Potential Outcomes and Consequence of a Proposed Grazing Permit Buyout Program

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Abstract

This study investigated the role that a public land grazing permit buyout would have on ranching operations and conserving private land open space in the Rocky Mountain region of the western United States. Loss of grazing permits could serve as a pivotal factor in expediting private land fragmentation if ranching operations are enticed to sell their land due to loss of economic viability. This type of program inadvertently could be detrimental to overall ecosystem health and have unintended economic, ecological, and cultural consequences for the administering agencies and grazing permittees. The goal of this study was to provide sociodemographic profiles of landowners to better understand social motivations for ranching, implications of permit removal, ongoing conservation activities, and possible policy solutions. We assessed likely participation levels, demographic attitudes, and reasons for participation in a proposed grazing permit buyout program. This paper is based on data collected from a mail survey of 2 000 permittees in the Rocky Mountain States (39% response rate), and data collected from qualitative personal interviews. These interviews assessed motivations for participation, potential costs, and search for unforeseen consequences related to a proposed buyout program. We interviewed 49 individuals (33 ranchers, 16 agency personnel), which enabled us to describe likely outcomes and previously unmentioned items for consideration related to a proposed buyout program. Interview data were analyzed and broken into two major themes: motivation for participation in a buyout and potential consequences. Our study indicated that overall participation in potential buyout would be relatively low (17%); however, the associated financial, ecological, and administrative costs could be substantial. We note several unanticipated motivations for possible participation in this type of program, as well as possibly unrecognized impacts for administering agencies and permittees.

Resumen

Este estudio investigó el papel que la compra de un permiso de apacentamiento de pastizales públicos tendría en las operaciones de los ranchos y la conservación de los espacios abiertos de los terrenos privados en la región de las Montañas Rocallosas del oeste de Estados Unidos de América. La perdida de permisos de apacentamiento podría servir como un factor fundamental para facilitar la fragmentación de los terrenos privados, si los ranchos son engatusados para vender su tierra debido a la pérdida de viabilidad económica. Este tipo de programas pueden ser, inadvertidamente, perjudicial para la salud general del ecosistema y tener consecuencias no intencionadas del tipo económico, ecológico y cultural para las agencias administradoras y los permisionarios de apacentamiento. La meta de este estudio fue proveer los perfiles sociodemográficos de los propietarios de la tierra para entender mejor las motivaciones sociales de operar ranchos, las implicaciones de la remoción de los permisos, las actividades continuas de conservación y las posibles políticas de solución. Evaluamos los niveles probables de participación, las actitudes demográficas y las razones para participar en un programa propuesto de compra de permisos de apacentamiento. Este artículo esta basado en datos colectados de un cuestionario enviado por correo a 2 000 permisionarios en los estados de las Montañas Rocallosas (la tasa de respuesta fue 39%) y datos colectados de entrevistas cualitativas personales. Estas entrevistas evaluaron las motivaciones para participar, los costos potenciales, y la búsqueda de consecuencias imprevistas relacionadas con el programa de compras propuesto. Entrevistamos 49 individuos (33 rancheros y 16 de las agencias), lo cual nos permitió describir los posibles resultados y los problemas no mencionados previamente a considerar en relación al programa de compra propuesto. Los datos de las entrevistas fueron analizados y divididos en dos temas principales: motivación para la participar en la compra y las consecuencias potenciales. Nuestro estudio indicó que la participación general en la compra potencial sería relativamente bajo (17%); sin embargo, los costos financieros, ecológicos, y administrativos asociados podrían ser substanciales. Notamos algunas motivaciones no anticipadas para la posible participación en este tipo de programas, así como impactos posibles no reconocidos por las agencias administradoras y permisionarios.

Key Words: grazing permit buyout, landowner attitudes, fragmentation, public lands grazing, grazing fees, qualitative interviews

INTRODUCTION

Public land grazing policies are under scrutiny for reasons including impacts of livestock grazing on "ecosystem health." In addition, some argue that permits for grazing on public lands are subsidies due to the relatively low cost of grazing fees

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(Wuerthner and Matteson 2002; NPLGC 2004b), compared to fees charged for grazing on ecologically similar private lands (Quigley and Thomas 1989). Some critics argue for increased permit fees comparable to those charged on similar private lands (Moskowitz and Romaniello 2002), whereas others are concerned about adverse environmental effects (Wuerthner and Matteson 2002), and wish to see public lands used strictly for recreational purposes, wildlife habitat, enhanced environmental conditions, and aesthetic values (Gentner and Tanaka 2002).

A recently proposed policy would create an opportunity for permit holders to sell their grazing permits on public lands to the federal government in order to permanently retire lands from livestock grazing. The proposed program would provide compensation of $175 per animal unit month (AUM) to willing sellers, and permanently retire the associated permits (NPLGC 2004e). The number of permitted livestock allowed to graze are determined based on the available forage (Egan and Watts 1998). We examined likely implications and outcomes of the proposed buyout program as related to likely actions of involved permittees. It has been claimed that a buyout program would be well-received by involved ranchers (NPLGC 2003a, 2003b). However, no published studies describe permittees responses to such a program.

We hypothesized that there was potential for such a buyout to accelerate ongoing loss and associated fragmentation of "open space" as permittees take the buyout and then sell their land (base property). This was expected due to the interactions of increasing market values of rural lands for subdivision and the decreased economic viability of ranches without grazing on federal lands. The potential for such fragmentation is magnified by the location of many such properties adjacent to, or nearby, the public lands, particularly in counties with public land in the West where human populations are growing the fastest (Vesterby and Krupa 1997; Masnick 2001; Frentz et al. 2004). Accordingly, our study area was the 7 Rocky Mountain states (Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming).

