>9</td>
</tr>
<tr>
<td>Establish buffers around wetlands and natural water bodies</td>
<td>9</td>
</tr>
<tr>
<td>Restrict development on steep slopes</td>
<td>8</td>
</tr>
<tr>
<td>Create network of trails and greenways</td>
<td>7</td>
</tr>
<tr>
<td>Conservation easements and fee simple purchase</td>
<td>7</td>
</tr>
<tr>
<td>Inter-jurisdictional preservation partnerships</td>
<td>6</td>
</tr>
<tr>
<td>Transfer of development rights</td>
<td>5</td>
</tr>
<tr>
<td>Require open space dedication</td>
<td>5</td>
</tr>
<tr>
<td>Educational programs</td>
<td>4</td>
</tr>
<tr>
<td>Partner with NGOs to acquire and protect land</td>
<td>3</td>
</tr>
<tr>
<td>Preferential tax treatments</td>
<td>3</td>
</tr>
</tbody>
</table>
Cluster subdivision and density bonuses allow flexibility in minimum lot size requirements and additional development sites in exchange for open space preservation (Platt 1996). Cluster subdivisions generally paired with density bonuses were also found in all the study communities. Gallatin County was the only study community that did not provide for density bonuses. Planned unit developments were allowed under the Gallatin County subdivision code and encouraged in the general plan to preserve open space and agricultural lands, but since Gallatin County had no county-wide zoning, density bonuses were not included as an incentive.

Teton County was representative of how cluster subdivisions were used by the other four counties. The Jackson / Teton County Comprehensive Plan included the recommended regulatory action of creating a system of incentives and requirements for clustered development for natural resource protection. The development regulations then implemented the recommended regulatory action by including requirements for increased open space dedication in exchange for increased development density in planned residential developments.

While cluster subdivisions can protect open space within specific parcels being developed, natural resource protection zones or overlays generally provide additional protective regulations to preserve the natural resource of concern (Smart Growth Network 2002). All study communities addressed the protection of key natural resources in their comprehensive plans, including scenic views, highway view corridors, wetland and streams, and wildlife habitat areas. Blaine County and Teton County had overlays for view protection on hillsides and along highway corridors. Summit County, Utah
authorities established a Sensitive Lands zone district to protect steep slopes, wetlands and flood plain areas. Teton County and Summit County, Colorado had overlays for the protection of wildlife habitat areas. Gallatin County planning documents contained policies that encouraged the preservation of open space, wildlife habitat and agricultural lands. However, these policies were not action-oriented or specific and were not implemented county-wide through zoning, overlays or other regulatory processes.

In addition to more general overlays for natural and scenic resource protection, all of the study community plans also included policies for the protection of wetlands, lakes and streams in their comprehensive plan documents. Requiring buffers around wetlands, lakes and streams has been used to provide additional protective regulations or prohibit development within these areas (Edward and Haines 2007). All of the communities except Gallatin County had specific requirements for buffering these systems from developmental impacts. Teton County had the most restrictive standards for protection of wetlands and streams, requiring a minimum set-back of 150 feet from rivers, 50 feet from all streams and 30 feet from wetlands. Summit County, Utah restricted development of structures within 40 feet of a wetland and 100 feet of a perennial stream or lake. Summit County, Colorado and Blaine County established a 25-foot minimum buffer around all wetlands. Gallatin County commissioners established a policy intended to minimize adverse impacts of development on rivers, streams and riparian areas by encouraging development to demonstrate the adequacy of setbacks and buffers. However, the policy did not provide guidance as to what might be considered adequate.
The next three most commonly and specifically used techniques were: restricting development on steep slopes, conservation easements and fee simple purchase, and creating a network of trails and greenways. Policy statements within the planning documents generally indicated that limiting development on steep slopes would protect scenic mountain vistas, prevent the overcrowding of backcountry areas, and reduce impacts of erosion and mountain scaring from access roadways. Conservation easements, which involve the removal of development rights from a property either through donation or purchase of these rights (Wright 1994) or fee simple purchase were used to protect key open space areas within the communities. Trails and greenways helped to maintain wildlife corridors and recreation opportunities.

