

# RESPONSE OF PUBLIC LAND RANCHERS TO POLICY CHANGES

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## ABSTRACT

Policy analysis and planning require that we know the likely responses of affected parties to given policy changes. We conducted a random survey of ranchers holding 1998 public land grazing permits in all western states to determine the social and economic characteristics of permit holders, to assess their attitudes about public land policies, and to gauge their responses to three policies related to public land grazing. Respondents were asked how their operations would change due to three different levels of AUM reductions, three different grazing fee increases, and to changes in allowed season of use. The respondents were clustered into eight different types of ranchers using management objective, education, business organization, ranch size, labor, income, and financial aspects. Perceived ranching objectives included preserving family tradition, culture, and values; raising family in a rural setting; living closer to friends and family; earning a good return on investment; avoiding difficulty obtaining a job outside the ranch due to skills; protecting environmental resources; and planning to pass business on to children. Based on the clusters, different policy choices will have differential impacts depending on the type of rancher and individual management goals. Their responses to the various policy choices indicate that analysis using the refined clusters will lead to a different impact assessment compared to using average responses for the population.

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## INTRODUCTION

The federal government began actively managing grazing on public lands in 1897 with the creation of the Forest Reserves. With the passage of the Taylor Grazing Act in 1934, the Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) took over management of federal lands. Almost since the time that public land grazing came under federal control and administration, there have been debates over the appropriate fee and use levels. As these debates have intensified, discussions over the appropriate levels have led to often-times polarized battles.

Grazing fee levels have been debated and analyzed numerous times, with the most recent analysis indicating that none of the models are perfect for all cases (Torell et al. 1992). More recently, the intensity of debate has shifted to use levels, especially in riparian areas, and to the appropriate grazing season. As before, the one-size-fits-all solutions do not seem to work for all cases. What is left, then, is the policy alternative that is applied to all cases with very mixed results. What works in one situation fails miserably in another. Individuals affected by policy changes must be identified and defined in a way that is relevant to the situation. Workman (1986) and Fowler and Gray (1988) refer to the heterogeneity of ranchers. Fowler and Gray (1988) indicate it's due to the wide variety of physical settings under which ranches operate and the different institutional and social aspects of the ranchers. This has made it extremely difficult to categorize ranchers and evaluate production practices by applying only one economic or production strategy model to the industry.

The shift in management paradigm from a focus on consumptive uses of public lands, such as grazing, to a more recreation-based focus requires a change in the resource allocation on local and regional levels. The purpose of this project was to gather information that would allow an improved analysis of policy impacts starting at the ranch level. Assessing impacts involves many layers of information and many procedures. Marion Clawson (Vaughn 1995) suggested an approach for analyzing public resource policy issues involving gathering the answers to the following six questions:

1. What is the physical/biological feasibility and what are the physical/biological consequences of each resource management measure?
2. What is each measure's economic efficiency; that is, what are its costs in relation to its benefits?
3. What are the welfare and equity implications; that is, who gains and who pays?
4. What is the measure's social or cultural acceptability?
5. What is the measure's operational or administrative practicality? Do resource users have the skill and

technology they need to put the measure into practice? At the program level, is the appropriation of funds adequate?

6. Have the previous five considerations been integrated and reconciled? Attempting to maximize any single objective by itself could lead to a different policy choice than if all criteria are considered together.

This paper will discuss some of the information related to economic efficiency and the beginnings of welfare and equity implications. The remaining questions are outside the scope of this paper, but certainly make up the context for evaluating impacts.

## METHODS

We randomly sampled 1998 BLM and USFS grazing permit holders in the western United States. The lists obtained from the agencies were sorted and compared to remove duplicate names and addresses. Livestock operations doing business under multiple names and mailing addresses were not detectable by this method, but it is assumed to be a small error in the sampling procedure. Of the 21,018 unique public land operations identified, we randomly surveyed 2,000 operations using the Revised Total Design Method (Salant and Dillman 1994). The survey was designed to elicit information on the operator's objectives, education, business organization, type and size of livestock operation, labor, income sources, debt situation, demographic information, amount of seasonal forage dependency on public lands, attitudes about various policies, and likely responses to policy alternatives. Results were analyzed using cluster analysis (Lorr 1983, Aldenderfer and Blashfield 1984, Romesburg 1984, and Rosenberg and Turvey 1991).

In this paper, we will show the results of using the various clusters for analyzing the public land policies compared to using the overall averages. Our findings could be used in input-output analysis to obtain a more accurate picture of the impact on rural economies from the public land management alternatives. We will examine impacts of alternative grazing fees, AUM levels, and season-of-use adjustments.

## RESULTS

Of the 2,000 surveys mailed, 54 were returned due to bad addresses. From the 1,946 valid addresses, 1,052 completed surveys were returned, for a response rate of 54%. A follow-up phone survey of 100 non-respondents revealed that the means of several key demographic variables did not differ between respondents and non-respondents. The data can be considered to accurately represent the population of all public grazing permittees. Results should have an error rate of no more than +/-3%.

