Wild Horses and Allocation of Public Resources

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Editor's Note: *Resources for the Future is a privately funded policy research organization concentrating its efforts on natural resource problems. This article touches on the economics of the Wild Horse problem.*

Wild horse management is an issue of national interest. Concern over humane treatment of wild horses and their diminishing numbers led to protection under the Wild Horse and Burro Act of 1971. Since then, rapid increase in the wild horse population has created conflicts with other users of rangeland. The current drought has caused the death of many horses and expansion of existing conflicts. The result is national attention on the problem —including a front-page article in the *New York Times* (July 30, 1977) and a full-length program on national television (CBS, September 30, 1977).

Discussion has focused on management discretion and the allocation of public range resources. Public range managers would like to expand their managerial discretion. They are acutely aware of the great expense of some current practices. Humane and wild horse organizations recognize the problem but find the past record of public managers suspect and, therefore, are hesitant to tamper with the current law. Meanwhile, other rangeland users find themselves in direct competition with wild horses. Stockmen question the importance of a large population of wild horses at the expense of their own livelihood, while environmentalists are concerned with the impact on other wildlife. Each of these perspectives was summarized at a national forum, "The Wild horse and the Western Public Lands," at the University of Nevada, Reno, April 5–7, 1977.

This paper suggests we express our knowledge of the wild horse issue in an economic framework and, thereby, draw conclusions about efficient allocation of those public resources (rangeland, labor, equipment, and dollars) used by wild horses in competition with domestic livestock and wild game. There are three parts of the paper: (1) the general principles of resource allocation, (2) the general wild horse case, and (3) suggestions for developing a quantitative evaluation in a particular grazing district.

About the Author: Bill Hyde is a native of New Mexico with graduate degrees in both forestry and economics. For the past several years his research has focused on public land management, particularly management for conflicting timber and recreational uses. His interest in wild horses is a natural outgrowth of his New Mexico background and his research.

Principles of Resource Allocation

There are two fundamental economic problems, efficiency and equity. We shall discuss efficiency first and return to equity later.

Efficiency is the problem of maximizing social welfare from a given resource base. Profit maximization by each individual in a competitive market economy simulates welfare maximization. That is, society obtains its highest valued output from the land and other resources if we follow certain allocational rules: (1) Expand operation whenever the benefits due to the last unit of input are equal to or greater than its costs. (2) When there are two inputs, if the benefits from the last dollar's worth of the first exceed those of the last dollar's worth of the second, sell some of the second and buy more of the first input. If these rules do not hold for all inputs and all individuals, then sales occur and resources reallocate as one profit-maximizing individual exchanges with another until the rules do hold.

Notice that this system bears no prejudice against the preferences, desires, or values of any citizen. If your preferences do not infringe upon mine, you may pursue them, *without judgment by me,* until they no longer bring you benefits commensurate with your costs. If your preferences do infringe upon mine, as they might if you were a wild horse lover and I a rancher, then you would have to compensate me for my loss due to infringement by you. There is no need to stand judgment on anyone's preferences except as they affect one's own.

There are social costs and benefits, however, which fail to enter the market—for example, the cost in lost forage when wild horses trespass on private land. As a result, the market does not provide for all goods, services, and amenities at the levels we prefer. Endangered species provide an example. It would be difficult to protect endangered species at a level commensurate with the sum of individual preferences for protection if shares in members of each species were sold in the market. Such goods as endangered species are called "public goods." Public goods are (1) those goods which it is impossible to provide to some people but not to others (nonexclusion) and (2) goods for which the cost of collecting fees (transactions costs) is high relative to the value of the good itself. The wild horse case includes both nonexclusion and high transactions cost aspects.

The existence of public goods is justification for public intervention. Private individuals cannot profitably provide efficient levels of public goods. The public agency responsible for each

good optimally allocates resources in accordance with the competitive market rules. It has the difficult problem, however, of determining just what are the goods' incremental benefits and costs. For example, it is difficult enough assessing the ecological impact of another wild horse, let alone evaluating its social costs and benefits in dollar terms.

