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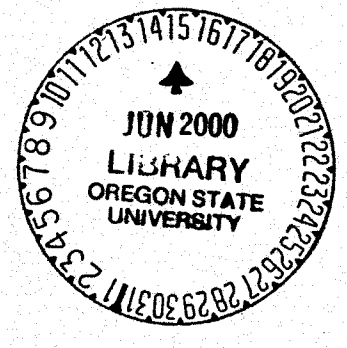
Public Land Grazing: Changing Trends in Southeastern Oregon, 1987 to 1998



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Public Land Grazing: Changing Trends in Southeastern Oregon, 1987 to 1998

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Public Land Grazing: Changing Trends in Southeastern Oregon, 1987 to 1998

The purpose of this publication is to examine the changes that occurred in livestock grazing on public lands in southeastern Oregon between 1994 and 1998 and between 1987 and 1998, and to revise some of the data in previous studies. All federal land management agency offices in Malheur, Harney, Lake, and Grant counties of southern Oregon were visited, and data were obtained from all permittee files.

The study area is a land of diversity and contrast. Harney, Lake, and southern Malheur counties' dry deserts are dominated by pale green vegetation and subtly blending earth colors. These contrast sharply with the dark volcanic rock rising out of the land in massive ridges at Abert Rim in Lake County and the Steens Mountain in Harney County. The desert landscape also contains pockets of aspen and pine forest where elevation and topography combine to create a more moist environment.

Where there is sufficient water for irrigation, high elevation and the consequent short growing season in Harney and Lake counties limit the crops to alfalfa and grass hay or small grains. The greens of alfalfa and irrigated grass contrast sharply to the sagebrush and native grass hills that surround them. Just as startling is the contrast between dry desert and irrigated fields in the Treasure Valley around Ontario, Vale, and Nyssa in northern Malheur County. Abundant water and a long growing season in this area allow a wide variety of crops including onions, potatoes, mint, vegetable seed, hops, and the traditional hay and grain crops.

Grant County has subalpine and alpine conifer forests with wide meadows of lush mountain grasses and wildflowers. Ranches are in the valleys, where irrigation water is available for production of winter forage, while the forest areas are used for timber production, summer livestock grazing, and recreation. The grazing season lasts from 5 months at the lower elevations to only 2 to 3 months in the high areas of the Blue and Strawberry Mountains, where snow still covers the land in mid- to late June. Here, the grass cannot withstand grazing until early to mid-July, and weather generally forces removal of livestock by October.

Contrast, however, is not the whole story, as the counties in the study area have a great deal in common. Common characteristics of the study area include:

- Great distances between towns. The area covers 33,041 square miles (*1999–2000 Oregon Blue Book*), which is 1,425 square miles larger than Vermont, Maryland, New Hampshire, Delaware, Rhode Island, and Connecticut combined (U.S. Dept. of Commerce).

- Low rainfall. Average annual precipitation in southeast Oregon ranges from 4 inches on the Alvord Desert in Harney County to about 15 inches in parts of Grant County, with the average for the study area at 12.46 inches per year (*1999–2000 Oregon Blue Book*).
- Few people. The average population density is 1.48 people per square mile. In comparison, the eastern states mentioned above have an average population density of 556.3 people per square mile, and they are some of the least densely populated states on the East Coast (U.S. Dept. of Commerce).
- Dependence on agriculture—and particularly livestock production—for their economic viability. The livestock industry throughout the study area depends heavily on public lands for summer forage, to the extent that any significant change in public range availability will have immediate economic impact on the entire community. Any issue revolving around public land use and regulation, be it grazing, logging, recreation, water use, conservation, or preservation, is of vital interest to the ranching community and to the towns that depend on agriculture for much of their economic activity.

Much of the land in the study area is under federal ownership, as illustrated in Table 1. Ownership patterns are consistent with much of the intermountain west, where homesteads were established in valleys with sufficient water to sustain crop production, and livestock were pastured on the surrounding "free" government land. Most ranches in the study area own land near the rivers and streams and depend on public land for a significant amount of their annual forage needs.

Table 1.—Federal land ownership by county.

County	Percent of County in Federal Ownership	Total Federal Land (sq miles)[1]	Percent BLM	Square Miles BLM	Percent USFS	Square Miles USFS
Malheur	73.72	7,318.32	99.9	7,783.88	0.0004	3.19
Harney	72.01	7,365.43	84	6,186.96	10	736.54
Lake	71.23	5,954.25	67	3,989.35	27	1,607.65
Grant	59.68	2,702.73	90	2,433.23	10	269.51

[1]One square mile = 640 acres

Sources:

Malheur, Harney, Lake, and Grant County Resource Atlas: Natural, Human, Economic, Public (Extension Community Development Project, Oregon State University Extension Service, August 1973).

1999–2000 Oregon Blue Book (Office of the Secretary of State, State of Oregon).

Public land grazing no longer is "free" but is regulated by a permit system that prescribes the duration of the grazing period, cost, and livestock numbers on grazing allotments within the national forests and on Bureau of Land Management (BLM) land. A detailed study of permittee[1] files in local United States Forest Service (USFS) and BLM offices was undertaken in 1989, 1994, and 1998. A number of fundamental changes in the livestock industry in southeastern Oregon were reported between 1987 and 1994 (Greer, 1994; Greer, 1996), including an increase in the number of federal permits, a decrease in the total number of livestock allowed on the range through permittee voluntary non-use and agency action, and a decrease in the number of large permits (5,000 AUMs[2] and above). Capital expenditures by permittees were minimal after 1992, while the overall dependence of permittees on federal range for livestock forage stayed relatively stable.

Since 1994, change has been less dramatic, but several trends have continued, including the almost total lack of capital expenditures on federal range by permittees, and a continuing decrease in average permit size (number of AUMs).

Agencies and permits

This study involves the livestock grazing programs administered by the two major federal land management agencies, the BLM and the USFS. Combining data from these two agencies requires reconciling the definitions used by each agency in describing and setting stocking rates. Stocking rate is the number of animals to be grazed on a parcel of land for a specified time period. The most common term used is the "animal unit month" (AUM), which can be a measure of livestock numbers, forage availability, or forage use. When forage is considered, 1 AUM is the amount of forage consumed by a cow and her suckling calf during a 30-day period. The Forest Service uses other measures, with "head month" being the closest to the traditional AUM measure.