All of the study communities except Gallatin County had policies within their master plan documents and regulations in their zoning or subdivision codes to limit development on steep slopes. Blaine County had a mountain overlay zone which decreased the allowable base density in areas where slopes exceeded 25 percent to one dwelling per 160 acres outside urban influence areas and one dwelling per 40 acres inside urban influence areas. Summit County, Colorado zoning regulations restricted development on slopes over 30 percent in grade within certain area of the Upper Blue Basin. Summit County, Utah’s sensitive lands zone included all lands with slopes of 30 percent or greater and had a minimum lot size of one unit per 40 acres to reduce the amount of development that could occur on the slopes. Teton County had specific development regulations that reduced the allowed density on a parcel of land in
proportion to the extent of steep slopes on the site. Only Gallatin County planning documents lacked policies and regulations for the protection of steep slope areas.

Regulations to move development off of steep slopes can help these areas, but the most certain method of preventing development in sensitive areas is to purchase it. In four of the study communities fee simple purchase of property was discussed as an open space protection strategy. Summit County, Colorado and Gallatin County authorities created funded open space acquisition programs. In Summit County, Colorado a real estate property tax was implemented, half of which was dedicated to the protection and acquisition of open space. The tax raised approximately 750,000 dollars per year. Gallatin County voters passed an open space bond measure to raise ten million dollars to be used for preserving open space by purchasing land and conservation easements.

Conservation easements were cited as important mechanisms for removing development potential from open space areas by all of the study communities. Conservation easements were generally cited within the plans and policies as a tool to be used with other open space protection techniques such as cooperative agreements with local land trust programs or open space acquisition programs. Teton County and Summit County, Utah documents referenced conservation easements as a tool that can be used in cooperative agreements with local land trusts. Gallatin County planning documents contained policies indicating that the purchase of conservation easements was an integral part of its open space acquisition plan. Summit County, Colorado and Blaine County documents included policies on the use of conservation easements as stand-alone mechanisms to reduce allowable development density and protect important natural
resources. Although all the study communities had policies regarding the use of conservation easements, only Summit County, Colorado and Gallatin County had specific programs in place for the purchase and management of open space conservation easements through their open space acquisition programs.

All study communities also had policies for the creation and maintenance of trail systems. Each county had a trails plan but these plans were generally not adopted through ordinances. The plans were maintained and implemented by parks and recreation departments rather than a planning department. Summit County, Colorado was unique in requiring trail dedication through the subdivision process. Planning documents contained goals and policies for developing a network of interconnected trails and for requiring dedication of trails identified for public use. The policies were implemented through the subdivision code and by a separate Open Space and Trails Department. Teton County planning documents contained references to maintaining the connection of trail heads to public lands but did not have any incentive or regulatory mechanisms in place. Summit County, Utah and Gallatin County planning documents had references to maintaining a trail network between developments and encouraging development to comply with established trail plans but did not contain specific policies or regulations to ensure implementation or compliance with the plans. Blaine County plans included policy language to support continued development of an established county-wide trail system managed largely by the Parks and Recreation Department.

The six remaining open space preservation tools and techniques were addressed to a lesser degree overall in the planning documents of the five study counties. However,
some of the open space policies and tools were used specifically by certain communities. Inter-jurisdictional preservation partnerships were present in Summit County, Colorado and Teton County. Although all communities except Teton County discussed transfer of development rights programs, only Summit County, Colorado had a transfer of development rights program in place. Only Teton and Blaine Counties required open space dedication with land subdivision in certain areas and only Blaine and Gallatin Counties had active open space education programs in place. Both preferential tax treatments and partnering with non-governmental organizations were discussed in planning documents of three study counties, but neither was specifically incorporated into policies or regulations.

Inter-jurisdictional preservation partnerships were established in Summit County, Colorado and Teton County. Summit County, Colorado worked with the towns of Breckenridge and Blue River to create the Joint Upper Blue Master Plan. One of the primary goals of the plan was to preserve the natural resources and undeveloped character of rural and backcountry areas within the Upper Blue Basin. Teton County and the Town of Jackson developed the Jackson / Teton County Comprehensive Plan, a joint planning document between the county and town which also had a primary goal of preserving the natural resources key to maintaining quality of life in both jurisdictions. Summit County, Utah and Blaine County each had policy statements in their respective comprehensive plans related to maintaining inter-jurisdictional partnerships. However, neither of these communities had specific policies or codes indicating how cooperation or
partnerships should occur. There were no specific joint planning efforts or areas indicated in Gallatin County planning documents.

