AN ECONOMIC STUDY OF DALL SHEEP HUNTING IN ALASKA: CONCEPTS AND METHODS

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ABSTRACT

Economic values of Dall sheep (Ovis dalli dalli) hunting in Alaska are needed for comparison with economic values of competing development alternatives such as grazing, settlement, agriculture and mining. This paper details the concepts and methods used to estimate the economic value of Dall sheep hunting to the State and to the hunter. A mail survey was used to question all 2,517 people who reported hunting Dall sheep in Alaska in 1983. After 8 weeks, over 85% of the questionnaires were completed and returned. Economic values of Dall sheep hunting will be estimated using travel cost, contingent valuation, and gross expenditure methods. These values will be used to demonstrate the value of Dall sheep hunting to the State economy and to Dall sheep hunters. The value of Dall sheep habitat can be inferred.

INTRODUCTION

Since passage of the Alaska Native Claims Settlement Act (1971) and the Alaska National Interest Lands Conservation Act (1980), the question, "Who owns what?" has become "What do we do with it?". Alaska is now confronted with critical resource use decisions ranging from the local level to statewide policy. Together, these decisions will affect the State's future.

The Alaska Constitution mandates that the State's natural resources will be managed "for the maximum benefit of its people" (Article VIII, Section 2). The Alaska State legislature and resource management agencies are faced with determining what constitutes "maximum benefit" in the broad public interest. These bodies recognize the need for information allowing for the objective evaluation of conflicting resource use allocations.

This paper focuses on the concepts and methods of economic valuation, a procedure which is increasingly being used by wildlife managers for determining "maximum benefit". The economic approach recognizes that tradeoffs must be made and provides an objective and consistent basis for comparing different uses of the same resources. This approach does not intend to deny the importance of non-economic considerations. In combination with biological, social, and cultural data, it can be used

to establish management priorities and policies and to improve the allocation of resources.

If economic valuation is to be used in analyzing situations involving wildlife and wildlife habitat allocations, it is especially important for wildlife managers to participate. If no values for wildlife are determined, then wildlife may not be considered among possible resource uses and will probably not be placed highly among competing uses. It is insufficient to say "wildlife is priceless". If we fail to demonstrate the economic values of wildlife, then habitat is likely to be allocated for other uses "for the maximum benefit" of the people of Alaska.

Wildlife managers of the Alaska Department of Fish and Game (ADF&G) have the responsibility to participate in such an economic valuation process. Title 16 of the Alaska Statutes states that employees of ADF&G, as extensions of the duties of the Commissioner, have the responsibility to "manage, protect, maintain, improve, and extend the fish, game, and aquatic plant resources of the State in the interest of the economy and general well-being of the State" (emphasis added). Article II of the State Constitution broadly defines the "State" as the "people".

This study was begun by the Dall sheep research staff of the Alaska Department of Fish and Game in response to the clear need for an economic value for Dall sheep and Dall sheep habitat. Over three-fourths of the Dall sheep in Alaska live outside National Parks and are vulnerable to resource use decisions. Even sheep in National Parks may not be entirely protected from the consequences of resource development as portions of their range may extend beyond Park boundaries. Uses already proposed for Dall sheep habitat that are incompatible with Dall sheep include grazing of domestic livestock, human settlement, agriculture, and mining of major mineral licks.

This study focuses on one use of Dall sheep, hunting, and estimates the contribution of expenditures related to sheep hunting to the State and the value of sheep hunting to hunters. Other uses of Dall sheep such as viewing or "just knowing they are there" certainly have value too, but those values are more difficult to measure. Thus, the economic value obtained will represent a minimum value for Dall sheep. This study will not measure the value of sheep in National Parks and in State-managed closed areas as they are unavailable to hunting.

METHODS

A mail survey was used to question all resident and nonresident hunters who reported (as mandated by law) hunting Dall sheep in Alaska in 1983. Subsistence hunters, who may compose about 2% of the hunters, were not surveyed.

Gross expenditures, travel cost, and contingent valuation were 3 techniques used in the survey to determine economic values of Dall

sheep hunting. More than one method was used so the value of Dall sheep hunting will be comparable to the values of alternative uses obtained through several methods. Additional techniques could have been applied, but they would have required a longer questionnaire, which could have lowered the response rate. The gross expenditures technique sums up the total amount of money spent on the hunt. Expenditure data are useful in estimating monetary costs to the user. It is commonly used as an impressive figure to bolster a point of view. However, it can be misunderstood and misused because it does not consider costs, and it does not estimate net benefits.