The Bureau of Land Management provides an excellent example of justifiable public intervention. Before the Taylor Grazing Act, range was open to anyone's stock. Nonexclusion led to overgrazing and prevented individual ranchers from making range improvements because they could not be certain of capturing the full benefit of their efforts. This problem could have been solved by selling the public land to individual stockmen, but to do so would have been to ignore, therefore to misallocate, other public goods originating on the public land. The solution is for each use of public land to pay its own way to the extent that (1) the use is exclusive, (2) its costs are identifiable, and (3) transactions costs are small. Thus, ranchers are required, under the new Organic Act, to pay the fair market value for grazing rights. Nonexclusion and high transactions costs, nevertheless, may still prevent BLM from covering the costs of maintaining the public land for its recreational and vicarious values.

We have discussed the rules for efficient resource allocation, as well as the justification for public intervention. We can turn to the other fundamental economic problem, equity. Equity refers to the distribution of wealth. Adjustments in the wild horse population have their most significant impact on stockmen, but there already exist many public measures for protection of this group's *overall* well-being. When adjustments in the wild horse population create particular hardship for an individual stockman, however, equity is an important concern—for example, when efficiency requires one ranch to forgo a substantial portion of its public grazing rights. Such cases may require additional consideration, including public assistance to ease the ranch's adjustment. Such cases are probably isolated and can be handled as they arise.

The General Applied Problem

The first thing we can do about the wild horse issue is to dismiss all arguments about the "nativeness" of today's wild horses. It is sufficient that some people have a preference for maintaining them. The job of the public resource manager is to see that this preference, like all others, is met at a level commensurate with its costs.

Of course it is reasonable to inform the public of the fact regarding these horses' ancestry—but it is not clear just what the facts mean. These horses may not be direct descendants of the original Spanish horses, but this does not mean they are unnatural in their environment. Just what is natural or unnatural at this moment in time, or just what is the optimal historical link, is something for biologists and historians to argue. The fundamental point for us is that no one has the authority to judge another's preference *vis-à-vis* wild horses once the facts are available.

Once we have accepted the preferences of some for continued existence of wild horses, then we can proceed to discuss wild horse management. And wild horses must be managed, otherwise overpopulation and coincident destruction of the range will lead to numerical control by starvation and disease. Predators do not play a large role. One of the co-issues in wild horse management is *humane* treatment. There is nothing humane about destruction of the range for all uses and control by starvation.

Public resource managers now include management of wild horses in their land use plans. Too often, however, they are satisfied with the simple knowledge that consumer demand exists before turning to the easier questions of production. They show little interest in the level of demand. They are handicapped by the paucity of data on wild horse demand, but if they are to efficiently allocate public resources, they must not only be aware of this problem, they must overcome it.

From this statement of the wild horse problem, we can now turn to its qualitative evaluation. The general procedure for wild horse management compares consumer benefits with management costs. Again, efficient allocation of public resources occurs when an additional unit of management (one dollar's worth of labor, for example) yields as much benefit as it costs. The qualitative benefits and costs are:

benefits = 1) value of recreational viewing of the horses, plus
2) the vicarious values

costs = 1) the opportunity value for domestic livestock and wildlife forgone, plus
2) the separable cost of managing wild horse, minus
3) the value of wild horses to their foster parents, plus
4) the cost of public scrutiny of foster homes, plus
5) the cost of negative externalities created by the horses.

The actual quantities depend on (1) the character of the basic resources and (2) the availability of alternatives.

The value of recreational viewing of wild horses is straightforward—if difficult to calculate. It is the value of the thrill a schoolchild, for example, gets when he observes a wild herd. Vicarious values are those gained through the enjoyment of others or through just knowing wild horses will be there whether a person ever sees them or not. Given the nationwide support for wild horses from people who are unlikely to ever see more than a picture of a wild horse, vicarious values may be large in our case.

Opportunity cost is the value of livestock and game forgone because horses are on the public range. There are many costs of general range management. Those directly due to wild horses, and not for joint management of range for several purposes, are separable costs. The most obvious separable costs of wild horse management are round-up costs and the legal costs incurred in defense of public agency management. Other costs include extra measures required to ensure humane treatment, including enforcement of regulations on foster homes. They are decreased by the value of wild horses to their foster parents. Negative externalities are unwilling costs incurred by private individuals and due to public wild horse management, notably unwanted wild horse grazing on private land.

Even without quantifying these values, there are a few things they suggest about optimal resource allocation: (1) an advantage to public, as opposed to private, management, (2) an advantage for a few centralized ranges, and (3) a tradeoff between viewing and vicarious benefits on the one hand and humane treatment on the other.