Cluster analysis was used to evaluate the valid responses. Analysis indicated that eight clusters were adequate. While there is no formula to define the appropriate number of clusters, the tests conducted and the needs of the project indicated that eight would suffice. Each cluster of respondents was given a defining name based on their response variables, and the names are used only for discussion purposes. We split the eight clusters into two basic groups, termed hobbyist and professional ranchers, with the difference being that the professional ranchers derive more than half their income from on-ranch sources.

## Clusters

The eight ranch types, or clusters, were given the names Small Hobbyist, Retired Hobbyist, Working Hobbyist, Trophy Rancher, Diversified Rancher, Dependent Rancher, Corporate Rancher, and Sheep Rancher. While these descriptive names are helpful in our perceptions of what each ranch type is like, there is nothing rigid in the names. The clustering of respondents only seeks to group together those ranchers with the most similar responses to key variables in the survey. For example, ranches with ewes were included in each of the clusters. While not every ranch within a cluster had ewes, there were enough sheep operations that were similar in responses, except that they had sheep instead of cattle, that they were clustered with cattle operations. Similarly, the cluster termed Sheep Rancher has a large number of cattle, again based on similarity of operational characteristics and attitudes rather than just livestock type. Sheep Rancher is the only type where a large percentage of respondents identified sheep as their primary business. Table 1 shows key variable means for the different types. We will briefly discuss some of the differences among the types and our rationale for keeping them separate.

Before discussing the defining characteristics of the different ranch types, note the rank order of objectives in Table 1. For all eight clusters, the objectives of “owning land and ranch is consistent with my family’s tradition, culture, and values” and a “ranch is a good place to raise a family” ranked first or second as the most important reasons for continuing in ranching. Some ranch types felt more strongly than others about these objectives, but they all considered these two objectives the most important. There was almost complete agreement that “owning the ranch primarily for environmental purposes” or that “their skills would make it difficult to obtain a job outside of the ranch” were the least important for continuing in ranching. The other three objectives—“living on a ranch allows me to live closer to my family and friends,” “obtaining a good return on my investment,” and “wanting to have a business to pass on to my children”—all ranked variously in the middle.

### *Small Hobbyist*

The Small Hobbyists get over half of their income from off-ranch sources, and the smallest amount from on-ranch

sources compared to all other clusters. They tend to be some of the most educated ranchers, with just over half having college degrees. They have the fewest number of cattle, the second-largest number of ewes, and the smallest amount of deeded land. They spend the least amount of family time on their ranches, but hire a fairly large amount of seasonal labor. They have relatively low dependence on federal forage in each of the grazing seasons.

### *Retired Hobbyist*

The Retired category gets about equal income from on-ranch and retirement sources. Though not addressed in the survey, our perception is that this group is mostly retired family ranchers who have stayed in the business at a reduced size, based on the number of cows and ewes. They spend the most family time of the hobbyists working on their ranches and also hire seasonal labor. While they have about the same level of federal forage dependence as Small Hobbyists, they have about twice as much deeded land.

### *Working Hobbyist*

Working Hobbyists get over three-fourths of their income from off-ranch sources. While they do spend time working their ranches, they are the least likely to hire labor. Our perception is that they are in ranching because they appreciate the consumptive values of ranching rather than to support a family with the income from ranching. Of the three smaller hobby clusters, they are the most dependent on federal forage.

### *Trophy Rancher*

While Trophy Ranchers get almost a third of their income from on-ranch sources, more of their incomes and wealth come from outside investments. They have the highest income of any cluster and the second-largest cattle herds. They also are the most educated, least likely to be working on the ranches, and very willing to hire outside labor. Our interpretation is that these are people that have purchased a large ranch as part of their investment portfolio mostly because of non-economic reasons. They are the least dependent on public forage. Our hypothesis is that these ranches are owned due to conspicuous consumption (Martin and Jeffries 1966), where satisfaction comes from owning a very large, extensive, and publicly visible ranch rather than from the income produced. There may be tax implications as well.

### *Diversified Rancher*

Diversified Ranchers have the lowest income level and percent of income from on-ranch sources of all the “full-time” ranchers. They are moderately educated, with about a quarter having college degrees. They are slightly smaller than Dependent Ranchers in terms of herd size, work a little less on the ranch, and hire a little more labor. While it does not show in Table 1, these ranchers are less dependent on live-

Table 1. Values of key variables for each type of rancher.

