Rural Sociology 87(2), 2022, pp. 605–641
DOI: 10.1111/ruso.12429

Preferences for Economic and Environmental Goals in Rural Community Development in the Western United States*

Jessica D. Ulrich-Schad
Department of Sociology & Anthropology
Utah State University

Paul M. Jakus
Department of Applied Economics
Utah State University

Malieka Bordigioni
Department of Economics
University of Nevada

Don E. Albrecht
Western Rural Development Center
Utah State University

Abstract Rural residents in the United States do not always agree on local development priorities, yet understanding and accounting for their preferences is a step towards more effective and equitable community development. We use survey data spanning different types of rural Intermountain West communities to gauge residents' preference weights for economic and environmental rural development goals. Given that community tenure and age are often related to development preferences, respondents are divided into three groups based on these factors using a classification tree approach. Long-term residents (>36 percent of life spent in the community) have the strongest economic preferences, while older newcomers have the strongest environmental preferences. The Leti heterogeneity index reveals that long-term residents also displayed the greatest homogeneity of preferences. Ordered probit analysis shows that goal preferences are also related to sex, education, household income, community financial security, and the share of county income derived from wealth assets. These findings provide a more nuanced and methods-based understanding of residential tenure in a community and its relationship to development attitudes across a variety of rural place types, all valuable information for rural community and economic development practitioners.

*Data used in this manuscript is based upon work that is supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, under award number 2017-68006-26237. Address correspondence to Jessica D. Ulrich-Schad, Department of Sociology & Anthropology, Utah State University, 0730 Old Main Hill, Room 216C, Logan, UT 84322-0730, USA. Email: jessica.schad@usu.edu

Jessica D. Ulrich-Schad and Paul M. Jakus shared first authorship.

Introduction

Community development is sometimes framed as a choice between either rapid growth of population, employment, and income in a community *or* the preservation of environmental amenities that often make rural communities desirable places to live. This description of the economic-environmental tradeoff presents a false choice. Instead, community development plans can enhance regional well-being by choosing among a continuum of possible economic and environmental outcomes. For example, while leaders in one community may put more emphasis on economic growth measures (e.g., by providing infrastructure improvements that encourage businesses to expand or relocate), in another, they may choose a plan that features slower economic growth while simultaneously augmenting environmental assets (e.g., by preserving open space for recreation). Still another approach may place stringent restrictions on selected economic growth measures and put greater emphasis on the preservation of environmental amenities. It is not an either-or, black-or-white choice between extremes but is, instead, a matter of choosing the relative weights of economic and environmental goals to be embodied in a development plan.

Choosing the relative economic-environmental emphasis for future development plans is especially important in rural places in the United States (U.S.) that have long depended both locally and regionally upon natural resources as the backbones of their social, cultural, and economic structures (Albrecht 2014; Krannich et al. 2014). Many rural communities find themselves under economic pressures from volatile (and, in many cases, declining) agricultural, energy, and mineral commodity markets (see, for example, Jacquet and Kay 2014). Other rural places that are increasingly reliant on non-extractive natural resource development (see Mueller 2021), are growing from amenity migration, and face different strains such as rapid population growth and increasing economic inequality (Gosnell and Abrams 2011; Krannich, Luloff, and Field 2011; Sherman 2018, 2021; Ulrich-Schad 2018).

Research has shown that residents of different types of rural places have divergent and complex views on development priorities (Hamilton et al. 2008; Ulrich-Schad et al. 2020). Existing literature suggests that how development preferences are weighted may also differ among community residents based on how long they have lived in the community and, in some cases, the age of the resident. Researchers have found somewhat different development preferences between what have been termed long-term residents (LTRs) and newcomers (NCs).[1] While the definition of these groups

[1]See, for example, Smith and Krannich (2000), Creighton et al. (2008), Hiner (2014), Qin (2016), and Ulrich-Schad and Qin (2018).

has not been standard across studies, findings suggest all groups strongly value environmental quality regardless of economic development preferences. However, views on how environmental resources should be used can differ between NCs, who tend to adopt a consumptivist approach favoring environmental goals, and LTRs who prefer a productivist approach emphasizing economic goals (Gosnell and Adams 2011). Most studies indicate that NCs tend to be younger than LTRs (Qin 2016), but there is much variation within each group, making the relationship between age, community tenure, and development preferences multifaceted.

Identifying the degree to which the relative importance of local development options is shared among residents is important in designing effective rural economic development policies (Mueller and Tickamyer 2020). As opposed to more traditional policy making which fails to incorporate views of local residents, planning that accounts for residents' views and builds trust in leaders and the process can contribute to better outcomes for more stakeholder groups. Particularly in relation to natural resource-related economic development, past research has argued that local community support is important if the efforts are to be sustainable and successful (Gordon and Barton 2015; Nunkoo, Smith, and Ramkissoon 2013; Park, Nunkoo, and Yoon 2015; Roseland 2000).

We contribute to this literature in four primary ways. First, in most quantitative studies, the distinction between NCs and LTRs reflects decisions that are based largely upon best professional judgment. Common approaches often use either a standard length of residence at which residents are assumed to be properly integrated into a local society (most often 10 years) or a cutoff point at which an influx of migration into a place started (e.g., since the onset of an oil and gas boom).[2] In contrast, we take advantage of a non-parametric machine-learning procedure to separate respondents into groups based on age and the proportion of life they have spent in the current community (i.e., life share). Specific values for life share and age are selected so as to minimize impurity in economic-environmental preferences within each group. Thus, the classification trees we use substitute explicit decision criteria for researchers' best judgment decisions.

Second, rather than examining differences among residents with only an LTR versus NC dichotomy, the classification tree approach sorts residents into three distinct categories based on life share and age. The additional variation in classification allows for a more nuanced look at residents' preferences regarding what they consider to be the appropriate balance among

[2]Qin (2016) offers an excellent review.

development goals within their community. In particular, we use numerical measures of within group preference heterogeneity and across group polarization to assess the divergence of preferences.

Third, the emphasis that a person places on achieving economic goals or environmental goals has rarely been operationalized by researchers as a relative tradeoff despite the interconnections between the two. Instead, surveys usually ask questions about economic goals discretely from environmental goals; this allows respondents to express maximum importance for both goals and to escape the survey without serious consideration of possible tradeoffs. Achieving economic goals does not mean a community must completely sacrifice environmental goals (or vice-versa), but emphasis on one goal relative to another implies a continuum involving some degree of substitution between them. With the exception of Smith and Krannich (2000) and Hamilton et al., (2008, 2014) Hamilton, Colocousis, and Duncan (2010), few studies ask respondents to weigh economic development goals relative to environmental goals as we do here. A recent study by Mueller and Tickamyer (2020) asks rural residents to rank support for seven forms of natural resource-related economic development but does not focus on economic and environmental goals.

Fourth, our empirical analysis is based on 1,652 survey respondents in 14 rural communities located in four Intermountain West (IMW) states. Many studies examining environmental or economic preferences focus only on high amenity or declining rural communities or a small number of case study sites. Here we are able to provide a unique examination of a relatively large number and variety of types of rural communities in the western U.S. Our survey data come from a non-probability sample, yet those who participated represent a broad range of constituencies interested in community development and participating in local policymaking.

Relative preferences for achieving economic and environmental goals were elicited using a single 17-point ordinal scale from which respondents could choose. About 19 percent of respondents chose a maximum emphasis on one goal or the other whereas more than 80 percent chose a weight reflecting some degree of the tradeoff in the relative importance of achieving economic or environmental goals.[3] This degree of variation allows us to use a Leti index to evaluate within life share-age group heterogeneity and polarization across the life share-age groups. We then use ordered probit models to examine the respective influence of respondent and community attributes on the

[3]Our survey question (presented below) is framed as "relative importance" of economic and environmental goals; our text uses the terms "importance", "weight", "preference", and "emphasis" interchangeably.

relative importance chosen. Our statistical analysis finds that differences in the relative emphasis across economic-environmental goals between life share-age groups are real and significant, but within group heterogeneity ameliorates between group polarization. In addition to group membership, the principal respondent characteristics that influence the chosen weight are education, sex, and household income. Significant community attributes include community financial security and the share of aggregate regional income derived from wealth assets.

Background

Primary commodity industries—agriculture, ranching, timber, energy, and mining—have long served as the cornerstone of rural economies in the western U.S. (Krannich et al. 2014). In the decades following western settlement (i.e., settler colonialism), these industries provided relatively stable employment and income in rural regions. In recent decades, natural resource-dependent economies have been beset by commodity price volatility, increased global competition, new technologies that reduce labor demand, and a more stringent—but increasingly uncertain—regulatory structure governing air and water quality, as well as use restrictions on publicly owned land (Carolan 2020).[4] Rural regions losing employment opportunities in extractive industries may also be exposed to political and social uncertainty associated with the exodus of young natives (see Carr and Kefalas 2009; Duncan 2014). Many rural communities are increasingly reliant on the nonextractive development of their natural resources through tourism and recreation, which is leading to an influx of migrants, including older retirees (Brown et al. 2008), who bring nonwage income and, sometimes, different values that can lead to a "culture clash" in the destination community (Smith and Krannich 2000; Ulrich-Schad and Qin 2018).

Communities facing these economic, environmental, and social pressures must navigate a difficult path when local leaders and residents work to craft a development plan, as efforts to aid development in

[4]For example, in 2012 coal-mining communities were hard hit by Obama administration rules governing mercury emissions from coal-fired powerplants. The Trump administration revoked these rules in 2020—but there is every expectation that the Biden administration will revert to the Obama regulation (Friedman and Davenport 2020). Similarly, in December 2017 the Trump administration significantly reduced the size of Utah's Bears Ears National Monument, which had been established one year earlier by the Obama administration. The Biden administration recently restored the monument's original boundaries (Partlow 2021).

one dimension, say, the pursuit of expanded resource extraction may restrict development options in another dimension, such as improving water and air quality. Gosnell and Abrams (2011) note that many rural economies have transitioned, or are transitioning, from productivist reliance on the landscape to generate market commodities to a consumptivist approach that treats the *in situ*, relatively undisturbed rural landscape as complementary to a rural lifestyle by providing satisfaction through leisure activities. These two approaches to the rural environment reflect underlying beliefs and values toward landscapes that are closely related to age and the length of time a person has lived in the community.