This report uses the traditional AUM definition, as described above. A bull is 1.4 AUMs, a horse is 1.4 AUMs, a yearling steer or heifer is 0.6 AUMs, and five ewes equal 1 AUM. All permits are let on a total AUM basis. A permit granted for 1,000 AUMs for a 5-month period equates to 200 head of mature breeding cows (1,000 ÷ 5) with their calves, or the equivalent (Greer, 1996).

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[1] As used in this report, the word "permittee" refers to a rancher who grazes livestock on federal range under permit or lease from the BLM or under permit from the USFS.

[2] AUM = "animal unit month." See the definition under "Agencies and permits."

Another difference between the BLM and USFS involves the type of contractual grazing agreements issued. The BLM issues Section 15 leases or Section 3 permits. Both are written for a 10-year period, although the stocking rate can be adjusted annually. The Forest Service issues either term or temporary permits depending on the abundance of forage. USFS term permits are basically the same as BLM Section 3 permits, as both designate the number of AUMs, the season of use, and any other special grazing requirements for specified grazing allotments.

A Section 15 BLM lease generally involves a relatively small acreage surrounded in whole or part by private land. All BLM leases in Grant County are of this nature, ranging in size from 4 to 1,900 AUMs. Section 15 leases, though small, may be very important to the private landowner. They quite often are not fenced; they may control water or some other resource critical to the usefulness of the surrounding private land.

With both BLM and USFS permits, the permittee is purchasing access to a portion of the forage on the land, rather than an economic interest in the land itself. Permits may be issued for common allotments with several ranchers grazing livestock together, or to a single rancher grazing a specific allotment exclusively.

Number and size of permits

The number of permits issued has declined, especially from 1994 to 1998, with only a slight decline overall since 1987. This is illustrated in Table 2 for the entire study area, and in Appendix 1 for individual years and counties. Between 1987 and 1990, permit numbers increased steadily from 879 to more than 1,000, then dropped suddenly in 1995 by 158 permits. It is unclear exactly what happened to many of these permits, but it is clear that they are no longer active, as there was an actual decrease in the number of licensed permits not being grazed. The decrease seen in Appendix 1 was greatest in Harney County and most likely was due to the demise of one large ranching unit, which used a significant number of permits, mostly small to medium in size and scattered throughout the county, between 1993 and 1995.

Malheur County also had an overall decrease in the number of permits, with the largest reductions in the "very small" category and in the 500 to 5,000 AUMs range (Appendix 1). The decrease in small permits also can be seen in the "Size Range" column of Appendix 1, where the minimum permit size jumped from 7 to 12 AUMs.

Table 2.—Permit size distribution by year for the study area.

Year	Size Average Range in AUMs	Number Permit Size in AUMs	Less Permits Not Used[1]	NUMBER OF PERMITS BY SIZE GROUP 101–300 Than 100 AUMs	301–500 AUMs	501–1,000 AUMs	1,001–5,000 AUMs	Over 5,000 AUMs	Total AUMs	Total AUMs	Active Permits in the Study Area[2]
1987	**2–16,574**	**771**	**151**	**236**	**140**	**82**	**220**	**186**	**15**	**675,199**	**879**
1988	2–25,058	815	141	254	163	82	229	203	11	732,047	942
1989	2–23,540	796	125	263	177	97	237	205	13	743,563	992
1990	2–35,104	792	122	279	183	112	247	199	12	762,778	1,032
1991	2–28,385	668	141	303	201	109	268	180	10	670,002	1,071
1992	2–20,460	583	151	302	214	132	237	179	5	585,043	1,069
1993	2–15,604	612	182	319	190	112	222	187	8	600,239	1,038
1994	**2–19,150**	**641**	**206**	**310**	**192**	**95**	**229**	**182**	**9**	**609,031**	**1,017**
1995	2–12,837	680	122	232	159	94	200	162	12	704,635	859
1996	3–12,837	676	120	241	151	98	216	166	12	718,800	884
1997	2–15,604	705	108	254	162	127	209	176	14	748,153	942
1998	**2–19,150**	**685**	**171**	**143**	**163**	**103**	**190**	**154**	**15**	**658,797**	**868**
Change: 1994–1998		**+44**	**-35**	**-67**	**-29**	**+8**	**-39**	**-28**	**+6**	**+49,766**	**-149**
Change: 1987–1998		**-86**	**+20**	**+7**	**+23**	**+21**	**-30**	**-32**	**0**	**-16,402**	**-11**

[1]Permits that were licensed but not grazed.
[2]Permits that were actively grazed during the year.

Changes in the number of active permits in the study area and changes in the number of active permits not being grazed do not match; this indicates that there are a significant number of permits that have become inactive. This is reinforced in part by Table 3, which compares new permits to those that have been discontinued.

Table 3.—Change in active permit numbers, 1994 to 1998; new vs. discontinued permits.

County	New permits Number	New permits AUMs	Discontinued Number	Discontinued AUMs	Net change in AUMs
Grant	61	15,324	24	15,398	-74
Malheur	30	46,980	23	66,297	-19,317
Harney	31	46,188	47	53,052	-6,864
Lake	19	14,429	19	28,158	-13,729
Area Totals	**141**	**122,921**	**88**	**162,905**	**-39,984**

The term "discontinued" in Table 3 means that either the base property has been sold, or the lease on the private land has not been renewed. In all counties, the discontinued AUMs are not being picked up by new or existing permittees. Economic theory and common sense tell us that if a resource earns more than it costs on a per-unit basis, or on the margin, then that resource will be in demand. The fact that there are permits not being used, and that inactive permits exist throughout the study area, indicates that the grazing activity on the permits does not cover their cost for some ranches. In other words, either cattle prices are too low, or grazing the public land is too expensive or too much hassle to make it a paying proposition for all ranchers.

