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The societal value of ranchlands to Routt County residents, 1995-2005*

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More than 90% of resident survey respondents would vote to protect Routt county ranchlands.

Routt residents are willing-to-pay $220 per year to preserve ranchlands in the county.

The estimated value of ranchlands to current Routt residents is likely to be about $20-30 million.

The natural environment, ranchlands, and western historical preservation are the three most important contributors to local qualify of life in Routt County.

Contribution of ranchland to society

Routt County, Colorado is by all accounts a great place to live. The spectacular views, rural lifestyle, and year round recreational opportunities created by nature and the people who live there combine to make Routt County one of the fastest growing and wealthiest counties in the United States. However, economic growth is not without its challenges. Routt County, like many communities with outstanding natural and manmade characteristics, is grappling with managing its prosperity such that the very features that generated the growth are not lost due to it. Among the principal growth related concerns of county residents is the conversion of privately held farms and ranches on large tracts of land into rural residential properties, often called "ranchettes," "hobby farms" or even "McMansions" or "starter castles" when the residence is particularly large, that are on parcels typically too small to sustain a commercial agricultural operation in the high mountain valleys.

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* For a brief overview of the results of this study please see "The Value of Ranchland to Routt County Residents, 1995-2005" October 2005. EDR05-02. Department of Agricultural and Resource Economics, Colorado State University. For the complete study, please see the masters thesis entitled, "How Routt County Residents Value Ranch Open Space, 1995-2005," N. Magnan, 2005, Department of Agricultural and Resource Economics, Colorado State University.

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Ranches predominate private land use in Routt County and ranching has been an important part of the economy and culture of the county for well more than a century. Ranchland in Routt County may demonstrate a variety of desirable (i.e., valuable) attributes including: productive value (Barlowe, 1978, Pope, 1985), environmental value (Crosson, 1985, Loomis et al., 2000), rural cultural value (Crosson, 1985), recreational value (Loomis et al., 2000) and viewscape value (Willis and Garrod, 1993). However, only the values privately held by the potential buyers of ranchland are fully captured in its market price. Other valuable features of ranchland are reflected indirectly in the market (e.g., viewscape, recreation). For some very real and important broader societal values of ranchland (e.g., culture, environmental quality), market signals scarcely exist at all. Consequently, the market will undervalue the contribution of ranchland to society and market transactions will result in less ranchland than would be socially desirable.

In this study, we hope to estimate the public or societal benefits of Routt County ranchland that accrue to Routt County residents. This estimate will contribute to our understanding of the implications of local land use change and policies on local residents. However, it does not constitute a total economic valuation of the contribution of Routt County ranchland to society since it does not take into account its value to visitors, who may enjoy benefits from viewing these lands or recreating on them as residents do, and other nonresidents, who may benefit simply by knowing ranchlands exist and will continue to exist for future generations.

Economic valuation of ranchlands

Economists use a number of methods to generate a more accurate assessment of the value of agricultural land than the market provides. The contingent valuation method (CVM) is used in this study and has been used in many studies on the value of open space and agricultural landscapes (see McConnell and Walls, 2005, Racevskis et al., 2000). CVM uses surveys to find the amount people are willing to pay (WTP) to get or keep a specific good or service. In the case of ranch open space, respondents are asked what they are WTP to prevent it from being developed.

Rosenberger (1996) and Rosenberger and Walsh (1997) used CVM to find the value of ranch open space conservation to residents of Routt County, Colorado. These studies found that the mean household WTP for ranchland conservation was $182 (inflation adjusted). Income was not a factor in determining WTP for ranch open space in and around Steamboat Springs, but was for ranchland elsewhere in the county. The importance of ranch open space in each area was a factor of determining WTP for conservation in that area. Household size had a statistically significant impact on WTP in both areas but age only influenced WTP for ranch open space in and around Steamboat.

The survey used in this study is nearly identical to that used by Rosenberger (1996) and Rosenberger and Walsh (1997) in order to obtain time series data that allow for intertemporal comparisons for the value of ranch open space in Routt County. These studies confronted residents with a hypothetical referendum regarding ranch open space conservation. Residents were asked what the ideal amount of ranchland to conserve would be and if they would vote “yes” on a referendum to conserve that amount of ranchland. These questions were asked in that order to set up the CVM question that asked what dollar amount would be the highest they would have to pay and still vote “yes” on the referendum to conserve their chosen amount of ranch open space. Using time series data allows this study to find changes in residents’ likelihood to vote for the protection of ranch open space and their WTP for ranchland over the past decade. Furthermore, this study will be able to examine what changes in attitudes and demographics cause changes in likely voting behavior and WTP.

Agricultural land preservation in Routt County

In 1995, Routt residents passed a referendum to raise property taxes one mill for 10 yrs to protect agricultural lands and natural areas. In 1996, that tax generated nearly $400,000 and by 1995 the one mill levy was worth some $748,000 to the program. Over the 10 yr life of the program, the tax will raise an estimated $6 million for the preservation of rural lands in the county.