	Hobbyist				Professional			
	Small	Retired	Working	Trophy	Diversified	Dependent	Corporate	Sheep
Number of operations	117	189	162	63	142	196	138	45
Source of net income (%)								
On-ranch	17	43	21	29	86	91	81	83
Off-ranch	57	5	77	16	8	5	9	6
Retirement	13	37	1	9	1	3	3	1
Investment	12	9	1	41	3	1	3	7
Other	2	6	0	5	2	1	4	3
Total net income (\$)	65,857	44,602	53,491	94,245	42,970	46,926	50,116	53,000
College degree (%)	50.4	29.1	30.9	71.5	25.3	7.6	41.3	46.6
Rank order of objectives (1 = most important, 7 = least important)								
Tradition, culture, values	1	1	2	1	2	1	1	2
Place to raise family	1	1	1	2	1	1	1	1
Live closer to family/friend	3	4	5	5	4	4	5	5
Return on investment/profit	4	5	4	3	3	5	4	4
Lack of skills for outside job	6	6	7	7	6	6	6	6
Environmental purposes	5	7	6	6	7	7	7	7
Business to pass to children	6	3	3	4	5	3	3	3
Deeded acres	1,398	2,620	1,563	11,134	4,765	4,058	12,554	14,849
Number of cows	80	122	143	467	276	296	615	386
Number of ewes	28	4	10	1	8	11	3	796
Production system (% of respondents)								
Cow-calf	67	72	71	71	72	69	53	43
Cow-calf-yearling	10	15	21	21	20	29	43	14
Stocker	3	4	2	5	2	1	4	2
Sheep	6	1	2	0	0	1	0	39
Horse	7	4	2	0	3	1	0	0
Other	6	4	2	3	3	0	0	2
Seasonal dependency on federal forage (%)								
Spring	17	20	28	18	23	25	21	29
Summer	42	44	51	37	50	51	46	51
Fall	31	27	37	24	32	34	31	36
Winter	14	14	20	25	10	14	13	33
Family labor (months/yr)	10.5	17.2	14.9	13.5	20.7	24.6	26.7	27.5
Hired labor (months/yr)	4.5	4.8	2.3	28.2	4.3	3.6	32.0	45.3

stock income and more dependent on other agricultural commodities and forest products than the Dependent Ranchers.

#### *Dependent Rancher*

The Dependent group is almost identical to the Diversified group, but with a little higher income and more dependence on on-ranch income. They rank profit motive lower than any cluster, suggesting that they feel very strongly about ranching as a way of life. They are the least educated of any of the clusters, with only about 8% having college degrees.

#### *Corporate Rancher*

The Corporate Ranchers own the largest cattle herds. They also hire a large amount of outside labor. They tend to be educated, with over 40% having college degrees. This group uses all forms of corporations to a much higher degree than any other cluster. While all ranch types focus on cow-calf operations, the Corporate Ranchers also have large proportions of cow-calf-yearling operations. The survey did not identify whether the corporate ranches were family or publicly held corporations, but only the type of legal and business structures of the operations. While similar in size to trophy ranches, the corporate ranches receive much higher percentages of much lower net incomes from on-ranch sources.

#### *Sheep Rancher*

The Sheep Ranchers have the largest number of ewes of any of the clusters and the largest deeded land holdings. They also have some of the largest cow herds, ranking behind both Corporate and Trophy ranchers. They hire the most outside labor of any of the clusters. Just under half have college degrees. This group has the highest dependence on public forage across all seasons.

### **Policy Implications of Heterogeneous Ranching Types**

Survey respondents were asked how they would react to different public land management alternatives related to grazing fee levels (\$2–5/AUM, \$5–8/AUM, and >\$8/AUM), AUM reductions (25, 50, and 100%), and loss of seasonal grazing permits (winter, spring, summer, and fall). The clustering of public land ranchers indicates that, while they are similar in some respects, they are still very heterogeneous. Just the differences in their motivations for being in ranching indicate they will likely react differently to changes and altered land-use policies.

The typical analysis of policy alternatives assumes that all operators are the same and will react similarly to policy changes. The questions raised here are whether these assumptions are true, or at least close enough that behaviors and impacts can be predicted, or whether using the clusters will lead to more predictable results. Also, if the policy impacts one type more than another, there may be differential impacts to the regional economy. For example, if the policy affects Sheep Ranchers or Trophy Ranchers relatively more than the

others, hired labor may be affected more because these ranchers rely on hired labor.

Survey respondents were asked to select discrete response strategies to different policy alternatives. The strategies were:

1. *Continue*—You think your current operation will work in the future or do not have the resources to change.
2. *Reduce*—You will cut back on livestock production, pass the operation down to next generation, reduce your herd, or sell your ranch.
3. *Intensify*—You will intensify your use of private grazing land by purchasing or leasing additional private land, instituting a new grazing system, increasing irrigated acres, improving forage, or similar practices.
4. *Diversify*—You will diversify your operation, either on- or off-ranch, by pursuing more or better off-ranch employment, growing different crops for cash sale, offering ranch-based recreation, or adding new classes of livestock.
5. *Unknown*—You are not sure what you would do in the face of this policy change.

#### *All Federal Grazing Permittees*

For each alternative grazing policy, respondents made discrete choices on what they thought they would do given their current situations. We begin by looking at the overall results for each policy. Figure 1 shows how all federal grazing permittees would respond to alternative grazing fee ranges. There appears to be a point at around \$5/AUM where ranchers change their decisions from *Continue* to either *Reduce* or *Unknown*. This shift intensifies if the fee goes above \$8/AUM.