Beliefs and preferences regarding the rural landscape may arise from differences in how people are attached to rural places, which are at the heart of many place-based natural resource disputes. In their study of a rural county in Washington state, Creighton, Blatner, and Carroll (2008) state that when place values or place attachments are homogeneous within a community, the little conflict will arise regarding landscape management and future development options. If these values differ across groups in a rural community, then disputes may become "…contentious and personal" (233). Residents form their place attachment in different ways, though. The place attachment of NCs (defined by these authors as those living in the community for less than seven years) is based on lifestyle desires whereas LTRs rooted their place attachment in their family and shared community history. Boucquey et al. (2012) reach a similar conclusion. Those who had lived in a rural coastal region of North Carolina for more than one generation could not separate the local environment from the community's shared history and culture. NCs, who had been in the region for a single generation or less, tended to view the local environment as an escape from the pressures of daily living. While all people value the environment, the way in which they think about and connect to that environment differs according to perspectives that are often related to community tenure.

Hiner (2014) uses a 20-year residency period to demarcate LTRs from NCs in a study conducted in California. While the distinction was informative, community tenure was not a clear-cut indicator of land use policy preferences. The full spectrum of political ideologies was present within each group, as was a range of environmental imaginaries. Hence, members of a given group often disagreed with one another over issues related to economic development and environmental preservation, indicating a large degree of within group heterogeneity. Hiner's conclusion harkens back to Smith and Krannich's (2000) seminal article on the clash between LTRs and NCs with regard

to preferences for land use, regional development, and environmental management. Focusing on three rapidly growing tourism regions (Teton Valley, WY; Moab, UT; and Vernal, UT), the authors define NCs as those who had lived in a community for ten years or less. Preferences and concerns regarding topics such as "general environmental concern", air and water quality, existing way of life, population growth, and economic opportunities, were elicited on an ordinal scale. Respondents from three communities answered nine preference and concern questions each, allowing for 27 LTR-NC group comparisons. Statistically significant differences were found for only one-third of the comparisons revealing that, despite their differences, the different community groups were not polarized with respect to many regional development concerns.

The Smith and Krannich (2000) study provides an excellent jumping off point to discuss a second feature reflected in many studies that survey residents about development preferences. Surveys typically elicit economic and environmental preferences in the absence of any tradeoff between the two. Consider the following questions from Smith and Krannich:

- "How important is environmental quality to the community's quality of life?"
- "How important is it to increase economic opportunities in the community?"

Using their 11-point ordinal scale (where 11 = "Extremely Important"), the range of the mean group responses across three communities was between 9.06 and 10.07 for the first question, and between 8.82 and 10.01 for the second. That is, responses are massed at one end of the ordinal scale as both environmental concern and economic opportunity are considered very important, regardless of community or group identification. This result should be of no surprise: people will highly value economic growth and good environmental quality when they do not have to choose between the two. Unfortunately, structuring surveys in this way does not reflect the very real choices and outcomes facing those who must design community development plans. This problem is not restricted to a single study. For instance, Boucquey et al. (2012) and Park et al. (2019) each use a similar question structure and find similar results.

In these studies and others, respondents are free to express strong desires for economic opportunities and positive environmental outcomes without having to consider the tradeoffs between them. For example, expansion of oil and gas extraction activities can negatively affect

water and air quality, as well as damage viewsheds: to what degree are residents willing to tolerate increased environmental protection costs (or deteriorating resource quality) to secure jobs and income in the energy sector? If a community leverages its local natural resources to accelerate tourism growth, are residents willing to endure congestion of both roads and recreation sites, traffic-related noise, air pollution, and the increased cost of living that often accompanies such a choice? In treating economic outcomes as isolated from environmental outcomes, many surveys have been constructed in such a way that respondents can have their cake, and eat it, too.

While indirectly focused on the natural environment through asking about quality of life, we can return to Smith and Krannich (2000) for a statement that more directly poses an economic-environmental tradeoff:

- "Too much economic development will ruin the community's quality of life."

Responses were elicited on an 11-point ordinal scale, where the maximum score (11) indicated that the respondent "Strongly Agreed" with the statement (1 = "Strongly Disagree"). Instead of responses being massed at one end of the scale regardless of the respondent's group and community, the group responses ranged between 4.87 (Vernal NCs) and 8.11 (Teton Valley LTRs). This statement elicited much greater response variation relative to the survey's previous questions because people were asked to consider an explicit tradeoff. Respondents revealed a more nuanced approach to community development: when residents place greater weight on economic development goals, the emphasis should be tempered with concern about other aspects of a community's quality of life.

Similarly, as part of the Community and Environment in Rural America (CERA) phone survey conducted in a variety of places throughout the rural U.S. from 2007 to 2012 by the Carsey School of Public Policy (formally the Carsey Institute) at the University of New Hampshire, rural residents were asked their preference on the following:

- "For the future of your community, do you think it is more important to use natural resources to create jobs or to conserve natural resources for future generations?"

Respondents could indicate they preferred to use the resources, conserve them, or weigh both equally. Analyses conducted by Hamilton et al. (2008, 2010, 2014) show significant variation by type of rural place (e.g., greatest preference to preserve in high amenity places and greatest preference to use in chronically poor places) and individual characteristics (e.g., more conservative, older residents are more likely to favor immediate use) in respondent preferences. While this question did ask respondents to make an explicit choice, it did not provide respondents the opportunity to indicate the strength of their support for either option.

Nuance has also been reflected in other recent studies, even when the surveys on which they are based have not made the tradeoff explicit. In their study of rural recreation counties, Ulrich-Schad and Qin (2018) find that those whose financial situations are the same or improved over the previous five years were less likely to see rapid economic development as a problem, but more likely to view rules governing the development process as good. Armstrong and Stedman (2019) gauged the role of "place" in assessing the environmental concern, but note that environmental concern is expressed by survey respondents within the context of "concern about the place overall" and that researchers should endeavor to directly compare environmental concerns with a host of other concerns, including economic concerns. Keske et al. (2017) evaluated threats to primary agricultural producers from amenity-led population growth, finding those producers would welcome growth as long as newcomers supported agriculture as an important economic base sector and embraced the existing community lifestyle and traditions.

These recent studies, plus that of Smith and Krannich (2000), demonstrate the interconnectedness of economic and environmental goals. Understanding this connection, and the relative importance of each goal, is a key aspect when designing a community development plan. Compared to the fairly uniform responses elicited when no tradeoff is implied, a question that asks respondents to explicitly make choices among economic and environmental goals is surely more helpful to community development planners.

Data and Methods

Data Collection

Data were collected as part of the Area Sectoral Analysis Process (ASAP), an effort by extension professionals for several Western Universities that aids communities in identifying feasible development options (Bordigioni et al. 2020). ASAP builds upon the work by Minshall et al.

(1971) and Cox et al. (2009), where the goal is to find a compatible set of assets between firms seeking to relocate or expand and communities seeking sustainable economic development. In addition, ASAP assesses the degree to which firms from a given industry are desirable given the economic, environmental, and social goals of community residents. Our focus here is on the responses of community residents to the ASAP Community Goal Survey (CGS) which elicits resident preferences for the relative importance of achieving economic quality goals relative to environmental quality goals.[5]

All ASAP programs used in this study were initiated between 2014 and 2019, and took, on average, about six to eight months to complete. Our data come from communities located in 14 nonmetro counties in Arizona (two ASAP efforts), Idaho (one), New Mexico (one), and Utah (10). In all cases, ASAP relied upon a local steering committee to lead the community through each of six program modules, with extension personnel providing regular guidance throughout. The CGS is initiated approximately two months into the process. The steering committee, after being provided with survey data collection protocols, is responsible for implementing a respondent-driven sampling procedure within the community, which is usually completed in four to six weeks.[6] The respondent-generated sample is intended to target a broad range of constituencies interested in community development. While random sampling of general community populations is not employed, the CGS implementation method is designed to reach a broad range of those most interested in local economic development decisions and, as such, collects data from residents with a desire to provide input in the local policymaking process. This population is certainly of interest for informing local policymaking, but it likely represents those with stronger opinions and leaves out more tempered views of the general population and those with less capital (e.g., social, political, economic, etc.) conducive to involvement. Table 1 provides a comparison between the CGS sample and data on the study counties from the American Community Survey (ACS). It shows that our sample is somewhat biased,

[5]Similar to this study, Spangler, Gayle, and Albrecht (2020) use ASAP CGS data to examine the economic-environmental tradeoff question. Their analysis compresses ordinal scale from 17 categories to two or five, and focuses solely on demographic factors that influence the response. They do not look at community-level factors as explanatory variables, nor do they examine within- or cross-group heterogeneity.

[6]All communities had the option to use paper surveys or complete a survey online both of which are available in English or Spanish (Bordigioni et al. 2020). Three communities chose to use paper only (Cibola, NM; Garfield and Piute, UT). The remainder used a mix of paper and online.

Table 1. Comparison of the CGS Sample and ACS Data

	CGS Sample	ACS
Age (median)	49.2	36.9
Male (%)	51.0	51.6
Bachelor's degree or higher (%)	51.2	15.7
Household Income (mean)	78,900	47,584

Note: American Community Survey (ACS) data was collected using estimates as close to the date the survey was collected as possible.