Although the county government has a variety of tools at its disposal (e.g., fee simple purchase, zoning), it has pursued a policy to purchase (or accept donation) of conservation easements (CEs), or development rights, from local landowners. The right to develop land can be separated from the right to own and use

the land by placing such an easement against the property. In a parallel fashion, local, regional and national private non-profit organizations (often called land trusts or conservancies) have participated in the purchase of development rights or the outright purchase of properties and donation of the development rights of agricultural lands in the county.

Currently, 40,000 acres of agricultural land are held under CEs. The largest holder of CEs in the county is the Yampa Valley Land Trust (YVLT), which holds CEs to 46 parcels of land totaling 23,000 acres. Other non-profit, non-government organizations that hold CEs in Routt County are The Nature Conservancy (TNC), American Farmland Trust (AFT), Trust for Public Lands (TPL) and the Elk Foundation. The county holds CEs to 12 parcels of land totaling 5,000 acres.

Procedures

The survey instrument was four pages and 23 questions. The survey was accompanied by a cover letter briefly explaining the importance of the study and the sampling procedure used. The survey had the Colorado State University logo in order to establish research objectivity and explained that the results would be used to plan future open space programs. Respondents were told they were randomly chosen from a list of registered voters and that their responses were confidential and anonymous. A postage paid envelope was included to encourage return of the survey.

Surveys were sent to 1,074 registered voters, 25 of which were returned as undeliverable. A postcard reminder followed the initial survey mailing 3 weeks after the first mailing and a second survey mailing followed the postcard by 3 weeks. The survey was implemented from August to October of 2004. A total of 459 surveys were returned, two of which were unusable, resulting in a 44% response rate.

Results

Attitudes toward and WTP for ranchland open space

Respondents were asked to compare how their enjoyment of the scenery provided by ranch open space compared with that provided by recreation open space such as parks, golf courses and trails. In 1994, 68% said that they enjoyed the scenery of ranch open space more than that of recreation open space, 25.3% enjoyed them equally and 6.7% enjoyed the scenery of ranch open space less than that of recreation open space. Preferences seemed to shift towards recreation open space in the past ten years, although the scenery provided by ranch open space was still preferred. In 2004, 56.5% preferred the scenery of ranch open space to recreation open space, 35.9% enjoyed them equally and 7.6% enjoyed the scenery of ranch open space less than that of recreation open space (Table 1).

Respondents were asked to compare the importance of ranch open space in and around Steamboat Springs and elsewhere in Routt County to other issues, such as air and water quality. Importance was reported on a scale of one to five, with three indicating equal importance to other issues. Residents gave the same importance ratings in 2004 as they did in 1994. Survey respondents valued ranch open space conservation in and around Steamboat Springs and ranch open space conservation elsewhere in Routt County equally in both 1994 and 2004. The ideal amount of existing ranch space they wanted to see conserved did not change, remaining around 75-80% (Table 1).

Concerning a referendum to protect ranch open space, there was also practically no change from 1994 to 2004. In 1994, 96.5% of respondents said they would have voted “yes” on such a referendum at no cost to them. In 2004, 93.7% said they would. When the referendum would cost respondents at least $1.00, 91.1% said they would have voted “yes” in 1994. In 2004, 91.3% of respondents said they would vote “yes” on the referendum at a cost of at least $1.00 (Table 1).

Respondents in 1994 would be willing to pay a maximum of $182.02 on average to protect local ranch open space through the county government. In 2004 the average WTP reported rose to $220.38. The mean WTP for ranchland in and around Steamboat Springs rose from $90.09 in 1994 to $119.41 in 2004. The mean WTP for ranchland elsewhere in Routt County increased slightly from $94.68 in 1994 to $105.58 in 2004. Residents were WTP more for conservation in and around Steamboat springs in 2004 than they were in 1994, and at least as much in areas elsewhere in the county (Table 1).

Aggregated benefit of ranch open space

The aggregate benefit of ranch open space conservation can be calculated by multiplying the number of households affected by the mean household WTP. This is the method typically used in economics. In public policy studies, however, the median WTP value is usually used (Willis and Garrod, 1993). Since mean WTP typically exceeds median WTP, mean WTP can be replaced by median WTP to help determine voting behavior. The median WTP in 1994 was $64 and in 2004 was $100.

The number of households in Routt County in 2004, based on a projection from 2000 census data, was 9,890 (Colorado Department of Local Affairs). Using the mean values, the total annual benefit of ranch open space conservation to Routt residents was $2,175,800 in 2004, or nearly three times the 2005 county program budget of $748,000. Using the median values the total annual benefit of ranch open space conservation was $989,000 in 2004.