Obviously, proposals to "buy out" grazing permits will have ramifications. We believed that these ramifications had not been thoroughly explored or revealed or both. We asked and sought answers to a series of "what if" questions that emerged from ongoing debates relative to public grazing polices and proposed buyouts of permits. We had three primary objectives:

1. Provide and analyze sociodemographic profiles of landowners with public land grazing permits.
2. Evaluate permittees' knowledge, likelihood of participation, and motivation for involvement in a buyout program.
3. Describe possible consequences of a grazing permit buyout program.

METHODS

We used a mixed-model research design, incorporating data from a quantitative mail survey and data from qualitative personal interviews. This provided insight to the problem's complex nature, diversity of the study region, and characteristics of the population of permit holders. Due to the extensive geographical area of concern and lack of pre-existing baseline data, the mail survey of permit holders was conducted first. This survey yielded data that provided insights to guide follow-up interviews, and identified a population willing to participate in the study. Accordingly, our primary objectives were to establish baseline demographic data, look for patterns among ranching characteristics and demographics related to motivation, and determine likely participation rates.

Mail Survey

A list of 14 267 grazing permit holders (10 787 BLM and 3 480 FS) was obtained from the USDA Forest Service (FS) and USDI Bureau of Land Management (BLM) in the seven-state study was obtained through a request made under the Freedom of Information Act (FOIA). These lists included permittees' names, addresses, number of AUMs, and the respective agency field office administering the permit. A quantitative mail-out survey was designed following the Total Design Method (TDM) (Dillman 2000) and was sent to 2 000 randomly selected ranchers (1 000 from each agency's files) during the fall of 2003. In order to better identify and define specific issues, a pretest was conducted which solicited advice from several ranchers, livestock association personnel, and academics in conservation areas.

Landowners provided information relative to size of property owned, year the property was acquired, location (county and state), proximity to public land, type of grazing permit associated with the property (BLM, FS, both, or none), and whether they inherited or purchased the property. Acreage, proximity to public land, and length of tenure were open-ended questions to provide continuous data. Total acreage of ownership was calculated by summing the acreages of each property described. Length of tenure was calculated by taking the earliest year of property ownership and subtracting from 2003. A section included questions aimed at evaluating reasons for owning land. These questions were developed using Likert's (1967) method for constructing an attitudinal scale of 1–5 from "very unimportant" to "very important," with a 3 equaling neither important or unimportant. Five questions assessed respondents' attitudes and participation relative to the proposed permit buyout program based on a 1–5 scale of "strongly disagree" to "strongly agree," again with a middle choice as neither agree nor disagree. Respondents were also asked what a preferable amount of money per AUM would be needed to sell their permits. Five choices were provided, ranging from $50 to $525. Several YES/NO questions were posed to respondents relative to their land conservation practices such as habitat management and holding a conservation easement. Finally, respondents were asked questions relative to occupation, education, age, and income.

Data were analyzed using SPSS for Windows Release 12.0 (SPSS for Windows 2003). Willingness to participate in a grazing permit buyout program was analyzed to provide insight for motivations to sell permits and likely scenarios that might unfold. We assessed differences between individuals who were willing to participate in the program and those who were not. These two groups were examined using an analysis of variance (ANOVA) and χ^2 comparing demographic characteristics, motivations for owning land, and potential reactions to grazing

buyout polices. Chi-square analysis was used to examine permittees if respondents had sold or intended to sell land, and if they had conduced habitat management or had a conservation easement.

Personal Interviews

The goal of the face-to-face open-ended[1] interviews was improvement of insights into the data gathered from the survey, and to uncover factors relative to unanticipated consequences of a buyout. Our population was discerned with a "random/purposive" sample to ensure a population that had direct knowledge of the issue but to still maintain an unbiased perspective (Berg 1998). The last question of the survey asked respondents if they would be willing to be interviewed. Those who replied YES were placed in a pool ($n = 406$). This group was divided into two categories based on responses to a survey item that stated: "I would consider selling my permit(s) in a permit buyout program." Responses include 5 choices which were scaled from (1) strongly disagree to (5) strongly agree. If respondents answered 1, 2, or 3 they were recoded as not willing to sell (0) ($n = 327$). If respondents chose 4 or 5 they were coded as potential sellers (1) ($n = 79$). These two groups were randomly sampled to select 15 individuals per group, for a total of 30. These 30 individuals were then contacted to see if they were still willing to be interviewed. Three additional interviews were conducted when opportunities arose to meet jointly with ranchers, raising the total to 33. In addition, we interviewed 16 FS (9) and BLM (7) personnel concerned with range management located in agency offices in the same locales as the interviewed permittees to give us a feel for their attitudes toward permittees and their perceptions of a proposed buyout program. Interviews were conducted between February and May, 2004.

Qualitative data requires a nonmathematical process for data interpretation. The process used to analyze interview data was "grounded theory," which involved coding for themes, developing each theme identified, determining the significance of themes, searching for hierarchies, and then comparing themes across interviews. This process involves continual comparison across all textual data, looking for emerging themes and then comparing those themes to theory (Strauss and Corbin 1998). This technique does not test a hypothesis, but rather provides a complete description of a situation by identifying all emergent themes (Glaser 1999). Our approach emphasized searching for specific themes and then making new observations to clarify previously developed ideas. The goal was to produce a set of explanative theories for an entire event.