Two additional methods were used to measure net benefits. The travel cost method was developed by Knetsch (1963) and numerous revisions have improved the technique (Stoll 1982). It is based on the principle that as the distance traveled to reach a site increases, travel costs increase, and the proportion of people in the associated geographic area willing to make the trip decreases. If people coming from different distances receive the same benefits on the site, then the difference in their travel costs equal the difference in the net benefits they receive (Bart et al. 1979).

Contingent valuation is another suitable technique for measuring net benefits. It asks users to estimate how much more their costs could increase before they would switch to another activity. The amount between what they actually paid and their ceiling amount is the net benefit. Answers to this question are typically constrained by income. Another technique for measuring contingent value is asking for how much a user would sell the activity. These methods are most easily used with goods already exchanged on the market. Users often have difficulty predicting their own willingness to pay or sell for non-market items (Dwyer et al. 1977).

As high response rates in mail surveys tend to reduce nonresponse bias and increase the precision of results (Filion 1978), a number of techniques recommended by Filion (1980) and Linsky (1975) were used to stimulate response from hunters. Pre-contact with sheep hunters was made through newspaper articles and posters displayed to the general public announcing the upcoming survey. The survey was pretested by the Alaska Chapter of the Foundation for North American Wild Sheep who offered improvements in the wording of questions. Length and appearance of the questionnaire were considered important. The final questionnaire contained 18 (for residents) or 20 (for nonresidents) questions on 4 double-sided pages (Watson, 1984 A and B). A cover letter signed by the Director of Game Division, Alaska Department of Fish and Game, explained the purpose of the survey and was printed inside the cover page. Illustrations and colored ink were used to enhance the visual impact of the questionnaire.

Respondents were assured of their anonymity and questionnaires were not individually identified. However, each questionnaires package included a postage-paid return envelope that was numbered to separate respondents from nonrespondents. Once questionnaires were removed from the numbered envelope, it was not possible to identify the respondent.

Questionnaires were mailed with first class postage to ensure return of undeliverable questionnaires. Colorful stamps rather than plain metered stamps were used.

Three weeks after the first mailing, a reminder postcard (Heimer, 1984) was sent to all hunters who had not yet responded. The postcard was an inexpensive means of soliciting additional response. It carried a brief message signed by the sheep research staff and was illustrated and printed on colored paper. Colorful first-class stamps were again used.

After 3 more weeks, the remaining nonrespondents were sent a second questionnaire via first-class mail. The second mailing contained an added letter from the Director asking for the hunter's cooperation (Pamplin 1984). In addition, the numbered and addressed return envelope carried a first-class stamp picturing a mountain sheep.

During the mailings, the study was given some publicity with 2 newspapers carrying articles and radio and television stations featuring it in outdoors reports and news. Public service announcements were sent to all television and radio stations in the State to be aired at their discretion. This publicity was used to remind and encourage hunters to respond.