Figure 2 shows the responses for AUM reductions. This question examined how the ranchers would respond if the USFS or BLM reduced their permits by a given percentage. While not as striking as with the fee increase, as the AUM reductions increase from 25% to 50%, fewer ranchers choose to *Continue*. *Reduce* and *Unknown* become more common responses. It appears that most of the adjustments would occur as reductions changed from 25% to 50%; not much difference is shown as the reductions rose to 100%.

Figure 3 shows how the ranchers would absorb the total loss of the seasonal use of their permits. As would be expected from the dependency levels in Table 1, loss of summer federal forage would cause the greatest impact on public land ranchers. Very few would be able to *Continue* their current operations. Most would either *Reduce* their operations or seek to *Intensify* by using private resources.

### Clustered Federal Grazing Permittees

While a lot of information can be gleaned from Figures 1–3, the assumption made in the analysis thus far is that all of the public land grazing permittees are the same. The question remains whether that is a valid assumption or whether additional information about rancher characteristics would provide more insight. By sorting the responses according to the eight clusters, we can compare those results with the overall results.

Figure 4 shows the responses to changes in the federal grazing fee. At the \$2–5/AUM level, all clusters respond about the same. Most would just continue what they had been doing and absorb the increased costs. A few would look at some of their production alternatives. Only the Retired group has a fairly large *Unknown* response. When the fee increased to \$5–8/AUM, the *Reduce* option increased dramatically for all groups, with Sheep and Dependent operators being most inclined to reduce the scale of their ranching operations. There are about as many Dependent operators with *Unknown* responses to the fee increase as there are in the Retired group. At the >\$8/AUM fee level, fewer operators in each cluster would be able to *Continue*, but the pattern is pretty much the same as with the \$5–8/AUM fee. What is most striking at this level is the great amount of *Unknown* responses. Almost half of the Dependent Ranchers do not know how they would respond to fees at that level. While it appears that Sheep and Dependent operations would be impacted most by the rise in grazing fees, the Sheep operators seem to have more options

to *Intensify* production on private land. As indicated in Table 1, the Sheep operations have about three times as much deeded land as the Dependent operations. Since the ranches identified as Sheep operations also have a large number of cattle, we do not know what sorts of adjustments they would make. Since Sheep margins tend to be relatively tighter, higher costs will make that enterprise less profitable faster and there may be a move towards more cattle and fewer sheep.

Figure 5 shows the clusters' responses to different AUM permit reductions. At the 25% reduction level, the Trophy Ranchers appear to be the most willing to make changes. Again, the Dependent Ranchers are the most uncertain as to how they would respond. This continues through all the levels of change. At the 50% reduction level, very few operators could *Continue* with many more likely to *Reduce* their operations. At the 100% reduction, Sheep operators could not *Continue*, and would either *Reduce* or seek other alternative sources of forage. For the remaining clusters, the 100% reduction does not appear to cause many additional changes over the 50% reduction other than *Unknown* increases across all clusters.

The last set of policy choices involved the loss of a particular grazing season from the yearlong operation (Fig. 6). The implication is that the ranchers would have to rebalance the yearlong forage and feed supplies for their operations if a particular season of federal forage was no longer available. The *Continue* response closely matches the level of