Using this strategy, we analyzed 2 broad themes regarding a buyout program: reasons for permittees to sell their permit (the "why questions"), and the potential consequences of a buyout (the "what if" questions). These interviews yielded key insights into differences between regions and raised concerns not considered.

Prior to the interviews, several potential consequences (including fragmentation and increased fire risk) of the buyout program had been tentatively identified and those issues were raised in each interview in an effort to establish their validity. This broad consequences theme contained 3 sections: ecological, administrative, and cultural consequences. These sections included several subthemes, including issues of habitat fragmentation, issues related to water, and loss of wildlife habitat. Additionally, several additional issues emerged, including tax consequences, responsibility for fencing (construction and/or renovation, and maintenance), management of common allotments[2], and logistics of managing inholdings of private or public land.

RESULTS AND DISCUSSION

Mail Survey

Of 2 000 surveys sent, 1 824 were identified as valid public ranchers. A total of 880 surveys were returned; 704 were useable and 176 were nonusable[3]. The overall response rate was 44% (880/2 000), although the useable responses from valid ranchers was 39% (704/1 824). A random "nonresponse bias test" was conducted on 125 individuals that did not return a survey (Chen 1996). This sample of individuals was contacted by phone. Seventy-six nonrespondents were successfully contacted, and 44 cooperated with the nonresponse test. Those 44 indicated that they were "too busy" to fill out the survey, and the data collected from them at this later date revealed little difference from the data collected with the survey. The 27 individuals who would not participate commented that they perceived the project as part of some "environmental" program or stated they did not have time to participate.

Willingness to sell a permit in a buyout was evaluated using a single survey item. The statement read: "I would consider selling my permit(s) in a permit buyout program." Responses include 5 choices which were scaled from (1) strongly disagree to (5) strongly agree. If respondents answered 1, 2, or 3 they were recoded as not willing to sell (0); if respondents chose 4 or 5 they were coded as potential sellers (1). This grouping revealed 17% of respondents ($n = 122$) indicating they would consider selling their permit, and 82% who would not consider selling ($n = 582$).

Differences in sociodemographic characteristics among the willing and nonwilling permit sellers were examined by calculating mean scores for continuous variables and percent frequencies for categorical variables in each of the 2 groups. The statistical significance of the observed variances was tested by ANOVA and χ^2, which revealed significant differences between groups relative to number of animal units in the ranching enterprise, age, education, and percent income derived from off-ranch jobs. Education was coded as follows: 1) less than high school, 2) high school equivalent, 3) some college, 4) college degree, and 5) training beyond college. Level of formal education was significantly higher for willing sellers (69% answered either 3 or 4), whereas nonwilling sellers had 55% of respondents in categories 3 or 4. The average number of AUMs

[1]Open-ended refers to the style of the interview, which asks a few predetermined questions, and then allows the interviewee to direct the interview with his or her comments or issues of concern.

[2]Common allotments are allotments where 2 or more permittees graze animals simultaneously or at different times of the year.

[3]The 176 nonuseable responses included listed permittees who were deceased, had wrong addresses, or who no longer held the permit.

Table 1. Differences (mean and SE) among permit sellers and nonpermit sellers related to reasons for owning land, reaction to permit buyout issues, land sale, and conservation behaviors.

Category variable	Would not sell permit	Would sell permit	
N	582	122	F^1
Reasons to own land (ANOVA)			
Agriculture production	4.68 (0.04)	4.58 (0.09)	1.02
Pass land to children	4.24 (0.05)	4.01 (0.12)	3.68
Family heritage	4.12 (0.06)	3.82 (0.13)	4.95*
Scenic beauty	3.93 (0.05)	3.57 (0.13)	8.03***
Investment	3.79 (0.06)	3.65 (0.14)	0.95
Provide habitat	3.63 (0.05)	3.3 (0.12)	7.09**
Recreation use	3.3 (0.06)	3.11 (0.13)	1.73
Hunting operation	2.47 (0.06)	2.21 (0.13)	3.21
Vacation	2.39 (0.07)	1.94 (0.12)	8.37***
Develop commercially	1.61 (0.05)	1.88 (0.12)	5.01*
Buyout questions (ANOVA)			
The buyout program is good	1.55 (0.04)	3.61 (0.11)	427.54***
If I sold my permit, I would sell my property	2.03 (0.05)	1.98 (0.12)	0.10
If I sold my permit, I'll continue to ranch	3.44 (0.06)	3.79 (0.12)	5.22*
I think other ranchers will participate	1.86 (0.04)	3.36 (.09)	188.38***
I will never sell my private land	3.38 (0.05)	3.04 (0.12)	6.01**
Acceptable buyout amount	4.8 (0.04)	3.9 (0.1)	83.34***
Property sale (χ^2)			
Have sold property	24%	29%	1.30
Considered selling property	35%	54%	15.3***
Conservation practices (χ^2)			
Conducted habitat management	57%	63%	1.30
Have a conservation easement	6%	7%	0.13

[1] $^*P < 0.05$, $^{**}P < 0.01$, $^{***}P < 0.001$.

was higher for willing sellers (191 AUMs) compared to nonwilling sellers (119), possibly indicating that those who stood to gain more from such action would be more likely to participate. Age was significantly lower for willing sellers (55.7 years) compared to nonwilling sellers (59.1 years), perhaps indicating a slightly younger group less enamored of the ranching business. Finally, the percent of income from off-ranch jobs was significantly higher for willing sellers than nonwilling sellers (26.4% compared to 19.7%), indicating less dependence on ranch income, and therefore grazing permits.