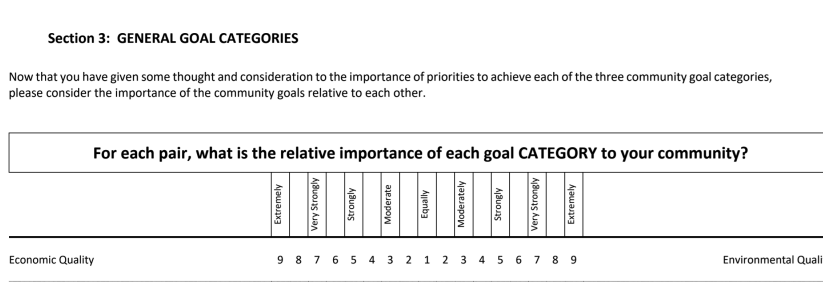

Figure 1. Question from CGS on Economic versus Environmental Preferences.

with respondents being older, more educated, and having higher greater household income than the general population in the study counties.

After survey respondents were asked to consider their relative preferences for five dimensions within both economic and environmental quality goals (questions not shown or used in our analyses), they were asked to rank the relative importance of each overall goal category (economic quality vs. environmental quality) as seen in Figure 1 using a 17-point scale.[7] This single question was used in our analyses to examine the relative weight rural residents place on economic versus

[7]While 17 points is much larger than scales normally used in social science, the CGS relied upon the standard question format of the well-known, and widely used and cited, Analytical Hierarchy Process (AHP; Saaty 1988; Mu and Pereyra-Rojas 2017). AHP questionnaires generally have either six or eight possible responses on either side of the "equal weight" response and are frequently used in research examining multi-attribute decisions. In this study we analyze ordered responses, elicited using an AHP structure, using a different analytical framework. One of the seminal papers of the "culture clash" literature (Smith and Krannich 2000) used an eleven-point scale, which is twice as large as the typical 5-point Likert scale. We could also collapse responses to a three- or five-point scale (similar to Spangler et al. 2020), but argue that doing so reduces the amount of information gathered. As shown in Figure 2, every possible response option was selected by survey respondents, furthering the argument for retaining all response options.

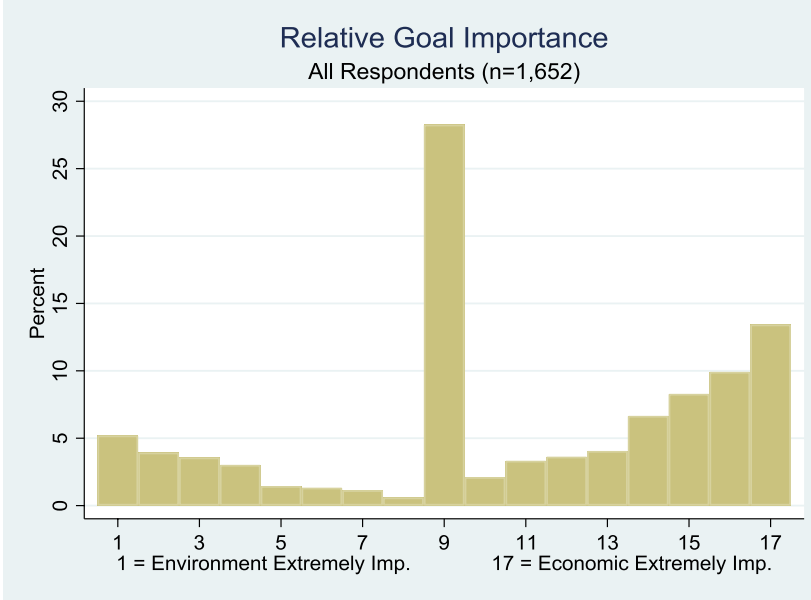

Figure 2. Economic and Environmental Goal Importance, All Respondents. [Colour figure can be viewed at wileyonlinelibrary.com]

environmental considerations.[8] Responses were re-calibrated to a 17-point ordinal scale, ranging from the strongest preference for environmental quality goals (coded as a "1"), equally weighted preferences ("9"), to the strongest preference for economic quality goals relative to environmental goals (coded as "17").[9] In addition to preferences for achieving economic goals relative to environmental goals, the CGS also asked respondents for basic personal information, such as age, sex, income, education as well as questions about respondent perspectives on personal and community economic standing.

[8]The CGS question addresses three paired goal comparisons (Economic vs. Environmental, Economic vs. Social, and Environmental vs. Social). This study examines only the first comparison.

[9]Armstrong and Stedman (2019) warn against using measures of environmental concern (in our case, environmental goals) that are geographically detached from the respondent's local environment. The six-month ASAP effort, which is focused on development choices within well-defined boundaries of a community or a county, make such detachment from the region of interest highly unlikely.

Table 2. Descriptive Statistics

Variable	*n*	Mean	Std. Deviation	Minimum	Maximum
Relative Importance toward Economics (17) or Environment (1)	1,652	10.775	4.880	1	17
Age (years)	1,652	49.213	13.748	18	89
Years in Community	1,652	25.186	17.003	1	84
Life Share in Community	1,652	0.525	0.332	0.012	1
Male (%)	1,652	0.510	0.500	0	1
Post-Bachelor's Degree (%)	1,634	0.239	0.427	0	1
Household Income ($1,000)	1,576	78.876	46.732	15	238.118
Personal Financial Security (1 = not secure at all, 5 = extremely secure)	1,643	3.313	0.948	1	5
Community Financial Security (1 = not secure at all, 5 = extremely secure)	1,636	2.872	0.891	1	5

Descriptive Statistics

Our initial dataset consists of communities located in 14 nonmetro counties of the IMW where at least 50 people had participated in the CGS (initial n = 2,004), a cutoff intended to provide sufficient community coverage/participation. Of these, some 260 respondents did not answer the age and/or community tenure questions, or they reported a community tenure longer than their reported age. Another 92 participants failed to answer the economic goal/environmental goal tradeoff question, leaving a total of 1,652 respondents in 14 counties.

Descriptive statistics are reported in Table 2. The mean economic-environmental preference score was 10.78. A histogram of this variable (Figure 2) shows the modal response was an equal weight between achieving economic and environmental goals (response category 9); the mean value indicates moderate importance of achieving economic quality goals relative to environmental goals. While the most common response was to weigh the goals equally (as seen by the spike in Figure 2), most respondents still chose to weigh one preference more than the other. The average respondent was 49 years old (*Age*) and had lived in the community for 25 years (*Years in Community*). The mean proportion of respondents' life spent living in the community (*Life Share in Community*, defined as *Years in Community* divided by *Age*) was just over 52 percent. Overall, the sample was composed of 51 percent *Male*, 23.9 percent had completed a graduate degree (*Post-Bachelor's Degree*), and the mean annual *Household Income* was just under $78,900. Using a five-point

Likert scale, respondents consider themselves more secure financially (3.31; *Personal Financial Security*) than they feel about the community they live in as a whole (2.87; *Community Financial Security*).

One's responses concerning the appropriate economic-environmental tradeoff is likely to be dependent upon the recent economic history of the community (e.g., Park et al. 2019). Economically healthy communities tend to have growing populations and rising per capita incomes; struggling communities will have falling populations, falling incomes, or both. At the same time, economic and population growth from amenity migration can lead to increased economic inequality at the local level and housing displacement for those with fewer resources (Sherman 2021). Table 3 shows the compound annual growth rates for population and income over the five-year period immediately preceding ASAP implementation. Six counties experienced negative population growth prior to CGS data collection; two counties experienced negative growth in per capita income. Another key driver of responses to an economic-environmental tradeoff—especially in states of the IMW—is the degree of public and tribal land ownership, which tends to be positively related to population growth (Frentz et al. 2004; Kruger, Mazza, and Stiefel 2008). None of our 14 counties has more than 43 percent of county land area in private ownership; 11 counties have less than 20 percent. In all communities, the majority of land is administered by federal, state, and/or tribal authorities (Table 3). Finally, while income growth may be important, the sources of income—particularly nonwage income—may also be of consequence. Our first source of nonwage income arises from wealth: the share of personal income derived from investments (dividend income), interest, and rent. High proportions of personal income derived from wealth can indicate a relatively affluent community (e.g., Valley County, ID, where 38 percent of personal income is wealth-related). The second source of nonlabor income is government transfer payments, which includes social security and unemployment payments, as well as veterans payments and medical benefits. High proportions of personal income derived from transfer payments could indicate a relatively distressed economy with fewer labor income opportunities (e.g., Graham County, AZ, where over 36 percent of personal income is from nonlabor government payments and is classified by the Economic Research Service (ERS) as "low employment") or relatively low-income retirement destinations where much of the population relies upon social security (e.g., Piute County, UT, where 35

Table 3. Five-year Growth Rates and Land Use for Study Counties

				County Growth Rates[b]		County Land Ownership				Nonlabor Income Shares[c] (%)	
	Year of Survey	County Type[a]	Population	Population	Per Capita Income	Private	Federal	State	Tribal	Wealth-related income	Government Transfers
Graham, AZ	2018	Federal/State Government	37,879	0.25	1.04	9.9	36.9	16.7	36.5	13.5	36.3
Greenlee, AZ	2018	Mining	9,504	1.58	1.64	8.3	77.0	14.7	0.0	9.7	26.2
Valley, ID	2016	Recreation	9,879	0.52	3.68	11.2	86.0	2.8	0.0	38.0	18.2
Cibola, NM	2015	Federal/State Government	27,382	−0.01	0.84	29.8	29.1	6.4	34.7	14.3	33.8
Beaver, UT	2017	Recreation	6,414	−0.32	−2.12	12.7	77.1	10.2	0.0	20.9	26.9
Carbon, UT	2018	Mining	20,356	−0.90	0.23	39.2	47.5	13.4	0.0	17.1	27.0
Garfield, UT	2016	Recreation	5,020	−0.86	2.41	5.1	90.0	4.8	0.0	24.3	21.4
Grand, UT	2016	Recreation	9,428	0.50	2.12	4.6	72.1	14.9	8.4	30.1	17.3
Millard, UT	2016	Nonspecialized	12,604	0.16	4.12	13.5	77.3	9.2	0.0	16.5	19.3
Piute, UT	2016	Farm	1,859	−0.95	2.28	13.3	74.0	12.7	0.0	19.4	34.9
San Juan, UT	2017	Mining	15,193	0.65	0.12	7.9	61.4	5.3	25.4	18.6	28.2
Sanpete, UT	2017	Federal/State Government	28,892	0.91	1.52	42.7	51.5	5.8	0.0	17.3	24.2
Sevier, UT	2017	Nonspecialized	20,961	0.26	1.40	19.3	76.8	3.8	0.1	18.7	25.2
Wayne, UT	2014	Federal/State Government	2,742	−0.10	−0.31	3.7	85.5	10.8	0.0	22.8	23.1