Another possibility is that some of the permits that have "disappeared" were discontinued because the corresponding land was sold, and the new owner is a neighbor who is using this land for summer range. Thus, some ranches get bigger, some cease to exist, and the net effect is that the ranching community continues to function but with fewer people involved. Thus, the national trend in agriculture toward larger farm and ranch units seems to be "alive and well" in southeast Oregon.

The number of animals grazed on an allotment or permit can be changed either by agency or rancher action, as illustrated in Table 4. Note that the reductions made by the federal agencies have been increasing since 1987, and increasing sharply since 1994, while reduction in cattle numbers by rancher actions have been declining. Agency changes in livestock numbers or season of use (see Appendix 3) may be by mutual agreement between the agency and the permittee, but generally they are not entirely voluntary on the part of the rancher. Both agency and rancher reductions may be the result of range conditions, while agency reductions also can be for disciplinary reasons if the permittee has violated allotment rules. It seems that most of the large number of AUMs that the ranchers are losing are being dictated by the federal land management agencies.

Table 4.—Reductions in permit numbers by agency[1] and permittee[2] (rancher) action in AUMs.[3]

Year Grant	Malheur		Harney		Lake		Area Totals			
	Agency	Rancher	Agency	Rancher	Agency	Rancher	Agency	Rancher	Agency	Rancher
1987	**1,701**	**5,543**	**29,184**	**9,649**	**25,450**	**30,533**	**7,962**	**31,187**	**64,297**	**76,912**
1988	2,836	7,558	46,522	7,100	23,061	34,249	15,173	29,063	87,592	78,015
1989	2,501	7,995	36,765	14,601	29,560	44,199	19,175	39,078	88,000	105,873
1990	2,393	7,102	55,942	16,911	45,637	17,918	30,495	40,019	134,467	81,950
1991	5,116	9,163	79,318	26,711	46,767	46,977	11,423	47,836	142,674	130,687
1992	6,251	11,696	56,063	16,816	60,707	60,560	10,781	9,758	133,802	138,830
1993	2,610	1,586	54,572	34,407	38,213	24,790	78,842	6,848	175,237	67,631
1994	**4,148**	**933**	**49,934**	**18,588**	**47,205**	**22,856**	**70,629**	**6,519**	**171,916**	**48,896**
1995	9,342	870	77,850	22,478	47,551	25,955	51,548	12,751	186,291	62,054
1996	11,990	1,169	63,862	18,460	73,781	22,293	86,828	6,211	236,281	48,133
1997	15,418	2,534	88,394	19,489	63,382	22,739	71,660	3,905	238,854	48,667
1998	**14,566**	**4,931**	**136,427**	**8,771**	**94,849**	**20,950**	**60,292**	**3,550**	**306,134**	**37,662**
Change in number of reductions (positive number means increased reductions; negative number means decreased reductions):										
1994–1998	**+10,418**	**+3,988**	**+86,493**	**-9,817**	**+47,644**	**-1,906**	**-10,337**	**-2,969**	**+134,218**	**-11,234**
1987–1998	**+12,865**	**-612**	**+107,243**	**-878**	**+69,399**	**-9,583**	**+52,330**	**-27,637**	**+241,837**	**-39,250**

[1]Permit number reduction by agency action means either suspension or non-scheduled by the BLM, or suspension by the USFS. Non-scheduled AUMs by the BLM may be a mutual agreement between the rancher and the agency; suspension is strictly an agency action, by either agency. Suspension can occur due to range or water conditions or for disciplinary reasons.

[2]Permit number reduction by the permittee or rancher means voluntary non-use.

[3]The numbers in Table 4 represent the reductions in permit numbers for a specific year. They are not cumulative, nor do they necessarily occur in the same permits each year. AUMs are removed or not used as conditions change from year to year.

Capital expenditure on federal range

Pasturing cattle on public lands is not without cost. Expenditures may be divided into grazing fees, non-fee costs, and capital expenditures. Fee and non-fee costs are the variable expenses of grazing cattle on public land and have been well documented elsewhere (McEowen and Harl, 1998; USDA, 1987–1998). In contrast, capital expenditures by permittees on public land (Table 5)—for developing watering facilities; building division fences, lay-down fences, or cross-fences; range seeding; or brush eradication—have received relatively minor attention.

Capital expenditures always have been relatively small on USFS land, and since 1990 they have been getting progressively smaller on BLM land. There was one notable exception in 1997 in Lake County, when a large expenditure was made for a fencing project associated with the division of MC Ranch permits among new owners.

Economic theory and common sense suggest that in order to enjoy the benefits of a capital expenditure fully, tenure in the improved resources must be sufficiently secure and of sufficient length to fully depreciate the improvements. Thus, if a permittee perceives that the federal range will not be available long enough to use fully (depreciate) a contemplated capital improvement to a permit, the permittee won't make the investment (which may be the thinking of the ranchers in the study area). This does not mean that the ranchers do not contribute to the upkeep of improvements on the federal range, as maintenance costs can be significant.

Table 5.—Capital expenditure on federal range by permittees.[1]

County & Agency	YEAR 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
	DOLLARS											
Grant:												
BLM	2,800	2,700	2,800	300	0	0	1,180	1,577	1,600	1,500	0	2,400
USFS	30	0	0	0	400	2,506	0	0	0	363	93	0
Malheur:												
BLM	0	0	0	578	0	0	31,319	0	0	0	0	0
USFS	0	0	0	0	0	0	0	0	0	0	0	0
Harney:												
BLM	21,498	15,140	5,000	4,654	8,250	0	228	0	0	3,000	4,825	0
USFS	0	0	0	0	0	624	0	0	0	0	0	0
Lake:												
BLM	5,862	12,912	17,675	24,995	8,423	0	0	0	0	0	69,000	0
USFS	2,100	2,261	1,500	5,500	3,000	0	345	979	0	4,689	0	0
Study Area Totals:												
BLM	30,160	30,752	25,475	30,527	16,672	0	32,727	1,577	1,600	4,500	73,825	2,400
USFS	2,130	2,261	1,500	5,500	3,000	3,130	345	979	0	5,052	93	0

[1]The numbers in Table 5 do not include maintenance costs borne by the permittees on existing fences and water developments, as these costs were not recorded in the permit files.