Although these 2 groups differed little demographically, there were distinct differences among motivations for owning land (Table 1). An ANOVA was used to examine the differences between willing and nonwilling sellers' motivations for owning land and attitudes related to a buyout program. Owning land for agriculture production and passing land to children were important to both groups, but neither was significant. However, maintaining a family heritage, scenic beauty, providing wildlife habitat, and vacation were all ranked significantly more important by individuals who did not want to sell their permits. Developing property for commercial purposes emerged as significant. Those who would sell permits ranked this reason as slightly more important than unwilling sellers, although both groups indicated overall this activity was "very unimportant" on a 1–5 scale.

Most variables related to the buyout program proved significant (Table 1). When asked if this program was a "good idea," willing sellers overwhelmingly agreed, compared to nonsellers. Likewise, when asked if they thought that other ranchers would participate, the willing sellers agreed that others would participate. When asked if they would continue to ranch if they sold their permits, nonsellers indicated they would be inclined to quit ranching if they sold their permits. Willing sellers were significantly more likely to sell their property even without a buyout.

One of the most interesting variables was the preferable buyout rate. Respondents were given 5 choices as follows: 1) \$50, 2) \$100, 3) \$175, 4) \$350, and 5) \$525. Based on the previous choices, willing sellers indicated they would seek substantially less money per AUM (approximately \$350) than nonsellers (approximately \$525), possibly indicating interest in participating. However, the \$350 amount they indicated as a preferable price was double the proposed amount of \$175/AUM.

Because questions related to land sale and conservation behaviors were binomial in nature, differences were examined via a χ^2 test. Only 1 variable from the questions related to land sale and conservation questions proved significant (Table 1). Although willing permit sellers had sold only slightly more property in the past 20 years (29%) than nonwilling sellers (24%), the difference was related to consideration of selling property. Fifty-four percent of willing permit sellers had seriously considered selling land prior to any proposed buyout, compared to nonwilling permit sellers (35%).

Personal Interview Results

A driving force for proponents of the proposed buyout is their conviction that livestock grazing is detrimental to public land health (NPLGC 2004b). In addition, this proposed program has been touted as a financial windfall for ranchers; however, we found little research related to this statement. At the time of this study no research had been conducted to determine likely participation rates or the likely outcomes (ecological, economic, and social) of a buyout for ranchers, communities, landscapes, or agencies. The personal interviews conducted for this study are not a means of quantifying information, but rather discovering unexplored ideas and providing clarity to some potential consequences.

Reasons To Sell. After evaluating initial survey responses, we could not establish definitive motivations for reasons to sell grazing permits. We predicted that frustration with agency directives and difficulties associated with ranching on federal land were 2 motivations for accepting a buyout. However, analysis of data from the interviews revealed 5 major motivations for selling permits by willing sellers. The first was administrative difficulties, which included poor relationships between the permittee and the administering agency, or compliance with regulations, or both. Additionally, impending retirement of the permittee from ranching was a common

reason to sell, as was debt or money problems related to looming business failure. Two additional motivations emerged: conflicts with recreationists and uncertainty related to continued availability of public lands for livestock grazing.

We used "agency influences" to categorize 2 issues: 1) poor relationship(s) between permittees and administering agencies, and 2) permittees' difficulty in complying with regulations—most notably protection of threatened or endangered species.

Retirement was thought to be a primary reason for willing participation in the proposed buyout. However, survey data indicated that willing sellers were slightly younger than non-willing sellers. Inversely, the subsequent interviews revealed a retirement factor among willing permit sellers. Retirement was not a function of age alone, but it was often found in conjunction with one of the other factors described here.

Debt/money problems were a prevalent theme in interviews, not only among willing sellers, but all ranchers. However, back-to-back years of losses were in some cases more than some individuals could sustain, and therefore they expressed interest in a buyout as a means to eliminate debt. Individuals who expressed this sentiment most often had either leased more permits prior to the beginning of the drought cycle or were having difficulty paying loans.

An unanticipated motivating factor for a buyout was conflict between recreationists and permittees. This clash had prompted some ranchers to want to quit the business, at least as it relates to using public land. The primary complaint was misbehavior by some recreationists that included leaving trash, leaving gates open, carelessly using water sources, chasing livestock, and destruction of habitat. In particular, some permittees felt that land management agencies had held them responsible for actions of careless recreationists.

Finally, the notion of "uncertainty" was detected in nearly all interviews. Most expressed fears of: having permitted AUMs further reduced; chances of finding a threatened or endangered species on their allotment; having their allotment closed to grazing; having permitted numbers of livestock reduced if new agency personnel with "green orientation" moved into their district office; and/or emergence of poor markets for livestock. Although these factors were difficult to isolate, such fears were palpable among a significant portion of those who would sell to escape an amorphous, but quite real, pervasive and growing sense of insecurity.

Potential Consequences. *Ranch Viability.* Public lands are only a portion of the overall landscape. Private lands comprise the rest and are generally more biologically productive and have an equal—or probably greater—role in assuring landscape health. Such private lands provide "open space" and significant wildlife habitat—specifically winter range for wild ungulates, as well as hydrologic benefits (Maestas et al. 2001).

Land fragmentation is ongoing and accelerating in western states, and a growing concern (Theobald 2000). Concerns stem from the fact that the vast majority of ranches using public land are highly dependent on these lands to retain economic viability, i.e., the private lands are not adequate for a viable ranching operation. Therefore, such operators would have to obtain more private land or lease private land to maintain a viable operation. Or they could sell or lease their private property to other ranchers in the same situation. This seems particularly true of smaller private properties relative to their residual value as agricultural operations.