All of the study communities except Teton County had policies referencing transfer of development rights programs. The transfer of development rights involves selling or trading one parcel's development rights to another parcel, which reduces or eliminates development on the first parcel and allows more development on the second parcel (Johnston and Madison 1997). Although all counties discussed transfer of development rights programs, only Summit County, Colorado had an active transfer of development rights program established to protect open space areas. The voluntary transfer of development rights program created regulations for transferring development density out of backcountry and rural areas and into the towns.

Summit County, Utah established a comprehensive plan policy which required the creation of a transfer of development rights program. The policy indicated that the program should promote the transfer of development rights from important scenic and natural resource areas to areas of existing development. However, the plan did not provide any guidance on how to implement the transfer of development rights program and the zoning and subdivision codes did not contain any regulations for implementing such a program. Gallatin County and Blaine County comprehensive plan documents included references to transfer of development rights programs as well, but only to encourage or evaluate such programs.

Only Teton County and Blaine County required new developments to dedicate certain percentages of the development area as open space. Teton County required
developments located within their Rural Zone District to provide either 50 or 70 percent of the land as open space depending on the development area. Teton County also had open space requirements that increased in proportion to requested density increases in planned unit developments. Blaine County also required open space dedication in planned unit developments with a requirement for either 20 or 50 percent of the land dedicated as open space depending on the zone district in which the Planned Unit Development was proposed.

While Teton County documents had policies to encourage open space education programs, only Gallatin and Blaine Counties had specific policies to implement educational programs. Gallatin County created an educational program for the public on techniques available to protect open space and keep land in agriculture. The Blaine County plan contained a policy indicating that the County would provide education to promote the identification and proper management of wetlands, the financial advantage of donating easements or land, and the community-wide benefits of open space. Teton County’s master plan contained policies to encourage the creation of a program to educate residents on ways to minimize potential conflicts between ranching operations and residential developments. However, there was no specific program required or implemented through the plan or supporting documents. Summit County, Colorado and Summit County, Utah documents did not contain policies or codes on providing public education on the preservation of open space or natural resources.

Two study communities had plan policies to promote partnership with non-governmental organizations, specifically land trusts, in the preservation of open space.
Summit County, Colorado created a cooperative partnership with citizens, community organizations and private land trusts to acquire and protect key open space areas. Summit County, Utah planning documents had policies that encouraged cooperation with the Utah Land Trust and other non-governmental organizations to evaluate benefits of acquiring conservation easements to preserve agricultural lands and open space. Teton County planning documents indicated that land trusts have been effective in preserving natural resources, but did not have any policies for partnering with land trusts. Gallatin and Blaine County documents did not discuss partnering with non-governmental organizations.

Preferential tax treatments generally involve reducing or deferring payment of property taxes on agricultural land (Platt 1996). Blaine County and Summit County, Colorado comprehensive plans both included policies that discussed tax incentives for property owners who voluntarily placed their land under conservation easements. The Blaine County plan discussed how tax incentives worked indicating that a conservation easement could eliminate all or part of the land's development potential and property taxes were then based on the difference in the value of the property before and after the grant of the easement. Teton County documents included a discussion of preferential tax treatments for agricultural land, indicating that agricultural operations did not pay property taxes on the market value of land upon which they were located in an effort to promote the retention of agricultural uses. Gallatin County and Summit County, Utah documents did not contain references to preferential tax treatments.
Overall, decision makers in each study county expressed a desire to preserve and protect open space as a key natural resource amenity in their community through their planning policies. The key types of open space identified in the communities included scenic mountain vistas and view corridors, wildlife habitat areas, wetlands and streams, and agricultural and ranch lands. Each study county used a unique mix of land use planning policies and techniques to protect these areas, with the most commonly used techniques being provided through the zoning and subdivision codes including: (1) agricultural, ranch or open space zoning districts, (2) cluster subdivisions and density bonuses, and (3) requiring buffers around wetlands and streams. Zoning and subdivision regulations supported policies in the counties’ comprehensive or master plan documents.