Business organization

Sole proprietorships still are the dominant form of business ownership in the study area, with corporations second, partnerships third, and "other" a distant last (Table 6). Most of the corporations are not large, outside interests; they are family-held businesses that incorporated for estate management purposes and still retain the family name. There are some notable exceptions to this, but they are few.

The "other" category includes estates, trusts, and an increasing number of limited liability companies. An LLC (limited liability company) is a hybrid type of organization that is a "cross" between a Subchapter S corporation and a partnership. It is an attempt to blend the best features of the two into a single entity without the disadvantages of either. For example, with the LLC, profit and loss are distributed to the "members" (shareholders) by agreement, as in a partnership, yet there is limited liability, as in a corporation. Further, shares in an LLC can be distributed through a will using trusts more easily than with a Subchapter S corporation (McEowen and Harl, 1998). For these reasons, this business structure is replacing both corporations and partnerships as a business and estate management tool.

Table 6.—Business organization distribution: 1990, 1994, and 1998 AUMs actively used by permittees in each business classification, and the percentage of total annual AUMs used by ranches in each classification.

County	Single Proprietor			Corporation			Partnership			Other[1]		
	1990	1994	1998	1990	1994	1998	1990	1994	1998	1990	1994	1998
Grant	103	122	124	40	43	47	7	11	10	9	9	13
AUMs	20,893	21,827	23,570	30,389	22,919	24,159	6,964	7,640	4,714	5,065	**	6,482
Percent[2]	33	40	40	47	42	41	12	14	8	8	4	11
Malheur	89	94	106	51	52	49	10	12	10	5	5	6
AUMs	100,531	103,122	94,737	138,570	138,400	131,579	19,019	16,282	28,947	13,586	13,569	7,894
Percent[2]	37	38	40	51	51	50	7	6	11	5	5	3
Harney	77	81	91	50	47	52	9	9	10	2	2	4
AUMs	89,156	69,153	40,889	139,759	102,795	62,470	9,639	13,083	6,815	**	**	**
Percent[2]	37	37	36	58	55	55	4	7	6	1	1	3
Lake	27	39	46	41	39	46	8	8	4	3	4	4
AUMs	14,724	22,197	35,340	154,610	105,067	104,484	12,884	13,318	9,219	**	**	**
Percent[2]	8	15	23	84	71	68	7	9	2	1	6	6
StudyArea	**296**	**336**	**367**	**182**	**181**	**194**	**48**	**42**	**34**	**16**	**20**	**27**
AUMs	225,304	216,299	194,536	463,326	369,181	323,056	48,506	50,323	49,695	22,902	25,020	27,022
Percent[2]	30	33	33	61	55	54	6	8	8	3	4	5

[1]"Other" refers to estates, trusts, and limited liability companies.
[2]The percentage of the total county AUMs allotted to single proprietors, corporations, partnerships, and "other."
**These figures were omitted, as the number of permittees was small enough to risk individual disclosure.

Seasonal dependencies

Few ranches have enough deeded land to support an economically viable livestock operation; thus, for many, public land grazing is vital to their existence. Summer forage dependencies traditionally range from 20 to 30 percent in early spring and fall, while in mid-summer, ranchers depend on public range for as much as 60 percent of their forage needs (Appendix 3).

Permit numbers throughout the area are declining, as summarized in Table 2. Permitted AUMs also are declining, yet the number of cattle in the study area is remaining relatively constant, with a slight upward trend (Appendix 2). If all these changes are occurring without affecting cattle numbers, then the conclusion must be that the AUMs leaving public land are being accommodated entirely on private land. This could mean that some ranchers either are going "all inside" with their cattle, or are leasing other private land for summer grazing. (Going "all inside" means that cattle are grazed entirely on private land owned by the rancher rather than on any public land.)

Given the fact that there is a very limited amount of private land available for lease in the study area, it would seem that the alternatives of choice are going "all inside" or summering cattle outside the area. This conclusion was reinforced in informal conversations with Extension agents[1] in the four counties. Cattle are being summered out of the area, on private, leased land, on the home ranch, or in some combination of arrangements. This calls for more intensive land and cattle management strategies on the deeded land, which are not possible on all ranch units.

It would be interesting to know exactly where these cattle are grazing during the summer, in what proportions, and what management changes have been undertaken to accommodate this. If private ranch land is being managed and used more intensively, is this sustainable or cost effective in the long run? Ranchers may be making short-term decisions based at least in part on directives from government agencies, as well as on the economics of running on federal range. These decisions also may have long-term consequences to the health of the private ranch land and the ranching community.

Those who can move "all inside" or procure summer range elsewhere apparently are doing so, or are at least working toward that goal. But public land grazing still is critical for ranches that lack the resources to use these alternatives. They may find themselves in an economically precarious position, as the cost of grazing public land continues to increase, and the trend continues for agencies to reduce cattle numbers on the federal range.

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[1]David Chamberlain, Harney County; DeVon Knutson, Malheur County; Judi Steward, Lake County; and Gary Delaney, Grant County.

Conclusions

In 1996, declining trends were noted (Greer, 1996) in the number of livestock on federal range, number of permits, permit size, total livestock numbers, and period of use on federal range. These trends continue today, with the exception of reduced livestock numbers. Due to the reduction in permits and permit numbers (AUMs) and the stability in overall cattle numbers, seasonal dependency on federal range is down from the pre-1994 period. This reinforces the conclusion that there is a trend away from using federal land for summer forage.

It seems logical that where ranches traditionally have been dependent on public land for part of their annual forage needs, ranching will not die; but it will evolve into fewer and larger operations that can provide all of their forage internally. This trend also would translate into fewer people, which means decreased economic activity in the rural communities. Communities such as Burns, Lakeview, and John Day may need to seek additional sources of economic activity to supplement ranching and timber harvest if they are to remain economically viable.

Ranches using federal range continue to be predominantly small businesses. Single proprietorships continue to dominate the business organization structure of the ranches in the study area, but both corporations and "other" organizations are increasing. Most of the corporation owners are local families. Thus, it seems that the majority of ranches using federal ranges are family-owned and operated businesses that are small by any conventional measure.