Among ranchers we interviewed, only 1 was certain that permittees could continue ranching on their private land without their permits. That individual felt that such individuals would continue in ranching as they would receive significant amounts of money from the buyout, which they could use to purchase or lease private lands to strengthen their position.

Proponents of a buyout also noted that revenue from a buyout could be used to acquire additional private land for ranching, which 1 agency person noted as well (NPLGC 2004a). This possibility was based on purchasing land in more arid areas where land is not now, nor is likely to be, valued for development. However, in most cases, the opportunities to buy additional land for livestock grazing, and thereby maintaining a viable ranching operation, was weakened by the relatively high and increasing market values of private property for purposes other than ranching/agricultural use.

Those in favor of the buyout argue that this program will help those with significant debt loads secure enough resources to pay off loans. That, in turn, will help them maintain ownership of their private property (NPLGC 2004a). However, many interviewees believed the chain of events would culminate in the sale of private land for subdivisions or "hobby ranches" or both because prices would trump the value to maintain the land for ranching.

Wildlife Consequences. Concern over winter wildlife habitat loss was an area of concern among ranchers and agency personal alike. Typically, wild ungulates utilize higher elevation terrain (which commonly is public land) during the spring–fall months, and migrate to lower elevations—largely private lands that have more moderate climates and less snow during winter. This was a particular sticking point with many ranchers, who already see themselves subsidizing a public good (wildlife) without compensation when wild ungulates eat hay, use water sources, consume supplemental feeds, cause repeated damage to fences, and have the perceived potential to spread transmittable diseases to their livestock. However, any increased land fragmentation resulting from the sale of property no longer viable for ranching will have some negative impact on ungulate wildlife as damage by wildlife is usually less tolerated by "suburbanites" (Patterson et al. 2003).

Finally, we heard numerous comments during interviews concerning the importance of developed water sources for wildlife populations, particularly ungulates. Some wildlife populations have become dependent on these water sources and their continued maintenance. If these water sources are considered ecologically valuable, their existence could be deemed essential to maintain in the case of a buyout.

Administrative Consequences. In addition to ecological implications, numerous administrative issues will likely require attention and resources from land management agencies. Specifically, the subdivision of at least some of these private lands raises questions regarding the rapidly growing wildland/urban interface (WUI). The WUI describes a circumstance where private property adjoining public lands is developed for housing and associated development. The wording of the proposed legislation relative to buyouts is lacking in terms of what management role federal and state agencies will have relative to retired allotments. Some range managers, and private

landowners with property adjacent to public lands, expressed unease about what kind of maintenance would be allowed, and who would be responsible. Issues of concern included fire danger, maintenance of water resources, responsibility for fencing, maintenance of common allotments, and the lost potential for using grazing as a management tool for vegetation.

The WUI is an increasingly politically sensitive area related to fire management by federal, state, and local government and agencies. As the WUI continues to grow, management pressure on agencies to protect those areas will increase. This threat of increased fire risk from flash fuel accumulation without grazing was a concern posed by those who do not favor a buyout; some respondents argued that regular grazing keeps fine fuels (grassland species and shrubs) at lower levels. This argument has been dismissed by others claiming the converse—that grazing is to blame for wildfire, or that many areas do not produce enough fine fuel to carry a fire (Wuerthner 2003). Nevertheless, the concern relative to fuel accumulation over time in the absence of grazing is real among ranchers and, to a lesser degree, among public land managers.

Maintenance of water sources developed for livestock grazing might be an issue of concern in the case of a buyout. In the event that a permittee sells his or her permit, he or she will no longer have responsibility for or need to maintain water resources on his or her allotment(s), which could lead to 2 scenarios.

If it is necessary to maintain these water sources, the maintenance responsibility would fall to the land management agency. As many ranchers pointed out, they invest time and dollars each year in the development and maintenance of water sources. Financial costs and time to maintain such systems would present land management agencies with additional responsibilities and costs. Likewise, in some instances, permittees own the water rights on federal lands associated with their grazing permits. In such cases on a retired allotment, if the agency had a need for the water, it seems likely that they would have to purchase water rights or water from the former permittee.

On the other hand, if these water resources are seen as attractive nuisances for humans and wildlife, removal or modifications might be necessary. These considerations will be conditional on whether the water rights are the property of the government or the permittee. In either scenario there would likely be costs for maintaining or dismantling these structures.

The issue of responsibility for fencing had not been previously discussed as a cost of a buyout program, yet almost every interviewee brought up the subject. These discussions led to 3 key points.

1. First was the concern that once a permit is retired, the government or the landowner who shares an adjoining fence line would be solely or jointly responsible for installation and/or fence maintenance. Several individuals felt that this would be a significant cost, especially in areas with large allotments which can include many miles of fence on federal land. It is unclear who would be responsible for fence construction, removal, or maintenance, depending on circumstances. Currently, federal agencies do not assume this responsibility.
2. The second issue concerned building fences where none now exist between private and public land. In most such cases permits exist adjacent to private land, which allows ranchers to move cattle easily between deeded ground and public ground. In some instances, particularly large sections of the private/public boundary are unfenced. If a permittee were to sell a permit, would he be required to fence this boundary to prevent a trespass of his livestock onto public land? If this financial responsibility rests solely on the permit seller it could, in effect, nullify any gains made from selling grazing permits.
3. The third issue involves the maintenance or removal of existing fences on public land after permittees exit. This was primarily a concern to agency personnel, who viewed "retired" fencing as potentially adverse to wildlife and a financial burden to agencies. If removal were deemed a necessity, the cost could be substantial when accounting for boundary and interior fences.