[a]These are the 2015 non-overlapping county economic types from the USDA Economic Research Service (USDA ERS 2017).
[b]Compound annual growth rates over five-year period ending in year prior to survey.
[c]Shares calculated for the year prior to the ASAP survey.

percent of personal income is from government transfers and is classified by the ERS as "retirement destination").[10]

Classification Trees

Rural development studies often find differences in the development preferences among community members, particularly between LTRs and comparative NCs to the community. There is little theory to help guide the practitioner in identifying which respondents belong to which group, and most researchers have used the best professional judgment in defining each group, an inductive reasoning approach. An alternative, deductive, method is to define groups based on some known date at which an exogenous event, such as an energy boom, is hypothesized to have affected a community. With fourteen communities spread over four states, a deductive approach was not empirically tractable.

We opted to use a systematic, data-driven tool often applied to exploratory analysis of big data, and akin to inductive reasoning. In this application, a classification tree is used to place observations into different groups that help maximize the predictive ability of the model (Ma 2018; Speybroeck 2012). The groups arising from a robust classification tree (CT) often have been found to be an improvement upon standard regression analysis, especially if the relationship between the dependent variable and the variables used to classify observations into groups is nonlinear.

CTs are structured according to an impurity measure which gauges the extent to which observations can be segmented into different categories based on values of the explanatory variable(s) and the dependent variable. In our application, groups are defined according to *Life Share in the Community* and *Age*. A group is considered pure if all observations in an age/life share group have the same value for the dependent variable; if observations within an age/life share group differ from one another there is some degree of impurity. The root of a CT consists of all observations, after which subsequent branches of the tree are defined by a series of binary splits at a given value of an explanatory variable. The branches of a CT are called "nodes".

There are many ways to measure impurity; we adopt the Gini measure. At any given node, τ, let $P\left(y_j\right)$ denote the proportion of cases reporting

[10]Population growth, income growth and income share data were collected from the CAINC4 files of the Bureau of Economic Analysis (https://apps.bea.gov/iTable/index_regional.cfm). County-level public land data were extracted from Headwaters Economics Economic Profile System (headwaterseconomics.org/eps).

a dependent variable in the category y_j. Given the 17 categories for the dependent variable, the Gini measure of impurity at that branch is

$$i(\tau) = 1 - \sum_{1}^{17} P\left(y_j\right)^2.$$

The equation makes clear that if all observations in a group have the same dependent variable response, y_j, then $P\left(y_j\right) = 1$ and $i(\tau) = 0$ (a pure group). Alternatively, groups that exhibit variation in responses will have impurity values greater than zero. If there are h unique values for a continuous splitting variable, there are $h - 1$ possible split values for it. The CT algorithm systematically checks all possible splitting values for each explanatory variable, and then chooses the value of one variable that minimizes measured impurity at that node. The algorithm then continues with a series of binary splits at each subsequent node, evaluating the newly calculated impurity measures until the reduction in impurity for any new split becomes very small. The terminal nodes of the CT define the groups.

Ordered Probit Analysis

Preferences for the tradeoff between economic goals and environmental goals are measured on a 17-point ordinal scale, so standard regression analysis is inappropriate. Instead, we use an ordered probit model to estimate the probability that a person with characteristics $\boldsymbol{X}$ living in a community with characteristics $\boldsymbol{C}$ will choose any one of the 17 possible responses. Though ordered probit models are discussed in some detail elsewhere (e.g., Greene 2008; Wooldridge 2010), we provide a basic outline here. Ordered probability models are an extension of bivariate probability models of a choice between two alternatives to a choice among K alternatives. Letting $\boldsymbol{Z}_{ij} = [\boldsymbol{X}_i, \boldsymbol{C}_j]$ be the vector of personal and community attributes for respondent i living in community j, then the probability of any choice of alternative k can be decomposed into a series of differences between cumulative probability distributions. With $\Phi(.)$ denoting the cumulative normal distribution, the probability for any response k for a given $\boldsymbol{Z}_{ij}$ may be written as

$$P\left(y=1\right) = \Phi\left(-\boldsymbol{Z}'_{ij}\boldsymbol{\beta}\right) P\left(y=2\right) = \Phi\left(\mu_1 - \boldsymbol{Z}'_{ij}\boldsymbol{\beta}\right) - \Phi\left(-\boldsymbol{Z}'_{ij}\boldsymbol{\beta}\right)$$
$$P\left(y=3\right) = \Phi\left(\mu_2 - \boldsymbol{Z}'_{ij}\boldsymbol{\beta}\right) - \Phi\left(\mu_1 - \boldsymbol{Z}'_{ij}\boldsymbol{\beta}\right) \ldots P\left(y=K\right) = 1 - \Phi\left(\mu_{K-1} - \boldsymbol{Z}'_{ij}\boldsymbol{\beta}\right),$$

where the μ_k are the $K - 1$ threshold parameters ("cut values") that divide the cumulative distribution into K portions, each portion corresponding to the probability of a given choice by someone with personal and community characteristics, $\mathbf{Z}_{ij}$. The $\boldsymbol{\beta}$ are estimated via maximum likelihood and are assumed to be constant across all choices.

The nonlinear probability distribution across multiple possible outcomes means the estimated parameters do not have a simple interpretation. The marginal effect of a given variable differs across the outcomes because a change in that variable shifts the entire probability density mass. One does not know, in general, if the net change in probability for a given response k will be positive or negative. However, the *direction* of the shift in probability mass is evident in the sign of a coefficient: a positive value means an increase in the independent variable will shift the mass to the right, increasing the probability of choice being the highest valued outcome ($k = K$) and decreasing the probability of the lowest valued outcome ($k = 1$). Similarly, a negative coefficient means the mass shifts to the left, such that an increase in an independent variable decreases the probability of a response in the $k = K$ category and increases the probability of the $k = 1$ category. The change in probability for all intermediate response categories ($k = 2, \ldots, K - 1$) must be calculated and cannot be determined from the coefficient alone.

Results

Life Share and Age Group Classification of Residents

A classification tree approach was used to examine differences in tradeoff responses in relation to respondents' life share and age.[11] The analysis yields three groups within which the impurity of the economic-environmental tradeoff score is minimized. The sample was first split into two groups according to *Life Share*, where the split value was 36 percent of a life spent living in the community. The node representing those who had spent more than 36 percent of their lives in the community had no further splits, but the node for those with less than 36 percent of their lives in the community was split into two branches at a split value for *Age* equal to 50. Our classification tree

[11]In addition to classification tree analysis using *Life Share* and *Age*, we also conducted analysis using *Age* and *Years in the Community*. Test statistics indicate the *Life Share* approach is preferred.

thus has terminal nodes defining three groups. These groups can generally be classified as newcomers (≤36 percent of their lives spent in the community) or long-term residents (>36 percent of their lives in the community). The newcomer group consists of younger newcomers (≤50 years old) and older newcomers (>50). Table 4 shows information about each of our three groups, where the table is arranged first by life share and then by age; a graphical depiction is shown in Figure 3.

Both younger newcomers (YNC) and older newcomers (ONC) had spent, on average, about 17 percent of their lives in the community. The group of long-term residents (LTR) is composed of all persons who had spent at least 36 percent of their lives living in the community, regardless of age. LTRs had spent an average of 74 percent of their lives in the community.

In general, LTRs place the greatest weight on achieving economic goals, followed by newcomers in the prime of their working lives. LTRs have a mean goal weight of 11.4 with a median weight of 12, indicating moderate to strong preferences for achieving economic goals relative to environmental goals. YNCs express a moderate preference for economic goals relative to environmental goals (mean = 10.5, median = 10). Older newcomers (ONCs) express a preference for equally weighting environmental and economic goals (mean = 8.95; median = 9). The preference of LTRs to weigh economic goals more heavily, for ONCs to show stronger preferences for environmental goals, and for YNCs to be somewhere in between was the same regardless of typology assigned to the county by the ERS (whether the county had a recreation-based economy, was a retirement destination, or was neither).

Figure 4 shows histograms for the economic-environmental tradeoff for each of the life share-age groups. Similar to the histogram for all respondents, a spike occurs at a tradeoff score of nine for all of the identified groups, indicating the modal response is for equal weight between economic and environmental goals. Again, however, *only* 32 percent or fewer respondents choose to weigh the economic and environmental preferences equally. Differences among groups emerge when comparing the tails of each distribution. We can characterize the dispersion of responses for any group with a Leti index and then compare indices across groups. Following Mussini (2018), the Leti index is calculated as $L = \sum_{j=1}^{K-1} F\left(y_j\right)\left[1 - F\left(y_j\right)\right]$, where K is the number of categories in the ordinal scale and $F(.)$ measures the cumulative relative frequency up to response j. That is, $F\left(y_j\right) = \sum_{i=1}^{j} n_i/n$

Table 4. Classification Tree Analysis of Community Life Share and Age (n = 1,652)

Terminal Group Name	Life Share	Age Group	Mean Life Share (Residence/Age)	Mean Economic-Environment Tradeoff	Median Economic-Environmental Tradeoff	Leti Heterogeneity Index
Newcomers						
Younger Newcomer (n = 317)	<0.360	Age 18–50	0.173 (0.101)[a]	10.517 (4.822)	10	0.681
Older Newcomer (n = 315)	<0.360	Age > 50	0.172 (0.100)	8.952 (5.130)	9	0.720
Long-term Residents						
Long-term Resident (n = 1,020)	>0.360	All Ages	0.743 (0.218)	11.418 (4.670)	12	0.647

[a] Standard deviation in parentheses.