There is a definite decrease in very large ranch units. Where are the wealthy "cattle barons" who are supposed to be reaping great profit from "heavily subsidized" public grazing? With cattle and sheep prices holding at the same levels for the past 2 or 3 years, it is difficult to conceive of anyone making great profits from ranching regardless of where they summer their cattle or sheep.

Change in ranch country is not a new trend, but it seems to have accelerated over the past 4 years. As with economic change in any part of the world, those who are able to adapt probably will survive and might even prosper. Those who do not have the resources will disappear. In the "overall scheme of things," the economic importance of their disappearance seems small indeed; therefore, to some it appears an inconsequential change. It is not inconsequential, however, to the family who is forced from ranching or a related business. To them it is an economic, social, and personal disaster.

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Appendix 1

Permit size distribution by county and year

County Year	Size Range in AUMs	Average Permit Size in AUMs	Number Permits Not Used[2]	NUMBER OF PERMITS BY SIZE GROUP: Less Than 100 AUMs	101–300 AUMs	301–500 AUMs	501–1,000 AUMs	1,001–5,000 AUMs	Over 5,000 AUMs	Total AUMs	Total Active Permits in Each County[3]
GRANT											
1987	**4–2,711**	**303**	**93**	**85**	**32**	**12**	**17**	**11**	**0**	**47,333**	**157**
1988	4–2,720	299	81	92	34	17	19	12	0	50,226	174
1989	3–3,968	325	57	100	37	15	29	12	0	61,939	193
1990	**3–2,620**	**304**	**40**	**105**	**43**	**19**	**28**	**13**	**0**	**63,311**	**208**
1991	2–3,800	281	30	113	47	16	32	10	0	61,006	218
1992	**3–2,307**	**244**	**23**	**122**	**48**	**16**	**21**	**12**	**0**	**53,576**	**219**
1993	3–2,471	254	26	130	45	13	22	14	0	57,409	224
1994	**3–2,758**	**245**	**35**	**128**	**49**	**10**	**25**	**11**	**0**	**54,569**	**223**
1995	2–3,184	283	34	121	35	10	19	18	0	57,395	203
1996	**3–3,184**	**275**	**28**	**124**	**44**	**14**	**22**	**18**	**0**	**61,014**	**222**
1997	2–2,124	261	27	127	47	17	25	16	0	60,460	232
1998	**2–2,052**	**256**	**35**	**134**	**37**	**20**	**23**	**16**	**0**	**58,925**	**230**
Change: 1994–1998		**+14**	**0**	**+6**	**-12**	**+20**	**-2**	**+5**	**0**	**+4,356**	**+7**
Change: 1987–1998		**-45**	**-58**	**+49**	**+5**	**+8**	**+6**	**+5**	**0**	**+11,592**	**+73**
MALHEUR											
1987	**7–10,244**	**1,205**	**6**	**37**	**34**	**22**	**114**	**81**	**8**	**266,325**	**296**
1988	7–25,058	1,336	3	38	38	20	120	88	6	310,026	310
1989	7–10,087	1,235	9	39	38	21	125	86	6	290,195	315
1990	**7–7,874**	**1,123**	**11**	**41**	**37**	**29**	**138**	**82**	**5**	**271,706**	**332**
1991	7–6,177	959	25	46	36	30	141	74	3	226,333	330
1992	**6–6,953**	**889**	**27**	**49**	**36**	**32**	**135**	**70**	**3**	**213,777**	**325**
1993	7–5,922	901	35	43	33	24	121	75	4	213,337	300
1994	**7–6,850**	**940**	**32**	**42**	**32**	**21**	**117**	**81**	**3**	**221,373**	**296**
1995	12–9,700	1,203	34	7	36	24	110	79	10	274,529	266
1996	**12–9,315**	**1,226**	**23**	**10**	**37**	**26**	**119**	**83**	**10**	**299,571**	**285**
1997	10–9,712	1,245	35	12	35	27	111	85	11	296,012	281
1998	**12–9,715**	**1,195**	**59**	**14**	**34**	**21**	**103**	**69**	**12**	**263,157**	**253**
Change: 1994–1998		**+262**	**+27**	**-28**	**+2**	**0**	**-14**	**-12**	**+9**	**+41,784**	**-43**
Change: 1987–1998		**-3**	**+53**	**-23**	**0**	**-1**	**-11**	**-12**	**+4**	**-3,168**	**-43**
HARNEY											
1987	**2–9,245**	**828**	**49**	**68**	**41**	**23**	**51**	**54**	**6**	**201,128**	**243**
1988	2–9,152	750	44	80	48	23	51	61	4	200,342	267
1989	2–9,745	784	45	80	59	33	47	67	6	228,792	292
1990	**2–20,812**	**810**	**52**	**82**	**62**	**34**	**48**	**62**	**6**	**240,964**	**294**
1991	2–15,264	687	57	89	66	39	61	48	5	211,722	308
1992	**2–5,155**	**560**	**68**	**73**	**73**	**48**	**43**	**54**	**1**	**162,418**	**291**
1993	2–9,515	634	73	78	62	43	48	54	2	177,582	287
1994	**2–9,303**	**677**	**76**	**81**	**64**	**36**	**50**	**47**	**5**	**186,900**	**283**
1995	2–12,357	632	22	45	41	29	34	30	1	113,733	180
1996	**2–8,666**	**618**	**31**	**47**	**31**	**24**	**35**	**34**	**1**	**108,211**	**172**
1997	2–8.235	653	19	51	36	40	34	35	1	128,646	197
1998	**2–7,134**	**638**	**33**	**41**	**43**	**31**	**30**	**32**	**1**	**113,581**	**178**
Change: 1994–1998		**-39**	**-43**	**-40**	**-21**	**-5**	**-20**	**-15**	**-4**	**-73,319**	**-105**
Change: 1987–1998		**-190**	**-16**	**-27**	**+2**	**+8**	**-21**	**-22**	**-5**	**-87,547**	**-65**
LAKE											
1987	**2–16,574**	**746**	**3**	**46**	**33**	**25**	**38**	**40**	**1**	**136,578**	**183**
1988	2–20,136	875	13	44	43	22	39	42	1	167,202	191
1989	2–23,540	838	14	44	43	28	36	40	1	160,972	192
1990	**2–35,104**	**930**	**19**	**51**	**41**	**30**	**33**	**42**	**1**	**184,059**	**198**
1991	2–28,385	745	29	55	52	24	34	49	1	160,112	215
1992	**2–20,460**	**639**	**33**	**59**	**57**	**36**	**38**	**43**	**1**	**146,866**	**234**
1993	2–15,604	657	48	68	50	32	31	44	2	145,853	227
1994	**2–19,150**	**701**	**63**	**59**	**47**	**28**	**37**	**43**	**1**	**147,981**	**215**
1995	9–12,837	603	32	59	47	31	37	35	1	126,661	210
1996	**9–12,837**	**585**	**38**	**60**	**39**	**34**	**40**	**31**	**1**	**119,927**	**205**
1997	10–15,604	662	27	64	44	43	39	40	2	153,674	232
1998	**10–19,150**	**652**	**44**	**54**	**49**	**31**	**34**	**37**	**2**	**153,653**	**207**
Change: 1994–1998		**-49**	**-19**	**-5**	**+2**	**+3**	**-3**	**-6**	**-1**	**+5,672**	**-8**
Change: 1987–1998		**-93**	**+41**	**+8**	**+16**	**+6**	**-4**	**-3**	**0**	**+17,075**	**+24**