**Land Use Planning Techniques and Their Effectiveness in Preserving Open Space**

The three most common land use planning techniques mentioned by interview respondents in association with the preservation (or lack of preservation) of open space were: (1) zoning ordinances, (2) out-right purchase of property, and (3) transfer of development rights. The responses regarding zoning ordinances were further refined into four types of zoning ordinance: (1) overlays or ordinances to protect natural and aesthetic resources, (2) agricultural zoning ordinances, (3) clustering and(or) density bonuses, and (4) wetland or stream protection ordinances. Although not always integrated with local jurisdictions as a land use planning technique, the use of land trusts was also frequently mentioned as a tool for preserving open space and natural amenities. Many respondents also discussed the roll of comprehensive plans in the preservation of
open space. Although comprehensive plans were not seen as a specific tool or technique implemented for open space preservation, these plans stated a vision for the community and created open space preservation policies that were implemented through land use planning tools and techniques.

Many respondents who discussed a particular land use tool or technique also indicated how effective that tool or technique had been in the preservation of open space. The most effective tools and techniques identified by respondents were outright purchase of property, land trusts, transfer of development rights and overlays or ordinances to protect natural and aesthetic resources. Wetland and stream protection ordinances, clustering development with density bonuses, and agricultural zoning ordinances were generally considered less effective. Respondents also indicated that comprehensive plans had been somewhat effective in creating a policy framework for the implementation of open space protection tools and techniques (Table 5).

The land use planning tools most frequently discussed in association with the preservation of open space were zoning ordinances. The most commonly mentioned zoning tools were overlays to protect natural and aesthetic resources. Respondents from Blaine County, Teton County, and Summit County, Utah spoke of specific ordinances in their communities. The overlays and ordinances mentioned included: the mountain, scenic, and natural resource overlays, and the sensitive lands ordinance.

In Blaine County, respondents discussed the success of the mountain overlay district in preserving environmental resources. A majority of respondents from both Blaine County and Teton County who discussed scenic overlays indicated they were
Table 5. Land use tools or techniques most frequently identified by interview respondents and the perceived effectiveness of those tools or techniques on the preservation of open space.

<table>
<thead>
<tr>
<th>Land use planning tool or technique</th>
<th>Frequency of discussion*</th>
<th>Effective</th>
<th>Somewhat effective</th>
<th>Not very effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoning ordinances</td>
<td>84%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overlays or ordinances to protect natural and aesthetic resources</td>
<td>29%</td>
<td>50%</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Agricultural zoning ordinances</td>
<td>27%</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Clustering and/or density bonuses</td>
<td>25%</td>
<td>13%</td>
<td>63%</td>
<td>25%</td>
</tr>
<tr>
<td>Wetland or stream protection ordinances</td>
<td>16%</td>
<td>44%</td>
<td>22%</td>
<td>33%</td>
</tr>
<tr>
<td>Outright purchase of property</td>
<td>45%</td>
<td>84%</td>
<td>16%</td>
<td>0%</td>
</tr>
<tr>
<td>Transfer of development rights</td>
<td>38%</td>
<td>73%</td>
<td>20%</td>
<td>7%</td>
</tr>
<tr>
<td>Land trusts</td>
<td>27%</td>
<td>79%</td>
<td>21%</td>
<td>0%</td>
</tr>
<tr>
<td>Comprehensive/ master plans**</td>
<td>58%</td>
<td>12%</td>
<td>81%</td>
<td>7%</td>
</tr>
</tbody>
</table>

* 77 total interviews

**A comprehensive/ master plan is not a land use tool or technique specifically used for the preservation of open space. However, it creates a policy framework for implementing preservation tools and techniques.
effective in preserving valued open vistas. Similar to the scenic overlays in Blaine County and Teton County, Summit County, Utah had a sensitive lands ordinance in place. All respondents from Summit County, Utah who discussed the sensitive lands ordinance stated that it had been effective in limiting development. In contrast to these comments, one Blaine County journalist indicated that the effectiveness of the scenic overlay was being eroded by development pressures. A Teton County planner valued the existing scenic overlay but acknowledged that its effectiveness was impaired by a lack of enforcement.

Teton County also had a natural resources overlay. While most respondents from Teton County agreed that the vision behind the natural resources overlay was on target, they saw the actual policy as less than effective. For example, an environmental group representative and a planner stated that while the overlay encouraged development to be sited outside the overlay zone, the lack of development prohibitions removed any ability to truly protect these areas. Another planner indicated that the overlay failed to address cumulative effects of development.