The difficulty of excluding nonpecuniary benefits, as well as the high transactions costs, both suggest wild horses are best a publicly managed resource. The difficulties in separating livestock and game uses from wild horse uses of the range reinforce this suggestion.

The way to obtain maximum recreational viewing benefits for the dollar may be to concentrate the horses on centralized ranges particularly suited for them, like the National Bison Range or various waterfowl sanctuaries. Viewing stations along roads and trails could be built with greater confidence that viewers would see wild horses from them than from the open range. Management costs would diminish as conflicts with domestic

ok then lets compare advantage of total removal + adoption costs -- to cost of effective pop. mgt in present locations

livestock use of the range disappear and as the protection effort is concentrated. Such National Wild Horse Ranges would have to be taken from range currently devoted to other uses. Thus an additional cost of separate wild horse ranges might be the cost of purchasing grazing rights from their current owners. Finally, we cannot overlook the fact that these ranges would have to be carefully chosen with the horse's natural range in mind, otherwise they could easily escape, first introducing on adjacent grazing land intended for domestic livestock and wild game, and eventually ranging afar and creating all the same problems we have today.

Mistreatment is a major reason for interest in wild horses, and it raises some difficult questions. Given that management implies some control on population levels—some removal, including killing—then concern over mistreatment suggests that any killing should be done quickly, minimizing the agony. This is no different than the treatment we expect in the processing of all livestock. Shooting is acceptable, and there is no harm in rendering the remains. Rendering could be looked upon as conserving a resource, as well as a means for providing additional financing for wild horse management. It is important to recognize that the additional costs of other answers to mistreatment questions imply that less money remains for other wild horse management issues, including providing for recreational viewing of the animals. Thus there is some tradeoff between the preferences for (1) humane treatment and (2) viewing opportunity.

The conclusion is one we already know. The wild horse is certainly no all-or-nothing issue. Managers and users must consider a variety of alternatives and competing issues—even in their own minds and aside from the valid preferences of others.

Quantitative Evaluation

The benefits and costs must be quantified to be useful for management. Benefits and costs will not be the same for all sites. Therefore, quantification must occur on the land-operating unit level. Actual quantities, solution to the allocation problem, must reflect site-specific land capabilities.

A demonstrative case study could help guide land managers. It should be completed by research scientists with both economic and biological abilities. The job is complicated by severe data shortcomings. Estimates *must* be made, nevertheless, for each benefit or cost before any allocational conclusions can be drawn. And we all know these conclusions will be drawn. If they are not drawn from poor estimates, they will be drawn from ignorance. Poor estimates are preferable to ignorance.

The case study should be chosen from a geographic area of sufficient size to include a full annual range for a wild horse population. The various costs can be gathered from the budgetary experience of local public agencies and rancher permittees. Better cost estimates can be obtained where public agencies use program budgets that associate input costs with output values. Market prices can determine the opportunity value of domestic livestock use. Where land use costs are unknown—particularly the costs associated with various management impacts on the land, the horse population, and its competitors—similar experiences elsewhere may provide insight, but biological expertise must be consulted to ensure that the experiences are similar.

Benefits of the recreational viewing and vicarious value sort are particularly difficult to estimate. *We cannot ignore them, however, if we expect to justify any level of wild horse population whatsoever.* Experience in benefit estimation is limited, but some guidance can be obtained from other efforts at wildlife evaluation. The economic theory is well developed. Its application can be valuable in development of fair laws and guidlines for land management where wild horses are involved.

In conclusion, the wild horse is no all-or-nothing problem. The laws and management practices concerning rangeland and wild horses need to be fully considered and amended or modified to keep within practical economic and social limits. Careful analysis of the problem for a localized demonstrative case would provide policy and management guidance.

Marketing Alfalfa Leafcutter Bees

The benefits from leafcutter bees in western Canada run into the millions every year, from selling bees and from the production of pedigree alfalfa seed.

The nature and manageability of leafcutter bees make them suitable for buying, selling, and renting. To encourage the expansion of this entomological industry, the Lethbridge Research Station has developed methods for estimating bee populations.

Such a system is needed to ensure fair prices and fair value for the sale of surplus bees. Accurate estimates must be based on known measures of precision, or bench marks, for the number of cocoons, females and parasites.—*Weekly Letter,* Research Station, Lethbridge