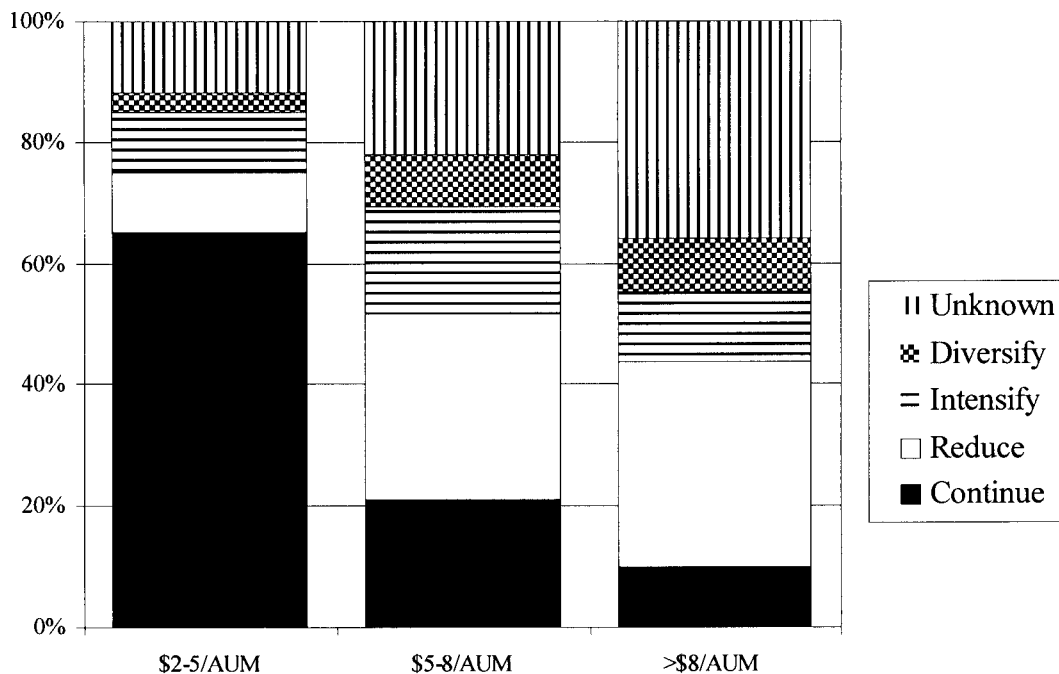


Figure 1. Responses of all federal land grazing permittees to different grazing fee levels.

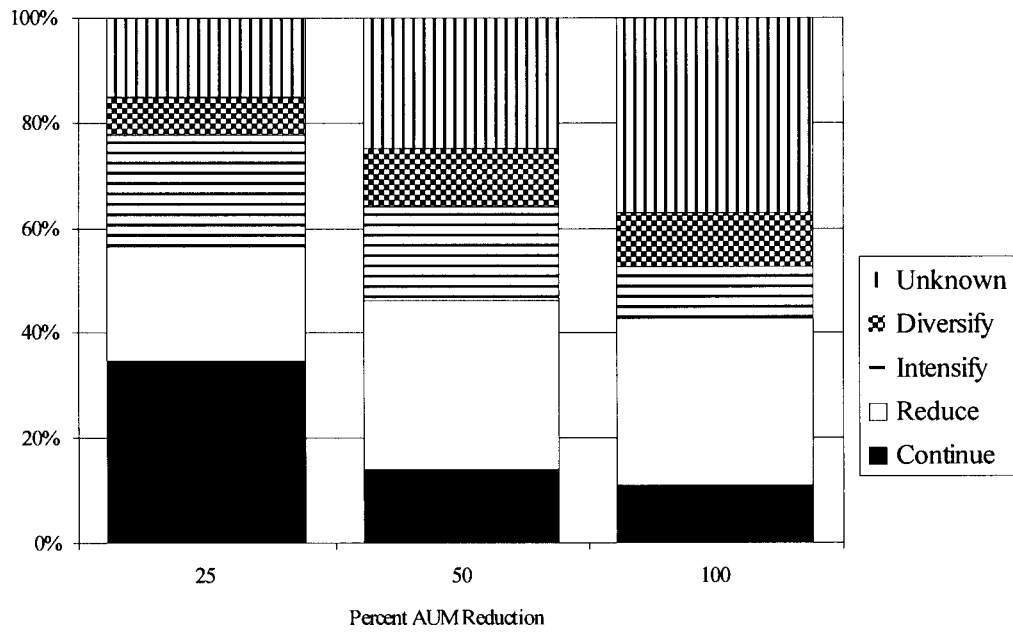


Figure 2. Responses of all federal land grazing permittees to different permit reductions.