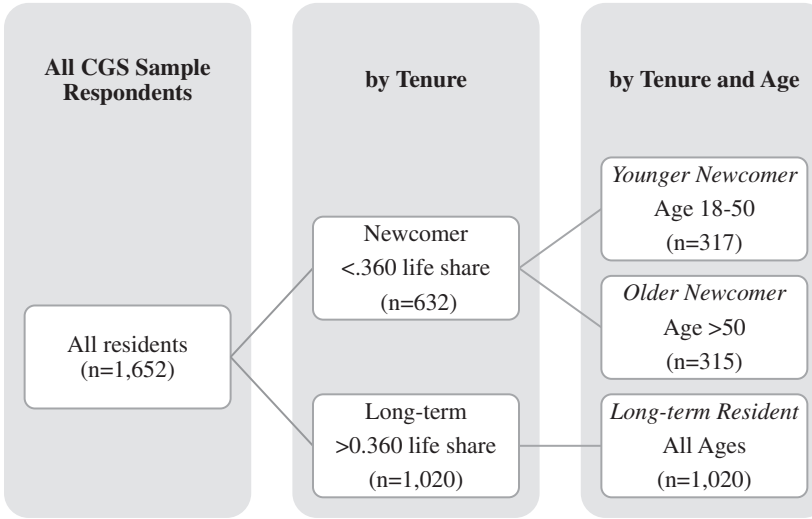

Figure 3. Classification Tree.

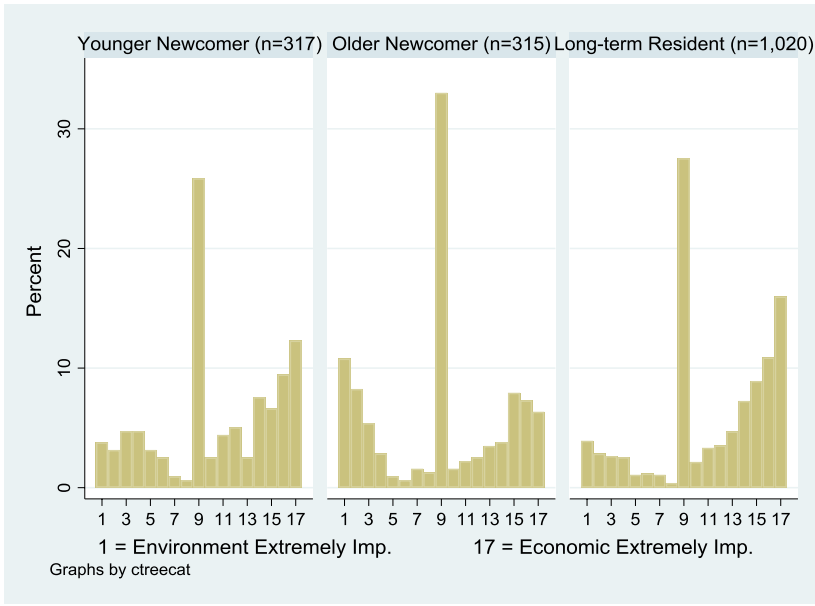

Figure 4. Economic and Environmental Goal Importance, by Life Share-Age Status. [Colour figure can be viewed at wileyonlinelibrary.com]

where n_i is the number of responses in each of categories 1 through j, and n is the total number of responses. When n is large, as in our case, the maximum value for the index is equal to or very close to $(K-1)/2$. A value of zero indicates perfect homogeneity—meaning all people in a group have the same tradeoff response. Perfect heterogeneity is given by the maximum value for L (equal to 7.999 or 8.000 in our study) which occurs when responses within a group are evenly distributed across all response categories. Dividing L by its maximum value yields a normalized L index bounded by zero (perfectly homogeneous) and one (perfectly heterogeneous).

The normalized Leti heterogeneity index for the full sample (n = 1,652) is equal to 0.682. The most homogenous group is LTRs, which has a Leti index of 0.647 (Table 4). Visual inspection of Figure 4 shows the distributional mass placed to the right of the mid-point value (i.e., relatively few people in these groups weighted environmental goals more heavily than economic goals). In contrast, the most heterogeneous group was composed of ONCs, where the normalized Leti index for this group is 0.720. Figure 4 shows the response distribution for this group is spread more evenly among the possible responses than for the other two groups. YNCs have a heterogeneity index almost identical to that of the full sample (0.681).

The Leti index for the full sample can be decomposed into within group heterogeneity, L^W, and between group heterogeneity, L^B. L^W is the proportionally weighted sum of the group heterogeneity measures; L^B is a proportionally weighted sum of squared differences between groups at each response category. The ratio of these two measures, L^B/L^W, is interpreted as an index of polarization between groups (Mussini 2018). The more homogenous the groups are, or the greater the sample proportion of more homogenous groups, the lower will be L^W measure and the higher the degree of polarization. Though the index has no upper bound, it will equal zero in the absence of polarization. Our polarization index is equal to 0.023, indicating that, although we observe a clear lean toward economic goals by LTRs, overall there is little measured polarization among the groups.

Ordered Probit Modeling

Ordered probit models appear in Table 5. Specifications are arranged so that Models #1 and #2 include only respondent attributes ($\boldsymbol{X}_i$), Models #3 and #4 include respondent and county attributes, $\boldsymbol{Z}_{ij} = [\boldsymbol{X}_i, \boldsymbol{C}_j]$, while the last two specifications (#5 and #6) use personal characteristics, $\boldsymbol{X}_i$, and county fixed effects (instead of county attributes $\boldsymbol{C}_j$). The specifications are paired in a way that allows one to test the effect of *Life Share* and

Table 5. Ordered Probit Models Dependent variable = Economic-Environmental Tradeoff; n = 1,542

Variable	Model #1	Model #2	Model #3	Model #4	Model #5	Model #6
Respondent Attributes						
Post-Bachelor's Degree	–0.232	–0.245	–0.198	–0.209	–0.198	–0.209
	(0.001)[a]	(0.001)	(0.004)	(0.002)	(0.004)	(0.006)
Male	0.224	0.222	0.186	0.189	0.177	0.181
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Household Income	0.002	0.002	0.002	0.002	0.002	0.002
	(0.002)	(0.003)	(0.014)	(0.013)	(0.023)	(0.020)
Personal Financial Security	0.045	0.040	0.032	0.030	0.035	0.033
	(0.162)	(0.212)	(0.333)	(0.360)	(0.293)	(0.310)
Community Financial Security	–0.069	–0.067	–0.072	–0.073	–0.076	–0.078
	(0.037)	(0.042)	(0.036)	(0.031)	(0.031)	(0.024)
Age	–0.004		–0.003		–0.003	
	(0.072)		(0.167)		(0.178)	
Life Share in Community	0.410		0.337		0.341	
	(0.001)		(0.001)		(0.001)	
Younger Newcomer		–0.142		–0.104		–0.104
		(0.039)		(0.132)		(0.130)
Older Newcomer		–0.498		–0.450		–0.450
		(0.001)		(0.001)		(0.001)
County Attributes						
Five-year Population Growth Rate			–7.268	–9.586		
			(0.393)	(0.261)		
Five-year Per Capita Income Growth Rate			5.549	4.822		
			(0.045)	(0.083)		
Wealth-related Income Share			–1.612	–1.766		
			(0.045)	(0.028)		
Transfer Payment Income Share			1.296	0.728		
			(0.440)	(0.666)		

Table 5. ***Continued***

Variable	Model #1	Model #2	Model #3	Model #4	Model #5	Model #6
% USFS Land			0.438	0.493		
			(0.186)	(0.137)		
% BLM Land			0.506	0.432		
			(0.129)	(0.198)		
% NPS Land			–0.092	0.189		
			(0.884)	(0.763)		
% State Trust Land			0.856	1.291		
			(0.310)	(0.131)		
% Tribal Land			–0.228	–0.166		
			(0.675)	(0.762)		
Community Fixed Effects included?	No	No	No	No	Yes	Yes
Log-likelihood	–3,650.69	–3,640.64	–3,633.68	–3,624.27	–3,632.09	–3,622.87
Chi-square Test Statistic (all $\beta = 0$)	85.77	109.24	112.15	133.02	119.64	139.36
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Corrected Akaike Information Criterion	7,347.05	7,327.95	7,332.68	7,313.86	7,337.86	7,319.42

Note: Sixteen cut-values (intercepts) for ordered categories suppressed for clarity, as are the sixteen fixed effects variables estimated for Models #5 and #6.

[a] p-values for H_o: $\beta = 0$ shown in parentheses, and are based on heteroskedasticity robust standard errors.

Age. The odd-numbered specifications treat *Life Share* and *Age* as continuous variables whereas the even-numbered specifications use the discrete life share-age categories identified by the classification tree analysis.

Across all specifications' personal characteristics $\boldsymbol{X}_i$ retain the same signs and, for the most part, their level of statistical significance. Regardless of the specification, having a *Post-Bachelor's Degree* shifts the probability mass to the left ($p < .05$), decreasing the probability of extreme importance of economic goals response. In contrast, being *Male* shifts the probability mass to the right, increasing the probability of extreme importance of economic goals response. Increasing *Household Income* increases the probability of an extreme weight placed on economic goals. Greater values of reported *Personal Financial Security* are not a significant predictor of the tradeoff weight. In contrast, *Community Financial Security* is negative and significant in all specifications. That is greater values of perceived *Community Financial Security* shift preferences toward the extreme importance of environmental goals.