However, in order to make these calculations for all of Routt County we have had to assume that nonrespondents to our survey (and those who were not surveyed) would provide the same mean and median WTP values as those who completed the survey. Other possibilities clearly exist. The most conservative method would be to assume that the 56% of the sample population that did not respond to the survey has a household WTP equal to the lower bound of the survey respondents, which is zero, and that this is representative of the population. In his case the aggregate annual WTP would be 44% of the mean WTP multiplied by the number of households, which totals $957,352.

However, it is unlikely that all households that failed to return the survey would be unwilling to pay to conserve ranch open space. Another method would be to assume that the 56% of the sample population that did not return the survey would have the median WTP, which is much lower than the mean. The mean can be used for the 44% of the sample population that did return the survey. This method yields a total annual WTP of $1,511,192.

The economic models that will be discussed later in this paper can also be used to estimate the total WTP of Routt County residents. When possible, data from the 2000 census (median income, age and education) is used in the model and when that data are not available (data collected specifically by the survey), the mean of the survey data are used. This method yields a household WTP of $216.48, which gives an aggregate annual WTP of $2,140,987.20.

Real estate prices "capitalize" anticipated future benefits and costs. That is, they are given in net present value (NPV) terms. Similarly, land that is protected by a conservation easement will provide benefits to residents beyond the year of investment, so aggregate annual WTP should also be measured in terms of present value (PV). To calculate PV in this study a 30-yr time horizon was used, meaning that all benefits extending more than 30 years into the future were not considered. Three different discount rates were used: 2%, 6% and 10%. Discount rates reflect the opportunity cost of buying land instead of investing funds elsewhere. Among other things, they are dependent on the interest rate and the expected rate of return on alternative investments (Table 2).

Local features that contribute to well being

In addition to finding changes in demographics and attitudes regarding ranch open space among Routt County residents, this study allows for comparisons to be made about why residents enjoy living in the county. The 1994 and 2004 surveys both asked respondents to rate a series of characteristics from one to nine, where a rating of one is strongly detracts from enjoyment, five is neutral, and nine indicates that the feature strongly contributes to the respondent's well being. Characteristics were divided into six categories: recreation amenities (trails, golf courses etc.), western historical preservation (working ranches, western art etc.), urban development (condos, restaurants etc.), community services (medical, religious, etc.), natural environment (mountains, rivers etc.) and ranch open space (meadows, hay lands etc.). Western historical preservation characteristics were included in 2004 to replace the western ranch culture category used in 1994.

The rank order of characteristic categories changed slightly from 1994 to 2004. In 1994 the highest rated characteristic categories were natural environment, ranch open space and recreation investments, followed

by western ranch culture, community services and urban development. In 2004 the highest rated characteristics were natural environment, ranch open space and western heritage, followed by community services, recreation attributes and urban characteristics. The community services category was the only characteristic to jump in the preference ordering from 1994 to 2004, surpassing recreation features.

The natural environment of Routt County was overwhelmingly the category that most contributed to respondents' enjoyment of living in Routt County. In 1994 the mean rating for this category was 8.31 and in 2004 the mean rating was 8.49, In 1994, 98.6% of respondents replied that the natural environment adds to their enjoyment of living in Routt County and in 2004 this number increased to 99.5%. The most important characteristic within the natural environment category was the Rocky Mountains, in both 1994 and 2004. Climate was the least important characteristic in the natural environment category in both 1994 and 2004. The percentage of people that said the climate added to their enjoyment of living in Routt County rose from 85.7% to 95.4%.

Ranch open space was the second highest rated characteristic category in both 1994 and 2004, which corresponds well with the evidence presented earlier that residents' attitudes towards ranch open space have not changed. In 1994, 98.6% or respondents reported that ranch open space contributed to their enjoyment of living in Routt County. In 2004 this number fell slightly, to 95.8%. No respondents said that ranch open space decreased their enjoyment of living in the county in 1994, and in 2004 only one respondent did (0.2% of the sample). Birds and other wildlife was the highest rated characteristic within the ranch open space category in both 1994 and 2004. However, over this time period the mean rating for birds and other wildlife dropped from 8.48 to 8.18, the mean rating for meadows dropped from 8.42 to 8.08, and the mean rating for viewing cattle, horses and sheep fell from 7.92 to 7.56.

Western historical preservation was the third highest rated group in terms of adding enjoyment to living in Routt County. In 2004, 94.9% of respondents said that western historical preservation contributed to their enjoyment of living in the county. The highest rated characteristics within this group were western art and museums, with mean ratings of 7.35 and 7.34, respectively. Traditional family ownership of ranches received a mean rating of 7.03, historical barns and other ranch structures received a rating of 6.80 and historical, working ranches received a rating of 5.82. The 1994 survey did not use the category "western historical preservation", but "western ranch culture", which was composed of different characteristics so comparisons cannot be made between the two. However, in both 1994 and 2004 the survey responses indicated that ranch open space was a more important aspect of ranch conservation to Routt County residents than both western historical preservation and western ranch culture.