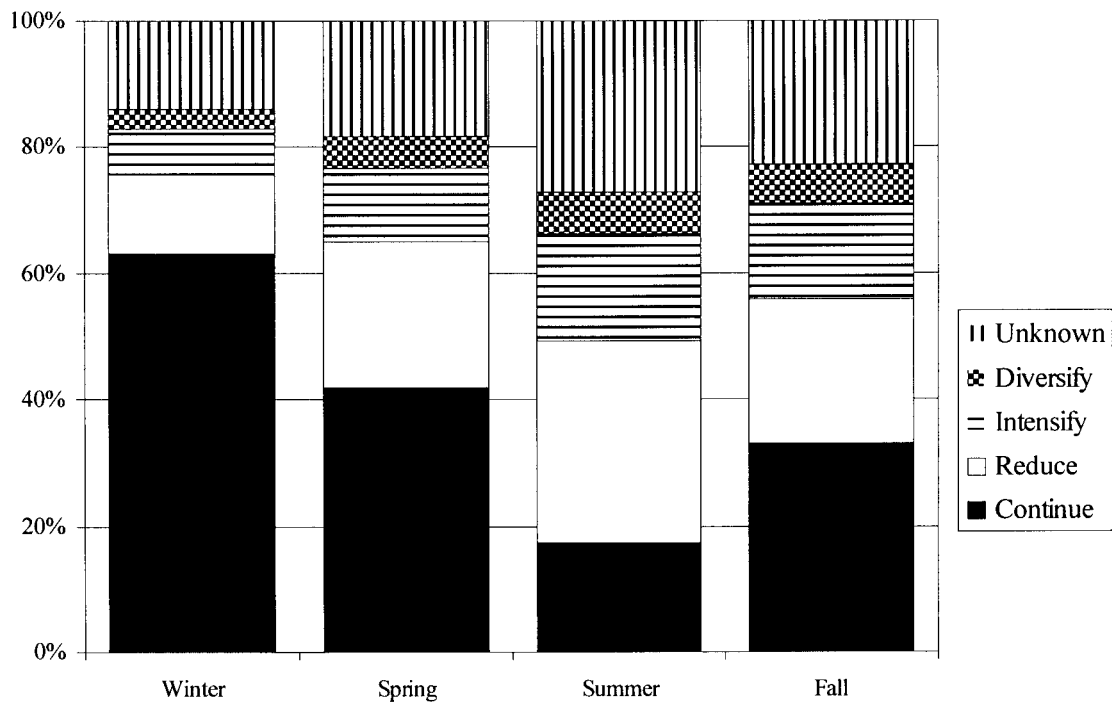


Figure 3. Responses of all federal land grazing permittees to loss of a federal grazing season.

federal forage dependence for each ranch type in Table 1. In general, those who are more dependent on federal forage in any given season are more likely to either *Reduce* or *Intensify* with the loss of season of use. Sheep Ranchers appear least likely to *Continue* in each of the seasons. This is expected given their high levels of forage dependence reported in Table 1. The *Unknown* response remains highest for the Dependent Ranchers, except for the winter season.

## DISCUSSION AND CONCLUSIONS

The purpose of this analysis was to determine whether clustering provided additional, useful information compared to gathering responses from the population, and to examine those differences in the context of three different public land grazing policies. The hobbyists groups are less than 50% dependent on that income, while the professional groups are more than 70% dependent. Other than the Corporate Rancher, the professional clusters are generally more dependent on federal grazing permits in spring, summer, and fall, compared to the hobbyists. The Sheep operations are more dependent in the winter as well.

For the grazing fee changes and AUM reduction policies examined, there appears to be a breaking point where relatively few ranchers can *Continue* their operations at the current level. As each of the policies increased in severity, there also was a larger *Unknown* response across the board. From both research and extension viewpoints, there could be several implications of these results. First, finding ways for ranchers to adapt in an economically and socially acceptable fashion will continue to be a goal. Second, for those ranchers who have not planned what they would do in a variety of circumstances, there is an educational opportunity to target programs to the different clusters. Helping ranchers find desirable alternatives has to begin with understanding their personal attitudes and goals.

From an ecological viewpoint, one potential problem is the number of permittees that would seek to intensify use of private lands if their public permits were reduced. Since the survey lumped a variety of private land options together under the banner of *Intensify*, there is no way to know whether respondents would graze their own lands heavier, convert hay fields into pasture, or lease additional private lands. If they choose to graze their own lands or other private lands heavier, assuming these lands are currently properly grazed,

there will be long-term ecological implications including increased erosion, habitat conversion, reduced production, and others.

By improving the definition of what a public land rancher is and how they will respond to different policy scenarios, we believe the analysis of such changes can be refined to more accurately reflect rancher behavior. The results of such an analysis can lead to a better depiction of local community economic and social impacts, including reduced seasonal employment and a shift from dependent (professional) ranchers to more hobbyists. There also is the opportunity for educators to help ranchers examine their options before the policy impact occurs. Educational programs should be designed to appeal to the objectives and characteristics of each type of public land rancher.