[1]AUM = animal unit month

[2]Permits that were licensed but not grazed during the year

[3]Permits that were licensed and grazed during the year

Appendix 2

County beef cattle numbers and AUM equivalents

Year County	Beef Cows & Heifers That Have Calved[1]	Bulls (20 cows per bull)	Replacement Heifers (15% rep. rate)	Estimated Monthly AUMs[2]	Estimated Annual AUMs[3]
1987					
Grant	26,000	1,300	3,900	30,160	361,920
Malheur	64,000	3,200	9,600	74,240	890,880
Harney	60,000	3,000	9,000	69,600	835,200
Lake	50,000	2,500	7,500	58,000	696,000
Area Totals	200,000	10,000	30,000	232,000	2,784,000
1988					
Grant	25,100	1,255	3,765	29,116	349,392
Malheur	61,800	3,090	9,270	71,688	860,256
Harney	57,000	2,850	8,550	66,120	793,440
Lake	50,300	2,515	7,545	58,348	700,176
Area Totals	194,200	9,710	29,130	225,272	2,703,264
1989					
Grant	25,500	1,275	3,825	29,580	354,960
Malheur	64,000	3,200	9,600	74,240	890,880
Harney	65,000	3,250	9,750	75,400	904,800
Lake	54,000	2,700	8,100	62,640	751,680
Area Totals	208,500	10,425	31,275	241,860	2,902,320
1990					
Grant	26,200	1,310	3,930	30,392	364,704
Malheur	70,500	3,525	10,575	81,780	981,360
Harney	65,500	3,275	9,825	75,980	911,760
Lake	56,300	2,815	8,445	65,308	783,696
Area Totals	218,500	10,925	32,775	253,460	3,041,520
1991					
Grant	26,000	1,300	3,900	30,160	361,920
Malheur	69,000	3,450	10,350	80,040	960,480
Harney	64,000	3,200	9,600	74,240	890,880
Lake	53,000	2,650	7,950	61,480	737,760
Area Totals	212,000	10,600	31,800	245,920	2,951,040
1992					
Grant	26,000	1,300	3,900	30,160	361,920
Malheur	62,000	3,100	9,300	76,920	863,040
Harney	57,500	2,875	8,625	66,700	800,400
Lake	38,000	1,900	5,700	44,080	528,960
Area Totals	183,500	9,175	27,525	212,860	2,554,320
1993					
Grant	26,400	1,320	3,960	30,624	367,488
Malheur	66,100	3,305	9,915	76,676	920,112
Harney	61,000	3,050	9,150	70,760	849,120
Lake	42,700	2,135	6,405	49,532	594,384
Area Totals	196,200	9,810	29,430	227,592	2,731,104
1994					
Grant	26,400	1,320	3,960	31,624	367,488
Malheur	64,600	3,230	9,690	74,936	899,232
Harney	58,800	2,940	8,820	68,208	818,496
Lake	41,100	2,055	6,165	47,676	572,112
Area Totals	190,900	9,545	28,635	221,444	2,657,328

[1]*Oregon Agricultural and Fisheries Statistics* (United States Department of Agriculture, Oregon Agricultural Statistics Service), 1987–88 through 1997–98.

[2]For purposes of this study, AUMs are calculated as follows:
one mature cow + calf = 1 AUM
one bull = 1.4 AUM
one yearling steer or heifer = 0.6 AUM

[3]Annual AUMs = (Monthly AUMs) x 12

Appendix 2 (continued)

County beef cattle numbers and AUM equivalents

Year Beef Cows County	Bulls & Heifers That Have Calved[1]	Replacement (20 cows per bull)	Estimated Heifers (15% rep. rate)	Estimated Monthly AUMs[2]	Annual AUMs[3]
1995					
Grant	29,000	1,450	4,350	33,640	403,680
Malheur	70,000	3,500	10,500	81,200	974,400
Harney	61,000	3,050	9,150	70,760	849,120
Lake	44,000	2,200	6,600	51,040	612,480
Area Totals	204,000	10,200	30,600	236,640	2,839,680
1996					
Grant	28,100	1,405	4,215	32,596	391,152
Malheur	70,200	3,510	10,530	81,432	977,184
Harney	64,100	3,205	9,615	74,356	892,272
Lake	42,600	2,130	6,390	46,416	592,992
Area Totals	194,200	10,250	30,750	237,800	2,853,600
1997					
Grant	28,240	1,412	4,236	32,758	393,101
Malheur	68,170	3,409	10,226	79,077	948,926
Harney	67,330	3,367	10,100	78,103	937,234
Lake	41,210	2,061	6,182	47,804	573,643
Area Totals	204,950	10,248	30,743	237,742	2,852,904
1998					
Grant	27,300	1,365	4,095	31,668	380,016
Malheur	64,400	3,220	9,660	74,704	896,448
Harney	68,000	3,400	10,200	78,880	946,560
Lake	46,400	2,320	6,182	53,824	645,888
Area Totals	206,100	10,305	30,915	239,076	2,868,912

Change:

1994–1998	15,200
1987–1998	6,100

Percentage Change:

1994–1998	7.96
1987–1998	3.05

[1] *Oregon Agricultural and Fisheries Statistics* (United States Department of Agriculture, Oregon Agricultural Statistics Service), 1987–88 through 1997–98.