Community services was rated as the fifth most important characteristic category by Routt County residents in 1994, but in 2004 was rated fourth, ahead of recreational features. The mean rating for community services rose from 5.99 to 6.59. This was the biggest rating change for any of the characteristic groups over the decade. In 1994, 69.9% of respondents said that community service characteristics added to their enjoyment of living in Routt County, whereas in 2004 this percentage rose to 86.3%. The most important service characteristic to Routt County residents in 1994 was schools, and in 2004 it was medical facilities. Employment (working conditions, benefits, pay) showed the biggest increase, moving from a rating of 5.60 in 1994 to 6.65 in 2004. Large increases were reported for housing (availability, price, rent, quality), from 5.06 to 6.00, repair services (auto, home and appliance), from 5.33 to 6.27, and government services (law enforcement, road maintenance), from 5.73 to 6.63 and medical services, which rose from 7.15 to 7.75.

Shopping characteristics (price, quality, availability) were the lowest rated community service characteristic in both 1994 and 2004. However, there has been an overwhelming shift in the way people view how shopping in Routt County affect their enjoyment of living there. Shopping characteristics had a rating of 4.82 in 1994, indicating that they detracted from the enjoyment of living in Routt County**.** In 2004 shopping characteristics were reported to add to the enjoyment of living in the county, receiving a mean rating of 5.48.

Recreation characteristics were rated as the fourth most important characteristic group in 1994 and as the fifth most important in 2004. However, the mean rating for recreational characteristics increased from

6.04 to 6.36 over this time period. In 1994 74.7% of respondents stated that recreation characteristics increased their enjoyment of living in Routt County, and in 2004 this percentage rose to 86.7%. The most important recreation characteristic to Routt County residents in both 1994 and 2004 was trails for hiking, bike riding and horseback riding. Camping characteristics received the second highest ratings in both 1994 (6.75) and 2004 (7.06). In 1994 skiing received the fourth highest rating, 5.95 (behind trails, camping and hot springs and pools), but was rated as the third most important recreation characteristic in 2004, receiving a rating of 6.92. In 1994, 57.4% of respondents said that skiing characteristics added to their enjoyment of living in Routt County and 27.9% said that skiing characteristics decreased their enjoyment. In 2004 the percent citing skiing characteristics as a positive rose to 72.2%, whereas the percent of those citing skiing characteristics as a negative fell to 11.3%. Clearly, skiing has become a more important part of living in Routt County to an increasing number of residents. Fishing opportunities received the fourth highest rating in the recreation characteristics category, 6.81, in 2004. A comparison cannot be made to 2004 because fishing was bundled with rivers and lakes, in the natural environment category. In 2004, 71.1% of respondents said that fishing opportunities added to their enjoyment of living in the county.

Golf courses and tennis courts were the second lowest rated recreation characteristic in both 1994 and 2004, but showed a large increase in rating over the decade. In 1994 golf and tennis characteristics received a rating of 4.76, indicating that they had a negative impact on the enjoyment of living in Routt County. In 2004 golf and tennis characteristics were reported to be a positive for county residents with a rating of 5.46. All recreation characteristics besides trails for hiking, horseback riding and biking and hot springs and swimming pools, received higher ratings in 2004 than in 1994. The biggest increases were for characteristics that require high levels of infrastructure investment: ski lifts and slopes, golf courses and tennis courts and access roads and parking.

The mean rating for urban characteristics increased slightly between 1994 and 2004, from 5.38 to 5.61. In 1994, 57.3% of respondents said that urban characteristics added to their enjoyment of living in Routt County, compared to 70.8% in 2004. The highest rated urban characteristic in both 1994 and 2004 was old historic buildings, receiving a mean rating of 7.48 and 6.69, respectively. This decrease was the largest by any characteristic across all categories, and indicates that although still important, old historic buildings add less enjoyment to living in Routt County than they did in the recent past. On the other hand, the mean ratings for restaurants, bars and hotels and for other businesses both increased greatly from 1994 to 2004. Restaurants, bars and hotels received a rating of 5.41 in 1994 and added to the enjoyment of living in Routt County to 45.6% of respondents. In 2004 their rating rose to 5.92 and they were reported as a positive by 63.4% of respondents. An even greater increase was seen in the rating for other businesses.