The role of *Life Share* and *Age* as continuous variables are examined in the odd-numbered specifications. *Age* is never statistically significant ($p > .05$). *Life Share in the Community* is statistically significant in all specifications in which it appears. As *Life Share* increases, the probability of placing extreme importance on economic goals increases. The even-numbered specifications replace continuous *Life Share* and *Age* variables with two discrete age/life share variables as identified by classification trees. The LTR group is not only the largest group identified by the classification tree analysis (about 62 percent of the sample) but it is also the most homogeneous as measured by the Leti heterogeneity index. Hence, we choose this group as the baseline against which other life share-age groups are compared. Given this group weighted achieving economic goals more highly than any other group, we expect negative coefficients on the other group variables. Relative to LTRs, the YNC group parameter is significant only in Model #2 and insignificant in the other two models. In contrast, the ONC group is statistically more likely, relative to LTRs, to place extreme importance on environmental goals relative to economic goals (Models #2, #4, and #6).

The models with continuous *Life share* and *Age* variables are not nested within those using the discrete group variables identified by classification trees, so one cannot simply compare log-likelihood values across specifications. One can use the corrected Akaike Information Criterion (AIC_c) to evaluate which specification is preferred, where the preferred

specification is the one with the minimum AIC_c score.[12] In all specification comparisons (#1 vs. #2, #3 vs. #4, and #5 vs. #6), the AIC_c indicates the classification tree group variables are preferred to the simple continuous *Age* and *Life Share* variables.

We turn now to county characteristics, $\boldsymbol{C}_j$, included in Models #3 and #4. *Population Growth* has no effect on preferences regarding economic or environmental goals. Faster *Per Capita Income Growth* in a county is associated with a shift of the probability mass to the right in Model #3, and a greater probability of responding that economic goals are of extreme importance relative to environmental goals. This variable is insignificant in Model #4. With respect to the components of personal income, as the *wealth-related* share of income increases, the probability of a more extreme weight toward achieving environmental goals increases. The share of income received from *Transfer Payments* has no significant effect on the tradeoff weight. Further, none of the public or tribal land measures has a significant effect on the relative importance of the goals.

Models #5 and #6 exclude county attributes in favor of a simple fixed effect approach. Here, the nine county attributes are replaced by 13 county-level dummy variables. Fixed effects can capture a broader array of community attributes than the few variables included in specifications #3 and #4, but the measured effect is restricted to a single-valued parameter for each community. As measured by the log-likelihood, the fixed effect specifications are, at first glance, superior to the alternatives. Once again this does not account for the different number of variables included in each model and the fact that the models are not nested. The AIC_c can be used to rank the models according to the relative likelihood of best approximating a correctly specified model (Burnham and Anderson 2002). In Table 5, the minimum AIC_c value is that of Model #4, making it the preferred specification. Further, differences in AIC_c values are informative. Relative to the minimum AIC value, differences greater than four indicate considerably less empirical support for the alternative model, and differences in excess of ten suggest essentially no support for that specification. Differences can also be used to calculate the relative probability of a given specification being closer to the correct model. For the specifications reported in Table 5, Model #4 has a 94 percent likelihood of being closest to the correctly specified model,

[12]The test statistic is calculated as $\mathrm{AIC}_c = -2\ln(L) + 2k + \left(\frac{2k(k+1)}{n-k-1}\right)$ where $\ln(L)$ is the value of the likelihood function, n is the number of observations, and k is the number of parameters estimated (Burnham and Anderson 2002).

far exceeding the next most likely specification (Model #6, just under 6 percent). The models with the continuous *Life share* and *Age* variables receive, essentially, zero support.

Marginal Effects Analysis

Table 6 shows the direction of the change in probability for each of the 17 possible response categories for each independent variable, where marginal effects are shown for only those that are statistically significant ($p \leq .05$). As is common with ordered probit models, a clear "break" in probabilities is evident; in this case, the break occurs roughly at response categories 10 or 11 (economic goals are moderately more important than environmental goals). Respondents achieving a graduate degree are less likely to place greater importance on economic goals and more likely to place equal or greater importance on achieving environmental goals. In contrast, males are more likely to rate the achievement of economic goals as (strongly) more important than environmental goals. Greater household income increases the probability of weighting economic goals more heavily than environmental goals. *Personal Financial Security* does not have a statistically significant marginal effect on any response. Increasing *Community Financial Security,* in contrast, increases the probability of greater weight toward achieving environmental goals. Significant marginal effects were calculated for ONCs, who are more likely to choose responses that rate achieving environmental goals as equal to or more important than economic goals.

Turning to community attributes, neither the *Population Growth Rate* nor the P*er Capita Income Growth Rate* affects the economic-environmental goal weight distribution. As the share of *Wealth-related Income* grows, the probability of choosing to weight environmental goals more highly increases. Responses were unrelated to the share of *Transfer Payments* in personal income, nor were responses statistically related to public or tribal land ownership.

Robustness Checks[13]

The models of Table 5 were evaluated for sensitivity to misspecification in the errors, the nature of the dependent variable, and omitted variables. Though the hypothesis tests reported above are based on standard errors that are robust to many types of misspecification, the models are based on the unlikely assumption of a normal distribution. We can approach the issue of misspecification only indirectly. First, all models were re-estimated

[13]We thank two referees for important comments leading to this analysis.

Table 6. Statistically Significant Marginal Effects for Model #4 (Preferred Specification)

	Outcome																
Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Respondent Attributes																	
Post-Bachelor's Degree	+	+	+	+	+	+	+	+	+			−	−	−	−	−	−
Male	−	−	−	−	−	−	−	−	−			+	+	+	+	+	+
Household Income	−	−	−	−	−	−	−		−			+	+	+	+	+	+
Personal Financial Security																	
Community Financial Security	+	+	+	+	+	+			+				−	−	−	−	−
Younger newcomer																	
Older newcomer	+	+	+	+	+	+	+	+	+	−	−	−	−	−	−	−	−
Community Attributes																	
Population growth																	
Per Capita Income Growth																	
Wealth income share	+	+	+	+	+	+			+			−	−	−	−	−	−
Transfer payment income share																	
% USFS land																	
% BLM land																	
% NPS land																	
% state trust lands																	
% Tribal land																	

Note: Direction of marginal effects reported only if $p \leq .05$; based on heteroskedasticity robust standard errors.

under the assumption that errors were distributed logistically. With the exception of *Per Capita Income Growth* ($p < .05$), all of the ordered logit results are qualitatively identical to that of the ordered probit. We also estimated a linear probability model (simple OLS) and find the results to be qualitatively identical to those of the ordered probit model.

The second test of model misspecification is to look for large changes between non-robust and robust standard errors. Long and Freese (2014:104) note that large differences between robust and classical errors for a given model are indicative of misspecification. In no case (ordered probit, ordered logit, or OLS) did we find large differences between robust and classical errors. For example, the average (Robust—Classical) difference for the preferred specification estimated using ordered probit was 0.13 percent, with a range of differences between −6.3 percent and +6.6 percent for the 16 variables in the model. For the ordered logit the average was 1.3 percent (range −4.0 percent to +7.0 percent), and for OLS the mean was 0.4 percent (range −6.8 percent to +3.9 percent).

One final approach is to examine our preferred specification under the assumption that the dependent variable represents a multinomial response instead of an ordered response. For the personal attributes of the respondent, the results largely mirror the ordered probit (e.g., having a graduate degree increases the probability of weighting environmental goals more heavily than economic goals, whereas being male does the exact opposite). However, the results for community attributes are more difficult to interpret. For example, increasing per capita income growth increases the probability that a respondent would choose to very strongly weight environmental goals over economic goals (response category = 3) and, at the same time, increase the probability one would choose to very strongly weight economic goals over environmental goals (response category = 16). Such results are problematic and suggest the multinomial assumption is incorrect; a model that directly allows for ordering is appropriate.

The qualitative results are clearly robust to a variety of technical modeling assumptions, but what about important omitted variables? Existing studies have shown that political party and religiosity/religious affiliation are important predictors of views on environmental issues (e.g., Brehm and Eisenhauer 2006; Brehm, Eisenhauer, and Krannich 2006; Kennedy and Johnson 2020). A limitation of our survey is that these questions were not asked, so we supplemented our data set with secondary county-level data on percent members of the Church of Jesus Christ of Latter-Day Saints (LDS) and the average percentage of the Republican vote in the 2012 and 2016 U.S. presidential elections. These aggregate measures were statistically insignificant in our preferred specification model and

thus not included in our final models. Had individual-level data been available, perhaps we would have had the variation needed to tease out a statistically significant result.

Discussion

The role of community tenure in characteristics, attitudes, and behaviors has been a key area of research focus in rural areas experiencing economic and demographic shifts, including whether a "culture clash" in values between newer and long-term residents is evident. Our modeling effort provides evidence of a more nuanced understanding of the "culture clash" between NCs and LTRs over preferences for economic and environmental goals. The classification tree analysis found that the most pronounced differences were between *older* NCs and LTRs, as opposed to simply NCs and LTRs. Leti homogeneity indices confirm that LTRs are, indeed, relatively homogeneous in their responses—and they prefer a stronger weight toward economic goals. On the other hand, ONCs were the most heterogeneous group in their development goals and placed the most weight on achieving environmental goals. This is in contrast to much of the existing literature showing an inverse relationship between age and environmental attitudes or concerns (Hamilton et al. 2014). Furthermore, past research has suggested that newcomers as a whole are likely to favor the preservation of natural resources (e.g., Blahna 1990); we find that this is not entirely true.