Another topic related to fencing involved management of grazing allotments where livestock from several individuals are run in common. The challenge is how to remove the purchased AUMs from a common allotment if only 1 permittee sells his portion of the larger pool of common AUMs. What was dictated by the proposed legislation could make it more difficult to manage common allotments. The now expired legislation (H.R. 3324) language stated that:

> . . . where the managing agency is physically unable to secure a representative portion of a shared allotment from grazing, permittees or lessees who graze that allotment will not be permitted to participate in the voluntary grazing permit buyout program unless all grazers on the shared allotment agree to retire their permits or leases (NPLGC 2004f).

This would either afford a privilege or an opportunity to those permittees who hold grazing permits in totality because they would be guaranteed a buyout, whereas common grazers might not be able to sell their permit. In June 2005, the legislation was revised and renamed the Multiple-Use Conflict Resolution Act (H.R. 3166), and as of July 2005 was referred to multiple congressional subcommittees for an undetermined amount of time (NPLGC 2005).

Likewise, the proposed legislation stipulated that in the event that 1 common permittee sells and others involved in that allotment do not, management agencies would be responsible for constructing and maintaining fences to fence off the representative portion of the allotment. That could be costly in construction, and then require an indefinite period of maintenance.

A different issue requiring a more detailed analysis is the feasibility of a buyout of permittees with public inholdings surrounded by the associated private land(s) and then how to manage those inholdings. Two types of inholdings are common throughout the West. "Checkerboarded" lands are properties typically found along railroads, resulting from a mid-1800s federal policy that granted alternate sections of land to different railroad companies to encourage development. The result is 20–40 mile wide areas with private, state, and public lands intermixed in 1-mile square blocks (Donahue 1999). In addition, mining claims and homestead laws, established in the 1800s, created numerous inholdings of private lands within blocks of federal lands with irregular boundaries interspersed

throughout public lands in the West. If these inholdings are linked to the proposed buyout program it could create unique management problems.

1. In either case, landowners have likely made numerous improvements such as roads, culverts, and gates. If there will be continued maintenance of these improvements on public lands, it could create additional workload and maintenance responsibility.
2. Fencing is a concern on these checkerboards, because all private sections would have to be fenced off to prevent trespass of livestock onto federal lands, if the private lands are to remain in livestock production. The majority of these checkerboarded lands occur in arid regions where low stocking density makes individual checkerboard blocks less individually viable as grazing units. This could create a significant expense and burden to the landholder using his private land in a commercially viable fashion in terms of moving livestock between private land sections.
3. Finally, it was pointed out that individuals with small public inholdings surrounded by private land might be inclined to sell their inholding allotments, knowing that it would be difficult to prevent a trespass on those inholdings. This would be operationally inefficient for government to fence and maintain. In effect, the individuals would benefit from selling their AUMs and potentially still use those inholdings without any real fear of a trespass violation.

Cultural and Community Impacts. Cultural and community impacts are often not a deciding factor in policy analysis because they can be difficult to quantify in economic terms or might be considered frivolous or insignificant. Nevertheless, some in the ranching community were quick to point out the value that their operations provide to the economic/social sustenance of small communities and to the West as a whole, as well as to themselves and their families. Consequently, 4 points emerged concerning the impacts of the program to individuals and communities.

Proponents of the proposed buyout typically dismiss loss of lifestyle as a reason to continue public land ranching and suggest that this lifestyle is not that important to rural communities (NPLGC 2004c). However, there are aspects of this proposed program that could have adverse effects on nonparticipating ranchers and involved communities. Some ranchers viewed this program as a "chink in the armor" of the ranching industry, and although such a program might be initially promoted as voluntary, they ultimately fear mandatory removal as their collective political influence declines over time with each buyout.

Second, the economic contribution of public land ranching has been questioned, citing the relatively few jobs tied directly to public land ranching compared to employment in the entire western region. Also, those jobs provide little real economic stimulus, either directly to individuals or to communities or the region (Power 1996). It has also been stated that ranches are more dependent on the rural communities than communities are dependent on ranching (Wuerthner and Matteson 2002). However, what is not fully discussed is the overall influence of ranches on communities or what effect their disappearance will have on small economies, including any "ripple effect" on associated service jobs and suppliers.

On a larger community scale, there were concerns over the future of state-owned grazing lands that are intermingled with federal lands. In our previous discussion about inholdings, private lands were the primary focus. However, in many cases some state lands are "checkerboarded" and therefore intermingled with federal and/or private lands. Typically, state lands are relatively small in size and are unable to support many AUMs, and are "landlocked" within federal lands or are managed cooperatively with federal lands. If a permittee sold permits to graze federal land, it is probable that this could, in some cases, effectively nullify any capability to generate revenue from the state's land. If such state lands were to continue to be used for grazing, previously described issues with inholdings would come into play. The required fencing and maintenance could likely be cost-prohibitive. If no water sources existed on the state lands use of these lands for grazing could be difficult. Finally, it should be noted that most state lands are managed under a trust doctrine, which stipulates that the lands produce revenue for state purposes—most notably school programs (Souder and Fairfax 1996).