Routt County residents' preferences regarding housing changed from 1994 to 2004. Condominiums and apartment buildings were the lowest rated characteristic across all categories in both 1994 and 2004. They were, however, rated much more highly in 2004 than 1994. In 1994 they received a mean rating of 3.03 and were reported to detract from the enjoyment of living in Routt County by 71.4% of respondents. In 2004 condos and apartment buildings received a mean rating of 4.00 and were reported as a negative by 53.9% of respondents. Both houses on small and medium sized lots (under 15 acres) and houses on large lots (more than 15 acres) were rated above condos and apartments in both 1994 and 2004. In 1994 houses on large lots received a rating of 5.51, which is possibly neutral but probably positive, and 45.7% of respondents said that houses on large lots added to their enjoyment of living in Routt County. In 2004 houses on large lots received a rating of 5.08. Meanwhile, the mean rating for houses on small and medium sized lots increased from 4.31 in 1994 to 5.26 in 2004, showing that in 1994 they detracted from the enjoyment of living in Routt County and in 2004 they added to it.

These results could be interpreted in several ways. It could be a sign of the urbanization of the Routt County population over the past decade. New urban in-migrants to the area may be more familiar and comfortable with concentrated development than the residents of the county ten years ago. Alternatively, preferences for concentrated development may indicate a stance favoring ranch open space conservation and against the subdivision of large lots into rural residential properties.

Economic Models for Voting Behavior

An economic model was created to help better understand what variables affect residents' probability of voting "yes" on a referendum to conserve ranch open space. Two models concerning voting behavior were considered. The first model looks at what factors affect the probability of a resident voting "yes" on a referendum to conserve ranch open space at no cost. The second examines what factors affect the probability of a resident voting "yes" on the same referendum, but with a cost of at least $1.00.

The likelihood of a Routt County resident to vote "yes" on a referendum to conserve ranch open space, either at no cost or an added cost, increases with the rating they give to the importance of ranch open space, as can be expected. Income only increases residents' likelihood to vote "yes" when an added cost of at least $1.00 is involved. Age and the number of years of residence in Routt County both affect likelihood to vote "yes" on a referendum at either no cost or and added cost, although minimally. The distance of residence from ranchland positively affects the likelihood to vote "yes" on a referendum, although only when no cost is involved. The marginal effects of changes in these variables are generally small, and only noticed when the changes are large. The main reason for this is that support for a ranchland conservation referendum, both at no cost and a cost of at least $1.00 is overwhelmingly strong.

Models of Willingness to Pay for Ranchland Preservation

A series of three models were developed for residents' WTP for ranch open space conservation: one for WTP for conservation in and around Steamboat Springs, one for ranch open space elsewhere in Routt County and one for conservation in all parts of the county. These distinctions were made to see if the factors that influenced residents' WTP for ranchland conservation in and around Steamboat Springs differed from the factors that influenced their WTP for ranchland conservation elsewhere in the county.

All the dependent variables considered for the voting behavior models were used in the models for WTP. The amount of ranch open space conservation desired was also considered in the WTP models. The amount of conservation desired in and around Steamboat Springs was used when modeling WTP for conservation in Steamboat Springs, the amount of conservation desired elsewhere in the county was used when modeling WTP for conservation elsewhere in the county and the sum of percent conservation in around Steamboat Springs and elsewhere in the county was used when modeling total WTP.

The three models for WTP yielded similar results. The variables that were determined to influence WTP were the importance rating given to ranch open space in a particular area (either in and around Steamboat Springs or elsewhere in Routt County), the desired amount of land to be conserved in a particular area, income, and an agricultural background. The importance a respondent placed on ranchland conservation in and around Steamboat Springs positively affected their WTP for ranchland conservation in and around Steamboat Springs, but did not affect their WTP for ranchland elsewhere in the county. Likewise, the importance a respondent placed on conserving ranch open space elsewhere in the county did not affect their WTP for conservation in and around Steamboat Springs, but did positively affect their WTP for conservation elsewhere in the county. The amount of ranch open space respondents wished to conserve in and around Steamboat Springs positively impacted the amount they were WTP to conserve that land, but did not affect the amount they were WTP to conserve ranchland elsewhere in the county. Similarly, the amount of ranchland respondents wished to conserve elsewhere in the county positively affected the amount they were WTP for ranchland conservation away from Steamboat Springs, but not the amount they were WTP for ranch open space conservation in and around Steamboat Springs. These observations show that people are sensitive as to where ranch open space is conserved. Respondents showed that they differentiate between ranch open space in and around Steamboat Springs and ranch open space elsewhere in Routt County. This information should allow policy makers to better determine where conservation easements should be placed to maximize their benefit to society.

The marginal effect of a one point increase from the mean (3.60) in the importance of ranch open space in Steamboat Springs increases WTP for conservation in Steamboat Springs WTP by $25 for those already WTP. For those not WTP, an increase of one point increases the probability that they would be WTP by 0.092. The same one point increase increases WTP for ranchland conservation in all areas of the county

by $30 for those already WTP and for those not WTP it increases the probability that they will become WTP by 0.063. The increase in total expected WTP for ranch open space caused by a one point increase was $36 for ranchland in and around Steamboat Springs and $43 for ranchland in all parts of the county. In the event of a one point decrease, the impacts would be equal but opposite.