The relatively strong environmental goal preferences of ONCs are likely related to their varied motivations and resources in their move to destination communities. Older adults or retirees who are new to the community are likely to have more stable sources of nonwage income and may have relocated for lifestyle reasons, such as access to natural amenities, climate, and outdoor recreation (Brown et al., 2008). YNCs also relocate to rural communities for access to environmental amenities, but members of this group are more likely to rely upon wage income through employment or entrepreneurship in their destination community (Ulrich-Schad 2018). The need for wage income will, of course, influence their economic-environmental preferences. While qualitative studies have documented some of the heterogeneity of NCs in high amenity rural areas (Matarrita-Cascante, Zunino, and Sagner-Tapia 2017; Sherman 2021; Ulrich-Schad 2018), our study better accounts for those variations than most quantitative studies. To the degree that a clash over future development options is evident in a community, to describe it in terms of NCs versus oldtimers/LTRs is an oversimplification.

Our findings further suggest that differences between life share-age groups hold across a variety of rural places in the IMW—it did not matter

if the county was a retirement destination, had a recreation-based economy, or was neither of these. The literature's focus on culture clashes in high amenity, high population growth areas would seem to overlook the fact that clashes can exist in other types of rural places. For instance, this may occur when residents of more established amenity destinations are displaced or desire less-developed or less-gentrified rural communities to reside in and move to emerge destinations that were previously considered less desirable. This outcome could also help explain why individual attributes were more significant predictors of views on economic-environmental tradeoffs than community attributes.

The modeling also reveals the complex role of income, perceived financial security of the community, and wealth-related income in determining a person's relative weighting of economic and environmental goals. The standard economic assumption is that environmental goods are normal/luxury goods (as income rises so, too, does the demand for environmental quality). Yet our results suggest the opposite—that as income rises the probability density shifts toward achieving economic goals and away from achieving environmental goals. The preference tradeoff question, though, is framed with the context of one's economic and environmental goals *for the community*. A high-income respondent living in a financially insecure community may choose to moderate personal environmental preferences for the public good, namely, better economic opportunities for their neighbors. Our models are consistent with this hypothesis in that community measures of income and wealth temper the shift associated with household income. As the respondent perceives the community, as a whole, to be more financially secure, the density function shifts back toward weighting environmental goals more heavily. A similar shift toward environmental goals is associated with an increasing percentage of aggregate regional income derived from wealth-related sources.

The net effect of the three income-related variables can be gauged by evaluating the probability index function ($\mathbf{Z'}_{ij}\boldsymbol{\beta}$) at mean values for the three variables. The net effect is negative; the positive effect of *Household Income* is outweighed by the negative effect of *Community Financial Security* and *Wealth-related Income Share*. This finding implies that a respondent's rural development preferences are a function of their personal financial situation and the financial situation of the community as a whole. Focusing on a single measure of financial well-being—most surveys elicit information about only income—is likely to miss key factors that influence a person's preferences.

One surprise that emerged from our modeling was the lack of significance of public land variables. Federal ownership and management of

large swaths of the IMW has been locally controversial for decades, and a strong upswell of protest emerged in the mid-2010s, just prior to when most of our communities were surveyed. The protest against federal land ownership is partially rooted in the belief that stringent federal land use regulations limit the economic productivity of federal lands and strangle local economic opportunity, especially in places where the federal government has a large footprint (Jakus and Akhundjanov 2019). While the typical county in our sample has in excess of 50 percent of its area federally-owned and managed, the empirical results show that the proportions of USFS ($p < .137$), BLM ($p < .198$), and NPS ($p < .763$) land in a community was unrelated to development goal preferences. Perhaps our sample communities were too homogeneous in federal land ownership—only three counties had less than 50 percent federal ownership—and the statistical issue is simply the lack of sampling variation in federal ownership.

Our paper also provides methodological contributions relevant to rural community development and other survey research. First, we find that using a classification tree analysis is a fruitful way to identify groups based on their life share in the community and age–both factors which past literature has shown to be important in understanding local development preferences. Using a data-driven process to identify groups yielded a number of key insights and distinguish this study from others (see Qin 2016). The classification tree groups were also helpful in specifying our ordered probit response models. The AIC statistic indicates that group-based models were preferable to models based on continuous age/life share variables, implying that tradeoff responses were not linear in age or life share.

We also found value in encouraging respondents to indicate the degree to which they would prefer to prioritize one goal over the other, while simultaneously acknowledging that more weight on one goal does not mean that there is an absence of support for another. Economic and environmental goals of rural communities are not mutually exclusive, but should be viewed as existing on a continuum. Typical measurements used in quantitative questionnaires do not allow residents to indicate possible tradeoffs, which instead often leads respondents to express maximum importance for both environmental and economic goals. We found that framing the question as a tradeoff led to response variation that proved insightful. Specifically, most respondents did not choose a maximum emphasis on either environmental or economic goals, but instead indicated some degree of the tradeoff in the relative importance of the two. In addition, while a substantial proportion (approximately one-third) of respondents chose to weigh environmental and economic goals equally, the majority expressed preferences that weighted one goal

more heavily than the other. Those designing rural community and economic development plans will likely find the more direct and nuanced type of information elicited through the methods we described as more useful in their planning.

In terms of the limitations of this study, our survey data is derived from questions asked of 1,652 residents of 14 counties in four states in the IMW. While there is diversity in the types of places represented, our study is not necessarily representative of all rural places in the IMW or the rural U.S. more broadly. Similar types of questions should be asked of rural residents across a greater variety of place types and regions in order to examine whether the findings are similar. In addition, probability sampling was not used in the study communities, meaning our results are more representative of residents who are more knowledgeable and/or involved in local development decision-making than the general public. Improving the survey implementation to include a greater representation of residents could encourage community buy-in for the process and local development efforts. Finally, the spike in Figures 2 and 4 at response category 9 (corresponding to an equal weight between economic goals and environmental goals) may indicate that some proportion of our respondents did not want to choose one goal over another and, by default, selected equal weights. Some 50 percent of these "equal weight" respondents (about 14 percent of our total sample) also chose an equal weight response when asked about tradeoffs between environmental goals and social goals, and between economic goals and social goals. While the conclusions presented in this study remain insensitive to the inclusion/exclusion of these respondents, researchers following a similar AHP elicitation format may wish to closely examine responses to this question in focus groups or in post-survey analysis.

Conclusion

Our findings show that the simple NC versus LTR debate is more nuanced than is often described in the popular press, by community leaders, and in some academic literature. We argue that the age of residents is also important to consider as are "culture clashes" over development in more than just high amenity growth places. Tensions in rural communities will likely continue to grow as more and more experienced high growth rates and growing economic inequality (Sherman 2021). This will likely lead to additional conflict over community development priorities at the local level in rural places experiencing these pressures (Ulrich-Schad 2018). Thus, understanding how residents' characteristics, as well as community characteristics, are related to development preferences will be important as communities adjust to these ongoing

and intensified demographic shifts and plan for the future. Notably, we found that few place characteristics were important in understanding preferences for economic-environmental preferences. However, a variety of respondent attributes, including life share-age, education, gender, household income, and perceived community financial security were. Characteristics of residents will thus be particularly important for rural community leaders to understand and account for in their planning.

Collecting and using residents' preferences in the planning process could be one way to foster greater community buy-in and thus more sustainable and successful development efforts. This is particularly important given the growing resentment and feelings of being left behind (and being left behind) documented in rural places in the U.S. (e.g., Cramer 2016; Hochschild 2018; Sherman 2021; Wuthnow 2018). While not all residents want to or can participate in local decision-making processes (e.g., a lack of social, political, or economic capital), providing residents with convenient options for providing their input (while acknowledging that structural issues are not being addressed), and actually accounting for these preferences in planning, may help to alleviate some feelings that rural residents have that they have no voice in their communities.

References

Albrecht, Don E. 2014. *Rethinking Rural*. Pullman, WA: Washington State University Press.

Armstrong, Andrea and Richard C. Stedman. 2019. "Understanding Local Environmental Concern: The Importance of Place." *Rural Sociology* 84(1):93–122.

Blahna, Dale J. 1990. "Social Bases for Resource Conflicts in Areas of Reverse Migration." Pp. 159–78 in *Community and forestry: Continuities in the sociology of natural resources*, edited by R. G. Lee, D. R. Field, and W. R. Burch (eds.). Boulder, CO: Westview Press.

Bordigioni, Malieka, Samjhana Koirala, Mimako Kobayashi & Paul M. Jakus 2020. "Area Sector Analysis Process: Technical Documentation." Western Rural Development Center. Retrieved May 13, 2021. (https://www.usu.edu/wrdc/publications/asap-technical-documentation)

Boucquey, Noelle, Lisa M. Campbell, Gabriel Cumming, Zoe A. Meletis, Carla Norwood, and Joshua Stoll. 2012. "Interpreting Amenities, Envisioning the Future: Common Ground and Conflict in North Carolina's Rural Coastal Communities." *GeoJournal* 77:3–101.

Brehm, Joan M. and Brian W. Eisenhauer. 2006. "Environmental Concern in the Mormon Culture Region." *Society and Natural Resources* 19(5):393–410.

Brehm, Joan M., Brian W. Eisenhauer, and Richard S. Krannich. "Community Attachments as Predictors of Local Environmental Concern: The Case for Multiple Dimensions of Attachment." *American Behavioral Scientist* 50(2):142–65.

Brown, David L., Nina Glasgow, László Kulcsár, Benjamin C. Bolender, and Marie-Joy Arguillas. 2008. *Rural Retirement Migration* (Vol. 21). Dordrecht: Springer.

Burnham, Kenneth P. and David Raymond Anderson. 2002. *Model Selection and Multimodel Inference: A Practical Information-Theoretic Approach* (2nd ed.). New York: Springer.