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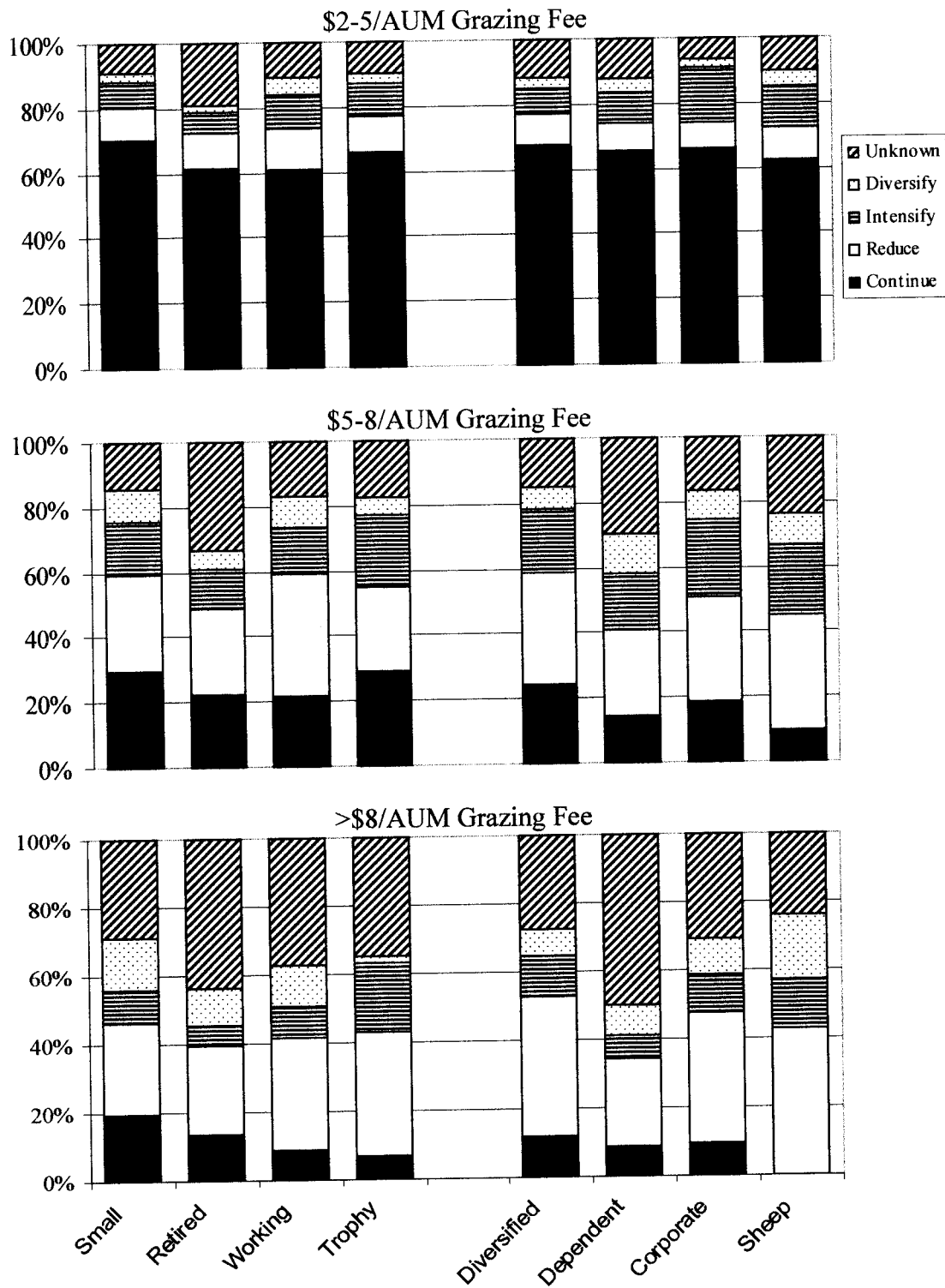


Figure 4. Responses by cluster to alternative federal grazing permit fees.