The marginal effect of a one point increase from the mean (3.65) in the importance rating for ranch open space elsewhere in the county on WTP for conservation elsewhere in the county was $15 for those already WTP. A one point increase in rating will increase the probability of someone becoming WTP for ranchland elsewhere in the county increases by 0.064. The marginal effects of a one point increase in the importance rating of ranchland elsewhere in the county boosts WTP for conservation in all areas of the county by $22 and increases the probability of someone becoming WTP by 0.048. The increase in total expected WTP for ranch open space caused by a one point increase was $21 for ranchland away from Steamboat Springs and $32 for ranchland in all parts of the county.

An increase in the importance rating for ranch open space in and around Steamboat Springs leads to an increase in total WTP almost twice as big as an equal increase for the importance rating of ranch open space elsewhere in the county. Another difference is how the increase of total WTP is distributed. For an increase in importance rating for ranch open space in and around Steamboat Springs, over four-fifths of the increase in WTP is allocated to conservation in Steamboat Springs. For an equal increase in the importance of ranch open space elsewhere in the county, less than two-thirds of the increase in WTP was allocated away from Steamboat Springs. The marginal effect of an increasing importance rating, for either area, is either constant or increasing up to the maximum score of five.

For conservation in and around Steamboat Springs, an additional one percent of ranchland conservation from the mean (77%) caused a $0.75 increase in WTP for those already WTP. An additional one percent desired conservation increases the likelihood of someone being WTP by 0.0027. When people previously unwilling to pay are considered, the increase in total WTP for conservation in and around Steamboat Springs is $1.08 for a one percent increase in ranch open space desired.

The effects of conservation desired in areas elsewhere in the county were similar to conservation in and around Steamboat Springs. From the mean (78%), a one percent increase in conservation desired leads to a $0.78 increase in WTP for those already WTP and a 0.034 increase in the probability of someone previously unwilling to pay becoming WTP. The total increase in household WTP for a 1% increase in the amount of conservation desired is $1.11. From the mean, these effects were slightly greater than for ranchland in and around Steamboat Springs.

Since people are WTP more for greater amounts of ranchland conservation in both areas we can see that marginal conservation has a value. From a policy perspective this shows that benefits to residents increase with additional conservation. In fact, since the models show no diminishing marginal returns to ranchland conservation, maximum community benefit will be supplied by the maximum amount of feasible ranchland conservation.

Income is a very important determinant of WTP for ranch open space conservation. An increase in $1,000 of household from the mean ($81,000) causes a $0.36 increase in WTP for ranchland conservation in and around Steamboat Springs for those already WTP and increases the probability of becoming WTP by 0.0013. The total increase in expected WTP for conservation in and around Steamboat Springs is $0.51.

Higher income boosts WTP for ranchland conservation in other areas of the county too. An increase of $1,000 in household income increases WTP for ranchland elsewhere in the county for those already WTP by $0.38 and the probability of becoming WTP by 0.0017. The total increase in WTP for ranchland elsewhere in Routt County caused by a $1,000 increase in household income is $0.55, slightly higher than the increase in WTP for conservation in and around Steamboat Springs. The model for WTP for ranchland conservation in all areas of the county shows a marginal increase of $0.62 for those already WTP, an increase of 0.0013 of becoming WTP and a $0.88 increase in total expected WTP for a $1,000 increase in household income.

The effects of income on WTP are very important because of the rapid rate of income growth in Routt County. The marginal effects of income growth on WTP are not diminishing, suggesting that as income rises in Routt County the benefits of ranchland conservation will also rise. However, it is likely that the cost of conservation will rise with the income of Routt County residents because of increasing opportunity costs of not developing. The effect of income on the costs of conservation is an interesting line of inquiry that merits further study.

Someone with an agricultural background will pay $72 more for ranchland conservation in all areas of the county than someone who is not from an agricultural background if they are already WTP something. If they are not already WTP, being from an agricultural background will increase their chances of becoming WTP by 0.09. A person from an agricultural background that is already WTP will pay $42 more for conservation in and around Steamboat Springs and $25 more for conservation elsewhere in county than the person from a non-agricultural background. The difference between the probability of two people, one from an agricultural background and one not WTP is 0.10 for the area in and around Steamboat Springs and 0.073 for areas elsewhere in the county.

Strategic responses may be the cause of people involved in agriculture, or with an agricultural background, giving higher WTP values than those not involved. Those with connections to agriculture are likely more familiar with CEs and the value of development rights. These people may realize that they will benefit from more, and more highly priced, CEs purchased by the government and other organizations. People with ties to agriculture may also place a higher premium on ranch open space because they better understand and appreciate the agricultural way of life and the benefits that ranch open space provides, and are therefore WTP more to protect it.