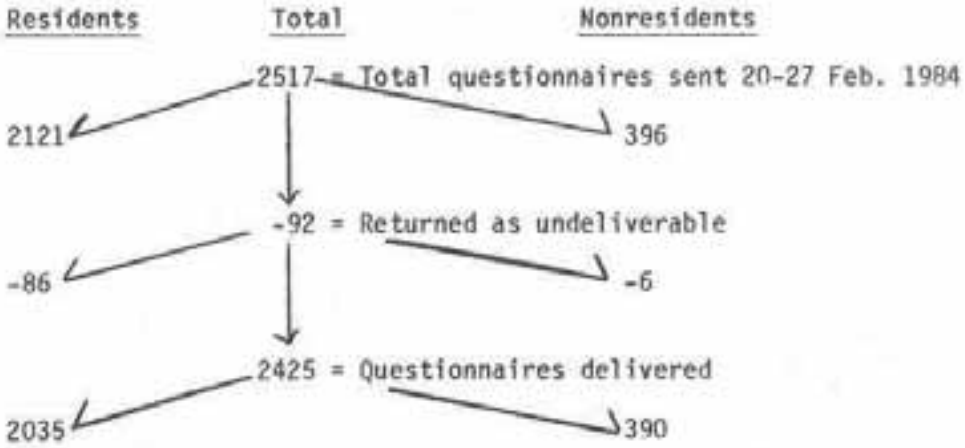
RESULTS

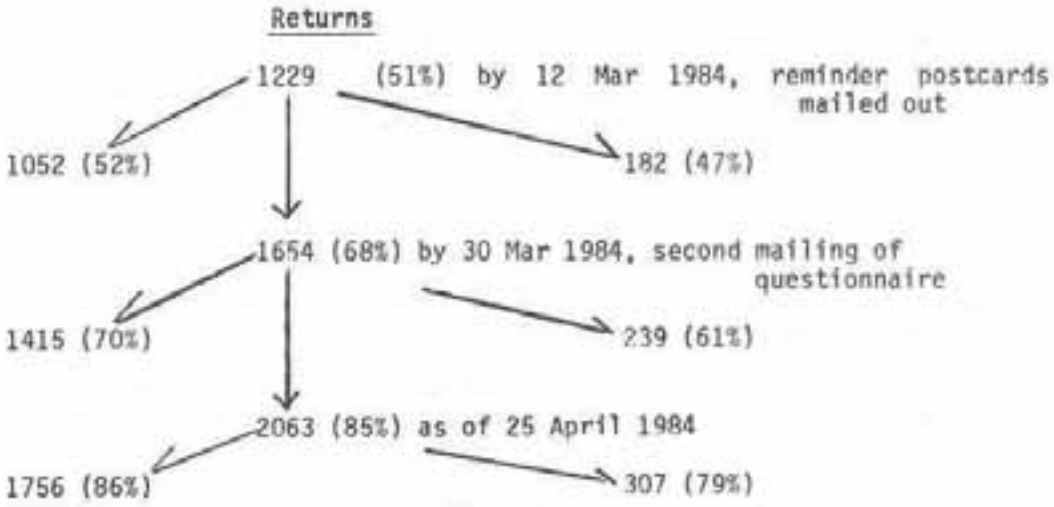
Between 20-27 February, 1984, 2,517 questionnaires were mailed to all hunters who reported hunting Dall sheep in Alaska in 1983: 2,121 were sent to residents and 396 were sent to nonresidents including 26 hunters from foreign countries. Ninety-two were returned as undeliverable reducing the total number of hunters receiving the questionnaire to 2,425 (2,035 residents, 390 nonresidents). After about 3 weeks, 1,229 (51%) had responded and reminder postcards were sent to the nonrespondents. After approximately 3 more weeks had passed, 1,654 (68%) had responded and a second mailing of the questionnaire was sent to nonrespondents. As of 25 April 1984, 2,063 (85%) of the hunters who had received questionnaires had responded, including 1,756 (86%) residents and 307 (79%) of the nonresidents. Twelve (46%) of the hunters from foreign countries had responded. Responses are still arriving in the mail, although at a slow rate. These results are graphically represented in Table 1. Questionnaire return rates are the only results available at this time.

DISCUSSION

The 85% (as of 25 April 1984) return is considered a high return rate for a mail survey (Filion 1980, Linsky 1975). There are probably 2 main reasons why this occurred. First, the survey sampled a relatively homogeneous population with a strong interest in the subject matter--Dall sheep hunting. Dall sheep hunters are consistently the most

Table 1. Flow chart showing the number of questionnaires sent to Dall sheep hunters (both residents and nonresidents) and the number returned. Reminder postcards and a second mailing of the questionnaire prompted additional responses.





responsive group of big game hunters in Alaska, with typically 75% annually reporting harvest data. In contrast, 65% and 30% of moose and caribou hunters, respectively, report harvest data each year. The second probable reason for the high return rate from sheep hunters is that the mail survey strategies for eliciting high response worked. A poorly designed questionnaire with no publicity or additional mailings probably would not have received much consideration by the public.

LITERATURE CITED

Bart, J., D. Allee, and M. Richmond. 1979. Using economics in defense of wildlife. Wildl. Soc. Bull. 7(3):139-144.

Dwyer, J.F., J.R. Kelley, and M.D. Bowes. 1977. Improved procedures for valuation of the contribution of recreation to national economic development. Water Resour. Center. Univ. of Illinois, Res. Rep. 128. 218 pp.

Filion, F.L. 1978. Increasing the effectiveness of mail surveys. Wildl. Soc. Bull. 6(3):135-141.

_____. 1980. Human surveys in wildlife management. Pages 441-453 in S.D. Schemnitz, ed. Wildlife Management Techniques Manual, 4th ed., revised. Wildl. Soc., Wash. D.C.

Heimer, W.E., 1984. Reminder postcard sent to sheep hunters who did not answer questionnaire. Alaska Department of Fish and Game release.

Knetsch, J.L. 1963. Outdoor recreation demands and benefits. Land Econ. 39:387-396.

Linsky, A.S. 1975. Stimulating responses to mailed questionnaires: a review. Public Opin. Q. 39:82-101.

Pamplin, W.L. 1984. Letter to sheep hunters accompanying second mailing of questionnaire. Alaska Dept. of Fish and Game release.

Stoll, J.R. 1982. Recreational activities and nonmarket valuation: the conceptualization issue. Texas Agri. Exp. Sta., TA-17539. 15 pp.

Watson, S.M. 1984a. Alaska resident Dall sheep hunter survey. Alaska Dept. of Fish and Game release.

Watson, S.M. 1984b. Alaska nonresident Dall sheep hunter survey. Alaska Dept. of Fish and Game release.