Finally, concern about what the buyout would produce in terms of a tax liability to ranchers was a prevalent discussion point. Questions that were brought to our attention included: What would be the effect on local tax bases? and How would the buyout receipts be treated by the Internal Revenue Service (IRS)? Additionally, in some cases, permittees had investments on the allotments in the form of fences, gates, and water sources. Would they be able to write off these expenses? Currently, grazing permits are termed "privileges," not "rights." So how would the IRS classify these sales? Some of these questions have been raised by proponents who have sought legal counsel (Perkins Coie 2004). However, no definitive ruling has been provided by the IRS. One permittee pointed out that the $175 would be substantially less after paying taxes. Additionally, assuming the coincidental sale of the livestock that were grazing on the public land, an even larger tax liability would occur. Such matters had not been explored or fully explained to permittees we interviewed.

The quantitative aspect of this research was to describe characteristics of permittees and their operations relative to a proposed grazing permit buyout. Such information aided in understanding permittees' economic and social motivations, and subsequently helped to partially explain reactions to various potential polices relative to buyout proposals. Ultimately, what we learned was not radically different from earlier information describing the population of public land ranchers. Numerous previous studies have revealed similar demographic descriptions (Bartlett et al. 1989; Coppock and Birkenfeld 1999; Rowe 2000; Bartlett et al. 2002; Gentner and Tanaka 2002).

Characteristics separating those willing to sell and those unwilling to sell were not immediately apparent. Permit sellers and nonsellers proved to be somewhat homogenous in terms of demographic and ranching characteristics. On the other hand, their reactions to grazing policy, landownership behaviors, and attitudes regarding grazing issues differed greatly. This blending of similar sociodemographic characteristics with dissimilar attitudes made it difficult to classify ranchers relative to reactions to the buyout.

The resulting inability to easily categorize willing permit sellers and nonwilling sellers preclude targeting specific groups of permittees to receive information related to a buyout proposal. The differences exposed from the survey data revealed little motivation as to why individuals would be willing to sell. Consequently, we focused the qualitative aspects of our research on understanding differences between these 2 groups.

Several key issues relative to the proposed buyout beg further evaluation. First, the overall likely participation rate we described was not substantial (17%). Second, the proposed incentive ($175/AUM) seemed to be too low to attract a significant number of participants. Most ranchers interested in participating in a buyout were inclined to require more than the proposed amount.

Those proposing the buyout claim that ranchers could use money from a buyout to purchase additional land for their operations (NPLGC 2004d). For this to occur the buyout price would have to be substantially higher than $175 for ranchers to garner enough money to purchase land for replacement grazing, given already high and accelerating land values. Current agriculture land values in the region currently range from $100/acre to $3 000/acre (USDA 2002), with market values exceeding $7 000/acre in some areas.

Finally, the concern about land sale with coincidental habitat fragmentation after a permit sale has some merit. Over half (54%) of the willing permit sellers have already given serious thought to selling their land, indicating that many willing sellers could be looking for opportunities to get out of the ranching business. It seems likely that many who would participate would sell out and leave ranching even if there were no buyout. Would the buyout simply accelerate what would happen anyway? If the goal is to retire permits, setting a policy whereby the associated permits were simply "retired" would achieve the same goal without the costs of a buyout.

In conjunction with our survey findings, a follow-up phase of personal interviews exposed previously unrevealed or unanticipated consequences that an exodus of ranchers from the public land grazing program could create in the form of a ripple effect of indirect impacts. Prior to conducting interviews, we anticipated that numerous hidden costs—social, ecological, and economic—might arise due to the proposed buyout. Interviews confirmed this suspicion and revealed other anticipated costs that seem likely to occur and that had not been previously considered. The potential loss of water sources on public land had not been considered relative to impacts on wildlife. No published concerns had been voiced over issues and responsibilities related to fencing (construction and/or removal); managing remaining permittees on common allotments; removal and/or management of existing improvements (water, gates, and cattle guards); problems related to management of inholdings and checkerboarded lands; or impacts on states' ability to generate revenue from state lands once surrounding federal lands cannot be grazed. Finally, cultural and social costs are typically considered secondary issues regarding this proposed policy, but personal interviews with permittees put these concerns in perspective, including monetary and social consequences for ranchers and the communities of which they are part.

Problems associated with the proposed buyout could effectively negate or offset resulting ecological or financial benefits. The total costs of purchasing AUMs and dealing with subsequent consequences could increase the amount of work on administering agencies, and potentially harm remaining ranchers and communities. Such a state of affairs does not inspire confidence in the advertised advantages of such a buyout and could produce results that are unexpectedly costly for administering agencies, less profitable than anticipated for potential participants, and potentially a legal quagmire.

LITERATURE CITED

Bartlett, E. T., R. G. Taylor, J. R. McKean, and J. G. Hof. 1989. Motivation of Colorado ranchers with federal grazing allotment. *Journal of Range Management* 42:454–457.

Bartlett, E. T., L. A. Torell, N. R. Rimbey, L. W. V. Tassell, and D. W. McCollum. 2002. Valuing grazing use on public land. *Journal of Range Management* 55:426–438.

Berg, B. L. 1998. Qualitative research methods for the social sciences. 34d ed. Boston, MA: Allyn and Bacon. 290 p.

Chen, H. C. K. 1996. Direction, magnitude and implications of non-response bias in mail surveys. *Journal of the Market Research Society* 38:267–277.

Coppock, D. L., and A. H. Birkenfeld. 1999. Use of livestock and range management practices in Utah. *Journal of Range Management* 52:7–18.

Dillman, D. A. 2000. Mail and internet surveys: The tailored design method. New York, NY: John Wiley & Sons. 464 p.