Carolan, Michael. 2020. "The Rural Problem: Justice in the Countryside." *Rural Sociology* 85(1):22–56.
Carr, Patrick J. and Maria Kefalas. 2009. *Hollowing out the Middle: The Rural Brain Drain and What It Means for America*. Boston, MA: Beacon Press.
Cox, Linda, Jonathan Alevy, Thomas Harris, Barbara Andreozzi, Joan Wright, and George Borden. 2009. "The Community Business Matching Model: Combining Community and Business Goals and Assets to Target Rural Economic Development." Pp. 255–78 in *Targeting regional economic development*, edited by S. Goetz, S. Deller, and T. Harris (eds.). New York, NY: Routledge.
Cramer, Katherine J. 2016. *The Politics of Resentment: Rural Consciousness in Wisconsin and the Rise of Scott Walker*. Chicago, IL: University of Chicago Press.
Creighton, Janean H., Keith A. Blatner, and Matthew Carroll. 2008. "People, Place, and Politics: The Role of Place Attachment and Conflict in Forest Communities." *Western Journal of Applied Forestry* 23(4):232–35.
Duncan, Cynthia M. 2014. *Worlds Apart: Poverty and Politics in Rural America* (2nd ed.). New Haven: Yale University Press.
Frentz, Irene C., Frank L. Farmer, James M. Guldin, and Kimberley G. Smith. 2004. "Public Lands and Population Growth." *Society and Natural Resources* 17(1):57–68.
Friedman, Lisa & Coral Davenport 2020. "EPA Weakens Controls on Mercury." Retrieved May 13, 2021. (https://www.nytimes.com/2020/04/16/climate/epa-mercury-coal.html?smid=em-share).
Gordon, Jason S. and Alan W. Barton. 2015. "Stakeholder Attitudes Toward Reforestation and Management of Bottomland Hardwood Forests in the Mississippi Delta." *Journal of Forestry* 113(3):308–14.
Gosnell, Hannah and Jesse Abrams. 2011. "Amenity Migration: Diverse Conceptualizations of Drivers, Socioeconomic Dimensions, and Emerging Challenges." *GeoJournal* 76:303–22.
Greene, William H. 2008. *Econometric Analysis*. New York: Pearson.
Hamilton, Lawrence C., Chris R. Colocousis, and Cynthia M. Duncan. 2010. "Place Effects on Environmental Views." *Rural Sociology* 75(2):326–47.
Hamilton, Lawrence C., Leslie R. Hamilton, Cynthia M. Duncan & Chris R. Colocousis 2008. "Place Matters: Challenges and Opportunities in Four Rural Americas." Reports on Rural America. Vol. 1. Durham, NH: Carsey Institute.
Hamilton, Lawrence C., Joel Hartter, Thomas G. Safford, and Forrest R. Stevens. 2014. "Rural Environmental Concern: Effects of Position, Partisanship, and Place." *Rural Sociology* 79(2):257–81.
Hiner, Colleen C. 2014. "'Been-Heres vs. Come-Heres' and Other Identities and Ideologies Along the Rural-Urban Interface: A Comparative Study in Calaveras County, California." *Land Use Policy* 41:70–83.
Hochschild, Arlie R. 2018. *Strangers in their Own Land: Anger and Mourning on the American Right*. New York City, NY: The New Press.
Jacquet, Jeffrey and David L. Kay. 2014. "The Unconventional Boomtown: Updating the Impact Model to Fit New Spatial and Temporal Scales." *Journal of Rural and Community Development* 9(1):1–23.
Jakus, Paul M. and Sherzod B. Akhundjanov. 2019. "The Antiquities Act, National Monuments, and the Regional Economy." *Journal of Environmental Economics and Management* 95:102–17. https://doi.org/10.1016/j.jeem.2019.03.004.
Kennedy, Brian and Courtney Johnson. 2020. *More Americans See Climate Change as a Priority, but Democrats Are Much More Concerned than Republicans*. Washington, D.C.: Pew Research Center.
Keske, Catherine M. H., R. Patrick Bixler, Christopher T. Bastian, and Jennifer E. Cross. 2017. "Are Population and Land Use Changes Perceived as Threats to Sense of Place in the New West? A Multilevel Modeling Approach." *Rural Sociology* 82(2):263–90.
Krannich, Richard S., Brian Gentry, Al E. Luloff, and Peter G. Robertson. 2014. "Resource Dependency in Rural America: Continuities and Change." Pp. 208–25. in *Rural*

america in a globalizing world, edited by C. Bailey, L. Jensen, and E. Ransom (eds.). Morgantown, WV: West Virginia University Press.
Krannich, Richard S., Al E. Luloff, and Donald R. Field. 2011. *People, Places and Landscapes: Social Change in High Amenity Rural Areas*. New York: Springer.
Kruger, Linda E., Rhonda Mazza, and Maria Stiefel. 2008. "Amenity Migration, Rural Communities, and Public Lands." Pp. 127–42 in *Forest Community Connections: Implications for Research, Management, and Governance*, edited by E. M. Donoghue and V. E. Sturtevant. Washington, DC: RFF Press.
Long, J. Scott and Jeremy Freese. 2014. *Regression Models for Categorical Dependent Variables Using Stata*. College station, TX: Stata Press.
Ma, Xin. 2018. *Using Classification and Regression Trees: A Practical Primer*. Charlotte, NC: Information Age Publishing Inc.
Matarrita-Cascante, David, Hugo Zunino, and Johanna Sagner-Tapia. 2017. "Amenity/Lifestyle Migration in the Chilean Andes: Understanding the Views of "The Other" and its Effects on Integrated Community Development." *Sustainability* 9(9):1619.
Minshall, Charles W., Dorothy Douglass, Fred Goodman & Janet Baker 1971. "An Analysis of The Economic Structure and Industrial Potential of the Four Corners Region." Retrieved May 13, 2021. (https://files.eric.ed.gov/fulltext/ED063072.pdf).
Mu, Enrique and Milagros Pereyra-Rojas. 2017. *Practical Decision Making*. Cham: Springer International Publishing.
Mueller, J. Tom 2021. "Defining Dependence: The Natural Resource Community Typology." *Rural Sociology* 86(2):260–300.
Mueller, J. Tom and Ann R. Tickamyer. 2020. "A More Complete Picture: Rural Residents' Relative Support for Seven Forms of Natural Resource-Related Economic Development." *Rural Sociology* 85(2):376–407.
Mussini, Mauro. 2018. "On Measuring Polarization for Ordinal Data: An Approach based on Decomposition of the Leti Index." *Statistics in Transition* 19(2):277–96.
Nunkoo, Robin, Stephen L. J. Smith, and Haywantee Ramkissoon. 2013. "Residents' Attitudes to Tourism: A Longitudinal Study of 140 Articles from 1984 to 2010." *Journal of Sustainable Tourism* 21(1):5–25.
Park, Duk-Byeong, Robin Nunkoo, and Yoo-Shik Yoon. 2015. "Rural Residents' Attitudes to Tourism and the Moderating Effects of Social Capital." *Tourism Geographies* 17(1):112–33.
Park, Minkyung, Monika Derrien, Emilian Geczi, and Patricia A. Stokowski. 2019. "Grappling with Growth: Perceptions of Development and Preservation in Faster-and Slower-Growing Amenity Communities." *Society & Natural Resources* 32(1):73–92.
Partlow, Joshua 2021. "Biden Expands Bears Ears and Other National Monuments, Reversing Trump Cuts." Washington Post. Retrieved May 13, 2021. (https://www.washingtonpost.com/climate-environment/2021/10/07/bears-ears-biden-monument/).
Qin, Hua. 2016. "Newcomers and Oldtimers: Do Classification Methods Matter in the Study of Amenity Migration Impacts in Rural America?" *Population and Environment* 38(1):101–14.
Roseland, Mark. 2000. "Sustainable Community Development: Integrating Environmental, Economic, and Social Objectives." *Progress in Planning* 54(2):73–132.
Saaty, Thomas L. 1988. "What Is the Analytic Hierarchy Process?" Pp. 109–21 in *Mathematical models for decision support*. Berlin: Springer.
Sherman, Jennifer. 2018. "'Not Allowed to Inherit My Kingdom': Amenity Development and Social Inequality in the Rural West." *Rural Sociology* 83(1):174–207.
———. 2021. *Dividing Paradise: Rural Inequality and the Diminishing American Dream*. Oakland, CA: University of California Press.
Smith, Michael D. and Richard S. Krannich. 2000. "'Culture Clash' Revisited: Newcomer and Longer-Term Residents' Attitudes Toward Land Use, Development, and Environmental Issues in Rural Communities in the Rocky Mountain West." *Rural Sociology* 65(3):396–421.

Spangler, Kaitlyn, Riana Gayle, and Don E. Albrecht. 2020. *Balancing Economic and Environmental Priorities in Rural Western Communities.* ASAP Research Series, Western rural Development Center Retrieved May 13, 2021. (https://www.usu.edu/wrdc/files/news-publications/ASAP-Balancing-Environmental-CGS-Analysis.pdf).

Speybroeck, Niko. 2012. "Classification and Regression Trees." *International Journal of Public Health* 57:243–46.

Ulrich-Schad, Jessica D. 2018. "'We Didn't Move Here to Move to Aspen': Community Making and Community Development in an Emerging Rural Amenity Destination." *Journal of Rural and Community Development* 13(4):43–66.

Ulrich-Schad, Jessica D., Erik C. Larson, Felix Fernando, and Abdelrahim Abulbasher. 2020. "The Goldilocks View: Support and Skepticism of the Impacts and Pace of Unconventional Oil and Gas Development in the Bakken Shale of the United States." *Energy Research & Social Science* 70:101799.

Ulrich-Schad, Jessica D. and Hua Qin. 2018. "Culture Clash? Predictors of Views on Amenity-Led Development and Community Involvement in Rural Recreation Counties." *Rural Sociology* 83(1):81–108.

USDA Economic Research Service 2017. "County Typology Codes." Retrieved May 13, 2021. (https://www.ers.usda.gov/data-products/county-typology-codes/).

Wooldridge, Jeffery. 2010. *Econometric Analysis of Cross-section and Time-series Data.* Boston: MIT Press.

Wuthnow, Robert. 2018. *The Left behind: Decline and Rage in Rural America.* Princeton: Princeton University Press.