Summary and Conclusions

Like many natural amenity rich areas, Routt County Colorado has been experiencing rapid growth and change. Home of world class skiing and many other outdoor activities, Routt County attracts urban immigrants and second homeowners from around the country. Over the past 20 years Routt County has had a growth rate that has been generally higher than both the sate and national rate. In addition to becoming larger, the county population has become older, more educated and wealthier. Residents live, on average, further from ranch open space than they did ten years ago and have a higher rate of homeownership. These changes make Routt County an appropriate location to study time series data to investigate changes in WTP and the changes in attitudes and demographics that cause them.

Two surveys, one administered in 1993-1994 and one in 2004, asked residents about their demographics, their attitudes towards open ranch space and other characteristics of the county, their support of a referendum to protect ranch open space and their WTP to do so. From the data collected in these surveys comparisons could be made between the 1994 and 2004 populations of Routt County to investigate the hypotheses discussed above. In addition, economic models were built to find what attitudinal and demographic characteristics determine residents' WTP to protect ranch open space.

Comparisons between the two surveys showed that residents feel as strongly about ranch open space protection now as they did a decade before, and are willing to pay at least as much to protect ranch open space in the area in and around Steamboat Springs, the county seat and largest community, and more to protect ranch open space elsewhere in the county. Routt County residents rated the importance of ranch open space compared to other community issues equally in 1994 and 2004 and they said that they were equally likely to vote "yes" on a referendum to protect it. Community characteristics caused by the presence of ranch open space were rated second only to characteristics caused by the natural environment of the region.

Economic models showed that the factors that increase residents' likelihood of voting "yes" on a referendum to protect ranch open space at no cost were how important they felt the issue was (positively), the distance they live from ranchland (positively), their age (negatively until middle age, then positively), the number of years they have lived in the county (negatively), and if they come from an agricultural background (positively). The factors that influenced residents' likelihood to vote "yes" on a referendum to protect ranch open space at a cost of at least $1.00 are the how important they felt the issue was

(positively), their age (negatively until middle age then positively) and the number of years they have lived in the county (negatively).

The economic models showed that residents' WTP to protect ranch open space were influenced by how important they felt the issue was (positively), the amount they wished to protect (positively), their incomes (positively), and whether or not they come from an agricultural background (positively). Ranch open space in and around Steamboat Springs was treated separately from ranch open space elsewhere in the county. Residents were sensitive to the difference between the areas.

From the comparative statistics and economic models it appears that income is the primary determinant of WTP. Of all the demographic changes occurring in Routt County, only income showed to influence WTP to protect ranch open space. Increasing income could mean more funds available to support conservation initiatives, but it is likely that land values will increase as well, causing additional pressure to develop. This study clearly shows that although the population of Routt County has grown and changed, the value placed on ranch open space by local residents has remained high, and residents are WTP at least as much to protect it as they were a decade ago.

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Tables

Table 1: Comparison of 1994 & 2004 samples

	1994	2004	Change
Mean Age	43.9	50.3	6.4***
Mean Years of Education	15	16.1	1.1***
Income (2004 dollars)	$69,321	$88,276	$18,955***
Mean Years residing in Routt County	18.0	19.3	1.3
Mean Number of people in household	2.68	2.55	-0.13
Rate of home ownership	80.9%	90.4%	9.5%***
Distance of residence from ranch land	1.52	1.89	0.37**
Family with agricultural background	22.5%	30.6%	8.1%**
Employment Status			
~~Employed outside the home	75.1%	70.5%	-4.6%
~~Retired	13.0%	17.6%	4.6%
~~Unemployed	2.4%	1.4%	-1.0%
~~Work from home	9.5%	10.5%	1.0%

* = 0.1 significance, ** = 0.05 significance, *** = 0.01 significance.

Table 2: Present value of ranchland conservation to Routt County residents over 30 yrs

	Discount rate		
Method	2%	6%	10%
Mean for all	$50,906,008	$32,125,320	$22,686,880
Median for all	$23,139,095	$14,602,418	$10,312,218
Mean for respondents, zero for non-respondents	$22,398,644	$14,135,141	$9,982,227
Mean for respondents, median for non-respondents	$35,356,536	$22,312,495	$15,757,070
Model	$50,091,507	$31,611,312	$22,323,888