Donahue, D. L. 1999. The western range revisited: Removing livestock from public lands to conserve native biodiversity. Norman, OK: University of Oklahoma Press. 388 p.

Egan, L. M., and M. J. Watts. 1998. Some costs of incomplete property rights with regard to federal grazing permits. *Land Economics* 74:171–186.

Frentz, I. C., F. L. Farmer, J. M. Guldin, and K. G. Smith. 2004. Public lands and population growth. *Society and Natural Resources* 17:57–68.

Gentner, B. J., and J. A. Tanaka. 2002. Classifying federal public land grazing permittees. *Journal of Range Management* 55:2–11.

Glaser, B. 1999. The discovery of grounded theory: Strategies for qualitative research. New York, NY: Aldine de Gruyter. 271 p.

Likert, R. 1967. The method of constructing and attitude scale. *In:* M. Fishbein (eds.). Readings in attitude theory and measurement. New York, NY: John Wiley & Sons. p 90–95.

Maestas, J. D., R. L. Knight, and W. C. Gilbert. 2001. Biodiversity and land-use change in the American mountain West. *The Geographical Review* 91:509–525.

Masnick, G. 2001. America's shifting population: understanding migration patterns in the West. *Changing Landscapes* 2:8–15.

Moskowitz, K., and C. Romaniello. 2002. Assessing of the full cost federal grazing program. Tucson, AZ: Center for Biological Diversity. 36 p.

NPLGC. 2003a. A letter to federal grazing permittees & lessees. Available at: http://www.publiclandsranching.org/htmlres/permitteeletter2.htm. Accessed 6 July 2004.

NPLGC. 2003b. Shays, Grijalva introduce voluntary grazing buyout bills in congress. Available at: http://www.publiclandsranching.org/htmlres/release_bills_introduced.htm. Accessed 6 July 2004.

NPLGC. 2004a. Grazing permit buyout: a great deal for public lands grazing permittees. Available at: http://www.publiclandsranching.org/htmlres/pb_great_deal.htm. Accessed 17 February 2005.

NPLGC. 2004b. National public lands grazing campaign. Available at: http://www.publiclandsranching.org/. Accessed 15 January 2004.

NPLGC. 2004c. Ranching is the foundation of rural economies. Available at: http://www.publiclandsranching.org/htmlres/wr_myth_economics.htm. Accessed 1 June 2005.

NPLGC. 2004d. A special message to federal grazing permittees and lessees. Available at: http://www.publiclandsranching.org/htmlres/pb_great_deal_enhanced.htm. Accessed 24 May 2005.

NPLGC. 2004e. Voluntary grazing permit buyout act (H.R. 3324) annotated. Section 5. Compensation for waived grazing permit or lease. Available at:

http://www.publiclandsranching.org/htmlres/buyout_legis_annotated.htm. Accessed 13 May 2004.

NPLGC. 2004f. Voluntary grazing permit buyout act (H.R. 3324) annotated. Section 6. Effect of waiver or donation of grazing permit or lease. Subsection (b) securing retired allotments against unauthorized use. Available at: http://www.publiclandsranching.ort/htmlres/buyout_legis_annotated.htm. Accessed 18 June 2004.

NPLGC. 2005. Multiple-use conflict resolution act (H.R. 3166). Available at: http://www.publiclandsranching.org/htmlres/MUCRA.htm. Accessed 29 July 2006.

Patterson, M. E., J. M. Montag, and D. R. Williams. 2003. The urbanization of wildlife management: social science, conflict, and decision making. *Urban Forestry & Urban Greening* 1:171–183.

Perkins Coie. 2004. Tax treatment of proposed federal grazing permit buyout program. Available at: http://www.publiclandsranching.org/htmlres/PDF/PerkinsCoie_tax_memo.PDF. Accessed 25 February 2005.

Power, T. M. 1996. Lost landscapes and failed economics: A search for value of place. Covelo, CA: Island Press. 304 p.

Quigley, T. M., and J. W. Thomas. 1989. Range management and grazing fees on the national forest—a time of transition. *Rangelands* 11:28–32.

Rowe, H. I. 2000. Public land ranching, rapid development and federal policy chance: Interactive relationships in northwestern Colorado [thesis]. Fort Collins, CO: Colorado State University. 134 p.

Souder, J. A., and S. K. Fairfax. 1996. State trust lands: History, management, and sustainable use. Lawrence, KS: University Press of Kansas. 370 p.

SPSS for Windows. 2003. Release 12.0.0. Chicago, IL: SPSS Inc.

Strauss, A. L., and J. M. Corbin. 1998. Basics of qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage Publications. 312 p.

Theobald, D. M. 2000. Fragmentation by inholdings and exurban development. *In:* R. L. Knight, F. H. Smith, S. W. Buskirk, W. H. Romme and W. L. Baker [eds.]. Forest fragmentation in the southern Rocky Mountains. Boulder, CO: University Press of Colorado. p 155–174.

USDA. 2002. United States census of agriculture. Washington, DC: US Government Printing Office. p 227–235.

Vesterby, M., and K. S. Krupa. 1997. Major uses of land in the United States, 1997. Statistical Bulletin No. 973. Washington, DC: Resource Economics Division, Economic Research Service, USDA. 66 p.

Wuerthner, G. 2003. Livestock grazing's contribution to fire hazard. Available at: http://www.onda.org/library/papers/Livestock_Grazing_and_Fire.pdf. Accessed 25 February 2005.

Wuerthner, G., and M. Matteson. 2002. Welfare ranching: The subsidized destruction of the American West. Washington, DC: Island Press. 346 p.