In addition to overlays for the protection of natural and aesthetic resources, respondents commonly cited agricultural zoning as a tool for protection of open spaces. Agricultural zoning is typically thought of as zoning that restricts the allowed uses of a parcel of land to activities associated with agricultural production. Summit County, Colorado and Blaine County, Idaho had agricultural zoning districts with a 20 acre minimum lot size. Most respondents agreed that this was not working to preserve agricultural lands, primarily because the lot sizes were too small given the increased
ability of individuals to afford large parcels for single-family residential developments. One planner from Blaine County stated that agricultural lands were protected not by the 20 acre minimum zone district, but by a political resistance to allow subdivision, even though subdividing was technically legal. A journalist from Blaine County stated that agricultural zoning was not effective in preserving agriculture and had actually made it possible for the development of large-parcel ranchette estates. This indicated that larger minimum lot sizes might better protect agriculture, but that in resort areas, people are willing and economically able to purchase large lots for ranchette and estate development rather than primarily for agriculture. Most respondents who discussed agricultural zoning indicated that the minimum lot sizes were not large enough to effectively protect agricultural lands. Even in cases where the minimum lot size was much larger than normal, there had been ranchette and estate development. Although 50 percent of respondents acknowledged that agricultural zoning had not been very effective in preserving open space and agricultural lands, a few suggested that combining agricultural zoning with other land use techniques such as clustering of development might be more effective.

Clustering of development and density bonuses were often considered tools that could be used in conjunction with zoning to preserve open spaces. A planner from Summit County, Utah described their clustering regulations as an effective tool for preserving open space, since it allowed development to be moved off of hillsides into a cluster development at the base of slopes and provided a density bonus in exchange for the open space preservation. Although it had not been adopted in his county, a developer
from Gallatin County indicated that clustering was a technique with a lot of support in his community, but stated that it would be challenging to make it work and convince developers that it was an economically viable option. A Teton County environmental group representative thought that very few people there used the cluster ordinance in place because developers could make greater profit by selling standard large lots with single family homes.

Respondents from several study counties indicated that clustering and density bonuses were viable protection strategies, but that the regulations to implement these techniques were too arduous and density bonuses too few to create the needed economic incentive. They thought that many developers would pass up this option in favor of traditional subdivisions. While respondents in all counties recognized cluster developments and density bonuses as potential tools for protecting open space, a majority of respondents indicated that these techniques were only somewhat effective and 25 percent of respondents indicated clustering development was not very effective since there was little real incentive for developers to use this option.

A final tool mentioned in conjunction with zoning regulations was the protection of wetlands, riparian areas, and stream corridors through mandatory buffers. More than 65 percent of respondents indicated that their community had effective or somewhat effective regulations in place to protect these natural resources. However, one-third of respondents acknowledged that while wetland protection regulations were in place, exceptions in the regulations and insufficient enforcement made this protection strategy ineffective.
After zoning ordinances, the most frequently discussed open space protection technique was the outright purchase of property. Some communities combined regulatory actions and fund raising programs to purchase key open space areas outright. Summit County, Colorado, and Gallatin County passed bonds or tax initiatives to raise money for open space preservation. More than 80 percent of respondents who discussed outright purchase of property as an open space protection strategy indicated that it was effective in preserving key open space areas.

While Blaine County and Teton County did not have publically sponsored dedicated open space acquisition funds or programs, many respondents discussed these programs as useful open space preservation tools. Respondents from Teton County indicated that a sales tax program, one-sixth of which could be used to purchase open space, was not sufficient because it did not create a dedicated fund for open space purchases. A number of Blaine County respondents talked about an attempt to pass an open space bond that had failed. One respondent stated that the failure was due to the large amount of public lands that many in the community see as permanently protected open space.

Although most respondents in communities with open space purchasing programs indicated that the programs were very valuable, those who stated that they were only somewhat effective indicated that they were adequate only in protecting key parcels of land and were not sufficient to protect all valuable open spaces. For example, a Summit County, Colorado attorney stated that the high price of property in resort communities quickly depleted the money raised for open space protection, but also indicated that some
protection was better than none at all. Many respondents indicated that open space purchasing programs needed to be coupled with other regulatory measures to ensure the preservation of open space.