Table 3: Attractiveness of features of Routt County

Natural and Man-made Assets 9 point scale: 1 = strongly detracts, 5 is neutral, and 9 = strongly contributes	Mean Score			Percent of Respondents Reporting (%) 2004		1994	
	2004	1994	Change	Adds	Detracts	Adds	Detracts
Natural Environment	***8.49***	***8.31***	***0.19***	***99.54***	***0.00***	***98.60***	***1.40***
Mountains, forests, wildlife	8.69	8.84	-0.14**	99.31	0.23	100.00	0.00
Rivers, lakes, streams, waterfalls	8.61	8.41	0.20	99.08	0.23	97.10	0.00
Air and water quality	8.43	8.31	0.12	95.39	0.69	95.70	2.90
Climate	8.23	7.73	0.50**	95.39	1.15	85.70	2.90
Ranch open space	***7.72***	***7.92***	***-0.20***	***96.31***	***1.38***	***95.90***	***1.40***
Birds, wildlife	8.18	8.48	-0.30**	95.83	0.23	98.60	0.00
Meadows	8.08	8.42	-0.34***	95.59	0.70	98.60	0.00
Hay land, hay stacks, corrals, ranch buildings	7.59	7.56	0.03	88.37	2.09	83.10	5.60
Viewing cattle, horses, sheep	7.56	7.92	-0.36*	87.30	2.54	91.60	4.20
Working ranch hands, cowboys	7.21	7.15	0.06	82.87	0.23	78.90	4.20
Western Heritage	***6.88***	***N/A***	***N/A***	***94.94***	***3.45***	***N/A***	***N/A***
Local western landmarks, statues, art	7.35	N/A	N/A	84.95	2.55	N/A	N/A
Local museums	7.34	N/A	N/A	85.58	2.56	N/A	N/A
Protection of traditional ranch family ownership	7.03	N/A	N/A	81.86	3.02	N/A	N/A
Historical barns, buildings, structures	6.80	N/A	N/A	71.00	6.96	N/A	N/A
Protection of historical working ranches	5.82	N/A	N/A	49.18	18.88	N/A	N/A
Community Services	***6.59***	***5.99***	***0.59******	***86.30***	***10.73***	***69.90***	***23.30***
Medical and dental services	7.75	7.15	0.60**	90.09	0.69	74.30	4.30
Schools, educational services, library	7.73	7.77	-0.04	88.97	1.38	87.10	2.90
Youth programs	6.68	6.20	0.49*	67.98	6.03	54.30	10.00
Jobs (working conditions, pay, benefits)	6.65	5.60	1.05***	65.43	13.92	45.70	22.90
Government (law enforcement, road maintenance)	6.63	5.73	0.90***	71.86	9.07	55.60	26.50
Repair services (auto, house, appliance)	6.27	5.33	0.94***	60.47	11.40	44.30	24.30
Housing (availability, price, rent, quality)	6.00	5.06	0.94***	53.60	22.04	37.10	30.00
Religious organizations	5.92	6.20	-0.28	45.48	12.06	54.30	10.00
Shopping (price, quality, availability)	5.48	4.82	0.66**	48.14	30.23	32.90	37.10
Recreation	***6.36***	***6.04***	***0.32****	***88.61***	***9.11***	***74.70***	***17.30***
Trails to walk, bike, ride horseback	7.82	7.92	-0.10	87.44	3.42	91.20	4.40
Campgrounds, picnic sites, playgrounds	7.06	6.75	0.31	82.07	4.14	72.10	0.00
Ski lifts, slopes	6.92	5.94	0.98***	72.18	11.26	57.40	27.90
Fishing opportunities	6.81	N/A	N/A	71.06	6.94	N/A	N/A
Other snow sports	6.75	N/A	N/A	71.96	10.05	N/A	N/A
Hot springs, swimming pools	6.63	6.75	-0.12	70.78	6.16	69.10	5.90
Access roads, parking	6.28	5.71	0.56**	62.00	11.42	57.40	27.90
Water recreation sports	6.11	N/A	N/A	59.21	10.49	N/A	N/A
Hunting opportunities	5.83	N/A	N/A	49.30	18.84	N/A	N/A
Ball diamonds, ice rinks, rodeo arenas	5.72	5.41	0.31	52.53	19.12	51.50	25.00
Golf courses, tennis courts	5.46	4.76	0.70**	44.11	25.40	39.70	33.80
Equipment rental, guide services	5.10	4.59	0.51*	30.47	21.86	25.00	33.80
Urban Amenities	***5.61***	***5.38***	***0.22***	***70.80***	***24.14***	***57.30***	***29.30***
Old historic buildings	6.69	7.48	-0.79***	77.55	4.63	87.20	1.40
Theatre, concert hall, dance studio, etc.	6.36	6.23	0.13	65.62	9.69	65.70	11.40
Restaurants, bars, motels, hotels	5.92	5.41	0.51*	63.40	17.72	45.60	20.10

Other retail businesses	5.77	5.07	0.70***	55.74	17.56	31.40	18.60
Houses on small and medium sized lots	5.26	4.31	0.96***	39.20	24.41	21.40	38.60
Houses on large lots, 15 acres or more	5.08	5.51	-0.42	37.15	30.14	45.70	28.60
Condos, apartment buildings	4.00	3.03	0.97***	13.82	53.86	7.20	71.40

* = 0.1significance level, ** = 0.05 significance level,*** = 0.01significance level, NA = not collected in 1994.