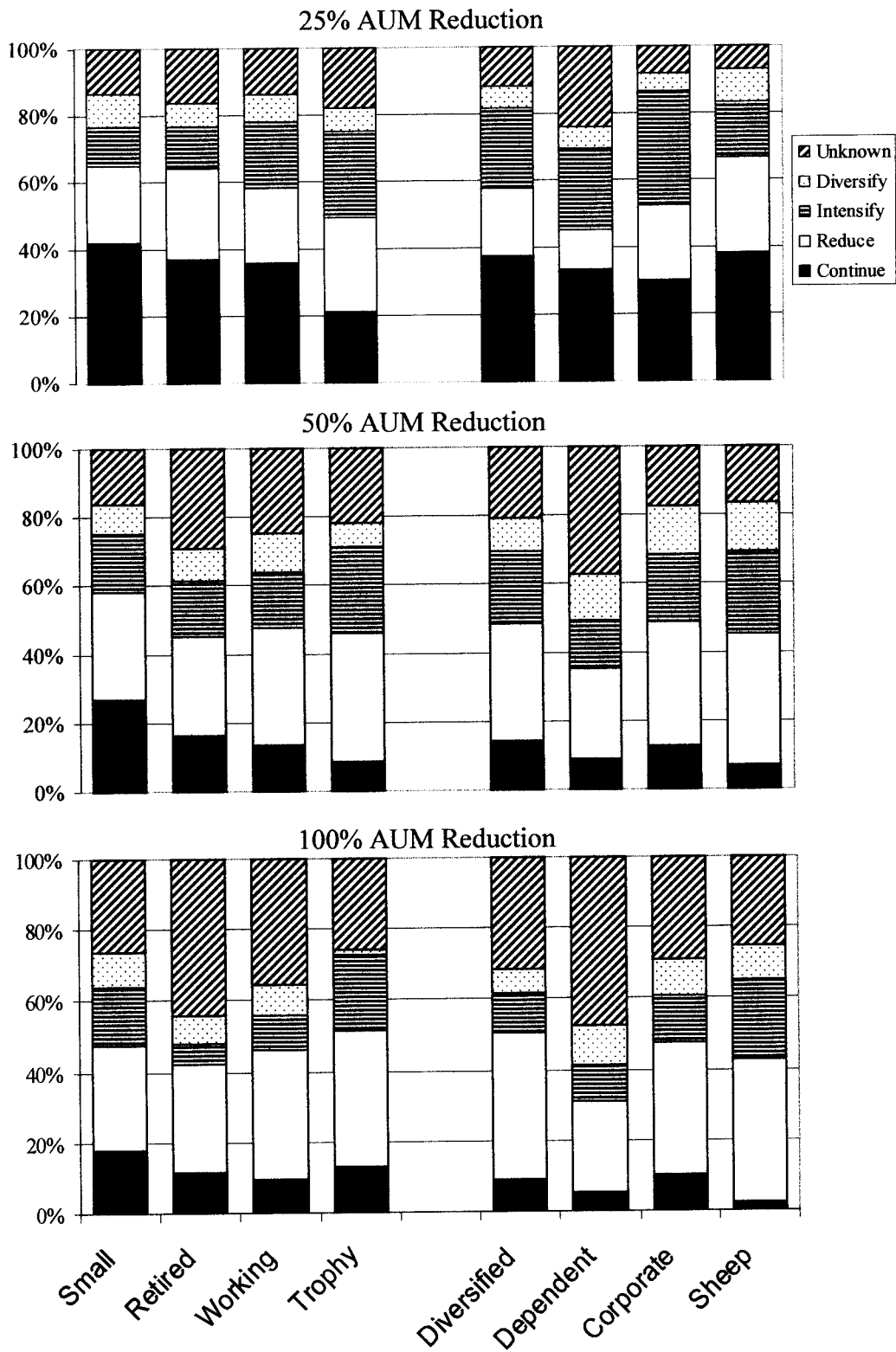


Figure 5. Responses by cluster to alternative levels of permit reductions.

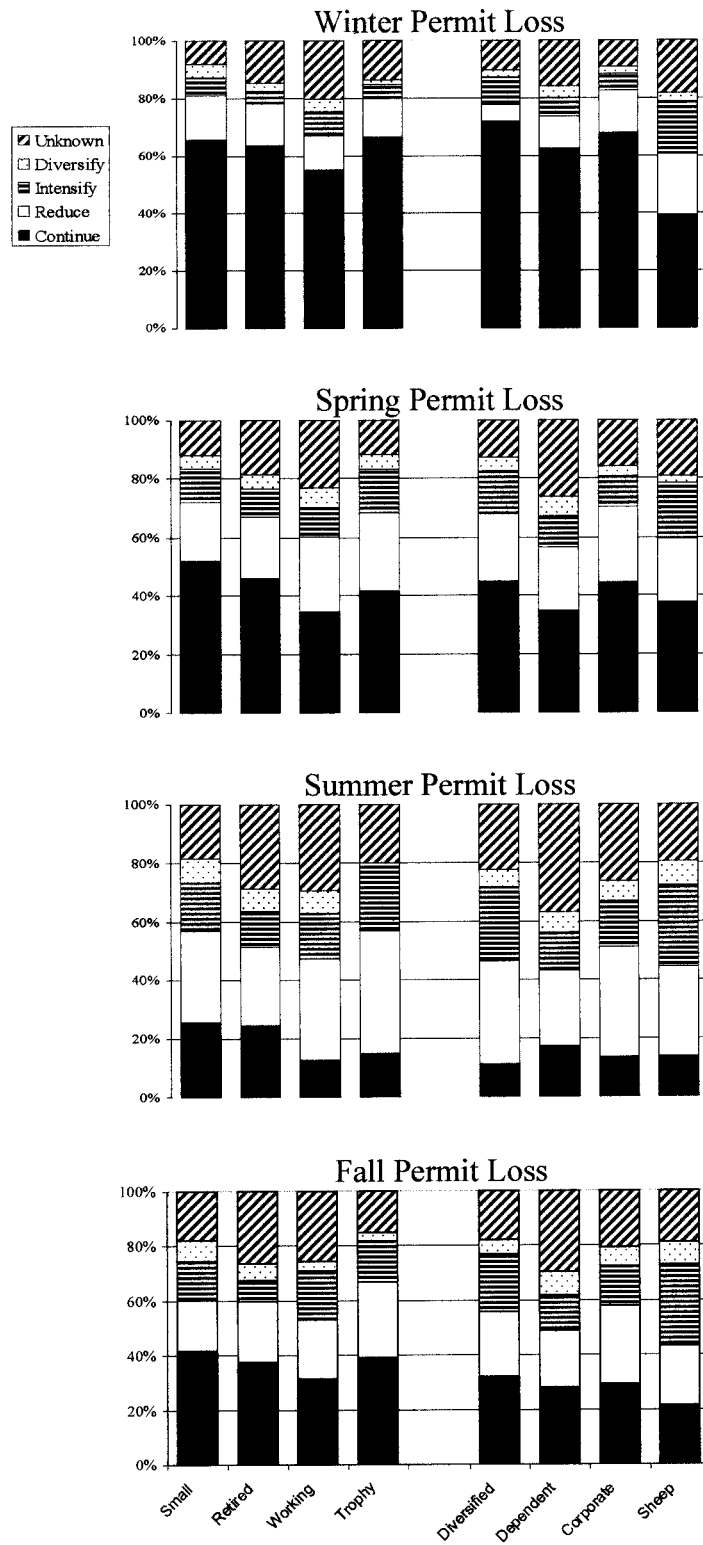


Figure 6. Responses by cluster to loss of season of use on federal lands.