Similar to outright purchase of property, the transfer of development rights from a property identified for preservation to a property more appropriate for development was identified as another method to preserve valued open space. Respondents from each study community discussed the implementation of transfer of development rights programs and the potential effectiveness of such programs.

More than 70 percent of respondents who discussed the effectiveness of transfer of development rights programs indicated they had been effective in preserving open spaces. The majority of respondents who discussed transfer of development rights and their effectiveness were from Summit County, Colorado, and Summit County, Utah where successful transfer of development rights programs had been implemented. A Summit County, Colorado planner indicated that the transfer of development rights program was likely one of the most successful in the country. He explained that the transfer of developments rights program, coupled with the open space purchase program, allowed the county to buy backcountry parcels, sell the development rights to recover some of the money and then trade those parcels to the Forest Service in exchange for parcels closer to urban areas which were more suitable for development.

A number of respondents from other counties stated that transfer of development rights programs could be useful tools in preserving open space, but there were a number of difficulties to overcome in creating a successful program. A Blaine County elected
official commented on the difficulties that can arise between counties and cities as transfer of development rights programs often attempt to remove density from more rural areas of a county and direct it toward cities where services are available. Another Blaine County elected official commented on citizen resistance to increasing density in their backyards which was echoed by an appraiser from Teton County. A Gallatin County planner commented on the difficulty of instituting a transfer of development rights program without having county-wide zoning.

Despite these difficulties, many respondents indicated that a well-designed transfer of development rights program might be effective in preserving open space and that the formation of transfer of development rights programs was a worthy pursuit. All of the study communities either had transfer of development rights programs in place or were attempting to overcome the difficulties mentioned by respondents to implement a transfer of development rights program.

The final open space preservation tool discussed by respondents was the use of land trusts. Although not traditionally considered a land use planning technique, almost 80 percent of respondents considered local land trusts a viable and effective tool in the preservation of key open space parcels. In Blaine County, which did not have an open space acquisition program or a transfer of development rights program in place, many respondents noted that land trusts filled a vital gap by acquiring valuable pieces of open space. A number of respondents noted that one of the difficulties faced by local land trusts was the increasing cost of land. However, a Teton County environmental group representative said that along with the increase in land prices came an influx of wealthy
individuals who were either willing to donate their conservation easements or donate money for the purchase of open space.

Over 50 percent of respondents also discussed the role of comprehensive plans in the preservation of open space. Comprehensive plans were considered a policy document that stated the community vision for growth and open space preservation, rather than a specific land use tool or technique for preserving open space. However, respondents indicated that the strength of policy language within a comprehensive plan influenced the effectiveness of open space preservation tools and techniques implemented through land use regulations. In addition, the comprehensive plan was used to actively manage development and promote open space protection in Gallatin County, where zoning had not been implemented county wide.

Most respondents from Gallatin County, where zoning had been implemented only in certain districts, stated that their general plan was both the vision for the community and was an effective tool for protecting open space and preventing sprawling development. For example, one environmental group representative described how their general plan had been successfully used by the county commission as justification to limit development in rural areas. Another environmental group representative indicated that the general plan was used to deny specific sprawling development proposals, but public support for area-wide policies was lacking.

A majority of respondents from other study communities indicated that their comprehensive plan was somewhat effective because it contained a solid vision for the future, but that the vision in the plan had not been implemented effectively through
regulations. An elected official from Summit County, Colorado said that in addition to stating goals such as agricultural protection, a master plan must identify ways to meet those goals.

Generally, respondents identified comprehensive or master plans as effective in defining a community’s vision. However, to be effective in preserving open space or any other quality of life attribute, a plan had to set goals for implementing the community vision, lead to ordinances to protect that vision, and ultimately have those goals and ordinances enforced. More than 80 percent of respondents indicated that their plan lacked in one or more of these areas, making it only somewhat effective.