[2] For purposes of this study, AUMs are calculated as follows:
one mature cow + calf = 1 AUM
one bull = 1.4 AUM
one yearling steer or heifer = 0.6 AUM

[3] Annual AUMs = (Monthly AUMs) x 12

Appendix 3

Monthly county permit use for 1987, 1992, 1993, and 1994, in AUMs

Year / Month	Grant AUMs	Grant % of Total[1]	Malheur AUMs	Malheur % of Total[1]	Harney AUMs	Harney % of Total[1]	Lake AUMs	Lake % of Total[1]	Area Totals AUMs	Area Totals % of Total[1]
1987										
JAN	30	0.10	4,343	6.01	6,510	9.35	2,483	4.28	13,366	5.76
FEB	30	0.10	4,292	5.94	6,008	8.63	2,223	3.83	12,553	5.41
MAR	147	0.49	13,083	18.11	3,002	4.31	10,040	17.31	26,272	11.32
APR	986	3.27	4,3711	60.51	22,220	31.93	20,431	35.23	87,348	37.65
MAY	1,887	6.26	45,282	62.68	30,000	43.10	24,838	42.82	102,007	43.97
JUN	7,893	26.17	39,004	53.99	29,772	42.78	22,325	38.49	98,993	42.67
JUL	11,093	36.78	35,280	48.84	29,211	41.97	16,931	29.19	92,515	39.88
AUG	11,698	38.79	32,443	44.91	27,977	40.20	13,844	23.87	85,962	37.05
SEP	8,985	29.79	28,462	39.40	21,043	30.23	9,946	17.15	68,437	29.50
OCT	3,610	11.97	22,686	31.40	7,475	10.74	3,739	6.45	37,509	16.17
NOV	939	3.11	6,503	9.00	4,909	7.05	2,623	4.52	14,974	6.45
DEC	30	0.10	3,651	5.05	8,636	12.41	3,512	6.06	15,829	6.82
1992										
JAN	12	0.04	1,866	2.45	3,329	4.99	1,686	3.83	6,894	3.18
FEB	12	0.04	823	1.08	3,516	5.27	2,972	6.74	7,322	3.37
MAR	372	1.23	7,712	10.13	4,629	6.94	11,774	26.71	24,486	11.28
APR	1,466	4.86	33,759	44.35	37,474	56.18	16,686	37.85	89,386	41.18
MAY	2,107	6.99	34,801	45.72	48,677	72.98	24,690	56.01	110,275	50.80
JUN	9,165	30.39	33,003	43.36	47,539	71.27	24,851	56.38	114,558	52.78
JUL	11,587	38.42	28,981	38.07	38,565	57.82	19,906	45.16	99,040	45.63
AUG	12,227	40.54	25,715	33.78	32,443	48.64	14,515	32.93	84,900	39.11
SEP	10,480	34.75	23,329	30.65	16,399	24.59	11,719	26.59	61,927	28.53
OCT	4,530	15.02	14,506	19.06	7,475	11.21	2,041	4.63	28,552	13.15
NOV	927	3.07	3,436	4.51	3,332	5.00	1,467	3.33	9,161	4.22
DEC	22	0.07	3,614	4.75	6,110	9.16	4,128	9.36	13,874	6.39
1993										
JAN	13	0.04	520	0.68	1,591	2.25	1,752	3.54	3,876	1.70
FEB	13	0.04	1,292	1.68	3,027	4.28	1,867	3.77	6,199	2.72
MAR	13	0.04	1,162	1.52	2,795	3.95	1,752	3.54	5,723	2.51
APR	13	0.04	6,758	8.81	12,387	17.51	1,867	3.77	21,025	9.24
MAY	2,510	8.20	34,601	45.13	32,860	46.44	19,765	39.90	89,735	39.43
JUN	10,480	34.22	32,873	42.87	31,987	45.21	22,466	45.36	97,805	42.97
JUL	12,945	42.27	29,764	38.82	26,502	37.45	24,464	49.39	93,675	41.16
AUG	12,987	42.41	30,516	39.80	24,227	34.24	22,804	46.04	90,534	39.78
SEP	11,237	36.69	24,861	32.42	12,834	18.14	17,459	35.25	66,390	29.17
OCT	4,620	15.09	13,347	17.41	3,030	4.28	5,367	10.84	26,364	11.58
NOV	917	3.00	2,680	3.50	4,094	5.79	1,064	2.15	8,755	3.85
DEC	40	0.13	3,703	4.83	4,443	6.28	1,881	3.80	10,068	4.42
1994										
JAN	14	0.04	2,555	3.41	3,049	4.47	2,095	4.39	7,713	3.47
FEB	14	0.04	2,585	3.45	2,996	4.39	3,374	7.08	8,969	4.03
MAR	185	0.59	7,334	9.79	1,008	1.48	11,973	25.11	20,500	9.22
APR	1,482	4.69	33,431	44.61	21,396	31.37	18,544	38.90	74,853	33.65
MAY	2,524	7.98	38,059	50.79	32,708	47.95	20,848	43.73	94,138	42.32
JUN	9,413	29.76	34,144	45.56	36,935	54.15	22,945	48.13	103,437	46.50
JUL	11,728	37.08	31,802	42.44	28,957	42.45	23,334	48.94	95,820	43.08
AUG	12,183	38.53	29,451	39.30	25,693	37.67	22,276	46.72	89,604	40.28
SEP	11,285	35.68	22,706	30.30	11,927	17.49	13,997	29.36	59,914	26.93
OCT	4,547	14.38	12,466	16.64	4,022	5.90	1,606	3.37	22,640	10.18
NOV	1,175	3.71	3,300	4.40	2,984	4.38	1,037	2.17	8,496	3.82
DEC	16	0.05	2,481	3.31	2,770	4.06	1,846	3.87	7,113	3.20

[1]Each number in the "% of Total" columns is the percent of seasonal or monthly livestock forage needs of the counties or the area provided by federal range lands.