Overall, the open space protection strategies observed through evaluating the comprehensive plans, zoning and subdivision codes in each community corresponded with those identified by the interview respondents as the land use tools used to protect open space. While agricultural zoning and cluster development provisions with density bonuses were the most often used techniques within the counties and among the most frequently cited by interview respondents, most individuals indicated that these tools were less than effective at preserving open space or agricultural lands. The most widely used tools that were also deemed successful were zoning overlays for the protection of natural resources, although lack of specificity and enforcement still left room for improvement. The less commonly used and often more complex tools such as transfer of development rights and open space acquisition programs were considered very effective in preserving open space. However, many respondents acknowledged that these tools alone were not sufficient to preserve open space on a large scale.
DISCUSSION

This study set out to explore whether land use planning policies in high amenity communities in the Rocky Mountain West have been effective in protecting open space resources in the face of rapid population growth and land subdivision. Results suggest that such policies can indeed protect open space resources, with some important qualifications, as will be discussed below.

It has been shown that rural communities are often less sophisticated in the implementation of land use planning tools and techniques (King and Harris 1989). Edwards and Haines (2007) explored the implementation of land use tools in their study of cities, towns and rural counties in Wisconsin. They found that most of the tools and techniques associated with smart growth principles were lacking in the planning documents of rural counties. However, many of these counties had implemented smart growth tools that dealt specifically with the preservation of open space, scenic areas and agricultural land. Because rural counties differ from urban areas in characteristics such as size, appearance, economic base, attitudes about community characteristics and the collective vision for growth and development, planning methods must reflect these differences (Daniels 1999, Edwards and Haines 2007).

My results are similar to findings of Edwards and Haines (2007). Rapidly growing, rural high amenity counties are employing a sophisticated mix of land use techniques for the preservation of open space. The land use tools included a combination of traditional land use planning policies and techniques such as comprehensive plans and
zoning ordinances and more complex techniques such as resource-protection overlay zoning, cluster development regulations, transfer of development rights, and programs for outright purchase of property. These results indicate that high amenity rural communities may have the resources and the need to implement more advanced tools and techniques to cope with the unique pressures of rapid development in a rural setting.

In the interviews, the most commonly mentioned techniques for protecting open space included zoning ordinances, out-right purchase of property, transfer of development rights programs, and land trusts. Techniques discussed by the interview respondents were consistent with the policies and tools identified through the planning document analysis, which demonstrates that the interview respondents had a thorough grasp of many of the open space protection strategies used by their communities. These open space protection strategies were very similar to the land use tools identified in the planning documents and discussed by individuals in Route County, Colorado, another rapidly growing high amenity rural county (Mitsch Bush 2000), supporting the conclusion that respondents in these rural communities have an advanced understanding of the tools available for open space preservation.

The four land use planning tools identified through the document content analysis that were not discussed by the interview respondents included: creation of trails and greenways, inter-jurisdictional preservation partnerships, required open space dedications, and educational programs. It is likely that respondents did not consider these preservation mechanisms as land use tools and techniques. In fact, of the four tools, only the requirement for an open space dedication was implemented through the zoning or
subdivision codes. The creation of trails and greenways, inter-jurisdictional preservation partnerships, and educational programs were discussed as policies in the counties’ comprehensive plans, but were not implemented as land use regulations. Although these policies were not considered as land use tools or techniques for open space protection by members of the community, these less traditional strategies can be included in planning documents and may add to the effectiveness of other policies and regulations (Daniels and Lapping 2005).

In their discussion of zoning ordinances, respondents focused less on what would be considered traditional zoning ordinances, and more on sophisticated techniques of open space protection including resource protection overlays, agricultural zoning, clustering provisions, and wetland/stream protection requirements. Resource protection zones or overlay districts and wetland/stream buffer requirements were described as more effective than clustering provisions or agricultural zoning districts.

Natural resource protection overlays or zoning districts and buffers around wetlands and streams have also been used effectively in other rural communities (Hasse and Lathrop 2003, Lynch and Liu 2007). Respondents who felt that buffering wetlands and streams from development had been ineffective cited a lack of enforcement as one of the primary problems with this technique. However, the effectiveness of any land use tool or technique depends heavily on the willingness and ability of the local jurisdiction to enforce the implementing regulations (Duerksen and VanHemert 2003, Watt et al. 2005). Thus, requiring buffers around wetlands and streams could provide an effective open space protection strategy if properly enforced.
Cluster development with or without density bonuses and agricultural zoning districts were viewed by respondents as somewhat effective or not very effective in the preservation of open space. In all study counties, clustering of development was allowed, with the incentive of density bonuses in some counties, but it was not required and respondents indicated there was little incentive for developers to use the clustering provisions. Cluster development and density bonuses have been noted as a tool to protect agricultural areas (Arendt 1999). However, Daniels (1997) found this tool promoted a suburban style of development that allowed residential construction while protecting some open space and rural character within a specific development site. Although cluster development may not protect agricultural lands, it could still be a useful tool in preserving larger open spaces that contribute to rural character if sufficient economic incentives are provided to convince developers to use this tool.

Agricultural zoning districts have been considered a primary tool for protecting a major portion of farmland in the United States (Coughlin 1991). This land protection technique was used in all study counties, but all respondents indicated it was somewhat or not very effective. A number of studies have shown that agricultural districts with minimum lot sizes less than 40 acres do not protect agricultural land from conversion to large lot single family homes or other types of commercial development (Nelson 1992, Daniels 2000b, Smith and Giraud 2006). Gallatin County and Summit County, Utah had agricultural zoning districts with minimum lot sizes larger than 40 acres, but Teton County, Blaine County and Summit County, Colorado had agricultural zoning districts
with minimum lot sizes ranging from 20 to 40 acres. To increase the effectiveness of agriculture zone districts, larger minimum lot sizes may be needed.

The outright purchase of property was described as an extremely effective means of preserving open space, with the important caveat that there will likely never be enough money available for communities to protect all of their desired open space in this manner. The rapidly-escalating price of land in these counties was cited as the main reason for this limitation. Gallatin County, Montana and Summit County, Colorado had publicly-run open space acquisition programs financed through voter-approved bond measures, and the other counties had attempted to create or were interested in creating such mechanisms in the future.

Summit County, Colorado and Summit County, Utah utilized transfer of development rights programs. Respondents in both of these counties said that despite the complexity of such programs, they were largely successful in protecting open space and encouraging more compact development in their counties. Respondents from the other three counties expressed interest in developing such programs, but discussed the difficulties in several past efforts to establish programs, especially finding appropriate sites to receive higher density due to negative reactions from adjacent property owners.

All study counties had active local land trusts. Teton County, Wyoming was the location of the first land trust established in the western United States. Land trusts were widely described by respondents as being very effective at preserving open space, especially due to their widespread use of conservation easements to purchase development rights on open space parcels, which stretched limited dollars much farther
than outright purchase programs. However, even with this advantage, many respondents noted that the rapidly-escalating land prices in these communities still limited this technique to being only a partial solution in protecting open space resources.

While the transfer of development rights, purchase of open space and conservation easements were frequently mentioned in land use planning documents and respondents indicated these programs were among the most successful at preserving open space areas, regulations to implement these techniques were uncommon. Recently, studies have shown that a mix of concentrated land preservation techniques such as sensitive land overlays, transfer of development rights programs, and outright purchase or conservations easements may be pivotal in the protection of open space areas (Lynch and Musser 2001, Daniels and Lapping 2005, Lynch and Liu 2007).

In addition to specific land use tools and techniques, respondents from all study counties noted that the creation of well-prepared, comprehensive/master plans that articulated a clear vision for protecting open space were a key to maintaining community quality of life. However, many respondents noted a disconnect between the vision and goals for protecting open space contained in their comprehensive/master plans and the strength of the zoning ordinances that were intended to implement those policy preferences. A commitment to planning for a common community vision through the creation of a master plan does not always mean that a community will be committed to the zoning or other regulatory methods required to implement that plan (Garkovich 1982). The ineffectiveness of agricultural zone districts could be one example of a lack of common commitment within some study counties. While members of the agricultural
community may want these areas protected, they may also want the option of future land
development and so oppose larger minimum lot sizes (Coughlin 1991).

Overall, respondents from these communities indicated there is no single land use
planning technique that has served to protect open space resources in these high amenity
counties. Taken individually, techniques such as agricultural zoning and cluster
development mechanisms have not been very effective in these communities and could
possibly be strengthened to provide more effective protection of open space resources.
However, a combination of land use planning techniques, perhaps with a greater focus on
open space preservation techniques such as transfer of development rights, outright
purchase and conservation easements could increase the overall effectiveness of open
space preservation efforts. Examining a combination of tools that can be tailored to the
vision of an individual community may serve other rural counties as they consider how to
protect open space resources in the face of increasing development pressures.
LITERATURE CITED