Appendix 3 (continued)

Monthly county permit use for 1995 through 1998, in AUMs

Year / Month	Grant AUMs	Grant % of Total[1]	Malheur AUMs	Malheur % of Total[1]	Harney AUMs	Harney % of Total[1]	Lake AUMs	Lake % of Total[1]	Area totals AUMs	Area totals % of Total[1]
1995										
JAN	0	0.00	2,877	3.54	3,775	5.33	601	1.18	7,253	3.07
FEB	0	0.00	2,508	3.09	4,237	5.99	1,999	3.92	8,745	3.70
MAR	41	0.12	8,998	11.08	3,665	5.18	2,702	5.29	15,406	6.51
APR	486	4.42	38,861	47.86	26,774	37.84	13,014	25.50	80,134	33.86
MAY	2,539	7.55	40,118	49.41	34,540	48.81	18,602	36.45	95,798	40.48
JUN	10,032	29.82	36,263	44.66	34,101	48.19	23,478	46.00	103,875	43.90
JUL	13,225	39.31	37,667	46.39	34,808	49.19	18,538	36.32	104,237	44.05
AUG	13,290	39.51	38,562	47.49	32,285	45.63	15,819	30.99	99,956	42.24
SEP	11,394	33.87	28,089	34.59	17,838	25.21	11,320	22.18	68,641	29.01
OCT	4,145	12.32	19,527	24.05	6,789	9.59	2,925	5.73	33,385	14.11
NOV	857	2.55	9,886	12.17	5,603	7.92	894	1.75	17,240	7.29
DEC	57	0.17	6,473	7.97	4,785	6.76	1,355	2.66	12,670	5.35
1996										
JAN	41	0.11	4,462	5.48	3,486	4.69	769	1.66	8,757	3.68
FEB	41	0.11	4,945	6.07	3,062	4.12	1,135	2.45	9,183	3.86
MAR	145	0.41	15,773	19.37	2,502	3.36	4,509	9.71	22,929	9.64
APR	2,233	6.27	45,680	56.10	24,261	32.63	15,449	33.28	87,623	36.85
MAY	2,443	6.86	45,446	55.81	33,377	44.89	20,616	44.42	101,883	42.84
JUN	9,441	26.52	40,093	49.23	34,354	46.20	22,878	49.29	106,765	44.90
JUL	14,118	39.66	39,466	48.46	35,212	47.36	21,818	47.01	110,614	46.52
AUG	13,929	39.13	35,943	44.14	32,722	44.01	18,906	40.73	101,500	42.68
SEP	12,227	34.35	28,113	34.52	19,545	26.29	13,068	28.15	72,953	30.68
OCT	5,027	14.12	16,430	20.18	6,281	8.45	2,523	5.44	30,262	12.73
NOV	938	2.64	10,534	12.94	2,600	3.50	422	0.91	14,495	6.10
DEC	55	0.15	8,180	10.05	2,448	3.29	1,659	3.57	12,342	5.19
1997										
JAN	41	0.12	5,678	7.18	4,830	6.18	1,662	3.48	12,211	5.14
FEB	41	0.12	5,174	6.54	3,662	4.69	3,510	7.34	12,386	5.21
MAR	45	0.14	16,107	20.37	3,574	4.58	10,482	21.93	30,208	12.71
APR	1,919	5.86	42,517	53.77	24,115	30.88	20,014	41.87	88,566	37.25
MAY	2,859	8.73	44,560	56.35	35,142	44.99	22,228	46.50	104,790	44.08
JUN	11,983	36.58	38,859	49.14	37,060	47.45	25,015	52.33	112,916	47.50
JUL	13,052	39.84	39,220	49.60	39,037	49.98	23,488	49.13	114,797	48.29
AUG	13,400	40.91	36,250	45.84	33,363	42.72	19,951	41.73	102,964	43.31
SEP	11,069	33.79	27,190	34.38	19,986	25.59	13,560	28.37	71,806	30.20
OCT	4,590	14.01	18,935	23.95	5,630	7.21	2,480	5.19	31,635	13.31
NOV	1,074	3.28	12,191	15.42	3,261	4.18	628	1.31	17,154	7.22
DEC	55	0.17	9,667	12.22	3,030	3.88	1,261	2.64	14,013	5.89
1998										
JAN	41	0.13	2,920	3.91	4,896	6.21	475	0.88	8,332	3.49
FEB	41	0.13	2,469	3.30	4,993	6.33	1,881	3.50	9,383	3.92
MAR	54	0.17	12,759	17.08	4,100	5.20	5,931	11.02	22,844	9.56
APR	1,770	5.59	42,382	56.73	20,074	25.45	14,128	26.25	78,354	32.77
MAY	2,818	8.90	42,608	57.04	29,462	37.35	17,467	32.45	92,355	38.63
JUN	9,165	28.94	32,822	43.94	29,712	37.67	21,916	40.72	93,615	39.16
JUL	13,591	42.92	36,222	48.49	29,014	36.78	19,858	36.90	98,686	41.28
AUG	14,178	44.77	32,550	43.57	25,824	32.74	16,331	30.34	88,884	37.18
SEP	11,300	35.68	23,915	32.01	16,364	20.74	10,543	19.59	62,122	25.98
OCT	4,417	13.95	15,615	20.90	5,522	7.00	1,461	2.72	27,015	11.30
NOV	996	3.15	5,333	7.14	3,669	4.65	349	0.65	10,347	4.33
DEC	180	0.57	4,011	5.37	4,194	5.32	507	0.94	8,892	3.72

[1] Each number in the "% of Total" columns is the percent of seasonal or monthly livestock forage needs of the counties or the area provided by federal range lands.

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